FORMER PENINSULA HOSPITAL SITE
FAR ROCKAWAY, QUEENS, NEW YORK

Remedial Action Work Plan

NYSDEC BCP Number: C241200

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CERTIFICATIONS

I, KEVIN LOYST, 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).

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

STATE OF NEW YORK KEVIN F. LOYST 076321-1 LICENSED PROFESSIONAL ENGINEER

NYS Professional Engineer #	Date	Signature
076321-1	1-20-21	

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.

FINAL REMEDIAL ACTION WORK PLAN

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LIST OF ACRONYMS

Acronym	Definition
1,1,1-TCA	1,1,1-Trichloroethane
ACMs	Asbestos-containing materials
ASP	Analytical Services Protocol
AST	Aboveground storage tank
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CAMP	Community Air Monitoring Program
CoC	chain-of-custody
CVOC	Chlorinated volatile organic compound
dB	Decibel
DEP	Department of Environmental Protection
DUSR	Data Usability Summary Report
EDDs	Electronic data deliverables
ELAP	Environmental Laboratory Approval Program
ESA	Environmental site assessment
FDNY	Fire Department of the City of New York
FAR	Floor area ratio
FPM	FPM Group, Ltd.
HASP	Health and Safety Plan
HDPE	High density polyethylene
HSO	Health and Safety Officer
MS/MSD	Matrix spike/matrix spike duplicate
MSL	Mean sea level
NAPL	Non-aqueous-phase liquid
ng/l	Nanograms per liter
NTU	Nephelometric turbidity unit
NYC	New York City
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PAH	Polynuclear aromatic hydrocarbon
PBS	Petroleum bulk storage
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
PFAS	Per- and polyfluoroalkyl substances
PG	Professional geologist
PID	Photoionization detector
PPE	Personal protective equipment

Acronym	Definition
PVC	Polyvinyl chloride
PVE	PVE Sheffler/Lawrence Environmental Group
QA/QC	Quality Assurance/Quality Control
QEP	Qualified environmental professional
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RIR	Remedial Investigation Report
RIWP	Remedial Investigation Work Plan
SCGs	Standards, criteria and guidance
SCOs	Soil Cleanup Objectives
SIM	Selective ion monitoring
Standards	Part 703.5 Class GA Ambient Water Quality Standards
SVI	Soil vapor intrusion
SVOCs	Semivolatile organic compounds
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TIC	Tentatively-identified compound
ug/l	Micrograms per liter
ug/m^3	Micrograms per cubic meter
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
USGS	United States Geologic Survey
USTs	Underground Storage Tanks
VOCs	Volatile organic compounds

EXECUTIVE SUMMARY

This Section includes a Site description and summary of its history, a summary of the Remedial Investigation (RI) results, a summary of the qualitative human health exposure assessment, and a brief summary of all elements of the proposed Remedial Action, including a description of each Engineering and Institutional Control.

Site Description/Physical Setting/Site History

The Former Peninsula Hospital Site (BCP #C241200) is located in Far Rockaway, Queens County, New York and is owned by Peninsula Rockaway Limited Partnership (Volunteer). The Site occupies approximately 8.76 acres and was previously identified by the New York City Tax Map as Borough of Queens, Block 15843, Lot 1 and Block 15842, Lot 1; these lots were recently merged and the Site is now identified on the New York City Tax Map as Borough of Queens, Block 15843, Lot 1 with an address of 51-15 Beach Channel Drive. The Site received approvals in November 2019 for a series of land use actions, including a zoning map amendment, special permits, and a City Map amendment, to facilitate redevelopment.

The Site was formerly developed with a large building between 1957 and 1962 that was operated as the Peninsula Hospital until it closed in 2012. The hospital building was surrounded by paved parking areas. A small maintenance building was formerly present on the southwest corner of the Site from 1983 until it was removed (between 1994 and 2003). Prior to the hospital use, the Site was undeveloped except for the southwestern corner, which was formerly occupied successively by a small hotel (from prior to 1912 until sometime before 1933), several residences, and three small stores (by 1951). The former hospital building was serviced by municipal water and sewer provided by the City of New York, and electric and gas services provided by Con Edison of New York. These utilities were disconnected prior to building demolition. The Site's solid waste was formerly removed by the NYC Department of Sanitation.

The hospital building was formerly heated via fuel oil-fired heating equipment located in the boiler room in the south wing of the building. The associated fuel oil underground storage tanks (USTs) were removed with NYSDEC oversight in 2016. An above-ground storage tank (AST) for fuel oil was also removed in 2016 and a geophysical survey was performed to locate any additional tanks. Several geophysical anomalies were identified and excavated in 2016, but no additional tanks were identified.

A petroleum release (NYSDEC spill #1508760) was identified in association with the fuel oil USTs. Petroleum-impacted soil and floating product on the water table in the vicinity of the USTs were removed during the 2016 tank removal activities. This spill remains open.

Other areas of potential concern were identified for the Site, including a former hazardous materials and paint storage area and a former maintenance building. All of the areas of concern were investigated during the RI.

Demolition of the onsite buildings commenced in January 2018 and was completed by mid-2018. Demolition included all above-grade building materials and below-grade foundation elements. The concrete was crushed and re-used onsite as needed for temporary backfill in the depressed areas that resulted from building demolition, as per New York City (NYC) Department of Buildings requirements. All other building materials, including excess crushed concrete, were removed and disposed offsite.

Redevelopment of the Site is planned; the proposed uses include restricted residential and commercial uses. When fully redeveloped the Site will include ten multi-story mixed-use buildings, parking areas, new streets, landscaped public open spaces, and a public plaza. During redevelopment the Site grade will be raised for flood protection and the lowest levels of the newly-constructed buildings will generally be at the new grade. At-grade areas will generally be used for parking, retail, and community facility space.

Site redevelopment will be conducted over several years in a phased manner, with the northern portion of the Site redeveloped first, followed by the other portions of the Site. As redevelopment proceeds, the current tax lot will be subdivided into multiple lots. Remedial activities for the entire Site will be conducted under this Remedial Action Work Plan (RAWP) during the initial phase of Site redevelopment. Subsequent activities will be conducted under a Site Management Plan (SMP).

Summary of the Remedial Investigation

The Site is located on the Rockaway Peninsula, between Jamaica Bay and the Atlantic Ocean, which has influenced its geologic and hydrogeologic conditions. The present topographic elevation of the Site is approximately 5 to 10 feet above mean sea level (MSL) and the ground surface is relatively flat. The Site has been modified from its original configuration (former marsh with an elevation near sea level) by placement of historic fill. Beneath the historic fill, the Site is underlain successively by organic marsh deposits in places, and by Upper Glacial Formation sand, silt, and clay outwash deposits. The Gardiners Clay, consisting of clay with interbedded silt and sand, is present below the Upper Glacial Formation and acts as an aquitard between the Upper Glacial Formation and the deeper Magothy Formation. The top of the Gardiners Clay is present at an approximate elevation of between -50 and -100 feet MSL in the Site vicinity.

Groundwater is present beneath the Site in the deeper portions of historic fill and in the underlying Upper Glacial Formation deposits. The depth to groundwater beneath the Site has generally been between 4 and 8 feet below grade, but was found to range from 2.5 to 4.5 feet below grade during the RI. This shallower water table may have resulted from higher-than-normal rainfall in 2018.

The regional groundwater flow direction in the Site vicinity is generally to the north, but the Site-specific groundwater flow direction determined during the RI showed a groundwater mound near the center of the Site and a lower water table surface to the northwest and southeast. The RI data were obtained in September and October 2018, several months after the hospital building was demolished and while much of the Site remained paved. The former location of the former hospital building had been backfilled with crushed concrete and was unpaved. During this time the above-average rainfall likely recharged the water table in the former area of the hospital building, resulting in a groundwater mound beneath the central portion of the Site.

Soil

Historic fill and native soil have been sampled during several Phase II investigations and during the RI. Historic fill is present throughout the Site, with the exceptions of much of the southeastern portion of the Site and small areas adjoining the eastern and western edges of the Site and generally ranges from 1 to 2 feet in thickness, with a very limited area near the southwestern corner of the Site having up to 5 feet of fill. The fill generally consists of brown to gray fine to coarse sand with trace quantities of brick, concrete, and/or gravel fragments and occasional asphalt fragments.

Native soil is present beneath the historic fill, or in cases where historic fill is absent, beneath the pavement that covers much of the Site. The native soil includes organic marsh deposits in places and Upper Glacial Formation sand, silt, and clay outwash deposits beneath the majority of the Site. The native soil was noted to generally consist of fine to medium-grained light brown to gray sand with intervals of gravel and/or silt. Organic (plant) materials from former marsh deposits were noted in the deeper portions of several of the RI borings.

The RI results demonstrate that the historic fill contains a limited range of VOCs, a wider range of SVOCs (primarily PAHs), several metals, and pesticides. The PCB Aroclor 1254 and cyanide were detected in a limited number of samples. The native soil was found to contain very few VOCs, some PAHs, several metals and pesticides. The PCB Aroclor 1254 was found in a limited number of samples and cyanide was detected in an extremely limited number of samples.

The soil/fill chemical analytical results are summarized as follows:

- VOCs for which exceedances of the unrestricted use SCOs were noted include acetone, xylenes, 2-butanone, and naphthalene. One naphthalene detection was also noted to exceed its SCO for restricted residential use. No chlorinated VOC (CVOC) detections in the soil/fill samples were noted to exceed any SCOs. In general, the concentrations of VOCs for which exceedances of the unrestricted use SCOs were noted decreased downward, with fewer exceedances noted in the native soil underlying the fill;
- SVOCs for which exceedances of the unrestricted use SCOs were noted in the soil/fill were primarily the PAHs. PAH detections also exceeded the SCOs for restricted residential use and/or protection of groundwater in several samples in the southwestern portion of the Site and in the former boiler room area. As visible or other indications of potential petroleum contamination were not observed in any of the RI borings, the presence of PAHs in the soil/fill may be related to the minor amounts of asphalt fragments observed in some of the samples. As the exceedances in the native soil were noted in only a limited number of

samples collected from just below the fill or overlying asphalt pavement, it is likely that some of the PAHs detected in the native soil are related to the overlying fill or asphalt;

- Metals for which exceedances of the unrestricted use SCOs were noted include arsenic, barium, cadmium, chromium, copper, lead, mercury, silver, and zinc. Some of the metals detections in samples collected during the RI and prior investigations also exceeded the SCOs for restricted residential use; these include two fill samples from the eastern part of the Site and several samples from the southwestern part of the Site that contained lead exceeding the SCO for restricted residential use, samples from the southwestern and southeastern parts of the Site that contained arsenic in excess of its restricted residential use SCO, one sample with a cadmium exceedance in the southwestern portion of the Site, and one sample from the northeastern portion of the Site that contained mercury in excess of its restricted residential use SCO. All of the exceedances of the restricted residential use SCOs for metals were in fill samples. The presence of metals in the fill is consistent with the nature of historic fill and does not appear to be related to former onsite hospital operations.

- Pesticides, including 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE, were detected in many of the soil/fill samples at levels above their unrestricted use SCOs. The pesticides heptachlor and cis-chlordane were each detected in one fill sample at levels above their unrestricted use SCOs and the pesticides dieldrin and cis-chlordane were each detected in one to two native soil samples at levels above the unrestricted use SCOs. None of the pesticide detections exceeded the restricted residential use SCOs and the concentrations decreased downward from the fill into the native soil. The widespread presence of these pesticides in both fill and the underlying native soil throughout the Site, including beneath the footprint of the former hospital building and the associated paved parking areas, indicates that these detections likely result from historic regional spraying of DDT for insect control. There does not appear to be a relationship between pesticide detections and former hospital operations.

- The PCB Aroclor 1254 was detected in several samples and the PCB Aroclor 1260 was detected in one sample at levels above the unrestricted use SCO; none of these detections exceeded the restricted residential use SCO. The PCBs are likely related to typical historic fill conditions and were noted to decrease downward.

- None of the cyanide detections in soil/fill exceeded any SCOs.

In summary, the soil/fill at the Site is impacted by VOCs, SVOCs, metals, pesticides, and two PCBs. Most of the impacts exceeded the unrestricted use SCOs, with some impacts also exceeding the restricted residential use and/or protection of groundwater SCOs. Most of the impacts appear to reflect typical historic fill conditions, including the presence of PAHs likely associated with the limited amounts of asphalt observed in the fill and metals associated with ordinary human activities. Pesticide detections appear to be related to historic regional DDT applications for insect control. None of these impacts appear to be related to prior hospital operations.

Groundwater

Groundwater sampling was conducted at 10 onsite wells during the RI. None of the groundwater samples contained any VOCs, PCBs, cyanide, or pesticides above NYSDEC Standards and 1,4-dioxane was not detected in any of the wells for which this analyte was tested.

Dissolved sodium, manganese, magnesium, iron, and/or antimony are present in groundwater at levels that exceed the Standards. The sodium levels are elevated in every well, likely due to the proximity of the Site to the Atlantic Ocean and Jamaica Bay. The magnesium concentrations vary with the sodium levels and appear to be related to seawater influence. Iron levels are typically elevated in Long Island groundwater and these detections are likely naturally-occurring. The detections of antimony and manganese in limited areas of Site groundwater do not appear to be related to Site soil conditions.

Benzo(a)pyrene was the only SVOC for which exceedances of its Standard were noted in groundwater. The maximum benzo(a)pyrene detection was at well MW-7, near the former maintenance building location. Elevated concentrations of benzo(a)pyrene were noted in nearby soils, including two detections that exceed the groundwater protection SCO and could be the source of the benzo(a)pyrene noted in groundwater.

PFOA and/or PFOS were detected in groundwater above NYSDEC guidance for these compounds in wells on the north and south sides of the Site. The highest concentrations were detected in well MW-8, which adjoins Rockaway Beach Boulevard on the south side of the Site and is not located in proximity to any of the former building locations or other formerly active areas of the Site. It is likely that the PFAS detections reflect ambient groundwater quality in the Site area.

Soil Vapor

1,1,1-TCA, TCE, PCE, and/or carbon tetrachloride were identified in soil vapor at several locations on the Site. Most of the detections were at relatively low levels, but somewhat elevated levels of 1,1,1-TCA, PCE and TCE were noted in proximity to the former hospital boiler room, and PCE was identified in soil vapor on the southwest portion of the Site in proximity to a former maintenance building location. TCE was previously detected in soil vapor in this area. Carbon tetrachloride was previously identified in proximity to the former hospital building. These VOC detections were at levels for which mitigation for SVI may be needed for future buildings.

Qualitative Human Health Exposure Assessment

Based on the data from the RI and prior investigations, it was concluded that the media of concern with respect to human health risk are the soil, soil vapor, and groundwater at Site. Potential routes of human exposure were evaluated for each of these media and the potential for completed exposure pathways was assessed.

Soil

The Site is presently vacant and secured and much of the area where the impacted soil is present remains paved. It was concluded that there is no reasonable potential for contact with the impacted soils under current conditions.

The Site is scheduled to be redeveloped. Construction and/or remediation workers may be exposed to the impacted soils during redevelopment activities. However, construction and remediation activities are anticipated to be conducted utilizing a Health and Safety Plan (HASP) that includes measures to control and minimize worker exposure to impacted soil. Therefore, it was concluded that there is no risk to construction and/or remediation workers from the impacted soil if the appropriate controls are implemented under a HASP.

Following redevelopment, there is the potential for future Site workers, occupants, or visitors to be exposed to the impacted soils if they are not removed or covered. However, it is anticipated that remedial measures for soil will be implemented during redevelopment. Remedial measures may include removal of the affected soils and/or engineering and/or institutional controls (ECs/ICs) to control potential exposures. Therefore, it was concluded that there is no risk to future

Site workers, occupants, or visitors from the impacted soil if the appropriate remedial measures and/or controls are implemented.

Soil Vapor

At present, there are no buildings on the Site and the Site is vacant and fenced. There are currently no workers, visitors, or occupants at the Site and, therefore, there is no reasonable potential for exposure to soil vapors under current conditions.

During redevelopment, construction and/or remediation workers may be exposed to soil vapors during intrusive activities in the areas where soil vapors are present. However, construction and remediation activities are anticipated to be conducted utilizing a HASP that would include monitoring for soil vapors and measures to control and minimize worker exposure to soil vapor. Therefore, it was concluded that there is no risk to construction and/or remediation workers from the soil vapors if the appropriate monitoring and controls are implemented under a HASP.

Chlorinated solvents are present in soil vapor at levels that could intrude into buildings and present an exposure concern via inhalation to workers, occupants or visitors of buildings to be constructed at the Site in the future. However, it is anticipated that mitigation measures for soil vapor will be implemented during redevelopment. Mitigation measures may include an EC, such as a vapor barrier or a sub-slab depressurization system (SSDS), and an associated IC to control potential exposures. Therefore, it does not appear that there is a risk to future Site workers, occupants, or visitors from soil vapors if the appropriate ECs and ICs are implemented.

Groundwater

At present, groundwater use is not occurring at the Site, the depth to groundwater is at least 2.5 feet across the entire Site, and the Site is vacant and secured by fencing. Therefore, there is no reasonable concern for potential exposure to Site groundwater under the current conditions.

During redevelopment, construction and/or remedial excavations could extend into the water table and/or dewatering may occur, presenting a concern for exposure. Remediation workers may also contact the impacted groundwater during monitoring activities. However, it is anticipated that these activities will be conducted utilizing a HASP that includes measures to control and minimize worker exposure to impacted groundwater. Therefore, it was concluded that potential exposures to impacted groundwater would be minimized for construction or remediation worker if the appropriate controls are implemented under a HASP.

Following redevelopment, exposure to the Site groundwater could potentially occur if the Site groundwater were to be used for potable water supply or other purposes. However, public water will be provided to the buildings when the Site is redeveloped. No use of onsite groundwater is contemplated and it is anticipated that an IC will be implemented prohibiting groundwater use without treatment to render it suitable for the proposed use. Therefore, it does not appear that there is a potential for exposure to the Site groundwater if the appropriate control (an IC) is implemented.

Potential for Offsite Exposure

The Site is located in an urban area and is presently fully fenced and partially paved, which precludes public access to Site soil. During redevelopment, it is anticipated that the Site will remain secured by fencing and the required soil erosion and dust control measures will be implemented. Redevelopment is anticipated to include remedial measures and/or ECs for impacted soil, which will eliminate the potential for completed exposure pathways for offsite receptors to Site soil. It is concluded that exposure of offsite receptors to Site soil is unlikely if appropriate controls are implemented.

The potential for offsite exposure to Site-related soil vapor was evaluated. Buildings and properties utilized for commercial, light industrial, transportation, and/or multi-family residential purposes are present in the surrounding community and nearly all are separated from the Site by roadways. None of the soil vapor detections is highly elevated or suggests the presence of a significant source of soil vapors, none of these VOCs was found in Site groundwater during the RI, and none of these VOCs was found in Site soil at levels above the unrestricted use SCOs. Collectively, these data indicate that no significant onsite source of soil vapor is present. As no source was identified and none of the soil vapor detections was highly elevated, it appears unlikely that soil vapors could migrate from the Site and present an exposure concern for offsite receptors.

The potential for Site groundwater to present an exposure concern for offsite receptors was previously evaluated by conducting a water supply well survey for the area within one-half mile of the Site; no public water or other supply wells were identified. Very little (if any) fresh groundwater is anticipated to be present in the Site vicinity due to the Site's location close to the

Atlantic Ocean and Jamaica Bay; this conclusion is supported by the elevated chloride levels present in the Site groundwater. Based on the urban nature of the surrounding area, the availability of public water via the New York City water supply system, and the saline nature of the groundwater in the Site vicinity, it is concluded that offsite exposure to groundwater migrating from the Site is highly unlikely.

Summary

In summary, there does not appear to be a concern for human health risk from the impacted media at the Site under current conditions. Potential contact with the affected media (soil, groundwater, and soil vapor) could occur during remediation and/or redevelopment activities; however, it is anticipated that these activities would be performed under HASPs that control potential exposures to these media. Potential exposure to the affected media by Site workers, occupants, and visitors could occur under future use of the redeveloped property unless appropriate remedial and/or control measures are implemented. Therefore, appropriate remedial measures and/or ECs/ICs should be implemented during the remedial action.

Summary of the Remedy

The proposed Remedial Action includes placing a cover over much of the soil that exceeds the restricted residential use SCOs, with targeted soil removal and offsite disposal as needed to ensure that the top two feet of exposed soil meet the restricted residential use SCOs and to remove soil that exceeds protection of groundwater SCOs, and installation of vapor barriers and implementation of SSDSs for new buildings constructed on the Site. An SMP with procedures to manage residual contamination on the Site would be implemented, and an environmental easement would be recorded to provide institutional controls to prevent exposure to residual contamination.

Based on the redevelopment plan, which includes a phased approach for construction, a final condition where nearly all of the ground surface will be paved or covered by buildings, and where portions of the Site must be raised to address potential flooding issues, a Track 4 cleanup would include placement of a cover consisting of the new building foundations and associated pavement over the residual soil in the initial construction area. If necessary, targeted excavation of shallow soil exceeding restricted residential use SCOs would also be performed in the initial construction area. Soil that exceeds protection of groundwater SCOs would also be removed. A soil/crushed concrete cover would be placed over the remaining Site surface where soil exceeding restricted residential use SCOs is present. This soil/crushed concrete cover would be replaced during later phases of construction by building foundations or pavement. These later activities would be conducted under the SMP.

A Track 4 cleanup for soil vapor would include mitigation of SVI concerns, which will be accomplished by placement of a vapor barrier and SSDS beneath each newly-constructed building. As the construction will be phased, the SVI mitigation measures for buildings constructed following the completion of the remedy would be implemented under an SMP, with all vapor barrier and SSDS operation, monitoring and maintenance included in the SMP.

A Track 4 cleanup for groundwater will include institutional controls in the form of a restriction on groundwater use and health and safety measures for redevelopment activities that may involve contact with the Site groundwater. These controls would be implemented via a Construction HASP and an environmental easement.

The following remedial elements are included in the proposed Remedial Action:

1. Construction and maintenance of an engineered composite cover consisting of new concrete building foundations, concrete and/or asphalt pavement, and/or two feet of cover soil/crushed concrete meeting the restricted residential use SCOs to prevent human exposure to residual contaminated soil/fill remaining under the Site. In areas that are to be vegetated, at least the top 6 inches of soil cover will be designed to support vegetation;

2. Excavation, as needed, of limited targeted areas of soil/fill exceeding restricted residential use SCOs and soil exceeding protection of groundwater SCOs, with end-point sampling and appropriate offsite disposal of all contaminated material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;

3. Installation of a soil vapor intrusion mitigation system consisting of a vapor barrier and an SSDS under all building structures;

4. Recording of an Environmental Easement, including Institutional Controls (noted below), to prevent future exposure to any residual contamination remaining at the Site;

5. Publication of an SMP for long term management of residual contamination as required by the Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

6. Screening for indications of all excavated soil during any intrusive Site remediation;

7. Import of materials to be used for backfill and cover in compliance with chemical limits and other specifications included in the RAWP, and all Federal, State and local rules and regulations for handling and transport of material;

8. All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations;

9. Institutional Controls to include:

   - Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence to all elements of the SMP;
   - All Engineering Controls must be operated and maintained as specified in the SMP;
   - The composite cover system must be inspected, certified and maintained as required in the SMP;
   - All Engineering Controls on the Site must be inspected and certified at a frequency and in a manner defined in the SMP;
   - Soil vapor and other environmental or public health monitoring must be performed as defined in the SMP;
   - Data and information pertinent to Site Management for the Site must be reported at the frequency and in a manner defined in the SMP;
   - Onsite environmental monitoring devices must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP;
   - Engineering Controls may not be discontinued without an amendment or extinguishment of the Environmental Easement.

Adherence to these Institutional Controls for the Site will be mandated by the Environmental Easement and will be implemented under the SMP. The Site will have Institutional Controls in the form of Site restrictions and requirements in the Environmental Easement, including:

- Vegetable gardens and farming on the Site will be prohibited;
- Use of groundwater underlying the Site will be prohibited without treatment rendering it safe for intended purpose;
- All future activities on the Site that will disturb residual contaminated material will be prohibited unless they are conducted in accordance with the soil management provisions in the SMP;
- The Site may be used for restricted residential, commercial, and/or industrial use only, provided the long-term Engineering and Institutional Controls included in the SMP are employed;
- The Site may not be used for a higher level of use, such as unrestricted or single-family residential use, without an amendment or extinguishment of the Environmental Easement;
- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Site are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Site at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow. This certification must be certified by an expert that the NYSDEC finds acceptable.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP and the NYSDEC-issued Decision Document. All deviations from the RAWP and/or Decision Document will be promptly reported to NYSDEC for approval and fully explained in the Final Engineering Report.

REMEDIAL ACTION WORK PLAN

1.0 INTRODUCTION

Volunteer Peninsula Rockaway Limited Partnership entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) in December 2017 to investigate and remediate an 8.76-acre property located at 51-15 Beach Channel Drive and 50-04 Rockaway Beach Boulevard in Far Rockaway, Queens, New York. Peninsula Rockaway Limited Partnership is a Volunteer in the Brownfield Cleanup Program. Restricted residential use and Commercial use are proposed for the property. When completed, the Site will contain multiple newly-constructed buildings containing affordable residential units and significant ground floor commercial and community facility space. Refer to the Brownfield Cleanup Program (BCP) application for additional details.

This Remedial Action Work Plan (RAWP) summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI), performed between June 2018 and December 2018 and prior investigations. It provides an evaluation of a Track 1 cleanup and other applicable Remedial Action alternatives, their associated costs, and the recommended and preferred remedy. The remedy described in this document is consistent with the procedures defined in DER-10 and complies with all applicable standards, criteria and guidance. The remedy described in this document also complies with all applicable Federal, State and local laws, regulations and requirements. The NYSDEC and New York State Department of Health (NYSDOH) have determined that this Site does not pose a significant threat to human health and the environment. The RI for this Site did not identify fish and wildlife resources.

A formal Remedial Design document will not be prepared.

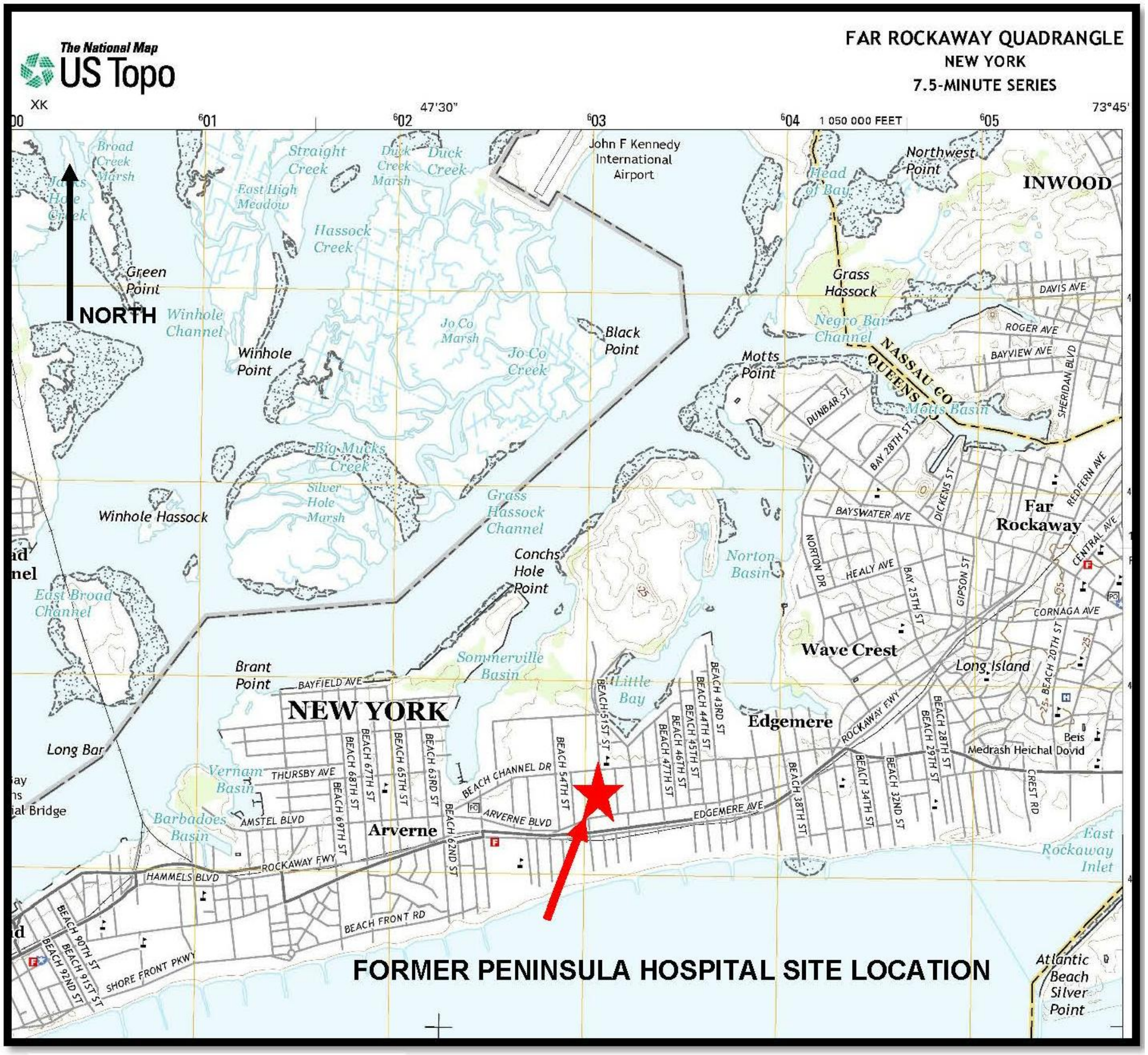
1.1 SITE LOCATION AND DESCRIPTION

The Site is located in the County of Queens, Far Rockaway, New York and was previously identified as Block 15843, Lot 1 and Block 15842, Lot 1 on the New York City, Borough of Queens Tax Map. These two tax lots have recently been merged and the Site is presently identified as Block 15843, Lot 1 on the New York City, Borough of Queens Tax Map and is presently assigned an address of 51-15 Beach Channel Drive. A United States Geological Survey (USGS) topographical quadrangle map (Figure 1.1.1) shows the Site location. The Site is situated on an approximately 8.76-acre area bounded by Beach Channel Drive and a nursing home building to the north, Rockaway Beach Boulevard to the south, Beach 50th Street and a nursing home building to the east, and Beach 53rd Street to the west (see Figure 1.1.2). A boundary map is attached to the BCA as required by Environmental Conservation Law (ECL) Title 14 Section 27-1419. The 8.76-acre property is fully described in Appendix A, which includes the Property Survey, a Metes and Bounds Description, and documentation of the November 2019 tax lot merger. A global positioning system coordinate for the starting point of the metes and bounds description is included on the survey.

1.2 CONTEMPLATED REDEVELOPMENT PLAN

The Remedial Action to be performed under the RAWP is intended to make the Site protective of human health and the environment consistent with the contemplated end uses. The proposed redevelopment plan and end uses are described here to provide the basis for this assessment. However, the Remedial Action contemplated under this RAWP may be implemented independent of the proposed redevelopment plan.

The Site owner, Peninsula Rockaway Limited Partnership, on November 14, 2019 secured approvals for a series of land use actions to facilitate redevelopment of the Site. The approvals included a zoning map amendment, special permits, a zoning text amendment, and a City Map amendment, all of which will facilitate construction of ten multi-story mixed-use buildings that will include restricted residential, retail, supermarket, and community facility uses. The residential portion of the redevelopment will include permanently-affordable housing units through the Mandatory Inclusionary Housing (MIH) program, with the remaining residential units being 100% affordable through a regulatory agreement with the New York City Department of Housing Preservation and Development (HPD) and/or the New York City Housing Development Corporation (HDC). In addition to the new buildings, the development plan includes parking, new streets, landscaped public open spaces, and a public plaza. A schematic site plan showing the general proposed layout of the redeveloped Site is included in Figure 1.2.1.



Source: US Geological Survey, 2016

SCALE: ONE MILE

FPM GROUP

FIGURE 1.1.1
FORMER PENINSULA HOSPITAL SITE LOCATION
51–15 BEACH CHANNEL DRIVE
FAR ROCKAWAY, QUEENS, NEW YORK

Drawn By: H.C.	Checked By: S.D.	Date: 1/14/20

NOTE: THE FORMER SITE BUILDINGS ARE SHOWN PRIOR TO THEIR 2018 DEMOLITION

FPM GROUP

FIGURE 1.1.2
SITE VICINITY PLAN

51–15 BEACH CHANNEL DRIVE
FAR ROCKAWAY, QUEENS, NEW YORK

Drawn By: H.C.	Checked By: S.D.	Date: 1/14/20

H:\PENINSULA ROCKAWAY\RAWP\FIGURE 1.1.2.dwg, 4/27/2020 11:24:08 AM, DWG To PDF.pc3

SCALE

0 20 40 60 80 100 FEET

SOURCE: SITE PLAN Z-100.00, AUFGANG ARCHITECTS

FPM GROUP

FIGURE 1.2.1
SITE REDEVELOPMENT PLAN

51-15 BEACH CHANNEL DRIVE
FAR ROCKAWAY, QUEENS, NEW YORK

Drawn By: H.C.	Checked By: S.D.	Date: 1/14/20

H:\PENINSULA ROCKAWAY\RAWP\FIGURE 1.2.1.dwg, 4/27/2020 11:26:12 AM, DWG To PDF.pc3

The Site grade will be raised so as to elevate much of the Site for flood protection. The newly-constructed buildings will generally be at grade relative to the new grade once the grade of the interior portion of the Site is raised. At-grade areas will generally be used for parking, retail, and community facility space. Additional details are provided in Section 7.0.

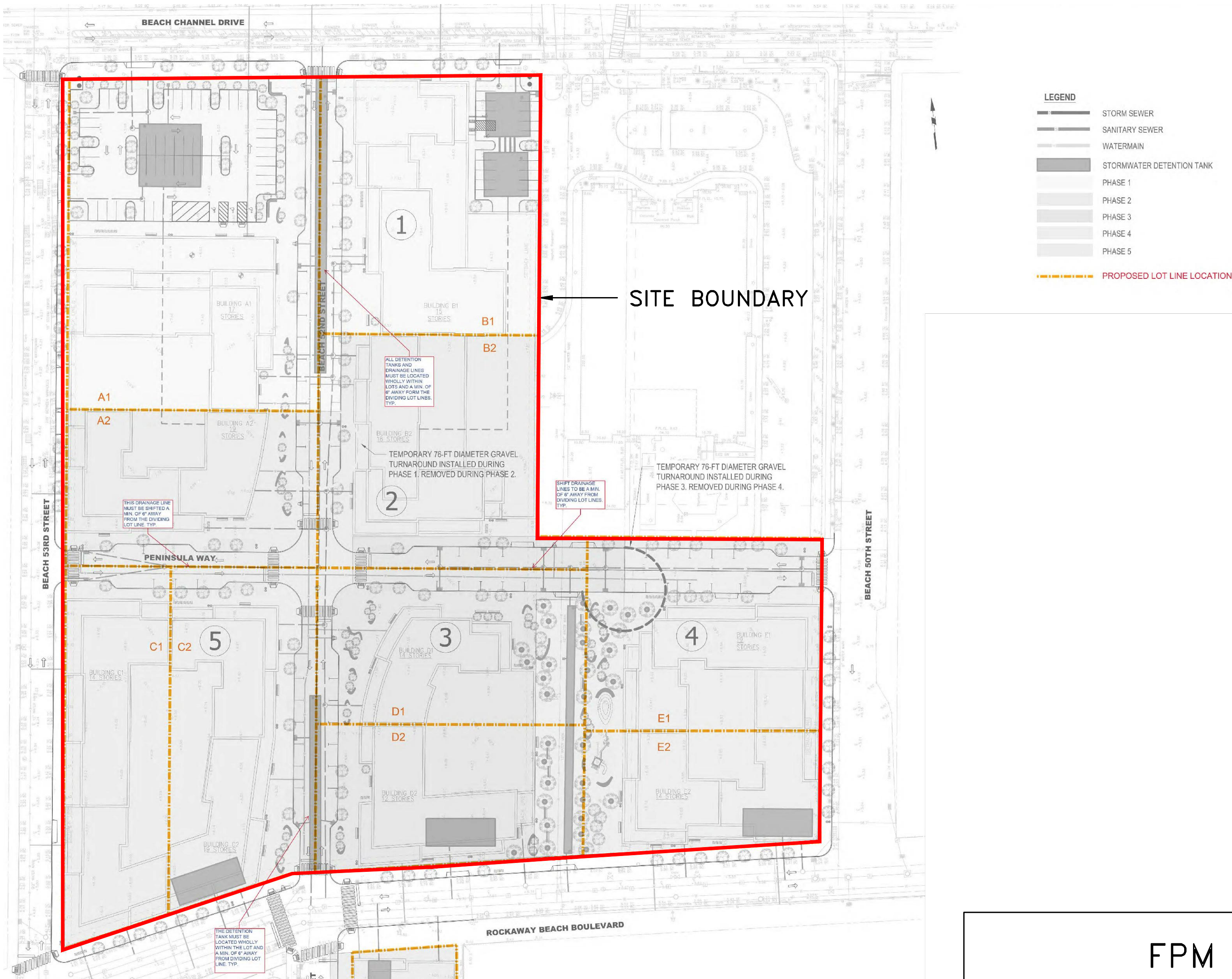
Site redevelopment will be conducted over several years in a phased manner, with the northern portion of the Site (areas A1 and B1, see Figure 1.2.2) redeveloped first, followed by the other portions of the Site. As redevelopment proceeds, the current tax lot will be subdivided into multiple lots, as generally shown on Figure 1.2.2. Remedial activities for the entire Site will be conducted under this RAWP. Subsequent activities, such as modifications to the cover and/or implementation of soil vapor intrusion mitigation measures for new buildings, will be conducted under a Site Management Plan (SMP).

1.3 DESCRIPTION OF SURROUNDING PROPERTY

The Site is located in an area historically used for mixed purposes, including residential, commercial and industrial uses. Buildings and properties utilized for commercial, light industrial, medical, transportation and/or multi-family residential purposes adjoin the Site either directly or across roadways. Adjoining property uses in each direction are as follows:

- South (across Rockaway Beach Boulevard): electrical substation, Solid Rock SDA Church, Royal Seafood (wholesale), All Star Document & Paper Shredding;
- Northeast Adjoining: Peninsula General Nursing Home;
- East (across Beach 50th Street): Parking lot for MTA bus depot, DDK Auto Corp parking lot;
- North (across Beach Channel Drive): Multi-family residential apartment buildings, PS 105 (The Bay School), and Conch Playground; and
- West (across Beach 53rd Street): Multi-family residential apartment buildings, Lawrence Nursing Care Center and parking lot, and a vacant property.

There are three wetland/estuarine areas within one-half mile of the Site, including Rockaway Beach (0.25 miles south), Conch Bay (0.25 miles northeast), and Sommerville Basin (0.35 miles west). These areas are separated from the Site by one or more multi-lane streets and/or the MTA Subway A Line; it is not anticipated that these areas will be impacted by Site activities. No surface water is located on or adjacent to the Site.



SOURCE: LANGAN, DRAWING PH–01

FPM GROUP

FIGURE 1.2.2
REDEVELOPMENT PHASING PLAN

51–15 BEACH CHANNEL DRIVE
FAR ROCKAWAY, QUEENS, NEW YORK

Drawn By: H.C.	Checked By: S.D.	Date: 1/14/20

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The Conch Playground is located to the northeast of the Site (across Beach Channel Drive). Other recreational/natural areas, including the Arverne Playground, Cardozo Playground, Rockaway Community Park, and the Dubos Point Wildlife Sanctuary, are close to the Site. However, these areas are also separated from the Site by multiple streets and are not anticipated to be impacted by Site activities.

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The Site was investigated in accordance with the scope of work presented in the NYSDEC-approved Remedial Investigation (RI) Work Plan dated April 2018. The investigation was conducted between June and December 2018. The RI was submitted to NYSDEC on August 29, 2019 and revised in November 2019 to address NYSDEC comments. The revised RI was approved by NYSDEC on December 10, 2019.

2.1 SUMMARY REMEDIAL INVESTIGATIONS PERFORMED

This section summarizes the RI elements and results. Tables and figures depicting the RI results are included in the appropriate subsections as noted.

2.1.1 Borings and Wells

Soil sampling was conducted during the RI at 56 locations (B-1 through B-56). These locations were selected to characterize the general nature and extent of contamination that may be present in areas where soil contamination has previously been identified (#6 fuel oil spill area) or was suspected (former maintenance building, boiler room and hazardous materials and paint storage areas), in areas of the Site for which the NYSDEC requested additional information (two locations along the eastern Site boundary and one area each to the south and west of the former hospital building location), and Site-wide.

A network of ten groundwater monitoring wells (MW-1 through MW-10) was installed onsite during the RI. The network of wells was designed to include wells on the anticipated upgradient side of the Site (south), wells on the anticipated downgradient side of the Site (north), and wells in areas of the Site where contamination was suspected to be present.

Soil vapor sampling was conducted during the RI at 19 locations (V-1 through V-19). These locations were selected to fill in data gaps from previous sampling efforts, further evaluate soil vapor conditions in the three areas where elevated concentrations of chlorinated solvents were previously detected, and evaluate the potential for offsite soil vapor impacts. No sub-slab soil vapor or indoor air sampling was conducted during the RI as the hospital building that was formerly present was demolished prior to the RI.

2.1.2 Samples Collected

Soil samples were collected from each of the 56 boring locations. The soil samples were collected so as to characterize the uppermost two-foot soil interval (typically fill) at all locations, and the native soil underlying the historic fill. In all instances where historic fill was found to be present, a soil sample was collected from the uppermost two-foot interval of native soil underlying the historic fill. For the soil borings where the data were to be used to evaluate the nature and extent of contamination that may be present in the suspect areas (#6 fuel oil spill, former maintenance building, boiler room and hazardous materials and paint storage areas), one sample was collected from the uppermost two-foot interval of soil (historic fill or native soil) at each location. In the #6 fuel oil spill area the borings were extended to below the depth where visible contamination was previously noted (7 feet below grade) and samples of the native soil were collected. In the other suspect areas, a deeper native soil sample was also collected. In instances where crushed concrete was used to backfill surface depressions resulting from building demolition, the soil underlying the crushed concrete was sampled. No visible indications of potential contamination were observed in the crushed concrete backfill and this material was not sampled.

Groundwater sampling was performed after the wells were installed and the groundwater flow direction had been determined so that groundwater conditions in proximity to the wells had stabilized. As non-aqueous-phase liquid (NAPL) was not identified in any of the wells, each of the ten wells was sampled.

One soil vapor sample was collected from each of the 19 soil vapor sampling locations.

2.1.3 Chemical Analytical Work Performed

All of the soil samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) plus 10 tentatively-identified compounds (TICs) using United States Environmental Protection Agency (USEPA) Method 8260C; TCL semivolatile organic compounds (SVOCs) plus 20 TICs using Method 8270D, Target Analyte List (TAL) metals using Method 6010D, mercury using Method 7471B, total cyanide using Methods 9010C/9012B, polychlorinated biphenyls (PCBs) using Method 8082A, and pesticides using Method 8081B.

All of the groundwater samples were analyzed for TCL VOCs plus 10 TICs using USEPA Method 8260C; TCL SVOCs plus 20 TICs using Method 8270D, TAL total metals using Method 6020B, mercury using Method 7470A, total cyanide using Methods 9010C/9012B, PCBs using Method 8082A, and pesticides using Method 8081B. In the case of each groundwater sample, a separate sample aliquot was obtained, filtered to remove turbidity, and analyzed for TAL dissolved metals using Method 6010C and mercury using Method 7470A. Based on the groundwater flow direction, select groundwater samples (MW-1, MW-2, MW-7, MW-8 and MW-10) were also tested for per- and polyfluoroalkyl substances (PFAS) and 1,4-dioxane. These samples were tested for PFAS by the modified USEPA Method 537 with isotope dilution and reporting limits of 2 nanograms per liter (ng/l, or parts per trillion) in water. These samples were also tested for 1,4-dioxane using Method 8270D and a mass spectrometer in selective ion monitoring (SIM) mode.

All of the soil vapor samples were analyzed for VOCs using Method TO-15.

Table 2.1.3.1 summarizes all of the RI sampling that was performed, including the matrices, analytes, and sample numbers.

2.1.4 RI Findings

Soil

The soil sampling results from the RI are summarized on Table 2.1.4.1 (included in Appendix B due to its length) and are compared to the NYSDEC's Soil Cleanup Objectives (SCOs) for unrestricted and restricted residential use. Exceedances of the SCOs for restricted residential use are presented visually on Figure 2.1.4.1, together with the data from prior investigations (details previously presented in the RI Work Plan). Exceedances of the SCOs for unrestricted use are not shown on Figure 2.1.4.1 as these exceedances were present in nearly all of the soil samples.

Crushed concrete from demolition of the former hospital building was identified in nearly all of the borings performed within the former building footprint. No odor, staining, PID responses, or other indications suggestive of potential contamination were noted within the crushed concrete. As this material has been temporarily placed, as per NYC Department of Buildings requirements, and much of this material will be removed during future construction, no sampling of this material was performed during the RI.

TABLE 2.1.3.1
REMEDIAL INVESTIGATION SAMPLING MATRIX
FORMER PENINSULA HOSPITAL SITE, NYSDEC SITE C241200
FAR ROCKAWAY, QUEENS, NEW YORK

Sample Matrix	Sample Numbers	Sample Depths	Number of Samples	Sample Analyses and Methods
Soil	B1 to B56 (two depths at each location)	Variable, depending on observed conditions. Generally 0 to 2 feet below grade and one deeper sample.	112	TCL VOCs plus TICs (Method 8260C)BN-TCL SVOCs plus TICs, TAL Metals, TCL pesticides, and PCBs (Methods 8270D, 6010B, 8081B/8082A, and 7470A/7241A)
Soil Vapor	V-1 to V-11	At least 3 feet below grade and 1 above groundwater	19	VOCs (Method TO-15)
Groundwater	MW-1 to MW-10	5 feet into the water table	10	TCL VOCs plus TICs (Method 8260C)
				BN-TCL SVOCs plus TICs, pesticides, and PCBs (Methods 8270D and 8081B/8082A)
				TAL metals (Methods 6010C and 7470A/7241A)
	MW-1, MW-2, MW-7, MW-8, MW-10		5	PFAS as per Full PFAS Target Analyte List (Method 537M with SIM-isotope dilution)
				1,4-Dioxane (Method 8270D with SIM-isotope dilution)

Notes:

VOCs = Volatile organic compounds
SVOCs - Semivolatile organic compounds
PCBs = polychlorinated biphenyls
PFAS = Per and poly-fluorinated alkyl substances

TAL = Target Analyte List
BN = Base-neutral
TICs = tentatively-identified compounds
TCL = Target Compound List

Sample No.	SB-18	6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	1-3	
Soil Type	Fill	
Sample Date	7/22/2016	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds in ug/kg		
Benzo[a]anthracene	1,020	1,000
TAL Metals		

Sample No.	B16	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	5-7	
Soil Type	Native	
Sample Date	8/29/18	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds in ug/kg		
Benzo(a)anthracene	1,400	1,000
Benzo(b)fluoranthene	1,200	1,000
Metals		
Pesticides		
Polychlorinated Biphenyls		
Cyanide		

Sample No.	B20		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	
Soil Type	Native	Native	
Sample Date	8/29/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Benzo(a)anthracene	14,000	-	1,000
Benzo(a)pyrene	12,000	-	1,000
Benzo(b)fluoranthene	14,000	-	1,000
Benzo(k)fluoranthene	4,600	-	3,900
Chrysene	12,000	-	3,900
Dibenzo(a,h)anthracene	1,900	-	330
Indeno(1,2,3-cd)pyrene	7,900	-	500
Metals			
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	B21		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	3-5	
Soil Type	Fill	Native	
Sample Date	8/30/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Benzo(a)anthracene	18,000	-	1,000
Benzo(a)pyrene	14,000	-	1,000
Benzo(b)fluoranthene	18,000	-	1,000
Benzo(k)fluoranthene	4,440	-	3,900
Chrysene	17,000	-	3,900
Dibenzo(a,h)anthracene	2,300	-	330
Indeno(1,2,3-cd)pyrene	7,900	-	500
Metals			
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	B22		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	5-7	
Soil Type	Fill	Native	
Sample Date	8/30/18		
TCL Volatile Organic Compounds in ug/kg			
Naphthalene	130,000	-	100,000
TCL Semivolatile Organic Compounds in ug/kg			
Fluoranthene	220,000	-	100,000
Benzo(a)anthracene	140,000	-	1,000
Benzo(a)pyrene	120,000	-	1,000
Benzo(b)fluoranthene	180,000	-	1,000
Benzo(k)fluoranthene	45,000	-	3,900
Chrysene	120,000	-	3,900
Phenanthrene	160,000	-	100,000
Dibenzo(a,h)anthracene	17,000	-	330
Indeno(1,2,3-cd)pyrene	66,000	-	500
Pyrene	200,000	-	100,000
Metals			
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	B24		NYSDEC Restricted-Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	
Soil Type	Fill	Native	
Sample Date	8/30/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds			
TAL Metals in mg/kg			
Cadmium	4.4	-	4.3
Lead	1,520	930	400
Pesticides			
Polychlorinated Biphenyls			

Sample No.	WB-4	6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	1-3	
Soil Type	Fill	
Sample Date	5/9/2017	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds in ug/kg		
Bis(2-ethylhexyl)phthalate	75.0 J	50
TAL Metals		

Sample No.	B25		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	
Soil Type	Fill	Native	
Sample Date	8/30/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Benzo(a)anthracene	3,200	-	1,000
Benzo(a)pyrene	2,900	-	1,000
Benzo(b)fluoranthene	3,700	-	1,000
Dibenzo(a,h)anthracene	440	-	330
Indeno(1,2,3-cd)pyrene	1,700	-	500
Metals			
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	WB-2		6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	1-3	5-6	
Soil Type	Fill	Native	
Sample Date	5/9/2017		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Benzo[a]anthracene	1,610	-	1,000
Benzo[a]pyrene	1,710	-	1,000
Benzo[b]fluoranthene	1,420	-	1,000
Dibenz(a,h)anthracene	421	-	330
Indeno[1,2,3-cd]pyrene	843	-	500
TAL Metals in mg/kg			
Arsenic	16.7	-	16

Sample No.	SB-17	6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	
Soil Type	Fill	
Sample Date	7/22/16	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds in ug/kg		
Benzo[a]anthracene	26,500	1,000
Benzo[a]pyrene	9,280	1,000
Benzo[b]fluoranthene	9,640	1,000
Benzo[k]fluoranthene	11,000	3,900
Chrysene	21,800	3,900
Dibenz(a,h)anthracene	1,710	330
Indeno[1,2,3-cd]pyrene	2,870	500
TAL Metals		

Sample No.	B23		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	5-7	
Soil Type	Fill	Native	
Sample Date	8/30/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Benzo(a)anthracene	1,300	-	1,000
Benzo(a)pyrene	1,400	-	1,000
Benzo(b)fluoranthene	2,100	-	1,000
Indeno(1,2,3-cd)pyrene	1,100	-	500
Metals in mg/kg			
Lead	437	-	400
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	B13		NYSDEC Restricted-Residential Use Soil Cleanup Objectives
Sample Depth (feet)	6-8	8-10	
Soil Type	Fill	Native	
Sample Date	8/28/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds			
TAL Metals in mg/kg			
Mercury	0.992	-	0.81
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	SB-3	NYSDEC Restricted-Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	
Soil Type	Fill	
Sample Date	3/29/16	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds		
TAL Metals in mg/kg		
Lead	440	400

Sample No.	SB-2	NYSDEC Restricted-Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	
Soil Type	Fill	
Sample Date	3/29/16	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds		
TAL Metals in mg/kg		
Lead	750	400

Sample No.	SB-5	6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	7-8	
Soil Type	Native	
Sample Date	11/16/15	
CP-51 Volatile Organic Compounds		
CP-51 Semivolatile Organic Compounds in ug/kg		
Benzo[a]anthracene	4,500	1,000
Chrysene	5,400	3,900

Sample No.	SB-3	6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	6-7	
Soil Type	Native	
Sample Date	11/16/15	
CP-51 Volatile Organic Compounds		
CP-51 Semivolatile Organic Compounds in ug/kg		
Benzo[a]anthracene	1,300	1,000

Sample No.	B37		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	2-4	4-6	
Soil Type	Fill	Native	
Sample Date	9/11/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Fluoranthene	220,000	-	100,000
Naphthalene	19,000	-	100,000
Benzo(a)anthracene	120,000	-	1,000
Benzo(a)pyrene	100,000	-	1,000
Benzo(b)fluoranthene	130,000	-	1,000
Benzo(k)fluoranthene	45,000	-	3,900
Chrysene	100,000	-	3,900
Phenanthrene	200,000	-	100,000
Dibenzo(a,h)anthracene	16,000	-	330
Indeno(1,2,3-cd)pyrene	61,000	-	500
Pyrene	190,000	-	100,000
Metals			
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	WB-3	6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	1-3	
Soil Type	Fill	
Sample Date	5/9/2017	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds		
TAL Metals in mg/kg		
Arsenic	24.0	16

Sample No.	B48		NYSDEC Restricted-Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	
Soil Type	Native	Native	
Sample Date	9/19/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds			
TAL Metals in mg/kg			
Arsenic	19	-	16
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

LEGEND:

SB-19 SOIL BORING LOCATION (PREVIOUS AND REMEDIAL INVESTIGATIONS)

SOIL EXCEEDS 6NYCRR PART 375 RESTRICTED RESIDENTIAL USE SCOs

NOTES:
- ALL SITE BUILDINGS DEMOLISHED IN 2018.
- PREVIOUS SOIL DATA ARE FROM MULTIPLE INVESTIGATIONS CONDUCTED BY FPM AND OTHERS AND INCLUDE SOME DUPLICATE SAMPLE NUMBERS.

N

0' 100' 200'

APPROXIMATE SCALE

FPM GROUP

FIGURE 2.1.4.1
SOIL SAMPLE RESULTS

FORMER PENINSULA HOSPITAL SITE
51-15 BEACH CHANNEL DRIVE
FAR ROCKAWAY, QUEENS, NY

Drawn By: H.C. | Checked By: S.D. | Date: 1/14/20

Fill (brown to gray fine to coarse sand with trace quantities of brick, concrete, and/or gravel fragments, including some asphalt) was identified beneath most of the Site, but was generally absent in much of the southeastern portion of the Site and in small areas along the eastern and western edges of the Site. The fill generally ranges from 1 to 2 feet thick, with a very limited area near the southwestern corner of the Site having up to 5 feet of fill. No organic material, PID responses, odors or staining suggestive of potential contamination were noted in any of the fill samples, including fill samples collected from the area of the former #6 fuel oil USTs. Chemical analytical testing of the fill revealed VOCs, SVOCs, metals, pesticides, and one PCB at levels exceeding the unrestricted use SCOs, with some impacts also exceeding the restricted residential use SCOs. Most of the impacts appear to reflect typical historic fill conditions, including the presence of PAHs likely associated with the limited amounts of asphalt observed in the fill and metals associated with ordinary human activities. Pesticide detections appear to be related to historic regional DDT applications for insect control.

Native soil was encountered in all of the borings across the Site starting from immediately below the pavement surface (where pavement was present) or from immediately below the base of historic fill. The native soil generally consists of fine to medium-grained light brown to gray sand with intervals of gravel and/or silt. Organic (plant) materials were noted in the deeper portions of several of the borings. No PID responses, odors or staining suggestive of potential contamination were noted in any of the native soil samples. Chemical analytical testing of the native soil revealed limited impacts by VOCs, SVOCs, metals, pesticides, and one PCB at levels exceeding the unrestricted use SCOs, with some PAH impacts at two locations also exceeding the restricted residential use SCOs. None of these impacts appears to be related to the prior hospital operations. Pesticide detections appear to be related to historic regional applications for insect control.

<u>Groundwater</u>

The groundwater sampling results from the RI are summarized on Table 2.1.4.2, and detections that exceed the NYSDEC Standards or other NYSDEC guidance (PFAS) are highlighted. These detections are presented visually on Figure 2.1.4.2. As discussed below, the total metals data are not included on Figure 2.1.4.2 as they are affected by excessive turbidity.

TABLE 2.1.4.2
GROUNDWATER SAMPLING RESULTS
FORMER PENINSULA HOSPITAL SITE, FAR ROCKAWAY, NEW YORK

Well No.	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-7D (duplicate)	MW-8	MW-9	MW-10	NYS Class GA Ambient Water Quality Standard
Sampling Date	10/18/2018	10/18/2018	10/19/2018	10/19/2018	10/19/2018	10/19/2018	10/18/2018	10/18/2018	10/18/2018	10/19/2018	10/18/2018	
Volatile Organic Compounds by GC/MS, in ug/l												
Bromomethane	ND	ND	ND	ND	ND	ND	ND	0.7 J	ND	ND	ND	5
Vinyl chloride	ND	ND	ND	ND	ND	ND	0.56 J	0.51 J	ND	ND	ND	2
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	1 J	1.1 J	ND	ND	ND	5
1,2-Dichloroethene, Total	ND	ND	ND	ND	ND	ND	1 J	1.1 J	ND	ND	ND	-
Acetone	ND	1.5 J	ND	ND	ND	ND	2.7 J	2.5 J	ND	ND	2 J	-
Carbon disulfide	2.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1 J	60
Naphthalene	ND	ND	1.7 J	ND	0.78 J	ND	ND	ND	ND	ND	ND	-
Polychlorinated Biphenyls by GC, in ug/l												
Aroclor 1254	ND	ND	ND	0.041 J	ND	ND	ND	ND	ND	ND	ND	0.09
PCBs, Total	ND	ND	ND	0.041 J	ND	ND	ND	ND	ND	ND	ND	0.09
Total Metals in ug/l												
Aluminum, Total	55,100	18,400	4,040	23,900	15,600	18,300	64,300	39,600	43,800	24,400	30,800	-
Antimony, Total	ND	0.75 J	ND	0.92 J	ND	0.47 J	**3.02 J**	1.97 J	ND	0.57 J	1.24 J	3
Arsenic, Total	**45**	19.75	10.78	20.34	16.46	7.62	**86.78**	**51.12**	**36.95**	9.31	19.34	25
Barium, Total	235.3	167.4	160.4	372.9	124.4	274.9	**1915**	**1698**	237.8	282.8	249.4	1,000
Beryllium, Total	**8.58**	1.97	0.45 J	**3.09**	1.77	1.65	**7.4**	**3.96**	**8.75**	1.18	**3.84**	-
Cadmium, Total	2.79	3.17	0.53	2.02	0.91	0.85	**7.15**	**10.13**	2.03	3.29	3.49	5
Calcium, Total	166,000	73,400	261,000	150,000	144,000	102,000	335,000	330,000	137,000	110,000	168,000	-
Chromium, Total	**271.4**	**145**	47.07	**237.1**	**103.5**	**165.3**	**507.2**	**339.6**	**142.6**	**189**	**269.5**	50
Cobalt, Total	84.29	17.98	3.34	22.24	10.44	15.5	56.04	30.89	30.24	10.4	26.56	-
Copper, Total	158.9	113.5	15.39	139.6	66.23	47.79	**283.2**	**238.1**	121.6	17.11	79.12	200
Iron, Total	**110,000**	**33,700**	**13,600**	**44,700**	**19,600**	**45,700**	**192,000**	**103,000**	**79,100**	**23,800**	**54,300**	300
Lead, Total	**112.5**	**46.84**	**174**	**84.24**	**25.67**	**108.6**	**5,985**	**8,695**	**90.99**	**207.7**	**321.8**	25
Magnesium, Total	**124,000**	13,300	**40,400**	30,000	22,800	15,300	**48,500**	**41,600**	33,100	**90,800**	**46,000**	35,000
Manganese, Total	**1067**	224	214.4	**498.6**	**421.3**	**429.7**	**2,023.00**	**1,456.00**	**828.2**	281.3	**722.6**	300
Mercury, Total	0.1 J	ND	0.11 J	ND	0.2	ND	**1.44**	**1.72**	0.24	0.15 J	0.14 J	0.7
Nickel, Total	**168**	59.88	18.77	91.06	61.04	63.57	**153.7**	97.02	71.04	53.79	**120.5**	100
Potassium, Total	54,400	8,640	15,700	16,200	10,100	6,300	16,400	12,500	10,200	39,600	13,900	-
Selenium, Total	**20.3**	9.81	ND	6.11	4.07 J	3.97 J	**24.4**	**11.2**	**15.4**	2.51 J	**11.6**	10
Silver, Total	0.25 J	ND	ND	ND	ND	ND	1.26	1.02	0.36 J	ND	0.29 J	50
Sodium, Total	**1,240,000**	**129,000**	**205,000**	**130,000**	**209,000**	**37,600**	**33,100**	**28,400**	**24,200**	**994,000**	**76,100**	20,000
Thallium, Total	**1.06**	**0.76**	0.19 J	0.31 J	ND	0.3 J	**1.23**	**0.79**	**0.7**	0.15 J	**0.74**	-
Vanadium, Total	338.5	175	45.69	172.4	101.4	157.9	325.9	199.8	214	164.7	249.9	-
Zinc, Total	411.5	338.2	169	375.3	649.3	331.6	**15,300**	**7,879**	578.1	221.2	686.8	-
Cyanide in ug/l												
Cyanide, Total	25	11	66	37	9	6	3 J	5	ND	4 J	ND	200
Dissolved Metals in ug/l												
Aluminum, Dissolved	68.3	410	50	247	74.9	156	69.1	47.2	11.2	957	102	-
Antimony, Dissolved	**3.9 J**	1.22 J	1.5 J	**4.43**	1.53 J	ND	2.76 J	**4.77**	2 J	2.93 J	1.8 J	3
Arsenic, Dissolved	1.87	6.23	2.74	5.14	12.55	2.77	5.91	4.59	1.49	3.86	3.76	25
Barium, Dissolved	26.27	8.74	70.9	44.6	8.06	16.57	64.47	76.83	5.74	72.76	14.75	1,000
Cadmium, Dissolved	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.07 J	ND	5
Calcium, Dissolved	154,000	40,200	257,000	147,000	134,000	85,800	110,000	122,000	72,200	125,000	95,300	-
Chromium, Dissolved	0.85 J	7.14	1.22	2.21	1.2	1.63	0.98 J	0.76 J	0.27 J	7.65	2.15	50
Cobalt, Dissolved	0.65	0.52	0.69	0.57	0.54	0.21 J	0.33 J	0.31 J	0.7	0.79	0.54	-
Copper, Dissolved	0.47 J	4.48	0.79 J	2.44	1.38	1.22	1.08	1.36	1.28	3.99	1.21	200
Iron, Dissolved	**353**	**702**	162	**455**	193	**2,440**	194	155	ND	**1,380**	164	300
Lead, Dissolved	ND	1.36	1.38	1.47	ND	1.4	11.73	21.38	ND	11	1.56	25
Magnesium, Dissolved	**124,000**	7,260	32,200	24,300	16,600	8,710	14,300	14,100	13,800	**83,500**	20,600	35,000
Manganese, Dissolved	105.8	14.19	158.5	163.8	198	141.6	**388.3**	**448.9**	46.97	117.6	112.6	300
Nickel, Dissolved	2.81	2.71	4.52	6.34	11.35	4.17	2.46	1.45 J	3.86	4.3	4.21	100
Potassium, Dissolved	46,100	6,220	16,700	14,800	8,920	4,520	8,360	8,000	3,960	45,600	8,840	-
Silver, Dissolved	0.94 J	ND	ND	ND	ND	ND	ND	0.9 J	ND	ND	ND	50
Sodium, Dissolved	**1,100,000**	**131,000**	**211,000**	**139,000**	**210,000**	**36,100**	**34,300**	**28,000**	**24,000**	**965,000**	**77,200**	20,000
Thallium, Dissolved	0.22 J	0.43 J	ND	ND	ND	ND	ND	0.18 J	ND	ND	ND	-
Vanadium, Dissolved	16.94	56.09	9.37	5.74	13.97	1.76 J	4.44 J	1.6 J	11.82	25.34	14.24	-
Zinc, Dissolved	5.39 J	7.14 J	10.15	5.68 J	19.1	6.5 J	20.24	24.95	6.62 J	7.71 J	5.5 J	-
Organochlorine Pesticides by GC, in ug/l												
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	0.005 J	ND	ND	0.2
4,4'-DDT	ND	ND	ND	ND	ND	ND	0.013 J	ND	0.011 J	0.006 J	0.005 J	0.2
Endosulfan II	ND	ND	ND	ND	ND	ND	0.011 J	ND	ND	ND	ND	-
Semivolatile Organics by GC/MS, in ug/l												
Bis(2-ethylhexyl)phthalate	ND	ND	ND	3.7	ND	ND	ND	ND	ND	2.9 J	ND	5
Benzoic Acid	ND	ND	ND	ND	ND	ND	ND	10 J	10 J	ND	11 J	-
Semivolatile Organics by GC/MS-SIM, in ug/l												
Acenaphthene	0.88	0.12	0.38	2	1.8	0.04 J	0.69	0.54	ND	1.1	0.07 J	-
Fluoranthene	ND	ND	0.09 J	0.35	ND	ND	1.5	0.7	0.07 J	0.03 J	0.07 J	-
Naphthalene	ND	ND	0.2	ND	ND	ND	0.07 J	ND	ND	ND	ND	-
Benzo(a)anthracene	ND	ND	0.03 J	ND	ND	ND	0.9	0.44	0.03 J	ND	0.04 J	-
Benzo(a)pyrene	ND	ND	**0.03 J**	ND	ND	ND	**0.94**	**0.43**	**0.04 J**	ND	**0.05 J**	ND
Benzo(b)fluoranthene	ND	ND	0.05 J	ND	ND	ND	1.3	0.63	0.06 J	ND	0.08 J	-
Benzo(k)fluoranthene	ND	ND	0.02 J	ND	ND	ND	0.45	0.19	0.02 J	ND	0.03 J	-
Chrysene	ND	ND	0.03 J	ND	ND	ND	0.94	0.46	0.03 J	ND	0.04 J	-
Acenaphthylene	ND	ND	ND	ND	ND	ND	0.13	0.07 J	ND	ND	ND	-
Anthracene	ND	ND	ND	0.06 J	ND	ND	0.26	0.1 J	ND	ND	ND	-
Benzo(ghi)perylene	ND	ND	0.02 J	ND	ND	ND	0.38	0.2	0.02 J	ND	0.03 J	-
Fluorene	0.03 J	ND	0.11	1.3	0.11	ND	0.49	0.26	ND	ND	ND	-
Phenanthrene	ND	ND	ND	ND	ND	ND	0.87	0.44	ND	ND	ND	-
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	0.14	0.06 J	ND	ND	ND	-
Indeno(1,2,3-cd)pyrene	ND	ND	0.03 J	ND	ND	ND	0.51	0.25	0.03 J	ND	0.03 J	-
Pyrene	ND	ND	0.08 J	0.18	ND	ND	1.8	0.87	0.07 J	0.03 J	0.07 J	-
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	0.07 J	ND	ND	ND	ND	-
Perfluorinated Alkyl Acids by Isotope Dilution, in ng/l												
Perfluorobutanoic Acid (PFBA)	28.0	7.61	-	-	-	-	14.4	12.6	223	-	8.25	-
Perfluoropentanoic Acid (PFPeA)	53.1	8.59	-	-	-	-	2.31	20.4	721	-	7.00	-
Perfluorobutanesulfonic Acid (PFBS)	9.74	3.62	-	-	-	-	1.80 J	1.59 J	3.37	-	1.36 J	-
Perfluorohexanoic Acid (PFHxA)	63.5	10.2	-	-	-	-	17.1	15.1	368	-	7.43	-
Perfluoroheptanoic Acid (PFHpA)	28.0	7.18	-	-	-	-	12.7	11.2	250	-	7.86	-
Perfluorohexanesulfonic Acid (PFHxS)	7.42	6.48	-	-	-	-	2.80	ND	3.00	-	2.39	-
Perfluorooctanoic Acid (PFOA)	**131**	**88.9**	-	-	-	-	29.8	26.8	**216**	-	60.9	70
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	18.7	60.6	-	-	-	-	19.0	12.0	8.69	-	7.95	-
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	-	-	-	-	ND	ND	0.983 J	-	ND	-
Perfluorononanoic Acid (PFNA)	10.8	10.9	-	-	-	-	9.91	10.0	9.50	-	3.00	-
Perfluorooctanesulfonic Acid (PFOS)	**83.2**	**73.7**	-	-	-	-	**81.8**	**87.5**	**108**	-	21.2	70
Perfluorodecanoic Acid (PFDA)	4.07	ND	-	-	-	-	1.48 J	ND	ND	-	1.24 J	-
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	ND	-	-	-	-	ND	ND	1.15 J	-	ND	-
Perfluorooctanesulfonamide (FOSA)	1.42 J	ND	-	-	-	-	ND	ND	ND	-	ND	-
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	3.62	ND	-	-	-	-	ND	ND	1.32 J	-	ND	-
PFOA and PFOS Sum	**214.2**	**162.60**	-	-	-	-	**111.6**	**114.3**	**324**	-	**82.1**	70
1,4 Dioxane by 8270D-SIM, in ug/l	ND	ND	-	-	-	-	ND	ND	ND	-	ND	-

Notes:

ND - Not detected at the reported detection limit for the sample.

J - Estimated concentration above the Method Detection Limit and below the Reporting Limit.

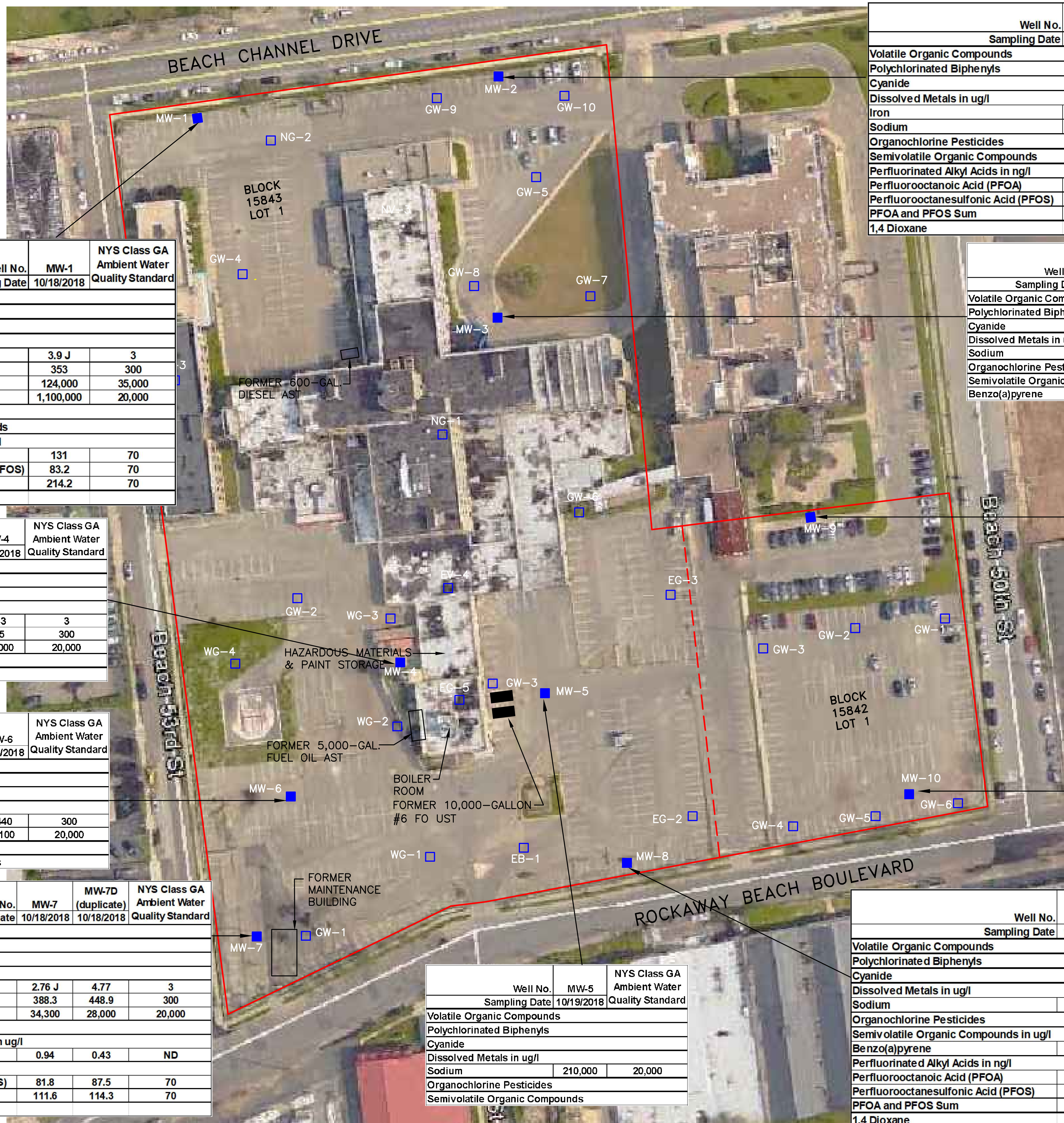
ug/l = micrograms per liter

ng/l = nanograms per liter

- = Not analyzed or not established

Bold yellow shaded values exceed applicable water quality criteria.

FPM



Well No.	MW-1	NYS Class GA Ambient Water Quality Standard
Sampling Date	10/18/2018	
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Antimony	3.9 J	3
Iron	353	300
Magnesium	124,000	35,000
Sodium	1,100,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		
Perfluorinated Alkyl Acids in ng/l		
Perfluorooctanoic Acid (PFOA)	131	70
Perfluorooctanesulfonic Acid (PFOS)	83.2	70
PFOA and PFOS Sum	214.2	70
1,4 Dioxane		

Well No.	MW-2	NYS Class GA Ambient Water Quality Standard
Sampling Date	10/18/2018	
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Iron	702	300
Sodium	131,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		
Perfluorinated Alkyl Acids in ng/l		
Perfluorooctanoic Acid (PFOA)	88.9	70
Perfluorooctanesulfonic Acid (PFOS)	73.7	70
PFOA and PFOS Sum	162.6	70
1,4 Dioxane		

Well No.	MW-3	NYS Class GA Ambient Water Quality Standard
Sampling Date	10/19/2018	
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Sodium	211,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		
Benzo(a)pyrene	0.03 J	ND

Well No.	MW-9	NYS Class GA Ambient Water Quality Standard
Sampling Date	10/19/2018	
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Iron	1,380	300
Magnesium	83,500	35,000
Sodium	965,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		

Well No.	MW-4	NYS Class GA Ambient Water Quality Standard
Sampling Date	10/19/2018	
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Antimony	4.43	3
Iron	455	300
Sodium	139,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		

Well No.	MW-10	NYS Class GA Ambient Water Quality Standard
Sampling Date	10/18/2018	
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Sodium	77,200	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		
Benzo(a)pyrene	0.05 J	ND
Perfluorinated Alkyl Acids in ng/l		
PFOA and PFOS Sum	82.1	70
1,4 Dioxane		

Well No.	MW-6	NYS Class GA Ambient Water Quality Standard
Sampling Date	10/19/2018	
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Iron	2,440	300
Sodium	36,100	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		

Well No.	MW-7	MW-7D (duplicate)	NYS Class GA Ambient Water Quality Standard
Sampling Date	10/18/2018	10/18/2018	
Volatile Organic Compounds			
Polychlorinated Biphenyls			
Cyanide			
Dissolved Metals in ug/l			
Antimony	2.76 J	4.77	3
Manganese	388.3	448.9	300
Sodium	34,300	28,000	20,000
Organochlorine Pesticides			
Semivolatile Organic Compounds in ug/l			
Benzo(a)pyrene	0.94	0.43	ND
Perfluorinated Alkyl Acids in ng/l			
Perfluorooctanesulfonic Acid (PFOS)	81.8	87.5	70
PFOA and PFOS Sum	111.6	114.3	70
1,4 Dioxane			

Well No.	MW-5	NYS Class GA Ambient Water Quality Standard
Sampling Date	10/19/2018	
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Sodium	210,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		

Well No.	MW-8	NYS Class GA Ambient Water Quality Standard
Sampling Date	10/18/2018	
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Sodium	24,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds in ug/l		
Benzo(a)pyrene	0.04 J	ND
Perfluorinated Alkyl Acids in ng/l		
Perfluorooctanoic Acid (PFOA)	216	70
Perfluorooctanesulfonic Acid (PFOS)	108	70
PFOA and PFOS Sum	324	70
1,4 Dioxane		

LEGEND:

MW-3	GROUNDWATER SAMPLE LOCATION (REMEDIAL INVESTIGATION)
GW-7	GROUNDWATER SAMPLE LOCATION (PREVIOUS INVESTIGATION
ND	NON-DETECT
ug/l	MICROGRAMS PER LITER
ng/l	NANOGRAMS PER LITER
J	ESTIMATED CONCENTRATION

NOTES:
- ALL SITE BUILDINGS DEMOLISHED IN 2018.
- PREVIOUS GROUNDWATER SAMPLE LOCATIONS ARE FROM MULTIPLE INVESTIGATIONS CONDUCTED BY FPM AND OTHERS AND INCLUDE SEVERAL NAMING CONVENTIONS.

0' 100' 200'
APPROXIMATE SCALE

FPM GROUP

FIGURE 2.1.4.2
GROUNDWATER SAMPLE RESULTS

FORMER PENINSULA HOSPITAL SITE
51-15 BEACH CHANNEL DRIVE
FAR ROCKAWAY, QUEENS, NY

Drawn By: H.C. | Checked By: S.D. | Date: 1/14/20

H:\PENINSULA ROCKAWAY\RAWP\FIGURE 2.1.2.2.dwg, 4/27/2020 11:49:04 AM, DWG To PDF.pc3

None of the groundwater data from the prior investigations showed any exceedances of the NYSDEC Standards and, therefore, none of these data are included on Figure 2.1.4.2.

The depth to groundwater in September and October 2018 generally ranged from 2.5 to 4.5 feet below grade and the groundwater relative elevation contours (presented in the RI Report) showed a more elevated water table surface (groundwater mound) near the center of the Site and a lower water table surface to the northwest and southeast. These data were obtained several months after the hospital building was demolished. During this time much of the Site remained paved but the location of the former hospital building, which is generally central within the Site, had been backfilled with crushed concrete and was unpaved. During this time above-average rainfall (40% more rainfall in 2018 than average) likely recharged the water table in the former area of the hospital building, resulting in a groundwater mound beneath the central portion of the Site.

Groundwater in the area of the former #6 fuel oil USTs previously exhibited free-phase product, which was removed during prior remedial efforts. Groundwater in this area (MW-5) was sampled during the RI and no visible indications or odors suggestive of petroleum impact were observed. Groundwater in this area and did not contain any petroleum constituents that exceeded NYSDEC Class GA Ambient Water Quality Standards (Standards).

None of the groundwater samples contained any VOCs, PCBs, cyanide, or pesticides above NYSDEC Standards. Groundwater in proximity to the former maintenance building location contained chlorinated solvents at low levels that do not exceed NYSDEC Standards and do not suggest an onsite source, but may contribute to the observed soil vapor conditions this area. 1,4-Dioxane was not detected in any of the wells for which this analyte was tested.

Groundwater contains levels of the dissolved metals sodium, manganese, magnesium, iron, and/or antimony that exceed the NYSDEC Standards. The sodium levels are elevated in every well, likely due to the proximity of the Site to the Atlantic Ocean and Jamaica Bay. As discussed in the RI Report, very little (if any) fresh groundwater is anticipated to be present in the Site vicinity due to the Site's location. The other dissolved metals were each detected in between one to five wells at levels that slightly to moderately exceed the applicable Standards. The magnesium detections may be related to seawater influence as seawater contains magnesium at an elevated level and the magnesium concentrations appear to vary with the sodium levels. Iron levels are typically elevated in Long Island groundwater and these detections are likely naturally-occurring. None of the antimony detections in soil was elevated and none of the manganese detections in soil exceeded any SCOs; the reasons for detections of antimony and manganese in limited areas of Site groundwater are not apparent.

None of the SVOC detections exceeded the NYSDEC Standards, with the exception of several detections of benzo(a)pyrene, for which the Standard is non-detect. The elevated detections were noted in wells MW-3, MW-7, MW-8 and MW-10; the maximum benzo(a)pyrene detection was 0.94 ug/l at well MW-7, near the former maintenance building location. Benzo(a)pyrene was detected in soil at several borings at levels above the commercial use and/or groundwater protection SCOs, and could be the source of the benzo(a)pyrene noted in Site groundwater.

PFAS compounds were detected in each of the wells for which this testing was conducted. PFOA and/or PFOS was detected above the then-current NYSDEC guidance of 0.07 ug/l for these compounds and their sum in wells MW-1 and MW-2 on the north side of the Site and wells MW-7, MW-8, and MW-10 on the south side of the Site. The highest concentrations (0.216 ug/l for PFOA and 0.108 ug/l for PFOS) were detected in well MW-8, which adjoins Rockaway Beach Boulevard on the south side of the Site. This well is not located in proximity to any of the former building locations or other formerly active areas of the Site and the PFAS detections may be indicative of ambient groundwater quality in the Site area.

<u>Soil Vapor</u>

The soil vapor sampling results from the RI are summarized on Table 2.1.4.3, and detections of VOCs for which the NYSDOH has provided guidance are highlighted. These detections are presented visually on Figure 2.1.4.3, together with the data from the prior investigations previously presented in the RI Work Plan.

The VOCs 1,1,1-trichloroethane (1,1,1-TCA), trichloroethene (TCE), tetrachloroethene (PCE), and/or carbon tetrachloride were identified in soil vapor at several locations; most of the detections were at relatively low levels that do not suggest a concern for potential soil vapor intrusion (SVI) for buildings eventually constructed on the Site. Somewhat elevated levels of 1,1,1-TCA, PCE and TCE were noted in proximity to the former hospital boiler room, and PCE

TABLE 2.1.4.3
SOIL VAPOR SAMPLING RESULTS
FORMER PENINSULA HOSPITAL SITE, FAR ROCKAWAY, NEW YORK

Sample No.	V-1	V-2	V-3	V-4	V-5	V-6	V-7	V-7D	V-8	V-9	V-10
Sample Date	8/17/2018					8/20/2018					
Volatile Organic Compounds in ug/m^3											
Dichlorodifluoromethane	2.24	2.02	ND	ND	2.24	ND	ND	ND	ND	55.4	2.15
Chloromethane	0.859	0.896	0.999	1.96	1.85	ND	ND	ND	ND	ND	ND
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Butadiene	1.81	3.1	27.4	81.2	26.1	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	1.89	1.89	ND	ND	ND	ND	ND	ND	ND
Vinyl bromide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	122	13.8 J	157	1,220	77.9 J	456	302	311	466	694	587
Trichlorofluoromethane (Freon 11)	5.41	1.12	ND	8.15	ND	ND	ND	ND	ND	714	7.87
iso-Propyl Alcohol	3.02	ND	2.48	29.3	ND	ND	ND	ND	ND	ND R	3.76 R
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butyl Alcohol	2.93	ND	5.31	8.67	6.40	ND	ND	ND	ND	ND	8.91
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Chloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	151	1.16	38.9	52.0	16.3	ND	ND	7.79	ND	ND	4.58
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	173	11.6	284	386	298	687	776	767	563	1,070	319
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	11.7	ND	5.57	2.72	ND	5.18	ND	ND	ND	20.6	5.13
Tetrahydrofuran	2.93	ND	4.19	ND	4.07	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Hexane	13.6	2.9	27.9	66.3	34.4	ND	ND	ND	ND	3.63	2.28
1,1,1-Trichloroethane	**2.01**	ND	ND	ND	ND	ND	ND	ND	ND	**119**	**30.1**
Benzene	21.7	3.04	209	95.2	26.3	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	28.2	3.42	11.8	40.3	41.6	ND	ND	ND	ND	ND	ND

Notes:

All samples analyzed using Method TO-15.

Shaded compounds are those for which the NYSDOH has provided guidance.

Bold yellow shading identifies detections of compounds for which the NYSDOH has provided guidance.

ug/m^3 = micrograms per cubic meter.

J = Estimated concentration.

R = Result rejected in DUSR due to non-target compound interferance.

TABLE 2.1.4.3 (CONTINUED)
SOIL VAPOR SAMPLING RESULTS
FORMER PENINSULA HOSPITAL SITE, FAR ROCKAWAY, NEW YORK

Sample No.	V-1	V-2	V-3	V-4	V-5	V-6	V-7	V-7D	V-8	V-9	V-10
Sample Date	8/17/2018					8/20/2018					
Volatile Organic Compounds in ug/m^3											
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**16**
2,2,4-Trimethylpentane	29.3	3.22	44.7	31.0	40.8	ND	ND	ND	ND	ND	2.73
Heptane	10.1	1.14	16.4	46.3	17.4	ND	ND	ND	ND	4.75	2.75
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	38.8	4.52	63.3	98.0	52.4	14.4	ND	ND	11.5	10.9	3.11
2-Hexanone	25.4	1.07	31.8	33.4	34.6	79.9	80.3	68	53.7	113	65.6
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	**12.9**	ND	**12.8**	**14.7**	**12.7**	**559**	ND	ND	ND	**46.7**	**583**
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	11.8	1.12	22.4	21.1	12.7	6.47	ND	ND	ND	ND	ND
p/m-Xylene	48.6	4.14	60.8	59.1	50.8	33.8	ND	ND	ND	17.8	4.12
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	2.94	ND	3.88	8.00	3.53	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	18.6	1.52	21.5	24.5	18.8	18.4	ND	ND	ND	12.2	3.06
4-Ethyltoluene	6.54	ND	6.93	6.00	6.98	8.85	ND	ND	ND	6.69	ND
1,3,5-Trimethylbenzene	9.14	ND	8.95	9.09	8.6	13.5	ND	ND	ND	11.0	2.25
1,2,4-Trimethylbenzene	26.1	1.54	26.3	24.8	25.8	47.7	ND	ND	14.2	39.9	7.13
Benzyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
All samples analyzed using Method TO-15.
Shaded compounds are those for which the NYSDOH has provided guidance.
Bold yellow shading identifies detections of compounds for which the NYSDOH has provided guidance.
ug/m^3 = micrograms per cubic meter.
J = Estimated concentration.

TABLE 2.1.4.3 (CONTINUED)
SOIL VAPOR SAMPLING RESULTS
FORMER PENINSULA HOSPITAL SITE, FAR ROCKAWAY, NEW YORK

Sample No.	**V-11**	**V-12**	**V-13**	**V-14**	**V-15**	**V-16**	**V-17**	**V-18**	**V-19**
Sample Date					**8/21/2018**				
Volatile Organic Compounds in ug/m^3									
Dichlorodifluoromethane	ND	183	3.20	4.00	2.63	ND	65.3	7.02	33.2
Chloromethane	ND	ND	1.73	0.84	0.603	ND	ND	ND	ND
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Butadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	1.46	ND	1.24	ND	ND
Vinyl bromide	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	568	352	463	534	575	1,330	454	770	1260
Trichlorofluoromethane (Freon 11)	ND	2,520 D	ND	171	4.15	6.18	702	51	1740
iso-Propyl Alcohol	7.60 R	ND R	3.69 R	ND R	6.12	17.5	ND R	6.37	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butyl Alcohol	12.3	ND	5.97	7.70	8.25	22.5	6.03	8.85	15
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
3-Chloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	7.75	43.3	157	1.44	1.66	ND	8.72	4.2	5.33
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	380	159	223	263	210	590	146	261	664
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	11.9	24.3	ND	1.74	ND	ND	3.04	1.66	ND
Tetrahydrofuran	ND	ND	ND	1.86	16	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Hexane	4.16	ND	20.1	2.77	2.14	8.85	1.99	2.83	8.92
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	3.9	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	**1.93**	ND	**16.5**	ND	ND	ND
Cyclohexane	ND	11.8	16.2	ND	ND	ND	ND	ND	3.44

Notes:

All samples analyzed using Method TO-15.

Shaded compounds are those for which the NYSDOH has provided guidance.

Bold yellow shading identifies detections of compounds for which the NYSDOH has provided guidance.

ug/m^3 = micrograms per cubic meter.

J = Estimated concentration.

R = Result rejected in DUSR due to non-target compound interferance.

D = Sample dilution required for analyte quantification.

TABLE 2.1.4.3 (CONTINUED)
SOIL VAPOR SAMPLING RESULTS
FORMER PENINSULA HOSPITAL SITE, FAR ROCKAWAY, NEW YORK

Sample No.	V-11	V-12	V-13	V-14	V-15	V-16	V-17	V-18	V-19
Sample Date					8/21/2018				
Volatile Organic Compounds in ug/m^3									
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2,4-Trimethylpentane	3.62	ND R	59.3	1.18	ND	ND	ND	ND	ND
Heptane	5.49	ND	3.40	5.37	3.90	11.9	2.07	4.51	10.9
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	26.9	ND	ND	101	31.2	305	ND	2.92	12.1
2-Hexanone	134	23.5	41.8	123	86.5	179	38.6	116	264
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	**35.9**	**11.3**	ND	**8.14**	**2.41**	ND	ND	**4.51**	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	1.41	ND	ND	ND	1.35	6.17
p/m-Xylene	6.52	ND	ND	4.78	2.69	8.08	ND	5.34	18.6
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	4.43	ND	ND	2.71	1.66	4.3	ND	2.7	9.43
4-Ethyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	2.58	ND	ND	1.02	ND	ND	ND	1.23	ND
1,2,4-Trimethylbenzene	8.06	7.28	5.26	3.44	2.73	3.44	ND	4.25	12.9
Benzyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	7.09	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:
All samples analyzed using Method TO-15.
Shaded compounds are those for which the NYSDOH has provided guidance.
Bold yellow shading identifies detections of compounds for which the NYSDOH has provided guidance.
ug/m^3 = micrograms per cubic meter.
J = Estimated concentration.
R = Result rejected in DUSR due to non-target compound interferance.

Sample No.	NV-4
Sample Depth (ft)	4
Sample Date	5/10/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.97
Tetrachloroethene	5.2

Sample No.	SV-8
Sample Depth (ft)	4
Sample Date	7/22/16
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	5.4
Trichloroethene	0.21 J

Sample No.	NV-2
Sample Depth (ft)	4
Sample Date	5/10/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	1.1
Tetrachloroethene	1.3

Sample No.	SV-4
Sample Depth (ft)	3
Sample Date	1/6/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.59

Sample No.	NV-3
Sample Depth (ft)	4
Sample Date	5/10/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	1.0
Tetrachloroethene	0.81 J

Sample No.	V-18
Sample Depth (ft)	3
Sample Date	8/21/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	4.51

Sample No.	V-15
Sample Depth (ft)	3
Sample Date	8/21/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	2.41

LEGEND:

SV-3 SOIL VAPOR SAMPLE LOCATION (PREVIOUS AND REMEDIAL INVESTIGATIONS)

ATTEMPTED SOIL VAPOR SAMPLE LOCATION

AREA OF HIGHER VOLATILE ORGANIC COMPOUND CONCENTRATIONS

NOTES:
- ALL SITE BUILDINGS DEMOLISHED IN 2018.
- PREVIOUS SOIL VAPOR DATA ARE FROM MULTIPLE INVESTIGATIONS CONDUCTED BY FPM AND OTHERS AND INCLUDE SOME DUPLICATE SAMPLE NUMBERS.
- DETECTIONS OF ALL VOLATILE ORGANIC COMPOUNDS IN THE NEW YORK STATE DEPARTMENT OF HEALTH SOIL VAPOR INTRUSION GUIDANCE DOCUMENT MATRICES ARE SHOWN.

Sample No.	NV-1
Sample Depth (ft)	4
Sample Date	5/10/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.73
Tetrachloroethene	1.4

Sample No.	V-16
Sample Depth (ft)	3
Sample Date	8/21/18
Volatile Organic Compounds in ug/m^3	
Carbon Tetrachloride	16.5

Sample No.	SV-2
Sample Depth (ft)	3
Sample Date	1/6/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.38 J

Sample No.	NV-5
Sample Depth (ft)	4
Sample Date	5/10/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.80
Tetrachloroethene	4.1

Sample No.	SV-3
Sample Depth (ft)	3
Sample Date	1/6/17
Volatile Organic Compounds in ug/m^3	
Carbon tetrachloride	42
Methylene chloride	0.45 J
Tetrachloroethene	0.81 J

Sample No.	V-12
Sample Depth (ft)	3
Sample Date	8/21/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	11.3

Sample No.	V-14
Sample Depth (ft)	3
Sample Date	8/21/18
Volatile Organic Compounds in ug/m^3	
Carbon tetrachloride	1.93
Tetrachloroethene	8.14

Sample No.	EV-3
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.59
Tetrachloroethene	1.5

Sample No.	SV-7
Sample Depth (ft)	4
Sample Date	7/22/16
Volatile Organic Compounds in ug/m^3	
Carbon tetrachloride	0.31 J
Trichloroethene	0.21 J

Sample No.	V-1
Sample Depth (ft)	3
Sample Date	8/17/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	12.9
1,1,1-Trichloroethane	2.01

Sample No.	EV-4
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.59
Tetrachloroethene	5.0

Sample No.	SV-6
Sample Depth (ft)	4
Sample Date	7/22/16
Volatile Organic Compounds in ug/m^3	
Carbon tetrachloride	0.38 J
Tetrachloroethene	11
Trichloroethene	0.32 J

Sample No.	WV-3
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	1.8
Methylene chloride	0.66
Tetrachloroethene	23

Sample No.	SV-1
Sample Depth (ft)	2 - 3
Sample Date	3/29/16
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	1.3
Trichloroethene	1.6

Sample No.	EV-2
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	3.5

Sample No.	WV-4
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	3.4
Tetrachloroethene	3.5
Vinyl chloride	0.36 J

Sample No.	V-10
Sample Depth (ft)	3
Sample Date	8/20/18
Volatile Organic Compounds in ug/m^3	
Trichloroethene	16
Tetrachloroethene	583
1,1,1-Trichloroethane	30.1

Sample No.	SV-3
Sample Depth (ft)	3
Sample Date	11/16/15
Volatile Organic Compounds in ug/m^3	
Methylene chloride	2.1
Tetrachloroethylene	10

Sample No.	SV-4
Sample Depth (ft)	2 - 3
Sample Date	3/29/16
Volatile Organic Compounds in ug/m^3	
Carbon tetrachloride	0.88 J
Tetrachloroethene	0.75 J
Trichloroethene	0.07 J

Sample No.	SV-5
Sample Depth (ft)	4
Sample Date	7/22/16
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	0.93
Carbon tetrachloride	0.82 J
Tetrachloroethene	3.1
Trichloroethene	0.70 J

Sample No.	EV-1
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	1.0

Sample No.	V-3
Sample Depth (ft)	3
Sample Date	8/17/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	12.8

Sample No.	SV-2
Sample Depth (ft)	3
Sample Date	11/16/15
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	1,000
1,1-Dichloroethene	1.8
Tetrachloroethene	13

0' 100' 200'

APPROXIMATE SCALE

Sample No.	EV-6
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	0.60 J
Methylene chloride	0.80
Tetrachloroethene	5.6

Sample No.	V-11
Sample Depth (ft)	3
Sample Date	8/21/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	35.9

Sample No.	WV-2
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.52
Tetrachloroethene	2.2

Sample No.	V-4
Sample Depth (ft)	3
Sample Date	8/17/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	14.7

Sample No.	V-9
Sample Depth (ft)	3
Sample Date	8/20/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	46.7
1,1,1-Trichloroethane	119

Sample No.	SV-4
Sample Depth (ft)	4
Sample Date	7/22/16
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	6.7
1,1-Dichloroethene	1.1
cis-1,2-Dichloroethene	0.59
Tetrachloroethene	340
Trichloroethene	38
Vinyl chloride	0.28 J

Sample No.	WV-1
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	2.8
cis-1,2-Dichloroethene	0.87
Tetrachloroethene	2.6

Sample No.	V-6
Sample Depth (ft)	3
Sample Date	8/20/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	559

Sample No.	V-5
Sample Depth (ft)	3
Sample Date	8/17/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	12.7

Sample No.	SV-1
Sample Depth (ft)	3
Sample Date	11/16/15
Volatile Organic Compounds in ug/m^3	
Methylene chloride	4.5

Sample No.	EV-5
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.63
Tetrachloroethene	4.6

FPM GROUP

FIGURE 2.1.4.3
SOIL VAPOR SAMPLE RESULTS

FORMER PENINSULA HOSPITAL SITE
51-15 BEACH CHANNEL DRIVE
FAR ROCKAWAY, QUEENS, NY

Drawn By: H.C. | Checked By: S.D. | Date: 1/14/20

H:\PENINSULA ROCKAWAY\RAWP\FIGURE 2.1.4.3.dwg, 4/27/2020 11:53:01 AM, DWG To PDF.pc3 was identified in soil vapor on the southwest portion of the Site in proximity to a former maintenance building location. TCE was previously detected in soil vapor in this area. These detections were at levels that present a concern for SVI for buildings that may be constructed onsite. Carbon tetrachloride was previously identified in proximity to the former hospital building, as shown on Figure 2.1.4.3; lower levels of carbon tetrachloride were found in this area during the RI.

None of the soil vapor detections was highly elevated or suggestive of the presence of a significant source of soil vapors. None of these VOCs was found in Site groundwater during the RI, and none of these VOCs was found in Site soil at levels above the unrestricted use SCOs. Collectively, these data indicate that although somewhat elevated levels of VOCs are present in soil vapor beneath portions of the Site, no significant onsite source of soil vapor is present.

2.1.5 Significant Threat

Based on the RI results, the NYSDEC and NYSDOH have determined that this Site does not pose a significant threat to human health and the environment. Notice of that determination has been provided for public review in an August 2020 Fact Sheet; a copy of the Fact Sheet is included in Appendix A.

2.2 SITE HISTORY

This section describes the Site history, including the history of environmental investigations. The investigation results are described in Section 2.4.

2.2.1 Past Uses and Ownership

The Site was undeveloped until 1959 except for its southwestern corner, which was formerly occupied successively by a small hotel (from prior to 1912 until sometime before 1933), several residences, and three small stores (present in 1951 and removed circa 1960).

The Site was redeveloped with a hospital building in 1959 that was operated as the Peninsula Hospital until it closed in 2012. The hospital building was surrounded by paved parking areas and a small maintenance building was formerly present on the southwest corner of the Site from 1983 until it was removed (between 1994 and 2003).

Demolition of the hospital building commenced in January 2018 and was completed by mid-2018. Demolition included all above-grade building materials and below-grade foundation elements. The concrete was crushed and re-used onsite as needed for temporary backfill in the depressed areas that resulted from building demolition, as per New York City (NYC) Department of Buildings backfill requirements for grading sites after demolition. The Site has remained vacant and partially paved since mid-2018.

The Site is presently owned by Peninsula Rockaway Limited Partnership, which on May 5, 2016 purchased the two tax lots that comprised the Site at that time. These two tax lots have recently been merged and Site is now comprised of current Queens Tax Map Block 15483, Lot 1. The previous owners of the former tax lots that comprise the Former Peninsula Hospital Site are as follows:

- Queens Tax Map Block 15843, Lot 1: Congregation Zichron Yitzchok Vmoshe Eliyahu (12/16/13 to 5/5/16), Beach Drive Holdings, LLC (5/8/2013 to 12/16/2013), The City of New York (12/20/1977 to 5/8/2013), Peninsula General Nursing Home (3/16/1971 to 12/20/1977), Peninsula General Hospital (8/14/1968 to 3/16/1971), Andes Foundation, Inc. (prior to 8/14/1968).
- Queens Tax Map Block 15842, Lot 1: Congregation Zichron Yitzchok Vmoshe Eliyahu (12/16/13 to 5/5/16), Beach Drive Holdings, LLC (5/8/2013 to 12/16/2013), New York City Industrial Development Agency (12/1/1998 to 5/8/2013), Peninsula Hospital Center (prior to 12/1/1998).

2.2.2 Phase I and Phase II Reports

Several Phase I Environmental Site Assessment (ESA) and Phase II Investigation reports were prepared for the two former tax lots that comprise the Former Peninsula Hospital Site, as follows:

Block 15843, Lot 1 (former hospital):

- Phase I Environmental Site Assessment, PVE Sheffler/Lawrence Environmental Group, October 21, 2015
- Phase II Environmental Site Assessment, PVE Sheffler/Lawrence Environmental Group, November 24, 2015
- Phase II Environmental Site Assessment, FPM Group, Ltd., August 30, 2016

- Tank Removal Report (draft), FPM Group, Ltd.
- Phase II Environmental Site Assessment, FPM Group, Ltd, June 26, 2017

Block 15842, Lot 1 (former hospital parking lot):

- Phase I Environmental Site Assessment, FPM Group, Ltd., March 2016
- Phase II Environmental Site Assessment, FPM Group, Ltd., April 12, 2016
- Phase II Environmental Site Assessment, FPM Group, Ltd, June 26, 2017

The information from these reports was summarized in the RI Work Plan and incorporated into the assessment of the nature and extent of contaminants in each of the Site media provided in the RI Report and discussed in Section 2.4.

2.2.3 Sanborn Maps

All Sanborn Fire Insurance maps available for this Site were reviewed prior to preparation of the RAWP; copies of the available Sanborn Fire Insurance maps are included in Appendix C. Information from the Sanborn Fire Insurance maps, which include the period from 1912 through 2006, is summarized as follows:

- A small hotel (Osceola Hotel) was present on the southwest corner of the Site from prior to 1912 until sometime before 1933;
- By 1933 the hotel building had been removed and five small residences were present on the southwest corner of the Site. No other development of the Site was apparent;
- By 1951 three of the dwellings had been replaced by a small store, but no further development of the Site was apparent;
- By 1981 the dwellings and store had been removed and the Peninsula General Hospital had been constructed on the central portion of the Site. The hospital building included a main volume of four wings constructed in 1959, with a boiler room present at the south end of the south wing. Another wing was constructed in 1965 and was attached to the west end of the west wing. A small gate house was also present on the northeastern portion of the Site and the area south of the hospital building was used for parking;

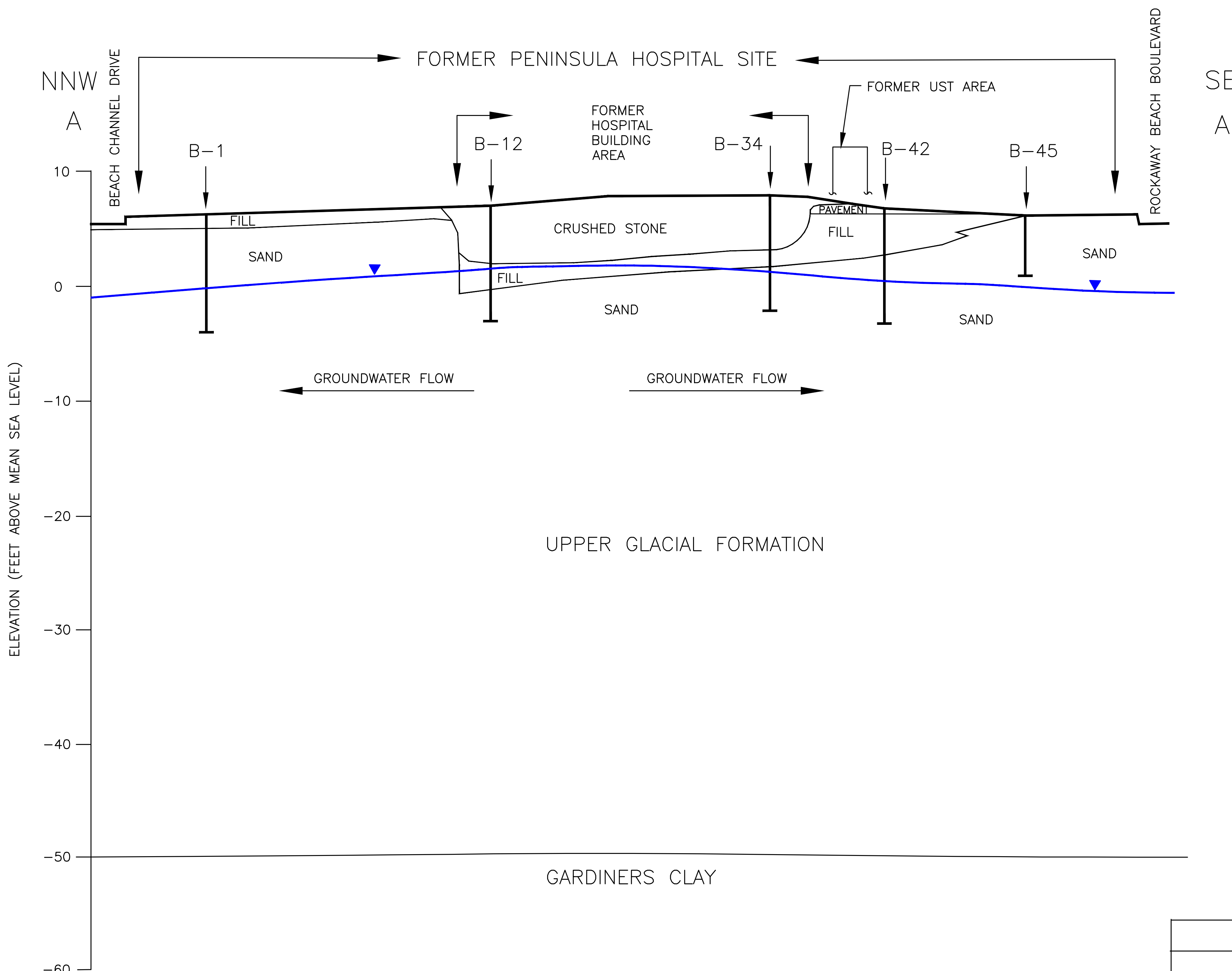
- Between 1982 and 1983 a small maintenance shop building was constructed on the southwest portion of the Site and between 1993 and 1995 a second small gate house was added to the southern portion of the Site;
- Between 1996 and 1999 the southern gate house was removed and a security tower and a fenced enclosure for oxygen tanks were added to the southern portion the Site;
- No further changes were noted on any of the Sanborn Fire Insurance maps through 2006. However, it should be noted that historic aerial photos indicate that the maintenance shop building was removed between 1994 and 2003.

2.3 GEOLOGICAL CONDITIONS

The geologic and hydrogeologic conditions at the Site have been investigated on several occasions, as noted in Section 2.2.2, and were further investigated during the RI, during which 56 soil borings were performed and 10 groundwater monitoring wells were installed. The Site is located on the Rockaway Peninsula, between Jamaica Bay and the Atlantic Ocean, which has influenced its geologic and hydrogeologic conditions. The present topographic elevation of the Site is approximately 5 to 10 feet above mean sea level (MSL) and the ground surface is relatively flat (USGS Far Rockaway, New York Quadrangle, 2016). A geologic cross-section is presented in Figure 2.3.1; the cross-section location is shown on Figure 2.3.2, which also illustrates the groundwater flow conditions.

Previous subsurface investigations document that the Site has been modified from its original configuration (former marsh with an elevation near sea level) by placement of historic fill. The RI data show that the fill thickness generally ranges from 1 to 2 feet, with a very limited area near the southwestern corner of the Site having up to 5 feet of fill. The fill was noted to generally consist of brown to gray fine to coarse sand with trace quantities of brick, concrete, and/or gravel fragments and occasional asphalt fragments.

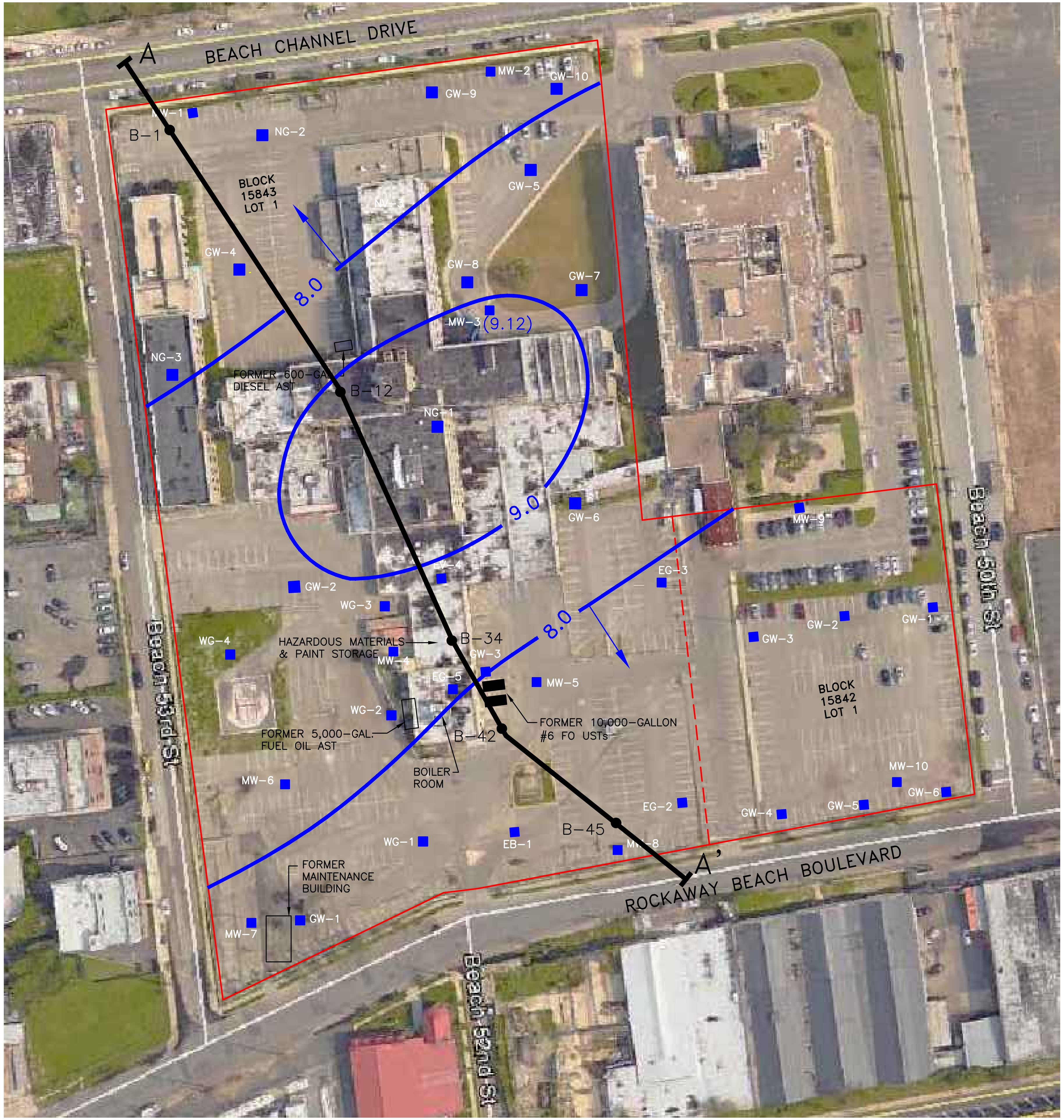
Beneath the historic fill, the Site is underlain successively by organic marsh deposits in places, and by Upper Glacial Formation sand, silt, and clay outwash deposits (USGS, 1963). During the RI native soil was identified starting from immediately below the pavement surface (where



H: 1"=200'
V: 1"=10'
VE=20X

FPM GROUP		
FIGURE 2.3.1 **GEOLOGICAL CROSS-SECTION** FORMER PENINSULA HOSPITAL SITE 51-15 BEACH CHANNEL DRIVE FAR ROCKAWAY, QUEENS, NY		
Drawn By: H.C.	Checked By: S.D.	Date: 1/14/20

H:\PENINSULA ROCKAWAY\RAWP\FIGURE 2.3.1.dwg, 4/27/2020 11:56:56 AM, DWG To PDF.pc3



LEGEND:

- ● REPRESENTATIVE SOIL BORING LOCATION
- ■ MW-3 GROUNDWATER SAMPLE LOCATION
- —9.0— WATER TABLE RELATIVE ELEVATION CONTOUR (OCTOBER 18, 2018)
- → GROUNDWATER FLOW DIRECTION
- A—A' CROSS-SECTION LOCATION

0' 100' 200'

APPROXIMATE SCALE

FPM GROUP

FIGURE 2.3.2
SITE PLAN AND CROSS-SECTION LOCATION

FORMER PENINSULA HOSPITAL SITE
51-15 BEACH CHANNEL DRIVE
FAR ROCKAWAY, QUEENS, NY

Drawn By: H.C.	Checked By: S.D.	Date: 1/14/20

H:\PENINSULA ROCKAWAY\RAWP\FIFURE 2.3.2.dwg, 4/27/2020 11:59:17 AM, DWG To PDF.pc3 pavement was present) or from immediately below the base of historic fill. In most borings at least 5 feet of native soil were penetrated, with up to 10 feet penetrated in the more northerly portions of the Site. The native soil was noted to generally consist of fine to medium-grained light brown to gray sand with intervals of gravel and/or silt. Organic (plant) materials were noted in the deeper portions of several of the borings. None of the RI or previous borings fully penetrated the Upper Glacial Formation deposits.

The Gardiners Clay, consisting of clay with interbedded silt and sand, is present below the Upper Glacial Formation (USGS, 1963) and acts as an aquitard between the Upper Glacial Formation and the deeper Magothy Formation. The top of the Gardiners Clay is present at an approximate elevation of between -50 and -100 feet MSL in the Site vicinity.

Groundwater is present beneath the Site in the deeper portions of historic fill and in the underlying Upper Glacial Formation deposits. The depth to groundwater beneath the Site has generally been between 4 and 8 feet below grade, based on information obtained during previous Site investigations in 2016 and 2017, but was found to range from 2.5 to 4.5 feet below grade during the RI. This shallower water table may have resulted from higher-than-normal rainfall in 2018 (the Central Park weather station reported nearly 40% more rainfall in 2018 than the long-term average rainfall).

The regional groundwater flow direction in the Site vicinity is generally to the north (USGS, 2009). The Site-specific groundwater flow direction was evaluated during the RI and the groundwater relative elevation contours show a more elevated water table surface (groundwater mound) near the center of the Site and a lower water table surface to the northwest and southeast, as shown on Figure 2.3.2. The RI data (Table 2.3.1) were obtained in September and October 2018, several months after the hospital building was demolished. Following demolition, much of the Site remained paved but the location of the former hospital building, which is generally central within the Site, had been backfilled with crushed concrete and was unpaved. During this time the above-average rainfall likely recharged the water table in the former area of the hospital building, resulting in a groundwater mound beneath the central portion of the Site.

TABLE 2.3.1
WELL TOP OF CASING AND GROUNDWATER RELATIVE ELEVATIONS
FORMER PENINSULA HOSPITAL SITE
51-15 BEACH CHANNEL DRIVE AND 50-04 ROCKAWAY BEACH BOULEVARD
FAR ROCKAWAY, NY

Well	Relative Elevation of Top of Casing (feet)	Depth to Water (feet)	Groundwater Relative Elevation (feet)
SEPTEMBER 11, 2018			
MW-1	10.69	3.47	7.22
MW-2	10.73	2.62	8.11
MW-3	11.65	2.18	9.47
MW-4	11.14	2.51	8.63
MW-5	11.54	3.88	7.66
MW-6	10.56	2.25	8.31
MW-7	10.19	2.24	7.95
MW-8	10.00	2.38	7.62
MW-9	10.95	3.20	7.75
MW-10	10.55	2.89	7.66
SEPTEMBER 19, 2018			
MW-1	10.69	3.67	7.02
MW-2	10.73	2.75	7.98
MW-3	11.65	2.38	9.27
MW-4	11.14	2.70	8.44
MW-5	11.54	3.97	7.57
MW-6	10.56	2.32	8.24
MW-7	10.19	2.13	8.06
MW-8	10.00	2.44	7.56
MW-9	10.95	3.19	7.76
MW-10	10.55	2.91	7.64
OCTOBER 18, 2018			
MW-1	10.69	3.62	7.07
MW-2	10.73	2.86	7.87
MW-3	11.65	2.53	9.12
MW-4	11.14	2.47	8.67
MW-5	11.54	4.01	7.53
MW-6	10.56	2.22	8.34
MW-7	10.19	2.29	7.90
MW-8	10.00	2.60	7.40
MW-9	10.95	3.13	7.82
MW-10	10.55	2.86	7.69

2.4 CONTAMINATION CONDITIONS

2.4.1 Conceptual Model of Site Contamination

The Site is located on the Rockaway Peninsula, between Jamaica Bay and the Atlantic Ocean. The Site, prior to development, was formerly a marsh with an elevation near sea level. To enable development, the original Site surface was modified by placement of historic fill, which raised the grade to the present elevation of approximately 5 to 10 feet MSL. The historic fill contains some contaminants that could be transported onsite or offsite, or could present a concern for human exposure, as discussed in the sections below.

The Site was most recently (1959 – 2012) used as a hospital (now demolished) and includes several Areas of Concern (AOCs) associated with this former use. These AOCs include a boiler room with associated underground storage tanks (USTs) at the south end of the former hospital building, a hazardous materials and paint storage area within the former hospital building, and a former maintenance building located on the southwest corner of the Site. Although these buildings have been demolished and the USTs removed, historic releases may have occurred in these areas that could result in soil, groundwater and/or soil vapor contamination. One petroleum spill is reported in association with the former USTs. Although the USTs and associated petroleum-impacted soil and free-phase product have been removed, residual impacts in the spill area, if present, could migrate or present an exposure concern.

Groundwater is present in the deeper portions of the historic fill and in the underlying Upper Glacial Formation deposits. The depth to groundwater beneath the Site has ranged from 2.5 to 8 feet below grade. The regional groundwater flow direction in the Site vicinity is generally to the north, but the Site-specific groundwater flow direction, which was determined following demolition the hospital building, appears to be influenced by recharge in the former hospital location, which was backfilled with crushed concrete and remains unpaved. A groundwater mound is present near the center of the Site and groundwater appears to flow outward from this mound to the northwest and southeast, as shown on Figure 2.3.2. Groundwater may contain contaminants that could present an exposure concern if groundwater were to be used. Groundwater may also transport dissolved contaminants onsite and offsite.

Soil vapor is present in the unsaturated zone above the water table and has the potential to contain vapor-phase contaminants that could migrate onsite. Soil vapor containing contaminants could intrude into buildings that may be constructed onsite in the future. As noted in the RI, no source of soil vapors was identified and none of the soil vapor detections was highly elevated; therefore, it is unlikely that soil vapors could migrate from the Site.

2.4.2 Descriptions of Areas of Concern

Several AOCs have been identified at the Site in association with historic preparation of the Site for development and with the former hospital use. Each AOC is described below, together with the available information. Additional detailed information concerning contamination associated with the AOCs is provided in subsequent sections.

<u>Former USTs and ASTs</u>

The Site is identified as Petroleum Bulk Storage (PBS) site 2-316660 due to the former presence of several tanks. These tanks included two 10,000-gallon #6 fuel oil USTs installed in December 1957 and closed in place in November 1998; one 550-gallon diesel UST reportedly closed in place in November 1998; one 5,000-gallon #2 fuel oil AST installed in June 2007 and listed as in service in 2015; and one 600-gallon diesel AST listed as in service in 2015.

The petroleum storage tanks that remained present on the Site were located and removed in 2016 following a work plan (FPM, May 23, 2016) that was reviewed and approved by the NYSDEC. The scope of work completed included a geophysical survey of the known and suspected UST areas, a visual survey of the building perimeter and nearby areas, and subsurface explorations to locate all of the remaining USTs. The remaining USTs and ASTs at the Site were located and properly removed and disposed, with advance NYSDEC notification and the appropriate Fire Department of New York Affidavit filed. The tanks removed included a 5,000-gallon #2 fuel oil AST and two closed-in-place 10,000-gallon #6 fuel oil USTs associated with the former boiler room.

An elevated platform for a backup diesel generator with an associated AST was observed on the northwest side of the former hospital building. Although some generator equipment and piping were still present, the former AST was determined to have been previously removed. The removed

AST appears to have been the 600-gallon diesel AST registered with the NYSDEC and noted to be in service in 2015.

A diligent search was made for the 550-gallon diesel UST that was reportedly closed in place, including a geophysical survey, a visual survey of the entire perimeter of the building for vent or fill pipes, and subsurface exploration using an excavator and hand excavation. However, the UST was not located and it was concluded that it was previously removed.

Petroleum-impacted soil and free-phase product were removed from the former boiler room's #6 fuel oil UST area in 2016 and properly disposed offsite to address spill #1508760 (discussed below), which remains open. Residual petroleum-stained soil remained present approximately 7 feet below grade in the former UST area in 2016. This area was further investigated during the RI by performing multiple soil borings and conducting groundwater sampling. No visible or other indications of potential petroleum contamination were observed in any of the borings in the former UST area, no free-phase petroleum was identified in the UST area monitoring well (MW-5), and no dissolved petroleum-related VOCs or SVOCs were identified in the UST area groundwater. Soil samples in the former UST area did not exhibit any exceedances of the SCOS for VOCs, but several SVOCs (primarily the polynuclear aromatic hydrocarbons, or PAHs) exceeded the SCOs for restricted residential use in the historic fill present in this area. As visible or other indications of potential petroleum contamination were not observed in any of the borings, the presence of PAHs in the fill appears likely related to the minor amounts of asphalt fragments observed in some of the fill.

<u>Spills</u>

Three NYSDEC Spills have been reported for the Site. Spill #9104015 was reported on July 15, 1991 when a 550-gallon diesel UST failed a tightness test. The UST was isolated and re-tested with no further failure report. The cleanup was noted to meet standards and the spill was closed on June 4, 1993. Spill #1311139 was reported on February 25, 2014 when an electrical fire in the vacant hospital building resulted in a release of non-PCB dielectric fluid. The spill was contained and cleaned up and the release area was reported to be free of contamination. This spill was closed on February 27, 2014.

Spill #1508760 was reported on November 24, 2015 when fuel oil-impacted soil was identified in proximity to the #6 fuel oil USTs during a Phase II investigation of the hospital property. A work plan to remove all of the Site's tanks and the petroleum-impacted soil in the #6 fuel oil UST area was submitted to the NYSDEC on May 23, 2016 and was approved on May 27, 2016. The remaining tanks were removed in July 2016, as discussed above, and petroleum-impacted soil and free-phase product were removed in the #6 fuel oil UST area. Some petroleum-stained soil remained present approximately 7 feet below grade in the former UST area in 2016, but testing of post-excavation samples from the floor and walls of the UST excavation did not show any exceedances of SCOs. As discussed above, this spill area was further investigated during the RI and no visible or other indications of potential petroleum contamination were observed in any of the borings or the monitoring well installed in the former UST area. PAHs were identified in the historic fill in the former UST area and are likely related to the minor amounts of asphalt fragments observed in some of the fill.

Former Maintenance Shop Area

A small maintenance shop building was formerly present on the southwest corner of the Site from about 1983 until it was removed between 1994 and 2003. The operations that occurred in this shop are not known, but presumably included maintenance operations for the former hospital facility. As the hospital was a RCRA hazardous waste generator between at least 1989 and 2012 and generated D001, D002, D003, F001 through F005, U044, U122, and U188 wastes, it is possible that some of these wastes were generated in the maintenance shop. Sampling conducted prior to the RI identified arsenic in soil above the restricted residential use SCO and PCE and TCE in soil vapor in this area. This area was further investigated during the RI and additional soil vapor impacts by PCE were identified. PAHs were also identified in shallow soil in this area, but are likely related to the historic fill conditions.

Former Hazardous Materials and Paint Storage Area

A hazardous materials and paint storage area was present in the south wing of the former hospital building and was identified during the 2015 Phase I ESA of this portion of the Site. This area was investigated during the RI and no soil, soil vapor or AOC-related groundwater impacts were identified.

Historic Fill

The Site has been modified from its original configuration (former marsh with an elevation near sea level) by placement of historic fill. The fill thickness generally ranges from 1 to 2 feet, with a very limited area near the southwestern corner of the Site having up to 5 feet of fill. The fill was noted to generally consist of brown to gray fine to coarse sand with trace quantities of brick, concrete, and/or gravel fragments and occasional asphalt fragments. No organic material, PID responses, odors or staining suggestive of potential contamination were noted in any of the fill samples, including fill samples collected from the area of the former #6 fuel oil USTs, during the RI. VOCs, SVOCs, metals, pesticides, and one PCB were detected in the fill at levels exceeding the unrestricted use SCOs, with some impacts also exceeding the restricted residential use SCOs and/or protection of groundwater SCOs. Most of the impacts appear to reflect typical historic fill conditions, including the presence of PAHs likely associated with the limited amounts of asphalt observed in the fill and metals associated with ordinary human activities. Pesticide detections appear to be related to historic regional DDT applications for insect control.

2.4.3 Identification of Standards, Criteria and Guidance

There are three types of SCGs that remedial actions may have to comply with:

- Chemical-specific SCGs set concentrations for the chemicals of concern (e.g., drinking water standards);
- Location-specific SCGs may restrict remedial actions based on the characteristics of the site or its environs (e.g., remedial activities proposed for wetlands may be restricted by regulations protecting these areas); and
- Action-specific SCGs may affect remediation activities based on the type of technology selected (e.g., alternatives involving groundwater extraction at greater than 45 gallons per minute may be impacted by the Long Island Well Permit Program).

The following chemical-specific SCGs have been identified for soils at the Site:

- Federal Resource Conservation and Recovery Act (RCRA) regulations establish regulatory levels for various contaminants to be utilized in the evaluation of whether a solid waste is a hazardous waste;

- The 6 NYCRR Part 375-6 Remedial Program Soil Cleanup Objectives and the associated CP-51 Soil Cleanup Guidance Policy provide soil cleanup objectives for various contaminants present in soil at the Site; and
- The New York State regulations for hazardous waste management (6 NYCRR Parts 370, 371 and 372) establish requirements for hazardous waste characterization and disposal.

The following chemical-specific SCGs have been identified for groundwater at the Site:

- NYSDEC Water Quality Regulations for Surface Waters and Groundwaters (6 NYCRR Parts 700-705, revised January 17, 2008), established water quality standards for surface waters, groundwater, and effluent discharges.

The following chemical-specific SCGs have been identified for soil vapor/indoor air at the Site:

- The NYSDOH Guidance Document for Evaluating Soil Vapor Intrusion in the State of New York (October 2006, matrices updated May 2017) provides guidance concerning remediation levels for various contaminants that may be present in indoor air and soil vapor at the Site.

One action-specific SCG was identified:

- If groundwater pumping at 45 gallons per minute (gpm) or more is contemplated, then the requirements of the Long Island Well Permit Program are applicable.

2.4.4 Soil/Fill Contamination

Historic fill and native soil are present at the Site and have been sampled during several Phase II investigations and during the RI. Historic fill is present throughout the Site, with the exceptions of much of the southeastern portion of the Site and small areas adjoining the eastern and western edges of the Site. The historic fill thickness generally ranges from 1 to 2 feet, with a very limited area near the southwestern corner of the Site having up to 5 feet of fill. The fill generally consists of brown to gray fine to coarse sand with trace quantities of brick, concrete, and/or gravel fragments and occasional asphalt fragments. No organic material, PID responses, odors or staining suggestive of potential contamination were noted in any of the fill samples, including fill samples collected from the area of the former #6 fuel oil USTs, during the RI.

Native soil is present beneath the historic fill, or in cases where historic fill is absent, beneath the pavement that covers much of the Site. The native soil includes organic marsh deposits in places and Upper Glacial Formation sand, silt, and clay outwash deposits beneath the majority of the Site. The native soil was noted to generally consist of fine to medium-grained light brown to gray sand with intervals of gravel and/or silt. Organic (plant) materials from former marsh deposits were noted in the deeper portions of several of the borings.

2.4.4.1 Summary of Soil/Fill Data

The historic fill was found to contain a limited range of VOCs, a wider range of SVOCs (primarily PAHs), several metals, and pesticides. The PCB Aroclor 1254 and cyanide were detected in a limited number of samples.

The native soil was found to contain very few VOCs, some PAHs, several metals and pesticides. The PCB Aroclor 1254 was found in a limited number of samples and cyanide was detected in an extremely limited number of samples.

Table 2.4.4.1.1 shows the minimum and maximum detection of each analyte detected in historic fill and native soil for all of the samples collected during the RI.

2.4.4.2 Comparison of Soil/Fill with SCGs

Table 2.1.4.1 (Appendix B) highlights all exceedances of the Track 1 Unrestricted Use and the Restricted Residential Use SCOs for all soil/fill at the Site. Figure 2.4.4.2.1 is a spider map that shows the location and summarizes exceedances of the Restricted Residential Use SCOs for all historic fill and native soil samples. A spider map showing exceedances of the Track 1 Unrestricted SCOs for all soil/fill was not prepared as it is impractical to depict that nearly all of the 113 sampled locations showed exceedances of the Track 1 Unrestricted Use SCOs.

The soil/fill chemical analytical results are summarized as follows:

- VOCs for which exceedances of the unrestricted use SCOs were noted include acetone, xylenes, 2-butanone, and naphthalene. The naphthalene detection (boring B-22) was also noted to exceed its SCO for restricted residential use. No chlorinated VOC (CVOC)

TABLE 2.4.4.1.1
SOIL CHEMICAL ANALYTICAL RESULTS RANGES
FORMER PENINSULA HOSPITAL SITE

TCL Volatile Organic Compounds in ug/kg	Min.	Max.	6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Methylene chloride	ND	ND	50	100,000
1,1-Dichloroethane	ND	0.33 J	270	26,000
Chloroform	ND	2.1	370	49,000
Carbon tetrachloride	ND	ND	760	2,400
1,2-Dichloropropane	ND	ND	-	-
Dibromochloromethane	ND	ND	-	-
1,1,2-Trichloroethane	ND	ND	-	-
Tetrachloroethene	ND	16 J	1,300	19,000
Chlorobenzene	ND	22 J	1,100	100,000
Trichlorofluoromethane	ND	1,800	-	-
1,2-Dichloroethane	ND	ND	20	3,100
1,1,1-Trichloroethane	ND	1.9	680	100,000
Bromodichloromethane	ND	ND	-	-
trans-1,3-Dichloropropene	ND	ND	-	-
cis-1,3-Dichloropropene	ND	ND	-	-
1,3-Dichloropropene, Total	ND	ND	-	-
1,1-Dichloropropene	ND	ND	-	-
Bromoform	ND	ND	-	-
1,1,2,2-Tetrachloroethane	ND	ND	-	-
Benzene	ND	22 J	60	4,800
Toluene	ND	44 J	700	100,000
Ethylbenzene	ND	300	1,000	41,000
Chloromethane	ND	1.5 J	-	-
Bromomethane	ND	0.84 J	-	-
Vinyl chloride	ND	0.75 J	20	900
Chloroethane	ND	ND	-	-
1,1-Dichloroethene	ND	ND	330	100,000
trans-1,2-Dichloroethene	ND	14 J	190	100,000
Trichloroethene	ND	0.22 J	470	21,000
1,2-Dichlorobenzene	ND	2.0 J	1,100	100,000
1,3-Dichlorobenzene	ND	0.19 J	2,400	49,000
1,4-Dichlorobenzene	ND	160 J	1,800	13,000
Methyl tert butyl ether	ND	ND	930	100,000
p/m-Xylene	ND	1,400	-	-
o-Xylene	ND	480	-	-
Xylenes, Total	ND	**1,900**	260	100,000
cis-1,2-Dichloroethene	ND	0.64 J	250	100,000
1,2-Dichloroethene, Total	ND	0.64 J	-	-
Dibromomethane	ND	ND	-	-
Styrene	ND	73 J	-	-
Dichlorodifluoromethane	ND	12	-	-
Acetone	ND	**670 J**	50	100,000
Carbon disulfide	ND	11 J	-	-
2-Butanone	ND	**490 J**	120	100,000
Vinyl acetate	ND	ND	-	-
4-Methyl-2-pentanone	ND	4.4 J	-	-
1,2,3-Trichloropropane	ND	ND	-	-
2-Hexanone	ND	2.4 J	-	-
Bromochloromethane	ND	ND	-	-
2,2-Dichloropropane	ND	ND	-	-
1,2-Dibromoethane	ND	ND	-	-
1,3-Dichloropropane	ND	ND	-	-
1,1,1,2-Tetrachloroethane	ND	ND	-	-
Bromobenzene	ND	ND	-	-
n-Butylbenzene	ND	0.2 J	12,000	-
sec-Butylbenzene	ND	18 J	11,000	100,000
tert-Butylbenzene	ND	ND	5,900	100,000
o-Chlorotoluene	ND	0.27 J	-	-
p-Chlorotoluene	ND	ND	-	-
1,2-Dibromo-3-chloropropane	ND	ND	-	-
Hexachlorobutadiene	ND	0.21 J	-	-
Isopropylbenzene	ND	26 J	-	-
p-Isopropyltoluene	ND	49 J	-	-
Naphthalene	ND	**130,000**	12,000	100,000
Acrylonitrile	ND	ND	-	-
n-Propylbenzene	ND	33 J	3,900	100,000
1,2,3-Trichlorobenzene	ND	610 J	-	-
1,2,4-Trichlorobenzene	ND	430 J	-	-
1,3,5-Trimethylbenzene	ND	22 J	8,400	52,000
1,2,4-Trimethylbenzene	ND	60 J	3,600	52,000
1,4-Dioxane	ND	ND	100	13,000
p-Diethylbenzene	ND	42 J	-	-
p-Ethyltoluene	ND	380	-	-
1,2,4,5-Tetramethylbenzene	ND	880 J	-	-
Ethyl ether	ND	ND	-	-
trans-1,4-Dichloro-2-butene	ND	ND	-	-
Tenatively Identified Compounds in ug/kg	ND	46,900 J	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.

TABLE 2.4.4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS RANGES
FORMER PENINSULA HOSPITAL SITE

TCL Semivolatile Organic Compounds in ug/kg	Min	Max.	6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Acenaphthene	ND	**38,000**	20,000	100,000
1,2,4-Trichlorobenzene	ND	1,200	-	-
Hexachlorobenzene	ND	ND	330	-
Bis(2-chloroethyl)ether	ND	ND	-	-
2-Chloronaphthalene	ND	ND	-	-
1,2-Dichlorobenzene	ND	200	1,000	-
1,3-Dichlorobenzene	ND	ND	2,400	-
1,4-Dichlorobenzene	ND	57 J	1,800	-
3,3'-Dichlorobenzidine	ND	ND	-	-
2,4-Dinitrotoluene	ND	ND	-	-
2,6-Dinitrotoluene	ND	ND	-	-
Fluoranthene	ND	**220,000**	100,000	100,000
4-Chlorophenyl phenyl ether	ND	ND	-	-
4-Bromophenyl phenyl ether	ND	ND	-	-
Bis(2-chloroisopropyl)ether	ND	ND	-	-
Bis(2-chloroethoxy)methane	ND	ND	-	-
Hexachlorobutadiene	ND	ND	-	-
Hexachlorocyclopentadiene	ND	ND	-	-
Hexachloroethane	ND	ND	-	-
Isophorone	ND	ND	-	-
Naphthalene	ND	**30,000**	12,000	100,000
Nitrobenzene	ND	ND	-	-
NDPA/DPA	ND	ND	-	-
n-Nitrosodi-n-propylamine	ND	ND	-	-
Bis(2-ethylhexyl)phthalate	ND	1,700	-	-
Butyl benzyl phthalate	ND	8,500 J	-	-
Di-n-butylphthalate	ND	260 J	-	-
Di-n-octylphthalate	ND	160 J	-	-
Diethyl phthalate	ND	ND	-	-
Dimethyl phthalate	ND	ND	-	-
Benzo(a)anthracene	ND	**140,000**	1,000	1,000
Benzo(a)pyrene	ND	**120,000**	1,000	1,000
Benzo(b)fluoranthene	ND	**160,000**	1,000	1,000
Benzo(k)fluoranthene	ND	**45,000**	800	3,900
Chrysene	ND	**120,000**	1,000	3,900
Acenaphthylene	ND	1,900	100,000	100,000
Anthracene	ND	76,000	100,000	100,000
Benzo(ghi)perylene	ND	54,000	100,000	100,000
Fluorene	ND	**41,000**	30,000	100,000
Phenanthrene	ND	**200,000**	100,000	100,000
Dibenzo(a,h)anthracene	ND	**17,000**	330	330
Indeno(1,2,3-cd)pyrene	ND	**66,000**	500	500
Pyrene	ND	**200,000**	100,000	100,000
Biphenyl	ND	3,300 J	-	-
4-Chloroaniline	ND	ND	-	-
2-Nitroaniline	ND	ND	-	-
3-Nitroaniline	ND	ND	-	-
4-Nitroaniline	ND	ND	-	-
Dibenzofuran	ND	**24,000**	7,000	-
2-Methylnaphthalene	ND	11,000	-	-
1,2,4,5-Tetrachlorobenzene	ND	ND	-	-
Acetophenone	ND	150 J	-	-
2,4,6-Trichlorophenol	ND	ND	-	-
p-Chloro-m-cresol	ND	ND	-	-
2-Chlorophenol	ND	ND	-	-
2,4-Dichlorophenol	ND	ND	-	-
2,4-Dimethylphenol	ND	ND	-	-
2-Nitrophenol	ND	ND	-	-
4-Nitrophenol	ND	ND	-	-
2,4-Dinitrophenol	ND	ND	-	-
4,6-Dinitro-o-cresol	ND	ND	-	-
Pentachlorophenol	ND	ND	800	6,700
Phenol	ND	260	330	100,000
2-Methylphenol	ND	ND	330	-
3-Methylphenol/4-Methylphenol	ND	**630 J**	330	-
2,4,5-Trichlorophenol	ND	ND	-	-
Benzoic Acid	ND	ND	-	-
Benzyl Alcohol	ND	ND	-	-
Carbazole	ND	26,000	-	-
Tenatively Identified Compounds in ug/kg	ND	433,000 J	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.

TABLE 2.4.4.1.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS RANGES
FORMER PENINSULA HOSPITAL SITE

Analytes	Min.	Max.	6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Metals in milligrams per kilogram				
Aluminum, Total	968	6,030	-	-
Antimony, Total	ND	4.62	-	-
Arsenic, Total	ND	**18.9**	13	16
Barium, Total	4.65	**400**	350	400
Beryllium, Total	ND	0.780	7.2	72
Cadmium, Total	ND	**4.4**	2.5	4.3
Calcium, Total	180	138,000	-	-
Chromium, Total	3.02	**52.4**	30	180
Cobalt, Total	0.59 J	6.58	-	-
Copper, Total	0.969	**217**	50	270
Iron, Total	1,540	21,800	-	-
Lead, Total	2.07 J	**1,520**	63	400
Magnesium, Total	334	40,200	-	-
Manganese, Total	11.4	197	1,600	2,000
Mercury, Total	ND	**0.992**	0.18	0.81
Nickel, Total	1.16 J	29.9	30	310
Potassium, Total	218 J	1,790	-	-
Selenium, Total	ND	0.811 J	3.9	180
Silver, Total	ND	**44.4**	2	180
Sodium, Total	60.8 J	815	-	-
Thallium, Total	ND	0.489 J	-	-
Vanadium, Total	3.80	28.5	-	-
Zinc, Total	2.71 J	**2,120**	109	10,000
Pesticides in micrograms per kilogram				
Delta-BHC	ND	ND	40	100,000
Lindane	ND	2.68 P	100	1,300
Alpha-BHC	ND	ND	20	480
Beta-BHC	ND	ND	36	360
Heptachlor	ND	**44.7**	42	2,100
Aldrin	ND	ND	5	97
Heptachlor epoxide	ND	22.5 P	-	-
Endrin	ND	3.77	14	11,000
Endrin aldehyde	ND	4.06	-	-
Endrin ketone	ND	ND	-	-
Dieldrin	ND	**7.43 PI**	5	200
4,4'-DDE	ND	**456**	3.3	8,900
4,4'-DDD	ND	**282**	3.3	13,000
4,4'-DDT	ND	**681**	3.3	7,900
Endosulfan I	ND	ND	2,400	24,000
Endosulfan II	ND	7.33 JPI	2,400	24,000
Endosulfan sulfate	ND	ND	2,400	24,000
Methoxychlor	ND	1.40 J	-	-
Toxaphene	ND	ND	-	-
cis-Chlordane	ND	**132 PI**	94	4,200
trans-Chlordane	ND	97.6	-	-
Chlordane	ND	702	-	-
Polychlorinated Biphenyls in micrograms per kilogram				
Aroclor 1016	ND	ND	100	1,000
Aroclor 1221	ND	ND	100	1,000
Aroclor 1232	ND	ND	100	1,000
Aroclor 1242	ND	87.7	100	1,000
Aroclor 1248	ND	ND	100	1,000
Aroclor 1254	ND	**246**	100	1,000
Aroclor 1260	ND	**351**	100	1,000
Aroclor 1262	ND	ND	100	1,000
Aroclor 1268	ND	39.3 J	100	1,000
General Chemistry				
Cyanide in milligrams per kilogram	ND	5.4	27	27

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
P = the RPD between the results for the two columns exceeds the method-specific criteria.
I = the lower value for the two columns has been reported due to interference.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.

Sample No.	SB-18	6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	1-3	
Soil Type	Fill	
Sample Date	7/22/2016	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds in ug/kg		
Benzo[a]anthracene	1,020	1,000
TAL Metals		

Sample No.	B16	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	5-7	
Soil Type	Native	
Sample Date	8/29/18	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds in ug/kg		
Benzo(a)anthracene	1,400	1,000
Benzo(b)fluoranthene	1,200	1,000
Metals		
Pesticides		
Polychlorinated Biphenyls		
Cyanide		

Sample No.	B20		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	
Soil Type	Native	Native	
Sample Date	8/29/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Benzo(a)anthracene	14,000	-	1,000
Benzo(a)pyrene	12,000	-	1,000
Benzo(b)fluoranthene	14,000	-	1,000
Benzo(k)fluoranthene	4,600	-	3,900
Chrysene	12,000	-	3,900
Dibenzo(a,h)anthracene	1,900	-	330
Indeno(1,2,3-cd)pyrene	7,900	-	500
Metals			
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	B21		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	3-5	
Soil Type	Fill	Native	
Sample Date	8/30/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Benzo(a)anthracene	18,000	-	1,000
Benzo(a)pyrene	14,000	-	1,000
Benzo(b)fluoranthene	18,000	-	1,000
Benzo(k)fluoranthene	4,440	-	3,900
Chrysene	17,000	-	3,900
Dibenzo(a,h)anthracene	2,300	-	330
Indeno(1,2,3-cd)pyrene	7,900	-	500
Metals			
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	B22		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	5-7	
Soil Type	Fill	Native	
Sample Date	8/30/18		
TCL Volatile Organic Compounds in ug/kg			
Naphthalene	130,000	-	100,000
TCL Semivolatile Organic Compounds in ug/kg			
Fluoranthene	220,000	-	100,000
Benzo(a)anthracene	140,000	-	1,000
Benzo(a)pyrene	120,000	-	1,000
Benzo(b)fluoranthene	180,000	-	1,000
Benzo(k)fluoranthene	45,000	-	3,900
Chrysene	120,000	-	3,900
Phenanthrene	160,000	-	100,000
Dibenzo(a,h)anthracene	17,000	-	330
Indeno(1,2,3-cd)pyrene	66,000	-	500
Pyrene	200,000	-	100,000
Metals			
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	B24		NYSDEC Restricted-Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	
Soil Type	Fill	Native	
Sample Date	8/30/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds			
TAL Metals in mg/kg			
Cadmium	4.4	-	4.3
Lead	1,520	930	400
Pesticides			
Polychlorinated Biphenyls			

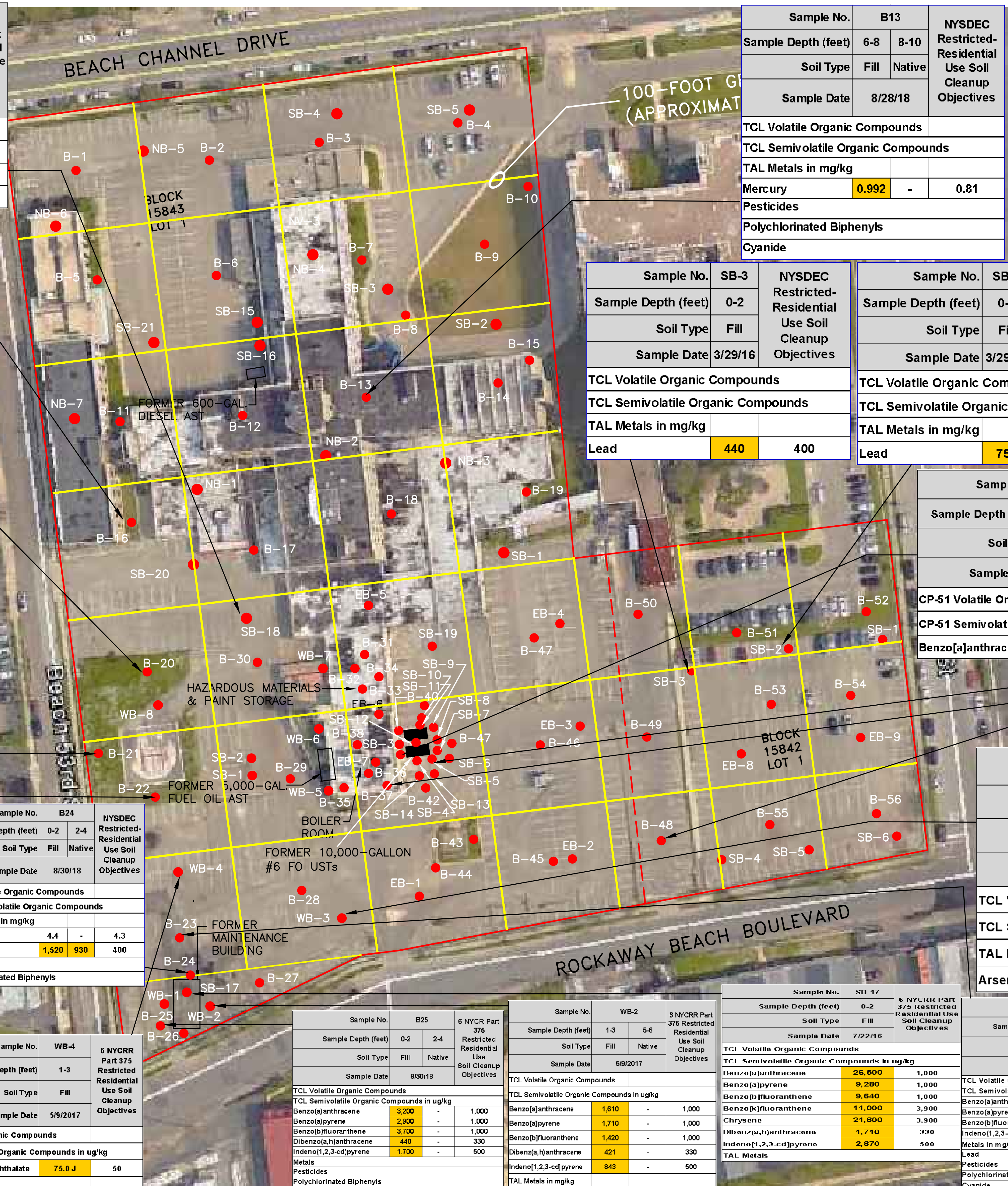
Sample No.	WB-4	6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	1-3	
Soil Type	Fill	
Sample Date	5/9/2017	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds in ug/kg		
Bis(2-ethylhexyl)phthalate	75.0 J	50
TAL Metals		

Sample No.	B25		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	
Soil Type	Fill	Native	
Sample Date	8/30/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Benzo(a)anthracene	3,200	-	1,000
Benzo(a)pyrene	2,900	-	1,000
Benzo(b)fluoranthene	3,700	-	1,000
Dibenzo(a,h)anthracene	440	-	330
Indeno(1,2,3-cd)pyrene	1,700	-	500
Metals			
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	WB-2		6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	1-3	5-6	
Soil Type	Fill	Native	
Sample Date	5/9/2017		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Benzo[a]anthracene	1,610	-	1,000
Benzo[a]pyrene	1,710	-	1,000
Benzo[b]fluoranthene	1,420	-	1,000
Dibenz(a,h)anthracene	421	-	330
Indeno[1,2,3-cd]pyrene	843	-	500
TAL Metals in mg/kg			
Arsenic	16.7	-	16

Sample No.	SB-17	6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	
Soil Type	Fill	
Sample Date	7/22/16	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds in ug/kg		
Benzo[a]anthracene	26,500	1,000
Benzo[a]pyrene	9,280	1,000
Benzo[b]fluoranthene	9,640	1,000
Benzo[k]fluoranthene	11,000	3,900
Chrysene	21,800	3,900
Dibenz(a,h)anthracene	1,710	330
Indeno[1,2,3-cd]pyrene	2,870	500
TAL Metals		

Sample No.	B23		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	5-7	
Soil Type	Fill	Native	
Sample Date	8/30/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Benzo(a)anthracene	1,300	-	1,000
Benzo(a)pyrene	1,400	-	1,000
Benzo(b)fluoranthene	2,100	-	1,000
Indeno(1,2,3-cd)pyrene	1,100	-	500
Metals in mg/kg			
Lead	437	-	400
Pesticides			
Polychlorinated Biphenyls			
Cyanide			



Sample No.	B13		NYSDEC Restricted-Residential Use Soil Cleanup Objectives
Sample Depth (feet)	6-8	8-10	
Soil Type	Fill	Native	
Sample Date	8/28/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds			
TAL Metals in mg/kg			
Mercury	0.992	-	0.81
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	SB-3	NYSDEC Restricted-Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	
Soil Type	Fill	
Sample Date	3/29/16	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds		
TAL Metals in mg/kg		
Lead	440	400

Sample No.	SB-2	NYSDEC Restricted-Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	
Soil Type	Fill	
Sample Date	3/29/16	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds		
TAL Metals in mg/kg		
Lead	750	400

Sample No.	SB-3	6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	6-7	
Soil Type	Native	
Sample Date	11/16/15	
CP-51 Volatile Organic Compounds		
CP-51 Semivolatile Organic Compounds in ug/kg		
Benzo[a]anthracene	1,300	1,000

LEGEND:

● SB-19 SOIL BORING LOCATION (PREVIOUS AND REMEDIAL INVESTIGATIONS)

SOIL EXCEEDS 6NYCRR PART 375 RESTRICTED RESIDENTIAL USE SCOs

NOTES:
- ALL SITE BUILDINGS DEMOLISHED IN 2018.
- PREVIOUS SOIL DATA ARE FROM MULTIPLE INVESTIGATIONS CONDUCTED BY FPM AND OTHERS AND INCLUDE SOME DUPLICATE SAMPLE NUMBERS.

Sample No.	SB-5	6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	7-8	
Soil Type	Native	
Sample Date	11/16/15	
CP-51 Volatile Organic Compounds		
CP-51 Semivolatile Organic Compounds in ug/kg		
Benzo[a]anthracene	4,500	1,000
Chrysene	5,400	3,900

Sample No.	B37		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	2-4	4-6	
Soil Type	Fill	Native	
Sample Date	9/11/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Fluoranthene	220,000	-	100,000
Naphthalene	19,000	-	100,000
Benzo(a)anthracene	120,000	-	1,000
Benzo(a)pyrene	100,000	-	1,000
Benzo(b)fluoranthene	130,000	-	1,000
Benzo(k)fluoranthene	45,000	-	3,900
Chrysene	100,000	-	3,900
Phenanthrene	200,000	-	100,000
Dibenzo(a,h)anthracene	16,000	-	330
Indeno(1,2,3-cd)pyrene	61,000	-	500
Pyrene	190,000	-	100,000
Metals			
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	WB-3	6 NYCRR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	1-3	
Soil Type	Fill	
Sample Date	5/9/2017	
TCL Volatile Organic Compounds		
TCL Semivolatile Organic Compounds		
TAL Metals in mg/kg		
Arsenic	24.0	16

Sample No.	B48		NYSDEC Restricted-Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	
Soil Type	Native	Native	
Sample Date	9/19/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds			
TAL Metals in mg/kg			
Arsenic	19	-	16
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

0' 100' 200'

APPROXIMATE SCALE

FPM GROUP

FIGURE 2.4.4.2.1
SOIL SAMPLE RESULTS

FORMER PENINSULA HOSPITAL SITE
51-15 BEACH CHANNEL DRIVE
FAR ROCKAWAY, QUEENS, NY

Drawn By: H.C. | Checked By: S.D. | Date: 1/14/20 detections in the soil/fill samples were noted to exceed any SCOs. In general, the concentrations of VOCs for which exceedances were noted decreased downward, with fewer exceedances noted in the native soil underlying the fill;

- SVOCs for which exceedances of the unrestricted use SCOs were noted in the soil/fill were primarily the PAHs, including benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, and others. PAH detections also exceeded SCOs for restricted residential use in several samples in the southwestern portion of the Site and in the former boiler room area. The PAH benzo(a)pyrene was also noted to exceed its protection of groundwater SCO (22,000 ug/kg) at two locations: B-22 at 0 to 2 feet in the southwestern portion of the Site and B-37 at 2 to 4 feet in the south-central portion of the Site. No other exceedances of the protection of groundwater SCOs were noted. As visible or other indications of potential petroleum contamination were not observed in any of the borings, the presence of PAHs in the soil/fill appears likely related to the minor amounts of asphalt fragments observed in some of the samples. As the exceedances in the native soil were noted in only a limited number of samples collected from just below the fill or overlying asphalt pavement, it is likely that some of the PAHs detected in the native soil are related to the overlying fill or asphalt;

- Metals for which exceedances of the unrestricted use SCOs were noted include arsenic, barium, cadmium, chromium, copper, lead, mercury, silver, and zinc. Some of the metals detections in samples collected during the RI and prior investigations also exceeded the SCOs for restricted residential use; these include two fill samples from the eastern part of the Site and several samples from the southwestern part of the Site that contained lead exceeding the SCO for restricted residential use, samples from the southwestern and southeastern parts of the Site that contained arsenic in excess of its restricted residential use SCO, one sample with a cadmium exceedance in the southwestern portion of the Site, and one sample from the northeastern portion of the Site that contained mercury in excess of its restricted residential use SCO, as shown on Figure 2.4.4.2.1. All of the exceedances of the restricted residential use SCOs for metals were in fill samples. The presence of metals in the fill is consistent with the nature of historic fill and does not appear to be related to former onsite hospital operations.

- Pesticides, including 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE, were detected in many of the soil/fill samples at levels above their unrestricted use SCOs. The pesticides heptachlor and cis-chlordane were each detected in one fill sample at levels above their unrestricted use SCOs and the pesticides dieldrin and cis-chlordane were each detected in one to two native soil samples at levels above the unrestricted use SCOs. None of the pesticide detections exceeded the restricted residential use SCOs and the concentrations decreased downward from the fill into the native soil. The widespread presence of these pesticides in both fill and the underlying native soil throughout the Site, including beneath the footprint of the former hospital building and the associated paved parking areas, indicates that these detections likely result from historic (mid-1940s to 1960s) regional spraying of DDT for insect (mosquito, elm bark beetle, and gypsy moth) control. There does not appear to be a relationship between pesticide detections and former hospital operations.

- The PCB Aroclor 1254 was detected in several samples and the PCB Aroclor 1260 was detected in one sample at levels above the unrestricted use SCO; none of these detections exceeded the restricted residential use SCO. The PCBs are likely related to typical historic fill conditions and were noted to decrease downward.
- None of the cyanide detections in soil/fill exceeded any SCOs.

In summary, the soil/fill at the Site is impacted by VOCs, SVOCs, metals, pesticides, and two PCBs. Most of the impacts exceeded the unrestricted use SCOs, with some impacts also exceeding the restricted residential use and/or protection of groundwater SCOs. Most of the impacts appear to reflect typical historic fill conditions, including the presence of PAHs likely associated with the limited amounts of asphalt observed in the fill and metals associated with ordinary human activities. Pesticide detections appear to be related to historic regional DDT applications for insect control. None of these impacts appear to be related to prior hospital operations.

2.4.5 On-Site and Off-Site Groundwater Contamination

2.4.5.1 Summary of Groundwater Data

Groundwater sampling was conducted at 10 onsite wells during the RI. None of the groundwater samples contained any VOCs, PCBs, cyanide, or pesticides above NYSDEC Standards and 1,4-dioxane was not detected in any of the wells for which this analyte was tested.

Dissolved sodium, manganese, magnesium, iron, and/or antimony are present in groundwater at levels that exceed the Standards. The sodium levels are elevated in every well, likely due to the proximity of the Site to the Atlantic Ocean and Jamaica Bay. The magnesium concentrations vary with the sodium levels and appear related to seawater influence. Iron levels are typically elevated in Long Island groundwater and are likely naturally-occurring. The detections of antimony and manganese in limited areas of Site groundwater do not appear to be related to Site soil conditions.

Benzo(a)pyrene was the only SVOC for which exceedances of its Standard were noted in groundwater. The maximum benzo(a)pyrene detection was at well MW-7, near the former maintenance building location. Elevated concentrations of benzo(a)pyrene were noted in nearby soils, including two detections that exceed the groundwater protection SCO and could be the source of the benzo(a)pyrene noted in groundwater.

PFOA and/or PFOS were detected in groundwater above the current NYSDEC guidance of 0.07 ug/l for these compounds and their sum in wells on the north and south sides of the Site. The highest concentrations were detected in well MW-8, which adjoins Rockaway Beach Boulevard on the south side of the Site and is not located in proximity to any of the former building locations or other formerly active areas of the Site. It is likely that the PFAS detections reflect ambient groundwater quality in the Site area.

Table 2.4.5.1.1 shows the minimum and maximum detection of each analyte detected in groundwater for all of the samples collected during the RI.

2.4.5.2 <u>Comparison of Groundwater with SCGs</u>

Table 2.1.4.2 (presented in Section 2.1) highlights exceedances of the Standards for all groundwater at the Site prior to the remedy. Figure 2.4.5.2.1 is a spider map that shows the locations and exceedances of the Standards for groundwater prior to the remedy.

The groundwater flow direction appears to be affected by groundwater mounding beneath the central portion of the Site, where the former hospital building was removed and the area remains unpaved. Ten groundwater sampling locations are present and are sufficient to characterize groundwater quality for the entire Site.

None of the groundwater samples contained any VOCs, PCBs, cyanide, or pesticides above NYSDEC Standards. 1,4-Dioxane was not detected in any of the wells for which this analyte was tested. Based on these results, there are no impacts to Site groundwater from these analyte groups.

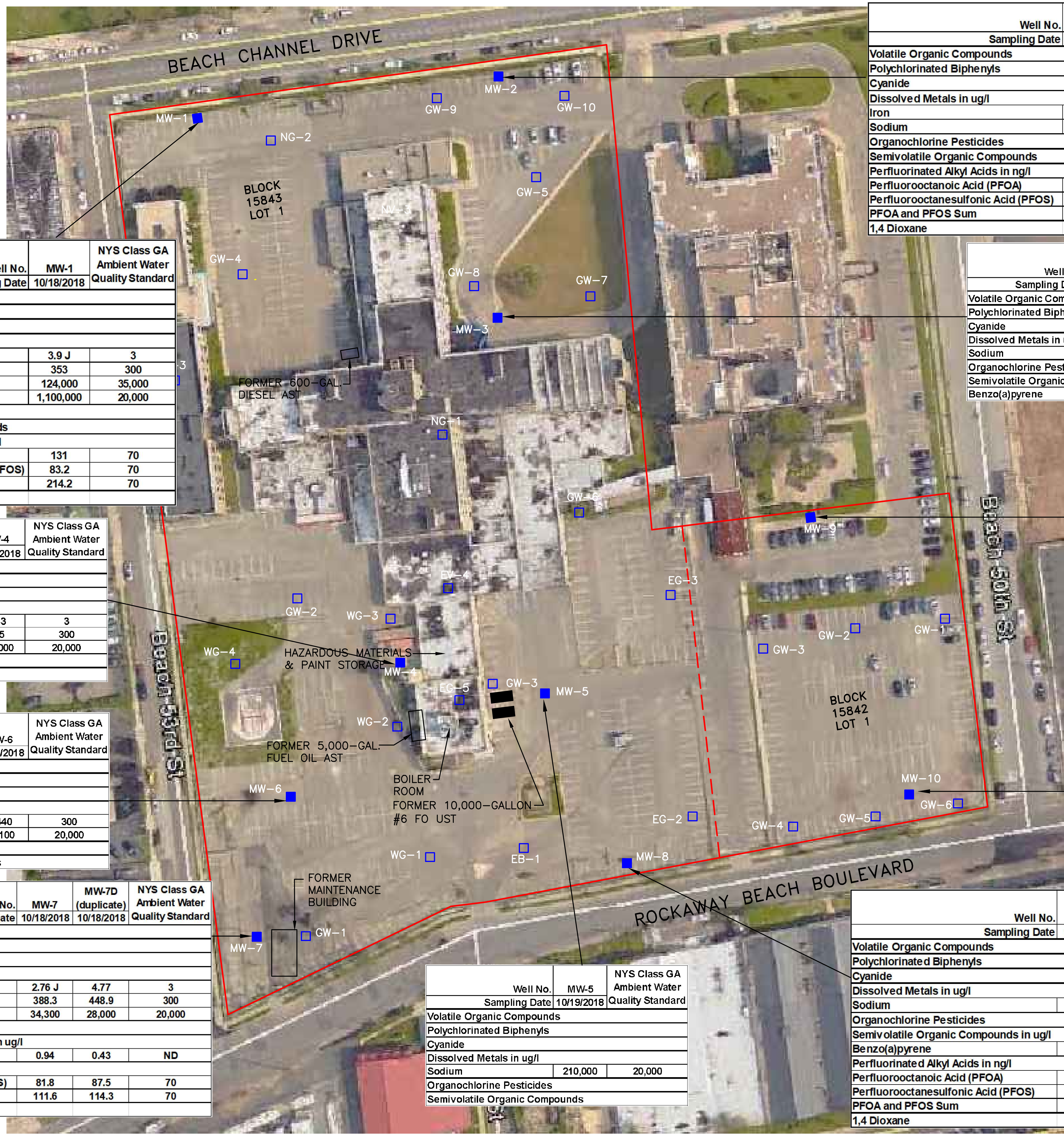
TABLE 2.4.5.1.1
GROUNDWATER CHEMICAL ANALYTICAL RESULTS RANGES
FORMER PENINSULA HOSPITAL SITE

Analytes	Min.	Max.	NYS Class GA Ambient Water Quality Standard
Volatile Organic Compounds by GC/MS, in ug/l			
Bromomethane	ND	0.7 J	5
Vinyl chloride	ND	0.56 J	2
cis-1,2-Dichloroethene	ND	1.1 J	5
1,2-Dichloroethene, Total	ND	1.1 J	-
Acetone	ND	2.7 J	-
Carbon disulfide	ND	2.2 J	60
Naphthalene	ND	0.78 J	-
Polychlorinated Biphenyls by GC, in ug/l			
Aroclor 1254	ND	0.041 J	0.09
PCBs, Total	ND	0.041 J	0.09
Total Metals in ug/l			
Aluminum, Total	4,040	64,300	-
Antimony, Total	ND	**3.02 J**	3
Arsenic, Total	7.62	**86.78**	25
Barium, Total	124.4	**1915**	1,000
Beryllium, Total	0.45 J	**8.75**	-
Cadmium, Total	0.53	**10.13**	5
Calcium, Total	73,400	335,000	-
Chromium, Total	47.07	**507.2**	50
Cobalt, Total	3.34	84.29	-
Copper, Total	15.39	**283.2**	200
Iron, Total	**13,600**	**192,000**	300
Lead, Total	**25.67**	**8,695**	25
Magnesium, Total	13,300	**124,000**	35,000
Manganese, Total	224	**2,023.00**	300
Mercury, Total	ND	**1.72**	0.7
Nickel, Total	18.77	**168**	100
Potassium, Total	6,300	54,400	-
Selenium, Total	ND	**24.4**	10
Silver, Total	ND	1.26	50
Sodium, Total	**24,200**	**1,240,000**	20,000
Thallium, Total	ND	**1.23**	-
Vanadium, Total	45.69	338.5	-
Zinc, Total	169	**15,300**	-
Cyanide in ug/l			
Cyanide, Total	ND	66	200
Dissolved Metals in ug/l			
Aluminum, Dissolved	11.2	957	-
Antimony, Dissolved	ND	**4.77**	3
Arsenic, Dissolved	1.49	12.55	25
Barium, Dissolved	5.74	76.83	1,000
Cadmium, Dissolved	ND	0.07 J	5
Calcium, Dissolved	40,200	257,000	-
Chromium, Dissolved	0.27 J	7.65	50
Cobalt, Dissolved	0.21 J	0.79	-
Copper, Dissolved	0.47 J	4.48	200
Iron, Dissolved	ND	**2,440**	300
Lead, Dissolved	ND	21.38	25
Magnesium, Dissolved	7,260	**124,000**	35,000
Manganese, Dissolved	14.19	**448.9**	300
Nickel, Dissolved	1.45 J	11.35	100
Potassium, Dissolved	3,960	46,100	-
Silver, Dissolved	ND	0.94 J	50
Sodium, Dissolved	**24,000**	**1,100,000**	20,000
Thallium, Dissolved	ND	0.43 J	-
Vanadium, Dissolved	1.6 J	56.09	-
Zinc, Dissolved	5.39 J	24.95	-

Analytes	Min.	Max.	NYS Class GA Ambient Water Quality Standard
Organochlorine Pesticides by GC, in ug/l			
4,4'-DDE	ND	0.005 J	0.2
4,4'-DDT	ND	0.013 J	0.2
Endosulfan II	ND	0.011 J	-
Semivolatile Organics by GC/MS, in ug/l			
Bis(2-ethylhexyl)phthalate	ND	3.7	5
Benzoic Acid	ND	11 J	-
Semivolatile Organics by GC/MS-SIM, in ug/l			
Acenaphthene	0.04 J	2	-
Fluoranthene	ND	1.5	-
Naphthalene	ND	0.2	-
Benzo(a)anthracene	ND	0.9	-
Benzo(a)pyrene	ND	**0.94**	ND
Benzo(b)fluoranthene	ND	1.3	-
Benzo(k)fluoranthene	ND	0.45	-
Chrysene	ND	0.94	-
Acenaphthylene	ND	0.13	-
Anthracene	ND	0.26	-
Benzo(ghi)perylene	ND	0.38	-
Fluorene	ND	1.3	-
Phenanthrene	ND	0.87	-
Dibenzo(a,h)anthracene	ND	0.14	-
Indeno(1,2,3-cd)pyrene	ND	0.51	-
Pyrene	ND	1.8	-
2-Methylnaphthalene	ND	0.07 J	-
Perfluorinated Alkyl Acids by Isotope Dilution, in ug/l			
Perfluorobutanoic Acid (PFBA)	0.00761	0.223	-
Perfluoropentanoic Acid (PFPeA)	0.007	0.721	-
Perfluorobutanesulfonic Acid (PFBS)	0.00136 J	0.00974	-
Perfluorohexanoic Acid (PFHxA)	0.00743	0.368	-
Perfluoroheptanoic Acid (PFHpA)	0.00718	0.25	-
Perfluorohexanesulfonic Acid (PFHxS)	ND	0.00742	-
Perfluorooctanoic Acid (PFOA)	0.0268	**0.216**	0.07
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.00795	0.0606	-
Perfluoroheptanesulfonic Acid (PFHpS)	ND	0.000983 J	-
Perfluorononanoic Acid (PFNA)	0.003	0.0109	-
Perfluorooctanesulfonic Acid (PFOS)	0.0212	**0.108**	0.07
Perfluorodecanoic Acid (PFDA)	ND	0.00407	-
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	0.00115 J	-
Perfluorooctanesulfonamide (FOSA)	ND	0.00142 J	-
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	0.00362	-
PFOA and PFOS Sum	**0.048**	**0.324**	0.07
1,4 Dioxane by 8270D-SIM, in ug/l	ND	ND	-

Notes:
ND - Not detected at the reported detection limit for the sample.
J - Estimated concentration above the Method Detection Limit and below the Reporting Limit.
ug/l = micrograms per liter
\- = Not analyzed or not established
Bold yellow shaded values exceed applicable water quality criteria.

FPM



Well No. / Sampling Date	MW-1 / 10/18/2018	NYS Class GA Ambient Water Quality Standard
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Antimony	3.9 J	3
Iron	353	300
Magnesium	124,000	35,000
Sodium	1,100,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		
Perfluorinated Alkyl Acids in ng/l		
Perfluorooctanoic Acid (PFOA)	131	70
Perfluorooctanesulfonic Acid (PFOS)	83.2	70
PFOA and PFOS Sum	214.2	70
1,4 Dioxane		

Well No. / Sampling Date	MW-2 / 10/18/2018	NYS Class GA Ambient Water Quality Standard
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Iron	702	300
Sodium	131,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		
Perfluorinated Alkyl Acids in ng/l		
Perfluorooctanoic Acid (PFOA)	88.9	70
Perfluorooctanesulfonic Acid (PFOS)	73.7	70
PFOA and PFOS Sum	162.6	70
1,4 Dioxane		

Well No. / Sampling Date	MW-3 / 10/19/2018	NYS Class GA Ambient Water Quality Standard
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Sodium	211,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		
Benzo(a)pyrene	0.03 J	ND

Well No. / Sampling Date	MW-4 / 10/19/2018	NYS Class GA Ambient Water Quality Standard
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Antimony	4.43	3
Iron	455	300
Sodium	139,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		

Well No. / Sampling Date	MW-9 / 10/19/2018	NYS Class GA Ambient Water Quality Standard
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Iron	1,380	300
Magnesium	83,500	35,000
Sodium	965,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		

Well No. / Sampling Date	MW-6 / 10/19/2018	NYS Class GA Ambient Water Quality Standard
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Iron	2,440	300
Sodium	36,100	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		

Well No. / Sampling Date	MW-10 / 10/18/2018	NYS Class GA Ambient Water Quality Standard
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Sodium	77,200	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		
Benzo(a)pyrene	0.05 J	ND
Perfluorinated Alkyl Acids in ng/l		
PFOA and PFOS Sum	82.1	70
1,4 Dioxane		

Well No. / Sampling Date	MW-7 / 10/18/2018	MW-7D (duplicate) / 10/18/2018	NYS Class GA Ambient Water Quality Standard
Volatile Organic Compounds			
Polychlorinated Biphenyls			
Cyanide			
Dissolved Metals in ug/l			
Antimony	2.76 J	4.77	3
Manganese	388.3	448.9	300
Sodium	34,300	28,000	20,000
Organochlorine Pesticides			
Semivolatile Organic Compounds in ug/l			
Benzo(a)pyrene	0.94	0.43	ND
Perfluorinated Alkyl Acids in ng/l			
Perfluorooctanesulfonic Acid (PFOS)	81.8	87.5	70
PFOA and PFOS Sum	111.6	114.3	70
1,4 Dioxane			

Well No. / Sampling Date	MW-5 / 10/19/2018	NYS Class GA Ambient Water Quality Standard
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Sodium	210,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds		

Well No. / Sampling Date	MW-8 / 10/18/2018	NYS Class GA Ambient Water Quality Standard
Volatile Organic Compounds		
Polychlorinated Biphenyls		
Cyanide		
Dissolved Metals in ug/l		
Sodium	24,000	20,000
Organochlorine Pesticides		
Semivolatile Organic Compounds in ug/l		
Benzo(a)pyrene	0.04 J	ND
Perfluorinated Alkyl Acids in ng/l		
Perfluorooctanoic Acid (PFOA)	216	70
Perfluorooctanesulfonic Acid (PFOS)	108	70
PFOA and PFOS Sum	324	70
1,4 Dioxane		

LEGEND:

■ MW-3	GROUNDWATER SAMPLE LOCATION (REMEDIAL INVESTIGATION)
□ GW-7	GROUNDWATER SAMPLE LOCATION (PREVIOUS INVESTIGATION)
ND	NON-DETECT
ug/l	MICROGRAMS PER LITER
ng/l	NANOGRAMS PER LITER
J	ESTIMATED CONCENTRATION

NOTES:
- ALL SITE BUILDINGS DEMOLISHED IN 2018.
- PREVIOUS GROUNDWATER SAMPLE LOCATIONS ARE FROM MULTIPLE INVESTIGATIONS CONDUCTED BY FPM AND OTHERS AND INCLUDE SEVERAL NAMING CONVENTIONS.

0' 100' 200'
APPROXIMATE SCALE

FPM GROUP

FIGURE 2.4.5.2.1
GROUNDWATER SAMPLE RESULTS

FORMER PENINSULA HOSPITAL SITE
51-15 BEACH CHANNEL DRIVE
FAR ROCKAWAY, QUEENS, NY

Drawn By: H.C. | Checked By: S.D. | Date: 1/14/20

H:\PENINSULA ROCKAWAY\RAWP\FIGURE 2.4.5.2.1.dwg, 4/27/2020 12:04:49 PM, DWG To PDF.pc3

Groundwater in the area of the former #6 fuel oil USTs previously exhibited free-phase product, which was removed during prior remedial efforts. Groundwater in this area was sampled during the RI; no visible indications or odors suggestive of petroleum impact were observed and no petroleum constituents were detected at levels that exceeded NYSDEC Standards.

The only chlorinated solvents detected in groundwater were vinyl chloride and cis-1,2-dichloroethene, both of which were detected only at very low estimated concentrations below the Standards in well MW-7 next to the former maintenance building location. Chlorinated solvents were not detected in any of the other groundwater monitoring wells. Although the chlorinated solvent detections noted in MW-7 do not exceed applicable regulatory criteria, these low-level concentrations may be related to the soil vapor conditions noted in this area.

Dissolved sodium, manganese, magnesium, iron, and/or antimony are present in groundwater at levels that exceed the Standards. The sodium levels are elevated in every well, likely due to the proximity of the Site to the Atlantic Ocean and Jamaica Bay. The other dissolved metals were each detected in between one to five wells at levels that slightly to moderately exceed the applicable Standards. The magnesium concentrations vary with the sodium levels and appear to be related to seawater influence. Iron levels are typically elevated in Long Island groundwater and these detections are likely naturally-occurring. The detections of antimony and manganese in limited areas of Site groundwater do not appear to be related to Site soil conditions.

Benzo(a)pyrene was the only SVOC for which exceedances of its Standard were noted in groundwater. The maximum benzo(a)pyrene detection was at well MW-7, near the former maintenance building location. Elevated concentrations of benzo(a)pyrene were noted in nearby soils, including two detections that exceed the groundwater protection SCO and could be the source of the benzo(a)pyrene noted in groundwater.

PFOA and/or PFOS were detected in groundwater above the current NYSDEC guidance of 0.07 ug/l for these compounds and their sum in wells on the north and south sides of the Site. The highest concentrations were detected in well MW-8, which adjoins Rockaway Beach Boulevard on the south side of the Site and is not located in proximity to any of the former building locations or other formerly active areas of the Site. It is likely that the PFAS detections reflect ambient groundwater quality in the Site area.

2.4.6 On-Site and Off-Site Soil Vapor Contamination

1,1,1-TCA, TCE, PCE, and/or carbon tetrachloride were identified in soil vapor at several locations on the Site. Most of the detections were at relatively low levels, but somewhat elevated levels of 1,1,1-TCA, PCE and TCE were noted in proximity to the former hospital boiler room, and PCE was identified in soil vapor on the southwest portion of the Site in proximity to a former maintenance building location. TCE was previously detected in soil vapor in this area. Carbon tetrachloride was previously identified in proximity to the former hospital building. These VOC detections were at levels for which mitigation for SVI may be needed for future buildings.

Table 2.4.6.1 shows the minimum and maximum detection of each analyte detected in soil vapor for all of the samples collected during the RI.

2.4.6.1 <u>Comparison of Soil Vapor with SCGs</u>

A table of soil vapor data collected during the RI and prior to the remedy is shown in Table 2.1.4.3 (see Section 2.1) and a spider map that indicates the location(s) of and summarizes all soil vapor data collected prior to the remedy is shown in Figure 2.4.6.1.1. The purposes of the additional soil vapor investigation during the RI were to locate potential sources of soil vapors and delineate the extent of impacted soil vapor, and assess the potential for offsite vapor impacts.

The VOCs 1,1,1-TCA, TCE, PCE, and/or carbon tetrachloride were identified in soil vapor at several locations on the Site. Most of the detections were at relatively low levels for which SVI is unlikely to present a concern for buildings eventually constructed on the Site. During the RI somewhat elevated levels of 1,1,1-TCA, PCE and TCE were noted in proximity to the former hospital boiler room, and PCE was identified in soil vapor on the southwest portion of the Site in proximity to a former maintenance building location. TCE was previously detected in soil vapor in this area. These detections are similar to the prior results and the concentrations were at levels that may present a concern for SVI for future buildings on the Site. Carbon tetrachloride was previously identified in proximity to the former hospital building, as shown on Figure 2.4.6.1.1; lower levels of carbon tetrachloride were found in this area during the RI.

TABLE 2.4.6.1
SOIL VAPOR ANALYTICAL RESULTS RANGES
FORMER PENINSULA HOSPITAL SITE

Volatile Organic Compounds in ug/m^3	Min.	Max.	Volatile Organic Compounds in ug/m^3	Min.	Max.
Dichlorodifluoromethane	ND	183	1,2-Dichloropropane	ND	ND
Chloromethane	ND	1.96	Bromodichloromethane	ND	ND
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	ND	1,4-Dioxane	ND	ND
Vinyl chloride	ND	ND	Trichloroethene	ND	**16**
1,3-Butadiene	ND	81.2	2,2,4-Trimethylpentane	ND	59.3
Bromomethane	ND	ND	Heptane	ND	46.3
Chloroethane	ND	1.46	cis-1,3-Dichloropropene	ND	ND
Vinyl bromide	ND	ND	trans-1,3-Dichloropropene	ND	ND
Acetone	13.8 J	1,330	1,1,2-Trichloroethane	ND	ND
Trichlorofluoromethane (Freon 11)	ND	2,520	Toluene	ND	305
iso-Propyl Alcohol	ND	29.3	2-Hexanone	1.07	264
1,1-Dichloroethene	ND	ND	Dibromochloromethane	ND	ND
tert-Butyl Alcohol	ND	15	1,2-Dibromoethane	ND	ND
Methylene chloride	ND	ND	Tetrachloroethene	ND	**583**
3-Chloropropene	ND	ND	Chlorobenzene	ND	ND
Carbon disulfide	ND	157	Ethylbenzene	ND	22.4
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	p/m-Xylene	ND	60.8
trans-1,2-Dichloroethene	ND	ND	Bromoform	ND	ND
1,1-Dichloroethane	ND	ND	Styrene	ND	8.00
Methyl tert butyl ether	ND	ND	1,1,2,2-Tetrachloroethane	ND	ND
2-Butanone	11.6	1,070	o-Xylene	ND	24.5
cis-1,2-Dichloroethene	ND	ND	4-Ethyltoluene	ND	8.85
Ethyl Acetate	ND	ND	1,3,5-Trimethylbenzene	ND	13.5
Chloroform	ND	24.3	1,2,4-Trimethylbenzene	ND	47.7
Tetrahydrofuran	ND	16	Benzyl chloride	ND	ND
1,2-Dichloroethane	ND	ND	1,3-Dichlorobenzene	ND	ND
n-Hexane	ND	66.3	1,4-Dichlorobenzene	ND	7.09
1,1,1-Trichloroethane	ND	**119**	1,2-Dichlorobenzene	ND	ND
Benzene	ND	209	1,2,4-Trichlorobenzene	ND	ND
Carbon tetrachloride	ND	**16.5**	Hexachlorobutadiene	ND	ND
Cyclohexane	ND	41.6			

Notes:

All samples analyzed using Method TO-15.

Shaded compounds are those for which the NYSDOH has provided guidance.

Bold yellow shading identifies detections of compounds for which the NYSDOH has provided guidance.

ug/m^3 = micrograms per cubic meter.

J = Estimated concentration.

LEGEND:

- SV-3 — SOIL VAPOR SAMPLE LOCATION (PREVIOUS AND REMEDIAL INVESTIGATIONS)
- ATTEMPTED SOIL VAPOR SAMPLE LOCATION
- AREA OF HIGHER VOLATILE ORGANIC COMPOUND CONCENTRATIONS

NOTES:

- ALL SITE BUILDINGS DEMOLISHED IN 2018.
- PREVIOUS SOIL VAPOR DATA ARE FROM MULTIPLE INVESTIGATIONS CONDUCTED BY FPM AND OTHERS AND INCLUDE SOME DUPLICATE SAMPLE NUMBERS.
- DETECTIONS OF ALL VOLATILE ORGANIC COMPOUNDS IN THE NEW YORK STATE DEPARTMENT OF HEALTH SOIL VAPOR INTRUSION GUIDANCE DOCUMENT MATRICES ARE SHOWN.

Sample No.	NV-4
Sample Depth (ft)	4
Sample Date	5/10/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.97
Tetrachloroethene	5.2

Sample No.	SV-8
Sample Depth (ft)	4
Sample Date	7/22/16
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	5.4
Trichloroethene	0.21 J

Sample No.	NV-2
Sample Depth (ft)	4
Sample Date	5/10/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	1.1
Tetrachloroethene	1.3

Sample No.	SV-4
Sample Depth (ft)	3
Sample Date	1/6/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.59

Sample No.	NV-3
Sample Depth (ft)	4
Sample Date	5/10/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	1.0
Tetrachloroethene	0.81 J

Sample No.	V-18
Sample Depth (ft)	3
Sample Date	8/21/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	4.51

Sample No.	V-15
Sample Depth (ft)	3
Sample Date	8/21/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	2.41

Sample No.	NV-1
Sample Depth (ft)	4
Sample Date	5/10/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.73
Tetrachloroethene	1.4

Sample No.	NV-5
Sample Depth (ft)	4
Sample Date	5/10/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.80
Tetrachloroethene	4.1

Sample No.	V-12
Sample Depth (ft)	3
Sample Date	8/21/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	11.3

Sample No.	SV-7
Sample Depth (ft)	4
Sample Date	7/22/16
Volatile Organic Compounds in ug/m^3	
Carbon tetrachloride	0.31 J
Trichloroethene	0.21 J

Sample No.	SV-6
Sample Depth (ft)	4
Sample Date	7/22/16
Volatile Organic Compounds in ug/m^3	
Carbon tetrachloride	0.38 J
Tetrachloroethene	11
Trichloroethene	0.32 J

Sample No.	WV-3
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	1.8
Methylene chloride	0.66
Tetrachloroethene	23

Sample No.	WV-4
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	3.4
Tetrachloroethene	3.5
Vinyl chloride	0.36 J

Sample No.	SV-5
Sample Depth (ft)	4
Sample Date	7/22/16
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	0.93
Carbon tetrachloride	0.82 J
Tetrachloroethene	3.1
Trichloroethene	0.70 J

Sample No.	EV-6
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	0.60 J
Methylene chloride	0.80
Tetrachloroethene	5.6

Sample No.	V-11
Sample Depth (ft)	3
Sample Date	8/21/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	35.9

Sample No.	V-6
Sample Depth (ft)	3
Sample Date	8/20/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	559

Sample No.	V-5
Sample Depth (ft)	3
Sample Date	8/17/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	12.7

Sample No.	SV-4
Sample Depth (ft)	4
Sample Date	7/22/16
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	6.7
1,1-Dichloroethene	1.1
cis-1,2-Dichloroethene	0.59
Tetrachloroethene	340
Trichloroethene	38
Vinyl chloride	0.28 J

Sample No.	WV-2
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.52
Tetrachloroethene	2.2

Sample No.	WV-1
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	2.8
cis-1,2-Dichloroethene	0.87
Tetrachloroethene	2.6

Sample No.	V-4
Sample Depth (ft)	3
Sample Date	8/17/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	14.7

Sample No.	SV-1
Sample Depth (ft)	3
Sample Date	11/16/15
Volatile Organic Compounds in ug/m^3	
Methylene chloride	4.5

Sample No.	EV-1
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	1.0

Sample No.	V-3
Sample Depth (ft)	3
Sample Date	8/17/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	12.8

Sample No.	V-9
Sample Depth (ft)	3
Sample Date	8/20/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	46.7
1,1,1-Trichloroethane	119

Sample No.	EV-5
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.63
Tetrachloroethene	4.6

Sample No.	SV-2
Sample Depth (ft)	3
Sample Date	11/16/15
Volatile Organic Compounds in ug/m^3	
1,1,1-Trichloroethane	1,000
1,1-Dichloroethene	1.8
Tetrachloroethene	13

Sample No.	V-16
Sample Depth (ft)	3
Sample Date	8/21/18
Volatile Organic Compounds in ug/m^3	
Carbon Tetrachloride	16.5

Sample No.	SV-2
Sample Depth (ft)	3
Sample Date	1/6/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.38 J

Sample No.	SV-3
Sample Depth (ft)	3
Sample Date	1/6/17
Volatile Organic Compounds in ug/m^3	
Carbon tetrachloride	42
Methylene chloride	0.45 J
Tetrachloroethene	0.81 J

Sample No.	V-14
Sample Depth (ft)	3
Sample Date	8/21/18
Volatile Organic Compounds in ug/m^3	
Carbon tetrachloride	1.93
Tetrachloroethene	8.14

Sample No.	EV-3
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.59
Tetrachloroethene	1.5

Sample No.	V-1
Sample Depth (ft)	3
Sample Date	8/17/18
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	12.9
1,1,1-Trichloroethane	2.01

Sample No.	EV-4
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
Methylene chloride	0.59
Tetrachloroethene	5.0

Sample No.	SV-1
Sample Depth (ft)	2 - 3
Sample Date	3/29/16
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	1.3
Trichloroethene	1.6

Sample No.	EV-2
Sample Depth (ft)	4
Sample Date	5/9/17
Volatile Organic Compounds in ug/m^3	
Tetrachloroethene	3.5

Sample No.	V-10
Sample Depth (ft)	3
Sample Date	8/20/18
Volatile Organic Compounds in ug/m^3	
Trichloroethene	16
Tetrachloroethene	583
1,1,1-Trichloroethane	30.1

Sample No.	SV-3
Sample Depth (ft)	3
Sample Date	11/16/15
Volatile Organic Compounds in ug/m^3	
Methylene chloride	2.1
Tetrachloroethylene	10

Sample No.	SV-4
Sample Depth (ft)	2 - 3
Sample Date	3/29/16
Volatile Organic Compounds in ug/m^3	
Carbon tetrachloride	0.88 J
Tetrachloroethene	0.75 J
Trichloroethene	0.07 J

0' 100' 200'

APPROXIMATE SCALE

FPM GROUP

FIGURE 2.4.6.1.1
SOIL VAPOR SAMPLE RESULTS

FORMER PENINSULA HOSPITAL SITE
51-15 BEACH CHANNEL DRIVE
FAR ROCKAWAY, QUEENS, NY

Drawn By: H.C. | Checked By: S.D. | Date: 1/14/20

H:\PENINSULA ROCKAWAY\RAWP\FIGURE 2.4.6.1.1.dwg, 4/27/2020 12:06:24 PM, DWG To PDF.pc3

None of the detections is highly elevated or suggests the presence of a significant source of soil vapors. As discussed in Section 2.4.5.2, none of these VOCs was found in Site groundwater during the RI, and as discussed in Section 2.4.4.2, none of these VOCs was found in Site soil at levels above the unrestricted use SCOs. Collectively, these data indicate that no significant onsite source of soil vapor is present. The somewhat elevated levels of VOCs in soil vapor are limited to the proximity of the former hospital boiler room, the former maintenance building area, and near the former front entrance to the hospital building.

2.5 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS

2.5.1 Qualitative Human Health Exposure Assessment

A qualitative human health exposure assessment was conducted during the RI in accordance NYSDEC DER-10 Section 3.3(c)4 to evaluate potential receptors and exposure pathways for the identified impacts at the Site. This exposure assessment considered the existing conditions, the anticipated redevelopment, and likely future use(s) of the Site (commercial and restricted residential), the Site setting (urban, with surrounding commercial, light industrial, transportation, and multi-family residential uses), and the above-described chemical analytical results of soil, soil vapor, and groundwater samples from the Site.

The RI and prior investigations have documented the following conditions for Site media:

- Soil impacted with PAH SVOCs, metals, and/or one VOC has been identified at concentrations above the NYSDEC SCOs for restricted residential use in several areas of the Site. The impacted soils are present in shallow soil at the current ground surface (paved and unpaved) and extend to a depth of up to 8 feet below the current grade.
- Several chlorinated solvents were detected in soil vapor at the Site. The detected concentrations were sufficiently elevated beneath parts of the Site to present a concern for SVI for future buildings.
- Dissolved sodium, manganese, magnesium, iron, and/or antimony are present in groundwater at levels that exceed the Standards. Benzo(a)pyrene was detected in one well in excess of its Standard and PFOA and/or PFOS were detected above the current NYSDEC guidance level in several wells.

Based on this information, it was concluded that the media of concern with respect to human health risk are the soil, soil vapor, and groundwater at Site. Potential routes of human exposure were evaluated for each of these media and the potential for completed exposure pathways was assessed.

- Soil

The Site is presently vacant and much of the area where the impacted soil is present remains paved. There are no workers, visitors, or occupants of the Site at this time, and the Site is fenced to exclude trespassers. Therefore, it is concluded that there is no reasonable potential for contact with the impacted soils under current conditions.

The Site is scheduled to be redeveloped. Construction and/or remediation workers may be exposed to the impacted soils during redevelopment activities. Exposure routes for construction and remediation workers are anticipated to include dermal contact, ingestion, or inhalation of impacted soils. However, construction and remediation activities are anticipated to be conducted utilizing a Health and Safety Plan (HASP) that includes measures to control and minimize worker exposure to impacted soil. Therefore, it does not appear that there is a risk to construction and/or remediation workers from the impacted soil if the appropriate controls are implemented under a HASP.

Following redevelopment, there is the potential for future Site workers, occupants, or visitors to be exposed to the impacted soils if they are not removed or covered. Exposure routes to impacted soil for these potential receptors might include dermal contact, ingestion, or inhalation. However, it is anticipated that remedial measures for soil will be implemented during redevelopment. Remedial measures may include removal of the affected soils and/or engineering and/or institutional controls (ECs/ICs) to control potential exposures. Therefore, it does not appear that there is a risk to future Site workers, occupants, or visitors from the impacted soil if the appropriate remedial measures and/or controls are implemented.

- Soil Vapor

At present, there are no buildings on the Site and the Site is vacant and fenced. There are currently no workers, visitors, or occupants at the Site and, therefore, there is no reasonable potential for exposure to soil vapors under current conditions.

During redevelopment, construction and/or remediation workers may be exposed to soil vapors during intrusive activities in the areas where soil vapors are present. The exposure route would be by inhalation. As noted above, construction and remediation activities are anticipated to be conducted utilizing a HASP that would include monitoring for soil vapors and measures to control and minimize worker exposure to soil vapor. Therefore, it does not appear that there is a risk to construction and/or remediation workers from the soil vapors if the appropriate monitoring and controls are implemented under a HASP.

Chlorinated solvents are present in soil vapor at levels that could intrude into buildings and present an exposure concern via inhalation to workers, occupants or visitors of buildings to be constructed at the Site in the future. However, it is anticipated that mitigation measures for soil vapor will be implemented during redevelopment. Mitigation measures may include an EC, such as a vapor barrier or a sub-slab depressurization system (SSDS), and an associated IC to control potential exposures. Therefore, it does not appear that there is a risk to future Site workers, occupants, or visitors from soil vapors if the appropriate ECs and ICs are implemented.

- Groundwater

At present, groundwater use is not occurring at the Site, the depth to groundwater is at least 2.5 feet across the entire Site, and the Site is vacant and secured by fencing. Therefore, there is no reasonable concern for potential exposure to Site groundwater under the current conditions.

During redevelopment, construction and/or remedial excavations could extend into the water table and/or dewatering may occur. During these activities, there is the potential for dermal exposure to groundwater by remedial or construction workers. Remediation workers may also contact the impacted groundwater during monitoring activities. However, it is anticipated that these activities will be conducted utilizing a HASP that includes measures to control and minimize worker exposure to impacted groundwater. Therefore, it does not appear that there is a significant potential for construction or remediation worker exposure to impacted groundwater if the appropriate controls are implemented under a HASP.

Following redevelopment, exposure to the Site groundwater could potentially occur for Site workers, occupants, and/or visitors via ingestion, dermal contact, and/or inhalation if the Site groundwater were to be used for potable water supply or other purposes. However, as discussed in Sections 2.1.2 and 2.4.5.2, groundwater beneath the Site has a high salt content due to the Site's proximity to the Atlantic Ocean and Jamaica Bay and public water will be provided to the buildings when the Site is redeveloped. No use of onsite groundwater is contemplated and it is anticipated that an IC will be implemented prohibiting groundwater use without treatment to render it suitable for the proposed use. Therefore, it does not appear that there is a potential for exposure to the Site groundwater for future workers, occupants, or visitors to the Site if the appropriate control (an IC) is implemented.

- Potential for Offsite Exposure

The vicinity of the Site was evaluated for evidence of potential exposure pathways to Site soil by offsite receptors. The Site is located in an urban area and is presently fully fenced and partially paved, which precludes public access to Site soil. During redevelopment, it is anticipated that the Site will remain secured by fencing and the required soil erosion and dust control measures will be implemented. Redevelopment is anticipated to include remedial measures and/or ECs for impacted soil, which will eliminate the potential for completed exposure pathways for offsite receptors to Site soil. It is concluded that exposure of offsite receptors to Site soil is unlikely if appropriate controls are implemented.

The potential for offsite exposure to Site-related soil vapor was evaluated. Buildings and properties utilized for commercial, light industrial, transportation, and/or multi-family residential purposes are present in the surrounding community and nearly all are separated from the Site by roadways. As discussed in Section 2.4.6.1, none of the soil vapor detections is highly elevated or suggests the presence of a significant source of soil vapors. As discussed in Section 2.4.5.2, none of these VOCs was found in Site groundwater during the RI, and as discussed in Section 2.4.4.2, none of these VOCs was found in Site soil at levels above the unrestricted use SCOs. Collectively, these data indicate that no significant onsite source of soil vapor is present. As no source was identified and none of the soil vapor detections was highly elevated, it appears unlikely that soil vapors could migrate from the Site and present an exposure concern for offsite receptors.

The potential for Site groundwater to present an exposure concern for offsite receptors was previously evaluated, as discussed in Section 1.2 of the RI Report. Potential exposure of offsite receptors to groundwater migrating from the Site was assessed by conducting a water supply well survey for the area within one-half mile of the Site; no public water or other supply wells were identified. As documented by the US Geological Survey (USGS, 1963), very little (if any) fresh groundwater is anticipated to be present in the Site vicinity due to the Site's location close to the Atlantic Ocean and Jamaica Bay. This conclusion is supported by the elevated chloride levels present in the Site groundwater. Based on the urban nature of the surrounding area, the availability of public water via the New York City water supply system, and the saline nature of the groundwater in the Site vicinity, it is concluded that offsite exposure to groundwater migrating from the Site is highly unlikely.

In summary, there does not appear to be a concern for human health risk from the impacted media at the Site under current conditions. Potential contact with the affected media (soil, groundwater, and soil vapor) could occur during remediation and/or redevelopment activities; however, it is anticipated that these activities would be performed under HASPs that control potential exposures to these media. Potential exposure to the affected media by Site workers, occupants, and visitors could occur under future use of the redeveloped property unless appropriate remedial and/or control measures are implemented. Therefore, appropriate remedial measures and/or ECs/ICs should be implemented.

2.5.2 Fish and Wildlife Resources Impact Analysis

As documented in the NYSDEC-approved RI Work Plan, a fish and wildlife resources impact analysis was not performed during the RI as fish and wildlife resources are not present at the Site or in its surrounding area. The Site is located in an urban setting and is presently nearly completely covered by pavement and the area where the hospital building was formerly present. The only non-covered areas present consist of former small lawn areas near the Site perimeter. These conditions are not supportive of potential fish or wildlife resources on the Site.

The Site is surrounded by paved streets and other fully-developed parcels that are used for multi-family residential and commercial purposes. The closest natural areas are the Atlantic Ocean at Rockaway Beach (about 0.25 miles south) and Conch Bay of Little Bay (about 0.25 miles northeast). These areas are separated from the Site by one or more multi-lane streets and/or the MTA Subway A Line. Based on these conditions, there are no fish or wildlife resources anticipated to be present in the vicinity of the Site.

2.6 INTERIM REMEDIAL ACTION

No formal Interim Remedial Actions (IRMs) have been conducted at this Site. However, some remedial activities have been performed to address tanks and spills, as described below. All of these activities were conducted under NYSDEC oversight.

The petroleum storage tanks on the Site were located and removed in 2016 following a work plan (FPM, May 23, 2016) that was reviewed and approved by the NYSDEC. The scope of work completed included a geophysical survey of the known and suspected UST areas, a visual survey of the building perimeter and nearby areas, and subsurface explorations to locate all of the remaining USTs. The remaining USTs and ASTs at the Site were located and properly removed and disposed, with advance NYSDEC notification and the appropriate Fire Department of New York Affidavit filed. The tanks removed included a 5,000-gallon #2 fuel oil AST and two closed-in-place 10,000-gallon #6 fuel oil USTs associated with the former boiler room.

An elevated platform for a backup diesel generator with an associated AST was observed on the northwest side of the former hospital building. Although some generator equipment and piping were still present, the former AST was determined to have been previously removed. The removed AST appears to have been the 600-gallon diesel AST registered with the NYSDEC and noted to be in service in 2015.

A diligent search was made for the 550-gallon diesel UST that was reportedly closed in place, including a geophysical survey, a visual survey of the entire perimeter of the building for vent or fill pipes, and subsurface exploration using an excavator and hand excavation. However, the UST was not located and it was concluded that it was previously removed.

Spill #1508760 was reported on November 24, 2015 when fuel oil-impacted soil was identified in proximity to the #6 fuel oil USTs during a Phase II investigation. This spill was addressed under the provisions of the tank removal work plan (FPM, May 23, 2016), which was approved by the NYSDEC on May 27, 2016. Petroleum-impacted soil and free-phase product were removed in the #6 fuel oil UST area and properly disposed offsite in July 2016 during the tank removal activities. Some petroleum-stained soil remained present approximately 7 feet below grade in the former UST area in 2016, but testing of post-excavation samples from the floor and walls of the UST excavation did not show any exceedances of SCOs. As discussed above, this spill area was further investigated during the RI and no visible or other indications of potential petroleum contamination were observed in any of the borings or the monitoring well installed in the former UST area. PAHs were identified in the historic fill in the former UST area and are likely related to the minor amounts of asphalt fragments observed in some of the fill.

Spill #9104015 was reported on July 15, 1991 when a 550-gallon diesel UST failed a tightness test. The UST was isolated and re-tested with no further failure report. The cleanup was noted to meet standards and the spill was closed on June 4, 1993.

Spill #1311139 was reported on February 25, 2014 when an electrical fire in the vacant hospital building resulted in a release of non-PCB dielectric fluid. The spill was contained and cleaned up and the release area was reported to be free of contamination. This spill was closed on February 27, 2014.

2.7 REMEDIAL ACTION OBJECTIVES

Based on the results of the Remedial Investigation, the following Remedial Action Objectives (RAOs) have been identified for this Site.

2.7.1 Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.

RAOs for Environmental Protection

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

2.7.2 Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.

RAOs for Environmental Protection

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

2.7.3 Soil Vapor

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at the Site.

3.0 DESCRIPTION OF REMEDIAL ACTION PLAN

This Remedial Action Plan has been developed for remedial measures to be implemented at this site during redevelopment and is based on the contamination identified at the site during the RI and previous investigations, and the planned site redevelopment for restricted residential and commercial uses.

Remedial action standards, criteria and guidance (SCGs) have been identified for this Site and include the following:

- 6 NYCRR Part 375-6 Soil Cleanup Objectives and associated CP-51 Soil Cleanup Guidance Policy provide soil cleanup objectives for contaminants in soil;
- New York State Groundwater Quality Standards – 6 NYCRR Part 703 establish water quality standards for groundwater and effluent discharges;
- NYSDEC Ambient Water Quality Standards and Guidance Values – TOGS 1.1.1 provide water quality standards for groundwater and effluent discharges;
- NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation -May 2010 provides guidance for remedial programs;
- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan provides guidance for development of Community Air Monitoring Plans;
- NYS Waste Transporter Permits – 6 NYCRR Part 364 are required when transporting hazardous and non-hazardous waste;
- NYS Solid Waste Management Requirements – 6 NYCRR Part 360 and Part 364 are applicable when managing solid waste;
- NYSDOH Guidance Document for Evaluating Soil Vapor Intrusion in the State of New York (October 2006, matrices updated May 2017) provides guidance concerning contaminants that may be present in soil vapor and indoor air;

- NYSDEC Long Island Well Permit Program is applicable for groundwater pumped at more than 45 gpm.

The remedial action SCGs are considered during the evaluation of remedial alternatives in the following section.

3.1 EVALUATION OF REMEDIAL ALTERNATIVES

This section includes a description of the remedial alternatives considered for the Site and a comparison of the alternatives with respect to several factors. The factors considered during this analysis of remedial alternatives are:

- Protection of human health and the environment;
- Compliance with standards, criteria, and guidelines (SCGs);
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of contaminated material;
- Implementability;
- Cost effectiveness;
- Community Acceptance; and
- Land use.

Two remedial alternatives are considered for this Site: a Track 1 Alternative that would achieve a full cleanup of the Site, and a Track 4 Alternative that would achieve a cleanup of the Site sufficient for it to be used for certain restricted uses subject to controls. Each Alternative is described and evaluated in the following sections.

3.1.1 Alternative A: Track 1 Cleanup

Alternative A, a Track 1 cleanup, would include remediation of all soil above bedrock that exceeds the NYSDEC unrestricted use SCOs, remediation of soil vapor impacts sufficient to eliminate soil vapor that presents an SVI concern, and groundwater remediation or, as the

Applicant is a Volunteer, if groundwater impacts are reduced to asymptotic levels a Track 1 cleanup could be achieved with a restriction on groundwater use.

Under this alternative, all of the soil above bedrock that exceeds the NYSDEC unrestricted use SCOs must be properly removed and disposed from the Site. Based on the existing data, soil exceeding these SCOs is present throughout much of the Site and the volume of soil that would require removal is estimated at a minimum of 75,000 cubic yards. Additional soil sampling is required in several areas of the Site to delineate the full depth of impacts that exceed the unrestricted use SCOs. For the purpose of this remedial alternative analysis, it is assumed that following the completion of delineation approximately 100,000 cubic yards of soil will require removal and disposal. Due to the depth of impacts extending below the water table in portions of the Site, excavation shoring and dewatering would be required. Dewatering fluids are likely to be acceptable for disposal to the sewer system. Following soil removal and confirmation sampling, the excavation areas would require restoration with a sufficient volume of approved fill that meets the unrestricted use SCOs so as to restore the Site grade sufficiently to permit redevelopment.

A Track 1 cleanup would require remediation of soil vapor impacts to the extent that they no longer present an SVI concern. It is reasonable to anticipate that soil removal will eliminate some, but not all, of the soil vapor impacts. The remaining soil vapor impacts would be addressed using a soil vapor extraction system that would operate for no more than five years to meet the remedial goals.

Groundwater impacts that may result from Site-related contamination include only benzo(a)pyrene noted at several locations. These impacts are likely to be reduced or eliminated as a result of removal of impacted soil. Therefore, it is reasonable to expect that the identified groundwater impacts may be reduced to asymptotic levels that can be documented via a groundwater monitoring program. As the Applicant is a Volunteer, if groundwater impacts are reduced to asymptotic levels, a Track 1 cleanup can be achieved with a restriction on groundwater use.

3.1.2 Alternative B: Track 4 Cleanup

Alternative B, a Track 4 cleanup, would include placement of a cover over the soil that exceeds the restricted residential use SCOs, with targeted soil removal and offsite disposal as needed to ensure that the top two feet of any exposed soil meets the restricted residential use SCOs and to remove soil that exceeds protection of groundwater SCOs (source soil), and installation of vapor barriers and implementation of sub-slab depressurization systems (SSDSs) for new buildings constructed on the Site. This Alternative would require a Site Management Plan (SMP) with procedures to manage residual contamination on the Site, and an environmental easement to provide institutional controls to prevent exposure to residual contamination.

Under this alternative, a cover would be placed above all Site soils that exceed the restricted residential use SCOs, with some soil removal in targeted areas as needed, and removal of source soil where present. Based on the redevelopment plan, which includes a phased approach for construction, a final condition where nearly all of the ground surface will be paved or covered by buildings, and where portions of the Site must be raised to address potential flooding issues, a Track 4 cleanup would include placement of a cover consisting of the new building foundations and associated pavement over the residual soil in the initial construction area. If necessary, targeted excavation of shallow soil in areas to be landscaped and that exceeds restricted residential use SCOs would also be performed in the initial construction area; the estimated volume of this soil is 400 cubic yards. Source soil that is present outside of the initial construction area (specifically B22 at 0 to 2 feet and B37 at 2 to 4 feet) would also be removed; the estimated volume of this soil is 450 cubic yards. A cover consisting of at least two feet of clean materials consisting of soil meeting the restricted residential use SCOs and/or crushed concrete (estimated volume: 20,000 cubic yards) would be placed over the remaining Site surface where soil exceeding restricted residential use SCOs is present and redevelopment will not occur until a later phase. This materials cover would be replaced during later phases of construction by building foundations or pavement. These later activities would be conducted under an SMP and an environmental easement would be needed.

A Track 4 cleanup for soil vapor would include mitigation of SVI concerns, which can be accomplished by placement of a vapor barrier and construction and operation of a sub-slab depressurization system (SSDS) beneath the habitable portions of each newly-constructed building. As the construction will be phased, the SVI mitigation measures for buildings constructed following the completion of the remedy would be implemented under an SMP, with all vapor barrier and SSDS operation, monitoring and maintenance procedures included in the SMP. An environmental easement would be needed.

A Track 4 cleanup for groundwater is anticipated to include institutional controls in the form of a restriction on groundwater use and health and safety measures for redevelopment activities that may involve contact with the Site groundwater. These controls would be implemented via a Construction HASP and an environmental easement.

3.1.3 Alternatives Analysis

Alternatives A and B are evaluated relative to criteria set forth in 6 NYCRR 375-1.8(f) and NYSDEC DER-10, Chapter 4. This evaluation considers the RAOs for the Site, the SCGs, the planned redevelopment of the Site with restricted residential and commercial uses, the phased approach to redevelopment, and Site-specific issues.

3.1.3.1 Protection of Human Health and the Environment

This threshold criterion addresses whether each remedial alternative achieves the RAOs, and includes an assessment of how potential exposures or impacts are eliminated, reduced or controlled.

Alternative A, a Track 1 cleanup that includes removal of all impacted soil, SVE to remediate soil vapor, groundwater monitoring and a use restriction, provides adequate protection of public health and the environment and will achieve the RAOs for the Site as all of the soil that could present a public health concern or contribute to groundwater contamination will be removed, soil vapor will be remediated, groundwater will be restored to the extent practicable, and groundwater use will be restricted. Potential exposures during remedial activities would be controlled through use of a Construction HASP and Community Air Monitoring Plan (CAMP).

This Alternative will result in some unavoidable remediation-related impacts to the surrounding community due to the large volume of soil that would require removal and transportation, and the associated import and placement of fill for the remedial excavations. These activities will result in a significant duration of excavation, trucking, and restoration, with attendant noise and vehicle emissions. These impacts can be partially controlled by using established trucking routes and noise-reducing measures, but some impacts cannot be avoided.

This Alternative will also result in some unavoidable remediation-related waste generation and energy use associated with the anticipated large number of confirmation samples, the need for disposal of dewatering fluids, operation of the SVE, and emissions generated from SVE. The SVE emissions can be controlled through treatment, but other impacts cannot be avoided.

Alternative B, a Track 4 cleanup that includes a cover over nearly all of the remaining impacted soil, with some targeted soil removal and offsite disposal as needed for impacted shallow soil and source soil, vapor barriers and SSDSs for new buildings, an SMP and an environmental easement, also provides adequate protection of public health and the environment. This Alternative will achieve the RAOs for the Site in that soil that could present a public health concern or contribute to groundwater contamination will be covered or removed, mitigation for potential SVI will be provided, groundwater will be restored to the extent practicable, and groundwater use will be restricted. Potential exposures during remedial activities would be controlled through use of a Construction HASP and CAMP.

This Alternative will result in some unavoidable remediation-related impacts to the surrounding community, but to a lesser extent than Alternative A. Some impacted soil would require removal, transportation, and disposal, and there may be some associated import of fill for the remedial excavations and for use as cover material. However, the duration of these activities will be significantly less than for Alternative A and there will be less noise and vehicle emissions. These impacts can be partially controlled by using established trucking routes and noise-reducing measures, but some impacts cannot be avoided.

This Alternative will also result in some unavoidable remediation-related waste generation and energy use associated with the confirmation samples. However, there is not anticipated to be a need for disposal of dewatering fluids or emissions that would be generated from SVE. Thus, remediation-related waste generation will be less than for Alternative A.

3.1.3.2 Compliance with standards, criteria, and guidelines (SCGs)

This threshold criterion addresses whether each remedial alternative conforms to the SCGs that are generally applicable, consistently applied, and officially promulgated, that are applicable, or relevant and appropriate, unless good cause exists why conformity should be dispensed with.

Alternative A, a Track 1 cleanup, will comply with the SGCs for the Site in that all soil exceeding the unrestricted use SCOs will be removed, soil vapor conditions that exceed NYSDEC SVI guidance will be remedied, groundwater will be restored to the extent practicable, and groundwater use will be restricted. This Alternative will comply with the SCGs to the extent technically practicable, although it is likely that some groundwater that exceeds SCGs will remain present. Exposure to this groundwater will be controlled.

Alternative B, a Track 4 cleanup, will also comply with the SGCs for the Site to the extent technically practicable. Under this Alternative, soil exceeding the restricted residential use SCOs will be either covered or removed, which will control potential contact with soil exceeding the SCGs for the planned use of the Site. Source soil that may contribute to groundwater contamination will also be removed. Soil vapors with the potential to result in SVI will be controlled to prevent exposure, groundwater will be restored to the extent practicable, and groundwater use will be restricted. This Alternative will also comply with the SCGs to the extent technically practicable, although it is likely that some groundwater that exceeds SCGs will remain present. Exposure to this groundwater would be controlled.

3.1.3.3 Short-term effectiveness and impacts

This primary balancing criterion addresses whether each remedial alternative has short-term adverse environmental impacts and human exposures during the implementation of the remedy and the effectiveness of controls. Short-term effectiveness and impacts are assessed relative to protection of the community, protection of workers, and environmental impacts during the timeframe that the remedy is implemented.

Implementation of Alternative A, a Track 1 cleanup, will result in remediation-related impacts to the surrounding community from the activities required to remove and transport a large volume of impacted soil (estimated 100,000 cubic yards), and the associated import and placement of fill for the remedial excavations. These activities will result in a significant duration of excavation, trucking, and Site restoration, with attendant noise, dust and vehicle emissions. These impacts can be partially controlled by using established trucking routes and dust- and noise-reducing measures, but some impacts to the surrounding community cannot be avoided.

Implementation of this Alternative will also result in some unavoidable remediation-related environmental impacts resulting from waste generation and energy use. Wastes will be generated and energy will be used for soil transportation and disposal. Wastes will also be generated and energy used for collection, shipping and testing of the anticipated large number of confirmation samples. Energy will be used for dewatering, and the dewatering fluids will require disposal. The SVE systems will require energy and materials for their construction and operation, and their operation will result in air emissions. SVE emissions can be controlled through treatment, and it may be possible to reduce energy consumption by employing green remediation techniques, but some of the environmental impacts from wastes and energy use cannot be avoided.

Alternative B, a Track 4 cleanup, will also result in some remediation-related impacts to the surrounding community from the activities required to remove and transport impacted soil/source soil (estimated 850 cubic yards), and associated import and placement of cover materials (estimated at 20,000 cubic yards), but the extent of these activities will be considerably less than for Alternative A. There will be some excavation, trucking, cover placement, and Site restoration, with attendant noise, dust and vehicle emissions during these operations. These impacts can be partially controlled by using established trucking routes and dust- and noise-reducing measures, but some impacts to the surrounding community cannot be avoided. However, based on the much smaller volumes of materials to be managed under this Alternative, these impacts will be less than for Alternative A.

Implementation of this Alternative will also result in some unavoidable remediation-related environmental impacts resulting from waste generation and energy use. Wastes will be generated and energy will be used for soil transportation and disposal, but these impacts will be less than for Alternative A. Wastes will also be generated and energy used for collection, shipping and testing of some confirmation samples, but the number of samples (and resulting waste generation and energy use) will be less than for Alternative A. Dewatering is not anticipated to be needed under this alternative and, therefore, there will be no energy used or waste generated. The SSDSs will require energy and materials for their construction and operation, and their operation will result in air emissions, but the energy use and emissions generated will likely be less than for the SVE systems contemplated under Alternative A.

3.1.3.4 Long-term effectiveness and permanence

This primary balancing criterion addresses whether each remedial alternative will result in an effective and permanent remedy that protects human health and the environment after it is implemented. Effectiveness is evaluated with respect to the magnitude of residual risks, adequacy of any controls in managing residual contamination, the reliability of controls against potential failure, and their potential to provide continued protection.

Implementation of Alternative A, a Track 1 cleanup, will result in complete removal of all impacted soil, full remediation of impacted soil vapor, and a control that prevents potential exposure to groundwater. This remedy will be effective and permanent in that it will provide full protection of human health by removing nearly all impacted materials from the Site and controlling potential exposures to groundwater. Groundwater containing residual impacts will remain present, but human exposures will be controlled via an environmental easement that prohibits groundwater use without treatment. In the unlikely event that the groundwater use restriction provision of the environmental easement is not adhered to, the risk of exposure to groundwater is low in that the groundwater is not sufficiently fresh to be used for potable water and the Site is located in an urban area with a municipal public water supply.

Implementation of Alternative B, a Track 4 cleanup, will result in residual soil, soil vapor and groundwater impacts remaining onsite and subject to ECs and ICs to present potential exposures. This remedy will be effective and permanent as protection of human health and the environment will be achieved by covering residual soil, removing some residual impacted soils and source soil, providing protection from SVI into new buildings by using vapor barriers and SSDSs, and controlling potential exposures to groundwater. Soil, soil vapor, and groundwater containing residual impacts will remain present, but human exposures will be controlled via conventional ECs and an environmental easement that requires the ECs to remain in place and prohibits groundwater use without treatment. The provisions of the environmental easement will be monitored via the Periodic Review Report (PRR) process and enforced by the NYSDEC if required.

3.1.3.5 Reduction of toxicity, mobility, or volume of contaminated material

This primary balancing criterion is an evaluation of the ability of the remedial alternative to permanently and significantly reduce the toxicity, mobility and volume of onsite contamination.

Implementation of Alternative A, a Track 1 cleanup, will result in complete removal of all impacted soil and impacted soil vapor from the Site, thus significantly reducing the volume of onsite contamination. This alternative will also include a control that prevents potential exposure to groundwater, essentially reducing its mobility and toxicity relative to human health.

Implementation of Alternative B, a Track 4 cleanup, will remove some of the impacted soil from the Site and will include an EC that prevents human exposure to the remaining residual soil. Source soil will also be removed. This alternative will not remove significant amounts of impacted soil vapor from the Site, but it will prevent human exposure to soil vapors by using an EC (vapor barrier and SSDS). This alternative will also include a control that prevents potential exposure to groundwater. Overall, this alternative will not reduce the toxicity or volume of the onsite contamination as much as Alternative A, but it will reduce the mobility and toxicity of the remaining residual contamination relative to human health.

3.1.3.6 Implementability

This primary balancing criterion is an evaluation of the technical and administrative feasibility of implementing the remedial alternative. A feasible remedy is one that can be successfully implemented with available technology and under the Site conditions, and considers the reliability and viability of the ECs and ICs.

Implementation of Alternative A, a Track 1 cleanup, will utilize conventional technologies (excavation and SVE) to remediate impacted Site soil and soil vapor and will rely on an IC (environmental easement) to control human exposure to residual groundwater. This alternative, while technically feasible, will likely have some technical and administrative difficulties associated with the extended timeframe for transportation of a large volume of impacted soil (estimated 100,000 cubic yards) through the urban area surrounding the Site and the associated importation of a large volume of fill for the remedial excavations.

Alternative B, a Track 4 cleanup, will also utilize a conventional technology (excavation) to remediate some of the impacted Site soil and source soil and will rely on a conventional technology (cover) and an IC (environmental easement) to prevent potential human exposure to the remaining residual soil. This alternative will also use a conventional technology (vapor barrier and SSDS) and an IC (environmental easement) to control potential human exposure to soil vapor, and will rely on an IC (environmental easement) to control human exposure to residual groundwater. This alternative is technically feasible and will likely have fewer technical and administrative difficulties with waste and fill transportation through the urban area surrounding the Site.

3.1.3.7 Cost effectiveness

This primary balancing criterion is an evaluation of the overall cost effectiveness of a remedial alternative. A remedy is cost effective if its costs are proportional relative to its overall effectiveness. The overall effectiveness is evaluated by considering the remedy's long-term effectiveness and permanence, reduction of toxicity, mobility or volume of contamination, and short-term impacts and effectiveness.

Alternative A (Track 1 cleanup) is estimated to cost approximately $19,935,000, as summarized on Table 3.1.3.7.1; a detailed cost estimate is included in Appendix D. As discussed above, this alternative will result in a long-term effective and permanent remedy, will significantly reduce the toxicity, mobility and volume of onsite contamination, but will have some potentially-significant short-term impacts on the surrounding community during its implementation.

Alternative B (Track 4 cleanup) is estimated to cost approximately $6,246,000, as summarized on Table 3.1.3.7.1; a detailed cost estimate is included in Appendix D. As discussed above, this alternative will also result in a long-term effective and permanent remedy, and will significantly reduce the toxicity, mobility and volume of onsite contamination. However, this alternative will have fewer short-term impacts on the surrounding community during its implementation.

Overall, Alternative B is more cost effective than Alternative A.

3.1.3.8 Community acceptance

This criterion is an evaluation of whether the community will be accepting of the preferred remedy.

Alternative A (Track 1 cleanup) and Alternative B (Track 4 cleanup, the preferred remedy) will both result in remedies that are protective of public health and the environment and are anticipated to be accepted by the public based on this consideration. Alternative B will result in

TABLE 3.1.3.7.1
REMEDIAL ALTERNATIVES ESTIMATED COSTS
FORMER PENINSULA HOSPITAL SITE

Remedial Alternative A (Track 1): Soil Excavation, Soil Vapor Extraction, Groundwater Monitoring, Institutional Controls	**Estimated Cost (rounded)**	**Remedial Alternative B (Track 4): Covers, Limited Soil Excavation, Vapor Barrier, Sub-Slab Depressurization, Institutional Controls**	**Estimated Cost (rounded)**
Excavate and Dispose Soil	$18,586,000	Covers (Foundations, Pavement)	$2,941,000
SVE Systems	$406,000	Cover (Soil, Crushed Concrete)	$658,000
Post-SVE Testing	$19,000	Limited Soil Excavation	$201,000
SVE Systems Removal	$17,000	Soil Vapor Mitigation (Vapor Barriers, SSDSs)	$964,000
Groundwater Monitoring Network Abandonment	$8,000	Groundwater Monitoring Network Abandonment	$8,000
Institutional Controls	$46,000	Post-SSDS SVI Testing	$17,000
Total Capital Costs:	**$19,082,000**	SSDSs Removal	$53,000
		Institutional Controls	$46,000
SVE Systems OM&M (annual)	$98,000	**Total Capital Costs:**	**$4,888,000**
Groundwater Monitoring (annual)	$71,000		
Reporting and Certification (annual)	$10,000	SSDSs OM&M (annual)	$58,000
Alternative A Net Present Worth:	**$19,935,000**	Reporting and Certification (annual)	$10,000
		Alternative B Net Present Worth:	**$6,246,000**

some residual impacts remaining present onsite, but exposures will be controlled via ECs and ICs and, therefore, there is not anticipated to be any community concern for potential exposures under the preferred remedy. Alternative A will require a more significant duration of remedial activities with the potential to impact the surrounding community, including excavations, loading and trucking, fill placement and compaction, shoring placement, and groundwater pumping. While measures will be taken to reduce these impacts, there is likely to be more community concern for the activities that will be required under Alternative A (not the preferred remedy). Therefore, it is anticipated that the community will be most accepting of the preferred remedy, Alternative B.

3.1.3.9 Land use

This criterion is an evaluation of the current, intended, and reasonably anticipated future use of the Site and its surroundings as it relates to a remedial alternative, when unrestricted use criteria will not be achieved.

Alternative A, a Track 1 cleanup, will achieve unrestricted use criteria for soil and soil vapor, but not for groundwater. Under this alternative, potential exposure to residual groundwater would be controlled under an IC (environmental easement). Implementation of this IC is not anticipated to impact either current land use (vacant) or the reasonably-anticipated future land use (restricted residential and commercial uses) as public water is available in the Site vicinity and is planned to be used for the proposed redevelopment.

Alternative B, a Track 4 cleanup, will not achieve unrestricted use criteria for soil, soil vapor, or groundwater. Under this alternative, potential exposures to residual impacted media would be controlled by ECs (cover, vapor barrier, and SSDSs) and under an IC (environmental easement). Implementation of these ECs and the IC is not anticipated to impact either current land use (vacant) or the reasonably-anticipated future land use (restricted residential and commercial uses). The ECs are conventional and/or will be located below areas that will be occupied and, therefore, are not anticipated to impede the proposed land uses. Implementation of a restriction on groundwater use is not anticipated to impede the proposed land uses as public water is available in the Site vicinity and is planned to be used for the proposed redevelopment. Additional evaluations concerning potential impacts on land use are presented in Section 3.2 below.

3.2 SELECTION OF THE PREFERRED REMEDY

The preferred remedy, Alternative B, is a Track 4 cleanup that would include placement of a cover over the majority of the soil that exceeds the restricted residential use SCOs, with targeted soil removal and offsite disposal as needed to ensure that the top two feet of exposed soil meet the restricted residential use SCOs and to remove source soil, and installation of vapor barriers and implementation of SSDSs for new buildings constructed on the Site. This Alternative would require an SMP with procedures to manage residual contamination on the Site, and an environmental easement with ICs to prevent exposure to residual contamination.

Under this alternative, a cover would be placed over the majority of the soil that exceeds the restricted residential use SCOs; some targeted excavations may be conducted to assure that the top two feet of exposed soil at the Site meets these SCOs. The source soil in two areas on the southern portion of the Site would also be removed. The redevelopment plan, which includes phased construction, will result in a final developed condition where nearly all of the Site ground surface will be paved or covered by buildings, and where portions of the Site must be raised to address potential flooding issues. A Track 4 cleanup will include placement of a cover consisting of the new building foundations and associated pavement over the residual soil in the initial construction area. If necessary, targeted excavation of shallow soil exceeding restricted residential use SCOs will also be performed in the initial construction area. Source soil on the southern portion of the Site would also be removed. During the initial phase of construction, a soil/crushed concrete cover will be placed over the remaining Site surface where soil exceeding restricted residential use SCOs is present. This soil/crushed concrete cover will be replaced during later phases of construction by building foundations or pavement. These later activities would be conducted under an SMP and an environmental easement would be needed.

Mitigation of SVI concerns will be accomplished by placement of a vapor barrier and SSDS beneath the ground-level habitable portions of each newly-constructed building. As it cannot be determined if active SVI mitigation will be necessary until it is possible to sample sub-slab soil vapor and indoor air, as a precautionary measure, the elements of an SSDS (piping, risers, blowers, and monitoring points) will be installed for each new building, with post-construction SVI testing performed to determine if active SVI mitigation is necessary. If necessary, then the SSDSs will be operated. As the construction will be phased, the SVI mitigation measures for buildings constructed following the completion of the remedy will be implemented under an SMP, with all vapor barrier and SSDS operation, monitoring and maintenance included in the SMP. An environmental easement will be needed.

Groundwater use will be restricted by an IC and health and safety measures will be implemented for redevelopment activities that may involve contact with the Site groundwater. These controls would be implemented via a Construction HASP and an environmental easement.

Alternative B will be protective of human health and the environment. The RAOs for the Site will be achieved as soil that could present a public health concern will be removed or covered, source soil that could contribute to groundwater contamination will be removed, mitigation for potential SVI will be provided, and groundwater use will be restricted. Potential exposures during remedial activities would be controlled through use of a Construction HASP and CAMP.

Alternative B will comply with the SGCs for the Site to the extent technically practicable. Under this Alternative, soil exceeding the restricted residential use SCOs will be either covered or removed, which will control potential contact with soil exceeding the SCGs for the planned use of the Site. Source soil that may contribute to groundwater contamination will be removed and groundwater use will be restricted. Soil vapors with the potential to result in SVI will be controlled to prevent exposure.

Alternative B will result in some short-term remediation-related impacts to the surrounding community, but the extent of these activities will be considerably less than for Alternative A and these impacts can be controlled by using established trucking routes and dust- and noise-reducing measures. Alternative B will also result in some unavoidable remediation-related environmental impacts resulting from waste generation and energy use, but these impacts will also be less than for Alternative A.

Alternative B will be an effective and permanent remedy in that protection of human health and the environment will be achieved by covering or removing soils that exceed the restricted residential use SCOs, removing soils that exceed groundwater protection criteria, providing protection from SVI into new buildings by using vapor barriers and SSDSs, and controlling potential exposures to groundwater. Some residual soil, soil vapor and groundwater impacts will remain present onsite, but will be subject to ECs and ICs to present potential exposures. The ECs and ICs will be monitored via the PRR process and enforced by the NYSDEC if required.

Alternative B will remove some of the impacted soil from the Site, thereby reducing the toxicity and volume of contaminated soil, and will include an EC that prevents human exposure to the remaining residual soil. This alternative will not remove significant amounts of impacted soil vapor from the Site, but it will prevent human exposure to soil vapors by using and EC (vapor barrier and SSDS). This alternative will also include a control that prevents potential exposure to groundwater. Overall, this Alternative will reduce the mobility and toxicity of the remaining residual contamination relative to human health.

Alternative B is technically feasible and readily implementable in that it will utilize a conventional technology (excavation) to remediate some of the impacted Site soil and will rely on a conventional technology (cover) and an IC (environmental easement) to prevent potential human exposure to the remaining residual soil. This alternative will also use a conventional technology (vapor barrier and SSDS) and an IC (environmental easement) to control potential human exposure to soil vapor, and will rely on an IC (environmental easement) to control human exposure to residual groundwater.

Alternative B will result in a long-term effective and permanent remedy, and will reduce the toxicity, mobility and volume of onsite contamination. This alternative is much less costly than Alternative A and will have fewer short-term impacts on the surrounding community during its implementation. Alternative B is the more cost-effective remedy.

Alternative B will result in a remedy that is protective of public health and the environment and is anticipated to be accepted by the public based on this consideration. Alternative B will result in some residual impacts remaining present onsite, but exposures will be controlled via ECs and ICs and, therefore, there is not anticipated to be any community concern for potential exposures. Alternative B will require a shorter duration of remedial activities with the potential to impact the surrounding community (excavations, loading and trucking, fill placement and compaction, shoring placement, and groundwater pumping) than Alternative A. Therefore, it is anticipated that the community will be most accepting of Alternative B, the preferred remedy.

Alternative B, a Track 4 cleanup, will not achieve unrestricted use criteria for soil, soil vapor, or groundwater. Under this alternative, potential exposures to residual impacted media would be controlled by ECs (cover, vapor barrier, and SSDSs) and under an IC (environmental easement). Implementation of these ECs and the IC is not anticipated to impact either current land use (vacant) or the reasonably-anticipated future land use (restricted residential and commercial uses). The ECs are conventional and/or will be located below areas that will be occupied and, therefore, are not anticipated to impede the proposed land uses. Implementation of a restriction on groundwater use is not anticipated to impede the proposed land uses as public water is available in the Site vicinity and is planned to be used for the proposed redevelopment.

3.2.1 Land Use Factors

The following land use factor evaluation examines whether the preferred alternative is acceptable based on the criteria required by Article 27, Title 14 of the Environmental Conservation Law 27-1415.

3.2.1.1 Zoning

The Site was rezoned in November 2019 to facilitate redevelopment with ten mixed-use new buildings containing affordable residential units and significant commercial (supermarket and retail), community facility, and parking space.

The preferred alternative, a Track 4 cleanup, will be acceptable under the current new zoning as it will result in a cleanup sufficient for restricted residential use (the most sensitive planned future use), with controls in place to prevent potential unacceptable exposures under the current zoning.

3.2.1.2 <u>Applicable comprehensive community master plans or land use plans</u>

The Site's redevelopment plan has been developed within the City's large-scale planning efforts to redevelop the community of Far Rockaway. In 2019 the City Council approved a series of land use actions to facilitate the proposed redevelopment of the Site under the Uniform Land Use Review Procedure (ULURP), including a zoning map amendment, zoning text amendments, and large-scale general development special permits. These actions will allow the Site redevelopment to include both restricted residential and commercial uses. Under these plans at least 25% of the Site's residential floor area will be permanently affordable at an average of 60% of the Area Median Income (AMI).

The preferred alternative will be acceptable under the approved land use plan as the cleanup will be sufficient for restricted residential use (the most sensitive planned use), with controls in place to prevent potential unacceptable exposures under the planned use.

3.2.1.3 Surrounding property uses

The Site is located in an area used for mixed purposes, including residential, commercial and industrial uses. Buildings and properties utilized for commercial, light industrial, medical, transportation and/or multi-family residential purposes adjoin the Site either directly or across roadways. The uses include an electrical substation, a church, commercial and light industrial businesses, two nursing facilities, parking lots, multi-family residential apartment buildings, a public school, and a playground.

Alternative B, the preferred alternative, will achieve a cleanup sufficient for restricted residential use (the most sensitive planned use) of the Site with controls in place to prevent potential unacceptable exposures. This cleanup would also be performed under a HASP and CAMP with measures to prevent unacceptable impacts and exposures to the surrounding community. Alternative B will result in a shorter duration of remedial activities with the potential to impact the surrounding properties (excavations, loading and trucking, fill placement and compaction, etc.) than Alternative A. Overall, Alternative B is evaluated to be the most acceptable relative to the surrounding property uses.

3.2.1.4 Citizen participation

Citizen participation activities conducted for this Site have not yet resulted in any comments from the public. The preferred alternative will be protective of the public and will have fewer activities with the potential for impacting the community in proximity to the Site. Therefore, it is anticipated that Alternative B will be most acceptable to the members of the public.

3.2.1.5 Environmental justice concerns

The proposed use of the redeveloped Site under either remedial alternative is not expected to cause or increase a disproportionate burden on the community in which the Site is located or to result in a disproportionate concentration of commercial or industrial uses in this historically mixed-use community. The redeveloped Site will include ten newly-constructed buildings containing affordable residential units and significant commercial (supermarket and retail), community facility, and parking space. No industrial uses are proposed. Therefore, it is anticipated that the preferred alternative will be acceptable with respect to potential environmental justice concerns.

3.2.1.6 Land use designations

There are no federal or state land use designations that are applicable to the property on which the Site is located. Therefore, it is anticipated that the preferred alternative will be acceptable relative to federal and state land use designations.

3.2.1.7 Population growth patterns

Based on 2010 US Census data, the population of Far Rockaway was just over 50,000 at that time and had increased by 3.4% relative to the population noted during the 2000 census. Far Rockaway's population has continued to increase, based on more local census information from 2008 (censusreporter.org). The proposed redevelopment of the Site is anticipated to help address the housing and other needs of this growing community by providing newly-constructed buildings containing affordable residential units and significant commercial, community facility, and parking space. The preferred alternative is anticipated to be acceptable, based on a consideration of the population growth in Far Rockaway.

3.2.1.8 Accessibility to existing infrastructure

Existing infrastructure in proximity to the Site includes major roadways and the MTA Subway A Line. The preferred alternative includes use of the major roadways for Site access and some offsite transport of materials to be disposed. However, the preferred alternative will require much less use of the existing infrastructure than Alternative A (a Track 1 cleanup) and, as such is anticipated to be acceptable with respect to access and use of existing infrastructure.

3.2.1.9 Proximity to cultural resources

The Site is not located in proximity to identified cultural resources, such as federal or state historic or heritage sites or Native American religious site. Therefore, implementation of the preferred remedy is anticipated to be acceptable with respect to cultural resources.

3.2.1.10 Proximity to natural resources

There are three wetland/estuarine areas within one-half mile of the Site, including Rockaway Beach (0.25 miles south), Conch Bay (0.25 miles northeast), and Sommerville Basin (0.35 miles west). These areas are separated from the Site by one or more multi-lane streets and/or the MTA Subway A Line; it is not anticipated that these areas will be impacted by activities associated with the preferred remedial alternative.

The Conch Playground is located to the northeast of the Site (across Beach Channel Drive). Other recreational/natural areas, including the Arverne Playground, Cardozo Playground, Rockaway Community Park, and the Dubos Point Wildlife Sanctuary, are close to the Site. However, these areas are also separated from the Site by one or more multi-lane streets and/or the MTA Subway A Line. These areas are not anticipated to be impacted by activities associated with the preferred remedial alternative

3.2.1.11 Off-Site groundwater impacts

The preferred remedial alternative is anticipated to be acceptable relative to the potential for offsite groundwater impacts. Onsite groundwater impacts are limited to several metals (sodium, manganese, magnesium, iron, and antimony), PFOA, and/or PFOS; these impacts appear to be related to ambient groundwater quality in the Site vicinity. One SVOC (benzo(a)pyrene) that may have originated from onsite soil was also identified in groundwater above its Standard in limited areas of the Site. These conditions indicate that the potential for offsite migration of Site-related groundwater impacts is very limited. The potential for Site-related groundwater to impact offsite receptors was evaluated, as discussed in Section 1.2 of the RI Report. No public water or other supply wells were identified within one-half mile of the Site and very little (if any) fresh groundwater is anticipated to be present in the Site vicinity due to the Site’s location close to the Atlantic Ocean and Jamaica Bay. Based on the urban nature of the surrounding area, the availability of public water via the New York City water supply system, and the saline nature of the groundwater in the Site vicinity, it was concluded that offsite exposure to groundwater migrating from the Site is highly unlikely.

3.2.12 Proximity to floodplains

The Site is located in Flood Zone AE on the most current FEMA Flood Hazard Map. This zone is an area of high flood risk for inundation by the 1% annual chance flood event. The preferred remedial alternative is anticipated to be acceptable relative to the Site's potential for flooding as it will include placement of a cover over much of the Site surface that will protect the residual soil from exposure in the event of a flood. This alternative will also not involve active remedial systems that might be damaged in the event of a flood.

3.2.1.13 Geography and geology of the Site

The preferred remedial alternative is anticipated to be acceptable relative to the Site's geology and geography. This alternative will involve only a limited removal of impacted soil and will require less import of clean fill, thus preserving most of the geologic materials beneath the Site. This alternative will also not require active remedial systems that might require above-grade structures at the Site.

3.2.1.14 Current Institutional Controls

There are no current environmental institutional controls, such as deed restrictions, that have been recorded for the Site. The preferred remedial alternative will require an institutional control in the form of an environmental easement that will include certain controls on the use of the Site, use of groundwater underlying the Site, and adherence to an SMP. Imposition of an environmental easement is not anticipated to affect any current institutional controls that may exist or the planned redevelopment of the Site.

3.3 SUMMARY OF SELECTED REMEDIAL ACTION

The proposed Remedial Action has been designed to stop offsite migration of Site-related mobile contamination (groundwater and soil vapor) to the maximum extent practicable. A Track 4 remedy is proposed, with the numerical values to be the Track 2 SCOs listed in Part 375-6 for restricted residential land use, which is the most sensitive type use for the Site's proposed end use. This section includes a comprehensive and concise summary of the remedial actions proposed for the Site, including a numbered bullet list of remedial elements.

The proposed Remedial Action includes placing a cover over much of the soil that exceeds the restricted residential use SCOs, with targeted soil removal and offsite disposal as needed to ensure that the top two feet of exposed soil meet the restricted residential use SCOs and to remove source soil, and installation of vapor barriers and implementation of SSDSs for new buildings constructed on the Site. An SMP with procedures to manage residual contamination on the Site would be implemented, and an environmental easement would be recorded to provide institutional controls to prevent exposure to residual contamination.

Based on the redevelopment plan, which includes a phased approach for construction, a final condition where nearly all of the ground surface will be paved or covered by buildings, and where portions of the Site must be raised to address potential flooding issues, a Track 4 cleanup would include placement of a cover consisting of the new building foundations and associated pavement over the residual soil in the initial construction area. If necessary, targeted excavation of shallow soil exceeding restricted residential use SCOs would also be performed in the initial construction area. Source soil that is present in two areas on the southern portion of the Site would also be removed. A soil/crushed concrete cover would be placed over the remaining Site surface where soil exceeding restricted residential use SCOs is present. This soil/crushed concrete cover would be replaced during later phases of construction by building foundations or pavement. These later activities would be conducted under the SMP.

A Track 4 cleanup for soil vapor would include mitigation of SVI concerns, which will be accomplished by placement of a vapor barrier and SSDS beneath the ground-level habitable portions of each newly-constructed building. As it cannot be determined if active SVI mitigation will be necessary until it is possible to sample sub-slab soil vapor and indoor air, as a precautionary measure, the elements of an SSDS (piping, risers, blowers, and monitoring points) would be installed for each new building, with post-construction SVI testing performed to determine if active SVI mitigation is necessary. If necessary, then the SSDSs would be operated. As the construction will be phased, the SVI mitigation measures for buildings constructed following the completion of the remedy would be implemented under an SMP, with all vapor barrier and SSDS operation, monitoring and maintenance included in the SMP.

A Track 4 cleanup for groundwater will include institutional controls in the form of a restriction on groundwater use and health and safety measures for redevelopment activities that may involve contact with the Site groundwater. These controls would be implemented via a Construction HASP and an environmental easement.

The following remedial elements are included in the proposed Remedial Action:

1. Construction and maintenance of an engineered composite cover consisting of new concrete building foundations, concrete and/or asphalt pavement, and/or two feet of cover soil/crushed concrete meeting the Track 4 SCOs to prevent human exposure to residual contaminated soil/fill remaining under the Site;
2. Excavation, as needed, of limited targeted areas of soil/fill exceeding Track 4 SCOs listed in Table 3.3.1. Excavation of soil exceeding protection of groundwater SCOs in two areas on the southern portion of the Site;
3. Installation of a soil vapor intrusion mitigation system, consisting of a vapor barrier and a sub-slab depressurization system, under all ground-level habitable buildings;
4. Recording of an Environmental Easement, including Institutional Controls (noted below), to prevent future exposure to residual contamination remaining at the Site (a copy of the NYSDEC's Environmental Easement template is provided in Appendix A);
5. Publication of a Site Management Plan for long term management of residual contamination as required by the Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;
6. Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during any intrusive Site remediation;
7. Collection and analysis of end-point samples in areas where soil exceeding the Track 4 SCOs is removed to evaluate the performance of the remedy with respect to attainment of Track 4 SCOs;
8. Appropriate offsite disposal of all contaminated material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;
9. Import of materials to be used for backfill and cover in compliance with: (1) chemical limits and other specifications included in Table 3.3.1, and (2) all Federal, State and local rules and regulations for handling and transport of material;

10. All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations;

11. Institutional Controls to include:

    - Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence of all elements of the SMP;
    - All Engineering Controls must be operated and maintained as specified in the SMP;
    - The composite cover system must be inspected, certified and maintained as required in the SMP;
    - All Engineering Controls on the Site (Controlled Property) must be inspected and certified at a frequency and in a manner defined in the SMP;
    - Soil vapor and other environmental or public health monitoring must be performed as defined in the SMP;
    - Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP;
    - Onsite environmental monitoring devices, including but not limited to, soil vapor probes in new buildings, must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP;
    - Engineering Controls may not be discontinued without an amendment or extinguishment of the Environmental Easement.

Adherence to these Institutional Controls for the Site will be mandated by the Environmental Easement and will be implemented under the Site Management Plan. The Controlled Property will also have a series of Institutional Controls in the form of Site restrictions and requirements in the Environmental Easement, including:

- Vegetable gardens and farming on the Controlled Property are prohibited;
- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose;

- All future activities on the Controlled Property that will disturb residual contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the Site Management Plan;
- The Controlled Property may be used for restricted residential, commercial, and/or industrial use only, provided the long-term Engineering and Institutional Controls included in the Site Management Plan are employed;
- The Controlled Property may not be used for a higher level of use, such as unrestricted or single-family residential use, without an amendment or extinguishment of this Environmental Easement;
- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow. This certification must be certified by an expert that the NYSDEC finds acceptable.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP and the Department-issued Decision Document. All deviations from the RAWP and/or Decision Document will be promptly reported to NYSDEC for approval and fully explained in the Final Engineering Report (FER).

4.0 REMEDIAL ACTION PROGRAM

4.1 GOVERNING DOCUMENTS

The documents governing the Remedial Action are introduced and summarized in this section. Greater detail is provided later in the body of this document and/or in the applicable Appendix. Copies of all documents governing the Remedial Action are provided in full in the applicable Appendix.

4.1.1 Standards, Criteria and Guidance

The following standards, criteria, and guidance (SCGs) are relevant to this Site and the proposed Remedial Action, applicable to Remedial Action projects in New York State, and will be consulted and adhered to as applicable:

- 6 NYCRR Parts 700-706 - Water Quality Standards
- STARS #1 - Petroleum-Contaminated Soil Guidance Policy (1992), noting that Sections III and IV have been replaced CP-51
- CP-51- Soil Cleanup Guidance (2010)
- Spill Response Guidance Manual (1995)
- TAGM 3028 - "Contained In" Criteria for Environmental Media: Soil Action Levels (August 1997)
- TOGS 1.1.1 - Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations (1998, Addenda 2000 and 2004)
- DAR-1 (formerly Air Guide 1) (1997) - Guidelines for the Control of Toxic Ambient Air Contaminants
- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes
- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
- 6 NYCRR Part 375 - Environmental Remediation Programs
- 6 NYCRR Part 376 - Land Disposal Restrictions
- 6 NYCRR Part 750 - State Pollutant Discharge Elimination System (SPDES) Permits

- DER-2 - Making Changes To Selected Remedies (Revised April, 2008)
- DER-23 – Citizen Participation Handbook for Remedial Programs (March, 2010)
- TOGS 1.3.8 - New Discharges to Publicly Owned Treatment Works
- CP-43 – Commissioner Policy on Groundwater Monitoring Well Decommissioning (December 2009)

4.1.2 Site-Specific Health and Safety Plan

A Site-specific Health and Safety Plan (HASP) is included in Appendix E of this RAWP. The HASP includes the Community Air Monitoring Plan (CAMP). All remedial work performed under the RAWP will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA.

The Volunteer and associated parties preparing the remedial documents submitted to the NYSDEC and those performing the construction work are completely responsible for the HASP and for the appropriate performance of work according to the HASP and applicable laws.

The HASP and requirements defined in this RAWP pertain to all remedial work performed at the Site until the issuance of a Certificate of Completion.

The Site Safety Coordinator is anticipated to be John Bukoski, PG. A resume will be provided to NYSDEC prior to the start of remedial construction.

Confined space entry is not anticipated or planned for the Remedial Action. In the event that confined space entry becomes necessary for the remedial action, then the confined space entry will comply with all OSHA requirements to address the potential risk posed by combustible and toxic gasses.

4.1.3 Quality Assurance Project Plan

End-point sampling will be performed in areas where soil exceeding the restricted residential SCOs or protection of groundwater SCOs is removed during the Remedial Action. SVI testing will be conducted to determine if SSDS operation is necessary. SSDS effluent sampling will also be performed to confirm that SSDS emissions are compliant with applicable SCGs. The Quality Assurance Project Plan (QAPP) is provided in Appendix F and includes the proposed sampling and analytical methods for end-point sampling, SVI testing, and effluent sampling.

4.1.4 Construction Quality Assurance Plan

The remedy includes construction of covers, vapor barriers, and SSDSs (engineering controls) to address residual soil and soil vapor contaminants at the Site. Sections 7 and 8 of this RAWP provide details concerning the construction of these engineering controls. Some residual soil may also be removed during the remedial process and source soil will be removed; Section 5 of this RAWP includes details concerning soil removal procedures. Quality assurance/quality control procedures for samples to be collected to document the remedial work are included in the QAPP in Appendix F of this RAWP.

All construction work for the remedy will be monitored by the Remedial Engineer, Kevin F. Loyst, PE, PMP or qualified environmental professionals under his supervision. All remedial construction activities will be documented in the Site field logbook and photographs will be taken of key aspects of the remedial construction. Reporting to the NYSDEC will be performed to document the progress of remedial construction, as described in Section 4.4 of this RAWP and an FER will be prepared to document the completed remedial work.

Monitoring will be performed during all remedial activities to protect the health of onsite remedial workers and the surrounding community. A Health and Safety Plan (HASP) with a Community Air Monitoring Plan (CAMP) has been prepared for this remedial action (see Appendix E); these plans include monitoring procedures, action levels and contingency measures that will be used to protect onsite remedial workers and public health.

4.1.5 Soil/Materials Management Plan

The Soil/Materials Management Plan (SoMP) is provided in Section 5.4 of this RAWP and includes detailed plans for managing all impacted soils/materials that are to be removed or covered at the Site, including excavation, handling, storage, transport and disposal. The SoMP includes all of the controls that will be applied to these efforts to assure effective, nuisance-free performance of the Remedial Action in compliance with all applicable Federal, State and local laws and regulations.

4.1.6 Storm-Water Pollution Prevention Plan

The remedial activities for this Site will be conducted in conjunction with Site redevelopment. As such, the redevelopment documents will include a Stormwater Pollution Prevention Plan (SWPPP) that will address the requirements of New York State Storm-Water Management regulations, including physical methods to control and/or divert surface water flows and to limit the potential for erosion and migration of Site soils. The erosion and sediment controls will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control.

4.1.7 Community Air Monitoring Plan

The Site-specific HASP included in Appendix E of this RAWP includes a Community Air Monitoring Plan (CAMP) developed in accordance with NYSDOH guidance (Appendix 1A of NYSDEC DER-10). All remedial work performed under the RAWP will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA.

4.1.8 Contractors Site Operations Plan

The Remedial Engineer for this project will review all contractor plans and submittals for the remedial work prior to the start of construction to confirm that they are in compliance with this RAWP. The Remedial Engineer will be responsible to ensure that all document submittals for this remedial project, including contractor and subcontractor document submittals, are in compliance with this RAWP.

4.1.9 Citizen Participation Plan

The approved Citizen Participation Plan (CPP) for this Site is included in Appendix G. Before the NYSDEC approves this RAWP, a Fact Sheet will be distributed to the Site Contact List. This Fact Sheet will describe the proposed RAWP and announce a 45-day public comment period. A public meeting may be held if requested by the affected community or at the discretion of the NYSDEC project manager. Prior to the start of the remedial action another Fact Sheet will be distributed to the Site Contact List that describes the upcoming remedial action.

A certification of mailing will be sent by the Volunteer to the NYSDEC project manager following the distribution of all Fact Sheets and notices that includes: (1) certification that the Fact Sheets were mailed, (2) the date they were mailed; (3) a copy of the Fact Sheet, (4) a list of recipients (contact list); and (5) a statement that the repository was inspected on (specific date) and that it contained all of applicable project documents.

No changes will be made to approved Fact Sheets authorized for release by the NYSDEC without written consent of the NYSDEC. No other information, such as brochures and flyers, will be included with the Fact Sheet mailing.

Document repositories have been established at the following locations and contain all applicable project documents:

The Archives at Queens Library
89-11 Merrick Road
Jamaica, NY 11432
(718) 990-0700
Hours: Monday 9 AM to 9 PM
Tuesday to Friday 9 AM to 7 PM
Saturday 10 AM to 5 PM
Sunday 12 PM to 5 PM

Queens Community Board #14
1931 Mott Avenue
Far Rockaway, NY 11691
(718) 471-7300
Hours: Monday to Friday 9 AM to 5 PM

4.2 GENERAL REMEDIAL CONSTRUCTION INFORMATION

4.2.1 Project Organization

The Remedial Action work will be conducted by remedial contractors under contract to the Volunteer, Peninsula Rockaway Limited Partnership. The remedial contractors will be identified to the NYSDEC prior to the start of remedial work.

4.2.2 Remedial Engineer

The Remedial Engineer for this project will be Kevin F. Loyst, PE, PMP. The Remedial Engineer is a registered Professional Engineer (PE) licensed by the State of New York and will have primary direct responsibility for implementation of the remedial program for the Former Peninsula Hospital Site (NYSDEC BCA Index No. C241200-08-17, Site No. C241200). In the event that Mr. Loyst is unavailable to be the Remedial Engineer, another properly-qualified Remedial Engineer who is a PE licensed by the State of New York will be identified.

The Remedial Engineer will certify in the Final Engineering Report that the remedial activities were observed by qualified environmental professionals (QEPs) under his supervision and that the remediation requirements set forth in this RAWP and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. Other Remedial Engineer certification requirements are listed later in this RAWP.

The Remedial Engineer and QEPs under his supervision will coordinate the work of the remedial contractors and subcontractors involved in all aspects of remedial construction, including soil excavation, stockpiling, characterization, removal and disposal, air monitoring, emergency spill response services, import of backfill material, and management of waste transport and disposal. The Remedial Engineer and QEPs under his supervision will be responsible for all appropriate communication with the NYSDEC and NYSDOH.

The Remedial Engineer and QEPs under his supervision will review all pre-remedial plans submitted by contractors for compliance with this RAWP and will certify compliance in the Final Engineering Report. The Remedial Engineer will provide the certifications listed in Section 10.1 in the Final Engineering Report.

4.2.3 Remedial Action Construction Schedule

As the remedial work described in this RAWP will be conducted during Site redevelopment, which is slated to be performed in phases, the remedial action construction schedule cannot be determined in any detail at this time. The following general schedule is anticipated:

- No remedial activities will be conducted until the NYSDEC approves this RAWP;
- Following RAWP approval, it is anticipated that remedial activities for the first phase of the redevelopment project are likely to commence in 2021 and be completed in 2022;
- A Final Engineering Report will be submitted to the NYSDEC following the completion of the first phase of remedial activities during the initial phase of redevelopment;
- Subsequent remedial activities will be conducted under a Site Management Plan (SMP) approved by the NYSDEC. These activities will take place during each phase of redevelopment for which remedial activities are required.

The NYSDEC will be notified in advance of the actual dates for remedial action construction for each phase of redevelopment.

4.2.4 Work Hours

The hours for operation of remedial construction will conform to the New York City Department of Buildings construction code requirements or according to specific variances issued by that agency. The NYSDEC will be notified by the Volunteer of any variances issued by the Department of Buildings. The NYSDEC reserves the right to deny alternate remedial construction hours.

4.2.5 Site Security

The Site is presently secured with fencing and will remain secured by fencing and controlled entrances throughout remedial construction. Site access will be provided only to remedial construction and redevelopment personnel.

4.2.6 Traffic Control

Traffic control will be established during remedial construction as needed in proximity to the controlled Site access points and in conformance with New York City traffic control requirements for construction sites. Traffic control is anticipated to include use of flaggers during entrance and egress of trucks from the Site and installation of signage on public streets in proximity to the controlled Site entrances.

4.2.7 Worker Training and Monitoring

Training and monitoring requirements for remedial construction workers should include HAZWOPER, site safety training, and medical monitoring. Details concerning the worker training and monitoring requirements are included in the HASP in Appendix E to this RAWP.

4.2.8 Agency Approvals

The Volunteer has addressed all SEQRA requirements for this Site. All permits or government approvals required for remedial construction have been, or will be, obtained prior to the start of remedial construction.

The planned end use for the Site is in conformance with the current zoning for the property as determined by New York City Department of Planning and as discussed in Section 3.2.1 of this

RAWP. It is understood that a Certificate of Completion will not be issued by the NYSDEC for the project unless the redevelopment conforms with the current zoning designation.

All local, regional and national governmental permits, certificates or other approvals or authorizations required to perform the remedial and redevelopment work will be obtained prior to the start of remedial construction and redevelopment.

None of the planned remedial or construction work will be conducted in regulated wetlands or adjacent areas. In the event that any such work is contemplated, this work will be specifically approved by the NYSDEC Division of Natural Resources prior to the start of construction to ensure that it meets the requirements for substantive compliance with those regulations. Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

4.2.9 NYSDEC BCP Signage

Signs are optional for BCP sites; if a BCP sign is contemplated for this Site, it will be discussed with the NYSDEC Project Manager prior to installation. If a sign is to be displayed, it must follow NYSDEC specifications for design and content; the NYSDEC Project Manager will provide details on signage protocol, if necessary.

If a project sign is to be installed, it is anticipated that it will be erected at the main entrance to the Site prior to the start of any remedial activities. The sign will indicate that the project is being performed under the New York State Brownfield Cleanup Program and will meet the detailed specifications to be provided by the NYSDEC Project Manager.

4.2.10 Pre-Construction Meeting with NYSDEC

Prior to the start of major remedial construction activities, a pre-construction meeting will be held with the NYSDEC. This meeting will include, at a minimum, representatives of the Volunteer, Remedial Engineer, remedial construction contractor, and NYSDEC. Additional representatives of other pertinent entities will be included as necessary. This meeting is anticipated to include discussions of the work to be performed, reporting responsibilities, health and safety issues, and other items necessary to conduct the work in accordance with this RAWP.

4.2.11 Emergency Contact Information

An emergency contact sheet with names and phone numbers will be provided during the pre-construction meeting. That document will define the specific project contacts for use by the NYSDEC and NYSDOH in the case of a day or night emergency during the project. Preliminary emergency contact information is included in the HASP in Appendix E to this RAWP. This emergency contact list will be updated as needed throughout the course of the remedial work.

4.2.12 Remedial Action Costs

The total estimated cost of the Remedial Action is approximately $6,246,000. An itemized and detailed summary of estimated costs for all remedial activity is included in Appendix D.

As the remedial work will be conducted in stages corresponding to the phasing of redevelopment, the actual remedial cost for each phase will be provided in the Final Engineering Report or subsequent Site Management Reports, as appropriate.

4.3 SITE PREPARATION

4.3.1 Mobilization

Prior to the start of remedial construction, the remedial contractor, Remedial Engineer and QEPs will mobilize any necessary equipment, supplies and personnel to the Site and stage the equipment and supplies as needed to execute the work.

4.3.2 Monitoring Well Decommissioning

Existing groundwater monitoring wells will be properly decommissioned in accordance with NYSDEC policy CP-43. The only exception to this is if the full length of the well is to be excavated during redevelopment.

4.3.3 Erosion and Sedimentation Controls

Erosion and sedimentation controls will be installed in accordance with the SWPPP. The erosion and sediment controls will be in conformance with requirements presented in the New York State Guidelines for Urban Erosion and Sediment Control.

4.3.4 Stabilized Construction Entrance(s)

Stabilized construction entrances will be established in accordance with the SWPPP at all locations where trucks loaded with contaminated soil will exit the Site. There will be continuity between any truck wash(es) and the stone-based egress path so that trucks do not get contaminated with Site soil prior to their departure from the Site.

4.3.5 Utility Marker and Easements Layout

The Volunteer and its contractors are solely responsible for the identification of utilities that might be affected by work under the RAWP and implementation of all required, appropriate, or necessary health and safety measures during performance of work under this RAWP. The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Volunteer and its contractors must obtain any local, State or Federal permits or approvals pertinent to such work that may be required to perform work under this RAWP. Approval of this RAWP by NYSDEC does not constitute satisfaction of these requirements.

The presence of utilities and easements on the Site will be investigated by the Volunteer prior to the start of remedial work. It is anticipated that no risk or impediment to the planned work under this RAWP is posed by utilities or easements on the Site.

4.3.6 Sheeting and Shoring

Sheeting and shoring are not anticipated to be needed for remedial measures to be implemented under this RAWP. In any case, appropriate management of structural stability of onsite and offsite structures during Site-related remedial activities, including excavation, is the sole responsibility of the Volunteer and its contractors. The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. Further, the Volunteer and its contractors are solely responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved RAWP.

4.3.7 Equipment and Material Staging

Equipment and materials to be used during the remedial activities will be staged onsite in a manner that protects them from damage and leaves them available for use by remedial personnel when needed, but does not interfere with redevelopment construction activities that may be ongoing. Equipment and material staging areas will be determined prior to the start of remedial work and in consultation with construction management personnel.

4.3.8 Decontamination Area

Equipment and personnel decontamination areas will be established as needed for activities involving residual materials. These areas will be established at locations that do not interfere with redevelopment construction activities that may be ongoing and that are safe for decontamination activities. Decontamination areas will be determined prior to the start of remedial work and in consultation with construction management personnel.

4.3.9 Site Fencing

The Site is presently secured with fencing and will remain secured by fencing and controlled entrances throughout remedial construction. Site fencing will be adjusted and maintained as needed to assure Site security and access to appropriately-authorized personnel and equipment.

4.3.10 Demobilization

Demobilization of remedial equipment and personnel following the completion of remedial activities during each phase of redevelopment will be performed in a manner that removes the no-longer-needed equipment and materials, and does not unduly interfere with ongoing redevelopment activities at the Site. Demobilization activities will vary depending on a number of factors, such as whether redevelopment activities are ongoing, the nature of the ongoing activities, and the nature of the remedial activities that have just been completed. Demobilization activities may include:

- Restoration of remedial support areas (e.g., staging areas, decontamination areas, storage areas, temporary soil management areas, and access areas);

- Removal of temporary access areas and restoration of access areas to facilitate ongoing redevelopment;
- Removal of sediment and erosion control measures that may no longer be needed and disposal of materials in accordance with acceptable rules and regulations;
- Equipment decontamination; and
- General refuse disposal.

4.4 REPORTING

Copies of all reports prepared during the remedial action will be included in the Final Engineering Report.

4.4.1 Daily Reports

During active remedial operations in the field, daily reports will be prepared to document the work performed. These reports will include, as appropriate:

- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the Site;
- References to alpha-numeric map for Site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP findings, including excursions;
- An explanation of notable Site conditions.

At the end of each work week, that week's daily reports will be compiled and provided to the NYSDEC and NYSDOH Project Managers. The NYSDEC assigned project number will appear on all reports.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accidents or spills), requests for changes to the RAWP or other sensitive or time-critical information. However, such conditions must also be included in the daily reports.

Emergency conditions and changes to the RAWP will be addressed directly to NYSDEC Project Manager via personal communication.

A Site map that shows a predefined alpha-numeric grid for use in identifying locations described in the daily reports will be submitted to the NYSDEC prior to the start of remedial work.

4.4.2 Monthly Reports

During active remedial work monthly reports will be submitted to NYSDEC and NYSDOH Project Managers within one week following the end of the month of the reporting period. These monthly reports will include:

- A summary of activities conducted at the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (i.e. tons of material exported and imported, etc.);
- Descriptions of approved activity modifications, including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and,
- An update of the remedial schedule, including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.

4.4.3 Other Reporting

Photographs will be taken of all remedial activities and submitted to the NYSDEC in digital (JPEG) format. Photos will illustrate all remedial program elements and will be of acceptable quality. Representative photos of the Site prior to any remedial actions will be provided. Representative photos will be provided of each contaminant source, source area, and Site structures before, during and after remediation. Photos will be included in the daily reports as needed, and a comprehensive collection of photos will be included in the Final Engineering Report.

Jobsite record-keeping for all remedial work will be appropriately documented. These records will be maintained onsite at all times during the active field portions of the project and will be available for inspection by NYSDEC and NYSDOH staff.

4.4.4 Complaint Management Plan

In the event that complaints are received from the public regarding nuisance or other Site conditions, the complaints will be addressed as follows:

- Each complaint will be documented in writing and included on the daily report of the day that it is received;
- Each complaint will be investigated to verify that it is legitimate and to assess the scope and nature of the issue. The investigation process and results will be documented in writing and included in the daily field report;
- Action will be taken as appropriate to correct the situation that resulted in the complaint and to resolve the complaint in accordance with applicable regulations. Any action(s) taken will be documented in writing and included in the applicable daily field report. If appropriate, the person making the complaint will be notified of the corrective action; and
- The NYSDEC and NYSDOH Project Managers will be notified of minor complaints and their resolution via the daily reports. In the case of more significant complaints, the NYSDEC and NYSDOH Project Managers will be personally contacted to discuss the complaint and/or its resolution.

4.4.5 Deviations from the Remedial Action Work Plan

In the event that there are any deviations from the RAWP, the following process will apply:

- The reasons for deviating from the approved RAWP will be explained, at a minimum, in the applicable daily field report. If the anticipated deviation is significant, the NYSDEC and NYSDOH Project Managers will be contacted in advance to discuss the anticipated deviation, its cause, and any resolution or mitigating circumstances;
- The process for approving and documenting deviations from the approved RAWP will

depend on the nature of the deviation and potential effect on the remedy. This process may range from a notification to the NYSDEC and NYSDOH and documentation in the daily reports and FER for minor deviations, to meeting with the NYSDOH and NYSDEC and preparing a RAWP amendment for more significant deviations; and

- In any case, the effect of any RAWP deviations on overall remedy will be assessed and documented.

5.0 REMEDIAL ACTION: MATERIAL REMOVAL FROM SITE

Under the selected Track 4 remedial alternative, the top two feet of soil that is exposed must meet the restricted residential use SCOs; a cover will be constructed over soil that exceeds these SCOs, with limited soil removal conducted as needed. Source soil that exceeds protection of groundwater SCOs and is present on the southern portion of the Site will also be removed. The redevelopment plan will result in a final developed condition where nearly all of the Site ground surface will be paved or covered by buildings and portions of the Site are raised to address potential flooding issues; the pavement and building foundations will constitute the Site cover following redevelopment.

Redevelopment will be phased, and will include placement of a cover consisting of the new building foundation, slabs, and associated pavement over the residual soil in the initial construction area. If necessary for construction purposes, targeted excavation of shallow soil exceeding restricted residential use SCOs will also be performed in the initial construction area. Source soil on the southern portion of the Site will also be removed during initial construction. A soil/crushed concrete cover will then be placed over the remaining Site surface where soil exceeding restricted residential use SCOs is present. The soil/crushed concrete cover placed during the initial phase of construction will be replaced during later phases of construction by building foundations or pavement. These later activities will be conducted under an SMP. An environmental easement will be executed to ensure compliance with the SMP.

5.1 SOIL CLEANUP OBJECTIVES

The Soil Cleanup Objectives for this Site are the 6 NYCRR Part 375 SCOs for restricted residential use and for protection of groundwater.

Soil and materials management onsite will be conducted in accordance with the Soil Management Plan as described below. No offsite soil or materials management is anticipated or planned.

The tables included in Appendix B highlight all of the exceedances of the SCOs for restricted residential use. A spider map that shows all soil samples that exceed the restricted residential use SCOs is shown in Figure 2.4.4.2.1. Shallow soil at the B22 and B37 locations also exceeds the protection of groundwater SCO for benzo(a)pyrene.

Figure 5.1.1 depicts the Site and shows the area of the initial phase of redevelopment, the soil in this area that exceeds the SCOs for restricted residential use (B-13 location only), and the B22 and B37 locations to the south where soil exceeds the protection of groundwater SCO for benzo(a)pyrene. The impacted soil at B-13 is fill that is found at a depth of 6 to 8 feet below grade and is underlain by native soil that meets the SCOs for restricted residential use. This area is to be raised to address potential flooding issues and will be covered by a new building and associated pavement. This soil will not be removed unless necessary for construction purposes. In the event that this soil is removed, it will be conducted in accordance with the Soil Management Plan. The shallow soil at B22 and B37 will be removed from the areas shown on Figure 5.1.1 to a depth of approximately 3 feet (B22) and approximately 5 feet (B37) in accordance with the Soil Management Plan. End-point sampling will be performed to confirm that removal of the targeted soil at B22 and B37 is complete.

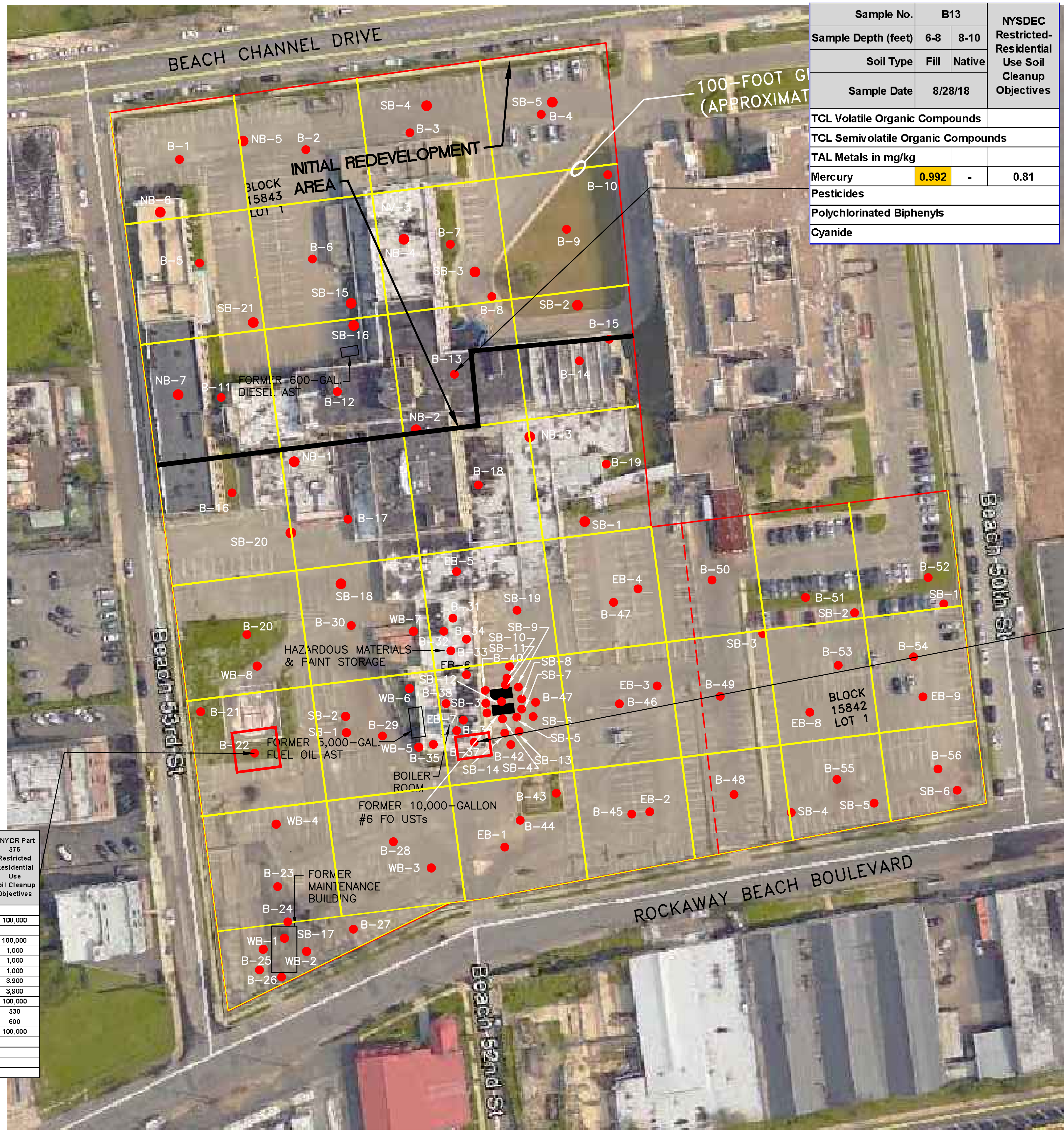
All known and suspected tanks have been investigated and all identified tanks have been removed in accordance with applicable regulations. In the event that previously-unknown USTs are identified, they will be removed and the removals will, at a minimum, conform to criteria defined in DER-10.

5.2 REMEDIAL PERFORMANCE EVALUATION (POST EXCAVATION END-POINT SAMPLING)

In the event that targeted excavation of shallow soil exceeding restricted residential use SCOs is performed, end-point sampling will be performed to document the condition of the remaining soil. End-point sampling will also be performed for areas where source soil exceeding the protection of groundwater SCOs is removed.

5.2.1 End-Point Sampling Frequency

End point sampling, including bottom and side-wall sampling, will be performed at a frequency in accordance with DER-10 Section 5.4 sample frequency requirements. Side-wall samples will be collected a minimum of every 30 linear feet for excavations of 20 to 300 feet in perimeter. For excavations less than 20 feet in perimeter, one sidewall sample will be collected in the direction of surface water runoff. Bottom samples will be collected at a rate of one for every



Sample No.	B13		NYSDEC Restricted-Residential Use Soil Cleanup Objectives
Sample Depth (feet)	6-8	8-10	
Soil Type	Fill	Native	
Sample Date	8/28/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds			
TAL Metals in mg/kg			
Mercury	0.992	-	0.81
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

LEGEND:

- SB-19 SOIL BORING LOCATION (PREVIOUS AND REMEDIAL INVESTIGATIONS)
- SOIL EXCEEDS 6NYCRR PART 375 RESTRICTED RESIDENTIAL USE SCOs
- SOIL TO BE REMOVED

NOTES:

- ALL SITE BUILDINGS DEMOLISHED IN 2018.
- PREVIOUS SOIL DATA ARE FROM MULTIPLE INVESTIGATIONS CONDUCTED BY FPM AND OTHERS AND INCLUDE SOME DUPLICATE SAMPLE NUMBERS.

Sample No.	B37		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	2-4	4-6	
Soil Type	Fill	Native	
Sample Date	9/11/18		
TCL Volatile Organic Compounds			
TCL Semivolatile Organic Compounds in ug/kg			
Fluoranthene	220,000	-	100,000
Naphthalene	19,000	-	100,000
Benzo(a)anthracene	120,000	-	1,000
Benzo(a)pyrene	100,000	-	1,000
Benzo(b)fluoranthene	130,000	-	1,000
Benzo(k)fluoranthene	45,000	-	3,900
Chrysene	100,000	-	3,900
Phenanthrene	200,000	-	100,000
Dibenzo(a,h)anthracene	16,000	-	330
Indeno(1,2,3-cd)pyrene	61,000	-	500
Pyrene	190,000	-	100,000
Metals			
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

Sample No.	B22		6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	5-7	
Soil Type	Fill	Native	
Sample Date	8/30/18		
TCL Volatile Organic Compounds in ug/kg			
Naphthalene	130,000	-	100,000
TCL Semivolatile Organic Compounds in ug/kg			
Fluoranthene	220,000	-	100,000
Benzo(a)anthracene	140,000	-	1,000
Benzo(a)pyrene	120,000	-	1,000
Benzo(b)fluoranthene	180,000	-	1,000
Benzo(k)fluoranthene	45,000	-	3,900
Chrysene	120,000	-	3,900
Phenanthrene	160,000	-	100,000
Dibenzo(a,h)anthracene	17,000	-	330
Indeno(1,2,3-cd)pyrene	66,000	-	500
Pyrene	200,000	-	100,000
Metals			
Pesticides			
Polychlorinated Biphenyls			
Cyanide			

0' 100' 200'

APPROXIMATE SCALE

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FIGURE 5.1.1
MATERIAL REMOVAL–INITIAL REDEVELOPMENT PHASE
FORMER PENINSULA HOSPITAL SITE
51–15 BEACH CHANNEL DRIVE
FAR ROCKAWAY, QUEENS, NY

Drawn By: H.C. Checked By: S.D. Date: 7/27/20

H:\PENINSULA ROCKAWAY\RAWP\FIGURE 5.1.1.dwg, 7/27/2020 3:46:53 PM, DWG To PDF.pc3

900 square feet. The FER will provide a tabular and map summary of all end-point sample results and exceedances of SCOs.

5.2.2 Methodology

End-point samples will be collected by an environmental professional using dedicated or decontaminated soil sampling equipment. All samples will be collected in accordance with the Quality Assurance Project Plan presented in Appendix F.

Chemical analyses will be performed for the analytes specified in the QAPP. Laboratories used for all end-point sample testing will be NYSDOH ELAP certified.

5.2.3 Reporting of Results

All end-point sample results will be documented in the FER. End-point sample results, once properly validated, will also be provided in the periodic (daily or monthly) reports to the NYSDEC and NYSDOH.

5.2.4 QA/QC

Quality assurance/quality control (QA/QC) samples will be collected during end-point sampling activities in accordance with the QAPP provided in Appendix F. QA/QC samples will include duplicates, trip blanks, field (equipment) blanks, and matrix/spike/matrix spike duplicates (MS/MSDs).

5.2.5 DUSR

A data usability summary report (DUSR) will be prepared for each laboratory report of end-point sample results. The DUSRs will be prepared in accordance with guidance in Appendix 2B of DER-10 and will be provided in an appendix of the FER. The results of the DUSRs will be used to evaluate the quality of the end-point data relative to their intended use.

5.2.6 Reporting of End-Point Data in FER

The FER will include a description of the end-point sampling locations, procedures, and results. A table of the end-point sample data that highlights any exceedances of the restricted residential use SCOs will be provided. A spider map showing all exceedances for the restricted residential use SCOs will also be presented in the FER.

5.3 ESTIMATED MATERIAL REMOVAL QUANTITIES

Soil removal may include targeted excavation of shallow soil needed for construction purposes. Source soil will also be removed from the southern portion the Site. In the event that removal of soil exceeding restricted residential use and/or protection of groundwater SCOs is performed, this removal will be conducted following the Soil Management Plan (SoMP) in Section 5.4 below. For the purpose of developing this RAWP, the quantity of soil to be removed from the Site was estimated as 850 cubic yards and the quantity of soil to be imported into the Site for cover was estimated as 10,000 cubic yards. The balance of the cover materials is expected to be the existing onsite crushed concrete.

5.4 SOIL MANAGEMENT PLAN

The elements of the SoMP are described in the following sections. This SoMP is applicable to removal of soil exceeding restricted residential use SCOs (residual soil) and soil exceeding protection groundwater SCOs (source soil).

5.4.1 Soil Screening Methods

Visual, olfactory and PID soil screening and assessment will be performed by a qualified environmental professional (QEP) or experienced field geologist under the direction of the Remedial Engineer during all remedial and development excavations into known or potentially contaminated material, identified as those soils exceeding restricted residential use SCOs (residual soil) and soil exceeding protection groundwater SCOs (source soil). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work in areas with residual and/or source soils performed during the remedy and development phases, such as excavations for foundations and utility work, prior to issuance of the COC.

Screening will be performed by a QEP or experienced field geologist under the direction of the Remedial Engineer. Resumes will be provided for all personnel responsible for field screening of invasive work during remediation and development work.

5.4.2 Stockpile Methods

Stockpiles that include residual or source soils will be inspected at a minimum of once each week and after every storm event. Results of these inspections will be recorded in a logbook maintained at the Site and available for inspection by NYSDEC.

Stockpiles of residual and source soils will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles of residual and source soils will be continuously encircled with silt fences. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

A dedicated water truck equipped with a water cannon will be available onsite for dust control. Alternatively, water will be available onsite at suitable supply and pressure for use in dust control.

5.4.3 Materials Excavation and Load Out

The Remedial Engineer or a QEP under his/her supervision will oversee all invasive work and the excavation and load-out of all excavated material. The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this SMP. The Volunteer and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all invasive work, the structural integrity of excavations, and for structures that may be affected by excavations (such as building foundations and bridge footings).

The presence of utilities and easements on the Site has been investigated by the Volunteer. It has been determined that no risk or impediment to the planned work under this RAWP is posed by utilities or easements on the Site.

The Remedial Engineer and QEPs will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this RAWP.

Each hotspot and structure that may be identified to be remediated (USTs, vaults and associated piping, transformers, etc.) will be removed and end-point remedial performance sampling completed before excavations related to Site development commence proximal to the hotspot or structure.

Development-related grading cuts and fills will not be performed without NYSDEC approval and will not interfere with, or otherwise impair or compromise, the performance of remediation required by this plan.

Mechanical processing of historical fill and contaminated soil onsite is prohibited.

All primary contaminant sources (including but not limited to tanks and hotspots) that may be identified during the Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. The survey information will be shown on maps to be reported in the Final Engineering Report.

Vehicles loaded with residual and/or source soil leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements). Vehicles leaving the Site with residual and source soil will not be overloaded. The Remedial Engineer's representative will make reasonable efforts to ensure that vehicles are not loaded beyond their NYSDOT weight rating and that all residual and source soil is secured beneath the truck bed cover.

A truck wash will be operated onsite. The Remedial Engineer will be responsible for ensuring that all outbound trucks containing residual or source soil will be washed at the truck wash before leaving the Site until the remedial construction is complete.

Locations where vehicles containing residual or source soil enter or exit the Site shall be inspected daily for evidence of offsite sediment tracking. The Remedial Engineer and QEPs under his supervision will be responsible for ensuring that all egress points for truck and equipment transport from the Site will be clean of soil and other materials derived from the Site during Site remediation and development. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

5.4.4 Materials Transport Off-Site

All transport of residual and source soil will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Truck transport will be in accordance with New York City-approved truck routes. All trucks loaded with residual or source materials will exit the vicinity of the Site using only approved truck routes. Proposed in-bound and out-bound truck routes to the Site are via Beach Channel Drive and are shown in Figure 5.4.4.1. These are the most appropriate routes and take into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of New York City-mapped truck routes; (c) prohibiting offsite 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.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site. Queuing of trucks will be performed onsite in order to minimize offsite disturbance. Offsite queuing will be prohibited.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

5.4.5 Materials Disposal Off-Site

Appropriate disposal locations will be identified for residual and source soil to be removed from the Site. The disposal locations will be established prior to the start of remedial activities and will be reported to the NYSDEC Project Manager.

The total quantity of residual and source soil expected to be disposed offsite has been estimated as 850 cubic yards. It is assumed that this residual and source soil will be disposed as non-hazardous waste at an appropriately licensed solid waste landfill.

All residual and source soil excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed in accordance with all local, State

Through Truck Route

Local Truck Route

Source: New York City Truck Route Map

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FIGURE 5.4.4.1

TRUCK ROUTES MAP
FORMER PENINSULA HOSPITAL SITE
FAR ROCKAWAY, NEW YORK

Drawn by: SOD Checked By: SOD Date: 3-11-2020 (including 6NYCRR Part 360) and Federal regulations. If disposal of soil from this Site is proposed for unregulated disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated offsite management of materials from this Site is prohibited without formal NYSDEC approval. Material that does not meet Track 1 unrestricted use SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

Waste characterization will be performed for offsite disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the FER. All data available for soil/material to be disposed at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

The following documentation will be obtained and reported by the Remedial Engineer or QEPs under his supervision for each disposal location used in this project to fully demonstrate and document that the disposal of the residual and source soil derived from the Site conforms with all applicable laws: (1) a letter from the Remedial Engineer or BCP Volunteer to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at an environmental remediation Site in New York State. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported (including Site Characterization data); and (2) a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the FER.

Non-hazardous historic fill and contaminated soils taken offsite will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360-1.2. Historical fill and contaminated soils (not meeting Track 1 unrestricted use SCOs) from the Site are prohibited from being disposed at Part 360-16 Registration Facilities (also known as Soil Recycling Facilities).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the Division of Materials Management (DMM) in NYSDEC to be Construction and Demolition (C/D) materials with contamination not typical of virgin soils. These soils may be sent to a permitted Part 360 landfill. They may be sent to a permitted C/D processing facility without permit modifications only upon prior notification of NYSDEC Region 2 DMM. This material is prohibited from being sent or redirected to a Part 360-16 Registration Facility. In this case, as dictated by DMM, special procedures will include, at a minimum, a letter to the C/D facility that provides a detailed explanation that the material is derived from a DER remediation Site, that the soil material is contaminated and that it must not be redirected to onsite or offsite Soil Recycling Facilities. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported.

The FER will include an accounting of the destination of all contaminated material removed from the Site during this Remedial Action, including excavated residual soil, solid waste, hazardous waste (if any), and contaminated fluids. Documentation associated with disposal of all contaminated material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the FER.

A Bill of Lading system or equivalent will be used for offsite movement of non-hazardous wastes and residual contaminated soils. This information will be reported in the FER. Hazardous wastes derived from the Site (not anticipated) will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal regulations.

Appropriately licensed haulers will be used for removal of contaminated materials from this Site and removals will be in full compliance with all applicable local, State and Federal regulations.

5.4.6 Materials Reuse On-Site

Chemical criteria for onsite reuse of material in the cover (top two feet of soil not otherwise covered by pavement or building foundations) include the 6 NYCRR Part 375 SCOs for restricted residential use. Any materials not meeting these criteria will not be reused in the cover. The Remedial Engineer or QEPs under his supervision will ensure that procedures defined for materials reuse in this RAWP are followed and that unacceptable material will not be reused onsite.

As noted in Section 2.2.3 of the RI Report, demolition of the Site buildings was conducted in 2018. Prior to demolition, the buildings were inspected for asbestos-containing materials (ACMs) and all ACMs were properly abated in 2016. ACM abatement documentation was provided to the NYC Department of Environmental Protection (DEP), which issued Asbestos Project Completion

Forms on October 6, 2016. Demolition included all above-grade building materials and below-grade foundation elements. Following demolition, the concrete was crushed and re-used onsite as needed for temporary backfill in the depressed areas that resulted from building demolition, as per NYC Department of Buildings backfill requirements for grading sites after demolition. Redevelopment plans include removal of the temporarily-placed crushed concrete during future construction. The crushed concrete may be reused onsite as cover in areas slated for future redevelopment; in this case, the crushed concrete cover will eventually be replaced by pavement and building foundations under the SMP. Further asbestos testing of the crushed concrete contemplated for onsite reuse is not warranted or planned.

Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site is prohibited for reuse onsite.

Contaminated onsite material, including residual contaminated soil removed for grading or other purposes, will not be reused within a cover soil layer or as backfill for subsurface utility lines. This will be expressed in the final SMP.

5.4.7 Fluids Management

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Liquids discharged into the New York City sewer system will be addressed through approval by NYCDEP.

Dewatered fluids will not be recharged back to the land surface or subsurface of the Site. Dewatering fluids will be managed offsite.

Discharge of water generated during remedial construction to surface waters (i.e. a local pond, stream or river) is prohibited without a SPDES permit.

5.4.8 Demarcation

After the completion of any residual or source soil removal and any other invasive remedial activities in areas of residual soil and prior to backfilling, a land survey will be performed by a New York State licensed surveyor. The survey will define the top elevation of residual contaminated soils. A physical demarcation layer, consisting of orange snow fencing material or equivalent material, will be placed on the surface of residual soil areas to provide a visual reference. This demarcation layer will constitute the top of the ‘Residuals Management Zone’, the zone that requires adherence to special conditions for disturbance of contaminated residual soils defined in the SMP. The survey will measure the grade covered by the demarcation layer before the placement of cover soils, pavement, structures, or other materials. This survey and the demarcation layer placed on this grade surface will constitute the physical and written record of the upper surface of the ‘Residuals Management Zone’ in the SMP. A map showing the survey results will be included in the FER and SMP.

5.4.9 Backfill from Off-Site Sources

All backfill materials proposed for import onto the Site will be approved by the Remedial Engineer or QEPs under his supervision and will be in compliance with provisions in this RAWP prior to receipt at the Site. Material from industrial sites, spill sites, other environmental remediation sites, or other potentially contaminated sites will not be imported to the Site. Solid waste will not be imported onto the Site.

The FER will include the following certification by the Remedial Engineer: “I certify that all import of soils from offsite, including source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan”.

All imported soils will meet NYSDEC-approved backfill or cover soil quality objectives for this Site. These NYSDEC approved backfill or cover soil quality objectives are the lower of the protection of groundwater or the protection of public health soil cleanup objectives for restricted residential use as set forth in Table 375-6.8(b) of 6 NYCRR Part 375 and listed in the tables in Appendix B. Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

Soils that meet ‘exempt’ fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Nothing in this RAWP should be construed as an approval for this purpose.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers.

5.4.10 Stormwater Pollution Prevention

A Stormwater Pollution Prevention Plan (SWPPP) that conforms to the requirements of NYSDEC Division of Water guidelines and NYS regulations, as applicable, will be utilized during redevelopment of the Site. Remedial activities will be conducted during the redevelopment activities and the approved SWPPP will be in force during remediation.

In general, it is anticipated that silt barriers and hay bale checks will be installed around the entire perimeter of the remedial construction area. and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All necessary repairs shall be made immediately. Accumulated sediments will be removed as required to keep the barrier and hay bale check functional. All undercutting or erosion of the silt fence toe anchor will be repaired with appropriate backfill materials. Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the SWPPP will be observed by the Remedial Engineer or his/her representative during remedial activities to ensure that they are operating correctly. Where discharge locations or points are accessible, they will be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

5.4.11 Contingency Plan

If USTs or other previously-unidentified contaminant sources are found during onsite remedial excavations or development-related construction, sampling will be performed on product, sediment, and surrounding soils, as applicable, to fully characterize the potential contaminant source(s). Chemical analytical work will be for full scan parameters, as identified in DER-10 and will not be limited to STARS parameters where tanks are identified without prior approval by NYSDEC. Analyses will not be otherwise limited without NYSDEC approval.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will be also included in daily and periodic electronic media reports.

5.4.12 Community Air Monitoring Plan

The Community Air Monitoring Plan (CAMP) for remedial work at the Site is included in the HASP in Appendix E. The CAMP was developed in accordance with guidance in Appendix 1A of DER-10 (Generic Community Air Monitoring Plan). The CAMP includes detailed provisions for the perimeter air monitoring program, methods for air monitoring, analytes to be measured and instrumentation to be used, action levels to be used to trigger modifications in remedial activities, descriptions of the general location(s) to be used for air monitoring (the exact locations monitored on a given day will be established based on the prevailing wind direction).

Exceedances observed during CAMP monitoring will be reported to NYSDEC and NYSDOH Project Managers and included in the appliable daily report(s).

5.4.13 Odor, Dust and Nuisance Control Plan

This section describes methods that may be used for odor, dust and nuisance control. The Final Engineering Report will include the following certification by the Remedial Engineer: "I certify that all invasive work during the remediation and all invasive development work involving residual soils were conducted in accordance with dust and odor suppression methodology defined in the Remedial Action Work Plan."

5.4.13.1 <u>Odor Control Plan</u>

Nuisance odors have not been observed onsite or documented during previous onsite investigations and nuisance odors are not anticipated during remediation or redevelopment activities. Nevertheless, it is possible that nuisance odors may become apparent during remedial or redevelopment activities. Therefore, this Odor Control Plan has been developed and includes methods anticipated to be capable of controlling emissions of nuisance odors in the unlikely event that they are noted.

Specific odor control methods to be used on a routine basis will depend on the nature and source of the odor. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the responsibility of the Volunteer and the Volunteer's Remedial Engineer and QEPs under his supervision.

All necessary means will be employed to prevent onsite and offsite nuisance odors. Odor control measures for excavations may include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances may include: (d) direct load-out of odorous soils to trucks for offsite disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

Where odor nuisances have developed during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided due to onsite conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering excavation and handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

5.4.13.2 Dust Control Plan

Nuisance dust has not been reported during previous onsite activities, including the Remedial Investigation or demolition of the prior onsite buildings. Nevertheless, nuisance dust may occur during remedial or redevelopment activities due to onsite conditions or activities, weather conditions, or other conditions not under the control of the Volunteer or Remedial Engineer. Therefore, a dust suppression plan has been developed that includes dust management measures that may be implemented during invasive onsite work, as needed.

Dust monitoring will be performed during remedial activities in accordance with the CAMP included in Appendix E and dust management measures will be implemented if the CAMP monitoring results indicate the need for dust suppression or if observations or complaints indicate the need for dust suppression. Dust suppression measures may include any of the items listed below or other means, as appropriate:

- Dust suppression may be achieved through the use of a dedicated onsite water truck for road wetting. Alternatively, water will be available onsite at suitable supply and pressure for use in dust control. Water application methods will be capable of spraying water directly onto off-road areas, including excavations and stockpiles.
- Clearing, grubbing, and/or excavation of larger portions of the site may be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel may be used on roadways to provide a clean and dust-free road surface.
- Onsite roads may be limited in total area to minimize the area required for water spraying.

5.4.13.3 Other Nuisances

A plan for rodent control will be developed and utilized by the Volunteer and its contractors prior to and during Site redevelopment and during all remedial work in accordance with New York City requirements.

A plan for noise control will be developed and utilized by the Volunteer and its contractors for all remedial work and will conform, at a minimum, to NYCDEP noise control standards.

6.0 RESIDUAL CONTAMINATION TO REMAIN ON-SITE

Since residual contaminated soil, groundwater and soil vapor will exist beneath the Site after the remedy is complete, Engineering and Institutional Controls (ECs and ICs) are required to protect human health and the environment. These ECs and ICs are described hereafter. Long-term management of EC/ICs and of residual contamination will be executed under a Site-specific Site Management Plan (SMP) that will be developed and included in the FER.

ECs will be implemented to protect public health and the environment by appropriately managing residual contamination. The Controlled Property (the Site) will have two primary EC systems. These are: (1) a composite cover system consisting of asphalt or concrete-covered roads, concrete-covered sidewalks, concrete building slabs, and at least two feet of approved cover materials and (2) a vapor barrier and sub-slab depressurization system beneath any at-grade or below-grade habitable portions of the buildings. The cover system installed during the remedial action, which will be conducted during the initial phase of redevelopment, may be modified during later phases of redevelopment under an approved SMP.

The FER will report residual contamination on the Site in tabular and map form. This will include a presentation of exceedances of both Track 1 and Track 4 SCOs.

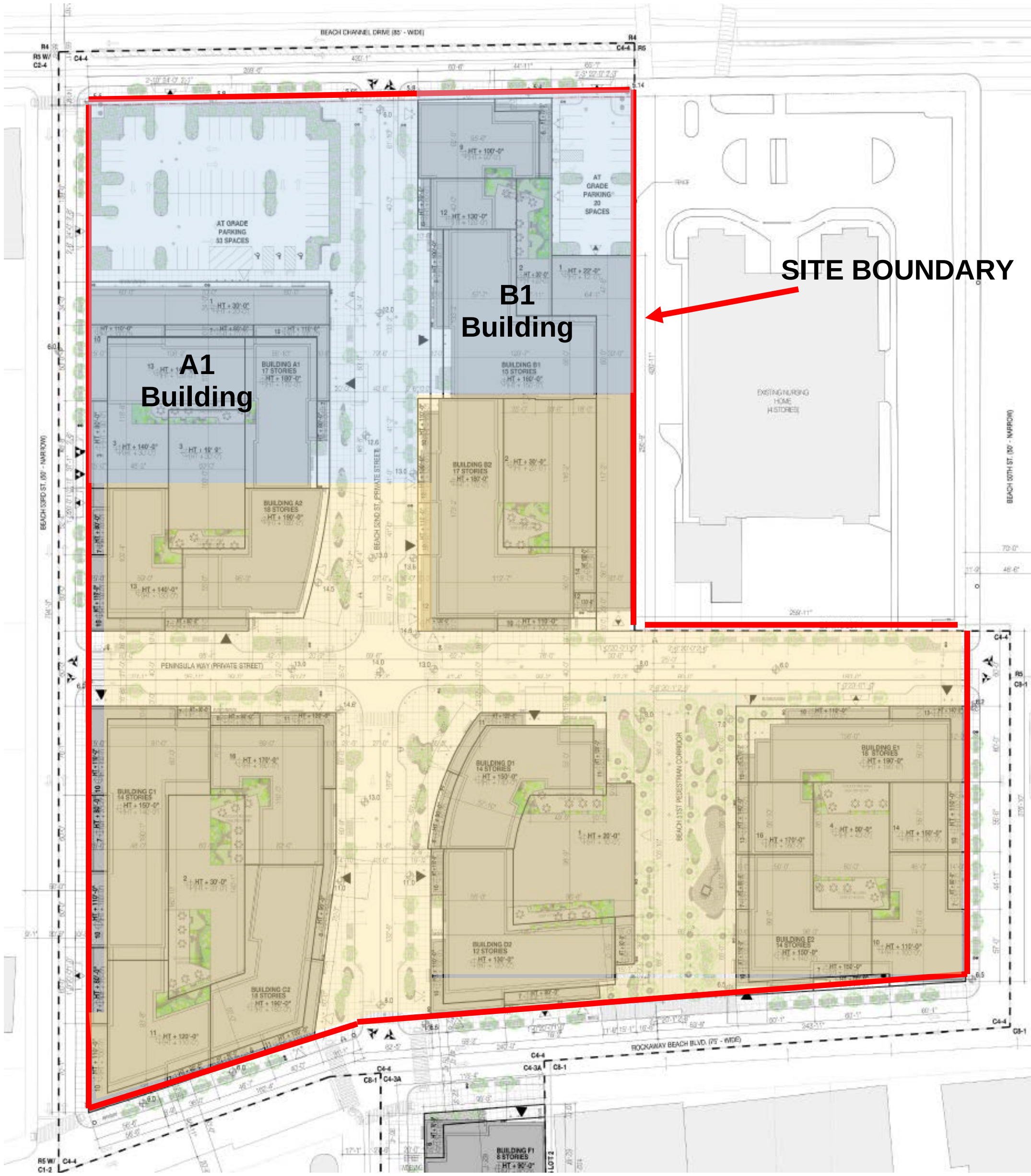
7.0 ENGINEERING CONTROLS: COMPOSITE COVER SYSTEM

Exposure to residual contaminated soils will be prevented by an engineered, composite cover system that will be built on the Site. During the initial phase of redevelopment this composite cover system will be comprised of asphalt or concrete-covered roads, concrete-covered sidewalks, and concrete building slabs and foundation elements in the initial redevelopment area and a minimum of two feet of cover material consisting of onsite crushed concrete and/or imported soil meeting 6 NYCRR Part 375 SCOs for restricted residential use on other portions of the Site. The cover system to be installed during the initial phase of redevelopment may be modified during subsequent phases of redevelopment under an approved SMP.

A map showing the areal distribution of the cover types to be built at the Site during the initial phase of redevelopment is included in Figure 7.0.1. In the initial redevelopment area these cover types include concrete slabs beneath Buildings A1 and B1, concrete sidewalks on three sides of these buildings, a concrete or asphalt roadway (Beach 52nd Street) between the two buildings, and concrete or asphalt-paved parking areas to the north of Building A1 and northeast of Building B1, and limited perimeter planting areas. The remainder of the Site surface will be covered by a minimum of two feet of crushed concrete or cover soil meeting 6 NYCRR Part 375 restricted residential use SCOs.

A diagram showing the design detail for each cover type is shown in Figure 7.0.2. These design details demonstrate that the concrete slabs will be four inches thick (minimum), the sidewalks will be four inches thick (minimum), the roadway pavement will meet NYS Department of Transportation thickness requirements and the pavement in the parking areas will be 4.5 inches thick (minimum). The perimeter planting areas will be surrounded by concrete curbing and filled with at least two feet of planting soil.

The remainder of the Site surface will be covered with at least two feet of cover materials consisting of crushed concrete derived from the prior demolition of the Site buildings, which may be supplemented as needed by imported soil meeting 6 NYCRR Part 375 SCOs for restricted residential use. This cover may be modified during later phases of redevelopment under an approved SMP.



Cover Materials: Concrete Building Slabs and Sidewalks, Asphalt or Concrete-Paved Roads and Parking Areas

Cover Materials: Crushed Concrete and/or Soil Meeting 6 NYCRR Part 375 Restricted Residential Use SCOs

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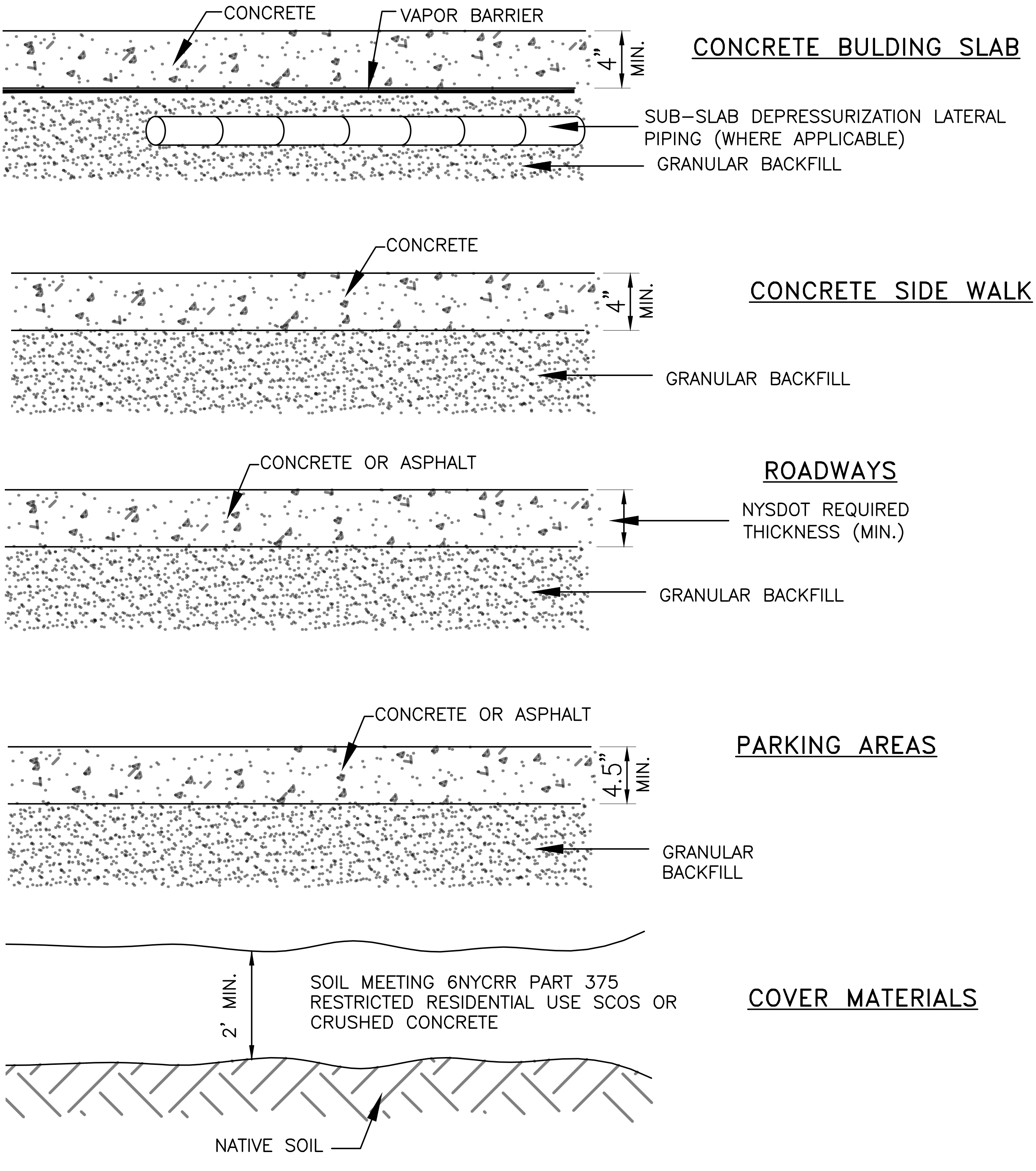
FIGURE 7.0.1

MAP OF COVER TYPES
FORMER PENINSULA HOSPITAL SITE
FAR ROCKAWAY, NEW YORK

Drawn by: SOD Checked By: SOD Date: 3-16-2020



NOTE:
DESIGNS ARE SCHEMATIC, NOT TO SCALE

FPM GROUP

FIGURE 7.0.2
COVER TYPE DESIGN DETAILS
FORMER PENINSULA HOSPITAL SITE
FAR ROCKAWAY, QUEENS, NY

Drawn By: H.C.	Checked By: S.D.	Date: 3/18/20

H:\PENINSULA ROCKAWAY\RAWP\FIGURE 7.0.2.dwg, 4/27/2020 3:33:28 PM, DWG To PDF.pc3

A Soil Management Plan (SoMP) will be included in the SMP and will outline the procedures to be followed in the event that the composite cover system and underlying residual contamination are disturbed after the Remedial Action is complete.

Maintenance of this composite cover system will be described in the SMP, which will be included in the FER.

8.0 ENGINEERING CONTROLS: TREATMENT SYSTEMS

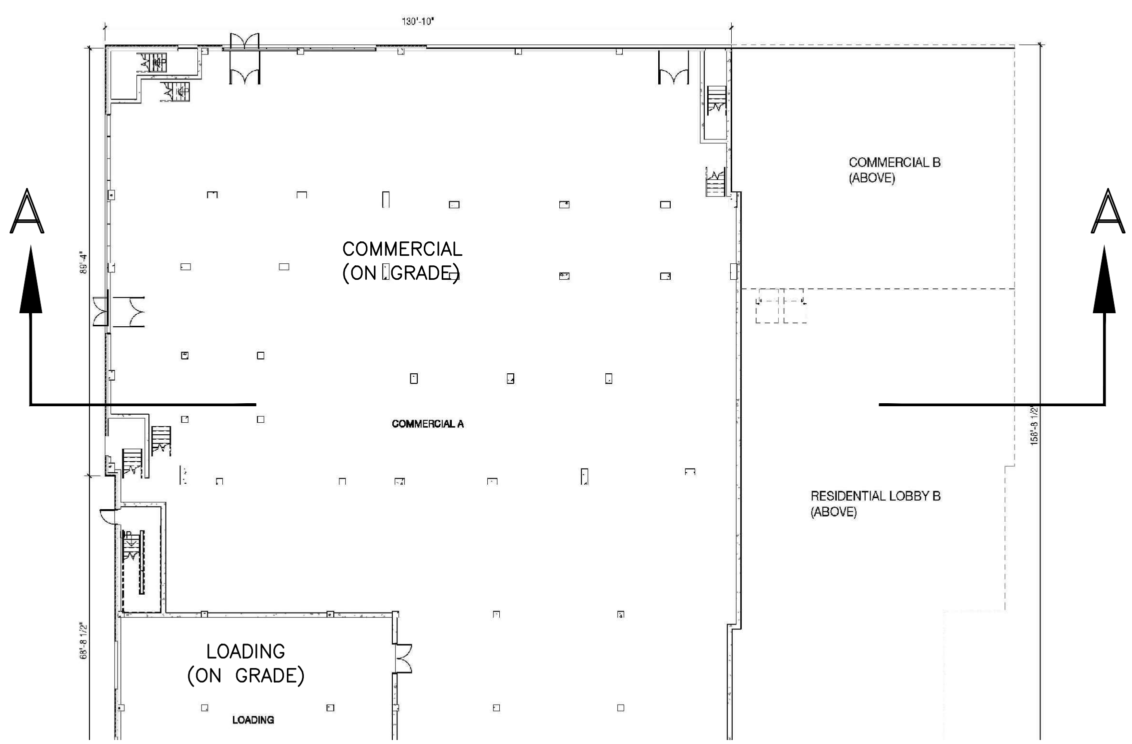
The ECs for soil vapor (vapor barrier and sub-slab depressurization systems, or SSDS) will be designed in detail as the plans for the new buildings are developed. The following design information will be applicable to all of the new buildings to be constructed onsite; the design information is demonstrated on the plans for the new A1 and B1 Buildings that are available at the time this RAWP was prepared. It is anticipated that any changes in the designs for these measures, if necessary, will be submitted to the NYSDEC.

A vapor barrier will be implemented as an EC for the planned buildings to prevent potential impacts to indoor air quality from soil vapors that may remain present onsite. The vapor barrier EC will coincide with the entire footprints of the planned buildings.

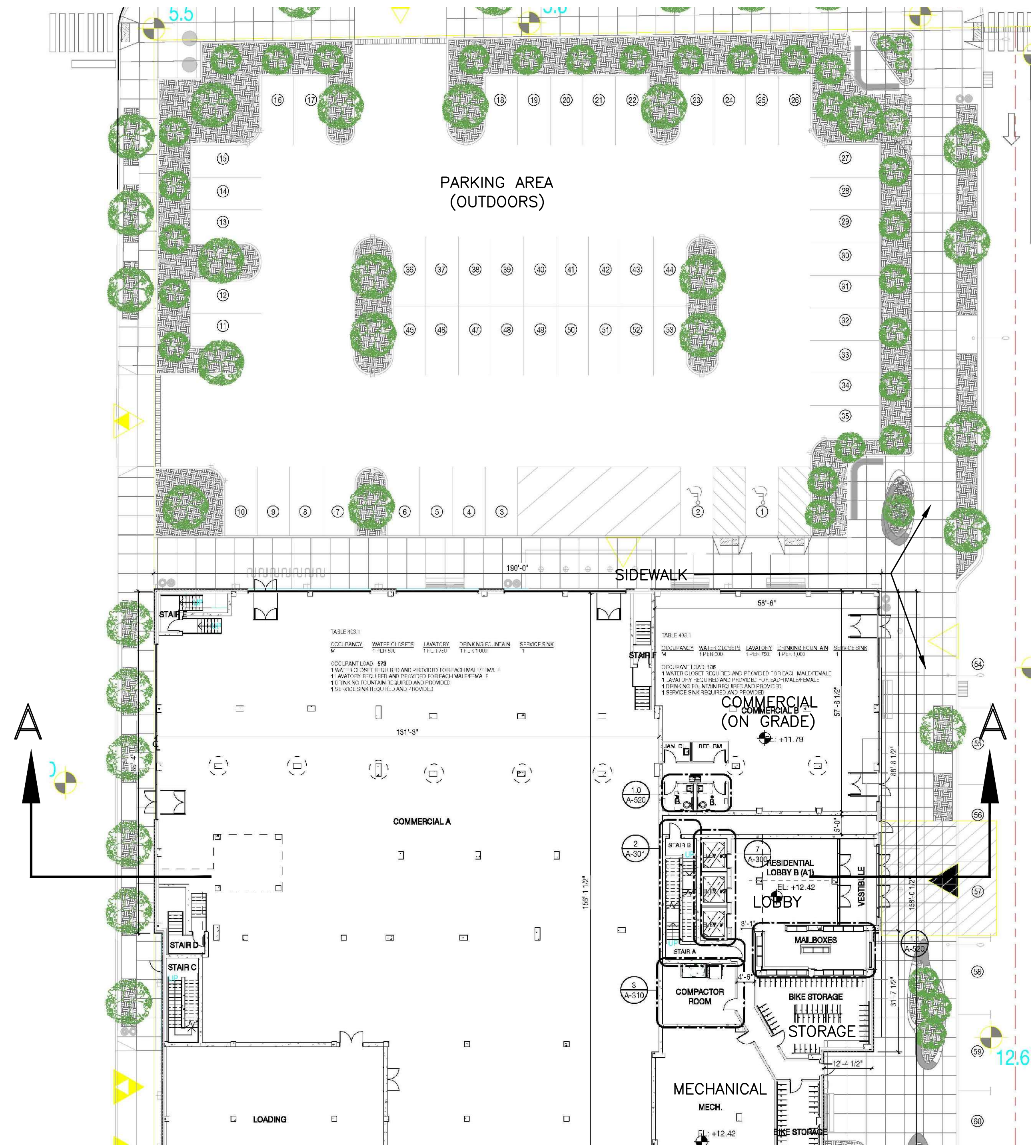
In addition, SSDSs will be constructed below the lowest level (on grade) habitable portions of the planned new buildings. As an example, Figures 8.0.1 and 8.0.2 show the configuration and planned uses for the lowest levels of the A1 and B1 Buildings to be constructed on the Site during the initial phase of redevelopment. In the case of the A1 Building, where the entire lowest level (on grade) will be used for commercial, loading dock, lobby and related purposes, the sub-slab SSDS components will be placed beneath the entire footprint of the building. In the case of the B1 Building, the lowest level (on grade) areas will be used for retail, mechanical, storage, and fully-ventilated parking. In this case, the sub-slab SSDS components will be placed beneath the habitable areas of the building, which include all areas except for the fully-ventilated parking area.

The SSDSs and vapor barriers will be constructed by a construction contractor firm that is familiar with SSDS and vapor barrier construction. Contractor selection will be conducted following NYSDEC approval of this RAWP and in conjunction with selection of the redevelopment construction contractor. SSDS and vapor barrier construction will be observed by a QEP and supervised by the Remedial Engineer.

Sub-slab SSDS construction will include installation of lateral piping beneath the concrete slab of the on grade habitable portions of new onsite buildings. As an example, the spacing and locations of the lateral piping for the new A1 and B1 Buildings are depicted in Figures 8.0.3 and 8.0.4 and are based on the configuration of the habitable portions of the on grade areas of these



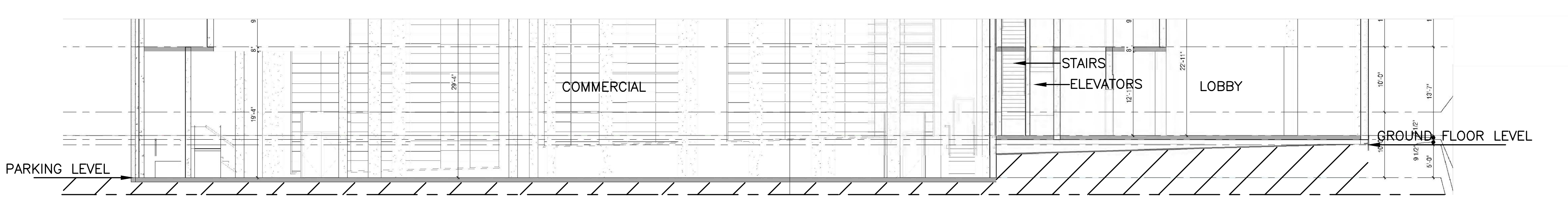
PARKING LEVEL BUILDING A1



GROUND FLOOR PLAN BUILDING A1

0' 20' 40' 80'

APPROXIMATE PLAN SCALE:



SECTION A

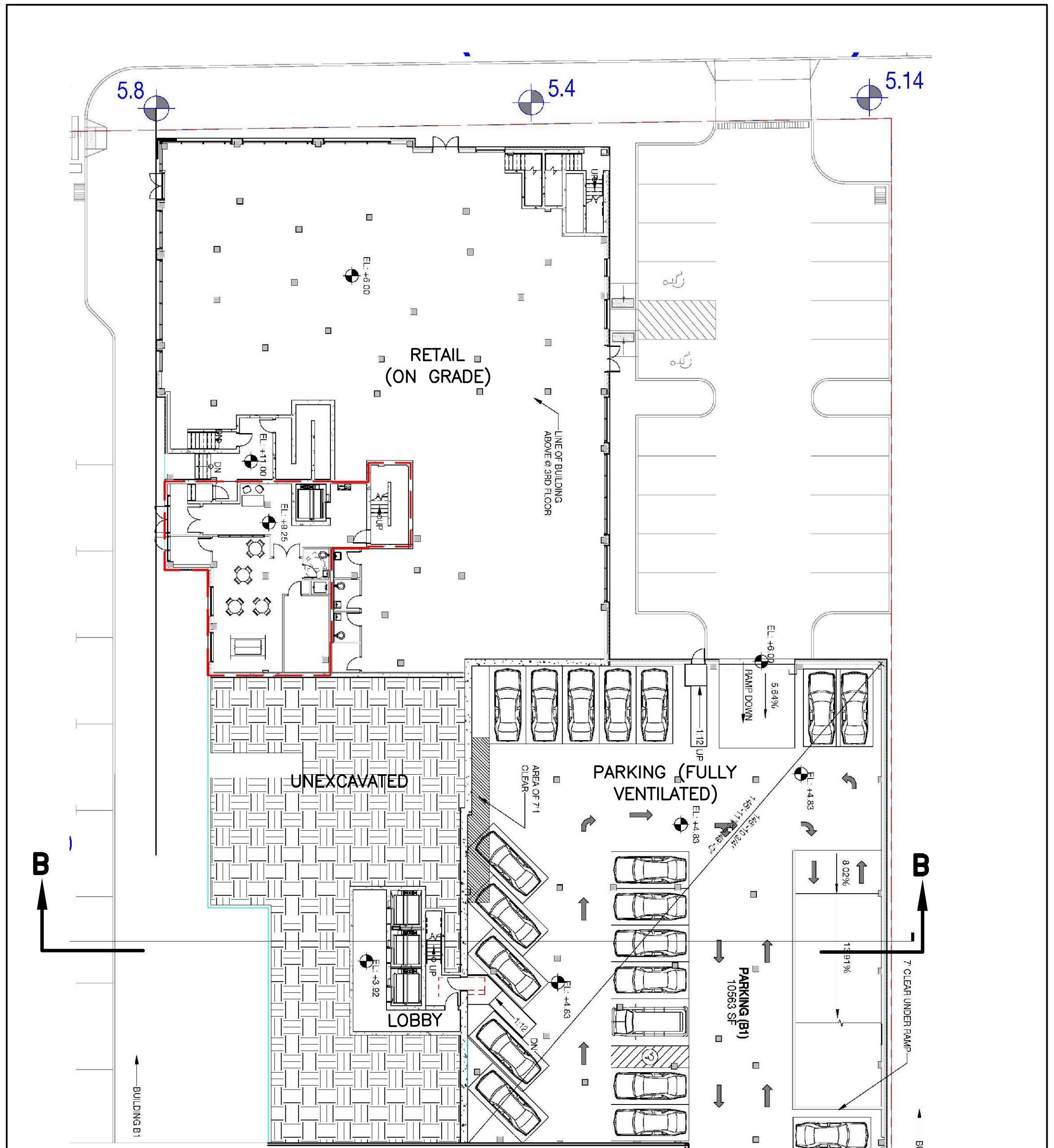
APPROXIMATE SECTION SCALE: 0' 10' 20' 40'

FPM GROUP

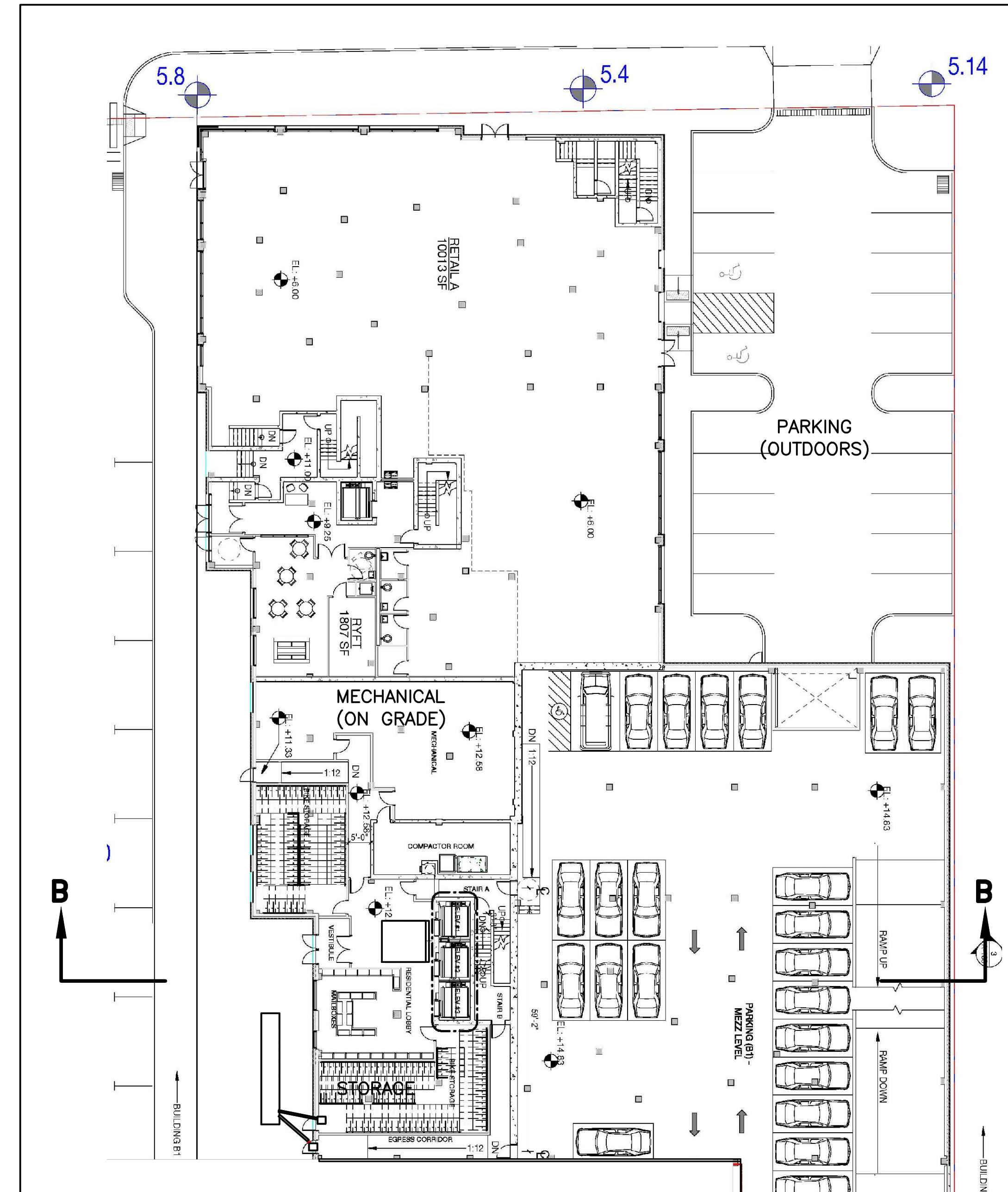
FIGURE 8.0.1
BUILDING A1 ON-GRADE USES

FORMER PENINSULA HOSPITAL SITE
FAR ROCKAWAY, NEW YORK

Drawn By: H.C.	Checked By: S.D.	Date: 3/18/20



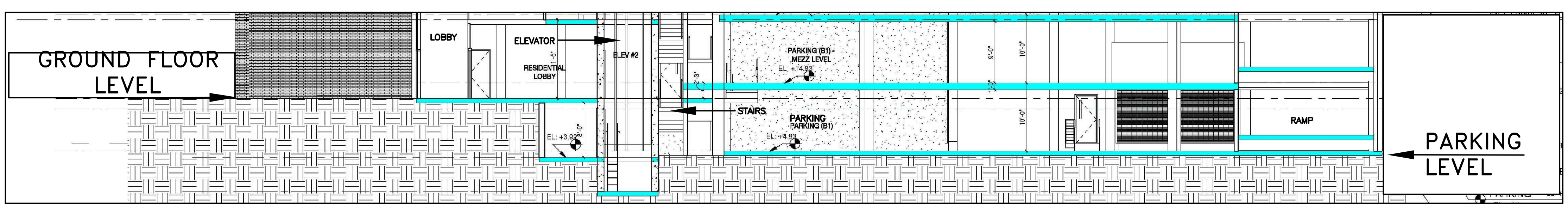
PARKING LEVEL BUILDING B1



GROUND FLOOR BUILDING B1

0' 20' 40' 80'

APPROXIMATE PLAN SCALE:



SECTION B

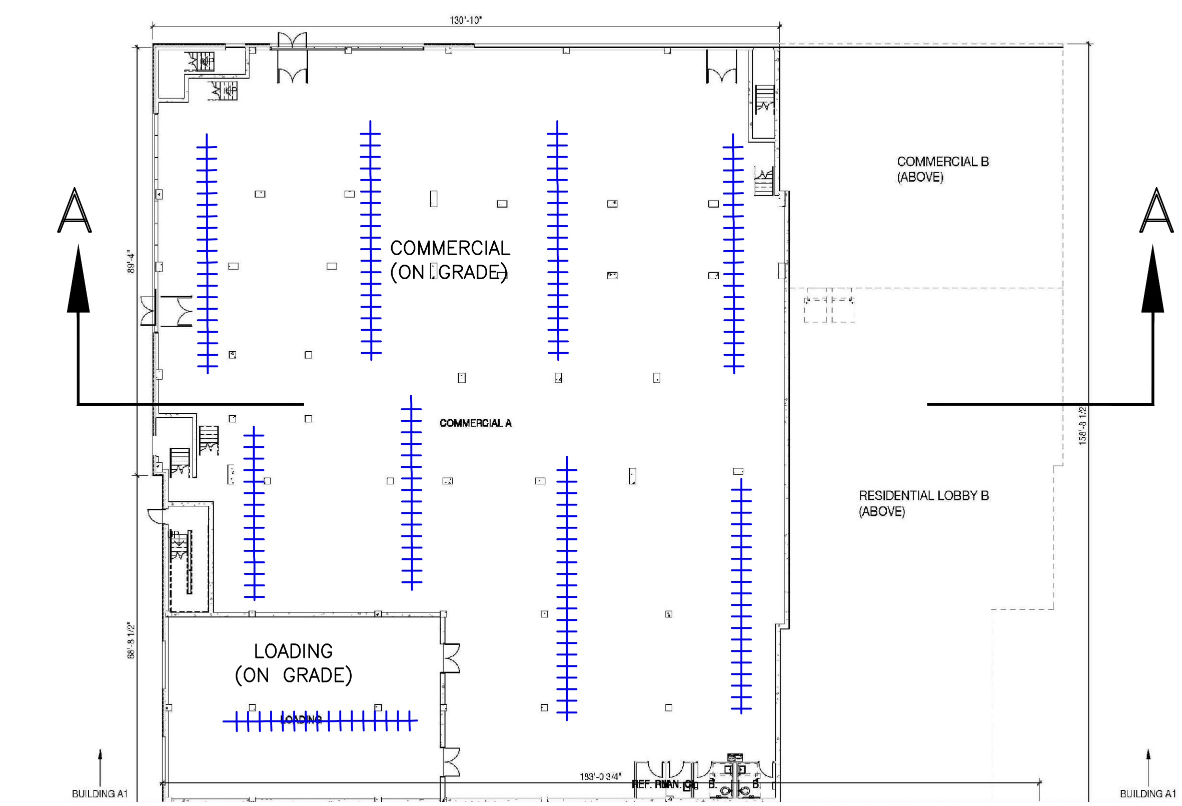
APPROXIMATE SECTION SCALE: 0' 10' 20' 40'

FPM GROUP

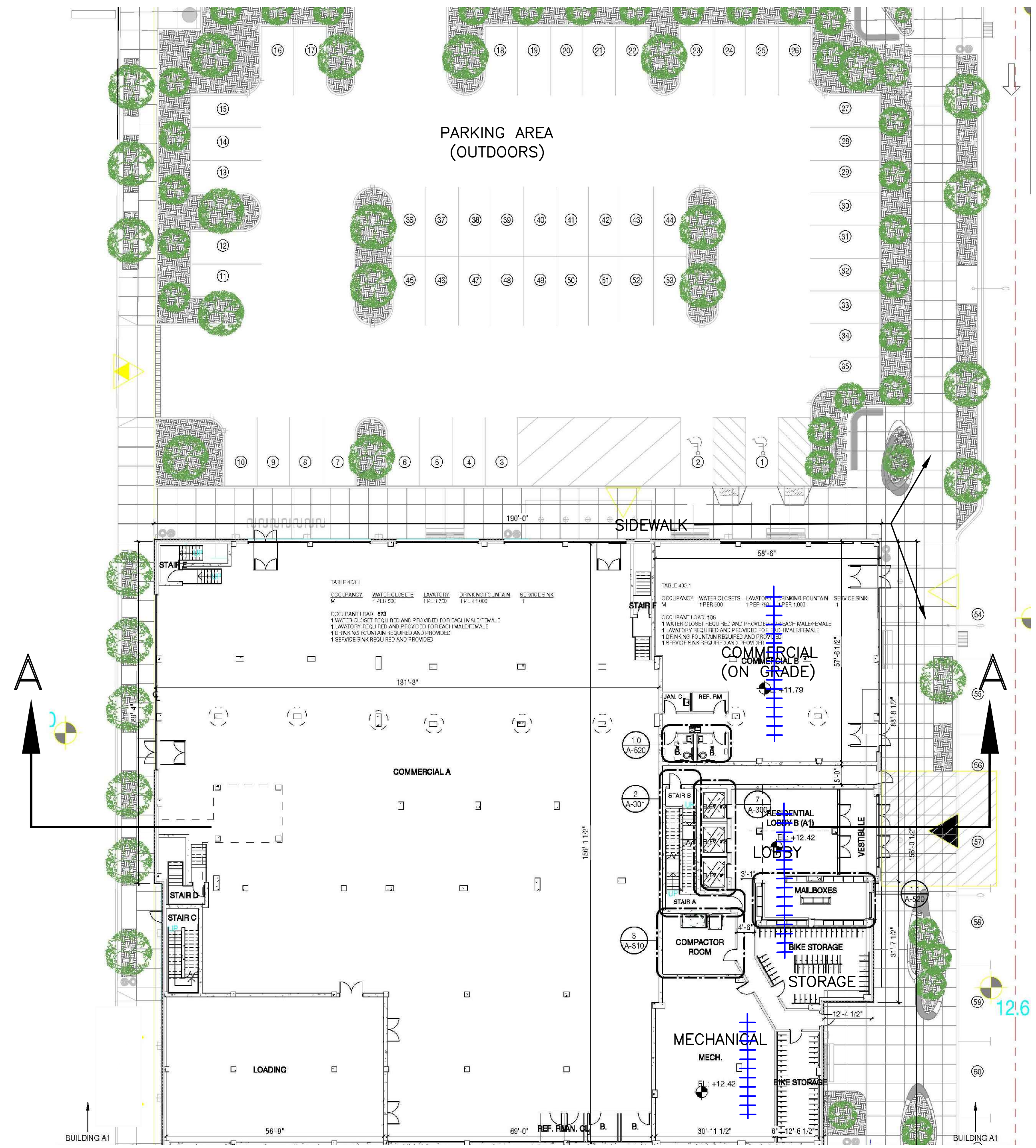
FIGURE 8.0.2
B1 BUILDING ON-GRADE USES

FORMER PENINSULA HOSPITAL SITE
FAR ROCKAWAY, NEW YORK

Drawn By: H.C.	Checked By: S.D.	Date: 3/23/20



PARKING LEVEL BUILDING A1



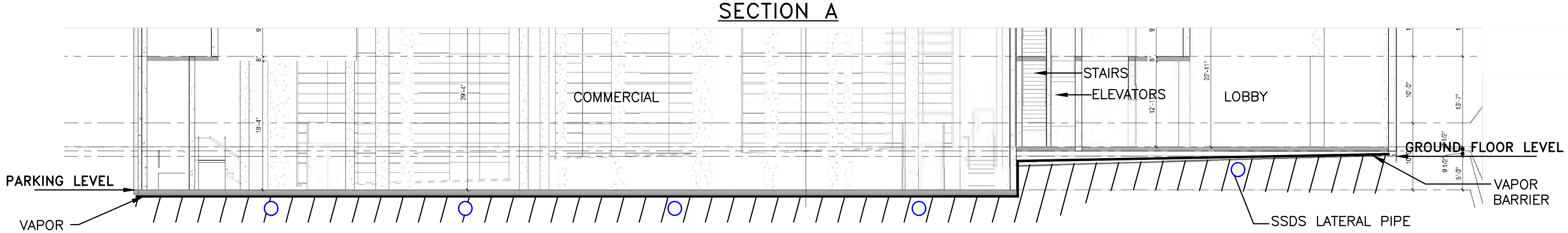
GROUND FLOOR PLAN BUILDING A1

0' 20' 40' 80'
APPROXIMATE PLAN SCALE:

LEGEND

SSDS LATERAL PIPING LOCATIONS (APPROXIMATE)

SECTION A



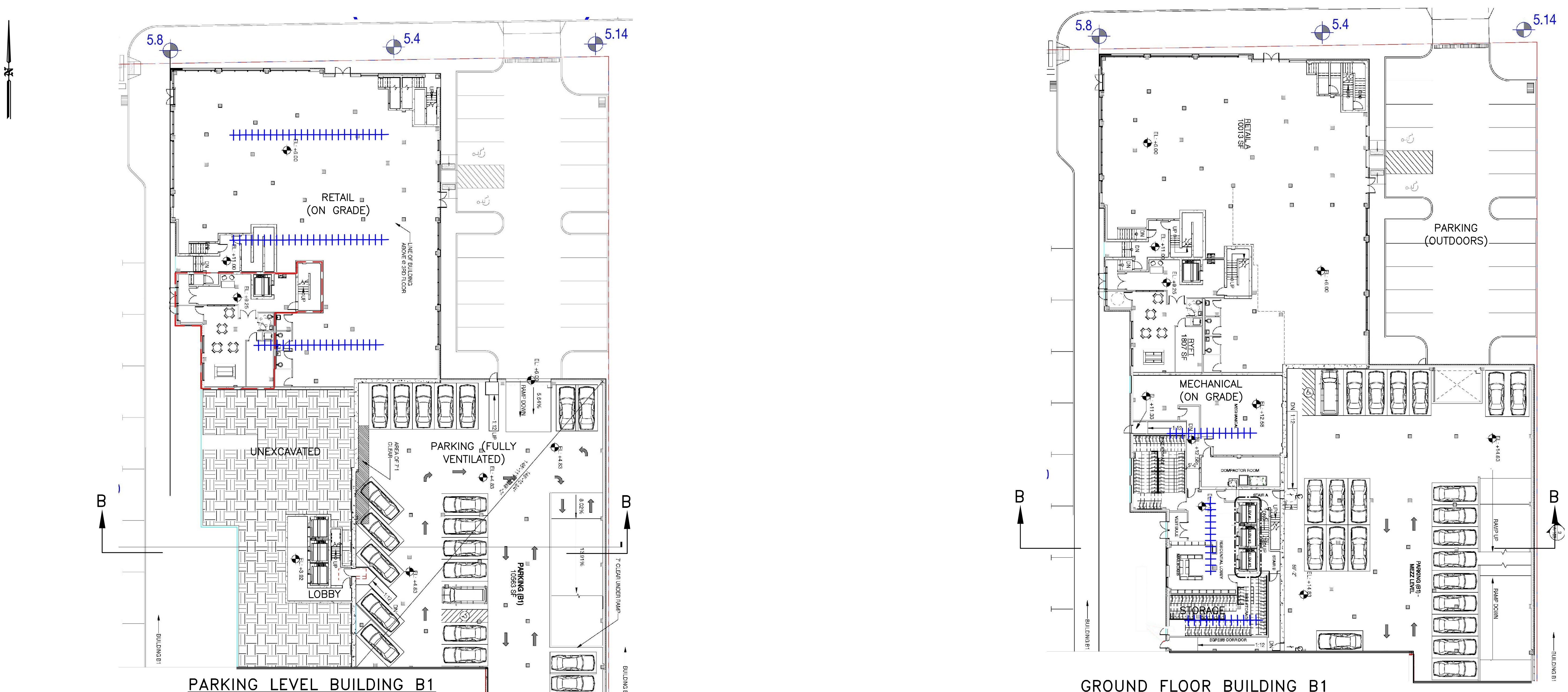
0' 10' 20' 40'
APPROXIMATE SECTION SCALE:

FPM GROUP

FIGURE 8.0.3
BUILDING A1 SSDS LATERAL PIPING

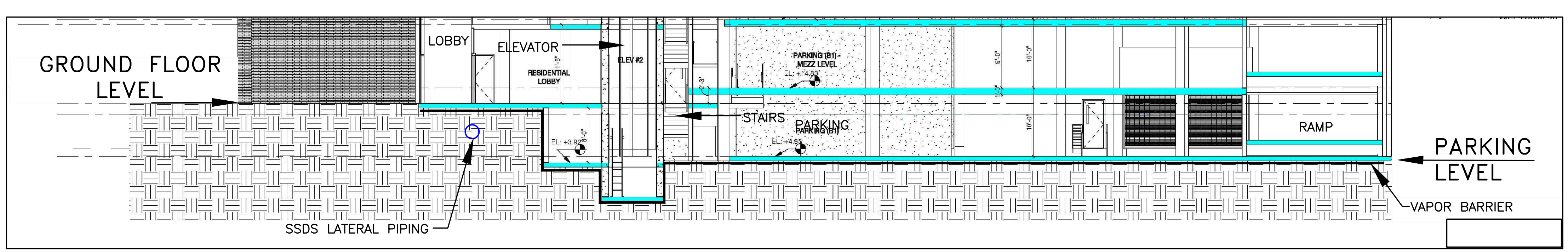
FORMER PENINSULA HOSPITAL SITE
FAR ROCKAWAY, NEW YORK

Drawn By: H.C.	Checked By: S.D.	Date: 3/23/20



0' 20' 40' 80'

APPROXIMATE PLAN SCALE:



SECTION B

APPROXIMATE SECTION SCALE: 0' 10' 20' 40'

LEGEND

SSDS LATERAL PIPING LOCATIONS (APPROXIMATE)

FPM GROUP

FIGURE 8.0.4
BUILDING B1 SSDS LATERAL PIPING

FORMER PENINSULA HOSPITAL SITE
FAR ROCKAWAY, NEW YORK

Drawn By: H.C.	Checked By: S.D.	Date: 3/25/20

H:\PENINSULA ROCKAWAY\RAWP\FUGURE 8.0.4.dwg, 4/27/2020 3:41:53 PM, DWG To PDF.pc3 buildings and typical radius of influence (ROI) testing results from local properties with installed SSDSs. The layout of the SSDS laterals is developed in a manner so as to provide mitigation for SVI throughout the entire target areas. As the mechanical, electrical and plumbing (MEP) aspects of these buildings have not yet been designed, it is possible that the final configuration of the lateral piping may need to be modified somewhat to accommodate sub-slab MEP features. Any modifications made will be designed to achieve the targeted ROIs.

The SSDS lateral piping will be constructed of perforated Schedule 40 PVC pipe with solid slip-on end caps. T-connections will be placed near the center of each lateral for connection to solid piping that will extend to the remedial equipment areas on the building roofs. Backfill around the lateral piping will consist of uniform gradation gravel-size base material for the concrete slab to be constructed above the laterals. Following lateral piping placement, the backfill will be field-compacted in a manner to reduce the potential for settlement while not damaging the installed lateral piping.

The vapor barrier will be placed during building construction and will be installed beneath the final finished slab and above the sub-slab SSDS components. The vapor barrier will be constructed of a VOC-resistant barrier material (15-mil Griffolyn Green, or approved equivalent) meeting or exceeding the ASTM E-1745 Class A Standard for vapor barriers used in contact with soil under concrete slabs. A geotextile fabric may be used above the sub-slab base material and below the vapor barrier to protect the barrier from possible damage from the base material. Sealing tape will be used to seal joins between sheets of vapor barrier and any pipe penetrations will also be sealed with vapor barrier material or pipe boots in accordance with the manufacturer's instructions.

Following placement of the vapor barrier, the concrete building slabs will be constructed. During slab construction the perforated laterals for the SSDS will be connected to solid Schedule 40 PVC piping that will be extended above the slabs, to the building roofs during building construction, and capped, pending pilot testing and installation of the SSDS operating equipment, which will be situated on the roof.

The solid piping from at least one leg of each SSDS will initially be connected to appropriate operating equipment and the SSDS leg will be operated in a pilot test mode to determine the appropriate blower sizing to achieve the desired ROI. Based on the pilot test results, the SSDS blowers will be sized to achieve the desired ROI for each portion of the SSDS.

SVI testing will be conducted for the completed new buildings once the HVAC systems are operating. If the results of SVI testing indicate that mitigation is necessary for potential SVI concerns, then the SSDS will be operated.

Sub-slab monitoring points will be necessary to conduct the pilot testing and the initial SVI testing. If the SSDSs are operated, then the monitoring points will also be used to optimize the operation of the SSDSs, to allow for periodic SVI monitoring to confirm the SSDS ROI and to assess when/if the potential for SVI is no longer present. Monitoring points will be installed through the building slabs at select locations in proximity to the SSDS laterals. Each monitoring point will be constructed using a stainless steel screen connected to inert tubing. The screens will be installed through the slab and into the underlying soil at a depth of approximately six inches below the slab. The top of the tubing will be equipped with a valve for monitoring purposes. Each monitoring point annulus will be gravel-packed to approximately six inches below grade and a bentonite seal will be installed above the gravel pack and in contact with the concrete slab. Each monitoring point will be protected by installing a steel protective manhole encased in concrete at the top of the slab. The base of the manhole will be layered with poly sheeting to further reduce the potential for SVI through the monitoring points and for short-circuiting between the atmosphere and the monitoring point screens. The monitoring points will be used initially during pilot testing to evaluate the ROI and following building completion to assess is SVI mitigation is necessary. If the SSDS is operated, the monitoring points will be used to assess SSDS performance and confirm the ROI.

Each SSDS operating system is anticipated to include a system control panel, an appropriately-sized blower, a moisture separator with a high-water safety switch, an air filter, an air flow meter, and vacuum gauges, all of which are typically housed in a roof-mounted skid. Each SSDS will discharge above the building roof via a stack. Blower selection will be in accordance with the necessary air flow and vacuum needed to achieve the desired ROI(s). The selected equipment will be installed, together with appropriate ancillary equipment, once the building roof is in place and ready for equipment installation.

The SSDS exhaust stack(s) will be located above the roof a minimum of 10 feet from windows and ventilation inlets. The stack height(s) will be determined based on the results of the SSDS emissions testing performed during the initial start-up period. Stack discharge limits will conform to the NYSDEC's DAR-1 guidance. The stack(s) will be outfitted to allow the use of carbon or other effluent treatment, if required based on the initial start-up results.

A calibrated photoionization detector (PID) will be utilized to monitor initial SSDS effluent emissions during pilot testing to evaluate whether emissions treatment is likely to be necessary. Effluent samples will also be collected to evaluate SSDS emissions compliance following system startup. Based on the existing soil vapor data, effluent treatment is unlikely to be necessary. However, in the event that effluent treatment is required (carbon canisters or other), then sampling will be performed between the blower and the effluent treatment to monitor system performance and also downstream of the effluent treatment to monitor emissions compliance.

Following SSDS startup, the performance of each SSDS with respect to sub-slab depressurization will be verified by monitoring the pressure beneath the building at the monitoring points to confirm that a downward pressure gradient is established. Monitoring will be performed during the startup period with the results reported in the FER.

Periodic sub-slab pressure monitoring will be continued following the startup of any of the SSDSs that are operated to confirm that a downward pressure gradient remains established while the SSDS is running. Additional SVI monitoring may be conducted following termination of the SSDS operation to confirm the post-remedial condition. Procedures for sub-slab pressure and SVI monitoring will be provided in the SMP.

All SSDS observations will be recorded in a system logbook that will be kept at the Site for operator reference. The logbook will include operating logs for recording system parameters from the various gauges and figures showing the SSDS lateral piping and monitoring point layout and equipment configuration. SSDS performance observations to be recorded will include obtaining pressure readings at the designated monitoring points to evaluate the SSDS ROIs. General procedures for operating and maintaining an SSDS will be in an Operation and Maintenance Plan to be included in the SMP. As-built drawings, signed and sealed by a professional engineer, will be included in the FER and in the Operations and Maintenance Manual.

9.0 CRITERIA FOR COMPLETION OF REMEDIATION/TERMINATION OF REMEDIAL SYSTEMS

9.1 Composite Cover System

The composite cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity.

9.2 Sub-Slab Depressurization System (SSDS)

The active SSDSs will not be discontinued without written approval by NYSDEC and NYSDOH. A proposal to discontinue the active SSDS operation may be submitted by the Volunteer based on confirmatory data that justifies such a request. SSDSs will remain in place and operational until permission to discontinue use is granted in writing by NYSDEC and NYSDOH.

10.0 INSTITUTIONAL CONTROLS

After the remedy is complete, the Site will have residual contamination remaining in place. Engineering Controls (ECs) for the residual contamination have been incorporated into the remedy to render the overall Site remedy protective of public health and the environment. Two elements have been designed to ensure continual and proper management of residual contamination in perpetuity: an Environmental Easement and a Site Management Plan.

All as-built drawings, diagrams, calculation and manufacturer documentation for treatment systems will be presented in the FER. A Site-specific Environmental Easement will be recorded with Queens County to provide an enforceable means of ensuring the continual and proper management of residual contamination and protection of public health and the environment in perpetuity or until released in writing by NYSDEC. It will require that the grantor of the Environmental Easement and the grantor's successors and assigns adhere to all Engineering and Institutional Controls (ECs/ICs) placed on this Site by this NYSDEC-approved remedy. ICs provide restrictions on Site usage and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. The Site Management Plan (SMP) describes appropriate methods and procedures to ensure compliance with all ECs and ICs that will be required by the Environmental Easement. Once the SMP has been approved by NYSDEC, compliance with the SMP will be required by the grantor of the Environmental Easement and grantor's successors and assigns.

10.1 ENVIRONMENTAL EASEMENT

An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination is left onsite after the Remedial Action is complete. As part of this remedy, an Environmental Easement approved by NYSDEC will be filed and recorded with the Queens County Office of the City Register. The Environmental Easement will be submitted as part of the Final Engineering Report.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with the Queens County Office of the City Register before the Certificate of Completion can be issued by NYSDEC. A series of Institutional Controls are required under this remedy to implement, maintain and monitor these Engineering Control systems, prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to restricted residential, commercial and industrial use(s) only. These Institutional Controls are requirements or restrictions placed on the Site that are listed in, and required by, the Environmental Easement. Institutional Controls can, generally, be subdivided between controls that support Engineering Controls, and those that place general restrictions on Site usage or other requirements. Institutional Controls in both of these groups are closely integrated with the Site Management Plan, which provides all of the methods and procedures to be followed to comply with this remedy.

The Institutional Controls that support Engineering Controls are:

- Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence of all elements of the SMP is required;
- All Engineering Controls must be operated and maintained as specified in the SMP;
- A composite cover system consisting of asphalt or concrete-paved roads and parking areas, concrete covered sidewalks, concrete building slabs, and at least two feet of cover materials meeting the 6 NYCRR Part 375 restricted residential use SCOs must be inspected, certified and maintained as required in the SMP;
- A soil vapor intrusion mitigation system consisting of a vapor barrier beneath all building footprints and a sub-slab depressurization system under all habitable portions of the on-grade building structures must be inspected, certified, operated and maintained as required by the SMP;
- All Engineering Controls on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP;
- Soil vapor and other environmental or public health monitoring must be performed as defined in the SMP;
- Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP;
- Onsite environmental monitoring devices, including but not limited to, soil vapor monitoring points, must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP;
- Engineering Controls may not be discontinued without an amendment or extinguishment of the Environmental Easement.

Adherence to these Institutional Controls for the Site will be mandated by the Environmental Easement and will be implemented under the Site Management Plan (discussed in the next section). The Controlled Property (Site) will also have a series of Institutional Controls in the form of Site restrictions and requirements. The Site restrictions that apply to the Controlled Property are:

- Vegetable gardens and farming on the Controlled Property are prohibited;
- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose;
- All future activities on the Controlled Property that will disturb residual contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the Site Management Plan;
- The Controlled Property may be used for restricted residential, commercial and/or industrial use only, provided the long-term Engineering and Institutional Controls included in the Site Management Plan are employed;
- The Controlled Property may not be used for a higher level of use, such as unrestricted or residential use, without an amendment or extinguishment of this Environmental Easement;
- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted annually, or an alternate period of time that NYSDEC may allow. This periodic statement must be certified by an expert that the NYSDEC finds acceptable.

10.2 SITE MANAGEMENT PLAN

Site Management is the last phase of remediation and begins with the approval of the Final Engineering Report and issuance of the Certificate of Completion (COC) for the Remedial Action. The Site Management Plan is submitted as part of the FER but will be written in a manner that allows its removal and use as a complete and independent document. Site Management continues in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the Site Management Plan are performed.

The SMP is intended to provide a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC. This includes: (1) development, implementation, and management of all Engineering and Institutional Controls; (2) development and implementation of monitoring systems and a Monitoring Plan; (3) development of a plan to operate and maintain any treatment, collection, containment, or recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual); (4) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC; and (5) defining criteria for termination of treatment system operation.

To address these needs, this SMP will include four plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems; and (4) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC. The SMP will be prepared in accordance with the requirements in NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation and the guidelines provided by NYSDEC.

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis. The certification period will initially be annually and thereafter at a frequency designated by the NYSDEC. The initial Periodic Review Report (PRR) will be based on a calendar year and will be due for submission to NYSDEC by March 1 of the year following the reporting period.

No exclusions for handling of residual contaminated soils will be provided in the SMP. All handling of residual contaminated material will be subject to provisions contained in the SMP.

11.0 FINAL ENGINEERING REPORT

A Final Engineering Report (FER) will be submitted to NYSDEC following implementation of the Remedial Action defined in this RAWP. The FER provides the documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will provide a comprehensive account of the locations and characteristics of all material removed from the Site, including the surveyed map(s) of all sources. The Final Engineering Report will include as-built drawings for all constructed elements, calculations and manufacturer documentation for treatment systems, certifications, manifests, bills of lading, as well as the complete Site Management Plan (including an Operation and Maintenance Plan for the ECs). The FER will provide a description of the changes in the Remedial Action from the elements provided in the RAWP and associated design documents. The FER will provide a tabular summary of all performance evaluation sampling results and all material characterization results and other sampling and chemical analysis performed as part of the Remedial Action. The FER will provide test results demonstrating that all mitigation and remedial systems are functioning properly. The FER will be prepared in conformance with DER-10.

Where determined to be necessary by NYSDEC, a Financial Assurance Plan will be required to ensure the sufficiency of revenue to perform long-term operations, maintenance and monitoring tasks defined in the Site Management Plan and Environmental Easement. This determination will be made by NYSDEC in the context of the Final Engineering Report review.

The FER will include written and photographic documentation of all remedial work performed under this remedy.

The FER will include an itemized tabular description of actual costs incurred during all aspects of the Remedial Action.

The FER will provide a thorough summary of all residual contamination left on the Site after the remedy is complete. Residual contamination includes all contamination that exceeds the SCOs for restricted residential use in 6NYCRR Part 375. A table that shows exceedances from the restricted residential use SCOs for all soil/fill remaining at the Site after the Remedial Action and a map that shows the location and summarizes exceedances from the restricted residential use SCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER.

The FER will provide a thorough summary of all residual contamination that exceeds the SCOs defined for the Site in the RAWP and must provide an explanation for why the material was not removed as part of the Remedial Action. A table that shows residual contamination in excess of Site SCOs and a map that shows residual contamination in excess of Site SCOs will be included in the FER.

The FER will include an accounting of the destination of all remedial material removed from the Site, including excavated contaminated soil/fill, solid waste, hazardous waste, and fluids. Documentation associated with disposal of all remedial material must also include records and approvals for receipt of the material. It will also provide an accounting of the origin and chemical quality of all remedial material imported onto the Site.

Before approval of a FER and issuance of a Certificate of Completion, all project reports must be submitted in digital form on electronic media (PDF).

11.1 CERTIFICATIONS

The following certification will appear in front of the Executive Summary of the FER. The certification will be signed by the Remedial Engineer, Kevin F. Loyst, PE, PMP, who is a Professional Engineer registered in New York State This certification will be appropriately signed and stamped. The certification will include the following statements:

I, __________________________, am currently a registered professional engineer licensed by the State of New York. I had primary direct responsibility for implementation of the remedial program for the Former Peninsula Hospital Site (NYSDEC BCA Index No. C241200-08-17, Site No. C241200).

I certify that the Site description presented in this FER is identical to the Site descriptions presented in the Environmental Easement, the Site Management Plan, and the Brownfield Cleanup Agreement for the Former Peninsula Hospital Site and related amendments.

I certify that the Remedial Action Work Plan dated [month day year] and Stipulations [if any] in a letter dated [month day year] and approved by the NYSDEC were implemented and that all requirements in those documents have been substantively complied with.

I certify that the remedial activities were observed by qualified environmental professionals under my supervision and that the remediation requirements set forth in the Remedial Action Work Plan and any other relevant provisions of ECL 27-1419 have been achieved.

I certify that all use restrictions, Institutional Controls, Engineering Controls, and all operation and maintenance requirements applicable to the Site are contained in an Environmental Easement created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded. A Site Management Plan has been submitted by the Volunteer for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by the NYSDEC.

I certify that the export of all contaminated soil, fill, water or other material from the property was performed in accordance with the Remedial Action Work Plan, and were taken to facilities licensed to accept this material in full compliance with all Federal, State and local laws.

I certify that all import of soils from off-Site, including source approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan.

I certify that all invasive work during the remediation and all invasive development work were conducted in accordance with dust and odor suppression methodology and soil screening methodology defined in the Remedial Action Work Plan.

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

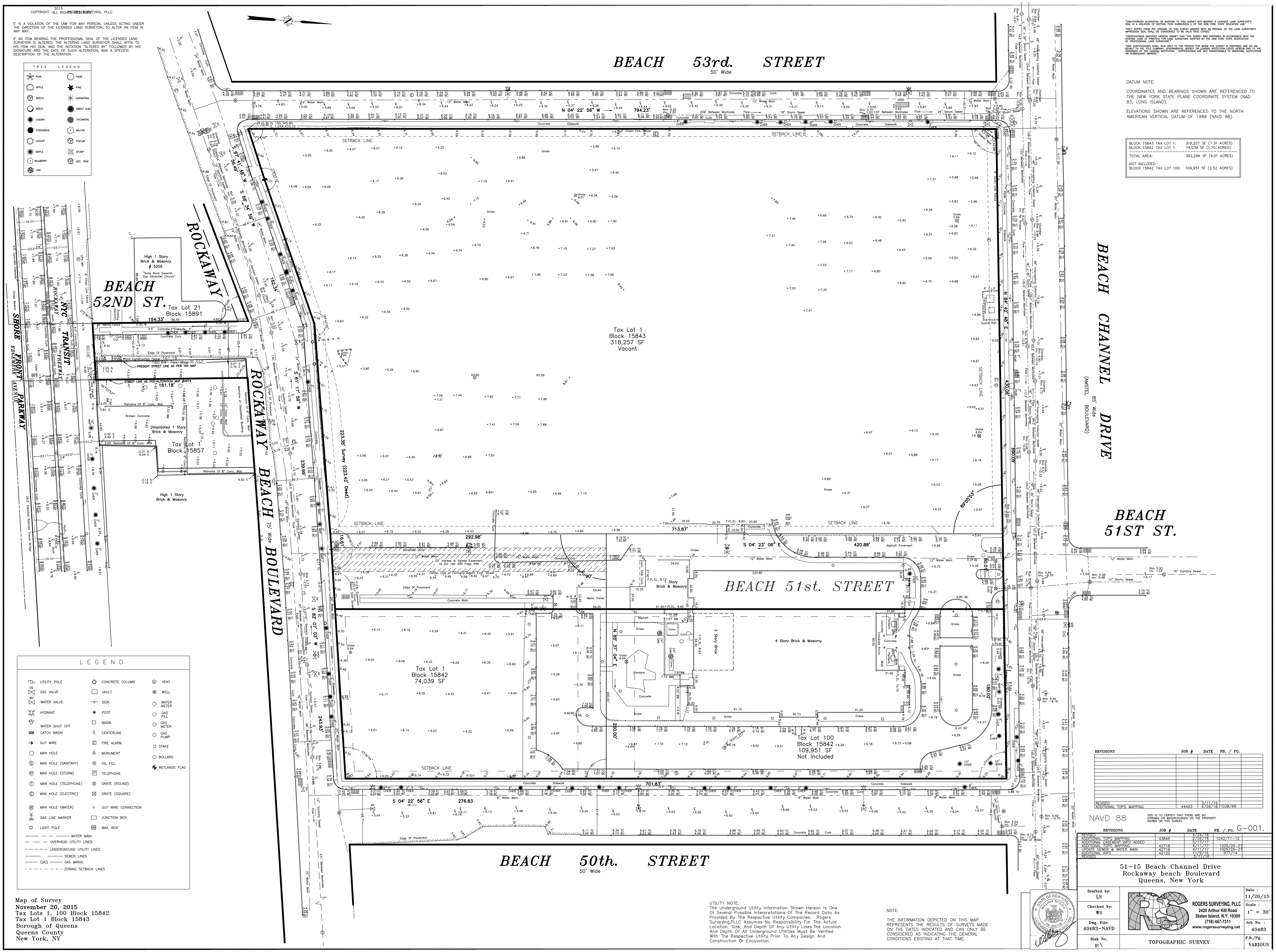
It is a violation of Article 130 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 130, New York State Education Law.

12.0 SCHEDULE

Remedial action is planned to start at the time that Site redevelopment begins, which is presently scheduled to commence in 2021. The initial remedial actions will include removal of source soil, targeted removal of residual soil as needed for construction, and construction of the sub-slab SSDS elements and vapor barriers in conjunction with building slab construction; this work is anticipated to be conducted in 2021 and 2022. Placement and construction of cover materials, including building slabs, roads, sidewalks, and parking area pavements, and cover materials in the areas of the Site that will not be redeveloped until a later time, will begin during slab construction and is anticipated to be completed in 2021 or 2022. A more detailed remedial schedule can be provided once the redevelopment schedule has been further defined.

APPENDIX A

- **Property Survey**
- **Metes and Bounds Description**
- **Tax Lot Merger**
- **Environmental Easement Template**
- **August 2020 Fact Sheet**



2015
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IT IS A VIOLATION OF THE LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF THE LICENSED LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY.
IF AN ITEM BEARING THE PROFESSIONAL SEAL OF THE LICENSED LAND SURVEYOR IS ALTERED, THE ALTERING LAND SURVEYOR SHALL AFFIX TO HIS ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.
TREE LEGEND
ALAN.
PEAR
APPLE
PINE
BEECH
SASSAFRAS
BEACH 53rd. STREET
50' Wide
N 04° 22' 56" W 794.23'
SETBACK LINE
BEACH 52ND ST.
ROCKAWAY
High 1 Story Brick & Masonry # 5205 "Solid Rock Seventh Day Adventist Church"
Tax Lot 21 Block 15891
SHORE FRONT PARKWAY
EDGEMERE AVENUE
NYC TRANSIT ROCKAWAY FREEWAY
ROCKAWAY BEACH BOULEVARD
75' Wide
Dilapidated 1 Story Brick & Masonry
Tax Lot 1 Block 15857
High 1 Story Brick & Masonry
Tax Lot 1 Block 15843 318,257 SF Vacant
223.36' Survey (223.42' Deed)
713.87'
BEACH CHANNEL DRIVE
85' Wide
(AMSTEL BOULEVARD)
BEACH 51ST ST.
292.98'
S 04° 23' 06" E 420.88'
BEACH 51st. STREET
4 Story Brick & Masonry
2 Story Brick
Tax Lot 1 Block 15842 74,039 SF
Tax Lot 100 Block 15842 109,951 SF Not Included
S 04° 22' 56" E 276.83
701.83'
BEACH 50th. STREET
50' Wide
LEGEND
UTILITY POLE
GAS VALVE
WATER VALVE
HYDRANT
WATER SHUT OFF
CATCH BASIN
GUY WIRE
MAN HOLE
MAN HOLE (SANITARY)
MAN HOLE (STORM)
MAN HOLE (TELEPHONE)
MAN HOLE (ELECTRIC)
MAN HOLE (WATER)
GAS LINE MARKER
LIGHT POLE
CONCRETE COLUMN
VAULT
SIGN
POST
BASIN
CENTERLINE
FIRE ALARM
MONUMENT
OIL FILL
TELEPHONE
GRATE (ROUND)
GRATE (SQUARE)
GUY WIRE CONNECTION
JUNCTION BOX
MAIL BOX
VENT
WELL
WATER METER
GAS FILL
GAS METER
GAS PUMP
STAKE
BOLLARD
WETLANDS FLAG
WATER MAIN
OVERHEAD UTILITY LINES
UNDERGROUND UTILITY LINES
SEWER LINES
GAS MAINS
ZONING SETBACK LINES
Map of Survey
November 20, 2015
Tax Lots 1, 100 Block 15842
Tax Lot 1 Block 15843
Borough of Queens
Queens County
New York, NY
"UNAUTHORIZED ALTERATION OR ADDITION TO THIS SURVEY NOT BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW."
"ONLY COPIES FROM THE ORIGINAL OF THIS SURVEY MARKED WITH AN ORIGINAL OF THE LAND SURVEYOR'S IMPRESSION SEAL SHALL BE CONSIDERED TO BE VALID TRUE COPIES."
"CERTIFICATIONS INDICATED HEREON SIGNIFY THAT THIS SURVEY WAS PREPARED IN ACCORDANCE WITH THE EXISTING CODE OF PRACTICE FOR LAND SURVEYORS ADOPTED BY THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS."
"SAID CERTIFICATIONS SHALL RUN ONLY TO THE PERSON FOR WHOM THE SURVEY IS PREPARED AND ON HIS BEHALF TO THE TITLE COMPANY, GOVERNMENTAL AGENCY OR LENDING INSTITUTION LISTED HEREON AND TO THE ASSIGNEES OF THE LENDING INSTITUTION. CERTIFICATIONS ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS."
DATUM NOTE:
COORDINATES AND BEARINGS SHOWN ARE REFERENCED TO THE NEW YORK STATE PLANE COORDINATE SYSTEM (NAD 83, LONG ISLAND).
ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
BLOCK 15843 TAX LOT 1: 318,257 SF (7.31 ACRES)
BLOCK 15842 TAX LOT 1: 74,039 SF (1.70 ACRES)
TOTAL AREA: 392,296 SF (9.01 ACRES)
NOT INCLUDED:
BLOCK 15842 TAX LOT 100: 109,951 SF (2.52 ACRES)
UTILITY NOTE:
The Underground Utility Information Shown Hereon Is One Of Several Possible interpretations Of The Record Data As Provided By The Respective Utility Companies. Rogers Surveying,PLLC Assumes No Responsibility For The Actual Location, Size, And Depth Of Any Utility Lines.The Location And Depth Of All Underground Utilities Must Be Verified With The Respective Utility Prior To Any Design And Construction Or Excavation.
NOTE:
THE INFORMATION DEPICTED ON THIS MAP REPRESENTS THE RESULTS OF SURVEYS MADE ON THE DATES INDICATED AND CAN ONLY BE CONSIDERED AS INDICATING THE GENERAL CONDITIONS EXISTING AT THAT TIME.
STATE OF NEW YORK WILLIAM SPIEZIA No. 050106 LICENSED LAND SURVEYOR
REVISIONS JOB # DATE FB. / PG.
REVISED 3/11/19
ADDITIONAL TOPO MAPPING 44493 6/26/18 1038/68
NAVD 88
THIS IS TO CERTIFY THAT THERE ARE NO STREAMS OR WATERCOURSES ON THE PROPERTY SHOWN ON THIS SURVEY.
REVISIONS JOB # DATE FB. / PG. G-001.
REVISED 4/24/18
ADDITIONAL TOPO MAPPING 43846 2/26/18 1042/11-12
ADDITIONAL EASEMENT INFO ADDED 5/17/17
ADDITIONAL TOPO MAPPING 42718 4/11/17 1005/26-27
UPDATE SEWER & WATER MAIN 42718 4/11/17 1005/26-27
ADDITIONAL INFO 42120 11/9/16 977/14
REVISED 3/11/16
51-15 Beach Channel Drive
Rockaway beach Boulevard
Queens, New York
Drafted by: LS
Checked by: WS
Dwg. File: 40483-NAVD
Disk No. p:\
ROGERS SURVEYING, PLLC
2420 Arthur Kill Road
Staten Island, N.Y. 10309
(718) 447-7311
www.rogerssurveying.net
TOPOGRAPHIC SURVEY
Date : 11/20/15
Scale : 1" = 30'
Job No. : 40483
F.B./Pg. VARIOUS

METES AND BOUNDS DESCRIPTION

FOR THE

FORMER PENINSULA HOSPITAL SITE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

BROWNFIELD CLEANUP PROGRAM SITE C241200

51-15 BEACH CHANNEL DRIVE AND 50-05 ROCKAWAY BEACH BOULEVARD, FAR ROCKAWAY, QUEENS, NEW YORK

QUEENS TAX MAP BLOCK 15843 LOT 1 AND BLOCK 15842 LOT 1

All that certain plot, piece, or parcel of land, with the improvements thereon erected, situate, lying and being in the Borough of Queens, City of New York, State of New York, more particularly bounded and described as follows:

Beginning at the Point of Beginning, which is at N 155,345.90, E 1,044,433.22;

Thence 794.23 feet N 04º 22’ 56” W to a point;

Thence 430.06 feet N 84º 42’ 48” E to a point;

Thence 420.88 feet S 04º 23’ 06” E to a point;

Thence 260.00 feet N 85º 37’ 04” E to a point;

Thence 276.83 feet S 04º 22’ 56” E to a point;

Thence 243.93 feet S 82º 07’ 03” W to a point;

Thence 239.99 feet S 81º 17’ 59” W to a point;

Thence 162.34 feet S 66º 34’ 59” W to a point;

Thence 56.49 feet S 67º 41’ 48” W to the Point of Beginning.

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

This page is part of the instrument. The City Register will rely on the information provided by you on this page for purposes of indexing this instrument. The information on this page will control for indexing purposes in the event of any conflict with the rest of the document.

2019111300831002001EC9D4

RECORDING AND ENDORSEMENT COVER PAGE **PAGE 1 OF 6**

Document ID: 2019111300831002 Document Date: 11-08-2019 Preparation Date: 11-13-2019
Document Type: ZONING LOT DESCRIPTION
Document Page Count: 4

PRESENTER:	**RETURN TO:**
KENSINGTON VANGUARD NATIONAL LAND SERVICES 39 W37TH STREET TITLE NO. 514921-X-NY-SS-KV NEW YORK, NY 10018 212-532-8686	KENSINGTON VANGUARD NATIONAL LAND SERVICES 39 WEST 37TH STREET, 3RD FLOOR ATTN: BOB AUDETTE NEW YORK, NY 10018

PROPERTY DATA

Borough	Block	Lot	Unit	Address
QUEENS	15843	1 Entire Lot		51-15 ROCKAWAY BEACH BOULE

Property Type: OTHER

CROSS REFERENCE DATA

CRFN_______ *or* DocumentID________ *or* _______ Year_____ Reel____ Page_____ *or* File Number__________

PARTIES

PARTY ONE:
PENINSULA ROCKAWAY HOUSING DEVELOPMENT CORP.
1044 NORTHERN BOULEVARD, 2ND FLOOR
ROSLYN, NY 11576

☒ Additional Parties Listed on Continuation Page

FEES AND TAXES

Mortgage :		
Mortgage Amount:	$	0.00
Taxable Mortgage Amount:	$	0.00
Exemption:		
TAXES: County (Basic):	$	0.00
City (Additional):	$	0.00
Spec (Additional):	$	0.00
TASF:	$	0.00
MTA:	$	0.00
NYCTA:	$	0.00
Additional MRT:	$	0.00
TOTAL:	$	0.00
Recording Fee:	$	57.00
Affidavit Fee:	$	0.00

Filing Fee:	$	0.00
NYC Real Property Transfer Tax:	$	0.00
NYS Real Estate Transfer Tax:	$	0.00

RECORDED OR FILED IN THE OFFICE OF THE CITY REGISTER OF THE CITY OF NEW YORK
Recorded/Filed 11-15-2019 15:18
City Register File No.(CRFN): **2019000373141**

Annette M Hill

City Register Official Signature

NYC DEPARTMENT OF FINANCE
OFFICE OF THE CITY REGISTER

2019111300831002001CCB54

RECORDING AND ENDORSEMENT COVER PAGE (CONTINUATION) **PAGE 2 OF 6**

Document ID: 2019111300831002 Document Date: 11-08-2019 Preparation Date: 11-13-2019
Document Type: ZONING LOT DESCRIPTION

PARTIES

PARTY ONE:
PENINSULA ROCKAWAY LIMITED PARTNERSHIP
1044 NORTHERN BOULEVARD, 2ND FLOOR
ROSLYN, NY 11576

514921-A

N.B. #________________
or
ALT. #________________

EXHIBIT III

ZONING LOT DESCRIPTION AND OWNERSHIP STATEMENT BY
BUILDING DEPARTMENT PERMIT APPLICANT
AND TO BE RECORDED IN THE
COUNTY CLERK'S OR REGISTER'S OFFICE

Peninsula Rockaway Housing Development Corp. 1044 Northern Boulevard, 2nd Floor, Roslyn, NY 11576
And
Peninsula Rockaway Limited Partnership, 1044 Northern Boulevard, 2nd Floor, Roslyn, NY 11576
Applicant(s) for present and future permits pursuant to the Zoning Resolution of the City of New York, effective December 15, 1961, and as subsequently amended, states that the zoning lot to which the aforementioned permit or permits pertain are shown on the Tax Map of the City of New York, County of Queens, as Lot(s) 1 in Block 15843 and is more particularly described as follows:

See Schedule A attached

Block 15843 Lot 1

All that certain plot, piece or parcel of land situate, lying and being in the Borough and County of Queens, City and State of New York being bounded and described as follows:

Beginning at the corner formed by the intersection of the southerly side of Beach Channel Drive with the easterly side of Beach 53rd Street;

Running thence easterly along the southerly side of Beach Channel Drive a distance of 430.06 feet;

Thence southerly, along a line forming an angle of 89 degrees 05 minutes 53 seconds on its westerly side with the southerly side of Beach Channel Drive, a distance of 420.89 feet;

Thence easterly at right angles to the westerly side of Beach 50th Street a distance of 260.00 feet to the westerly side of Beach 50th Street;

Thence southerly along the westerly side of Beach 50th Street a distance of 276.83 feet to the corner formed by the intersection of the westerly side of Beach 50th Street with the northerly side of Rockaway Beach Boulevard.

Thence westerly along the northerly side of Rockaway Beach Boulevard a distance of 243.93 feet to a point;

Thence continuing westerly along the northerly side of Rockaway Beach Boulevard a distance of 16.61 feet to a point;

Thence continuing westerly along the northerly side of Rockaway Beach Boulevard a distance of 223.38 feet to an angle point;

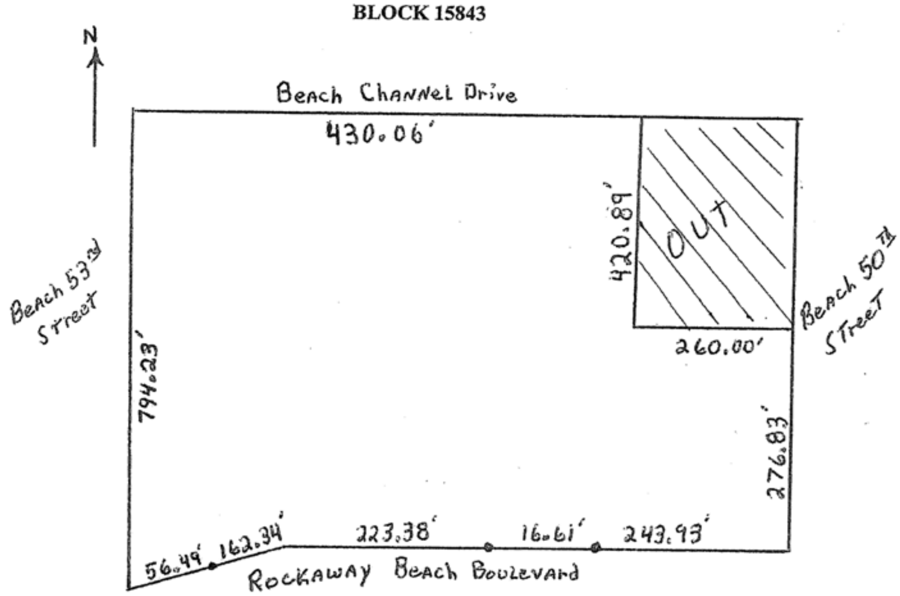
Thence southwesterly along the northwesterly side of Rockaway Beach Boulevard a distance of 162.34 feet to a point;

Thence continuing southwesterly along the northwesterly side of Rockaway Beach Boulevard a distance of 56.49 feet to the corner formed by the intersection of the northwesterly side of Rockaway Beach Boulevard with the easterly side of Beach 53rd Street;

Thence northerly along the easterly side of Beach 53rd Street a distance of 794.23 feet to the corner formed by the intersection of the southerly side of Beach Channel Drive with the easterly side of Beach 53rd Street, the point or place of Beginning.

That the said premises are known as and by the street address(es): N/A Rockaway Beach Boulevard, Far Rockaway, NY as shown on the following diagram:

BLOCK 15843



The above-described zoning lot is presently owned by:

Block	Tax Lot	Name	Address
15843	1	Peninsula Rockaway Housing Development Fund Corp.	1044 Northern Boulevard, 2nd Floor Roslyn, NY 11576
		-and-	
		Peninsula Rockaway Limited Partnership	1044 Northern Boulevard, 2nd Floor Roslyn, NY 11576

IN THE WITNESS WHEREOF that applicant(S) for permit has executed this instrument this 8 day of November, 2019

Peninsula Rockaway Housing Development Corp.

By: Daniel Moritz
Daniel Moritz
Authorized Signatory

Peninsula Rockaway Limited Partnership

By: Daniel Moritz
Daniel Moritz
Authorized Signatory

State of New York)
) ss.:
County of Nassau)

On the 8 day of November in the year 2019 before me, the undersigned, personally appeared Daniel Moritz known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is(are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Elizabeth Benedetto
Notary Public

ELIZABETH BENEDETTO
NOTARY PUBLIC-STATE OF NEW YORK
No. 01BE6354585
Qualified in Nassau County
My Commission Expires 02-13-2021

State of New York)
) ss.:
County of Nassau)

On the 8 day of November in the year 2019 before me, the undersigned, personally appeared Daniel Moritz known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name(s) is(are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

Elizabeth Benedetto
Notary Public

ELIZABETH BENEDETTO
NOTARY PUBLIC-STATE OF NEW YORK
No. 01BE6354585
Qualified in Nassau County
My Commission Expires 02-13-2021

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this _______day of _____________, 20__, between Owner(s) Enter property owner(s) name, having an office at Enter property owner's address, County of Dutchess, State of New York (the "Grantor"), and The People of the State of New York (the "Grantee."), acting through their Commissioner of the Department of Environmental Conservation (the "Commissioner", or "NYSDEC" or "Department" as the context requires) with its headquarters located at 625 Broadway, Albany, New York 12233,

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to encourage the remediation of abandoned and likely contaminated properties ("sites") that threaten the health and vitality of the communities they burden while at the same time ensuring the protection of public health and the environment; and

WHEREAS, the Legislature of the State of New York has declared that it is in the public interest to establish within the Department a statutory environmental remediation program that includes the use of Environmental Easements as an enforceable means of ensuring the performance of operation, maintenance, and/or monitoring requirements and the restriction of future uses of the land, when an environmental remediation project leaves residual contamination at levels that have been determined to be safe for a specific use, but not all uses, or which includes engineered structures that must be maintained or protected against damage to perform properly and be effective, or which requires groundwater use or soil management restrictions; and

WHEREAS, the Legislature of the State of New York has declared that Environmental Easement shall mean an interest in real property, created under and subject to the provisions of Article 71, Title 36 of the New York State Environmental Conservation Law ("ECL") which contains a use restriction and/or a prohibition on the use of land in a manner inconsistent with engineering controls which are intended to ensure the long term effectiveness of a site remedial program or eliminate potential exposure pathways to hazardous waste or petroleum; and

WHEREAS, Grantor, is the owner of real property located at the address of Enter street address of property in the Choose municipality type of Enter property municipality, County of Enter property county and State of New York, known and designated on the tax map of the County Clerk of Enter clerk county as tax map parcel numbers: Section Enter Tax ID Section #. Block Enter Tax ID Block # Lot Enter Tax ID Lot #, being the same as that property conveyed to Grantor by deed dated Enter Deed Date and recorded in the Enter county name or leave blank for NY City deeds County Clerk's Office in Liber and Page Enter Instrument # or Liber and Page #s. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately Enter Acreage +/- acres, and is hereinafter more fully described in the Land Title Survey dated Enter original survey date and, if applicable, "and revised on" and revised survey date prepared by Enter revised surveyor's name or original surveyor's name if not revised, which will be attached to the Site Management Plan. The Controlled Property description is set forth in and attached hereto as Schedule A; and

WHEREAS, the Department accepts this Environmental Easement in order to ensure the protection of public health and the environment and to achieve the requirements for remediation established for the Controlled Property until such time as this Environmental Easement is extinguished pursuant to ECL Article 71, Title 36; and

NOW THEREFORE, in consideration of the mutual covenants contained herein and the terms and conditions of Choose an Oversight Document TypeNumber: Enter SAC# or BCA/Consent Order Index # and “as amended by Amendment(s) #(s)” as applicable, Grantor conveys to Grantee a permanent Environmental Easement pursuant to ECL Article 71, Title 36 in, on, over, under, and upon the Controlled Property as more fully described herein ("Environmental Easement")

1. Purposes. Grantor and Grantee acknowledge that the Purposes of this Environmental Easement are: to convey to Grantee real property rights and interests that will run with the land in perpetuity in order to provide an effective and enforceable means of encouraging the reuse and redevelopment of this Controlled Property at a level that has been determined to be safe for a specific use while ensuring the performance of operation, maintenance, and/or monitoring requirements; and to ensure the restriction of future uses of the land that are inconsistent with the above-stated purpose.

2. Institutional and Engineering Controls. The controls and requirements listed in the Department approved Site Management Plan ("SMP") including any and all Department approved amendments to the SMP are incorporated into and made part of this Environmental Easement. These controls and requirements apply to the use of the Controlled Property, run with the land, are binding on the Grantor and the Grantor's successors and assigns, and are enforceable in law or equity against any owner of the Controlled Property, any lessees and any person using the Controlled Property.

A. (1) The Controlled Property may be used for:

Choose the allowable land use if current land use is selected, enter current use.

(2) All Engineering Controls must be operated and maintained as specified in the Site Management Plan (SMP);

(3) All Engineering Controls must be inspected at a frequency and in a manner defined in the SMP;

(4) The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Automatic County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;

(5) Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;

(6) Data and information pertinent to Site Management of the Controlled Property must be reported at the frequency and in a manner defined in the SMP;

(7) All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with the SMP;

(8) Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;

(9) Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical components of the remedy shall be performed as defined in the SMP;

(10) Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by this Environmental Easement.

B. The Controlled Property shall not be used for Choose the correct list of inapplicable uses., and the above-stated engineering controls may not be discontinued without an amendment or extinguishment of this Environmental Easement.

C. The SMP describes obligations that the Grantor assumes on behalf of Grantor, its successors and assigns. The Grantor's assumption of the obligations contained in the SMP which may include sampling, monitoring, and/or operating a treatment system, and providing certified reports to the NYSDEC, is and remains a fundamental element of the Department's determination that the Controlled Property is safe for a specific use, but not all uses. The SMP may be modified in accordance with the Department's statutory and regulatory authority. The Grantor and all successors and assigns, assume the burden of complying with the SMP and obtaining an up-to-date version of the SMP from:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, New York 12233
Phone: (518) 402-9553

D. Grantor must provide all persons who acquire any interest in the Controlled Property a true and complete copy of the SMP that the Department approves for the Controlled Property and all Department-approved amendments to that SMP.

E. Grantor covenants and agrees that until such time as the Environmental Easement is extinguished in accordance with the requirements of ECL Article 71, Title 36 of the ECL, the property deed and all subsequent instruments of conveyance relating to the Controlled Property shall state in at least fifteen-point bold-faced type:

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation

pursuant to Title 36 of Article 71 of the Environmental Conservation Law.

F. Grantor covenants and agrees that this Environmental Easement shall be incorporated in full or by reference in any leases, licenses, or other instruments granting a right to use the Controlled Property.

G. Grantor covenants and agrees that it shall, at such time as NYSDEC may require, submit to NYSDEC a written statement by an expert the NYSDEC may find acceptable certifying under penalty of perjury, in such form and manner as the Department may require, that:

(1) the inspection of the site to confirm the effectiveness of the institutional and engineering controls required by the remedial program was performed under the direction of the individual set forth at 6 NYCRR Part 375-1.8(h)(3).

(2) the institutional controls and/or engineering controls employed at such site:

(i) are in-place;

(ii) are unchanged from the previous certification, or that any identified changes to the controls employed were approved by the NYSDEC and that all controls are in the Department-approved format; and

(iii) that nothing has occurred that would impair the ability of such control to protect the public health and environment;

(3) the owner will continue to allow access to such real property to evaluate the continued maintenance of such controls;

(4) nothing has occurred that would constitute a violation or failure to comply with any site management plan for such controls;

(5 the report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;

(6) to the best of his/her knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and

(7) the information presented is accurate and complete.

3. Right to Enter and Inspect. Grantee, its agents, employees, or other representatives of the State may enter and inspect the Controlled Property in a reasonable manner and at reasonable times to assure compliance with the above-stated restrictions.

4. Reserved Grantor's Rights. Grantor reserves for itself, its assigns, representatives, and successors in interest with respect to the Property, all rights as fee owner of the Property, including:

A. Use of the Controlled Property for all purposes not inconsistent with, or limited by the terms of this Environmental Easement;

B. The right to give, sell, assign, or otherwise transfer part or all of the underlying fee interest to the Controlled Property, subject and subordinate to this Environmental Easement;

5. Enforcement

A. This Environmental Easement is enforceable in law or equity in perpetuity by Grantor, Grantee, or any affected local government, as defined in ECL Section 71-3603, against the owner of the Property, any lessees, and any person using the land. Enforcement shall not be defeated because of any subsequent adverse possession, laches, estoppel, or waiver. It is not a defense in any action to enforce this Environmental Easement that: it is not appurtenant to an interest in real property; it is not of a character that has been recognized traditionally at common law; it imposes a negative burden; it imposes affirmative obligations upon the owner of any interest in the burdened property; the benefit does not touch or concern real property; there is no privity of estate or of contract; or it imposes an unreasonable restraint on alienation.

B. If any person violates this Environmental Easement, the Grantee may revoke the Certificate of Completion with respect to the Controlled Property.

C. Grantee shall notify Grantor of a breach or suspected breach of any of the terms of this Environmental Easement. Such notice shall set forth how Grantor can cure such breach or suspected breach and give Grantor a reasonable amount of time from the date of receipt of notice in which to cure. At the expiration of such period of time to cure, or any extensions granted by Grantee, the Grantee shall notify Grantor of any failure to adequately cure the breach or suspected breach, and Grantee may take any other appropriate action reasonably necessary to remedy any breach of this Environmental Easement, including the commencement of any proceedings in accordance with applicable law.

D. The failure of Grantee to enforce any of the terms contained herein shall not be deemed a waiver of any such term nor bar any enforcement rights.

6. Notice. Whenever notice to the Grantee (other than the annual certification) or approval from the Grantee is required, the Party providing such notice or seeking such approval shall identify the Controlled Property by referencing the following information:

County, NYSDEC Site Number, NYSDEC Brownfield Cleanup Agreement, State Assistance Contract or Order Number, and the County tax map number or the Liber and Page or computerized system identification number.

Parties shall address correspondence to:

Site Number: Enter DEC Site #
Office of General Counsel
NYSDEC
625 Broadway
Albany New York 12233-5500

With a copy to:

Site Control Section
Division of Environmental Remediation
NYSDEC
625 Broadway
Albany, NY 12233

All notices and correspondence shall be delivered by hand, by registered mail or by Certified mail and return receipt requested. The Parties may provide for other means of receiving and communicating notices and responses to requests for approval.

7. Recordation. Grantor shall record this instrument, within thirty (30) days of execution of this instrument by the Commissioner or her/his authorized representative in the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

8. Amendment. Any amendment to this Environmental Easement may only be executed by the Commissioner of the New York State Department of Environmental Conservation or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

9. Extinguishment. This Environmental Easement may be extinguished only by a release by the Commissioner of the New York State Department of Environmental Conservation, or the Commissioner's Designee, and filed with the office of the recording officer for the county or counties where the Property is situated in the manner prescribed by Article 9 of the Real Property Law.

10. Joint Obligation. If there are two or more parties identified as Grantor herein, the obligations imposed by this instrument upon them shall be joint and several.

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

Enter Grantor's Name:

By: ______________________________________

Print Name: _______________________________

Title:____________________ Date:_____________

Grantor's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF)

On the _______ day of __________, in the year 20 __, before me, the undersigned, personally appeared ____________________, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

____
Notary Public - State of New York

THIS ENVIRONMENTAL EASEMENT IS HEREBY ACCEPTED BY THE PEOPLE OF THE STATE OF NEW YORK, Acting By and Through the Department of Environmental Conservation as Designee of the Commissioner,

By: ____
Robert W. Schick, Director
Division of Environmental Remediation

Grantee's Acknowledgment

STATE OF NEW YORK)
) ss:
COUNTY OF ALBANY)

On the _______ day of _________, in the year 20__, before me, the undersigned, personally appeared Robert W. Schick, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/ executed the same in his/her/ capacity as Designee of the Commissioner of the State of New York Department of Environmental Conservation, and that by his/her/ signature on the instrument, the individual, or the person upon behalf of which the individual acted, executed the instrument.

____
Notary Public - State of New York

SCHEDULE "A" PROPERTY DESCRIPTION

Enter Property Description

FACT SHEET

Brownfield Cleanup Program

Former Peninsula Hospital
51-15 Beach Channel Dr /
50-04 Rockaway Beach Blvd
Far Rockaway, NY 11691

SITE No. C241200
NYSDEC REGION 2

August 2020

Where to Find Information

Access project documents through the DECinfo Locator and at these locations:

The Archives at Queens Library
89-11 Merrick Boulevard
Jamaica, NY 11432

Queens Community Board #14
1931 Mott Avenue
Far Rockaway, NY 11691
(718) 471-7300

(*Repositories are temporarily unavailable due to COVID-19 precautions. If you cannot access the online repository, please contact the NYSDEC project manager listed below for assistance)

Who to Contact

Comments and questions are welcome and should be directed as follows:

Project-Related Questions
Javier Perez-Maldonado, Project Manager
NYSDEC
625 Broadway
Albany, NY 12233
(518) 402-9172
javier.perez-maldonado@dec.ny.gov

Project-Related Health Questions
Sarita Wagh
NYSDOH
Bureau of Environmental Exposure Investigation
Empire State Plaza – Corning Tower
Room 1787
Albany, NY 12237
(518) 402-7860
beei@health.ny.gov

For more information about New York's Brownfield Cleanup Program, visit:
www.dec.ny.gov/chemical/8450.html

Remedy Proposed for Brownfield Site Contamination; Public Comment Period Announced

The public is invited to comment on a proposed remedy being reviewed by the New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), to address contamination related to the Former Peninsula Hospital site ("site") located at 51-15 Beach Channel Drive and 50-04 Rockaway Beach Boulevard , Far Rockaway, NY. Please see the map for the site location.

Based on the findings of the investigation, NYSDEC in consultation with NYSDOH has determined that the site does not pose a significant threat to public health or the environment. This decision is based on the nature of the existing contaminants identified at the site.

How to Comment: NYSDEC is accepting written comments about the proposed plan, called a "Draft Remedial Action Work Plan (RAWP)" for 45 days, from **August 5 through September 21, 2020**

- Access the RAWP and other project documents online through the DECinfo Locator: https://www.dec.ny.gov/data/DecDocs/C241200/.
- Documents also are available at the location(s) identified at left under "Where to Find Information."
- Please submit comments to the NYSDEC project manager listed under Project-Related Questions in the "Who to Contact" area at left.

Draft Remedial Work Plan: The proposed Restricted Residential Use remedy consists of:

- Excavation and off-site disposal of limited, targeted areas of on-site soil which exceeds protection of groundwater soil cleanup objectives (SCOs) for contaminants present in groundwater to achieve a restricted residential remedy;
- Installation of a site cover to allow for restricted residential use of the site in areas where the upper two foot of exposed surface soil exceeds the SCOs. The site cover will consist of new concrete building foundations, concrete and/or asphalt pavement, and/or two feet of clean soil. The clean soil for backfill and soil cover will meet established SCOs;
- Collection and analysis of end-point soil samples to evaluate the effectiveness of the remedy;
- Implementation of a Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) during all ground intrusive activities;

BROWNFIELD CLEANUP PROGRAM

- Implementation of a Site Management Plan (SMP) for long-term maintenance of the remedial systems; and
- Recording of an Environmental Easement to ensure proper use of the site.

The proposed remedy was developed by Peninsula Rockaway Limited Partnership (“applicant”) after performing a detailed investigation of the site under New York's Brownfield Cleanup Program (BCP).

Next Steps: NYSDEC will consider public comments, revise the cleanup plan as necessary, and issue a final Decision Document. NYSDOH must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The applicant(s) may then design and perform the cleanup action to address the site contamination, with oversight by NYSDEC and NYSDOH.

NYSDEC will keep the public informed throughout the investigation and cleanup of the site.

Site Description: The 8.76-acre site is located in Far Rockaway, NY and includes Block 15842, Lot 1 and Block 15843, Lot 1 on the Queens County tax map. The site is bounded by Beach Channel Drive to the north, Beach 50th Street to the east, Beach 53rd Street to the west, and Rockaway Beach Boulevard to the south. The site is currently vacant with asphalt pavement, crushed concrete, and limited areas of vegetation.

The site was formerly developed with a large building between 1957 and 1962 that was operated as the Peninsula Hospital until closing in 2012. Prior to the hospital use, the site was undeveloped except for the southwestern corner, which was occupied by a small hotel (from prior to 1912 until sometime before 1933), several residences, and three small stores (by 1951).

Additional site details, including environmental and health assessment summaries, are available on NYSDEC's Environmental Site Remediation Database (by entering the site ID, C241200) at:
http://www.dec.ny.gov/cfmx/extapps/derexternal/index.cfm?pageid=3

Summary of the Investigation: Soil and groundwater samples were collected and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), pesticides and per- and polyfluoroalkyl substances (PFAS). Soil vapor samples were analyzed for VOCs. VOCs, SVOCs and metals were detected in soil at concentrations above soil cleanup objectives for the intended residential use of the site down to 8 feet below grade. Metals and the SVOC benzo(a)pyrene were detected in groundwater above standards. Chlorinated VOCs were detected in soil vapor. This contamination is the result of a former petroleum spill and past site uses.

Brownfield Cleanup Program: New York's Brownfield Cleanup Program (BCP) encourages the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and redeveloped. These uses may include recreation, housing, business or other uses. A brownfield site is any real property where a contaminant is present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance adopted by NYSDEC that are applicable based on the reasonably anticipated use of the property, in accordance with applicable regulations.

For more information about the BCP, visit:
http://www.dec.ny.gov/chemical/8450.html

We encourage you to share this fact sheet with neighbors and tenants, and/or post this fact sheet in a prominent area of your building for others to see.

Stay Informed With DEC Delivers
Sign up to receive site updates by email:
www.dec.ny.gov/chemical/61092.html

Note: Please disregard if you already have signed up and received this fact sheet electronically.

DECinfo Locator
Interactive map to access DEC documents and public data about the environmental quality of specific sites: http://www.dec.ny.gov/pubs/109457.html

BROWNFIELD CLEANUP PROGRAM

Site Location Map

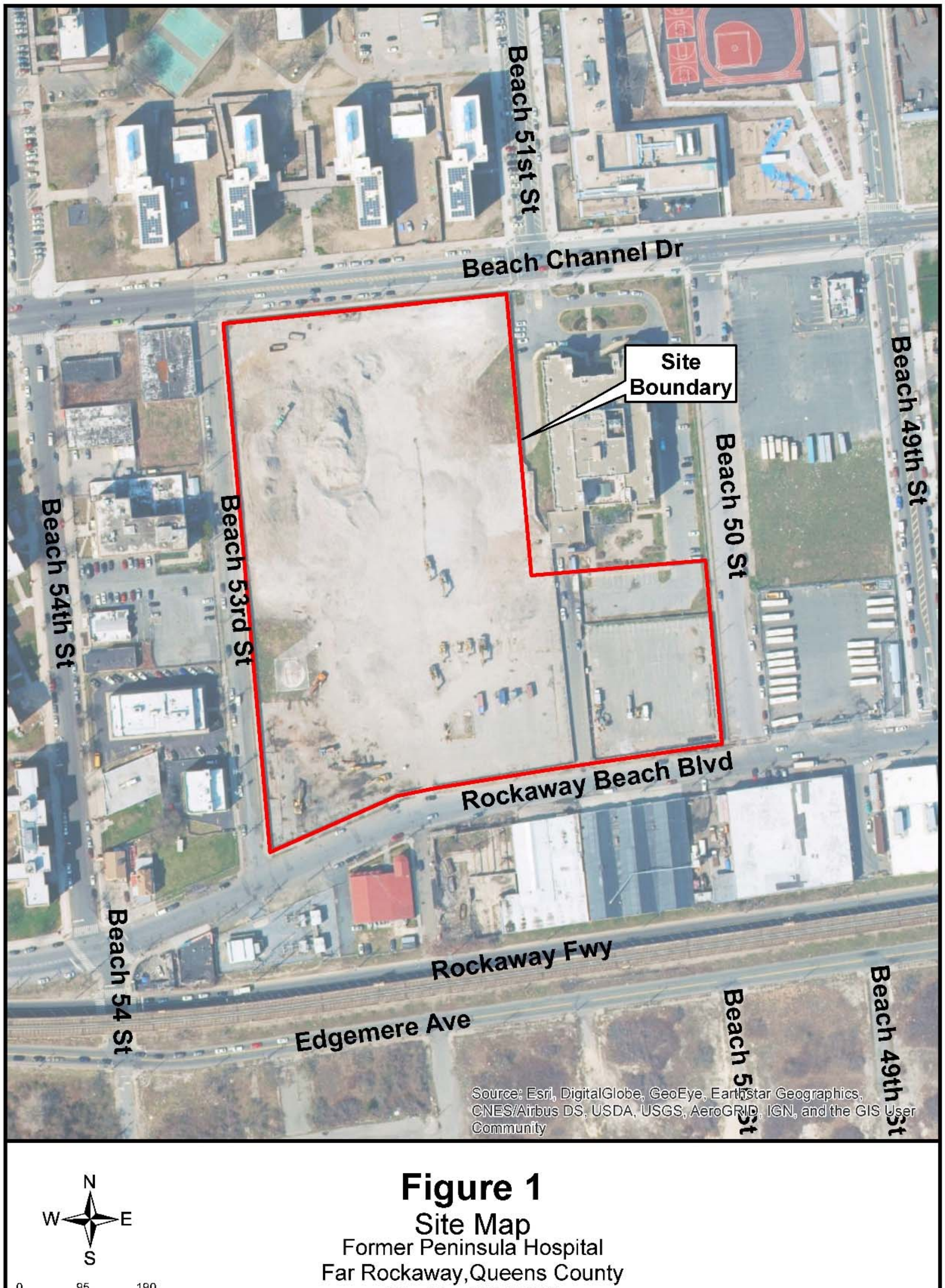


Figure 1
Site Map
Former Peninsula Hospital
Far Rockaway,Queens County
Site No. C241200

APPENDIX B

REMEDIAL INVESTIGATION
SOIL CHEMICAL ANALYTICAL RESULTS
(TABLE 2.1.4.1)

TABLE 2.1.4.1
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B1		B2		B3		B4		B5			B6		B7		B8		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	0-2 (dup)	2-4	0-2	2-4	0-2	2-4	0-2	2-4		
Soil Type	Fill	Native	Fill	Native	Fill	Native	Fill	Native	Fill	Fill	Native	Fill	Native	Fill	Native	Fill	Native		
Sample Date	8/24/18								8/28/18			8/24/18				8/29/18			
TCL Volatile Organic Compounds in ug/kg																			
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	100,000
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270	26,000
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	370	49,000
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	760	2,400
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,300	19,000
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000
Trichlorofluoromethane	ND	ND	ND	1.4 J	ND	ND	ND	ND	2.9 J	ND	2.5 J	ND	ND	ND	ND	ND	ND	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	3,100
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	680	100,000
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	60	4,800
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	700	100,000
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	300	ND	1,000	41,000
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	900
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190	100,000
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	470	21,000
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	49,000
1,4-Dichlorobenzene	0.90 J	0.94 J	0.97 J	0.54 J	1.3 J	1.3 J	0.95 J	0.61 J	ND	ND	ND	0.43 J	1.1 J	0.77 J	1.3 J	ND	ND	1,800	13,000
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	930	100,000
p/m-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,400	ND	-	-
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	480	ND	-	-
Xylenes, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1,900**	ND	260	100,000
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	250	100,000
1,2-Dichloroethene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetone	7.2 J	8.7 J	ND	**55**	26	11 J	6.6 J	7.0 J	**110**	5.9 J	25	ND	20	8.3 J	**54**	ND	11	50	100,000
Carbon disulfide	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Butanone	ND	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	120	100,000
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12,000	-
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11,000	100,000
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,900	100,000
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Naphthalene	ND	ND	ND	ND	ND	ND	0.86 J	ND	ND	ND	ND	ND	ND	ND	ND	110 J	ND	12,000	100,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,900	100,000
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8,400	52,000
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	30 J	ND	3,600	52,000
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	13,000
p-Diethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20 J	ND	-	-
p-Ethyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33 J	ND	-	-
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	58 J	ND	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tenatively Identified Compounds in ug/kg	ND	ND	ND	ND	ND	ND	ND	ND	3.59 J	2.87 J	12.5 J	ND	3.25 J	2.35 J	8.45 J	1,250 J	10.8 J	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

FPM

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B1		B2		B3		B4		B5			B6		B7		B8		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	0-2 (dup)	2-4	0-2	2-4	0-2	2-4	0-2	2-4		
Soil Type	Fill	Native	Fill	Native	Fill	Native	Fill	Native	Fill	Fill	Native	Fill	Native	Fill	Native	Fill	Native		
Sample Date	8/24/18								8/28/18			8/24/18				8/29/18			
TCL Semivolatile Organic Compounds in ug/kg																			
Acenaphthene	ND	ND	ND	ND	27 J	ND	ND	ND	35 J	59 J	92 J	55 J	ND	25 J	ND	ND	67 J	20,000	100,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,000	-
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	-
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,800	-
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Fluoranthene	ND	ND	22 J	ND	270	ND	130	ND	730	900	1,600	770	ND	370	150	ND	510	100,000	100,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	29 J	ND	260	ND	75 J	65 J	ND	210 J	12,000	100,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
NDPA/DPA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,700	ND	170 J	ND	ND	ND	-	-
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	880	ND	ND	ND	ND	ND	-	-
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzo(a)anthracene	ND	ND	ND	ND	130	ND	83 J	ND	350	390	720	460	ND	220	130	ND	440	1,000	1,000
Benzo(a)pyrene	ND	ND	ND	ND	120 J	ND	100 J	ND	380	390	630	440	ND	220	100 J	ND	360	1,000	1,000
Benzo(b)fluoranthene	ND	ND	ND	ND	160	ND	160	ND	560	560	890	910	ND	400	160	ND	610	1,000	1,000
Benzo(k)fluoranthene	ND	ND	ND	ND	52 J	ND	40 J	ND	180	180	260	250	ND	130	72 J	ND	220	800	3,900
Chrysene	37 J	ND	76 J	ND	140	ND	100	ND	370	400	690	540	ND	290	150	ND	510	1,000	3,900
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND	94 J	99 J	45 J	1,200	ND	500	300	ND	1,100	100,000	100,000
Anthracene	ND	ND	ND	ND	61 J	ND	ND	ND	150	150	360	250	ND	92 J	57 J	ND	180	100,000	100,000
Benzo(ghi)perylene	ND	ND	ND	ND	120 J	ND	110 J	ND	300	260	380	570	ND	240	100 J	ND	390	100,000	100,000
Fluorene	ND	ND	ND	ND	25 J	ND	ND	ND	35 J	64 J	100 J	92 J	ND	41 J	20 J	ND	91 J	30,000	100,000
Phenanthrene	ND	ND	ND	ND	200	ND	51 J	ND	390	640	1,100	530	ND	190	75 J	ND	300	100,000	100,000
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	ND	ND	67 J	70 J	100 J	140	ND	65 J	ND	ND	89 J	330	330
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	87 J	ND	83 J	ND	290	280	400	**580**	ND	240	100 J	ND	370	500	500
Pyrene	26 J	ND	38 J	ND	230	ND	120	ND	640	760	1,400	770	ND	390	230	ND	870	100,000	100,000
Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibenzofuran	ND	ND	ND	ND	17 J	ND	ND	ND	18 J	37 J	38 J	57 J	ND	19 J	ND	ND	ND	7,000	-
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	21 J	ND	ND	ND	ND	150 J	ND	44 J	28 J	ND	ND	-	-
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	110 J	ND	ND	ND	ND	150 J	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	800	6,700
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
3-Methylphenol/4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Carbazole	ND	ND	ND	ND	31 J	ND	ND	ND	74 J	70 J	180 J	85 J	ND	ND	ND	ND	22 J	-	-
Tenatively Identified Compounds in ug/kg	ND	385 J	ND	204 J	ND	358 J	142 J	273 J	ND	1,950 J	1,060 J	16,500 J	ND	10,100 J	6,320 J	2,000 J	47,900 J	-	-

Notes:

ND = Not detected.

J = Estimated concentration below the RL but above the MDL.

Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

FPM

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B1		B2		B3		B4		B5			B6		B7		B8		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	0-2 (dup)	2-4	0-2	2-4	0-2	2-4	0-2	2-4		
Soil Type	Fill	Native	Fill	Native	Fill	Native	Fill	Native	Fill	Fill	Native	Fill	Native	Fill	Native	Fill	Native		
Sample Date	8/24/18								8/28/18			8/24/18				8/29/18			
Metals in milligrams per kilogram																			
Aluminum, Total	1,200	968	1,200	2,420	2,690	1,100	4,720	992	2,440	4,700	1,660	3,470	1,320	3,200	1,820	2,050	2,840	-	-
Antimony, Total	0.351 J	ND	ND	ND	1.05 J	ND	0.411 J	ND	0.979 J	1.21 J	0.549 J	1.59 J	ND	0.978 J	ND	ND	ND	-	-
Arsenic, Total	2.06	ND	1.97	0.949	4.16	0.574 J	4.83	0.539 J	2.12	4.48	1.22	8.32	0.232 J	4.38	1.98	2.12	3.15	13	16
Barium, Total	8.03	5.22	5.70	9.10	24.4	4.65	60.1	4.82	39.7	45.7	66.9	54.6	7.41	46.1	21.3	15.8	24.3	350	400
Beryllium, Total	ND	ND	ND	0.056 J	0.096 J	ND	0.296 J	ND	0.045 J	0.24 J	ND	0.129 J	ND	0.169 J	0.053 J	ND	ND	7.2	72
Cadmium, Total	0.099 J	ND	0.096 J	ND	0.513 J	ND	0.328 J	ND	0.296 J	0.471 J	0.17 J	0.473 J	ND	0.261 J	0.106 J	0.356 J	0.258 J	2.5	4.3
Calcium, Total	52,800	180	39,600	428	29,300	254	46,000	279	58,900	58,000	8,920	17,700	356	5,070	531	27,200	877	-	-
Chromium, Total	4.44	3.02	3.77	6.60	9.84	4.19	52.4	3.38	11.4	28.3	6.47	12.9	5.54	9.86	6.56	7.52	7.69	30	180
Cobalt, Total	1.3 J	0.59 J	1.44 J	1.57 J	3.80	0.733 J	4.54	0.667 J	1.88	3.48	1.47 J	2.2	0.937 J	3.26	1.16 J	2.57	2.27	-	-
Copper, Total	3.52	1.14	6.48	2.12	13.3	1.31	40.5	0.969	13.5	26.8	5.60	29.1	2.28	**57.9**	6.99	14.7	14.8	50	270
Iron, Total	3,890	1,750	3,940	2,650	19,000	2310	7,880	1540	5,740	9,560	3,200	8,030	1,610	6,380	4230	5,110	4670	-	-
Lead, Total	3.5 J	2.07 J	6.47	3.32 J	27.4	1.32 J	52.8	1.07 J	58.2	51.1	44.2	**233**	1.33 J	**85.6**	20.7	14.5	34.6	63	400
Magnesium, Total	29,300	334	22,600	794	9,980	395	7,170	354	20,400	8,460	3,460	2,400	457	1,230	666	11,600	1,020	-	-
Manganese, Total	56.8	11.4	45.8	23.8	113	14.2	133	13.5	174	143	37.9	82.8	14.0	73.7	23.0	58.6	27.3	1,600	2,000
Mercury, Total	ND	ND	ND	ND	0.068	ND	0.025 J	ND	**0.608**	**0.639**	ND	0.136	ND	0.125	ND	0.037 J	0.022 J	0.18	0.81
Nickel, Total	2.56	1.16 J	2.64	3.23	6.24	1.54 J	13.4	1.21 J	5.11	13.1	3.48	7.80	1.81 J	9.58	2.82	4.89	6.63	30	310
Potassium, Total	386	244	365	524	454	278	940	258	425	703	308	611	218 J	459	513	453	497	-	-
Selenium, Total	ND	ND	0.272 J	ND	ND	ND	ND	ND	ND	0.4 J	ND	ND	ND	0.32 J	ND	ND	ND	3.9	180
Silver, Total	ND	ND	ND	ND	ND	ND	ND	ND	**4.02**	**5.02**	0.966	1.85	ND	0.32 J	ND	1.79	ND	2	180
Sodium, Total	87.7 J	61.9 J	135 J	103 J	92.4 J	98.4 J	174	47.3 J	115 J	194	70.3 J	163 J	98.4 J	107 J	74.5 J	159 J	60.8 J	-	-
Thallium, Total	ND	ND	ND	ND	0.489 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vanadium, Total	7.65	3.92	7.89	7.81	11.1	4.56	16.2	4.23	10.5	16.6	7.16	18.3	3.80	12.4	8.50	15.2	10.9	-	-
Zinc, Total	7.78	2.71 J	7.76	8.99	64.1	6.05	**242**	3.06 J	90.1	**239**	47.1	96.6	6.55	**235**	11.6	53.6	31.2	109	10,000
Pesticides in micrograms per kilogram																			
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	100,000
Lindane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,300
Alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	480
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	36	360
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	42	2,100
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	97
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	11,000
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	200
4,4'-DDE	ND	ND	ND	ND	**10.1 J**	ND	ND	ND	**70.4**	**48.1**	**7.34**	**378**	ND	**210**	ND	**9.34**	ND	3.3	8,900
4,4'-DDD	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.18	ND	**48.4**	ND	**28.6**	ND	ND	ND	3.3	13,000
4,4'-DDT	ND	ND	ND	ND	**11.6 J**	ND	ND	ND	**107**	**108**	**9.9**	**653**	ND	**468**	**10.4 P**	**12.0 J**	ND	3.3	7,900
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.26 J	ND	73.9	ND	56.3 P	ND	ND	ND	94	4,200
trans-Chlordane	ND	ND	ND	ND	9.61 J	ND	ND	ND	ND	0.728 JPI	ND	51.5 PI	ND	31.9 PI	ND	ND	ND	-	-
Chlordane	ND	ND	ND	ND	37.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Polychlorinated Biphenyls in micrograms per kilogram																			
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1254	ND	ND	ND	ND	3.81 J	ND	ND	ND	12.2 J	ND	ND	**137 P**	ND	32.8 J	ND	12.2 J	ND	100	1,000
Aroclor 1260	ND	ND	ND	ND	ND	ND	6.65 J	ND	10.5 J	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1262	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1268	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
General Chemistry																			
Cyanide in milligrams per kilogram	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	ND	0.67 J	ND	1.8	2.0	27	27

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
P = the RPD between the results for the two columns exceeds the method-specific criteria.
I = the lower value for the two columns has been reported due to interference.

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B9		B10		B11		B12		B13		B14		B15		B16		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	2-4	4-6	0-2	2-4	0-2	2-4	5-7	7-9	6-8	8-10	2-4	4-6	0-2	2-4	3-5	5-7		
Soil Type	Native		Native		Native		Fill	Native	Fill	Native	Fill	Native	Fill	Native	Fill	Native		
Sample Date	8/28/18												8/29/18					
TCL Volatile Organic Compounds in ug/kg																		
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	100,000
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270	26,000
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	370	49,000
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	760	2,400
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tetrachloroethene	ND	ND	ND	ND	ND	ND	16 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,300	19,000
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000
Trichlorofluoromethane	ND	ND	ND	ND	1.2 J	ND	140 J	9.0	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	3,100
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	680	100,000
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	11 J	1.5	ND	22 J	ND	ND	ND	ND	60	4,800
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.8	ND	ND	ND	ND	ND	ND	700	100,000
Ethylbenzene	ND	ND	ND	ND	ND	ND	15 J	ND	44 J	2.7	ND	64 J	1.1	0.20 J	ND	ND	1,000	41,000
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.5 J	ND	ND	ND	ND	ND	ND	-	-
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	900
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190	100,000
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	470	21,000
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	49,000
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	13 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,800	13,000
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	930	100,000
p/m-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.7	ND	ND	3.6	ND	ND	ND	-	-
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.6	ND	28 J	1.7	ND	ND	ND	-	-
Xylenes, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ND	28 J	5.3	ND	ND	ND	260	100,000
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	250	100,000
1,2-Dichloroethene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Styrene	ND	ND	ND	ND	ND	ND	25 J	ND	13 J	1.5	ND	18 J	ND	ND	ND	ND	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	7.4 J	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetone	**670 J**	18	22	9.9 J	**84**	35	ND	**72**	ND	**190**	**59**	ND	23	**54**	7.6 J	ND	50	100,000
Carbon disulfide	ND	ND	ND	ND	ND	ND	ND	11 J	ND	18	ND	ND	ND	ND	ND	ND	-	-
2-Butanone	**490 J**	ND	ND	ND	ND	ND	ND	ND	ND	22	ND	ND	ND	7.3 J	ND	ND	120	100,000
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12,000	-
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	18 J	ND	ND	ND	ND	11,000	100,000
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,900	100,000
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isopropylbenzene	ND	ND	ND	ND	ND	ND	10 J	ND	8.4 J	0.32 J	ND	690	ND	0.43 J	ND	ND	-	-
p-Isopropyltoluene	20 J	0.68 J	0.20 J	ND	ND	ND	ND	ND	ND	0.52 J	ND	17 J	ND	ND	ND	ND	-	-
Naphthalene	ND	ND	ND	ND	ND	ND	780	1.1 J	2,100	160	ND	740	ND	ND	0.67 J	11,000	12,000	100,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33 J	ND	ND	ND	ND	3,900	100,000
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	17 J	1.9 J	ND	ND	ND	ND	ND	ND	8,400	52,000
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	38 J	4.9	ND	ND	ND	ND	ND	ND	3,600	52,000
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	13,000
p-Diethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	31 J	2.1 J	ND	31 J	ND	ND	ND	ND	-	-
p-Ethyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	69 J	2.4	ND	280	ND	1.1 J	ND	ND	-	-
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	18 J	1.9 J	ND	470	ND	ND	ND	63 J	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tenatively Identified Compounds in ug/kg	3,620 J	2.43 J	5.63 J	2.25 J	14.1 J	7.84 J	7,740 J	104 J	13,700 J	222 J	3.14 J	46,900 J	ND	5.25 J	2.82 J	12,600 J	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

FPM

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B9		B10		B11		B12		B13		B14		B15		B16		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	2-4	4-6	0-2	2-4	0-2	2-4	5-7	7-9	6-8	8-10	2-4	4-6	0-2	2-4	3-5	5-7		
Soil Type	Native		Native		Native		Fill	Native	Fill	Native	Fill	Native	Fill	Native	Fill	Native		
Sample Date	8/28/18												8/29/18					
TCL Semivolatile Organic Compounds in ug/kg																		
Acenaphthene	ND	ND	20 J	ND	88 J	35 J	350	410	580	410	99 J	860	ND	ND	1,500	5,200	20,000	100,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,000	-
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	-
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,800	-
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Fluoranthene	330	42 J	750 J	ND	1,400	370	560	96 J	750	810	810	2,100	720	1,000	2,100	6,400	100,000	100,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Naphthalene	ND	ND	34 J	ND	33 J	ND	410	69 J	500	580	110 J	97 J	63 J	220 J	1,400	9,300	12,000	100,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
NDPA/DPA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	350	ND	460	ND	120 J	260	490	ND	ND	450 J	ND	ND	-	-
Butyl benzyl phthalate	ND	ND	180	ND	830	ND	1,600	ND	83 J	440	270	92 J	ND	ND	ND	120 J	-	-
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	61 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	160 J	-	-
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzo(a)anthracene	170	39 J	400	ND	600	170	140	ND	200	290	340	460	430	560	740	**1,400**	1,000	1,000
Benzo(a)pyrene	180	ND	380	ND	460	160	95 J	ND	110 J	210	240	260	1,100	500 J	580	730	1,000	1,000
Benzo(b)fluoranthene	270	39 J	560	ND	620	220	150	ND	200	350	380	440	660	730	900	**1,200**	1,000	1,000
Benzo(k)fluoranthene	68 J	ND	160	ND	250	80 J	48 J	ND	62 J	110 J	120	140	160 J	160 J	200 J	300	800	3,900
Chrysene	180	44 J	400	ND	530	180	160	ND	300	310	340	580	760	750	700	1,200	1,000	3,900
Acenaphthylene	ND	30 J	66 J	ND	29 J	ND	ND	ND	120 J	170	63 J	59 J	200 J	560 J	280 J	720	100,000	100,000
Anthracene	ND	ND	72 J	ND	270	53 J	92 J	ND	390	210	120	510	140 J	270 J	700	2,700	100,000	100,000
Benzo(ghi)perylene	140 J	33 J	280	ND	250	100 J	66 J	ND	79 J	150 J	140 J	120 J	750	380 J	400 J	340	100,000	100,000
Fluorene	ND	ND	22 J	ND	80 J	24 J	290	290	450	340	68 J	1,300	45 J	ND	1,300	5,600	30,000	100,000
Phenanthrene	130	24 J	280	ND	971	260	550	ND	920	680	390	410	410	490	3,200	17,000	100,000	100,000
Dibenzo(a,h)anthracene	38 J	ND	72 J	ND	66 J	28 J	ND	ND	27 J	42 J	44 J	ND	170 J	95 J	94 J	82 J	330	330
Indeno(1,2,3-cd)pyrene	140 J	27 J	290	ND	280	110 J	67 J	ND	84 J	170	150 J	140 J	340	350 J	410 J	380	500	500
Pyrene	300	61 J	660	ND	1,200	330	370	34 J	570	820	850	1,400	830	1,400	1,600	4,400	100,000	100,000
Biphenyl	ND	ND	ND	ND	ND	ND	56 J	ND	120 J	79 J	ND	ND	ND	ND	420 J	1,400	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibenzofuran	ND	ND	ND	ND	41 J	ND	200 J	41 J	390	260	47 J	800	ND	ND	1,000	4,300	7,000	-
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	200 J	ND	460	350	56 J	31 J	ND	140 J	1,200	7,300	-	-
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetophenone	ND	ND	ND	ND	ND	ND	28 J	ND	ND	33 J	ND	ND	ND	ND	ND	ND	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	800	6,700
Phenol	ND	ND	ND	ND	ND	ND	97 J	ND	69 J	120 J	ND	ND	ND	ND	ND	260	330	100,000
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
3-Methylphenol/4-Methylphenol	1,100	ND	ND	ND	ND	ND	ND	ND	40 J	ND	ND	ND	ND	ND	ND	ND	330	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Carbazole	ND	ND	27 J	ND	140 J	33 J	51 J	ND	150	110 J	76 J	63 J	53 J	ND	220 J	910	-	-
Tenatively Identified Compounds in ug/kg	15,500 J	605 J	367 J	ND	2,110 J	150 J	1,430 J	ND	4,040	6,820 J	665 J	3,570 J	18,100 J	18,200 J	1,790 J	11,400 J	-	-

Notes:

ND = Not detected.

J = Estimated concentration below the RL but above the MDL.

Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.

FPM

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B9		B10		B11		B12		B13		B14		B15		B16		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	2-4	4-6	0-2	2-4	0-2	2-4	5-7	7-9	6-8	8-10	2-4	4-6	0-2	2-4	3-5	5-7		
Soil Type	Native		Native		Native		Fill	Native	Fill	Native	Fill	Native	Fill	Native	Fill	Native		
Sample Date	8/28/18												8/29/18					
Metals in milligrams per kilogram																		
Aluminum, Total	5,970	1,030	2,470	1,940	1,260	1,140	3,900	4,130	2,910	3,050	2,890	2,560	2,590	1,170	1,360	2,410	-	-
Antimony, Total	0.972 J	ND	0.33 J	0.43 J	0.361 J	0.54 J	2.11 J	0.911 J	1.66 J	1.84 J	0.721 J	ND	ND	ND	ND	ND	-	-
Arsenic, Total	4.21	0.646 J	3.30	1.22	1.02	1.24	3.35	3.95	3.26	3.61	2.96	1.72	2.63	1.80	3.07	2.41	13	16
Barium, Total	45.3	11.0	28.7	9.68	13.8	13.4	40.2	19.7	52.3	26.4	37.2	34.3	30.3	15.8	72.5	62.1	350	400
Beryllium, Total	0.218 J	ND	0.085 J	ND	0.036 J	ND	0.371 J	0.194 J	0.093 J	0.103 J	0.1 J	0.169 J	0.036 J	ND	0.033 J	ND	7.2	72
Cadmium, Total	0.436 J	ND	0.313 J	0.099 J	0.09 J	0.11 J	0.297 J	0.215 J	0.37 J	0.16 J	0.246 J	0.309 J	0.578 J	ND	0.312 J	0.218 J	2.5	4.3
Calcium, Total	831	249	2,460	382	11,200	545	65,200	2,390	21,600	13,100	29,400	807	24,700	405	10,800	9,560	-	-
Chromium, Total	28.6	3.95	9.14	5.47	3.62	4.18	11.6	12.5	11.4	11.3	11.9	6.86	21.2	4.40	6.65	11.9	30	180
Cobalt, Total	2.5	0.752 J	1.35 J	1.34 J	0.803 J	0.911 J	4.07	4.52	2.14	2.32	2.08	1.8 J	1.81	0.888 J	1.42 J	1.73 J	-	-
Copper, Total	17.8	2.36	17.7	4.16	4.11	4.49	**116**	7.61	24.5	13.8	18.4	9.52	8.35	6.66	10.6	12.4	50	270
Iron, Total	10,000	1,820	4,790	3,940	2,580	2,950	7,940	10,800	8,420	7,440	5,850	5,980	5,500	1,930	4,260	4,960	-	-
Lead, Total	**85.2**	6.21	**65.8**	2.38 J	17.7	15.9	**68.6**	6.24	60.1	28.0	46.9	39.8	**115**	23.0	**150**	**89.9**	63	400
Magnesium, Total	916	424	1,220	857	1,270	416	14,900	1,630	4,120	3,930	6,980	700	1,860	442	5,210	1850	-	-
Manganese, Total	95.3	13.8	74.0	22.6	27.1	21.6	124	118	68.3	58.7	88.4	29.7	79.8	13.1	72.0	61.8	1,600	2,000
Mercury, Total	**0.239**	ND	**0.271**	ND	0.108	0.022 J	**0.410**	ND	**0.992**	**0.277**	**0.216**	ND	0.076	ND	0.137	**0.473**	0.18	0.81
Nickel, Total	7.30	1.58 J	4.58	2.96	1.71 J	2.45	10.0	9.11	5.51	5.01	5.83	4.96	4.23	2.35	3.59	4.57	30	310
Potassium, Total	300	256	314	612	320	330	726	1,040	906	987	636	476	563	270	324	376	-	-
Selenium, Total	ND	ND	ND	ND	ND	ND	0.538 J	0.573 J	0.556 J	0.395 J	ND	ND	ND	ND	ND	ND	3.9	180
Silver, Total	ND	ND	0.296 J	ND	0.676 J	ND	**3.33**	ND	**44.4**	**11.9**	ND	ND	ND	ND	ND	1.75	2	180
Sodium, Total	111 J	54.5 J	118 J	94.5 J	95.1 J	68.1 J	489	252	432	426	249	145 J	120 J	55.2 J	85 J	168 J	-	-
Thallium, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vanadium, Total	24.5	6.40	10.0	7.51	4.56	5.63	10.0	16.3	9.38	13.2	9.76	10.1	8.98	6.90	7.93	8.98	-	-
Zinc, Total	74.4	5.14	77.3	7.28	22.7	13.5	**320**	26.9	80.9	26.2	92.1	62.1	**343**	22.1	96.3	**142**	109	10,000
Pesticides in micrograms per kilogram																		
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	100,000
Lindane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,300
Alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	480
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	36	360
Heptachlor	ND	ND	ND	ND	0.979	ND	ND	ND	ND	ND	ND	ND	ND	ND	**44.7**	6.12	42	2,100
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	97
Heptachlor epoxide	43.2	ND	10.9 P	ND	2.81 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	22.5 P	7.37 P	-	-
Endrin	ND	ND	ND	ND	ND	ND	3.77	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	11,000
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dieldrin	ND	ND	4.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	200
4,4'-DDE	**442**	1.95 PI	**456**	ND	**35.7**	0.935 J	**29.6**	ND	**6.82 PI**	**13.8 PI**	**890**	ND	ND	ND	**81.4**	**49.0**	3.3	8,900
4,4'-DDD	**41.1**	ND	**6.26**	ND	**4.14**	ND	**4.00**	ND	**15.5 P**	**25.0 P**	**87.1**	ND	ND	**16.9**	ND	ND	3.3	13,000
4,4'-DDT	**73.1**	ND	**681**	ND	**39.0**	**7.31**	**66.6 P**	ND	**14.6**	**51.9 P**	**754**	ND	**22.0**	ND	**135**	**61.4**	3.3	7,900
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-Chlordane	**120 P**	ND	23.3 P	ND	20.5	ND	ND	ND	ND	ND	8.54	ND	ND	ND	**132 PI**	58.4	94	4,200
trans-Chlordane	29.5	ND	12.6 PI	ND	5.65 PI	ND	ND	ND	ND	ND	12.3	ND	ND	ND	97.6	42.3 P	-	-
Chlordane	ND	ND	ND	ND	112	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.62	374	-	-
Polychlorinated Biphenyls in micrograms per kilogram																		
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1242	ND	ND	ND	ND	ND	ND	87.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1254	ND	ND	ND	ND	**110**	ND	**246**	ND	67.4	71.8	86.3 P	ND	ND	6.43 J	ND	**178**	100	1,000
Aroclor 1260	ND	ND	ND	ND	19.1 J	ND	34.6	ND	ND	36.5 J	48.9 P	ND	26.5 J	ND	ND	ND	100	1,000
Aroclor 1262	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1268	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	39.3 J	ND	12.6 J	ND	ND	ND	100	1,000
General Chemistry																		
Cyanide in milligrams per kilogram	ND	ND	ND	ND	0.42 J	ND	0.60 J	ND	1.9	5.4	0.53 J	1.6	0.26 J	2.4	0.51 J	ND	27	27

Notes:

ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
P = the RPD between the results for the two columns exceeds the method-specific criteria.
I = the lower value for the two columns has been reported due to interference.

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B17		B18		B19		B20			B21		B22		B23		B24		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	5-7	7-9	5-7	7-9	4-6	6-8	0-2	2-4	2-4 (dup)	0-2	3-5	0-2	5-7	0-2	5-7	0-2	2-4		
Soil Type	Fill	Native	Fill	Native	Fill	Native	Native			Fill	Native	Fill	Native	Fill	Native	Fill	Native		
Sample Date	8/29/18									8/30/18									
TCL Volatile Organic Compounds in ug/kg																			
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	100,000
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270	26,000
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	370	49,000
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	760	2,400
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.80	1,300	19,000
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000
Trichlorofluoromethane	12	0.94 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	3,100
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	680	100,000
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzene	ND	ND	0.43 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.27 J	ND	ND	ND	60	4,800
Toluene	0.69 J	ND	2.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	44 J	ND	700	100,000
Ethylbenzene	1.1 J	ND	0.77 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.8	1.7	ND	ND	1,000	41,000
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.75 J	20	900
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14 J	ND	190	100,000
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	470	21,000
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	49,000
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	160 J	ND	ND	ND	ND	ND	1,800	13,000
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	930	100,000
p/m-Xylene	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	51	8.7	ND	ND	-	-
o-Xylene	2.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	23	3.2	ND	ND	-	-
Xylenes, Total	8.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	74	12	ND	ND	260	100,000
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.61 J	ND	120	0.64 J	250	100,000
1,2-Dichloroethene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.61 J	ND	130 J	0.64 J	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Styrene	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetone	**79**	17	**130**	33	ND	45	ND	22	19	ND	31	ND	35	**180**	**83**	ND	150	50	100,000
Carbon disulfide	ND	ND	ND	ND	ND	13	ND	4.8 J	ND	ND	ND	ND	ND	ND	8.8 J	ND	ND	-	-
2-Butanone	6.0 J	ND	11	4.7 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	44	21	ND	44	120	100,000
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12,000	-
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11,000	100,000
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,900	100,000
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.32 J	ND	ND	ND	-	-
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	49 J	0.44 J	ND	ND	ND	ND	2.6	ND	ND	ND	ND	-	-
Naphthalene	1.8 J	ND	22	0.63 J	2,500	20	1,100	1.3 J	ND	2,800	1.6 J	**130,000**	ND	1.6 J	ND	2,700	ND	12,000	100,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,900	100,000
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	610 J	ND	ND	ND	ND	ND	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	430 J	ND	ND	ND	ND	ND	-	-
1,3,5-Trimethylbenzene	0.26 J	ND	0.39 J	ND	13 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8,400	52,000
1,2,4-Trimethylbenzene	0.48 J	ND	1.0 J	ND	34 J	ND	42 J	ND	ND	ND	ND	ND	ND	ND	ND	29 J	ND	3,600	52,000
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	13,000
p-Diethylbenzene	ND	ND	ND	ND	ND	ND	17 J	ND	ND	ND	ND	220 J	ND	ND	ND	26 J	ND	-	-
p-Ethyltoluene	ND	ND	ND	ND	29 J	ND	33 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,4,5-Tetramethylbenzene	ND	ND	0.96 J	ND	64 J	ND	70 J	ND	ND	ND	ND	880 J	ND	ND	ND	62 J	ND	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tenatively Identified Compounds in ug/kg	20.8 J	13.0 J	69.4 J	6.32 J	4,190 J	17.1 J	2,670 J	ND	ND	3,060 J	6.16 J	37,000 J	21.1 J	ND	6.18 J	1,610 J	4.92 J	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

FPM

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B17		B18		B19		B20			B21		B22		B23		B24		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	5-7	7-9	5-7	7-9	4-6	6-8	0-2	2-4	2-4 (dup)	0-2	3-5	0-2	5-7	0-2	5-7	0-2	2-4		
Soil Type	Fill	Native	Fill	Native	Fill	Native	Native			Fill	Native	Fill	Native	Fill	Native	Fill	Native		
Sample Date	8/29/18									8/30/18									
TCL Semivolatile Organic Compounds in ug/kg																			
Acenaphthene	ND	63 J	270	600	160	460	5,300	ND	ND	3,100	ND	**30,000**	34 J	210	ND	55 J	ND	20,000	100,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,000	-
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	-
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	36 J	ND	1,800	-
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Fluoranthene	280	490	210	310	200	24 J	33,000	190	100	36,000	ND	**220,000**	700	3,500	50 J	1,000	61 J	100,000	100,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Naphthalene	35 J	70 J	120 J	100 J	140 J	ND	1,800	ND	ND	1,400	ND	**30,000**	83 J	180	ND	100 J	ND	12,000	100,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
NDPA/DPA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	ND	580	ND	ND	ND	ND	ND	390	ND	570	ND	-	-
Butyl benzyl phthalate	100 J	ND	ND	ND	1,500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	39 J	ND	-	-
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzo(a)anthracene	160	200	110 J	100 J	52 J	ND	**14,000**	79 J	45 J	**18,000**	ND	**140,000**	400	**1,300**	24 J	480	21 J	1,000	1,000
Benzo(a)pyrene	150	180	110 J	89 J	ND	ND	**12,000**	64 J	ND	**14,000**	ND	**120,000**	280	**1,400**	ND	470	ND	1,000	1,000
Benzo(b)fluoranthene	220	290	150	130	37 J	ND	**14,000**	100 J	51 J	**18,000**	ND	**180,000**	420	**2,100**	34 J	680	ND	1,000	1,000
Benzo(k)fluoranthene	70 J	73 J	35 J	40 J	ND	ND	**4,600**	ND	ND	**4,440**	ND	**45,000**	160	600	ND	210	ND	800	3,900
Chrysene	160	210	120	100 J	41 J	ND	**12,000**	82 J	44 J	**17,000**	ND	**120,000**	390	**1,600**	31 J	520	11 J	1,000	3,900
Acenaphthylene	110 J	81 J	74 J	54 J	ND	ND	250 J	ND	ND	1,900	ND	1,300 J	370	600	ND	78 J	ND	100,000	100,000
Anthracene	48 J	74 J	61 J	100 J	46 J	ND	14,000	ND	ND	10,000	ND	60,000	110 J	680	ND	140	ND	100,000	100,000
Benzo(ghi)perylene	120 J	140 J	72 J	71 J	ND	ND	7,600	46 J	23 J	6,400	ND	54,000	230	930	27 J	350	ND	100,000	100,000
Fluorene	19 J	45 J	190	450	110 J	200	6,300	ND	ND	4,100	ND	**35,000**	64 J	480	ND	63 J	36 J	30,000	100,000
Phenanthrene	130	240	62 J	48 J	280	ND	34,000	140	66 J	33,000	ND	**160,000**	270	3,400	39 J	580	160	100,000	100,000
Dibenzo(a,h)anthracene	23 J	28 J	ND	ND	ND	ND	**1,900**	ND	ND	**2,300**	ND	**17,000**	61 J	250	ND	85 J	ND	330	330
Indeno(1,2,3-cd)pyrene	120 J	150	69 J	65 J	ND	ND	**7,900**	47 J	ND	**7,900**	ND	**66,000**	250	**1,100**	ND	360	ND	500	500
Pyrene	270	400	250	260	150	ND	27,000	170	86 J	32,000	ND	**200,000**	820	3,100	47 J	970	54 J	100,000	100,000
Biphenyl	ND	ND	ND	ND	46 J	ND	450 J	ND	ND	220 J	ND	2,900 J	ND	ND	ND	ND	ND	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibenzofuran	ND	36 J	340	420	110 J	ND	4,200	ND	ND	2,000	ND	**21,000**	27 J	260	ND	31 J	20 J	7,000	-
2-Methylnaphthalene	24 J	23 J	47 J	50 J	170 J	ND	1,800	ND	ND	630	ND	10,000	48 J	130 J	ND	34 J	ND	-	-
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31 J	ND	ND	ND	ND	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	800	6,700
Phenol	ND	ND	ND	ND	ND	76 J	ND	ND	ND	83 J	ND	ND	ND	ND	ND	ND	ND	330	100,000
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
3-Methylphenol/4-Methylphenol	ND	ND	ND	ND	ND	34 J	ND	ND	ND	50 J	ND	**630 J**	ND	31 J	ND	ND	ND	330	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzyl Alcohol	ND	ND	ND	ND	140 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Carbazole	22 J	31 J	ND	ND	35 J	ND	3,100	ND	ND	1,900	ND	26,000	31 J	380	ND	64 J	ND	-	-
Tenatively Identified Compounds in ug/kg	1,410 J	1,390 J	1,940 J	2,120 J	4,190 J	192 J	37,700 J	5,140 J	1,880 J	34,900 J	898 J	321,000 J	5,970 J	8,640	12,900 J	5,770 J	5,080 J	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B17		B18		B19		B20			B21		B22		B23		B24		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	5-7	7-9	5-7	7-9	4-6	6-8	0-2	2-4	2-4 (dup)	0-2	3-5	0-2	5-7	0-2	5-7	0-2	2-4		
Soil Type	Fill	Native	Fill	Native	Fill	Native	Native			Fill	Native	Fill	Native	Fill	Native	Fill	Native		
Sample Date	8/29/18									8/30/18									
Metals in milligrams per kilogram																			
Aluminum, Total	6,030	1,260	1,130	1,310	3,920	1,330	4,260	2,670	2,660	2,400	1,460	2,180	3,740	3,460	1,900	3,570	2,570	-	-
Antimony, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.381 J	ND	2.28 J	ND	-	-
Arsenic, Total	8.37	0.42 J	1.07	1.32	3.17	1.38	4.67	1.48	1.6	8.27	1.72	10.1	5.30	8.69	2.16	11.2	4.26	13	16
Barium, Total	22.4	9.87	13.4	19.2	37.1	8.88	177	32.8	35	49.4	17.5	57.5	33.1	250	22.1	**400**	176	350	400
Beryllium, Total	0.13 J	ND	ND	0.20 J	0.106 J	ND	0.081 J	ND	ND	ND	ND	0.043 J	0.067 J	0.097 J	0.043 J	0.102 J	ND	7.2	72
Cadmium, Total	0.408 J	ND	0.113 J	0.152 J	0.150 J	ND	0.528 J	0.107 J	0.126 J	0.264 J	ND	0.306 J	0.26 J	0.726 J	0.112 J	**4.4**	0.951	2.5	4.3
Calcium, Total	8,330	444	1,640	472	74,800	985	6,140	644	956	914	341	844	31,500	30,300	8,000	15,800	2,000	-	-
Chromium, Total	20.8	4.16	5.00	5.77	17.2	4.65	12.2	11.7	8.74	7.20	7.99	10.7	30.6	12.1	7.21	**50.6**	20.0	30	180
Cobalt, Total	4.19	1.01 J	0.94 J	2.53	2.49	1.54 J	6.58	2.62	3	2.16	1.06 J	2.07	2.75	3.44	1.17 J	4.34	2.13	-	-
Copper, Total	11.7	2.66	10.9	35.0	28.1	1.86	**65.7**	6.51	10.2	13.1	2.69	18.9	14.6	31.4	6.90	**217**	**106**	50	270
Iron, Total	18,000	1,840	3,120	3,890	5,660	2,400	12,400	5,420	5,860	7,450	3,300	6,950	5,850	10,200	3,140	21,800	5,920	-	-
Lead, Total	15.6	3.34 J	18.1	56.2	30.0	2.16 J	**219**	26.1	28.2	**115**	2.23 J	**303**	52.4	**437**	55.8	**1,520**	**930**	63	400
Magnesium, Total	3,450	538	429	467	20,000	545	2,770	1,250	1,270	861	513	746	6,410	4,840	4,590	7,100	906	-	-
Manganese, Total	100	17.3	16.6	23.4	101	22.5	141	66	70.8	71	20.8	69.5	88.3	141	38.9	197	48.5	1,600	2,000
Mercury, Total	**0.320**	ND	0.100	ND	0.123	ND	**0.344**	0.096	ND	ND	ND	0.070	0.040 J	**0.181**	0.086	**0.958**	0.085	0.18	0.81
Nickel, Total	8.27	2.23 J	2.48	5.80	6.15	2.85	12.6	5.23	5.62	5.24	2.14 J	6.33	9.98	7.87	2.90	16.6	9.38	30	310
Potassium, Total	1,790	374	500	281	814	505	1,360	1,230	1,340	302	330	255	384	363	365	252	316	-	-
Selenium, Total	0.733 J	ND	ND	ND	ND	ND	ND	ND	ND	0.306 J	ND	ND	ND	0.478 J	ND	0.806 J	0.346 J	3.9	180
Silver, Total	0.306 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.75**	0.418 J	2	180
Sodium, Total	684	132 J	261	307	366	135 J	91.6 J	58.5 J	50.3 J	31.6 J	23.5 J	105 J	86.9 J	115 J	157 J	99.4 J	55.7 J	-	-
Thallium, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vanadium, Total	28.5	4.10	5.33	5.43	10.4	5.32	15.6	9.57	9.86	12.1	9.56	14.4	13.9	14.9	9.75	28.5	19.7	-	-
Zinc, Total	54.4	8.78	33.9	**276**	**110**	6.64	**348**	30.9	75	65.2	7.32	85.0	51.6	**310**	24.4	**2,120**	**513**	109	10,000
Pesticides in micrograms per kilogram																			
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	100,000
Lindane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,300
Alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	480
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	36	360
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	42	2,100
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	97
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.55 PI	ND	ND	1.45 J	-	-
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	11,000
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**6.49**	ND	3.06 P	ND	5	200
4,4'-DDE	**112**	**34.5**	2.91 P	ND	**4.21 P**	ND	**110**	**19.5**	0.815 JPI	21.1 P	ND	99.20	ND	225	3.55 PI	82.4	5.08	3.3	8,900
4,4'-DDD	**40.7**	**50.0**	2.10	1.76 J	1.93	ND	**17.4**	1.59 J	ND	ND	ND	12.7 PI	ND	227	8.35 PI	108	9.42	3.3	13,000
4,4'-DDT	**154**	**11.6**	ND	ND	1.68	ND	**41.7 P**	**8.38**	1.83 J	13.6 J	ND	115 P	ND	16.40	ND	13.6	3.03 J	3.3	7,900
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.33 JPI	ND	1.40 JPI	ND	ND	ND	2,400	24,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.40 J	ND	-	-
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.26 J	ND	ND	ND	117	1.32 J	26.3	1.34 J	94	4,200
trans-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	66.7	1.56 J	19.7	1.06 J	-	-
Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	702	12.7 J	ND	15.3	-	-
Polychlorinated Biphenyls in micrograms per kilogram																			
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1254	23.1 J	ND	ND	ND	7.75 J	ND	11.1 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	14 J	100	1,000
Aroclor 1260	ND	ND	ND	ND	ND	ND	13.6 J	ND	ND	ND	ND	ND	ND	17.6 J	ND	21.5 J	ND	100	1,000
Aroclor 1262	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1268	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
General Chemistry																			
Cyanide in milligrams per kilogram	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.2	ND	ND	0.44 J	ND	27	27

Notes:

ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
P = the RPD between the results for the two columns exceeds the method-specific criteria.
I = the lower value for the two columns has been reported due to interference.

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B25			B26		B27		B28		B29		B30		B31		B32		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	2-4 (dup)	0-2	3-5	0-2	2-4	0-2	3-5	0-2	3-5	0-2	2-4	4-6	6-8	5-7	7-9		
Soil Type	Fill	Native	Native	Fill	Native	Fill	Native	Native		Fill	Native	Fill	Native	Fill	Native	Fill	Native		
Sample Date	8/30/18					9/4/18								9/5/18					
TCL Volatile Organic Compounds in ug/kg																			
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	100,000
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270	26,000
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	370	49,000
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	760	2,400
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tetrachloroethene	0.67	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,300	19,000
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22 J	ND	ND	ND	1,100	100,000
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,800	15	220 J	0.81 J	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	3,100
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	680	100,000
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	60	4,800
Toluene	ND	ND	ND	ND	ND	24	2.8	24	2	12	4.2	12	4.8	140	0.55 J	ND	ND	700	100,000
Ethylbenzene	6.6	ND	ND	ND	ND	0.49 J	ND	0.36 J	ND	ND	ND	ND	ND	90	0.25 J	130	ND	1,000	41,000
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	900
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190	100,000
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	470	21,000
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	49,000
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	0.71 J	0.99 J	0.80 J	0.57 J	0.57 J	0.88 J	0.44 J	0.22 J	13 J	ND	14 J	ND	1,800	13,000
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	930	100,000
p/m-Xylene	33	ND	ND	ND	ND	2.5	ND	1.4 J	ND	ND	ND	ND	ND	310	0.72 J	690	ND	-	-
o-Xylene	12	ND	ND	ND	ND	1.5	ND	0.70 J	ND	ND	ND	ND	ND	170	0.37 J	260	ND	-	-
Xylenes, Total	45	ND	ND	ND	ND	4.0	ND	2.1 J	ND	ND	ND	ND	ND	**480**	1.1 J	**950**	ND	260	100,000
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	250	100,000
1,2-Dichloroethene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	73 J	ND	ND	ND	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0 J	ND	12	-	-
Acetone	7.6 J	36	25	41	6.5 J	**62**	34	26	13	23	9.9	12	7.7 J	ND	**94**	ND	27	50	100,000
Carbon disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Butanone	ND	ND	ND	5.6 J	ND	7.0 J	4.0 J	ND	ND	ND	ND	ND	ND	ND	4.3 J	ND	ND	120	100,000
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12,000	-
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11,000	100,000
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,900	100,000
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	26 J	ND	7.6 J	0.11 J	-	-
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13 J	ND	ND	ND	-	-
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	180 J	10	53 J	0.65 J	12,000	100,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	15 J	ND	ND	ND	3,900	100,000
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22 J	ND	ND	ND	8,400	52,000
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	60 J	0.32 J	ND	ND	3,600	52,000
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	13,000
p-Diethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	42 J	ND	ND	ND	-	-
p-Ethyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	34 J	ND	ND	0.76 J	-	-
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	19 J	ND	ND	ND	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tenatively Identified Compounds in ug/kg	ND	2.26 J	ND	ND	ND	5.81 J	3.09 J	ND	2.43 J	6.16 J	2.73	ND	2.84 J	3,050 J	35.7 J	876 J	11.8 J	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

FPM

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B25			B26		B27		B28		B29		B30		B31		B32		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	2-4 (dup)	0-2	3-5	0-2	2-4	0-2	3-5	0-2	3-5	0-2	2-4	4-6	6-8	5-7	7-9		
Soil Type	Fill	Native	Native	Fill	Native	Fill	Native	Native		Fill	Native	Fill	Native	Fill	Native	Fill	Native		
Sample Date	8/30/18					9/4/18								9/5/18					
TCL Semivolatile Organic Compounds in ug/kg																			
Acenaphthene	650	ND	ND	ND	ND	74 J	ND	ND	ND	ND	ND	ND	ND	24 J	72 J	26 J	52 J	20,000	100,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,000	-
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	-
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,800	-
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Fluoranthene	6,600	ND	ND	170	ND	1,200	ND	ND	44 J	540 J	ND	ND	ND	170	700	200	270	100,000	100,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Naphthalene	240	ND	ND	ND	ND	70 J	ND	ND	ND	ND	ND	ND	ND	54 J	63 J	130 J	160 J	12,000	100,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
NDPA/DPA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	84 J	580	ND	ND	ND	ND	ND	ND	ND	ND	130 J	ND	110 J	ND	-	-
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,400	ND	740	ND	-	-
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	46 J	ND	ND	ND	-	-
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzo(a)anthracene	**3,200**	ND	ND	97 J	ND	600	ND	ND	27 J	420 J	ND	ND	ND	100	200	140	270	1,000	1,000
Benzo(a)pyrene	**2,900**	ND	ND	100 J	ND	520	ND	ND	ND	ND	ND	ND	ND	99 J	87 J	170	340	1,000	1,000
Benzo(b)fluoranthene	**3,700**	ND	ND	150	ND	660	ND	ND	33 J	620 J	ND	ND	ND	140	160	270	580	1,000	1,000
Benzo(k)fluoranthene	**1,100**	ND	ND	53 J	ND	240	ND	ND	ND	ND	ND	ND	ND	43 J	53 J	100 J	170	800	3,900
Chrysene	**3,200**	ND	ND	110	ND	570	ND	100 J	27 J	480 J	ND	190 J	ND	120	250	170	320	1,000	3,900
Acenaphthylene	320	ND	ND	ND	ND	84 J	ND	ND	ND	720 J	ND	ND	ND	98 J	140 J	400	1,200	100,000	100,000
Anthracene	1,400	ND	ND	ND	ND	220	ND	ND	ND	ND	ND	ND	ND	41 J	180	85 J	170	100,000	100,000
Benzo(ghi)perylene	1,700	ND	ND	92 J	ND	370	ND	ND	ND	400 J	ND	ND	ND	97 J	86 J	180	410	100,000	100,000
Fluorene	560	ND	ND	ND	ND	80 J	ND	ND	ND	ND	ND	ND	ND	21 J	95 J	42 J	87 J	30,000	100,000
Phenanthrene	5,800	ND	ND	92 J	ND	740	ND	ND	ND	340 J	ND	ND	ND	160	240	170	150	100,000	100,000
Dibenzo(a,h)anthracene	**440**	ND	ND	ND	ND	84 J	ND	ND	ND	ND	ND	ND	ND	28 J	ND	41 J	110	330	330
Indeno(1,2,3-cd)pyrene	**1,700**	ND	ND	73 J	ND	380	ND	ND	ND	370 J	ND	ND	ND	79 J	72 J	170	430	500	500
Pyrene	6,400	ND	20 J	170	ND	1,000	ND	100 J	41 J	590 J	ND	190 J	ND	170	530	220	360	100,000	100,000
Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibenzofuran	260	ND	ND	ND	ND	34 J	ND	ND	ND	ND	ND	ND	ND	19 J	72 J	29 J	35 J	7,000	-
2-Methylnaphthalene	140 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	48 J	29 J	130 J	100 J	-	-
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32 J	ND	56 J	45 J	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	800	6,700
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140 J	41 J	69 J	ND	330	100,000
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
3-Methylphenol/4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100 J	ND	58 J	ND	-	-
Carbazole	660	ND	ND	ND	ND	110 J	ND	ND	ND	ND	ND	ND	ND	ND	19 J	23 J	26 J	-	-
Tenatively Identified Compounds in ug/kg	12,100 J	2,710 J	3,500 J	2,020 J	2,350 J	5,800 J	ND	2,830 J	896 J	4,060 J	ND	ND	ND	3,240 J	1,690 J	7,640 J	13,100 J	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B25			B26		B27		B28		B29		B30		B31		B32		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	2-4 (dup)	0-2	3-5	0-2	2-4	0-2	3-5	0-2	3-5	0-2	2-4	4-6	6-8	5-7	7-9		
Soil Type	Fill	Native	Native	Fill	Native	Fill	Native	Native		Fill	Native	Fill	Native	Fill	Native	Fill	Native		
Sample Date	8/30/18					9/4/18								9/5/18					
Metals in milligrams per kilogram																			
Aluminum, Total	2,820	1,720	1,780	2,670	4,820	2,800	2,190	2,220	1,040	1,640	1,450	1,360	1,310	4,960	418	2,720	1,620	-	-
Antimony, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.69 J	ND	ND	ND	2.47 J	0.377 J	1.77 J	0.966 J	-	-
Arsenic, Total	**13.8**	1.10	1.11	3.28	1.62	5.51	2.74	3.40	0.72 J	2.04	0.644 J	3.35	0.872 J	3.83	0.458 J	4.44	1.38	13	16
Barium, Total	33.3	17.2	17.6	25.9	68.8	26.7	10.1	20.9	9.81	18.7	14.0	11.5	10.7	64.6	4.56	34.0	22.6	350	400
Beryllium, Total	0.060 J	ND	ND	ND	ND	0.067 J	0.056 J	0.067 J	ND	0.069 J	ND	ND	ND	0.780	ND	0.165 J	0.072 J	7.2	72
Cadmium, Total	0.387 J	0.156 J	0.156 J	0.401 J	0.715 J	0.261 J	0.169 J	0.244 J	ND	0.254 J	ND	0.345 J	ND	0.476 J	ND	0.382 J	0.108 J	2.5	4.3
Calcium, Total	11,300	424	407	40,500	1,060	124,000	518	62,300	367	11,600	1,170	95,200	358	67,300	1,240	19,600	483	-	-
Chromium, Total	21.7	5.66	5.75	18.9	11.0	7.83	6.99	5.65	4.50	4.76	5.67	4.00	4.65	20.8	2.08	13.4	6.35	30	180
Cobalt, Total	2.67	1.61 J	1.65 J	2.40	4.18	2.80	2.49	2.18	0.858 J	1.79	1.03 J	2.35	1.02 J	10.6	0.377 J	2.18	1.34 J	-	-
Copper, Total	24.4	2.58	2.52	26.0	11.4	11.0	6.38	10.3	2.56	13.8	2.27	15.5	2.94	**204**	1.98	19.1	**59.0**	50	270
Iron, Total	7,630	3,280	3,260	6,340	8,240	7,970	3,730	6,070	2,330	5,270	2,470	6,390	2,490	10,800	945	4,770	4,180	-	-
Lead, Total	**194**	11.5	7.08	**101**	**188**	18.6	1.34 J	16.0	17.4	52.5	3.55 J	18.3	2.68 J	**155**	4.83	29.5	29.4	63	400
Magnesium, Total	1,560	689	728	18,400	1,400	8,000	806	14,300	370	1,180	572	40,200	432	6,040	160	2,820	615	-	-
Manganese, Total	97.2	29.0	29.5	104	66.2	250	35.2	114	18.3	65.6	21.7	116	17.8	157	9.32	65.8	24.8	1,600	2,000
Mercury, Total	**0.237**	ND	ND	0.154	0.021 J	0.074	ND	0.021 J	ND	0.052 J	ND	0.047 J	ND	**0.388**	**0.342**	**0.356**	0.034 J	0.18	0.81
Nickel, Total	10.0	3.10	3.08	7.76	10.1	7.13	4.15	5.52	1.84 J	5.24	2.33	4.73	2.26 J	29.9	0.854 J	6.28	3.25	30	310
Potassium, Total	394	448	480	316	765	408	525	436	236	269	346	294	316	1,010	194 J	606	372	-	-
Selenium, Total	0.267 J	ND	ND	0.242 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.444 J	ND	0.252 J	ND	3.9	180
Silver, Total	0.86	ND	ND	1.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.38**	ND	2	180
Sodium, Total	45.9 J	23.5 J	25.3 J	89.2 J	214	206	33.5 J	110 J	25.5 J	93.6 J	37.4 J	246	95.4 J	815	224	262	110 J	-	-
Thallium, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vanadium, Total	19.1	6.84	6.93	17.3	14.2	6.98	7.88	11.8	5.63	10.5	6.51	13.4	6.79	11.0	1.64	9.13	8.28	-	-
Zinc, Total	**117**	27.5	27.1	109	**656**	22.8	18.9	23.2	4.96	41.0	5.96	29.6	7.44	**1,370**	4.82	82.4	19.2	109	10,000
Pesticides in micrograms per kilogram																			
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	100,000
Lindane	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.68 P	ND	ND	ND	ND	ND	ND	ND	100	1,300
Alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	480
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	36	360
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	42	2,100
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	97
Heptachlor epoxide	2.86 J	ND	ND	ND	ND	3.73 PI	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	11,000
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.06	ND	ND	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dieldrin	0.854 JPI	ND	ND	ND	2.60	0.755 JPI	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	200
4,4'-DDE	**62.3**	ND	ND	**19.0**	2.85	**239**	0.658 J	**40.2**	ND	**56.1**	ND	**24.6 J**	ND	**4.10 PI**	1.73 JPI	**31.3**	ND	3.3	8,900
4,4'-DDD	**4.56 P**	ND	ND	**10.1**	3.15	**88.6**	0.724 J	**16.6**	ND	**50.5**	1.02 J	ND	ND	ND	**4.10**	**26.1**	**26.4**	3.3	13,000
4,4'-DDT	**53.2 P**	ND	ND	**3.55**	ND	**11.1**	ND	ND	ND	**11.7 P**	ND	**44.9 J**	ND	**9.10**	ND	**30.8 PI**	ND	3.3	7,900
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan II	5.92 P	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-Chlordane	1.80 JPI	ND	ND	2.07 J	5.90	3.61	ND	ND	ND	2.31 PI	ND	ND	ND	ND	ND	ND	ND	94	4,200
trans-Chlordane	1.31 JPI	ND	ND	1.28 J	3.25 PI	1.63 JPI	ND	ND	ND	3.62 PI	ND	ND	1.65 JPI	ND	ND	ND	ND	-	-
Chlordane	ND	ND	ND	ND	ND	44.6 PI	ND	ND	ND	40.0	ND	ND	ND	ND	ND	ND	ND	-	-
Polychlorinated Biphenyls in micrograms per kilogram																			
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1254	26.6 J	ND	ND	ND	ND	ND	ND	ND	ND	9.84 J	ND	ND	ND	10.7 J	ND	11.2 J	ND	100	1,000
Aroclor 1260	29.4 J	ND	ND	10.8 J	8.94 J	19.9 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1262	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1268	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
General Chemistry																			
Cyanide in milligrams per kilogram	0.26 J	ND	ND	ND	ND	0.25 J	ND	ND	ND	0.86 J	ND	ND	ND	ND	ND	3.1	2.9	27	27

Notes:

ND = Not detected.

J = Estimated concentration below the RL but above the MDL.

Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

P = the RPD between the results for the two columns exceeds the method-specific criteria.

I = the lower value for the two columns has been reported due to interference.

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B33		B34			B35		B36		B37		B38		B39		B40			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	4-6	6-8	5-7	7-9	7-9 (dup)	4-6	6-8	2-4	4-6	2-4	4-6	2-4	4-6	2-4	4-6	0-2	2-4	2-4 (dup)		
Soil Type	Fill	Native	Fill	Native	Native	Fill	Native	Native		Fill	Native	Fill	Native	Fill	Native	Fill	Native	Native		
Sample Date	9/5/18									9/11/18										
TCL Volatile Organic Compounds in ug/kg																				
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	100,000
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270	26,000
Chloroform	ND	ND	ND	ND	ND	0.75 J	0.56 J	0.15 J	0.41 J	ND	0.63 J	ND	2.1	0.27 J	0.71 J	ND	ND	ND	370	49,000
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	760	2,400
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tetrachloroethene	ND	ND	ND	ND	ND	0.23 J	0.93	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND	1,300	19,000
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000
Trichlorofluoromethane	27	0.99 J	7.0	ND	ND	ND	0.88 J	2.1 J	3.0 J	ND	ND	1.6 J	16	1.8 J	ND	ND	ND	ND	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	3,100
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	0.23 J	1.0	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND	ND	680	100,000
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzene	0.27 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	60	4,800
Toluene	0.90 J	ND	0.64 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	700	100,000
Ethylbenzene	9.6	ND	0.14 J	ND	ND	ND	6.7	ND	ND	ND	ND	ND	ND	0.55 J	ND	0.56 J	ND	ND	1,000	41,000
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	900
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190	100,000
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.22 J	ND	ND	ND	ND	ND	ND	ND	470	21,000
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	1.7 J	1.1 J	ND	ND	0.55 J	2.0 J	ND	ND	0.23 J	ND	ND	ND	0.18 J	1,100	100,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.19 J	ND	ND	ND	ND	ND	ND	ND	2,400	49,000
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	0.32 J	0.34 J	ND	ND	ND	0.69 J	ND	ND	ND	ND	ND	ND	0.46 J	1,800	13,000
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	930	100,000
p/m-Xylene	48	ND	ND	ND	ND	ND	38	ND	ND	ND	ND	ND	ND	3.3	ND	2.5	ND	ND	-	-
o-Xylene	22	ND	0.36 J	ND	ND	ND	21	ND	ND	ND	ND	ND	ND	1.4	ND	0.99 J	ND	ND	-	-
Xylenes, Total	70	ND	0.36 J	ND	ND	ND	59	ND	ND	ND	ND	ND	ND	4.7	ND	3.5 J	ND	ND	260	100,000
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	250	100,000
1,2-Dichloroethene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Styrene	9.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dichlorodifluoromethane	0.99 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetone	**88**	ND	**360 J**	18	26	**70**	32	ND	ND	**180**	48	22	ND	12	15	12	41	**79**	50	100,000
Carbon disulfide	ND	ND	ND	ND	5.5 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Butanone	6.6 J	ND	39	ND	ND	10	ND	ND	ND	13 J	9.8 J	ND	ND	ND	ND	ND	6.9 J	6 J	120	100,000
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Methyl-2-pentanone	ND	ND	4.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Hexanone	ND	ND	2.4 J	ND	ND	1.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Butylbenzene	ND	ND	ND	ND	0.2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12,000	-
sec-Butylbenzene	ND	ND	ND	ND	0.16 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11,000	100,000
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,900	100,000
o-Chlorotoluene	ND	ND	ND	ND	ND	0.27 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	0.21 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isopropylbenzene	0.26 J	ND	ND	ND	ND	ND	0.23 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Isopropyltoluene	ND	ND	0.12 J	ND	0.15 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Naphthalene	1.4 J	ND	ND	ND	ND	42	1.4 J	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	ND	12,000	100,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,900	100,000
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	0.67 J	ND	ND	ND	1.9 J	0.52 J	ND	ND	1.6 J	ND	ND	ND	ND	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	1.3 J	0.32 J	ND	ND	2.8	0.77 J	ND	ND	2.2	ND	ND	ND	ND	-	-
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	0.26 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8,400	52,000
1,2,4-Trimethylbenzene	0.54 J	ND	ND	ND	ND	0.90 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,600	52,000
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	13,000
p-Diethylbenzene	0.22 J	ND	ND	ND	ND	0.93 J	0.25 J	ND	ND	0.36 J	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Ethyltoluene	0.42 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	1.1 J	ND	ND	ND	0.34 J	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tenatively Identified Compounds in ug/kg	99.0 J	12.8 J	2,290 J	ND	6.47 J	398 J	ND	ND	ND	57.7 J	87.2 J	41.5 J	42.4 J	33.9 J	19.8 J	42.2 J	12.2 J	67 J	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

FPM

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B33		B34			B35		B36		B37		B38		B39		B40			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	4-6	6-8	5-7	7-9	7-9 (dup)	4-6	6-8	2-4	4-6	2-4	4-6	2-4	4-6	2-4	4-6	0-2	2-4	2-4 (dup)		
Soil Type	Fill	Native	Fill	Native	Native	Fill	Native	Native		Fill	Native	Fill	Native	Fill	Native	Fill	Native	Native		
Sample Date	9/5/18									9/11/18										
TCL Semivolatile Organic Compounds in ug/kg																				
Acenaphthene	ND	ND	52 J	150 J	130 J	ND	360	ND	21 J	**38,000**	ND	20 J	27 J	30 J	90 J	20 J	160	55 J	20,000	100,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	290 J	ND	ND	ND	ND	ND	ND	ND	1,200	ND	ND	ND	ND	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	53 J	32 J	ND	ND	ND	ND	ND	200	ND	ND	ND	ND	1,000	-
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	-
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	57 J	ND	ND	ND	ND	1,800	-
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Fluoranthene	460 J	82 J	230	390	870	1,600	5,200	170	410	**220,000**	140	410	220	330	1,100	180	260	98 J	100,000	100,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Naphthalene	ND	ND	45 J	160 J	41 J	ND	260	ND	25 J	**19,000**	ND	ND	ND	91 J	30 J	ND	ND	ND	12,000	100,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
NDPA/DPA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-ethylhexyl)phthalate	1,100 J	ND	ND	ND	ND	ND	ND	ND	200	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Butyl benzyl phthalate	8,500 J	ND	210	ND	70 J	ND	ND	ND	3,300	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Di-n-butylphthalate	260 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzo(a)anthracene	250 J	51 J	100 J	87 J	260	930 J	**1,100**	100	210	**120,000**	80 J	290	120	300	630	140	170	55 J	1,000	1,000
Benzo(a)pyrene	ND	51 J	100 J	74 J	250	770 J	430	100 J	170	**100,000**	64 J	250	110 J	240	520	120 J	160	45 J	1,000	1,000
Benzo(b)fluoranthene	270 J	66 J	130	100 J	290	1,000	700	130	240	**130,000**	86 J	360	160	560	690	200	230	65 J	1,000	1,000
Benzo(k)fluoranthene	ND	ND	42 J	ND	140	310 J	220	46 J	70 J	**45,000**	ND	110	53 J	200	200	54 J	64 J	ND	800	3,900
Chrysene	230 J	49 J	100 J	83 J	240	810 J	**1,400**	110	190	**100,000**	70 J	260	110 J	440	580	190	170	48 J	1,000	3,900
Acenaphthylene	ND	ND	49 J	37 J	55 J	330 J	130 J	61 J	84 J	1,000 J	ND	190	ND	660	210	60 J	41 J	ND	100,000	100,000
Anthracene	ND	ND	52 J	ND	99 J	ND	1,700	ND	64 J	76,000	ND	62 J	ND	120	190	ND	35 J	ND	100,000	100,000
Benzo(ghi)perylene	150 J	33 J	82 J	51 J	140 J	590 J	200	90 J	120 J	51,000	51 J	190	81 J	340	320	100 J	90 J	34 J	100,000	100,000
Fluorene	ND	ND	36 J	110 J	87 J	ND	660	ND	28 J	**41,000**	ND	26 J	ND	41 J	84 J	ND	38 J	ND	30,000	100,000
Phenanthrene	350 J	29 J	120	54 J	220	990 J	2,500	75 J	210	**200,000**	78 J	180	110 J	190	660	69 J	120	39 J	100,000	100,000
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	56 J	21 J	31 J	**16,000**	ND	43 J	ND	92 J	80 J	34 J	27 J	ND	330	330
Indeno(1,2,3-cd)pyrene	140 J	35 J	77 J	56 J	150 J	**560 J**	210	82 J	130 J	**61,000**	44 J	190	83 J	340	340	75 J	100 J	35 J	500	500
Pyrene	380 J	84 J	200	270	650	1,500	3,700	170	370	**190,000**	130	380	200	410	910	170	240	90 J	100,000	100,000
Biphenyl	ND	ND	ND	ND	ND	ND	55 J	ND	ND	3,300 J	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibenzofuran	ND	ND	39 J	110 J	59 J	ND	240	ND	20 J	**24,000**	39 J	ND	ND	44 J	27 J	ND	40 J	ND	7,000	-
2-Methylnaphthalene	ND	ND	25 J	31 J	ND	ND	140 J	ND	ND	11,000	ND	ND	ND	79 J	ND	ND	ND	ND	-	-
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	800	6,700
Phenol	ND	ND	ND	ND	ND	ND	46 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
3-Methylphenol/4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Carbazole	ND	ND	ND	ND	ND	ND	120 J	ND	20 J	23,000	ND	21 J	ND	34 J	74 J	ND	ND	ND	-	-
Tenatively Identified Compounds in ug/kg	2,230 J	874 J	2,980 J	2,230 J	ND	ND	7,270 J	238 J	376 J	433,000 J	ND	2,260 J	168 J	10,200 J	525 J	ND	233 J	2,070 J	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
Bold orange-shaded values exceed NYSDEC Restricted Residential Use Soil Cleanup Objectives.

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TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B33		B34			B35		B36		B37		B38		B39		B40			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	4-6	6-8	5-7	7-9	7-9 (dup)	4-6	6-8	2-4	4-6	2-4	4-6	2-4	4-6	2-4	4-6	0-2	2-4	2-4 (dup)		
Soil Type	Fill	Native	Fill	Native	Native	Fill	Native	Native		Fill	Native	Fill	Native	Fill	Native	Fill	Native	Native		
Sample Date	9/5/18									9/11/18										
Metals in milligrams per kilogram																				
Aluminum, Total	3,600	2,050	2,520	2,110	1,760	1,740	1890	2,250	1,670	2,580	1,730	1,580	1,400	1,940	2,170	1,080	1,860	2,180	-	-
Antimony, Total	4.45 J	1.91 J	1.70 J	1.20 J	0.819 J	0.882 J	0.500 J	2.07 J	0.79 J	0.675 J	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Arsenic, Total	1.85	0.754 J	1.94	0.593 J	0.979	5.99	3.29	2.04	10.2	5.94	3.32	2.02	2.98	6.84	1.42	3.64	2.68	2.09	13	16
Barium, Total	41.4	21.5	37.8	40.0	30.9	28.4	29.2	26.2	23.0	41.3	19.4	29.4	24.0	35.3	18.1	8.59	23.8	16.5	350	400
Beryllium, Total	0.461	0.058 J	0.131 J	0.088 J	0.075 J	0.071 J	ND	0.079 J	0.045 J	ND	ND	0.107 J	ND	0.052 J	ND	ND	0.058 J	0.118 J	7.2	72
Cadmium, Total	0.362 J	0.203 J	0.505 J	0.262 J	0.179 J	0.282 J	0.288 J	0.310 J	ND	0.352 J	0.138 J	0.387 J	0.158 J	0.377 J	ND	0.282 J	0.124 J	0.176 J	2.5	4.3
Calcium, Total	53,100	1,660	15,000	606	939	4,510	4,760	15,800	534	12,600	608	2,680	3,100	4,640	4,390	66,200	16,700	668	-	-
Chromium, Total	14.0	12.6	15.8	7.70	6.42	18.1	10.2	9.42	7.04	20.0	**36.2**	6.18	6.21	9.74	11.8	3.30	4.76	6.39	30	180
Cobalt, Total	4.01	1.59 J	2.17	1.74 J	1.46 J	1.55 J	1.64 J	1.78	1.33 J	2.63	1.40 J	2.49	1.46 J	2.07	1.51 J	1.16 J	1.36 J	2.84	-	-
Copper, Total	**69.7**	16.6	**73.7**	10.4	9.74	26.9	**54.2**	40.0	4.03	**50.5**	13.4	38.5	9.65	26.9	7.82	3.47	7.82	25.3	50	270
Iron, Total	7,580	3,720	7,830	6,330	4,630	4,530	5,020	6,170	3,380	9,360	2,560	5,240	3,900	10,100	3,370	4,230	3,890	6,780	-	-
Lead, Total	55.2	21.4	**126**	50.4	34.7	32.7	62.8	41.5	12.4	45.6	11.6	**96.6**	31.6	55.9	14.1	9.13	27.3	40.7	63	400
Magnesium, Total	4,120	814	5,870	804	737	2,160	1,040	2,240	719	1,720	580	1,120	1,940	1,020	1,230	37,200	9,460	630	-	-
Manganese, Total	107	27.6	128	37.0	30.6	43.3	42.7	67.1	23.0	72.7	18.0	47.9	25.5	67.5	31.7	83.9	38.3	42.7	1,600	2,000
Mercury, Total	**0.218**	**0.259**	**0.560**	0.180	**0.265**	0.081	0.079	**0.403**	ND	0.166	0.115	0.030 J	ND	0.087	0.109	0.037 J	0.029 J	ND	0.18	0.81
Nickel, Total	11.9	9.07	13.7	8.20	5.27	4.16	5.53	11.0	3.12	6.64	6.69	9.16	3.13	5.63	3.35	6.22	3.05	6.36	30	310
Potassium, Total	615	500	726	558	478	433	388	579	575	623	383	463	332	570	552	206 J	271	272	-	-
Selenium, Total	0.316 J	ND	ND	ND	ND	ND	ND	ND	0.296 J	ND	ND	ND	ND	ND	ND	ND	0.240 J	ND	3.9	180
Silver, Total	ND	ND	1.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	180
Sodium, Total	606	197	412	241	232	129 J	126 J	290	90.6 J	208	45.5 J	108 J	125 J	188	96.1 J	41.3 J	134 J	92.9 J	-	-
Thallium, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vanadium, Total	8.62	9.01	7.42	9.19	7.33	7.78	9.66	8.46	8.40	10.8	5.34	8.97	7.58	10.0	8.11	61.4	11.0	8.65	-	-
Zinc, Total	**554**	43.4	65.0	27.7	23.4	52.1	61.5	49.6	15.8	81.7	35.1	**265**	43.0	49.0	20.6	16.0	23.5	**192**	109	10,000
Pesticides in micrograms per kilogram																				
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	100,000
Lindane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,300
Alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	480
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	36	360
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	42	2,100
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	97
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	11,000
Endrin aldehyde	ND	ND	ND	3.50	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	200
4,4'-DDE	**25.5**	1.26 JPI	**55.2 P**	**22.2 P**	**25.6**	**4.30 JPI**	**32.5 P**	1.42 JPI	2.62 PI	ND	0.648 J	ND	ND	**3.58 P**	1.34 J	**92.7**	**27.2 P**	1.02 J	3.3	8,900
4,4'-DDD	**6.03 J**	2.94	**5.47**	2.81	**5.76 P**	**6.25 J**	**12.6**	ND	1.37 J	ND	ND	ND	ND	ND	ND	**282**	**42.2**	1.94	3.3	13,000
4,4'-DDT	**29.1**	ND	**26.1**	ND	**3.4 J**	ND	**25.3**	2.47 J	**4.37**	ND	ND	ND	3.13 J	**3.76**	3.04 J	ND	**4.35**	ND	3.3	7,900
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	94	4,200
trans-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Polychlorinated Biphenyls in micrograms per kilogram																				
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1254	80.6	ND	9.15 J	ND	ND	ND	ND	ND	ND	55.4	ND	ND	ND	10.5 J	ND	ND	ND	ND	100	1,000
Aroclor 1260	32.5 J	ND	8.82 J	ND	ND	9.06 J	22.6 J	ND	ND	65.1 P	ND	ND	ND	13.5 J	ND	ND	ND	ND	100	1,000
Aroclor 1262	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1268	ND	ND	ND	ND	ND	4.22 J	ND	10.9 J	ND	ND	ND	ND	ND	6.79 J	ND	ND	ND	ND	100	1,000
General Chemistry																				
Cyanide in milligrams per kilogram	ND	ND	0.27 J	ND	ND	0.37 J	0.42 J	ND	ND	0.28 J	ND	ND	ND	0.50 J	ND	ND	0.37 J	ND	27	27

Notes:

ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
P = the RPD between the results for the two columns exceeds the method-specific criteria.
I = the lower value for the two columns has been reported due to interference.

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B41		B42		B43		B44		B45		B46		B47			B48		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	1-3	3-5	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	2-4 (dup.)	0-2	2-4		
Soil Type	Fill	Native	Fill		Native		Fill	Native	Native		Native		Native			Native			
Sample Date	9/11/18								9/19/18										
TCL Volatile Organic Compounds in ug/kg																			
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	100,000
1,1-Dichloroethane	ND	ND	0.33 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270	26,000
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	370	49,000
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	760	2,400
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tetrachloroethene	ND	ND	0.22 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,300	19,000
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	3,100
1,1,1-Trichloroethane	ND	ND	1.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	680	100,000
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	60	4,800
Toluene	ND	ND	0.65 J	ND	0.55 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	700	100,000
Ethylbenzene	1.2	ND	76	0.18 J	ND	ND	ND	ND	ND	ND	0.24 J	0.18 J	0.30 J	ND	ND	ND	ND	1,000	41,000
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	900
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190	100,000
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	470	21,000
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	49,000
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,800	13,000
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	930	100,000
p/m-Xylene	6.4	ND	450	0.78 J	ND	ND	ND	ND	34 J	ND	0.87 J	0.51 J	0.84 J	ND	ND	ND	ND	-	-
o-Xylene	2.5	ND	140	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.28 J	ND	ND	ND	ND	-	-
Xylenes, Total	8.9	ND	**590**	0.78 J	ND	ND	ND	ND	34 J	ND	0.87 J	0.51 J	1.1 J	ND	ND	ND	ND	260	100,000
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	250	100,000
1,2-Dichloroethene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetone	27	20	**53**	39	18	33	17	**63**	ND	38	15	38	46	**54**	**70**	23	6.9 J	50	100,000
Carbon disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Butanone	ND	ND	ND	ND	ND	ND	ND	3.0 J	ND	ND	ND	ND	ND	9.90	6.6 J	ND	ND	120	100,000
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12,000	-
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11,000	100,000
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,900	100,000
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isopropylbenzene	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12,000	100,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Propylbenzene	ND	ND	0.39 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,900	100,000
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3,5-Trimethylbenzene	ND	ND	0.42 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8,400	52,000
1,2,4-Trimethylbenzene	ND	ND	0.89 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,600	52,000
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	13,000
p-Diethylbenzene	ND	ND	0.27 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Ethyltoluene	ND	ND	1.4 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tenatively Identified Compounds in ug/kg	62.3 J	19.4 J	ND	18.2 J	8.75 J	12.8 J	5.38 J	8.87 J	ND	3.20 J	18.9 J	7.47 J	22.6 J	10.0 J	6.03 J	21.7 J	ND	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

FPM

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B41		B42		B43		B44		B45		B46		B47			B48		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	1-3	3-5	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	2-4 (dup.)	0-2	2-4		
Soil Type	Fill	Native	Fill		Native		Fill	Native	Native		Native		Native			Native			
Sample Date	9/11/18								9/19/18										
TCL Semivolatile Organic Compounds in ug/kg																			
Acenaphthene	ND	38 J	ND	ND	36 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20,000	100,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,000	-
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	-
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,800	-
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Fluoranthene	90 J	280	150	82 J	420	400	23 J	ND	ND	ND	340	ND	180	90 J	210	190	ND	100,000	100,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Naphthalene	ND	49 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	32 J	ND	ND	120 J	ND	12,000	100,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
NDPA/DPA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Butyl benzyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Di-n-butylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzo(a)anthracene	89 J	190	100	51 J	180	240	ND	ND	ND	ND	180	ND	130	51 J	100 J	120	ND	1,000	1,000
Benzo(a)pyrene	88 J	190	110 J	49 J	140	230	ND	ND	ND	ND	160	ND	130 J	55 J	100 J	120 J	ND	1,000	1,000
Benzo(b)fluoranthene	120	270	150	68 J	210	310	ND	ND	ND	ND	210	ND	170	76 J	130	160	ND	1,000	1,000
Benzo(k)fluoranthene	45 J	90 J	54 J	ND	70 J	120	ND	ND	ND	ND	84 J	ND	59 J	37 J	47 J	52 J	ND	800	3,900
Chrysene	97 J	180	110	49 J	170	230	ND	ND	ND	ND	170	ND	140	68 J	100 J	210	ND	1,000	3,900
Acenaphthylene	35 J	250	90 J	37 J	ND	87 J	ND	ND	ND	ND	ND	ND	66 J	40 J	ND	51 J	ND	100,000	100,000
Anthracene	ND	72 J	ND	ND	92 J	49 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	58 J	ND	100,000	100,000
Benzo(ghi)perylene	67 J	130 J	81 J	42 J	98 J	140	ND	ND	ND	ND	120 J	ND	60 J	52 J	71 J	120 J	ND	100,000	100,000
Fluorene	ND	32 J	ND	ND	32 J	ND	ND	ND	ND	ND	ND	ND	30 J	ND	ND	39 J	ND	30,000	100,000
Phenanthrene	41 J	160	84 J	47 J	380	130	ND	ND	ND	ND	190	ND	110 J	35 J	94 J	170	ND	100,000	100,000
Dibenzo(a,h)anthracene	ND	35 J	21 J	ND	22 J	38 J	ND	ND	ND	ND	35 J	ND	190	ND	ND	35 J	ND	330	330
Indeno(1,2,3-cd)pyrene	54 J	140 J	77 J	38 J	100 J	160	ND	ND	ND	ND	120 J	ND	ND	52 J	74 J	99 J	ND	500	500
Pyrene	86 J	260	150	82 J	320	360	21 J	ND	ND	ND	310	ND	ND	91 J	170	260	ND	100,000	100,000
Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibenzofuran	ND	ND	ND	ND	25 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	34 J	ND	7,000	-
2-Methylnaphthalene	ND	40 J	21 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	24 J	ND	ND	140 J	ND	-	-
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	800	6,700
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
3-Methylphenol/4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Carbazole	ND	19 J	ND	ND	45 J	19 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	31 J	ND	-	-
Tenatively Identified Compounds in ug/kg	ND	1,630 J	2,190 J	ND	ND	579 J	ND	ND	ND	ND	1,050 J	ND	1,410 J	2,110 J	3,390 J	1,120 J	320 J	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.

FPM

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B41		B42		B43		B44		B45		B46		B47			B48		6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	1-3	3-5	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	2-4 (dup.)	0-2	2-4		
Soil Type	Fill	Native	Fill		Native		Fill	Native	Native		Native		Native			Native			
Sample Date	9/11/18								9/19/18										
Metals in milligrams per kilogram																			
Aluminum, Total	1,750	1,800	1,580	1,700	2,530	2,210	3,480	1,420	1,740	980	1,420	636	1,570	1,310	1,800	2,030	1,130	-	-
Antimony, Total	1.17 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.362 J	ND	0.621 J	0.434 J	-	-
Arsenic, Total	2.63	1.26	2.21	3.59	2.98	2.88	3.37	1.12	1.58	0.531 J	1.85	0.592 J	2.58	1.41	2.05	**18.9**	2.55	13	16
Barium, Total	14.1	25.6	20.6	16.2	19.0	19.0	10.9	26.0	15.8	15.3	35.7	3.10	24.3	15.5	6.2	46.9	10.5	350	400
Beryllium, Total	ND	ND	ND	ND	ND	0.033 J	0.065 J	ND	0.112 J	ND	0.050 J	ND	0.032 J	0.039 J	0.081 J	0.276 J	ND	7.2	72
Cadmium, Total	0.186 J	ND	0.158 J	0.130 J	0.374 J	0.139 J	0.122 J	ND	0.201 J	ND	0.193 J	ND	0.146 J	0.181 J	0.108 J	0.820 J	ND	2.5	4.3
Calcium, Total	33,200	750	13,700	583	1,110	284	236	319	12,200	184	763	214	53,600	1,670	449	20,900	365	-	-
Chromium, Total	4.50	7.06	9.49	5.81	5.94	6.26	5.95	5.22	16.60	5.93	5.82	2.92	4.53	8.35	4.85	6.44	4.90	30	180
Cobalt, Total	1.42 J	1.21 J	1.32 J	1.49 J	2.01	2.05	2.25	0.928 J	2.62	0.755 J	1.33 J	0.552 J	1.10 J	1.53 J	1.18 J	4.89	1.32 J	-	-
Copper, Total	11.2	5.27	6.31	5.04	10.7	5.17	2.43	4.12	12.3	2.03	6.15	1.12	6.44	9.72	2.23	39.4	3.46	50	270
Iron, Total	3,490	3,380	4,130	4,620	4,860	5,740	6,200	2,260	9,320	2,230	3,080	1,550	6,310	3,430	5,580	12,000	3,430	-	-
Lead, Total	**226**	17.6	20.9	15.6	38.2	13.7	5.60	26.7	6.80	1.92 J	27.8	1.08 J	25.0	28.7	3.28 J	**109**	5.51	63	400
Magnesium, Total	18,000	734	7,690	678	1,050	468	422	498	6,710	374	564	238	25,800	436	204	11,300	450	-	-
Manganese, Total	48.6	24.2	33.2	26.3	77.4	37.7	56.5	15.5	136	13.9	40.3	12.1	78.7	54.3	23	45.2	16.6	1,600	2,000
Mercury, Total	0.067 J	ND	ND	ND	0.059 J	0.018 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.050 J	ND	0.18	0.81
Nickel, Total	3.46	2.64	3.05	2.78	9.86	6.91	2.82	2.03 J	6.62	2.12 J	3.34	1.19 J	2.98	4.67	2.44	13.6	3.32	30	310
Potassium, Total	261	424	431	488	312	195 J	128 J	304	365 J	306 J	286 J	175 J	138 J	220 J	90.1 J	192 J	289 J	-	-
Selenium, Total	ND	ND	ND	ND	ND	ND	ND	0.244 J	0.353 J	ND	ND	0.211 J	0.404 J	0.228 J	0.262 J	0.811 J	ND	3.9	180
Silver, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	180
Sodium, Total	63.6 J	40.5 J	37.1 J	33.0 J	33.8 J	22.8 J	38.8 J	49.0 J	96.6 J	35.1 J	22.2 J	14.8 J	58.3 J	106 J	46.5 J	114	43.1 J	-	-
Thallium, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vanadium, Total	12.3	9.17	8.13	8.11	34.7	32.9	9.68	7.80	11.8	4.32	12.0	3.29	14.5	6.33	5.76	16.0	6.84	-	-
Zinc, Total	31.8	10.9	**119**	18.7	77.5	23.7	7.94	8.50	13.7	4.51 J	23.0	2.3	33.6	26.3	7.45	57.4	5.59	109	10,000
Pesticides in micrograms per kilogram																			
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	100,000
Lindane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,300
Alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	480
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	36	360
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	42	2,100
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	97
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.29	ND	ND	ND	ND	-	-
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	11,000
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	200
4,4'-DDE	**168**	1.86	**5.90 J**	1.39 J	**225**	**11.5**	2.81	ND	1.62	ND	**10.2**	0.521 J	**14.1 P**	**10.8 P**	ND	3.07	ND	3.3	8,900
4,4'-DDD	**174**	1.72 J	**10.7**	ND	12.0 P	1.73	ND	ND	ND	ND	ND	ND	**16.5 P**	1.93 P	ND	**14.0**	ND	3.3	13,000
4,4'-DDT	**36.0**	ND	ND	3.24 J	**243 P**	**4.49**	ND	ND	ND	ND	**13.9**	ND	ND	**9.26 P**	ND	**3.57**	ND	3.3	7,900
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-Chlordane	9.43 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	94	4,200
trans-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Polychlorinated Biphenyls in micrograms per kilogram																			
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1254	ND	5.00 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1260	ND	ND	ND	ND	ND	7.44 J	ND	ND	ND	ND	ND	ND	8.29 J	ND	ND	19.6 J	ND	100	1,000
Aroclor 1262	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1268	ND	ND	ND	ND	ND	4.19 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.39 J	ND	100	1,000
General Chemistry																			
Cyanide in milligrams per kilogram	ND	0.39 J	0.24 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.28 J	ND	ND	0.27 J	ND	27	27

Notes:

ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.
P = the RPD between the results for the two columns exceeds the method-specific criteria.
I = the lower value for the two columns has been reported due to interference.

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B49		B50		B51		B52		B53		B54		B55		B56			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	2-4 (dup.)		
Soil Type	Fill	Native	Native		Native		Fill	Native	Native		Native		Native		Native				
Sample Date	9/19/18																		
TCL Volatile Organic Compounds in ug/kg																			
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	50	100,000
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	270	26,000
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	370	49,000
Carbon tetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	760	2,400
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,300	19,000
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	3,100
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	680	100,000
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	60	4,800
Toluene	ND	ND	ND	ND	ND	ND	0.68 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	700	100,000
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.17 J	0.19 J	ND	ND	ND	ND	1,000	41,000
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.84 J	ND	ND	ND	ND	ND	ND	-	-
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	900
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	190	100,000
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	470	21,000
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,100	100,000
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	49,000
1,4-Dichlorobenzene	ND	0.18 J	ND	ND	ND	ND	0.21 J	ND	ND	ND	ND	ND	ND	ND	1.2 J	ND	ND	1,800	13,000
Methyl tert butyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	930	100,000
p/m-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.70 J	ND	ND	ND	ND	-	-
o-Xylene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Xylenes, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.70 J	ND	ND	ND	ND	260	100,000
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	250	100,000
1,2-Dichloroethene, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dichlorodifluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetone	22	7.4 J	34	**60**	16	6.3 J	8.5 J	37	37	33	**130**	23	15	40	**52**	**64**	**65**	50	100,000
Carbon disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.2 J	ND	120	100,000
Vinyl acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12,000	-
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11,000	100,000
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5,900	100,000
o-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Isopropyltoluene	ND	ND	ND	ND	0.54 J	0.26 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12,000	100,000
Acrylonitrile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Propylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,900	100,000
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8,400	52,000
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3,600	52,000
1,4-Dioxane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	13,000
p-Diethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Ethyltoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,4,5-Tetramethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Ethyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
trans-1,4-Dichloro-2-butene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Tenatively Identified Compounds in ug/kg	ND	2.48 J	8.36 J	7.65 J	8.04 J	9.40 J	ND	6.27 J	16.3 J	42.0 J	46.5 J	12.0 J	7.81 J	13.7 J	3.73 J	2.53 J	43.6 J	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.
Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

FPM

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B49		B50		B51		B52		B53		B54		B55		B56			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	2-4 (dup.)		
Soil Type	Fill	Native	Native		Native		Fill	Native	Native		Native		Native		Native				
Sample Date	9/19/18																		
TCL Semivolatile Organic Compounds in ug/kg																			
Acenaphthene	ND	ND	ND	ND	ND	ND	62 J	ND	29 J	ND	ND	ND	ND	ND	ND	ND	ND	20,000	100,000
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
Bis(2-chloroethyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,000	-
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	-
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1,800	-
3,3'-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,6-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Fluoranthene	34 J	ND	200	ND	370	ND	1,000	ND	450	56 J	260	740	96 J	ND	270	32 J	ND	100,000	100,000
4-Chlorophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Bromophenyl phenyl ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroisopropyl)ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-chloroethoxy)methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Isophorone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Naphthalene	26 J	ND	97 J	ND	ND	ND	37 J	ND	42 J	ND	21 J	26 J	ND	ND	ND	ND	ND	12,000	100,000
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
NDPA/DPA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
n-Nitrosodi-n-propylamine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	140 J	ND	200	ND	ND	ND	ND	86 J	ND	ND	ND	ND	ND	-	-
Butyl benzyl phthalate	ND	ND	ND	ND	99 J	ND	ND	ND	42 J	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Di-n-butylphthalate	ND	ND	74 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Di-n-octylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Diethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dimethyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzo(a)anthracene	23 J	ND	120	ND	160	ND	610	ND	230	39 J	160	290	64 J	ND	140	ND	ND	1,000	1,000
Benzo(a)pyrene	ND	ND	120 J	ND	160	ND	580	ND	250	62 J	180	240	72 J	ND	130 J	ND	ND	1,000	1,000
Benzo(b)fluoranthene	46 J	ND	210	ND	68 J	ND	760	ND	350	76 J	240	350	89 J	ND	170	ND	ND	1,000	1,000
Benzo(k)fluoranthene	ND	ND	65 J	ND	170	ND	300	ND	120	ND	98 J	120	34 J	ND	72 J	ND	ND	800	3,900
Chrysene	46 J	ND	180	ND	ND	ND	580	ND	260	53 J	170	340	77 J	ND	140	20 J	ND	1,000	3,900
Acenaphthylene	ND	ND	ND	ND	37 J	ND	85 J	ND	58 J	ND	120 J	99 J	29 J	ND	44 J	ND	ND	100,000	100,000
Anthracene	ND	ND	42 J	ND	120 J	ND	160	ND	72 J	ND	100	88 J	ND	ND	43 J	ND	ND	100,000	100,000
Benzo(ghi)perylene	36 J	ND	130 J	ND	ND	ND	350	ND	180	67 J	170	150	71 J	ND	100 J	ND	ND	100,000	100,000
Fluorene	ND	ND	25 J	ND	180	ND	49 J	ND	30 J	ND	17 J	26 J	ND	ND	ND	ND	ND	30,000	100,000
Phenanthrene	34 J	ND	190	ND	29 J	ND	570	ND	270	26 J	93 J	230	35 J	ND	160	ND	ND	100,000	100,000
Dibenzo(a,h)anthracene	ND	ND	42 J	ND	120 J	ND	110	ND	45 J	ND	27 J	34 J	20 J	ND	ND	ND	ND	330	330
Indeno(1,2,3-cd)pyrene	28 J	ND	110 J	ND	310	ND	390	ND	170	47 J	140	150	55 J	ND	94 J	ND	ND	500	500
Pyrene	47 J	ND	190	ND	ND	ND	910	ND	400	73 J	240	540	93 J	ND	250	31 J	ND	100,000	100,000
Biphenyl	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
3-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dibenzofuran	ND	ND	32 J	ND	ND	ND	28 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7,000	-
2-Methylnaphthalene	38 J	ND	170 J	ND	ND	ND	ND	ND	50 J	ND	ND	ND	ND	ND	ND	ND	ND	-	-
1,2,4,5-Tetrachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Acetophenone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
p-Chloro-m-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
4,6-Dinitro-o-cresol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	800	6,700
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	100,000
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
3-Methylphenol/4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	330	-
2,4,5-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzoic Acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Carbazole	ND	ND	25 J	ND	22 J	ND	88 J	ND	39 J	ND	29 J	28 J	ND	ND	20 J	ND	ND	-	-
Tenatively Identified Compounds in ug/kg	ND	ND	1,990 J	ND	4,880 J	ND	985 J	414 J	541 J	208 J	1,350 J	2,350 J	ND	ND	ND	528 J	ND	-	-

Notes:
ND = Not detected.
J = Estimated concentration below the RL but above the MDL.

FPM

TABLE 2.1.4.1 (CONTINUED)
SOIL CHEMICAL ANALYTICAL RESULTS
FORMER PENINSULA HOSPITAL SITE

Sample No.	B49		B50		B51		B52		B53		B54		B55		B56			6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives	6 NYCR Part 375 Restricted Residential Use Soil Cleanup Objectives
Sample Depth (feet)	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	0-2	2-4	2-4 (dup.)		
Soil Type	Fill	Native	Native		Native		Fill	Native	Native		Native		Native		Native				
Sample Date	9/19/18																		
Metals in milligrams per kilogram																			
Aluminum, Total	1,250	1,140	1,600	1,180	2,380	598	3,060	2,380	1,620	2,290	1,900	1,760	2,630	1,080	1,730	1,530	1,970	-	-
Antimony, Total	ND	0.342 J	0.422 J	ND	ND	ND	ND	4.62	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Arsenic, Total	0.954	0.377 J	3.40	0.669 J	3.56	0.525 J	6.96	3.22	2.56	4.54	2.84	2.30	2.93	1.15	2.08	2.14	0.978 J	13	16
Barium, Total	10.0	6.05	44.1	5.82	16.3	6.42	68.6	34.1	38.9	37.7	29.5	30.0	40.0	10.8	21.7	14.5	15.1	350	400
Beryllium, Total	ND	ND	0.066 J	ND	0.068 J	ND	0.087 J	ND	0.048 J	0.114 J	0.090 J	ND	0.050 J	ND	ND	ND	ND	7.2	72
Cadmium, Total	ND	ND	0.314 J	ND	0.279 J	ND	0.309 J	0.359 J	0.272 J	0.201 J	0.254 J	0.461 J	0.313 J	0.141 J	0.399 J	0.254 J	0.117 J	2.5	4.3
Calcium, Total	2,880	266	976	304	12,500	173	17,400	2,380	13,500	138,000	63,000	1,230	8,050	47,700	2,060	771	504	-	-
Chromium, Total	4.51	5.96	6.25	4.50	7.20	2.61	7.50	8.99	5.53	5.36	6.26	6.72	7.66	4.57	6.77	5.84	6.16	30	180
Cobalt, Total	1.09 J	0.965 J	1.75	0.965 J	1.86	0.396 J	1.86	1.95	1.45 J	2.08	1.97	1.79	1.97	0.955 J	1.86	1.62 J	1.32 J	-	-
Copper, Total	2.43	2.34	23.7	1.79	9.15	0.86	11.2	19.3	15.7	8.32	10.2	19.5	13.0	6.88	14.9	16.4	4.14	50	270
Iron, Total	2,450	1,780	9,430	2,250	8,430	1,190	5,990	10,900	4,190	5,120	5,340	8,250	5,980	2,820	5,540	4,600	3,670	-	-
Lead, Total	5.36	1.63 J	**74.5**	1.24 J	42.8	3.81 J	**201**	53.9	**73.6**	30.1	52.1	**85.4**	**75.7**	24.2	**63.3**	59.7	22.2	63	400
Magnesium, Total	1,790	466	722	467	4,140	192	980	1,180	6,610	20,600	31,800	532	3,440	25,200	950	550	752	-	-
Manganese, Total	22.6	15.8	37.4	17.4	60.9	8.65	85.0	85.0	38.8	106	95.5	76.8	67.4	61.8	35.9	27.0	26.7	1,600	2,000
Mercury, Total	ND	ND	0.085	ND	0.052 J	ND	0.074	0.106	0.060 J	ND	0.068	0.066 J	0.020 J	0.026 J	0.058 J	0.044 J	ND	0.18	0.81
Nickel, Total	2.60	2.40	4.78	2.31	4.28	1.06 J	4.01	12.3	3.88	5.16	4.94	5.18	5.34	3.69	6.39	5.4	3.17	30	310
Potassium, Total	246 J	322 J	297 J	335 J	219	86.6 J	194 J	289	215	410	348	231	340	223	259	262	422	-	-
Selenium, Total	0.303 J	ND	0.463 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.9	180
Silver, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	180
Sodium, Total	43.7 J	37.5 J	64.2 J	35.6 J	43.1 J	11.0	31.1 J	71.6 J	32.8 J	106 J	102 J	105 J	41.5 J	46.5 J	30.3 J	32.2 J	31 J	-	-
Thallium, Total	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Vanadium, Total	6.93	5.26	10.3	5.47	10.6	3.44	10.2	102	12.5	13.3	10.4	15.7	12.9	14.0	15.4	17	8.72	-	-
Zinc, Total	9.41	5.23	**120**	7.74	42.5	2.63 J	90.6	38.9	61.1	35.5	43.0	48.1	76.0	15.1	51.9	42.6	18.7	109	10,000
Pesticides in micrograms per kilogram																			
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	100,000
Lindane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,300
Alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	480
Beta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	36	360
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	42	2,100
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	97
Heptachlor epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	14	11,000
Endrin aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Endrin ketone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Dieldrin	ND	ND	ND	ND	ND	ND	1.97	ND	2.42 PI	ND	2.55	4.53	**5.38 PI**	ND	**7.43 PI**	3.26 P	2.57 P	5	200
4,4'-DDE	1.50 J	ND	2.13	ND	**62.7**	ND	**29.6**	ND	**10.8**	2.68 J	**44.1**	**74.4**	**15.8**	ND	**3.77 PI**	**5.96 P**	2.57 P	3.3	8,900
4,4'-DDD	11.9	ND	**3.91**	ND	ND	ND	2.97 P	ND	**4.30 P**	**6.25 J**	**19.0**	**75.7**	ND	ND	ND	**9.26 P**	**3.79**	3.3	13,000
4,4'-DDT	ND	ND	3.16	ND	**67.8**	ND	**43.6**	ND	**18.4**	ND	**10.9**	**9.55**	**31.3 P**	ND	**21.1 P**	ND	ND	3.3	7,900
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Endosulfan sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2,400	24,000
Methoxychlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Toxaphene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
cis-Chlordane	ND	ND	ND	ND	ND	ND	1.46 JPI	ND	2.44 P	ND	5.58 P	7.88 P	4.41 P	ND	3.59 P	ND	ND	94	4,200
trans-Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Chlordane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
Polychlorinated Biphenyls in micrograms per kilogram																			
Aroclor 1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1248	ND	ND	9.14 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1254	ND	ND	ND	ND	ND	ND	ND	ND	ND	9.88 J	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1260	ND	ND	ND	ND	8.61 J	ND	18.9 J	ND	**125**	11.8 J	38.1	28.0 J	99.2	ND	**351**	**112**	ND	100	1,000
Aroclor 1262	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	1,000
Aroclor 1268	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.74 J	ND	ND	ND	ND	ND	100	1,000
General Chemistry																			
Cyanide in milligrams per kilogram	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	27	27

Notes:

ND = Not detected.

J = Estimated concentration below the RL but above the MDL.

Bold yellow-shaded values exceed NYSDEC Unrestricted Use Soil Cleanup Objectives.

P = the RPD between the results for the two columns exceeds the method-specific criteria.

I = the lower value for the two columns has been reported due to interference.

APPENDIX C

SANBORN FIRE INSURANCE MAPS

FPM

5115 Beach Channel Drive, Far Rockaway, Queens NY

5115 Beach Channel Drive
Far Rockaway, NY 11691

Inquiry Number: 4432641.3
October 08, 2015

Certified Sanborn® Map Report

EDR®

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

10/08/15

Site Name:	Client Name:
5115 Beach Channel Drive, Far	PVE Sheffler
5115 Beach Channel Drive	48 Springside Avenue
Far Rockaway, NY 11691	Poughkeepsie, NY 12603
EDR Inquiry # 4432641.3	Contact: Neil Curri

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by PVE Sheffler were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Site Name: 5115 Beach Channel Drive, Far Rockaway,
Address: 5115 Beach Channel Drive
City, State, Zip: Far Rockaway, NY 11691
Cross Street:
P.O. # 500070
Project: 500070
Certification # F707-48A8-A112

Sanborn® Library search results
Certification # F707-48A8-A112

Maps Provided:

2006	1999	1990	1982
2005	1996	1988	1981
2004	1995	1987	1951
2003	1993	1986	1933
2002	1992	1985	1912
2001	1991	1983	

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

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Sanborn Sheet Thumbnails

This Certified Sanborn Map Report is based upon the following Sanborn Fire Insurance map sheets.

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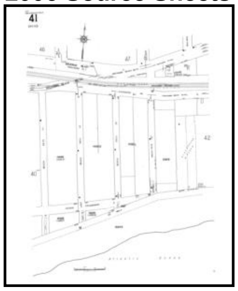

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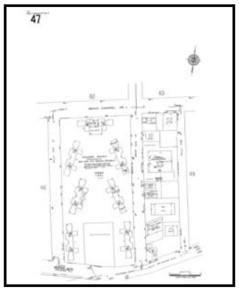

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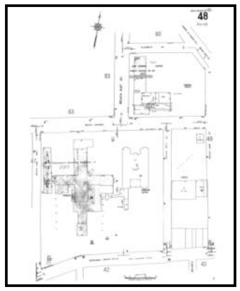

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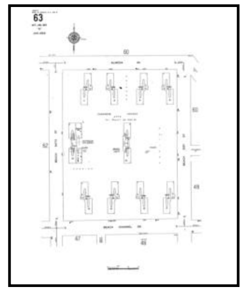

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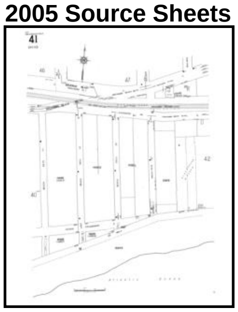

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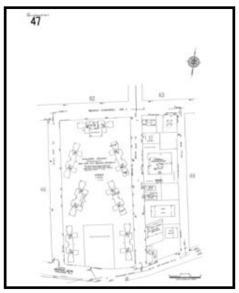

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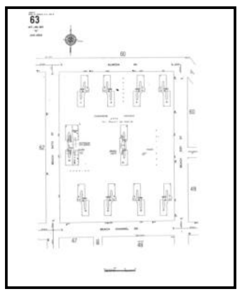

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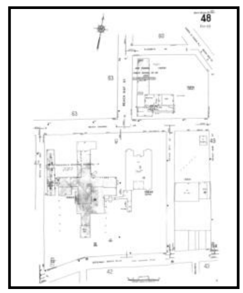

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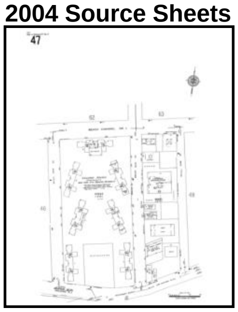

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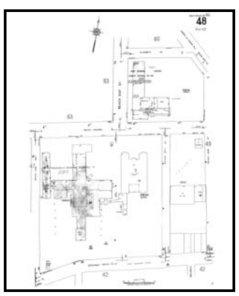

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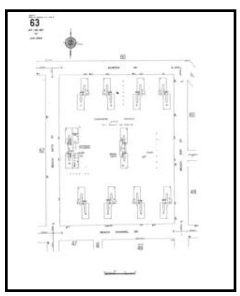

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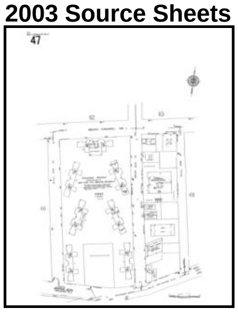

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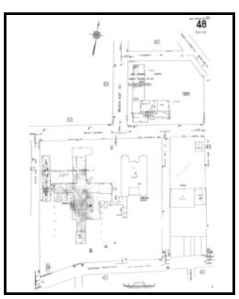

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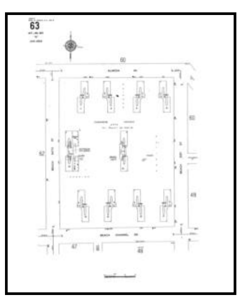

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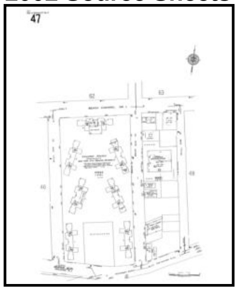

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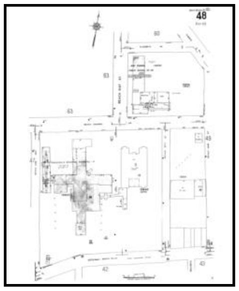

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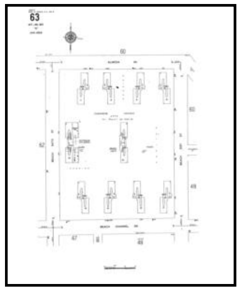

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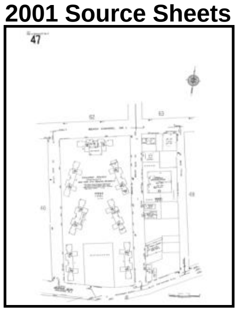

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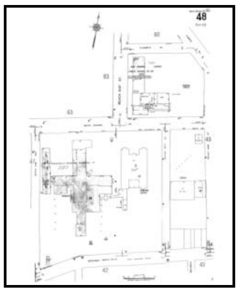

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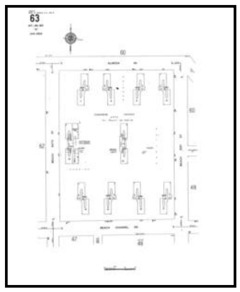

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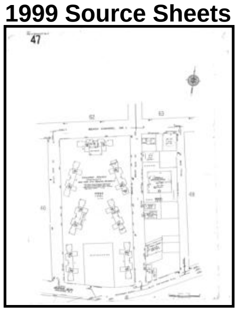

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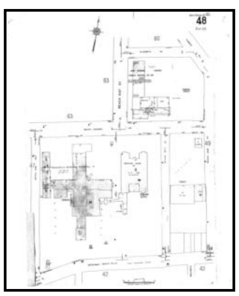

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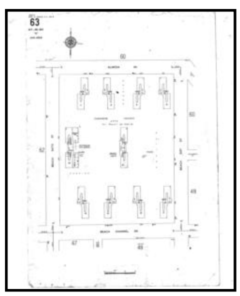

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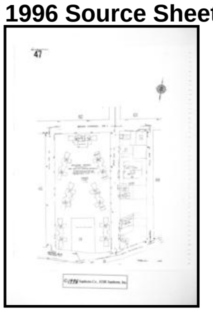

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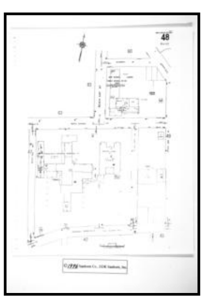

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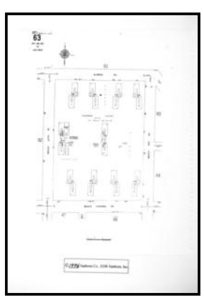

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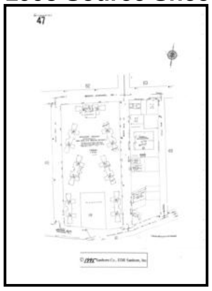

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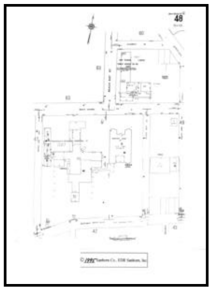

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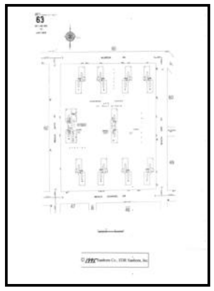

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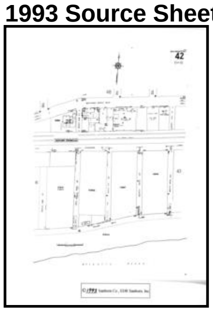

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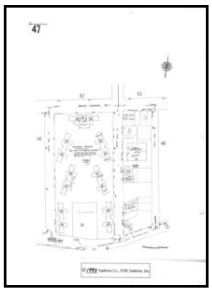

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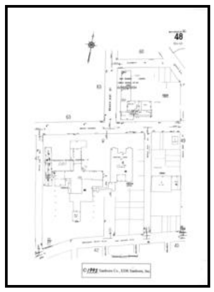

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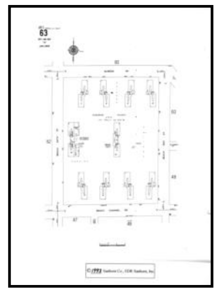

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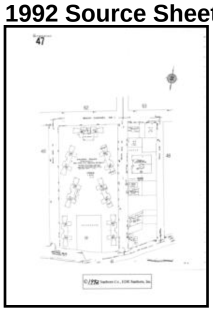

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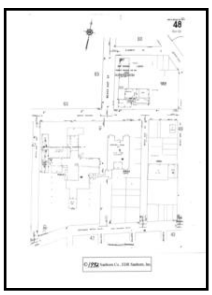

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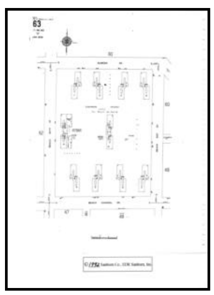

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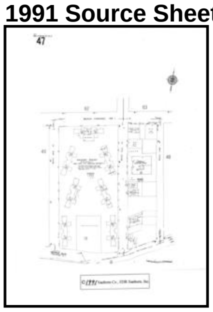

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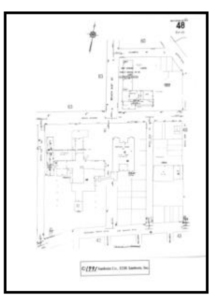

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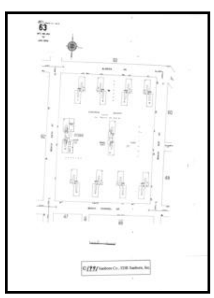

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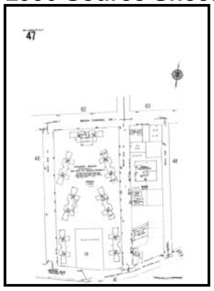
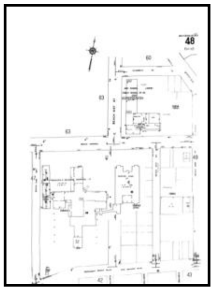


Volume 8, Sheet 47



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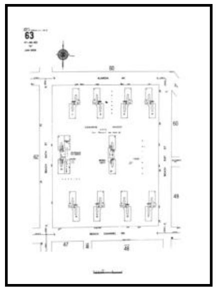

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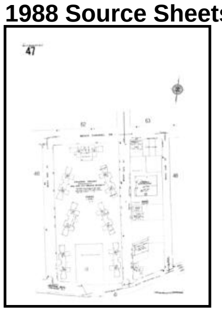

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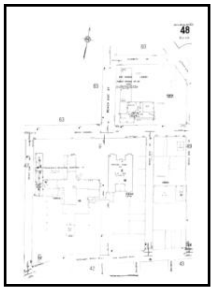

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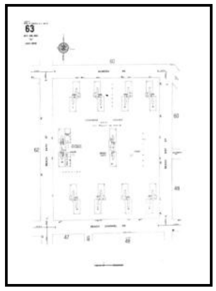

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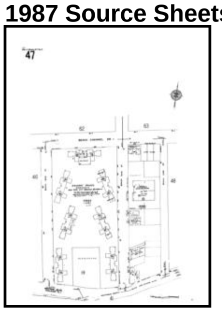

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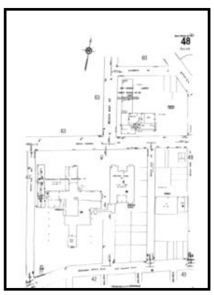

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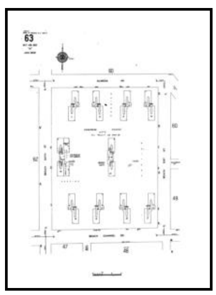

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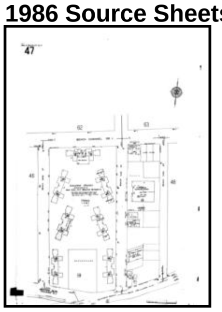

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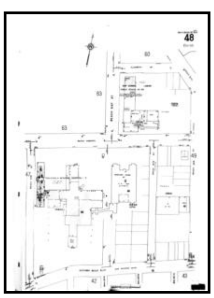

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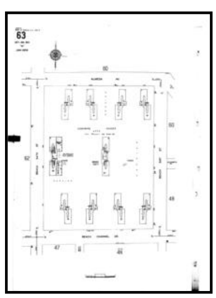

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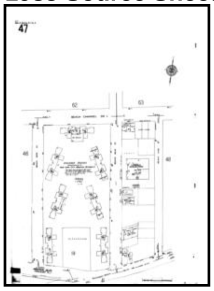

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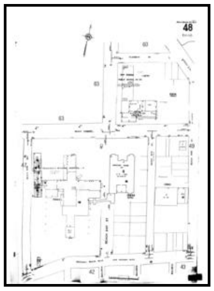

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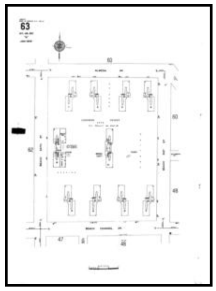

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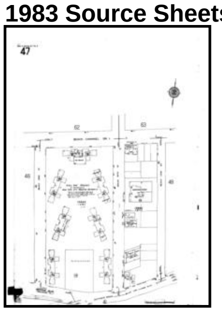
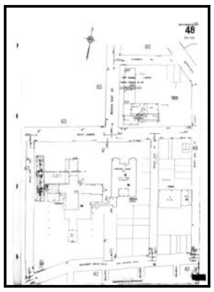


Volume 8, Sheet 47



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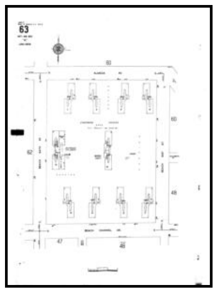

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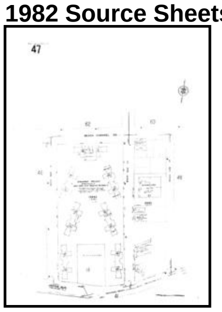

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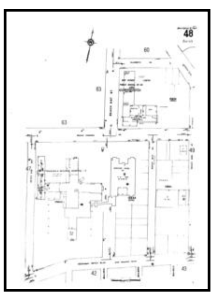

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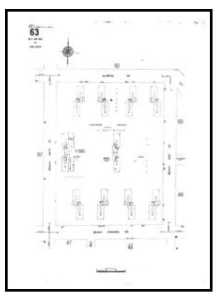

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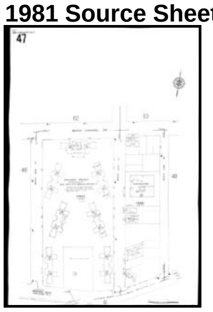

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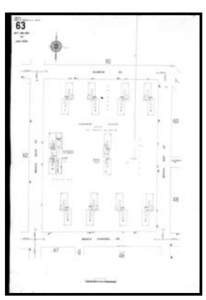
Volume 8, Sheet 48



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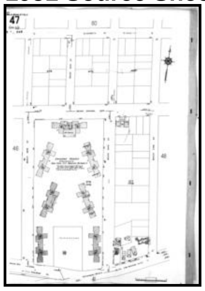
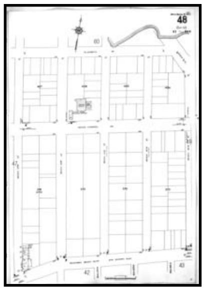


Volume 8, Sheet 47



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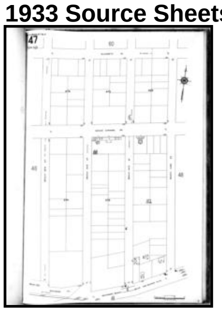
1933 Source Sheets



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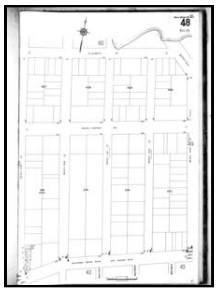

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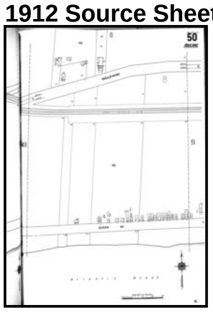

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2006 Certified Sanborn Map

Site Name: 5115 Beach Channel Drive, Far Rockaway, Queens NY
Address: 5115 Beach Channel Drive

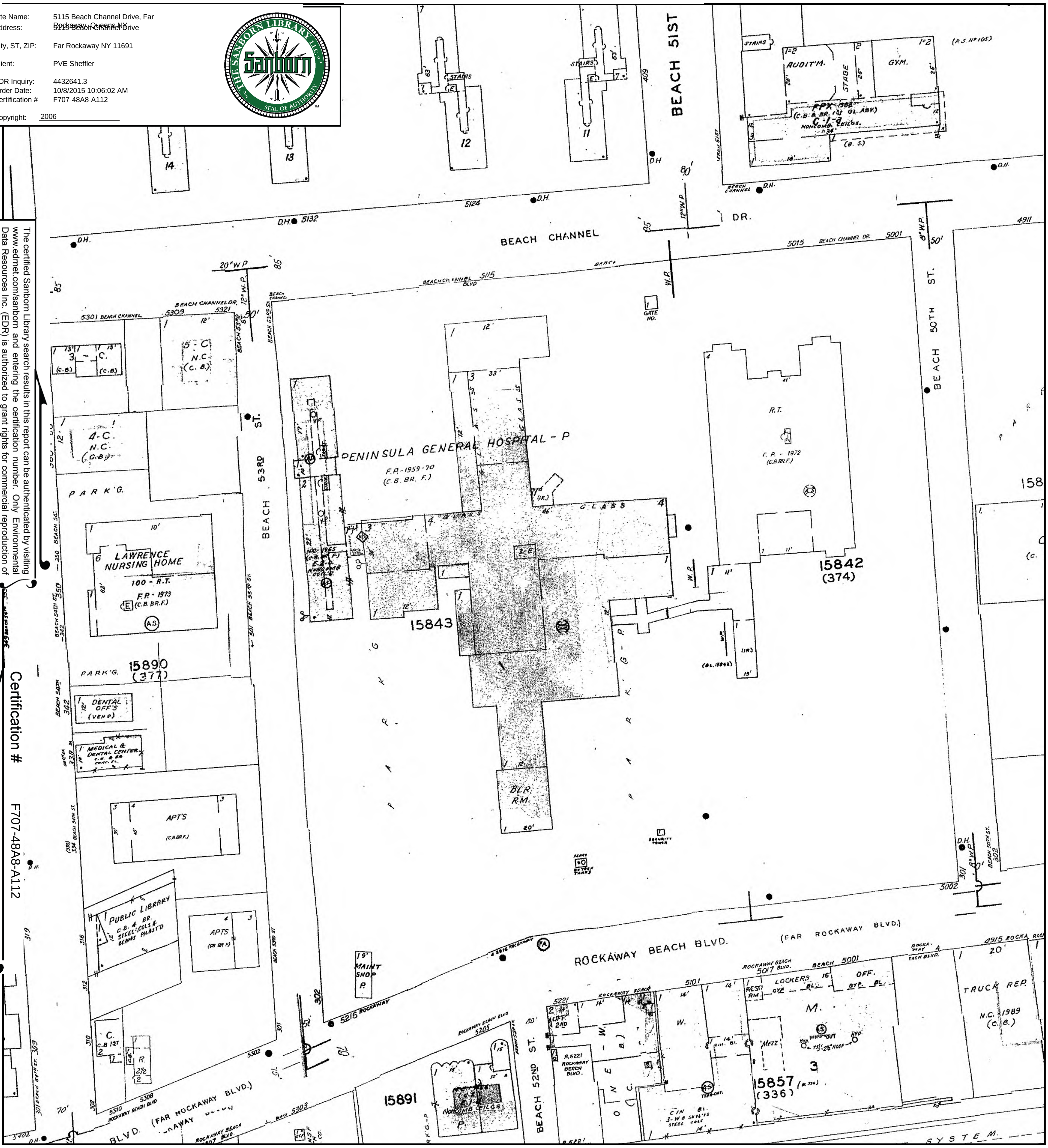
City, ST, ZIP: Far Rockaway NY 11691

Client: PVE Sheffler

EDR Inquiry: 4432641.3
Order Date: 10/8/2015 10:06:02 AM
Certification # F707-48A8-A112

Copyright: 2006

Certification # F707-48A8-A112



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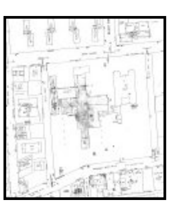

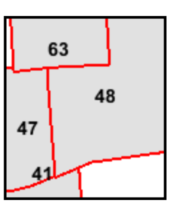

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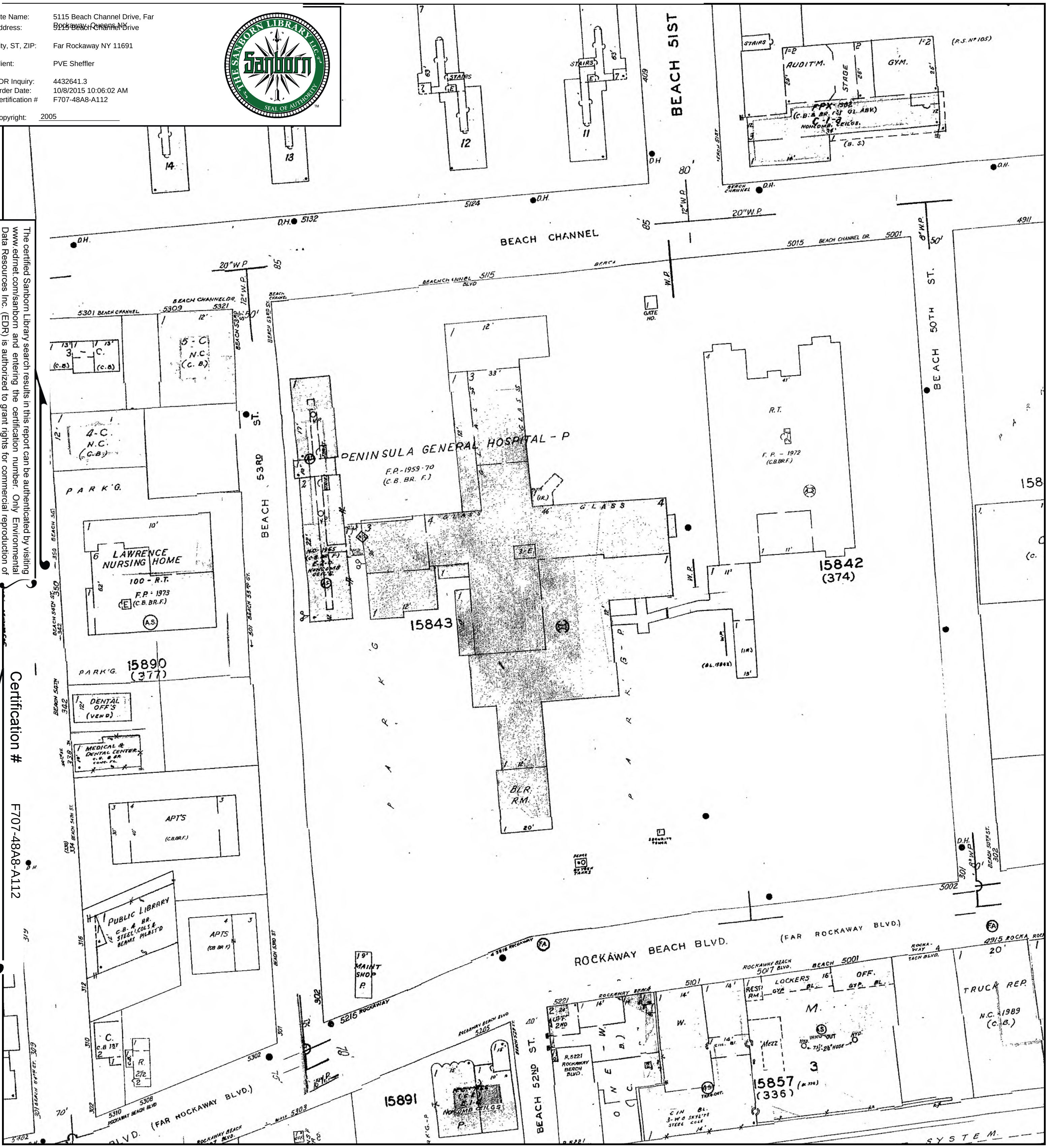
2005 Certified Sanborn Map

Site Name:	5115 Beach Channel Drive, Far Rockaway, Queens NY
Address:	5115 Beach Channel Drive
City, ST, ZIP:	Far Rockaway NY 11691
Client:	PVE Sheffler
EDR Inquiry:	4432641.3
Order Date:	10/8/2015 10:06:02 AM
Certification #	F707-48A8-A112
Copyright:	2005

Certification # F707-48A8-A112



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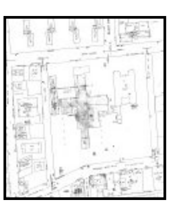

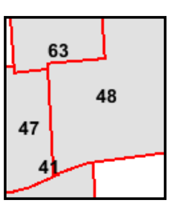

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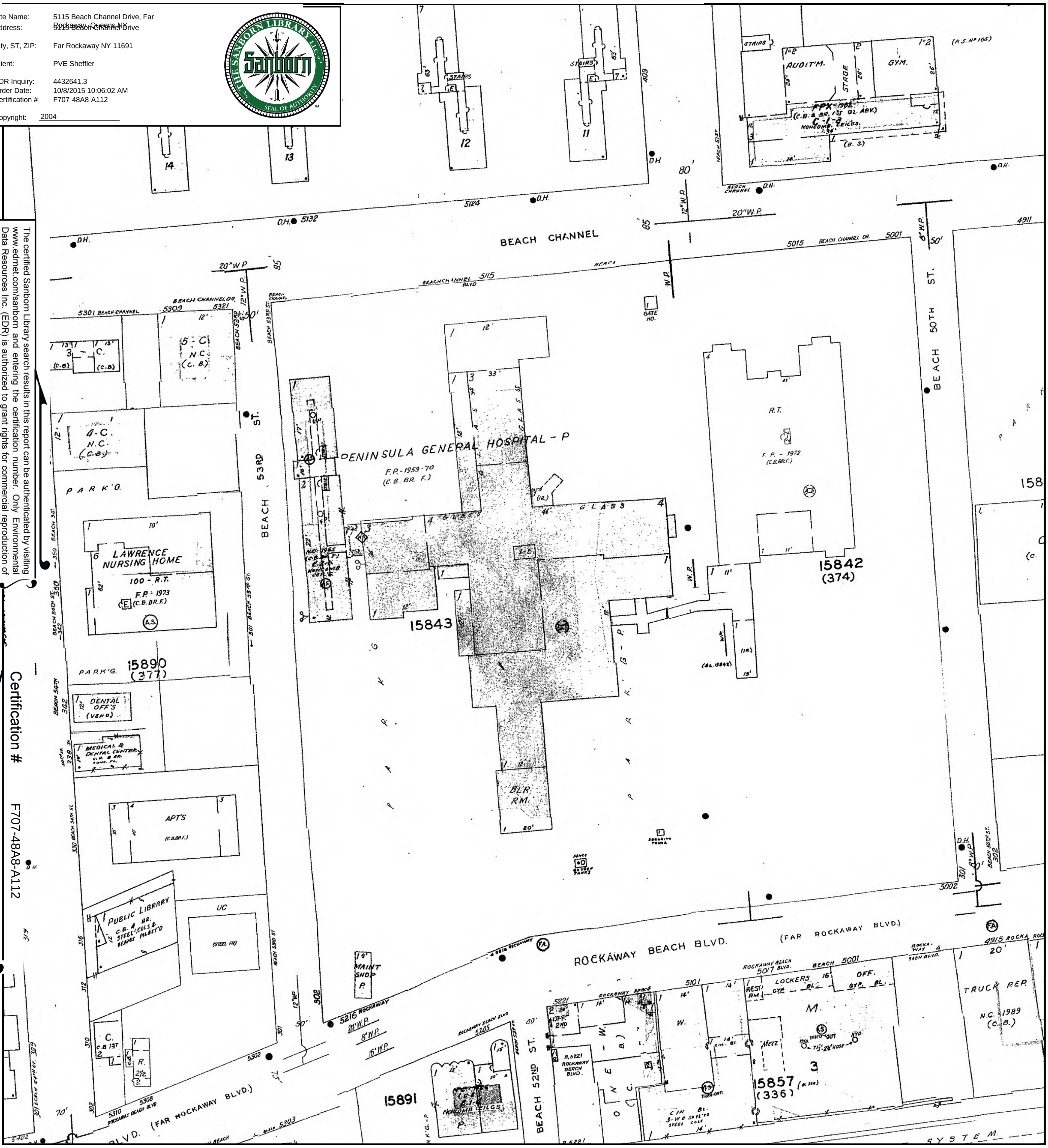
N

2004 Certified Sanborn Map

Site Name: 5115 Beach Channel Drive, Far Rockaway, Queens NY
Address: 5115 Beach Channel Drive
City, ST, ZIP: Far Rockaway NY 11691
Client: PVE Sheffler
EDR Inquiry: 4432641.3
Order Date: 10/8/2015 10:06:02 AM
Certification # F707-48A8-A112

Certification # F707-48A8-A112



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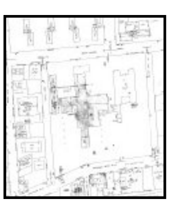

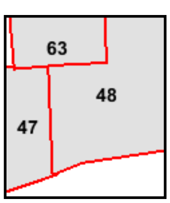

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2003 Certified Sanborn Map

Site Name:	5115 Beach Channel Drive, Far Rockaway - Queens NY
Address:	5115 Beach Channel Drive
City, ST, ZIP:	Far Rockaway NY 11691
Client:	PVE Sheffler
EDR Inquiry:	4432641.3
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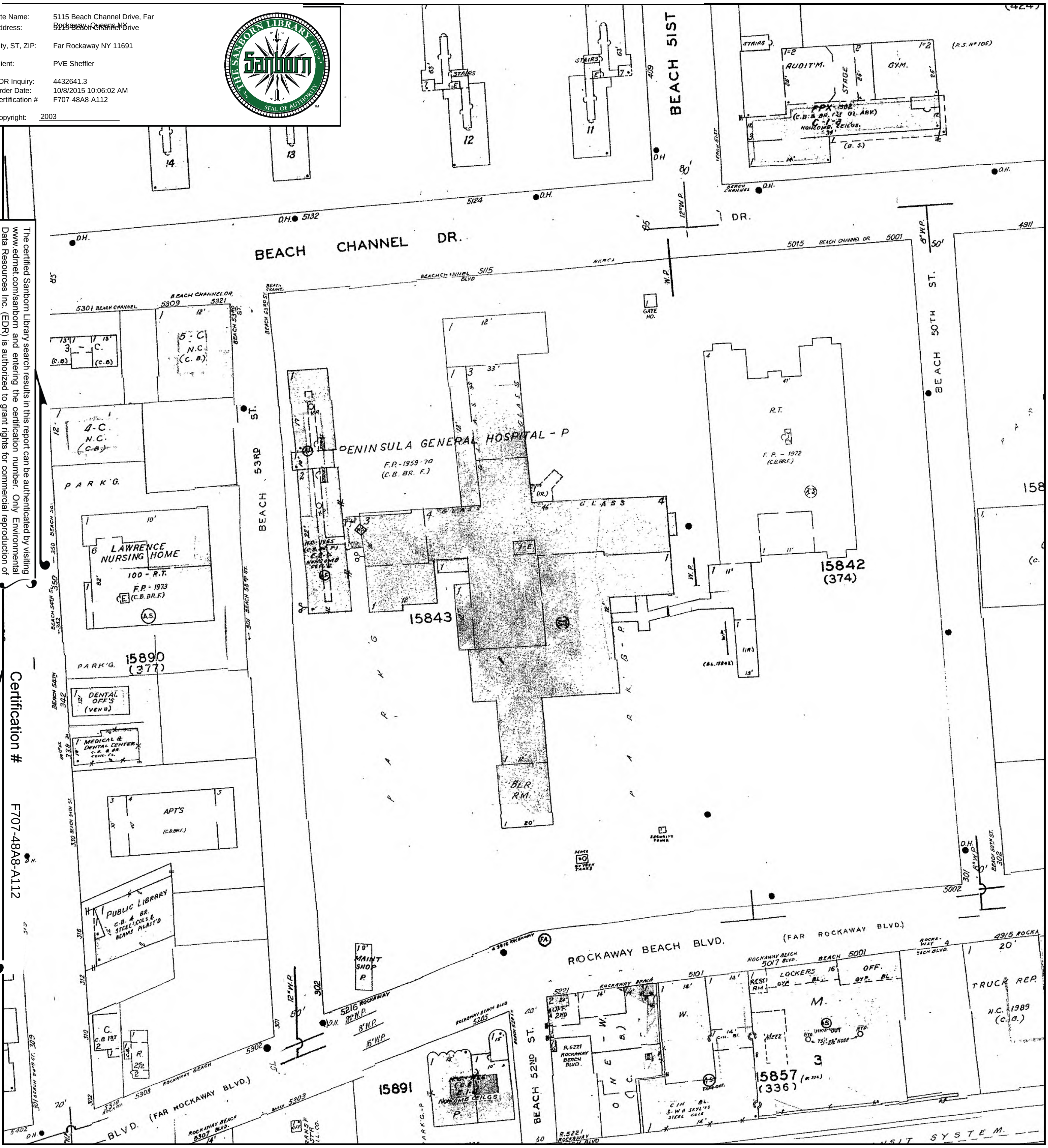

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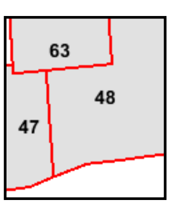

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2002 Certified Sanborn Map

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Address:	5115 Beach Channel Drive
City, ST, ZIP:	Far Rockaway NY 11691
Client:	PVE Sheffler
EDR Inquiry:	4432641.3
Order Date:	10/8/2015 10:06:02 AM
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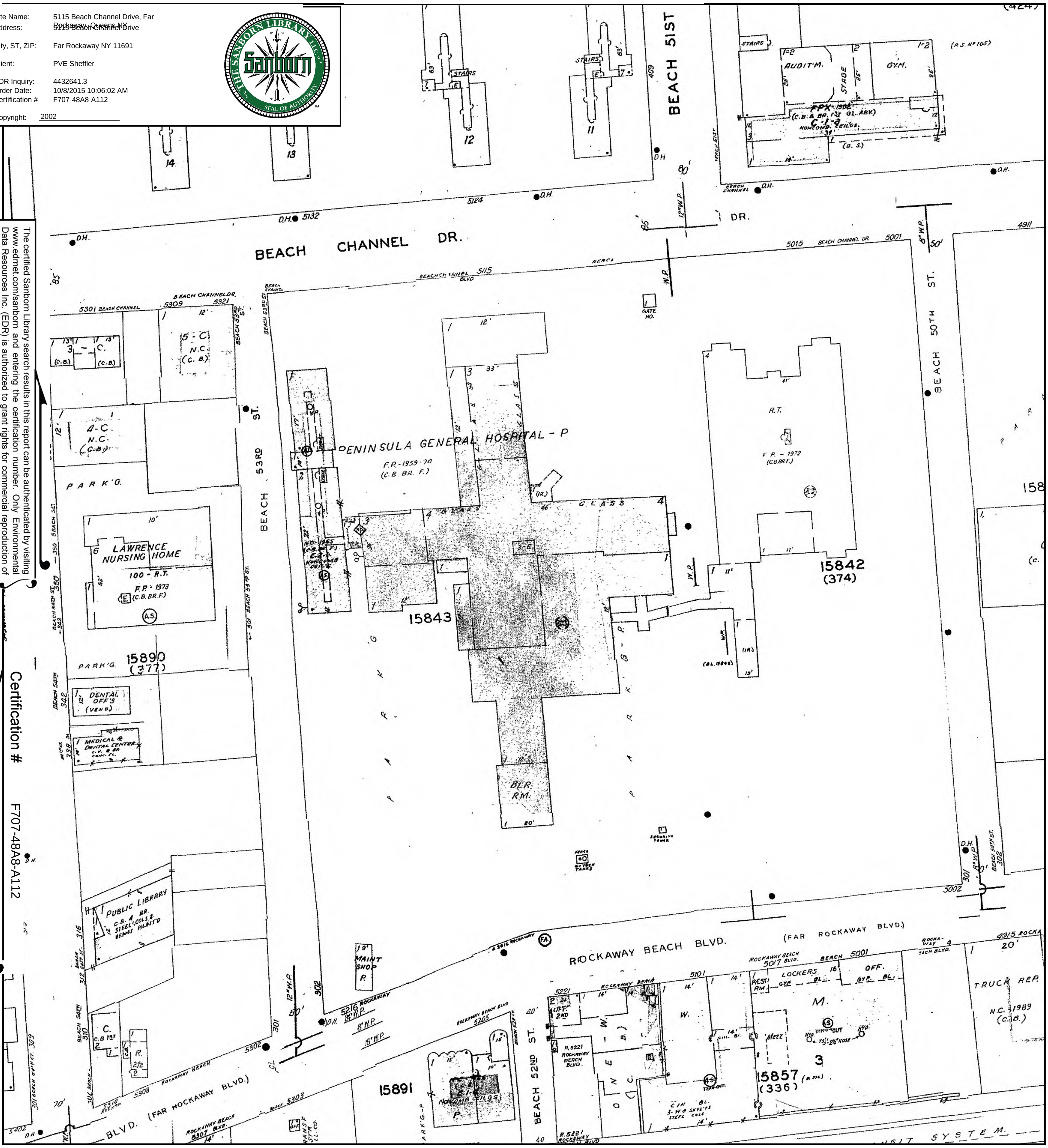

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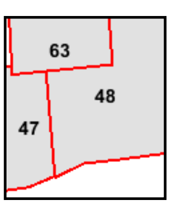

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2001 Certified Sanborn Map

Site Name:	5115 Beach Channel Drive, Far Rockaway, Queens NY
Address:	5115 Beach Channel Drive
City, ST, ZIP:	Far Rockaway NY 11691
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EDR Inquiry:	4432641.3
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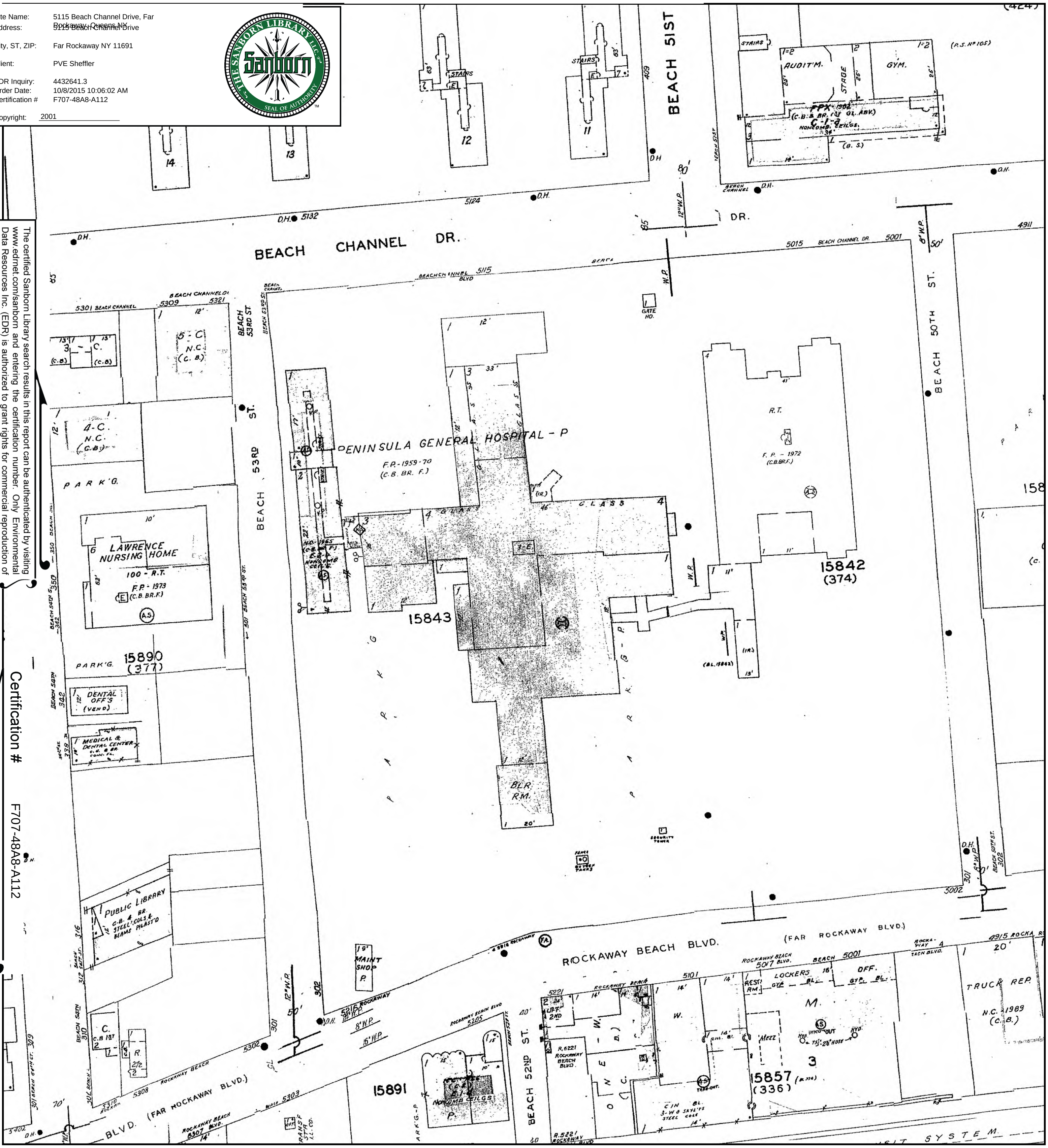

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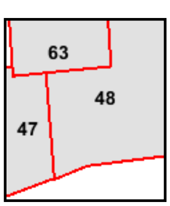

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N

1999 Certified Sanborn Map

Site Name: 5115 Beach Channel Drive, Far Rockaway, Queens NY
Address: 5115 Beach Channel Drive
City, ST, ZIP: Far Rockaway NY 11691
Client: PVE Sheffler
EDR Inquiry: 4432641.3
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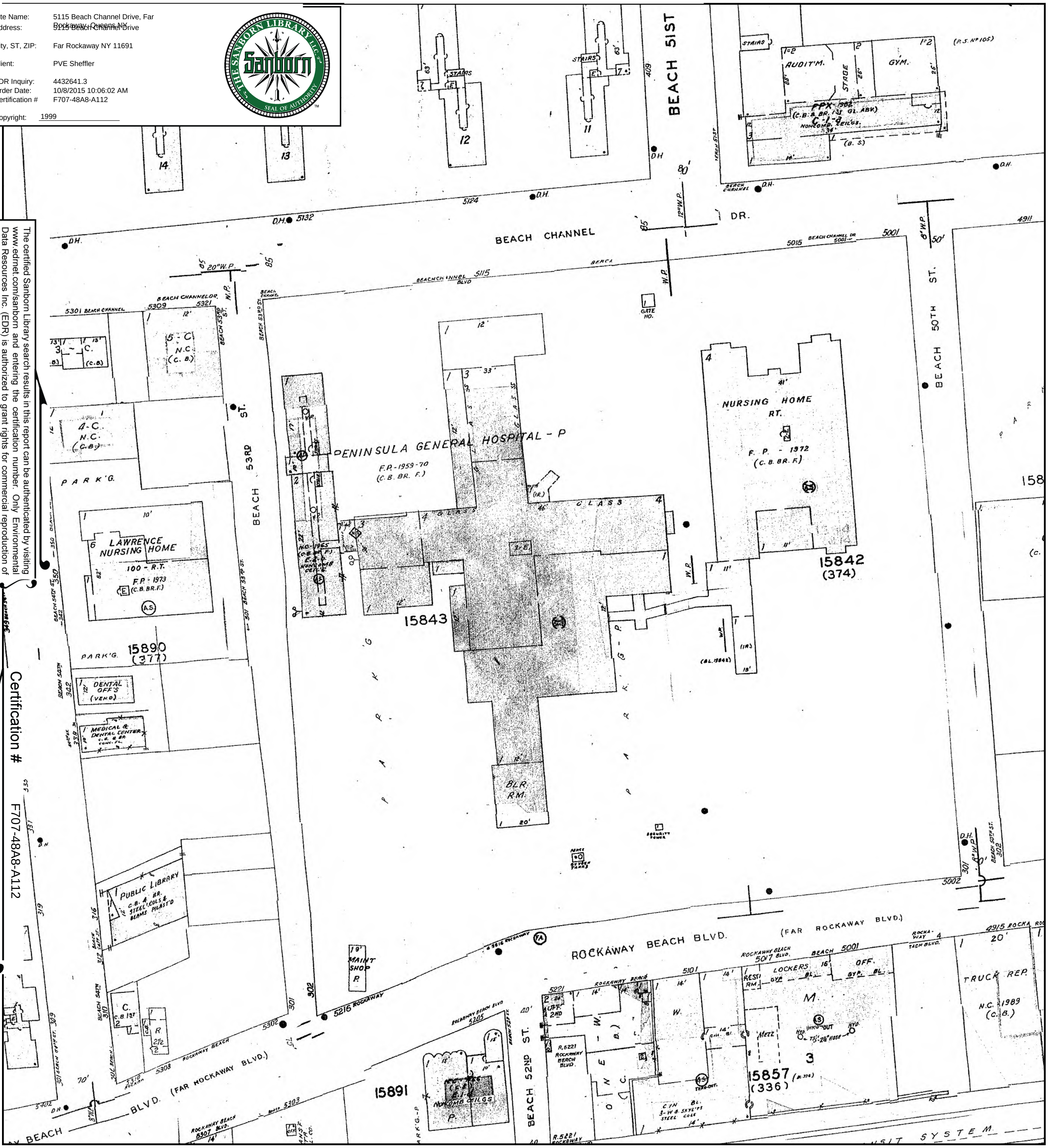
Certification # F707-48A8-A112



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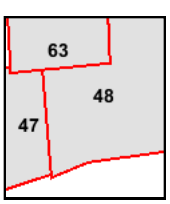

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N

1996 Certified Sanborn Map

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Address:	5115 Beach Channel Drive
City, ST, ZIP:	Far Rockaway NY 11691
Client:	PVE Sheffler
EDR Inquiry:	4432641.3
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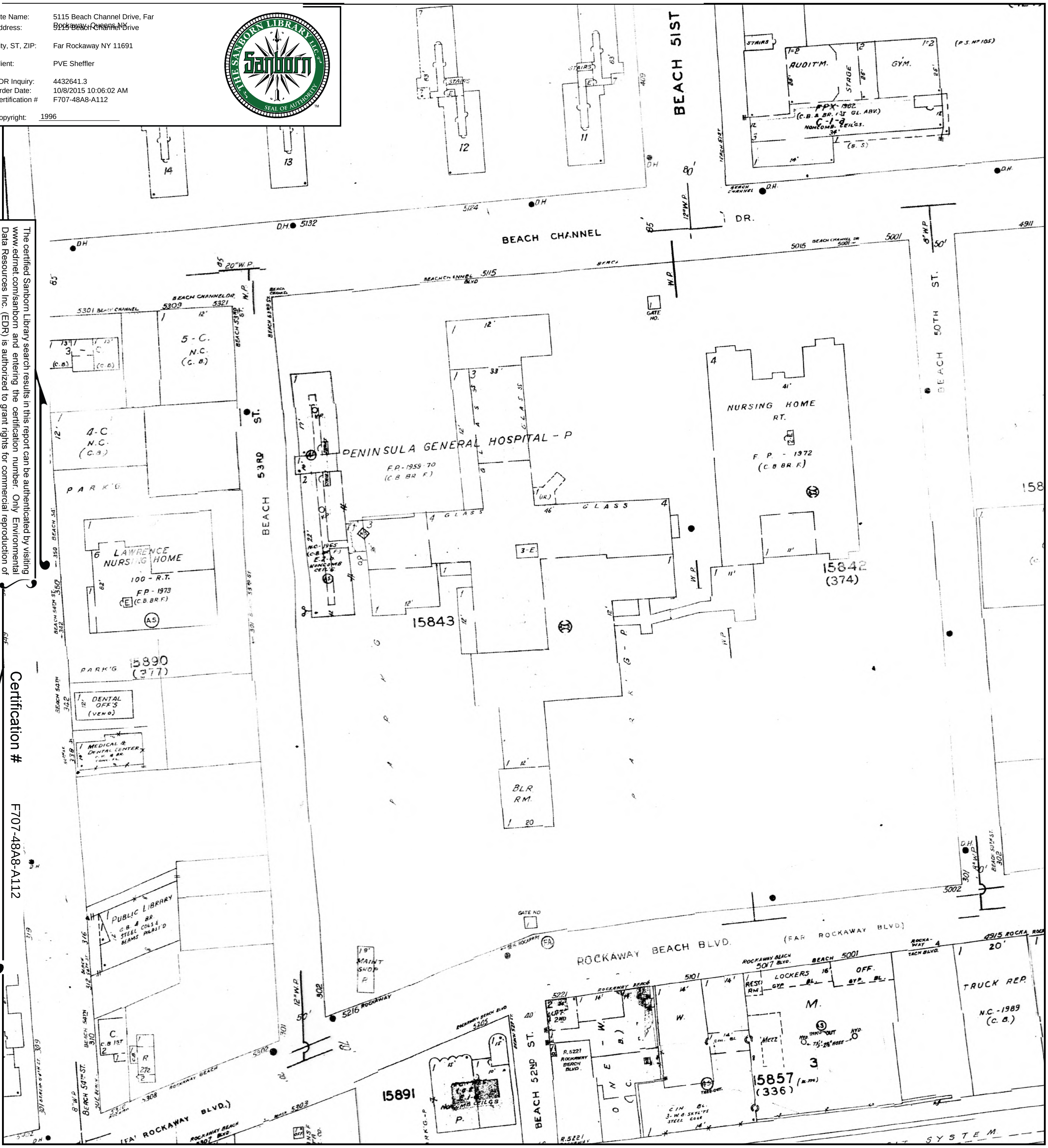

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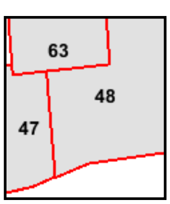

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N

1995 Certified Sanborn Map

Site Name: 5115 Beach Channel Drive, Far Rockaway, Queens NY
Address: 5115 Beach Channel Drive
City, ST, ZIP: Far Rockaway NY 11691
Client: PVE Sheffler
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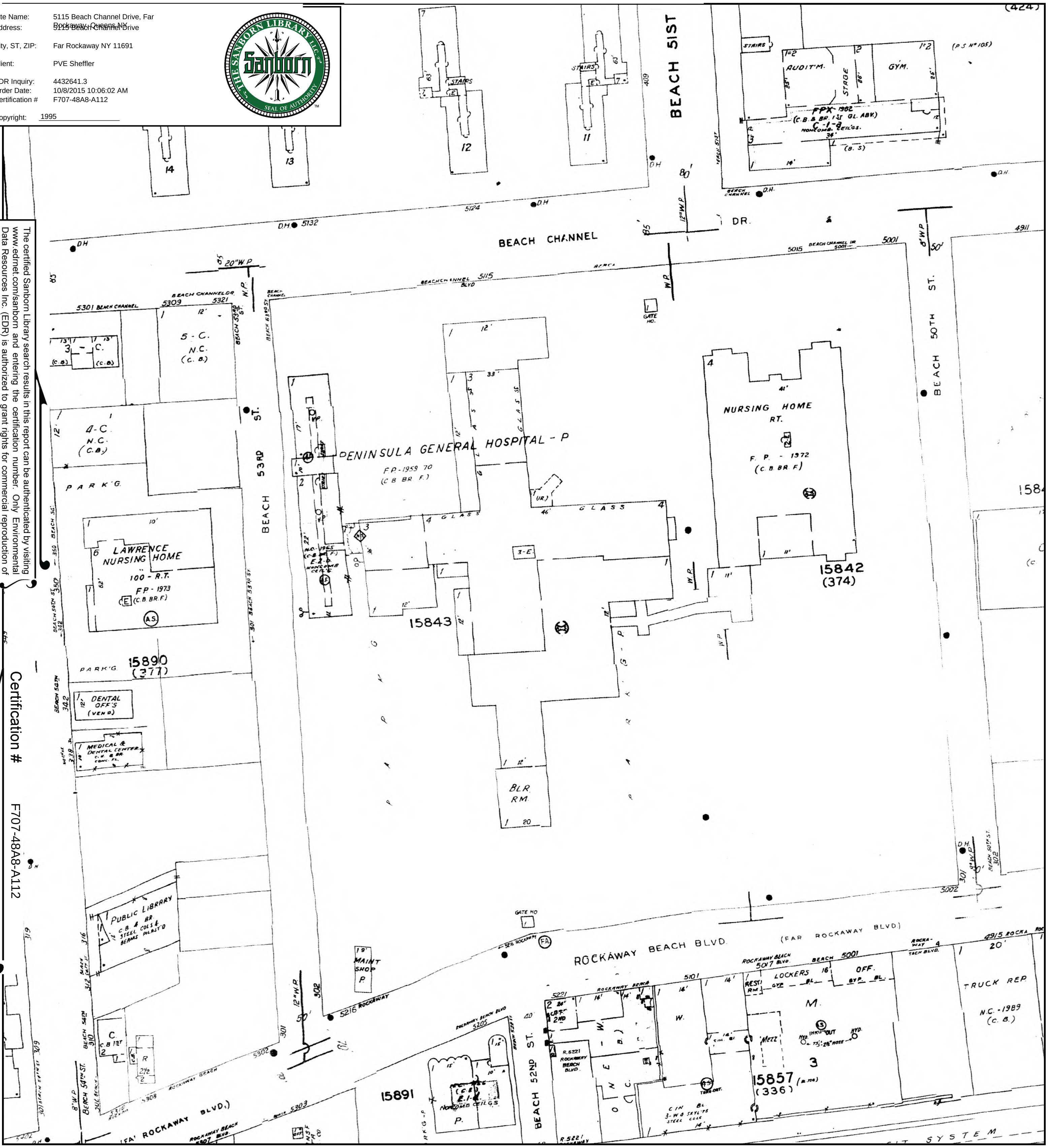
Certification # F707-48A8-A112
Copyright: 1995

Certification # F707-48A8-A112



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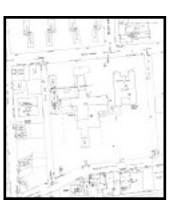

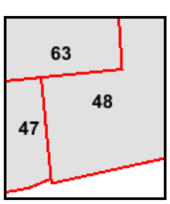

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N

1993 Certified Sanborn Map

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Address: 5115 Beach Channel Drive
City, ST, ZIP: Far Rockaway NY 11691
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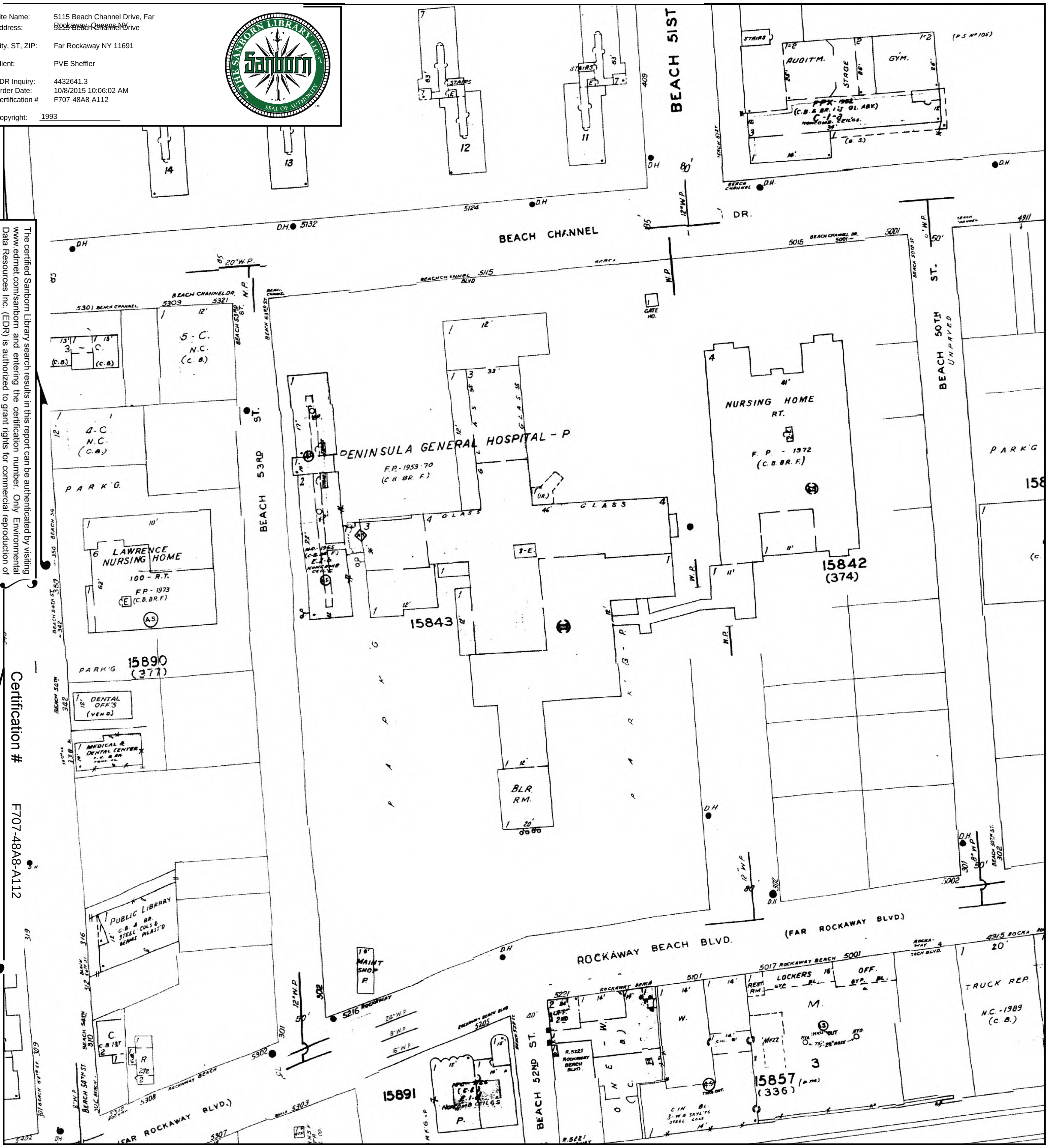
EDR Inquiry: 4432641.3
Order Date: 10/8/2015 10:06:02 AM
Certification # F707-48A8-A112



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Certification # F707-48A8-A112

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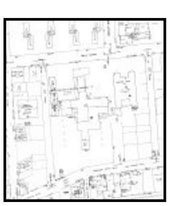

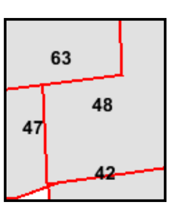

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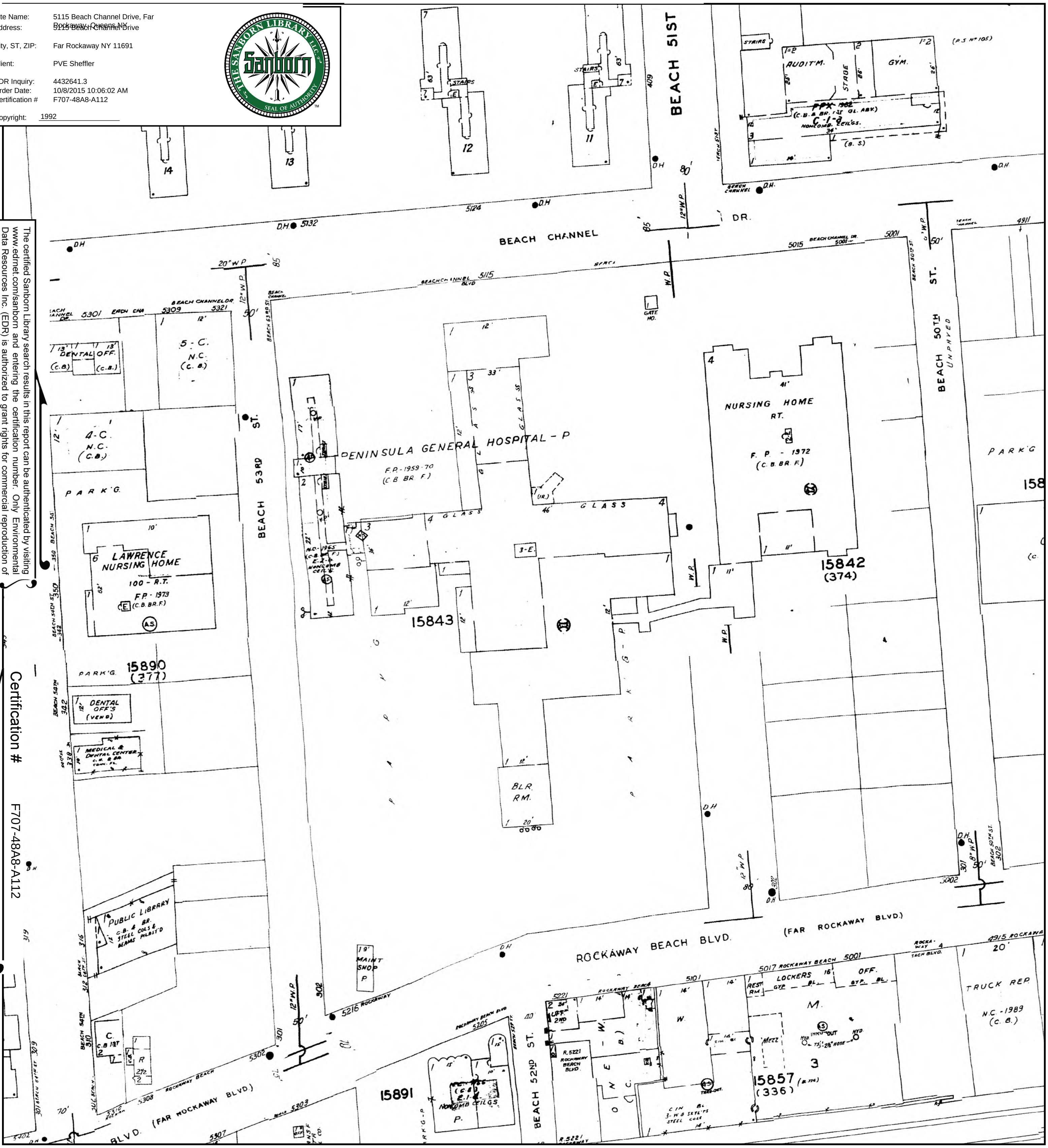
Volume 8, Sheet 63

N

1992 Certified Sanborn Map

Site Name:	5115 Beach Channel Drive, Far Rockaway, Queens NY
Address:	5115 Beach Channel Drive
City, ST, ZIP:	Far Rockaway NY 11691
Client:	PVE Sheffler
EDR Inquiry:	4432641.3
Order Date:	10/8/2015 10:06:02 AM
Certification #	F707-48A8-A112
Copyright:	1992

Certification # F707-48A8-A112



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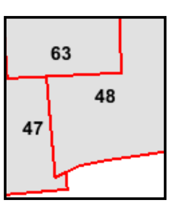

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Volume 8, Sheet 63

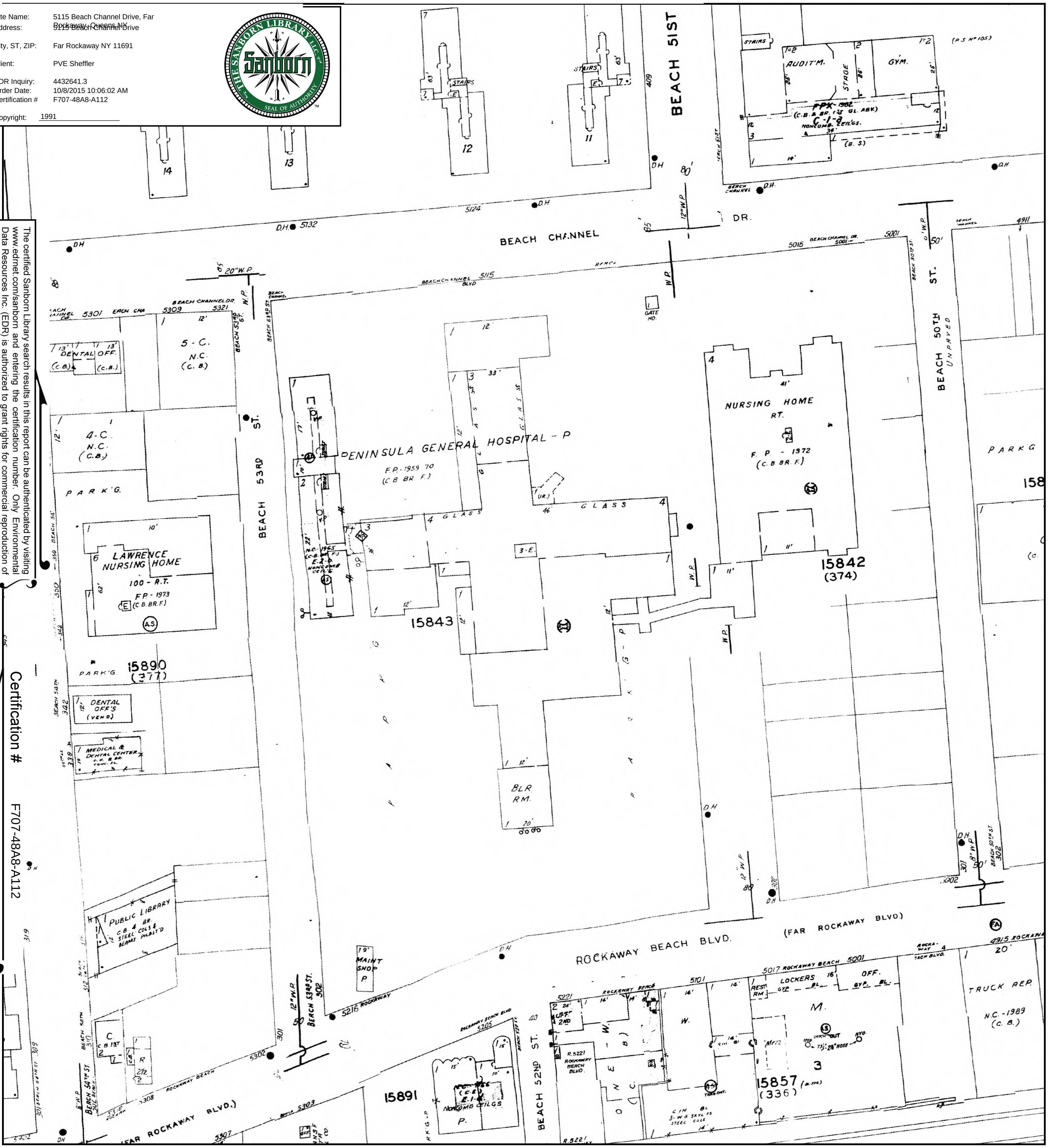
0 Feet 150 300 600

N

1991 Certified Sanborn Map

Site Name: 5115 Beach Channel Drive, Far Rockaway - Queens, NY
Address: 5115 Beach Channel Drive
City, ST, ZIP: Far Rockaway NY 11691
Client: PVE Sheffler
EDR Inquiry: 4432641.3
Order Date: 10/8/2015 10:06:02 AM
Certification # F707-48A8-A112
Copyright: 1991

Certification # F707-48A8-A112



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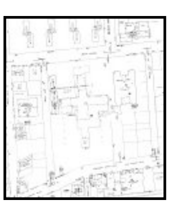

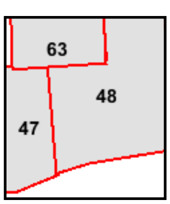

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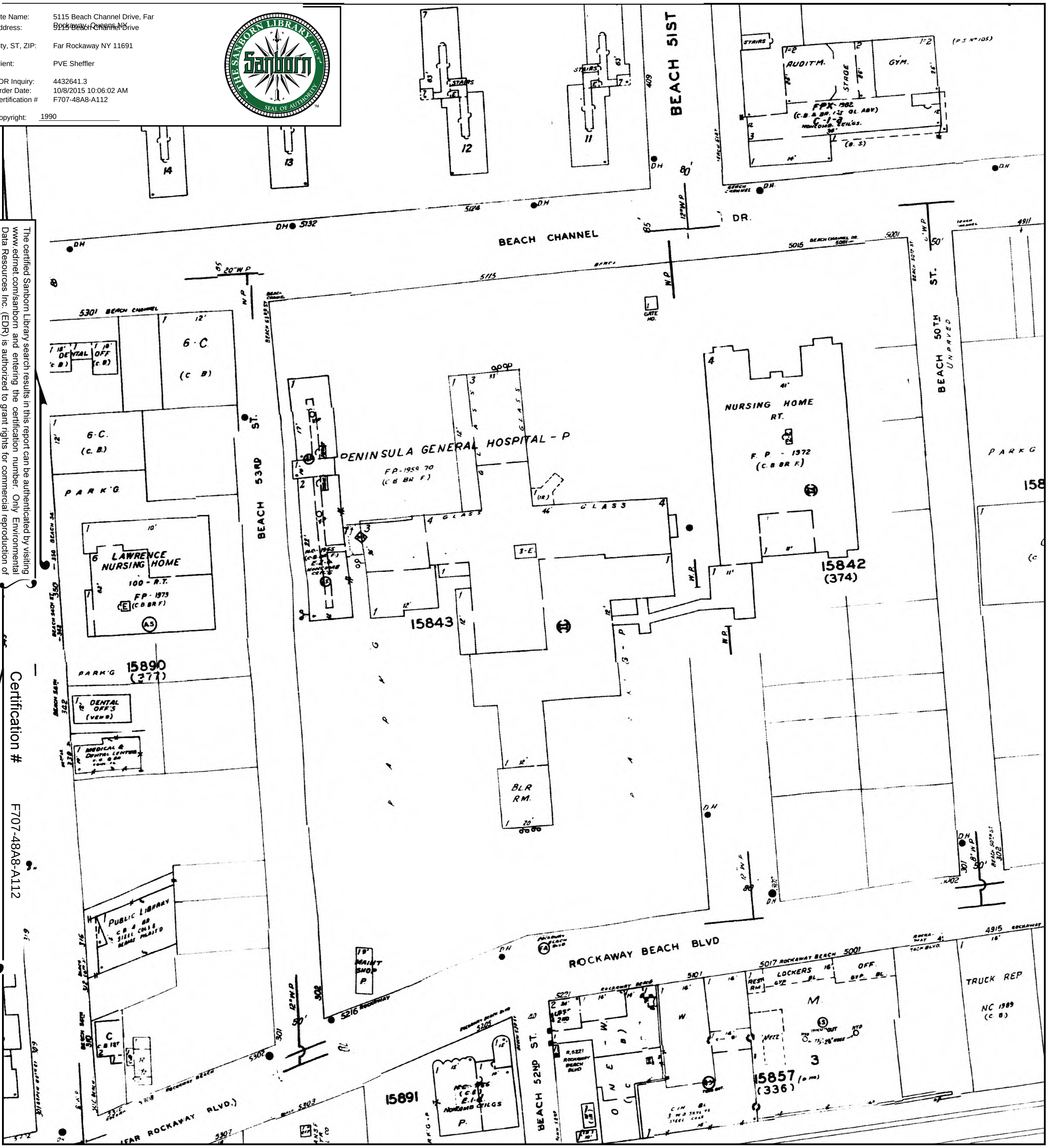
N

1990 Certified Sanborn Map

Site Name: 5115 Beach Channel Drive, Far Rockaway, Queens NY
Address: 5115 Beach Channel Drive
City, ST, ZIP: Far Rockaway NY 11691
Client: PVE Sheffler
EDR Inquiry: 4432641.3
Order Date: 10/8/2015 10:06:02 AM
Certification #: F707-48A8-A112
Copyright: 1990

Certification # F707-48A8-A112



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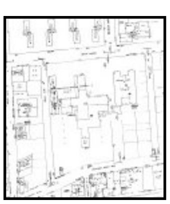

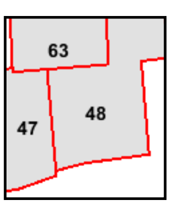

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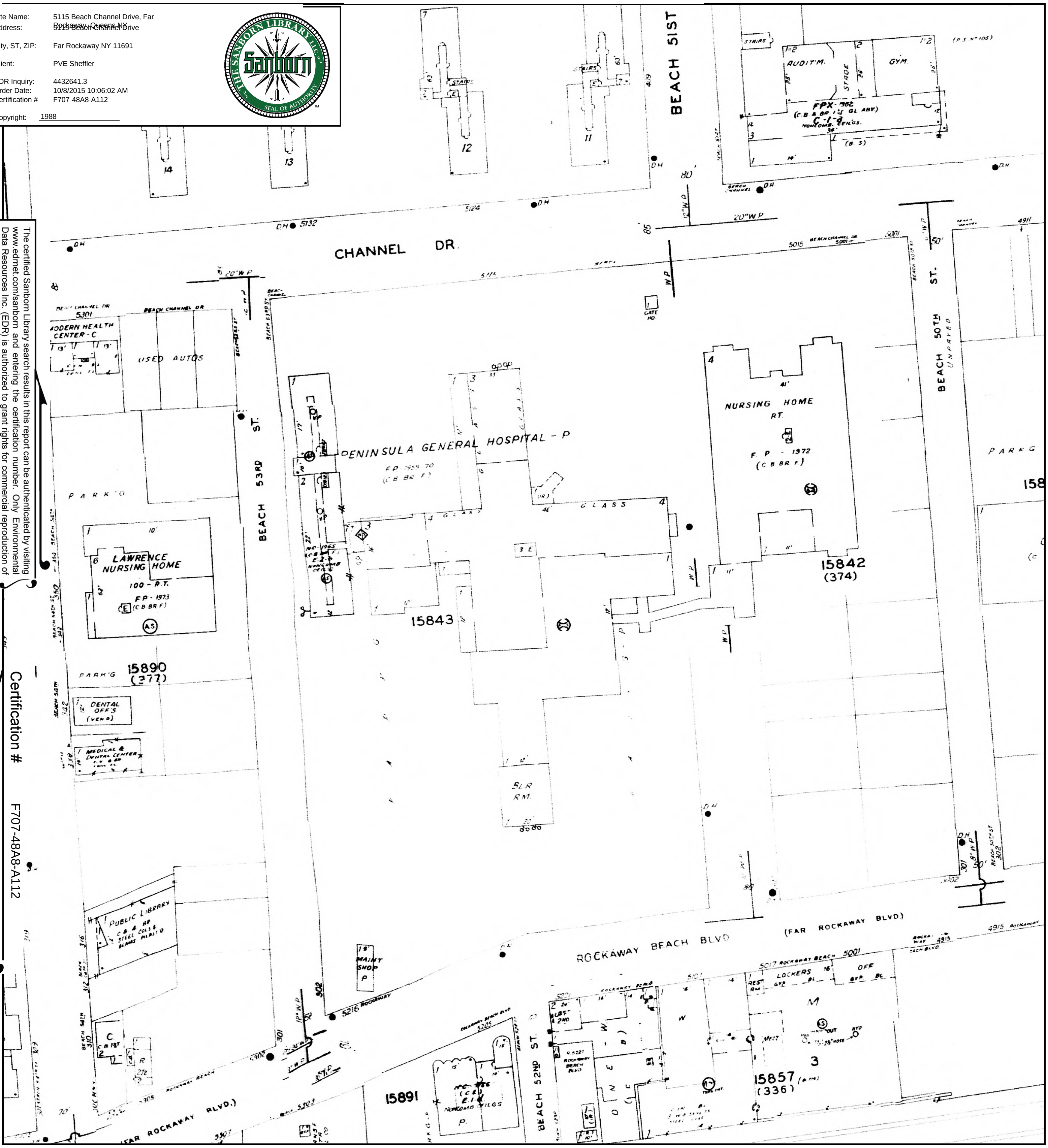
N

1988 Certified Sanborn Map

Site Name:	5115 Beach Channel Drive, Far Rockaway, Queens NY
Address:	5115 Beach Channel Drive
City, ST, ZIP:	Far Rockaway NY 11691
Client:	PVE Sheffler
EDR Inquiry:	4432641.3
Order Date:	10/8/2015 10:06:02 AM
Certification #	F707-48A8-A112
Copyright:	1988

Certification # F707-48A8-A112



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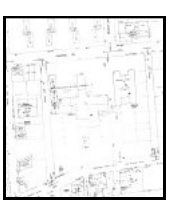

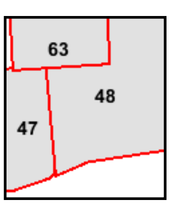

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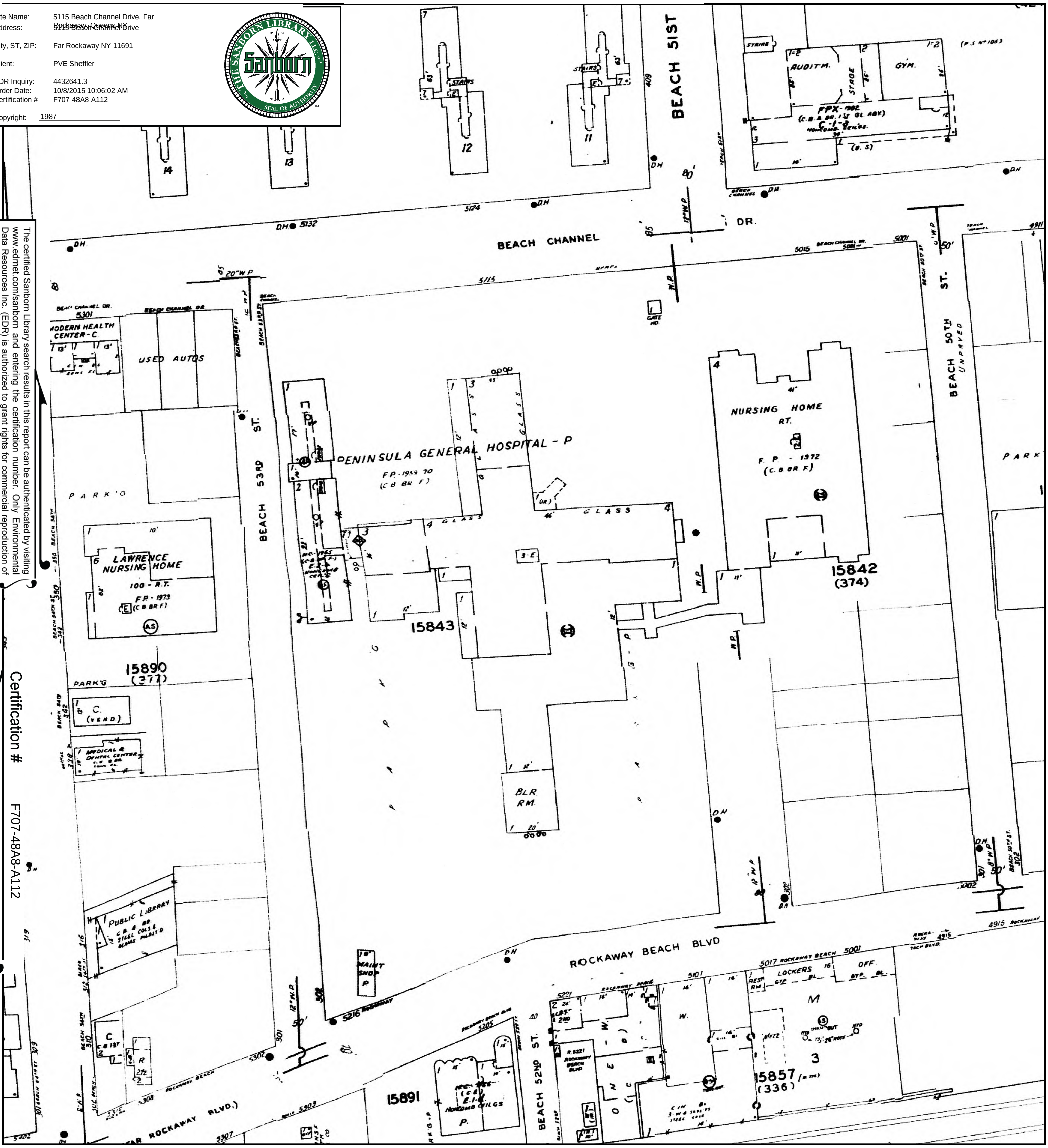
N

1987 Certified Sanborn Map

Site Name:	5115 Beach Channel Drive, Far Rockaway, Queens NY
Address:	5115 Beach Channel Drive
City, ST, ZIP:	Far Rockaway NY 11691
Client:	PVE Sheffler
EDR Inquiry:	4432641.3
Order Date:	10/8/2015 10:06:02 AM
Certification #	F707-48A8-A112
Copyright:	1987

Certification # F707-48A8-A112



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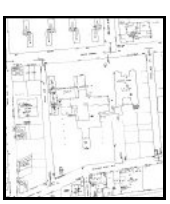

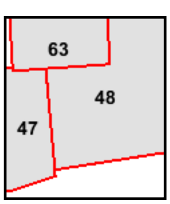

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1986 Certified Sanborn Map

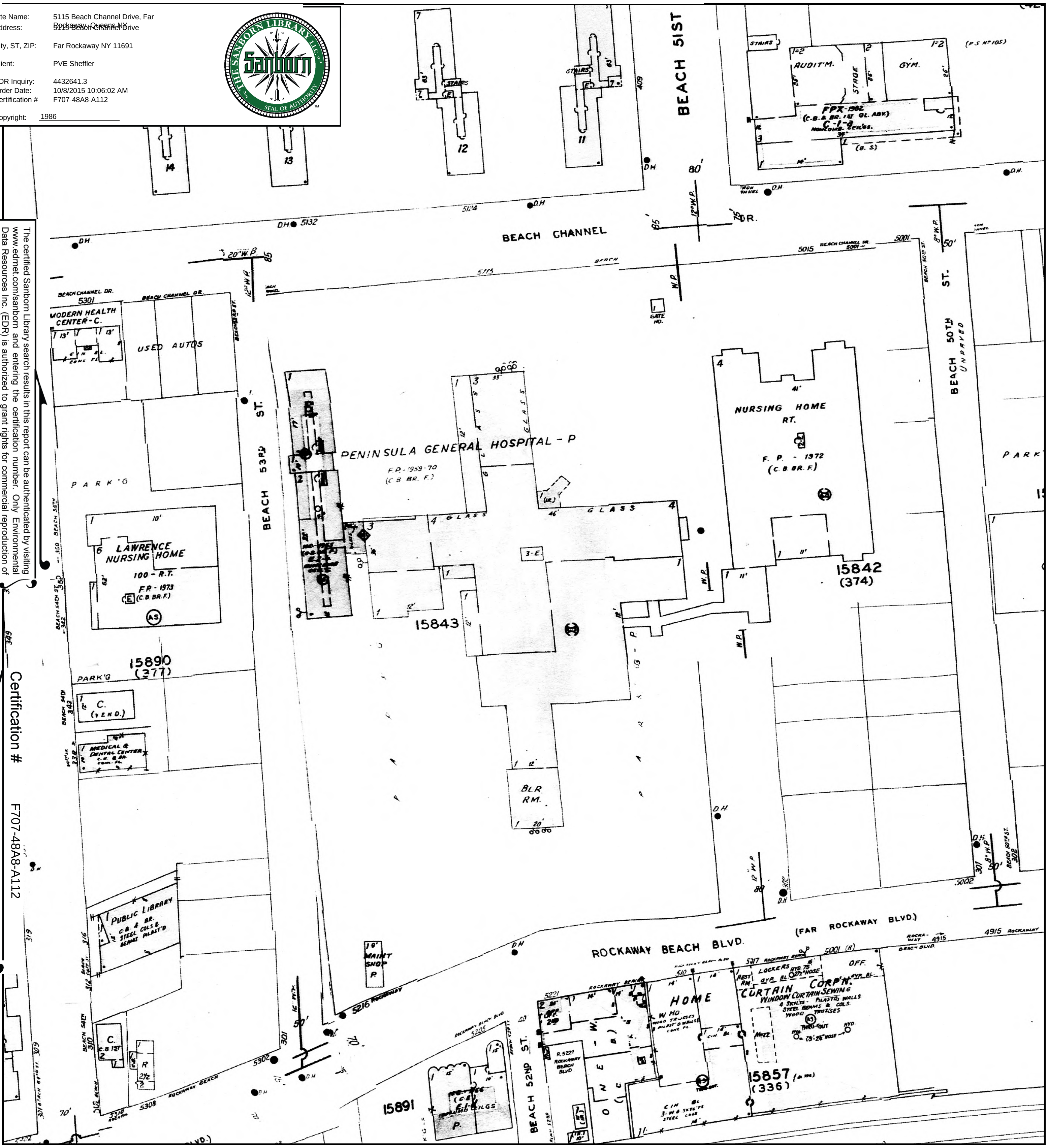
Site Name: 5115 Beach Channel Drive, Far Rockaway, Queens NY
Address: 5115 Beach Channel Drive

City, ST, ZIP: Far Rockaway NY 11691

Client: PVE Sheffler

EDR Inquiry: 4432641.3
Order Date: 10/8/2015 10:06:02 AM
Certification # F707-48A8-A112

Certification # F707-48A8-A112



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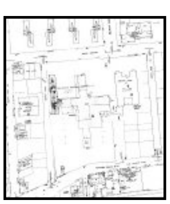

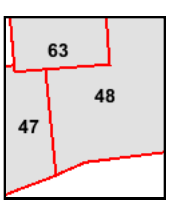

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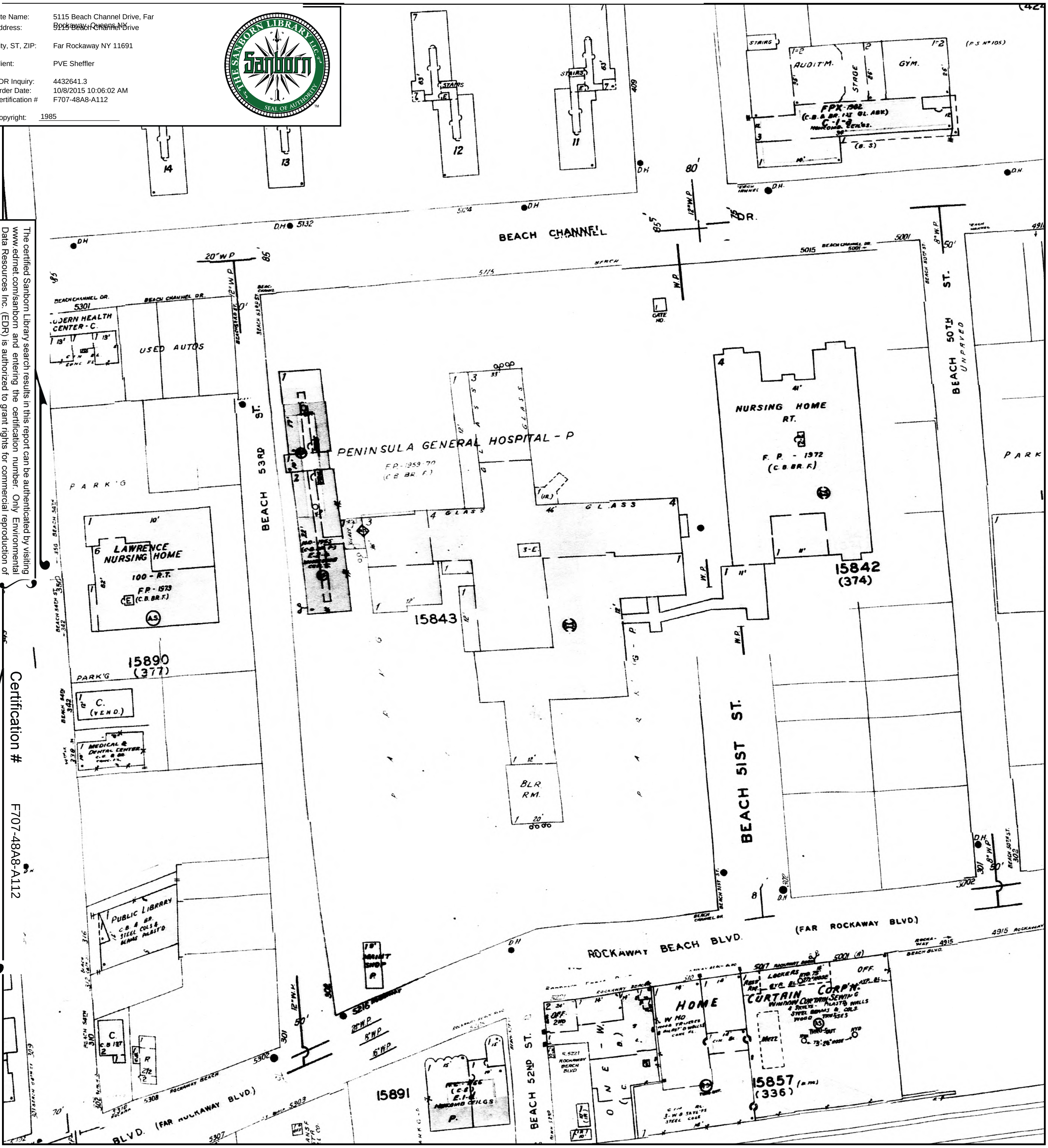
N

1985 Certified Sanborn Map

Site Name: 5115 Beach Channel Drive, Far Rockaway, Queens NY
Address: 5115 Beach Channel Drive
City, ST, ZIP: Far Rockaway NY 11691
Client: PVE Sheffler
EDR Inquiry: 4432641.3
Order Date: 10/8/2015 10:06:02 AM
Certification # F707-48A8-A112
Copyright: 1985

Certification # F707-48A8-A112



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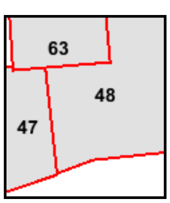

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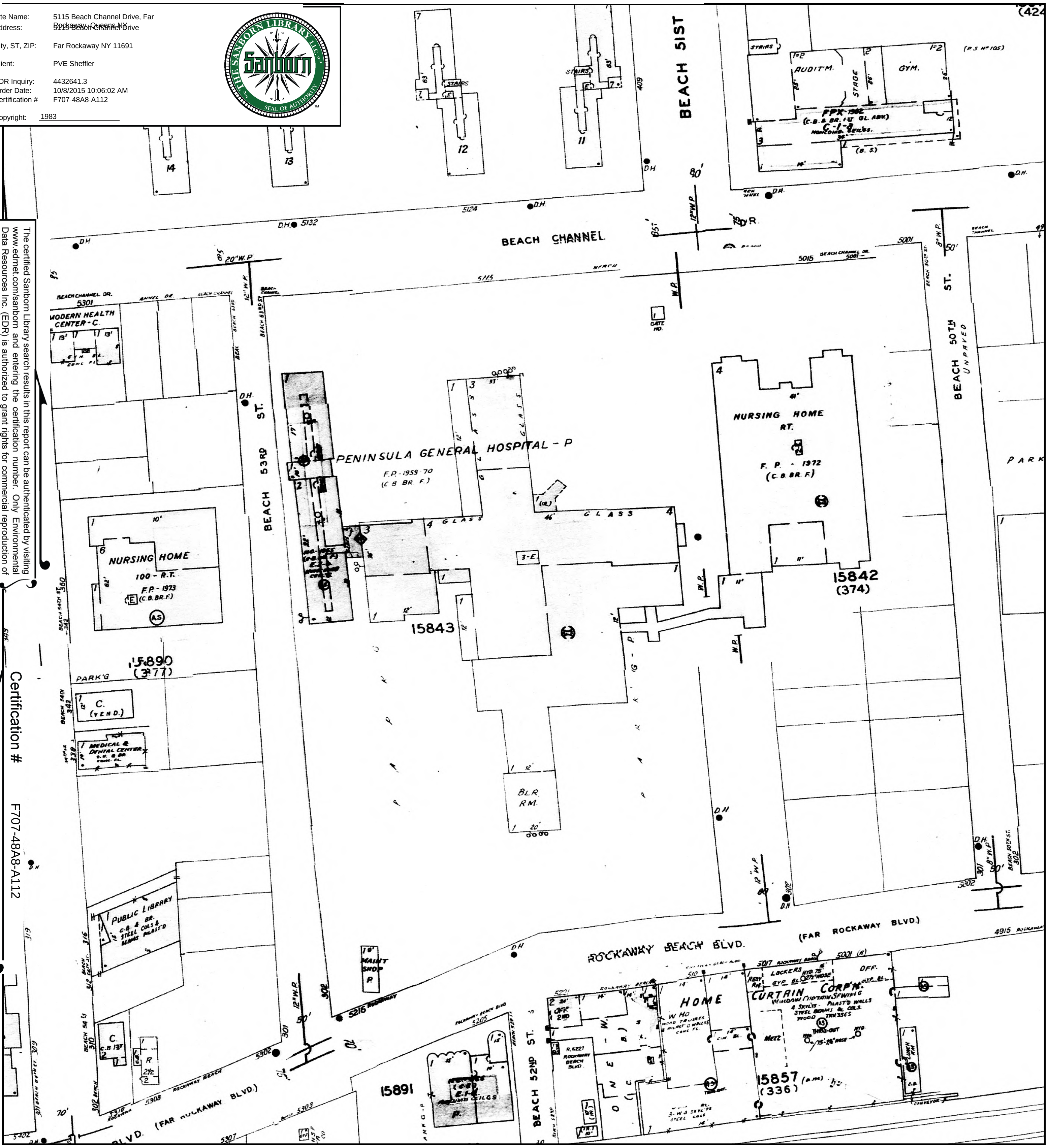
1983 Certified Sanborn Map

Site Name: 5115 Beach Channel Drive, Far Rockaway, Queens NY
Address: 5115 Beach Channel Drive
City, ST, ZIP: Far Rockaway NY 11691
Client: PVE Sheffler
EDR Inquiry: 4432641.3
Order Date: 10/8/2015 10:06:02 AM
Certification # F707-48A8-A112
Copyright: 1983

Certification # F707-48A8-A112



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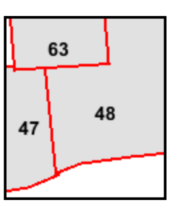

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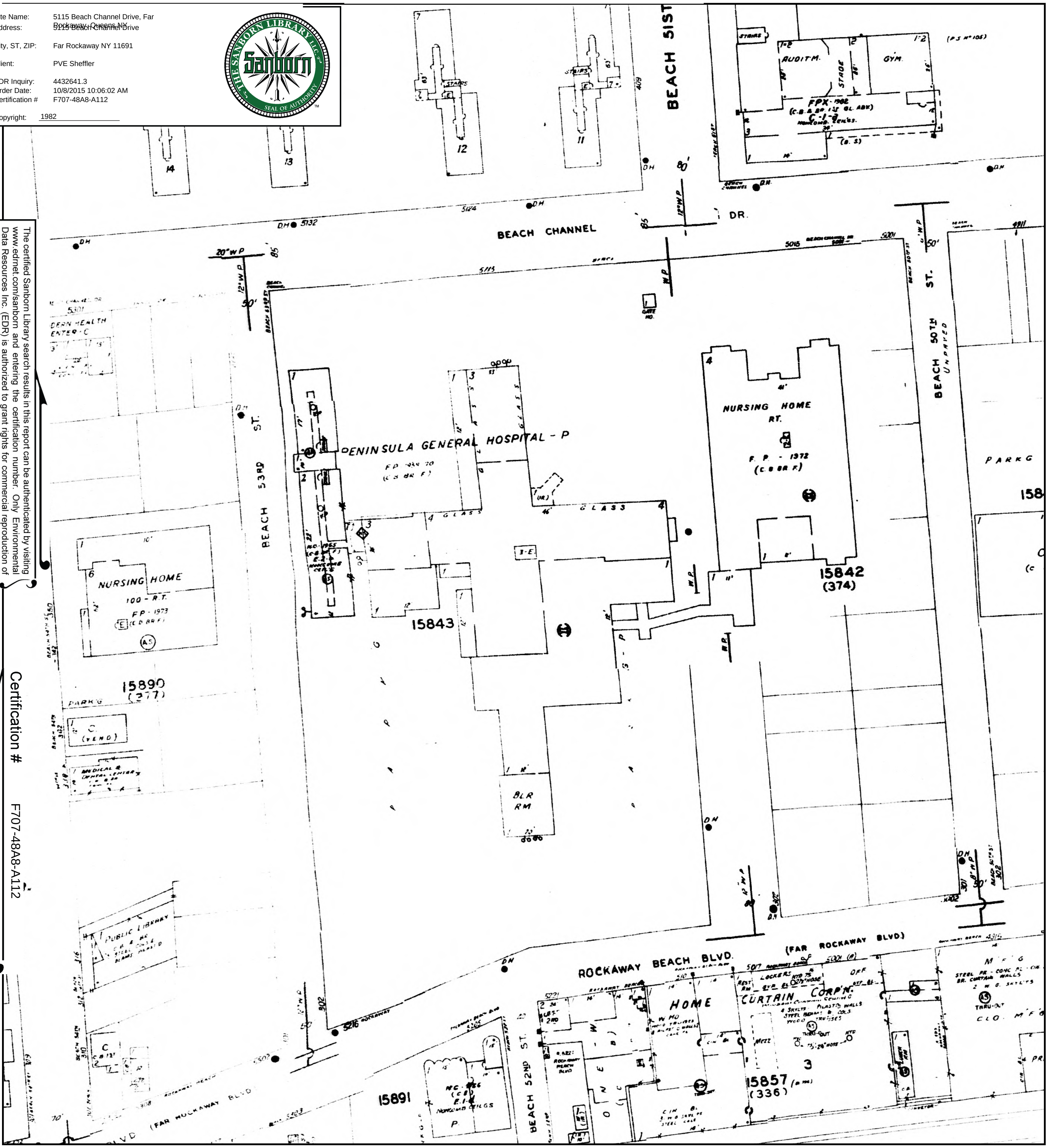
1982 Certified Sanborn Map

Site Name:	5115 Beach Channel Drive, Far Rockaway, Queens NY
Address:	5115 Beach Channel Drive
City, ST, ZIP:	Far Rockaway NY 11691
Client:	PVE Sheffler
EDR Inquiry:	4432641.3
Order Date:	10/8/2015 10:06:02 AM
Certification #	F707-48A8-A112
Copyright:	1982



Certification # F707-48A8-A112

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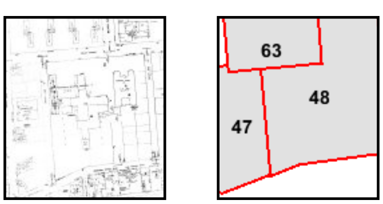

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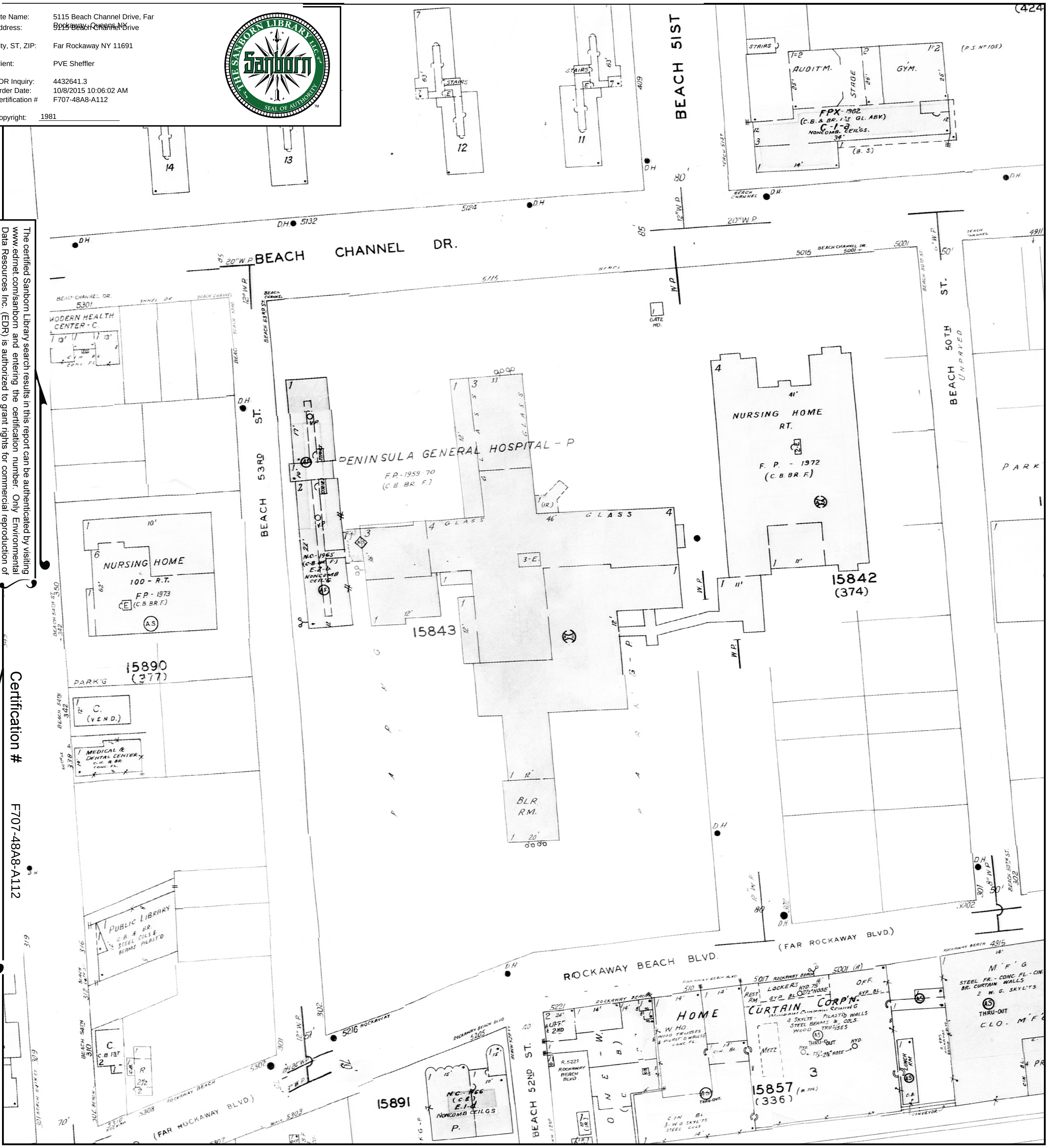
1981 Certified Sanborn Map

Site Name:	5115 Beach Channel Drive, Far Rockaway, Queens NY
Address:	5115 Beach Channel Drive
City, ST, ZIP:	Far Rockaway NY 11691
Client:	PVE Sheffler
EDR Inquiry:	4432641.3
Order Date:	10/8/2015 10:06:02 AM
Certification #	F707-48A8-A112
Copyright:	1981

Certification # F707-48A8-A112



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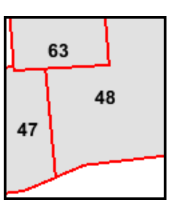

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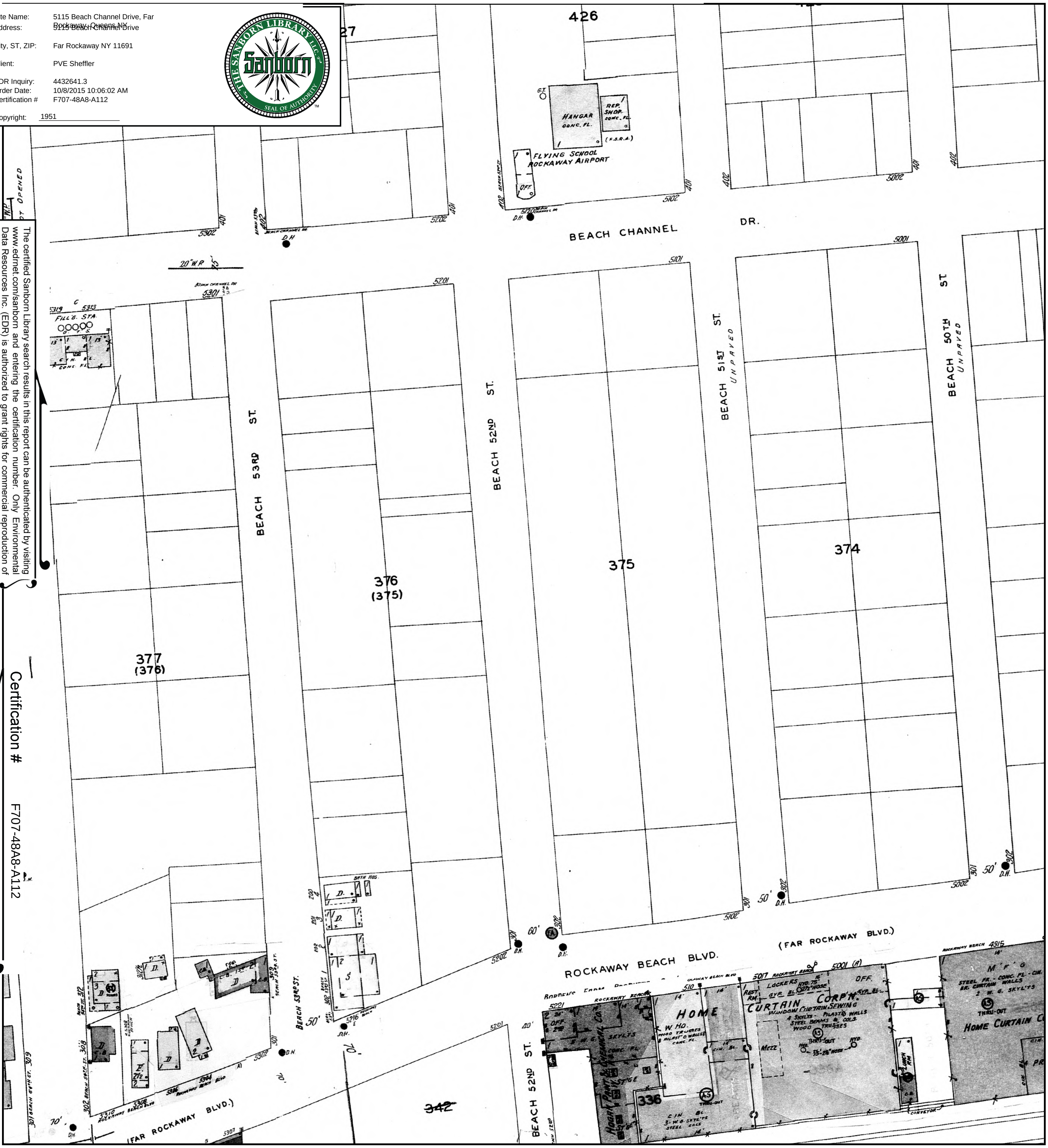
N

1951 Certified Sanborn Map

Site Name: 5115 Beach Channel Drive, Far Rockaway, Queens NY
Address: 5115 Beach Channel Drive
City, ST, ZIP: Far Rockaway NY 11691
Client: PVE Sheffler
EDR Inquiry: 4432641.3
Order Date: 10/8/2015 10:06:02 AM
Certification # F707-48A8-A112
Copyright: 1951

Certification # F707-48A8-A112



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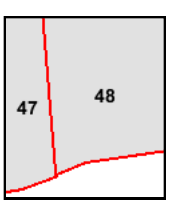

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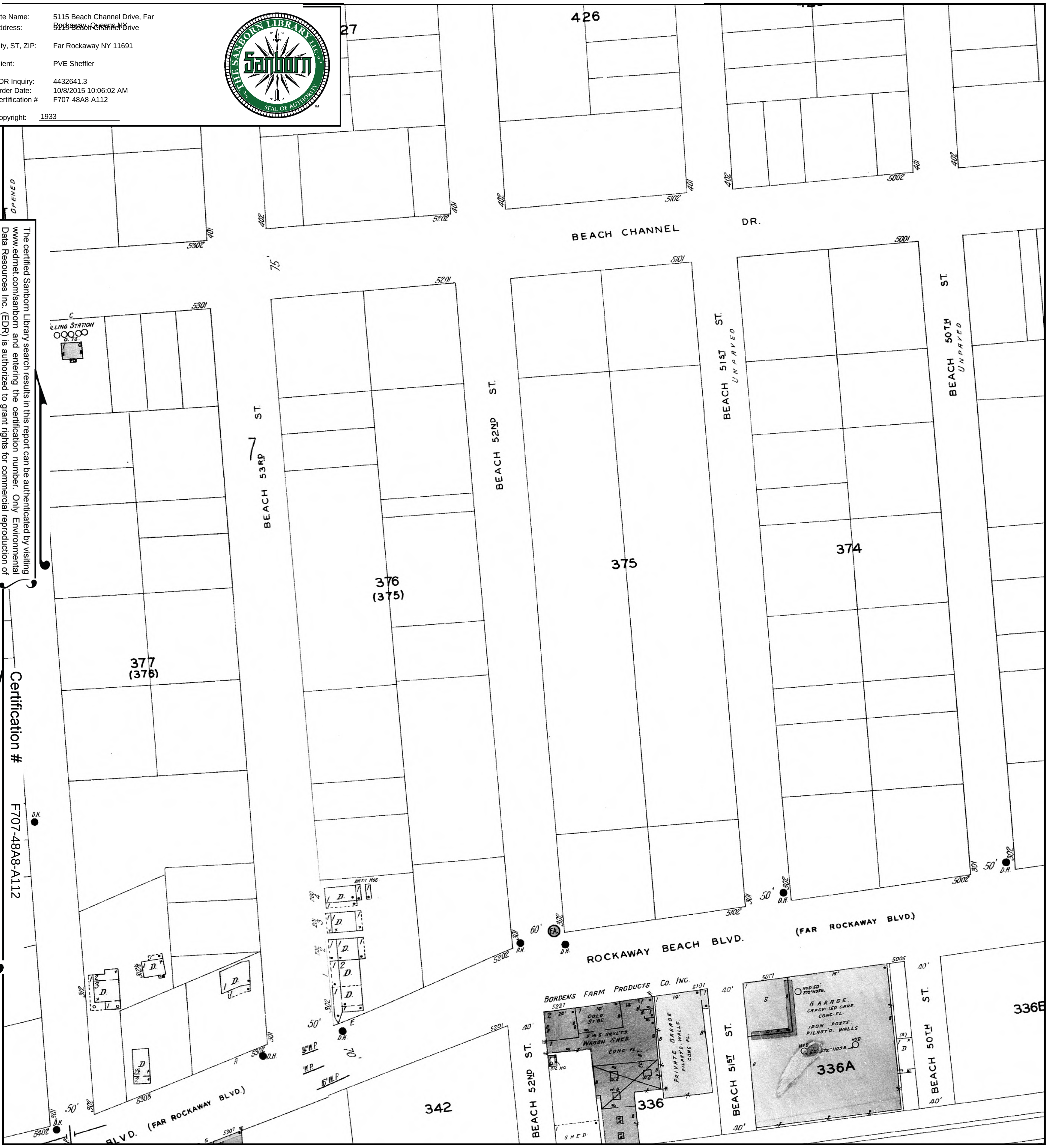
N

1933 Certified Sanborn Map

Site Name: 5115 Beach Channel Drive, Far Rockaway, Queens NY
Address: 5115 Beach Channel Drive
City, ST, ZIP: Far Rockaway NY 11691
Client: PVE Sheffler
EDR Inquiry: 4432641.3
Order Date: 10/8/2015 10:06:02 AM
Certification # F707-48A8-A112



Certification # F707-48A8-A112

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

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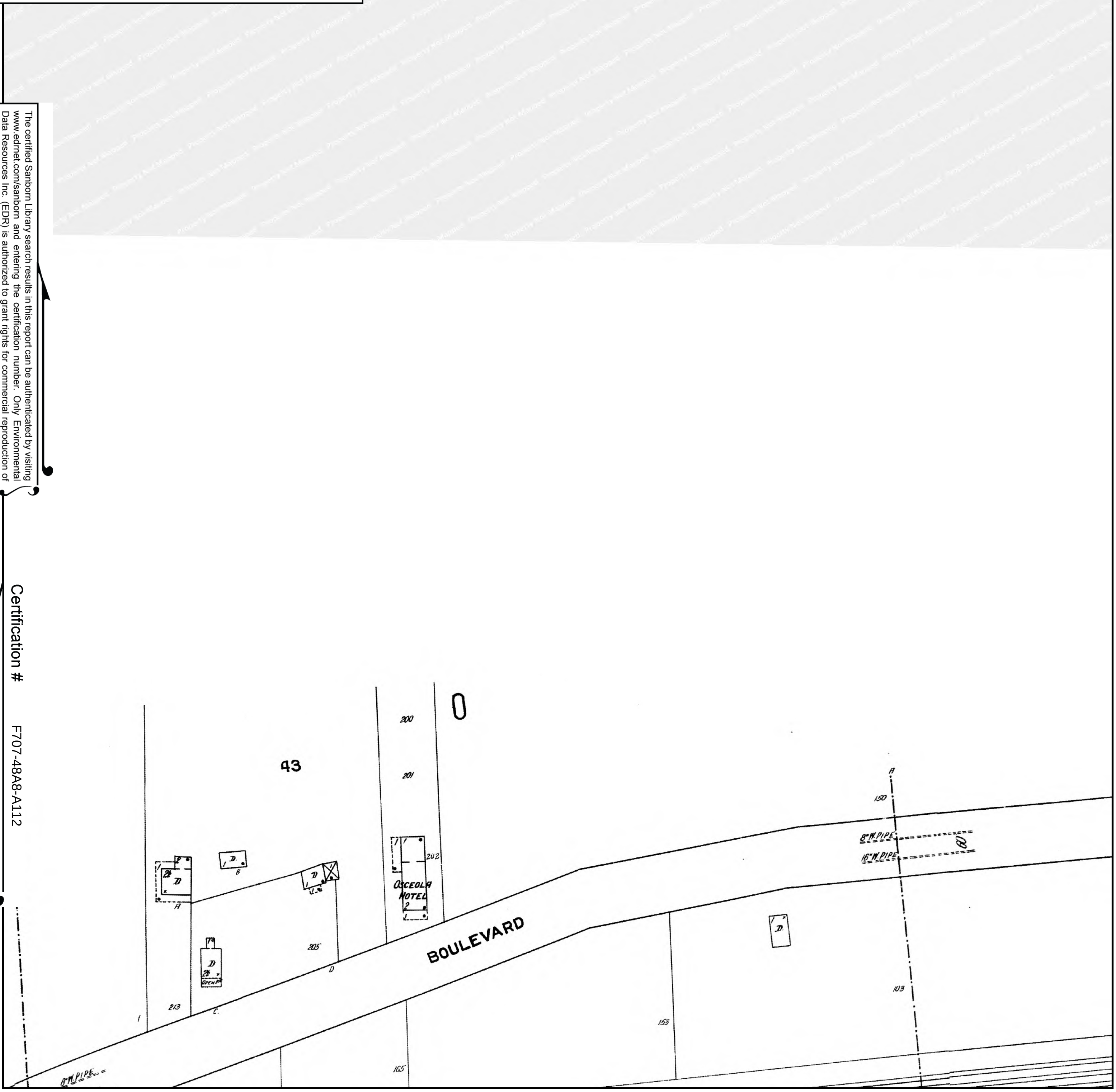
1912 Certified Sanborn Map

Site Name: 5115 Beach Channel Drive, Far Rockaway, Queens NY
Address: 5115 Beach Channel Drive
City, ST, ZIP: Far Rockaway NY 11691
Client: PVE Sheffler
EDR Inquiry: 4432641.3
Order Date: 10/8/2015 10:06:02 AM
Certification # F707-48A8-A112

Certification # F707-48A8-A112



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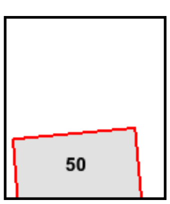

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APPENDIX D

REMEDIAL COST ESTIMATES

Remedial Alternative A (Track 1 Cleanup): Soil Excavation, SVE, GW monitoring, ICs

	No. units	Unit Cost	Item Total
Excavate and Dispose 100,000 cy soil exceeding unrestricted use SCOs			
Delineation Sampling (allowance)	1	$20,000	$20,000
Contractor Mob/demob	1	$20,000	$20,000
Shoring (6 areas each 40 feet by 20 feet, 4,800 sf, not dedicated)	4,800	$25	$120,000
Dewatering permit, including testing (allowance)	1	$5,000	$5,000
Dewatering equipment, including treatment (allowance)	1	$10,000	$10,000
Sewer discharge fee (allowance)	1	$5,000	$5,000
Excavate/Stockpile up to 100,000 cy soil	100,000	$12	$1,200,000
Waste Characterization (1/1,000 cy)	100	$1,000	$100,000
Loading Soil (per cy)	100,000	$10	$1,000,000
Transport/Dispose (135,000 tons, non-hazardous)	135,000	$50	$6,750,000
Backfill (import, place, compact 100,000 cy)	100,000	$40	$4,000,000
Confirmatory samples (est. 40 for VOCs, SVOCs, metals, pests., PCBs)	40	$1,000	$40,000
DUSR prep	3	$2,000	$6,000
Subtotal:			**$13,276,000**
Contingency (15% of construction costs)			$1,991,400
Engineering Design (15% of construction costs)			$1,991,400
Oversight/Reporting (10% of construction costs)			$1,327,600
Total Capital Cost for excavation:			**$18,586,400**
SVE System Design and Installation - 7 areas of Site			
Contractor Mob/demob	1	$5,000	$5,000
SVE Well installation (14 2" PVC wells to 5 feet)	14	$2,000	$28,000
Trenching & Piping (4,200 feet in unpaved surface)	4,200	$50	$210,000
SVE Components (4 blowers, knockout drums, filters)	4	$6,000	$24,000
Remedial Enclosure	1	$5,000	$5,000
Electrical Service	1	$10,000	$10,000
Electrical Controls	1	$8,000	$8,000
Subtotal:			**$290,000**
Contingency (15% of system construction costs)			$43,500
System Design (15% of system construction costs)			$43,500
Oversight and Reporting (10% of system construction costs)			$29,000
Total Capital Cost for SVE:			**$406,000**
SVE OM&M and Reporting (Annual)			
Labor (monthly OM&M)	12	$1,500	$18,000
Repair and maintenance materials (routine, annual)	1	$500	$500
Repair and maintenance materials (non-routine, 1/3 of SVE components)	1	$7,920	$7,920
Effluent lab analysis - TO-15, quarterly	16	$350	$5,600
Reporting, as part of Annual Certification	1	$5,000	$5,000
Electrical service (monthly)	12	$4,000	$48,000
Subtotal:			**$85,020**
Contingency (15% of annual costs)			$12,753
Total SVE Annual OM&M Cost:			**$97,773**
Post-SVE Soil Vapor Testing and Reporting			
Labor and materials	1	$5,000	$5,000
SV lab analysis - TO-15, 10 samples plus QAQC	13	$350	$4,550
DUSR prep	1	$2,000	$2,000
Reporting	1	$5,000	$5,000
Subtotal:			**$16,550**
Contingency (15% of costs)			$2,483
Total Post-SVE Soil Vapor Testing and Reporting Cost:			**$19,033**
SVE System Removal			
Cut and plug below-grade piping	1	$5,000	$5,000
Remove/dispose above-grade components	1	$5,000	$5,000
Terminate/remove electrical service	1	$2,000	$2,000
Subtotal:			**$12,000**
Contingency (15% of removal costs)			$1,800
Abandonment Specs (15% of removal costs)			$1,800
Oversight and Reporting (10% of removal costs)			$1,200
Total Capital Cost for SVE system removal:			**$16,800**
GW Monitoring and Reporting (Annual)			
Labor and Materials (10 wells quarterly monitoring)	4	$6,000	$24,000
Repair and maintenance of wells (routine, annual)	1	$500	$500
Repair and maintenance of wells (non-routine, replace 1 well)	1	$3,000	$3,000
SVOC analysis only (10 wells pls QAQC, quarterly)	52	$400	$20,800
DUSR prep	4	$2,000	$8,000
Reporting, as part of Annual Certification	1	$5,000	$5,000
Subtotal:			**$61,300**
Contingency (15% of annual costs)			$9,195
Total Annual GW Monitoring and Reporting Cost:			**$70,495**
GW Monitoring Network Abandonment			
Contractor Mob/demob	1	$500	$500
Well abandonment (10 wells to 10 feet, 2" PVC)	10	$500	$5,000
Subtotal:			**$5,500**
Contingency (15% of abandonment costs)			$825
Abandonment Specs (15% of abandonment costs)			$825
Oversight and Reporting (10% of abandonment costs)			$550
Total Capital Cost for GW monitoring network abandonment:			**$7,700**
ICs			
Prepare Site Management Plan	1	$20,000	$20,000
Prepare/Record Environmental Easement (prohibit GW use)	1	$10,000	$10,000
Alta survey	1	$10,000	$10,000
Subtotal for ICs:			**$40,000**
Contingency (15% of IC costs)			$6,000
Total Capital Cost for ICs:			**$46,000**
Reporting and Certification (Annual)			
Labor (periodic and annual inspections)	2	$2,000	$4,000
Report preparation (inspections only, not incl. monitoring reporting costs)	1	$5,000	$5,000
Subtotal:			**$9,000**
Contingency (15% of annual costs)			$1,350
Total Annual Reporting and Certification Cost:			**$10,350**
Total Capital Costs for Remedial Alternative A (Track 1 Cleanup):			**$19,081,933**
Total Annual OM&M Costs:			**$178,618**

Remedial Alternative A: Soil Excavation, SVE, GW monitoring, and ICs
Net Present Worth Calculations

		Net Present Worth (4 and 30 years)	years	Reporting Only Costs for Calcs
Capital Cost:	**$19,081,933**			
OM&M and Reporting (annual, first 4 years):	**$178,618**		**years**	
Reporting (annual, years 5 - 30):	**$10,350**			
interest rate: 0.05		$ 178,618	**1**	
inflation rate: 0.02		$ 173,416	**2**	$ 10,049
		$ 168,365	**3**	$ 9,756
		$ 163,461	**4**	$ 9,472
Total Net Present Worth at 4 years:		**$ 19,765,791**		
		$ 9,196	**5**	
		$ 8,928	**6**	
		$ 8,668	**7**	
		$ 8,415	**8**	
		$ 8,170	**9**	
		$ 7,932	**10**	
		$ 7,701	**11**	
		$ 7,477	**12**	
		$ 7,259	**13**	
		$ 7,048	**14**	
		$ 6,843	**15**	
		$ 6,643	**16**	
		$ 6,450	**17**	
		$ 6,262	**18**	
		$ 6,080	**19**	
		$ 5,902	**20**	
		$ 5,731	**21**	
		$ 5,564	**22**	
		$ 5,402	**23**	
		$ 5,244	**24**	
		$ 5,092	**25**	
		$ 4,943	**26**	
		$ 4,799	**27**	
		$ 4,659	**28**	
		$ 4,524	**29**	
		$ 4,392	**30**	
Total Net Present Worth at 30 years:		**$ 19,935,116**		

Remedial Alternative B (Track 4 Cleanup): Covers, Limited Soil Excavation, Vapor Barriers/SSDSs, ICs

	No. units	Unit Cost	Item Total
Construct Building Foundation and Pavement Covers (A1 and B1 Building areas)			
Contractor Mob/demob	1	$25,000	$25,000
Site Prep Allowance (grading, remove obstructions)	1	$50,000	$50,000
Construct concrete building slab (per square foot)	59,118	$20	$1,182,360
Construct concrete sidewalks (per square foot)	11,700	$10	$117,000
Construct paved parking areas (per square foot)	31,900	$15	$478,500
Construct paved roads (per square foot)	12,400	$20	$248,000
Subtotal:			**$2,100,860**
Contingency (15% of construction costs)			$315,129
Engineering Design (15% of construction costs)			$315,129
Oversight/Reporting (10% of construction costs)			$210,086
Total Capital Cost for Foundation and Pavement Covers:			**$2,941,204**
Excavate and Dispose Source Soil and Limited Soil exceeding restricted residential use SCOs			
Delineation Sampling (allowance)	1	$7,000	$7,000
Contractor Mob/demob	1	$10,000	$10,000
Excavate/Stockpile up to 850 cy soil	850	$12	$10,200
Waste Characterization (1/1,000 cy)	1	$1,000	$1,000
Loading Soil (per cy)	850	$10	$8,500
Transport/Dispose (1,150 tons, non-hazardous)	1,150	$50	$57,500
Backfill (import, place, compact 850 cy)	850	$40	$34,000
Confirmatory samples (est. 20 plus QAQC for SVOCs, metals)	28	$400	$11,200
DUSR prep	2	$2,000	$4,000
Subtotal:			**$143,400**
Contingency (15% of construction costs)			$21,510
Engineering Design (15% of construction costs)			$21,510
Oversight/Reporting (10% of construction costs)			$14,340
Total Capital Cost for limited excavation:			**$200,760**
Cover Materials Over Balance of Site (assumes 20,000 cy cover meeting restricted residential use SCOs)			
Materials Sampling prior to import (allowance)	1	$5,000	$5,000
Contractor Mob/demob	1	$10,000	$10,000
Cover Materials (grade 10,000 cy of existing crushed concrete)	10,000	$5	$50,000
Cover Materials (import, place, grade 10,000 cy)	10,000	$40	$400,000
Survey	1	$5,000	$5,000
Subtotal:			**$470,000**
Contingency (15% of construction costs)			$70,500
Engineering Design (15% of construction costs)			$70,500
Oversight/Reporting (10% of construction costs)			$47,000
Total Capital Cost for cover materials:			**$658,000**
Soil Vapor Mitigation (vapor barrier and SSDSs)			
Contractor Mob/demob	1	$5,000	$5,000
Vapor barrier	59,118	$3	$177,354
SSDSs (allowance per square foot of building slab under habitable spaces)	48,555	$10	$485,550
SSDS Pilot Testing (allowance)	1	$10,000	$10,000
Effluent lab analysis - TO-15, 2 systems, once	2	$350	$700
SVI Testing (initial, allowance)	1	$10,000	$10,000
Subtotal:			**$688,604**
Contingency (15% of system construction costs)			$103,291
System Design (15% of system construction costs)			$103,291
Oversight and Reporting (10% of system construction costs)			$68,860
Total Capital Cost for soil vapor mitigation:			**$964,046**
GW Monitoring Network Abandonment			
Contractor Mob/demob	1	$500	$500
Well abandonment (10 wells to 10 feet, 2" PVC)	10	$500	$5,000
Subtotal:			**$5,500**
Contingency (15% of abandonment costs)			$825
Abandonment Specs (15% of abandonment costs)			$825
Oversight and Reporting (15% of abandonment costs)			$825
Total Capital Cost for GW monitoring network abandonment:			**$7,975**
ICs			
Prepare Site Management Plan	1	$20,000	$20,000
Prepare/Record Environmental Easement	1	$10,000	$10,000
Alta survey	1	$10,000	$10,000
Subtotal for ICs:			**$40,000**
Contingency (15% of IC costs)			$6,000
Total Capital Cost for ICs:			**$46,000**
SSDS OM&M and Reporting (Annual)			
Labor (quarterly OM&M)	4	$1,500	$6,000
Repair and maintenance materials (routine, annual)	1	$500	$500
Repair and maintenance materials (non-routine, allowance)	1	$3,000	$3,000
Reporting, as part of Annual Certification	1	$5,000	$5,000
Electrical service (monthly)	12	$3,000	$36,000
Subtotal:			**$50,500**
Contingency (15% of annual costs)			$7,575
Total SSDS Annual OM&M Cost:			**$58,075**
Reporting and Certification (Annual)			
Labor (periodic and annual inspections)	2	$1,500	$3,000
Report preparation (inspections only, not incl. monitoring reporting costs)	1	$5,000	$5,000
Subtotal:			**$8,000**
Contingency (15% of annual costs)			$1,200
Total Annual Reporting and Certification Cost:			**$9,200**
Post-SSDS SVI Testing and Reporting			
Labor and materials	1	$5,000	$5,000
Sample analysis - TO-15, 10 samples plus QAQC	13	$350	$4,550
Reporting	1	$5,000	$5,000
Subtotal:			**$14,550**
Contingency (15% of costs)			$2,183
Total Post-SSDS SVI Testing and Reporting Cost:			**$16,733**
SSSDS Removal			
Cut and plug below-grade piping	2	$5,000	$10,000
Remove/dispose operating components	2	$5,000	$10,000
Terminate/remove electrical service	2	$1,000	$2,000
Subtotal:			**$22,000**
Contingency (15% of removal costs)			$3,300
Abandonment Specs (15% of removal costs)			$3,300
Oversight and Reporting (10% of removal costs)			$2,200
Total Capital Cost for SSDS removal:			**$52,800**
Total Capital Costs for Remedial Alternative B (Track 4 Cleanup):			**$4,887,517**
Total Annual OM&M Costs:			**$67,275**

Remedial Alternative B: Covers, Limited Soil Excavation, Vapor Barriers/SSDSs, ICs

Net Present Worth Calculations

		Net Present Worth (30 years)		
Capital Cost:	**$4,887,517**			
OM&M and Reporting (annual):	**$67,275**			**years**
interest rate: 0.05		$	67,275	**1**
inflation rate: 0.02		$	65,316	**2**
		$	63,413	**3**
		$	61,566	**4**
		$	59,773	**5**
		$	58,032	**6**
		$	56,342	**7**
		$	54,701	**8**
		$	53,108	**9**
		$	51,561	**10**
		$	50,059	**11**
		$	48,601	**12**
		$	47,185	**13**
		$	45,811	**14**
		$	44,477	**15**
		$	43,181	**16**
		$	41,924	**17**
		$	40,702	**18**
		$	39,517	**19**
		$	38,366	**20**
		$	37,249	**21**
		$	36,164	**22**
		$	35,110	**23**
		$	34,088	**24**
		$	33,095	**25**
		$	32,131	**26**
		$	31,195	**27**
		$	30,286	**28**
		$	29,404	**29**
		$	28,548	**30**
	Total Net Present Worth at 30 years:	**$**	**6,245,695**	

APPENDIX E

HEALTH AND SAFETY PLAN

AND

COMMUNITY AIR MONITORING PLAN

APPENDIX E
HEALTH AND SAFETY PLAN

This worker Health and Safety Plan (HASP) has been prepared by FPM Group (FPM) for New York State Department of Environmental Conservation (NYSDEC) Brownfield Program Site #C241200, identified as the Former Peninsula Hospital Site located at 51-15 Beach Channel Drive Far Rockaway, Queens, New York (Site). This HASP is part of the Remedial Action Work Plan (RAWP) and includes measures for the protection of worker health and safety during remedial activities. A Community Air Monitoring Plan (CAMP) is also included to address potential issues that may affect the Site community during onsite remedial activities.

E.1 Worker Health and Safety Plan

E.1.1 <u>Introduction</u>

This HASP has been written for compliance with "OSHA Hazardous Waste Operations Standards (29 CFR 1910.120)", the guidance documents, "Standard Operating Safety Guidelines (Office of Solid Waste and Emergency Response, 1992)" and the "Occupational Safety and Health Guidance Manual for Hazardous Waste Activities" (U.S. Department of Health and Human Services, 1985).

E.1.2 <u>Scope and Applicability of the HASP</u>

This HASP is designed to be applicable to locations where remedial activities are performed at the Site by all parties that either perform or witness the activities. The remedial activities may include soil borings and sampling, soil vapor implant installation and sampling, groundwater monitoring well abandonment, and construction of remedial elements, including covers, vapor barriers, and sub-slab depressurization systems (SSDSs). This HASP may be modified or amended to meet specific needs of the proposed work.

This HASP will detail the Site safety procedures, Site background, and safety monitoring. Contractors will be required to adopt this HASP in full or to follow an FPM-approved HASP. The Health and Safety Officer (HSO) will be present at the Site to inspect the implementation of the HASP; however, it is the sole responsibility of the contractor(s) to comply with the HASP.

The HASP has been formulated as a guide to complement professional judgment and experience. The appropriateness of the information presented should always be evaluated with respect to unforeseen Site conditions that may arise.

E.1.3 <u>Site Work Zone and Visitors</u>

The Site work zone (a.k.a. exclusion zone) during the performance of remedial activities will be a 30-foot radius about the work location. This work zone may be extended if, in the judgment of the HSO, Site conditions warrant a larger work zone.

No visitors will be permitted within the work zone without the consent of the HSO. All visitors will be required to be familiar with, and comply with, the HASP. The HSO will deny access to those whose presence within the work zone is unnecessary or those who are deemed by the HSO to be in non-compliance with the HASP.

All Site workers with the potential to contact residual materials, including the contractors, will be required to have 40-hour hazardous material training (eight-hour refresher courses annually), respirator fit test certification, and current medical surveillance as stated in 29 CFR 1910.120.

The HSO will also give an on-Site health and safety discussion to all Site personnel, including the contractors, prior to initiating the Site work. Workers not in attendance during the health and safety talk will be required to have the discussion with the HSO prior to entering the work zone.

Emergency telephone numbers and directions to the nearest hospital are shown in Table E.1.3.1 and will be kept at the Site in the possession of the HSO and will be available to all Site workers and visitors.

E.1.4 Key Personnel/Alternates

The Senior Manager (project coordinator) for this project is Stephanie Davis, PG. The Quality Assurance Officer (QAO) will be Ben Cancemi, PG. The Project Manager will be John Bukoski, PG, who will also act as the HSO. An Assistant Project Manager and Assistant HSO may be designated for the field activities.

E.1.5 Site Background

Based on the Site history and previous analyses of samples, the known chemicals present at the Site include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. VOCs are present in soil vapor at the Site, SVOCs and metals are present in groundwater at the Site, and SVOCs and metals are present in soil at the Site. Soil, groundwater, and soil vapor containing chemicals in excess of applicable regulatory criteria are considered residual materials. Remedial activities may include activities with the potential for exposure to residual materials, including soil, soil vapor, and/or groundwater.

E.1.6 Task/Operation Health and Safety Analysis

This section presents health and safety analyses for the remedial tasks. In general, FPM will employ one to two persons at the Site. No intrusive remedial operations with the potential to contact residual materials will be conducted by contractors without the presence of an FPM representative onsite. In the event that the HSO is not present on the Site, the Assistant HSO will implement the HASP. Levels of personal protection mentioned in this section are defined in Section E.1.9.

Intrusive Sampling and Monitoring Well Abandonment Safety Analysis

Intrusive sampling and monitoring well abandonment activities present the potential for contact with residual materials. These activities will be performed by a direct-push contractor, well abandonment contractor, and/or FPM personnel, as appropriate. If soil borings are performed, they will be performed by a direct-push contractor advancing tooling into unconsolidated deposits consisting primarily of sand. The depth to groundwater is approximately 4 to 8 feet below grade at the Site and may be contacted during soil borings. Soil sampling will be conducted by FPM personnel. Groundwater monitoring well abandonment will be performed by a well abandonment contractor. Soil vapor implants will be installed by FPM personnel during construction of the new building slabs and sampling will be performed by FPM personnel. FPM personnel will be present to coordinate, oversee, and monitor all intrusive remedial activities.

To minimize the potential for dust inhalation during intrusive activities, the HSO will assess wind and soil moisture conditions and, if it is deemed necessary by the HSO, the affected area will be wetted with

TABLE E.1.3.1
EMERGENCY TELEPHONE NUMBERS AND
DIRECTIONS TO ST. JOHN'S EPISCOPAL HOSPITAL

Police.. 911
Ambulance.. 911
Poison Control Center.. 212-689-9014
St. John's Episcopal Hospital (Emergency Room) 718-869-7000

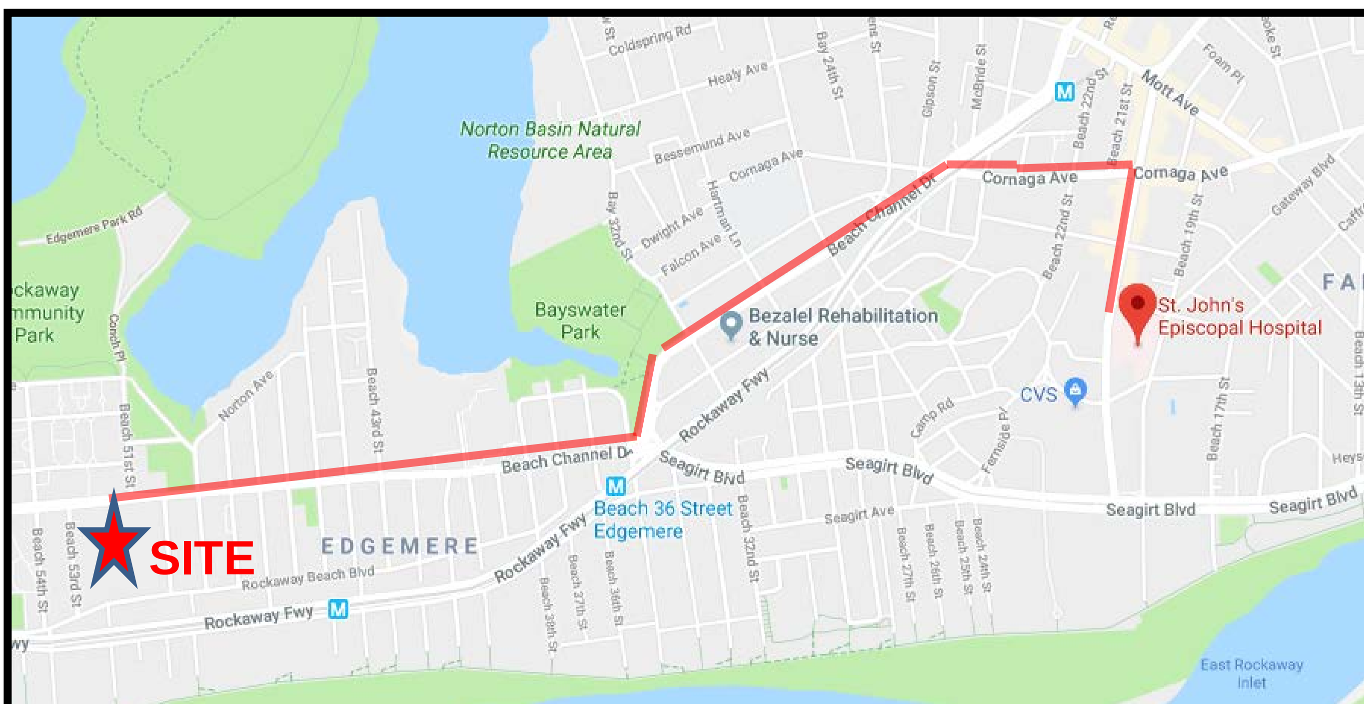
<u>FPM Contact Personnel (631-737-6200)</u>

Stephanie Davis, PG Senior Project Manager .... Cell # 516-381-3400
John Bukoski, PG, Project Manager .... Cell #516-381-3535
Ben Cancemi, PG, QAO .... Cell # 516-383-7106

<u>Directions to the St John's Episcopal Hospital Emergency Room</u>

327 Beach 19th Street (entrance is on Beach 20th Street)
Far Rockaway, NY 11691
Tel: 718-869-7000

Exit the north side of the Site and turn right onto Beach Channel Drive. Travel east on Beach Channel Drive for about 16 blocks to the intersection with Seagirt Boulevard. Stay to the left and continue on Beach Channel Drive for about seven blocks to Cornaga Avenue. Turn right onto Cornaga Avenue and continue about four blocks to Beach 20th Street. Turn right onto Beach 20th Street and continue for about two blocks. The Hospital is on east (left) side of the street and the Emergency Room entrance is next to the main entrance; follow the signs to the Emergency Room.



FPM

potable water. If this measure is determined to be ineffective, the HSO may decide to upgrade personal protection to Level C respiratory protection to include respirators with dust cartridges. If extremely dusty conditions exist that cannot be successfully controlled by dust suppression with potable water, then the HSO may choose to postpone intrusive activities until such time as conditions improve.

During intrusive activities, organic vapor concentrations will be monitored in the work zone by utilizing a Photovac MicroTIP PID or equivalent. The PID will be "zeroed" by exposing the PID to ambient (outdoor) air prior to intrusive activities and the upper range of calibration will be established by calibrating at 98 to 100 parts per million (ppm) of isobutylene. Background organic vapor concentrations will then be established in the work zone prior to intrusive activities and recorded in the HSO field book. Upon commencement of intrusive activities, PID readings will be obtained in the workers' breathing zone. Readings will be obtained periodically as the work proceeds and, at the discretion of the HSO, PID readings may be obtained more frequently. All readings and observations will be recorded in the HSO's field book. PID air monitoring will be conducted by FPM personnel. Steady-state PID readings greater than five ppm in the worker's breathing zone will require upgrading to Level C personal protective equipment. Steady-state readings, for this purpose, will be defined as readings exceeding five ppm above background for a minimum of ten seconds at points approximately one foot above and then around the immediate work area. These points will define the worker's breathing zone. Level C personal protection will be implemented including full-face air-purifying respirators with dust and organic vapor cartridges (personal protective equipment will be described in greater detail in Section E.1.9). All FPM personnel and contractors must be properly trained and fit tested prior to donning respirators.

If PID readings exceed steady-state levels greater than 50 ppm above background or any conditions exist for which the HSO determines require Level B personal protective equipment, all work at the Site will cease immediately and all personnel will evacuate the work zone. Evacuation will occur in the upwind direction if discernible. Specific evacuation routes will be discussed prior to commencement of work at each location based on work location and wind direction and an evacuation meeting place will be determined. Level B conditions are not anticipated to be encountered; however, if level B conditions arise, no Site work will be performed by FPM or contractors and a complete evaluation of the operation will be performed and this HASP will be modified.

All personnel will be required to wear chemical-resistant nitrile gloves when the potential for dermal contact with the soil or groundwater is possible. This will include handling equipment retrieved from the borehole or wells. Dermal contact with soil or groundwater and equipment that has been in contact with soil or groundwater will be avoided.

<u>Remedial Excavation and Construction Safety Analysis</u>

Remedial excavation and construction activities will likely involve the use of heavy equipment. Construction activities that may be occurring onsite during the remedial activities may also involve the use of heavy equipment. Heavy equipment operations for remedial activities will be performed by a qualified contractor with oversight by FPM.

Safety concerns during heavy equipment operations include risk of injury due to being struck by equipment, being trapped between moving equipment parts, being struck by dropped materials, and hearing damage due to equipment noise. All remedial personnel will take precautions against these risks when working in the vicinity of heavy equipment by being aware of equipment locations and movement, by wearing steel-toed boots and hard hats, and by using hearing protection, if necessary. Remedial personnel who have not previously worked in the vicinity of heavy equipment will be paired with an experienced person for at least one day to familiarize themselves with heavy equipment operations and safety procedures. All mobile equipment will be equipped with audible alarms to indicate when the equipment is being operated in reverse. All remedial personnel will be advised to stay away from construction areas if these activities are ongoing.

Remedial or construction activities may result in open excavations at the Site. If construction activities are ongoing during the remedial work, all remedial personnel will be alerted to the possibility of open excavations and advised to stay out of construction areas.

Other Safety Considerations

- Noise

During operations that may generate potentially harmful levels of noise, the HSO will monitor noise levels with a Realistic[tm] hand-held sound level meter. Noise levels will be monitored in decibels (dBs) in the A-weighted, slow-response mode. Noise level readings which exceed the 29 CFR 1910.95 permissible noise exposure limits will require hearing protection (see Table E.1.6.1 for Permissible Noise Exposures).

Hearing protection will be available to all remedial workers and will be required for exceedances of noise exposure limits. The hearing protection will consist of foam, expansion-fit earplugs (or other approved hearing protection) with a noise reduction rating of at least 29 dB. Hearing protection must alleviate worker exposure to noise to an eight-hour time-weighted average of 85 dB or below. In the event that the hearing protection is inadequate, work will cease until a higher level of hearing protection can be incorporated.

TABLE E.1.6.1
PERMISSIBLE NOISE EXPOSURES*

Duration Per Day Hours	Sound Level dBA Slow Response
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
½	110

Notes:

When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1+C_2/T_2+.....C_n/T_n$ exceeds unity, then, the mixed exposure should be considered to exceed the limit value. C_n indicates the total time of exposure at a specified noise level, and T_n indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

*Standards derived from 29 CFR 1910.95

- <u>Slip/Trip/Fall Preventative Measures</u>

To reduce the potential for slipping, tripping, or falling, the work zone will be kept clear of unnecessary equipment. In addition, all remedial workers will be required to wear work boots with adequate tread to reduce the potential for slipping (work boots must be leather or chemical-resistant and contain steel toes and steel shanks).

- <u>Insects</u>

Potential insect problems include, but are not limited to stinging insects such as bees, wasps, and hornets, and ticks. Prior to commencement of work, each work area will be surveyed for nests and hives to reduce the possibility of disturbing stinging insects. In addition, each remedial worker will be asked to disclose any allergies related to insect stings or bites. The worker will be requested to keep his or her anti-allergy medicine onsite.

Tick species native to Long Island consist of the pinhead-sized deer tick and the much-larger dog tick. Ticks are unlikely to exist at the Site due to a paucity of suitable habitat. All remedial workers will be advised to avoid walking through vegetated areas and will be advised to check for ticks on clothing periodically.

- <u>Potential Electrical and Other Utility Hazards</u>

Potential electric hazards consist mainly of overhead and underground power lines. Other utilities that may present hazards include telephone lines, gas lines, sewer lines, water lines, and other overhead or underground utilities. Prior to commencement of remedial work at the Site, all locations will be inspected with respect to overhead lines. Intrusive work involving heavy equipment will not be performed when the horizontal distance between the equipment and overhead wires is less than 30 feet.

Underground potential utility hazards will be minimized by contacting the One-Call service to provide markouts of the utilities beneath adjoining public streets.

- <u>Heat/Cold Stress</u>

Heat stress may become a concern especially if protective clothing is donned that will decrease natural ventilation. To assist in reducing heat stress, an adequate supply of water or other liquids will be staged on the Site and personnel will be encouraged to rehydrate at least every two hours even if not thirsty. In addition, a shady rest area will be designated to provide shelter during sunny or warm days and Site workers will break for at least 10 minutes every two hours in the rest area, and, in very hot weather, workers wearing protective clothing may be rotated.

Indications of heat stress range from mild (fatigue, irritability, anxiety, decreased concentration, dexterity or movement) to fatal. Medical help will be obtained for serious conditions.

Heat-related problems are:

- <u>Heat rash</u>: caused by continuous exposure to heat and humid air and aggravated by chafing clothes. Decreases ability to tolerate heat.

- <u>Heat cramps</u>: caused by profuse perspiration with inadequate fluid intake and chemical replacement (especially salts). Signs: muscle spasm and pain in the extremities and abdomen.

- Heat exhaustion: caused by increased stress on various organs to meet increased demands to cool the body. Signs: shallow breathing; pale, cool, moist skin; profuse sweating; dizziness and lassitude.

- Heat stroke: the most severe form of heat stress. Can be fatal. Medical help must be obtained immediately. Body must be cooled immediately to prevent severe injury and/or death. Signs: red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

Cold exposure is a concern if work is conducted during cold weather, marginally cold weather during precipitation periods, or moderate to high wind periods. To assist in reducing cold exposure the following measures will be taken when cold exposure concerns are present:

- All personnel will be required to wear adequate and appropriate clothing. This will include head gear to prevent the high percentage loss of heat that occurs in this area (thermal liners for hard hats if hard hats are required).

- A readily-available warm shelter will be identified near the work zone.

- Work and rest periods will be scheduled to account for the current temperature and wind velocity conditions.

- Work patterns and the physical condition of workers will be monitored and personnel will be rotated, as necessary.

- Indications of cold exposure include shivering, dizziness, numbness, confusion, weakness, impaired judgment, impaired vision, and drowsiness. Medical help will be obtained for serious conditions if they occur.

Cold exposure-related problems are:

- Frost bite: Ice crystal formation in body tissues. The restricted blood flow to the injured part results in local tissue destruction.

- Hypothermia: Severe exposure to cold temperature resulting in the body losing heat at a rate faster than the body can generate heat. The stages of hypothermia are shivering, apathy, loss of consciousness, decreasing pulse and breathing rate, and death.

The Buddy System

All activities in contaminated or potentially contaminated areas will be conducted by pairing off the Site workers in groups of two (or three if necessary). Each person (buddy) will be able to provide his or her partner with assistance, observe his or her partner for signs of chemical, cold, or heat exposure, periodically check the integrity of his or her partner's protective clothing, and notify the HSO or others if emergency help is needed. The buddy system will be instituted at the beginning of each work day. If new workers arrive on Site, a buddy will be chosen prior to the new worker entering the work zone.

Site Communications

Two sets of communication systems will be established at the Site: internal communication among personnel onsite, and external communication between onsite and offsite personnel. Internal communication will be used to alert team members to emergencies, pass along safety information such as heat stress and protective clothing checks, communicate changes in the work to be accomplished, and maintain Site control. Due to ambient noise, verbal communications may be difficult at times. The HSO will carry a whistle (and compressed air horn if respirators are donned) to signal Site workers. A single whistle blast will be the signal to immediately evacuate the work zone through the access control point. This signal will be discussed with all Site workers prior to commencement of work.

An external communication system between onsite and offsite personnel will be established to coordinate emergency response, report to the Project Manager, and maintain contact with essential off-Site personnel. A field cellphone will be available at all times to the HSO. In addition, onsite workers' cellphones will be identified prior to the commencement of onsite operations.

General Safe Work Practices

Standing orders applicable during remedial operations are as follows:

- No smoking, eating, drinking, or application of cosmetics in the work zone.
- No matches or lighters in the work zone.
- All remedial workers will enter/exit the work zone through the Site access point.
- Any signs of contamination, radioactivity, explosivity, or unusual conditions will require evacuating the Site immediately and reporting the information to the HSO.
- Loose-fitting clothing and loose long hair will be prohibited in the work zone during heavy equipment operations.
- A signal person will direct the backing of work vehicles.
- Equipment operators will be instructed to check equipment for abnormalities such as oozing liquids, frayed cables, unusual odors, etc.

C.1.7 Personnel Training Requirements

All FPM personnel and contractor personnel will receive adequate training prior to entering the Site. FPM and contractor personnel with the potential for contacting residual materials will, at a minimum, have completed OSHA-approved, 40-hour hazardous materials Site safety training and OSHA-approved, eight-hour safety refresher course within one year prior to commencing field work. In addition, each worker must have a minimum of three days field experience under the direct supervision of a trained, experienced supervisor.

Prior to Site field work, the HSO will conduct an in-house review of the project with respect to health and safety with all FPM personnel who will be involved with field work at the Site. The review will include discussions of signs and symptoms of chemical exposure and heat/cold stress that indicate potential medical emergencies. In addition, review of PPE will be conducted to include the proper use of air-purifying respirators.

E.1.8 Medical Surveillance Program

All workers at the Site must participate in a medical surveillance program in accordance with 29 CFR 1910.120. A medical examination and consultation must have been performed within the last twelve months to be eligible for field work.

The content of the examination and consultation will include a medical and work history with special emphasis on symptoms related to the handling of hazardous substances, health hazards, and fitness for duty including the ability to wear required personal protective equipment under conditions (i.e., temperature extremes) that may be expected at the work Site.

All medical examinations and procedures shall be performed by, or under the supervision of, a licensed physician. The Physician shall furnish a written opinion containing:

- The results of the medical examination and tests;
- The physician’s opinion as to whether the employee has any detected medical conditions which would place the worker at increased risk of material impairment of the employee's health from work in hazardous waste operations;
- The physician's recommended limitations upon the worker assigned to the work; and
- A statement that the worker has been informed by the physician of the results of the medical examination and any further examination or treatment.
- An accurate record of the medical surveillance will be retained. The record will consist of at least the following information:
- The name and social security number of the employee;
- The physician’s written opinions, recommended limitations, and results of examinations and tests; and
- Any worker medical complaints related to exposure to hazardous substances.

E.1.9 Personal Protective Equipment

General Considerations

The two basic objectives of the personal protective equipment (PPE) are to protect the wearer from safety and health hazards, and to prevent the wearer from incorrect use and/or malfunction of the PPE.

Potential Site hazards have been discussed previously in Section E.1.6. The duration of Site activities is estimated to be periods of several days. All work is expected to be performed during daylight hours and workdays, in general, are expected to be eight to ten hours in duration. Any work performed beyond daylight hours will require the permission of the HSO. This decision will be based on the adequacy of artificial illumination and the type and necessity of the task being performed.

Personal protection levels for the Site activities, based on past investigations at the Site, are anticipated to be Level D with the possibility of upgrading to Level C. The equipment included for each level of protection is provided as follows:

<u>Level C Protection</u>

Level C personnel protective equipment includes:

- Air-purifying respirator, full-face
- Chemical-resistant clothing includes: Tyvek^{tm} (spunbonded olefin fibers) for particulate and limited splash protection or Saranex^{tm} (plastic film-laminated Tyvek) for permeation resistance to solvents.
- Coveralls*, or
- Long cotton underwear*
- Gloves (outer), chemical-resistant
- Gloves (inner), chemical-resistant
- Boots (outer), leather or chemical-resistant, steel toe and

  shank
- Boot covers (outer), chemical-resistant (disposable)*
- Hard hat (face shield)*
- Escape mask*
- 2-way radio communications (inherently safe)*

(*) optional

Meeting all of these criteria permits use of Level C protection:

- Oxygen concentrations are not less than 19.5% by volume.
- Measured air concentrations of identified substances will be reduced by the respirator below the substance's threshold limit value (TLV).
- Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any body area left unprotected by chemical-resistant clothing.
- Job functions do not require self-contained breathing apparatus.
- Direct readings are below 50 ppm on the PID.

Level D Protection

Personnel protective equipment:

- Coveralls
- Gloves*
- Boots/shoes, leather or chemical-resistant, steel toe and shank
- Safety glasses or chemical splash goggles*
- Hard hat (face shield*)
- Escape mask*

(*) optional

Meeting any of these criteria allows use of Level D protection:

- No contaminant levels above 5 ppm organic vapors or dusty conditions are present.
- Work functions preclude splashes, immersion, or the reasonable potential for unexpected inhalation of any chemicals above the TLV.

Additional Considerations for Selecting Levels of Protection

Other factors that will be considered in selecting the appropriate level of protection are heat and physical stress. The use of protective clothing and respirators increases physical stress, in particular, heat stress on the wearer. Chemical protective clothing greatly reduces natural ventilation and diminishes the body's ability to regulate its temperature. Even in moderate ambient temperatures, the diminished capacity of the body to dissipate heat can result in one or more heat-related problems.

All chemical protective garments can be a contributing factor to heat stress. Greater susceptibility to heat stress occurs when protective clothing requires the use of a tightly-fitted hood against the respirator face piece, or when gloves or boots are taped to the suit. As more body area is covered, less cooling takes place, increasing the probability of heat stress.

Wearing protective equipment also increases the risk of accidents. It is heavy, cumbersome, decreases dexterity, agility, interferes with vision, and is fatiguing to wear. These factors all increase physical stress and the potential for accidents. In particular, the necessity of selecting a level of protection will be balanced against the increased probability of heat stress and accidents.

Donning and Doffing Ensembles

- Donning an Ensemble

A routine will be established and practiced periodically for donning a Level C ensemble. Assistance may be provided for donning and doffing since these operations are difficult to perform alone. Table E.1.9.1 lists sample procedures for donning a Level C ensemble. These procedures should be modified depending on the particular type of suit and/or when extra gloves and/or boots are used.

TABLE E.1.9.1
SAMPLE LEVEL C DONNING PROCEDURES

1. Inspect the clothing and respiratory equipment before donning (see Inspection in subsection C.1.7).

2. Adjust hard hat or headpiece if worn, to fit user's head.

3. Standing or sitting, step into the legs of the suit; ensure proper placement of the feet within the suit; then gather the suit around the waist.

4. Put on chemical-resistant safety boots over the feet of the suit. Tape the leg cuff over the tops of the boots.

5. Don the respirator and adjust it to be secure, but comfortable.

6. Perform negative and positive respirator facepiece seal test procedures.

   – To conduct a negative pressure test, close the inlet part with the palm of the hand or squeeze the breathing tube so it does not pass air, and gently inhale for about 10 seconds. Any inward rushing of air indicates a poor fit. Note that a leaking facepiece may be drawn tightly to the face to form a good seal, giving a false indication of adequate fit.

   – To conduct a positive pressure test, gently exhale while covering the exhalation valve to ensure that a positive pressure can be built up. Failure to build a positive pressure indicates a poor fit.

7. Depending on type of suit:

   – Put on inner gloves (surgical gloves).

   – Additional overgloves, worn over attached suit gloves, may be donned later.

8. Put on hard hat

9. Have assistant observe the wearer for a period of time to ensure that the wearer is comfortable, psychologically stable, and that the equipment is functioning properly.

• Doffing an Ensemble

Exact procedures for removing Level C ensembles must be established and followed to prevent contaminant migration from the work area and transfer of contaminants to the wearer's body, the doffing assistant, and others. Doffing procedures are provided in Table E.1.9.2. These procedures should be performed only after decontamination of the suited worker. They require a suitably attired assistant. Throughout the procedures, both worker and assistant should avoid any direct contact with the outside surface of the suit.

TABLE E.1.9.2
DOFFING PROCEDURES

1. Remove any extraneous or disposable clothing, boot covers, outer gloves, and tape.

2. Remove respirator by loosening straps and pulling straps over the top of the head and move mask away from head. Do not pull mask over the top of the head.

3. Remove arms, one at a time, from suit, avoiding any contact between the outside surface of the suit and wearer's body and lay the suit out flat behind the wearer. Leave internal gloves on, if any.

4. Sitting, if possible, remove both legs from the suit.

5. After suit is removed, remove internal gloves by rolling them off the hand, inside out.

Respirator Fit Testing

The fit or integrity of the facepiece-to-face seal of a respirator affects its performance. Most facepieces fit only a certain percentage of the population; thus, each facepiece must be tested on the potential wearer in order to ensure a tight seal. Facial features such as scars, hollow temples, very prominent cheekbones, deep skin creases, dentures or missing teeth, and the chewing of gum and tobacco may interfere with the respirator-to-face seal. A respirator shall not be worn when such conditions prevent a good seal. The worker's diligence in observing these factors shall be evaluated by periodic checks. Fit testing will comply with 29 CFR 1910.1025 regulations.

Inspection

The PPE inspection program will entail five different inspections:

- Inspection and operational testing of equipment received from the factory or distributor;
- Inspection of equipment as it is issued to workers;
- Inspection after use;
- Periodic inspection of stored equipment; and
- Periodic inspection when a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise.

The inspection checklist is provided in Table E.1.9.3. Records will be kept of all inspection procedures. Individual identification numbers will be assigned to all reusable pieces of equipment and records should be maintained by that number. At a minimum, each inspection should record the ID number, date, inspector, and any unusual conditions or findings. Periodic review of these records may indicate an item or type of item with excessive maintenance costs or a particularly high level of down-time.

TABLE E.1.9.3
PPE INSPECTION CHECKLIST

CLOTHING

Before use:

- Determine that the clothing material is correct for the specified task at hand.
- Visually inspect for imperfect seams, non-uniform coatings, tears, and/or malfunctioning closures.
- Hold up to light and check for pinholes.
- Flex product and observe for cracks or other signs of deterioration.
- If the product has been used previously, inspect inside and out for signs of chemical attack, including discoloration, swelling, and/or stiffness.

During the work task, periodically inspect for:

- Evidence of chemical attack such as discoloration, swelling, stiffening, and softening. Keep in mind, however, that chemical permeation can occur without any visible effects.
- Indication of physical damage, including closure failure, tears, punctures, and/or seam discontinuities.

GLOVES

Before use:

- Pressurize glove to check for pinholes. Either blow into glove, then roll gauntlet toward fingers, or inflate glove and hold under water. In either case, no air should escape.

AIR-PURIFYING RESPIRATORS

- Inspect air-purifying respirators before each use to be sure they have been adequately cleaned.
- Check material conditions for signs of pliability, deterioration, and/or distortion.
- Examine cartridges to ensure that they are the proper type for the intended use, the expiration date has not been passed, and they have not been opened or used previously.
- Check faceshields and lenses for cracks, crazing, and/or fogginess.
- Air-purifying respirators will be stored individually in resealable plastic bags.

Storage

Clothing and respirators will be stored properly to prevent damage or malfunction due to exposure to dust, moisture, sunlight, damaging chemicals, extreme temperatures, and impact. Storage procedures are as follows:

- Clothing: Potentially-contaminated clothing will be stored in a well-ventilated area separate from street clothing, with good air flow around each item, if possible. Different types and materials of clothing and gloves will be stored separately to prevent issuing the wrong materials by mistake, and protective clothing will be folded or hung in accordance with manufacturer's recommendations.

- Respirators: After each use air-purifying respirators will be dismantled, washed, and placed in sealed plastic bags.

PPE Maintenance

Specialized PPE maintenance will be performed only by the factory or an authorized repair person. Routine maintenance, such as cleaning, will be performed by the personnel to whom the equipment is assigned. Respirators will be cleaned at the end of each day with alcohol pads or, preferably, by washing with warm soapy water.

Decontamination Methods

All personnel, clothing, equipment, and samples leaving the work zone area of the Site must be decontaminated to remove any harmful chemicals that may have adhered to them. Decontamination methods either (1) physically remove contaminants (2) inactivate contaminants by chemical detoxification or disinfection/sterilization, or (3) remove contaminants by a combination of both physical and chemical means.

In many cases, gross contamination can be removed by physical means involving dislodging/displacement, rinsing, wiping off, and evaporation. Contaminants that can be removed by physical means include dust, vapors, and volatile liquids. All reusable equipment will be decontaminated by rinsing in a bath of detergent and water (respirators, gloves to be reused). Monitoring equipment will be decontaminated by wiping with paper towels and water. All used PPE to be discarded will be disposed offsite as solid waste.

The effectiveness of the decontamination will be evaluated near the beginning of remedial activities and will be modified if determined to be ineffective. Visual observation will be used for this purpose. The HSO will inspect decontaminated materials for discoloration, stains, corrosive effects, visible dirt, or other signs of possible residual contamination.

E.2 Community Air Monitoring Plan

This Community Air Monitoring Plan (CAMP) will be implemented at the Site by FPM during the intrusive remedial activities, including soil borings, well abandonment, vapor implant installation, sampling, and excavations. Due to the nature of the VOCs in soil vapor at the Site, there is a potential for organic vapor emissions as these activities occur. In addition, there is the potential for dust to be associated with intrusive activities. To address these potential concerns, organic vapor monitoring and dust monitoring will be performed. It should be noted that CAMP monitoring was performed during intrusive activities conducted during the Remedial Investigation, with no exceedances noted. Based on these prior CAMP results and the nature of the residual impacts present at the Site, organic vapor and dust emissions are not anticipated during remedial activities; however, CAMP monitoring will be conducted out of an abundance of caution.

Any CAMP monitoring results that exceed the action levels described below will be reported (or notice provided by another arrangement acceptable to the NYSDEC) when identified if a NYSDEC representative is present at the Site or within two hours by phone call or email to the NYSDEC Project manager when no NYSDEC representative is onsite. Exceedances of the CAMP action levels will also be summarized in the monthly progress reports, including the duration of the exceedance(s) and any response actions taken.

E.2.1 Organic Vapor Monitoring

Under the CAMP, organic vapor concentrations will be monitored at the boundaries of the work zone. It will be the responsibility of the HSO to implement the plan and to ensure that proper action is taken in the event that any of the established action levels are exceeded.

To monitor organic vapors, a PID capable of calculating 15-minute running average concentrations will be used and maintained in good operating condition. Calibration of the PID will be performed according to manufacturer's instructions. Background levels of organic vapors will be measured at the work zone boundary prior to beginning work and upwind of the work area periodically using a PID. Monitoring may be performed more frequently at the discretion of the HSO. Organic vapors will be monitored continuously at the downwind perimeter of the work area during ground intrusive activities.

PID readings will be recorded in the field logbook for both background and work area perimeter. Logbook recordings will include the time, location, and PID readings observed. Downwind perimeter levels will be recorded in the log whenever the level reaches 5 ppm above the background along with the action(s) taken to mitigate the level. If the level of organic vapors exceeds 5 ppm above the background at the downwind perimeter of the work area, work activities will be halted and monitoring continued. The vapor emission response plan will then be implemented.

E.2.1.1 Vapor Emission Response Plan

The vapor emission response plan includes the following trigger levels and responses:

- Greater than 5 ppm at perimeter:

  In the event the level of organic vapors exceeds 5 ppm above the background at the downwind perimeter of the work area, activities will be halted and monitoring continued. If the organic vapor level then decreases to below 5 ppm above background, work activities can resume but organic vapor readings will be obtained more frequently as directed by the HSO.

- 5 ppm to 25 ppm at perimeter and less than 5 ppm at the work zone boundary:

  If the level of organic vapors is greater than 5 ppm but less than 25 ppm over background at the downwind perimeter of the work area, activities will be halted, the source of the vapors will be identified and corrective actions will be taken. Monitoring will be continued and activities will resume if the organic vapor concentration at half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background. More frequent intervals of monitoring will be performed as directed by the HSO.

- Above 25 ppm at perimeter:

  If the level of organic vapors is above 25 ppm at the perimeter of the work area, activities will be shut down. Should such a shutdown be necessary, downwind air monitoring will continue as directed by the HSO to confirm that organic vapor concentrations decrease. Actions will be taken to abate the source of vapor emissions and activities will not resume until the source is controlled.

E.2.1.2 Major Vapor Emission Response Plan

The Major Vapor Emission Response Plan shall automatically be placed into effect if:

- Efforts to abate the emission source are unsuccessful and levels above 5 ppm persist for more than 30 minutes in the 20-foot zone; or

- The vapor levels are greater than 10 ppm above background in the 20-foot zone.

Upon activation of the Major Vapor Emission Response Plan, the following activities will be undertaken:

- All emergency response contacts as listed in the HASP will be notified;

- Air monitoring will be conducted at 30-minute intervals within the 20-foot zone. If two successive readings below action levels are measured, air monitoring will be halted or modified as directed by the HSO; or

- If air monitoring readings remain above action levels, work will be halted and further measures taken to reduce organic vapors.

If a Major Vapor Emission Response Plan is implemented, the NYSDEC and NYSDOH will be contacted within 24 hours.

E.2.2 Dust Monitoring

Dust (particulate) monitoring will be performed during intrusive activities with the potential to create dust by using a Miniram personal monitor calibrated according to the manufacturer's instructions. The Miniram will be capable of calculating 15-minute running average concentrations and operated continuously at the downwind perimeter of the work zone during ground intrusive activities. To ensure the validity of the fugitive dust measurements, appropriate QA/QC measures will be employed, including periodic instrument calibration, operator training, daily instrument performance (span) checks, and record-keeping on daily log sheets. If measurable dust levels are noted, then readings will also be obtained upwind of the work zone. If the downwind particulate level exceeds the upwind level by more than 100 micrograms per cubic meter (ug/m^3), then dust suppression techniques will be employed or work will be halted or controlled such that dust levels are reduced at the downwind perimeter to within 150 ug/m^3 of the upwind level.

If dust is generated during remedial activities, then dust suppression will be performed, as discussed in Section E.1.6 of this HASP. Corrective measures may include increasing the level of PPE for onsite personnel and implementing additional dust suppression techniques. Should the action level of 150 μg/m^3 continue to be exceeded, work will stop and the NYSDEC will be notified as described in Section E.2 above. The notification will include a description of the control measures implemented to prevent further exceedances.

Reasonable fugitive dust suppression techniques will be employed during all intrusive remedial activities that may generate fugitive dust. Particulate (fugitive dust) monitoring will be employed during the handling of contaminated soil or when onsite activities may generate fugitive dust from exposed contaminated soil.

Fugitive dust from contaminated soil that migrates offsite has the potential for transporting contaminants offsite. Although there may be situations when the monitoring equipment does not measure dust at or above the action level, visual observation may indicate that dust is leaving the Site. If dust is observed leaving the working area, additional dust suppression techniques will be employed.

The following techniques have been shown to be effective for controlling the generation and migration of dust during intrusive remedial activities and will be used as needed during remedial activities at the Site:

- Wetting equipment and exposed soil;
- Restricting vehicle speeds to 10 mph;
- Covering areas of exposed soil after investigation activity ceases; and
- Reducing the size and/or number of areas of exposed soil.

When techniques involving water application are used, care will be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will be considered to prevent overly wet conditions, conserve water, and provide an effective means of suppressing fugitive dust.

Evaluation of weather conditions is also necessary for proper fugitive dust control. When extreme wind conditions may make dust control ineffective, investigation actions may be suspended until wind speeds are reduced.

E.2.3 Noise Monitoring

Due to the use of heavy equipment, there is a potential for noise to impact the surrounding community. Work will be performed only during normal working hours when ambient noise levels are elevated due to ongoing activities in the surrounding community, which is primarily urban and commercial. Therefore, the potential for noise impacts on the surrounding community is low.

However, if pedestrians are present in the Site vicinity, it is possible for noise impacts to occur. To address these concerns and other safety concerns, pedestrians will be barred from entering the work zone. In addition, the HSO will periodically monitor noise levels at the work zone boundary and the closest property boundary with a Realistic^{tm} hand-held sound level meter. Noise levels will be monitored in dBs in the A-weighted, slow-response mode. If noise level readings exceed an eight-hour time-weighted average of 85 dB at the work zone boundary or at the closest property boundary, the HSO will take appropriate measures to reduce noise exposure beyond these boundaries. These measures may include extension of the work zone boundary, issuing appropriate hearing protection devices as discussed in Section E.1.6 of this Plan, or other measures, as appropriate. In the event that the noise exposure measures are inadequate, work will cease until noise levels can be reduced to below 85 dB at the work zone boundary and/or at the closest property boundary.

APPENDIX F

QUALITY ASSURANCE PROJECT PLAN

FPM

APPENDIX F
QUALITY ASSURANCE PROJECT PLAN

This Quality Assurance Project Plan (QAPP) has been prepared by FPM Group (FPM) for New York State Department of Environmental Conservation (NYSDEC) Brownfield Program Site #C241200, identified as the Former Peninsula Hospital Site located at 51-15 Beach Channel Drive Far Rockaway, Queens, New York (Site). This QAPP is part of the Remedial Action Work Plan (RAWP) and is applicable to remedial activities at this Site.

F.1 Project Organization

The remedial activities will be managed by FPM on behalf of the Volunteer, Peninsula Rockaway Limited Partnership. The Remedial Engineer for this project will be Kevin F. Loyst, PE, PMP, who is a New York State-licensed Professional Engineer (PE); Mr. Loyst will have primary direct responsibility for implementation of the remedial program for the Site. In the event that Mr. Loyst is unavailable to be the Remedial Engineer, another properly-qualified Remedial Engineer who is a PE licensed by the State of New York will be identified.

The Senior Manager (project coordinator) for this project is Stephanie Davis, PG. Ms. Davis is a New York State-licensed Professional Geologist (PG), a Senior Hydrogeologist/Project Manager with FPM and has over 35 years of professional environmental project experience. The Quality Assurance Officer (QAO) will be Ben Cancemi, PG. Mr. Cancemi is also a New York State-licensed PG and a Senior Hydrogeologist with over 20 years of professional environmental experience. The Field Services Manager will be John Bukoski, PG; Mr. Bukoski is also a New York State-licensed PG with over 20 years of environmental field services experience.

Subcontracted services will include direct-push/drilling services as needed (subcontractor to be determined), laboratory services (Alpha Analytical), and DUSR preparation (Ramboll Environ).

F.2 Data Quality Objectives

The Data Quality Objectives (DQOs) will be applicable to all data-gathering for remedial activities at the Site. DQOs will be incorporated into sampling, analysis, and quality assurance tasks associated with remedial activities. A Qualified Environmental Professional (QEP) will oversee all remedial and data-gathering activities.

The data users for this project are FPM, the NYSDEC, and the New York State Department of Health (NYSDOH). The Site owner will also be provided with the data. No other data users are anticipated. The collected data are intended to evaluate the nature and extent of contaminants in onsite soil and soil vapor in connection with remedial activities.

F.3 Standards, Criteria, and Guidance

The following standards, criteria, and guidance (SCGs) have been identified for the Site:

- NYSDEC DER-10;
- The NYSDEC Class GA Ambient Water Quality Standards (Standards), which are used to evaluate the groundwater chemical analytical results;

- NYSDEC-provided guidance for PFAS and 1,4-dioxane;
- The 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (SCOs), which are used to evaluate soil sample results;
- The 6 NYCRR Parts 370, 371, and 372 regulations for hazardous waste management, which are used to guide hazardous waste characterization and disposal; and
- The NYSDOH *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (October 2006, with May 2017 updated matrices), which is used to evaluate soil vapor, indoor air, and ambient air sample results.

F.4 Sampling Procedures

For the remedial work, field screening will be performed during sampling activities. Field screening includes monitoring for organic vapors in the soil as it is exposed or managed and in the air in the work zone using a Photovac MicroTIP PID (or equivalent), and making visual observations of soil characteristics. All readings and observations will be recorded by the FPM QEP in his or her field notebook.

The procedures for each type of sampling are described below. All soil sampling will be performed by a QEP. Quality assurance/quality control (QA/QC) procedures are presented in Section F.6.

➢ <u>Soil Sampling</u>

Soil sampling will be performed as needed to conduct delineation, characterize soil for waste disposal purposes, confirm soil quality following remedial excavation activities, and/or confirm the quality of backfill soil prior to import to the Site. Soil samples will be collected using decontaminated or dedicated sampling equipment; decontamination procedures are described in Section F.6. The soil samples will be visually examined, screened by the QEP with a calibrated PID, and classified using the Unified Soil Classification System (USCS). The soil observations will be recorded on boring logs or in the field notebook, as appropriate, and all onsite sample locations will be identified using a global positioning system (GPS).

Soil sample numbers and depths will vary, depending on the purpose of the sampling, waste disposal facility requirements, the areal size and depth of remedial excavations, the volume of backfill to be imported, and other relevant factors. For all delineation and confirmatory soil sampling locations, if visibly-impacted material is encountered, then at a minimum the soil samples will be collected from the most visibly-impacted material and from visibly-unimpacted material below the impacted interval.

Soil samples will be submitted for laboratory analysis, with testing conducted as needed, depending on the purpose of the sampling. Sample analyses are discussion in Section F.5. All soil samples retained for VOC analysis will be collected using Method 5035A preservation procedures. Upon completion of sampling, the sample containers will be sealed, labeled, managed, transported, and tracked as described in Section F.5.

If soil borings are conducted for delineation or other purposes, the completed borings will be backfilled with soil cuttings and their surface locations will be marked with surveyor's flags for future reference. As noted above, all onsite soil sample locations will be identified using a GPS.

- <u>Soil Vapor and Air Sampling</u>

Soil vapor sampling will be conducted at sub-slab monitoring points that will be installed for the new buildings. Each monitoring point will consist of a permanent vapor sampling point installed approximately 6 inches below the base of the slab and at least one foot above the water table, if feasible. Each sampling point will consist of a stainless-steel vapor implant connected to sufficient inert tubing so as to bring the tubing above grade. Each implant will be surrounded with inert porous backfill and a bentonite slurry seal will be placed above the backfill and screened portion of the implant so as to seal the implant zone from the atmosphere. For protection, a traffic-rated manhole will be installed in the building slab above each implant.

Indoor air and ambient (outdoor) air sampling will be conducted together with sub-slab soil vapor sampling during soil vapor intrusion (SVI) testing for new buildings. For indoor air and ambient air sampling, each sample will be collected into a laboratory-supplied Summa canister equipped with a calibrated flow controller that is set so as not to exceed a flow of 0.2 liters per minute. Sample collection will be conducted over time intervals commensurate with the use of each area: 8-hour intervals for areas used for commercial purposes and 24-hour intervals for areas associated with restricted residential use. FPM will observe the flow controllers and seal the canisters while some vacuum remains.

For sub-slab soil vapor sampling, prior to conducting the sampling, one to three volumes of air will be purged through each implant and tubing at a rate of less than 0.2 liters per minute using an air pump to ensure that a representative sample is obtained. To confirm the integrity of the bentonite seal, a helium tracer gas will be confined over the surface seal and the potential presence of helium in the tubing will be checked with a helium meter. Following purging and the seal integrity check, the sub-slab soil vapor sample will be collected into a laboratory-supplied Summa canister equipped with a calibrated flow controller that is set so as not to exceed a flow of 0.2 liters per minute. Sample collection will be conducted over time intervals commensurate with the use of each area: 8-hour intervals for areas used for commercial purposes and 24-hour intervals for areas associated with restricted residential use. FPM will observe the flow controllers and seal the canisters while some vacuum remains.

Upon completion of sampling, each sample canister will be sealed, labeled, managed, transported, and tracked as described in Section F.5. Sample analysis is also discussed in Section F.5. Following the completion of sampling, the tubing for each sub-slab vapor implant will be placed back into its manhole and each manhole will be secured.

F.5 Sample Management and Analyses

Each sample container will be labeled using a ball-point pen, and the labeled containers containing soil samples will be placed in a cooler with ice (blue ice packs will not be used) to depress the sample temperature. Samples for PFAS testing, if collected, will be placed into individual sealed Zip-lock bags and stored in a separate cooler from all other samples. The filled labeled Summa canisters will be secured in shipping containers. A chain of custody form will be completed and kept with each of the coolers and shipping containers to document the sequence of sample possession. At the end of each day, the filled coolers and shipping containers will be transported by FPM or overnight courier to the analytical laboratory.

The anticipated analytical laboratory for all soil and soil vapor samples is Alpha Analytical of Westborough, Massachusetts, which is NYSDOH ELAP-certified for the proposed analyses.

The soil sample analytes will be selected based on the purpose of the samples. Soil samples collected for waste classification purposes will be tested for the analytes required by the targeted disposal facility. Soil samples collected for delineation or post-excavation confirmation purposes will be tested for the analytes that exceeded the restricted residential use or protection of groundwater SCOs, as applicable, at the location of interest. Samples of soil that is proposed to be imported for backfill purposes will be tested for full Part 375 parameters, including TCL VOCs using EPA Method 8260C; TCL SVOCs using Method 8270D, TAL metals using Method 6010C, mercury using Methods 7471A or 7470A, total cyanide using Methods 9010C/9012B, PCBs using Method 8082A, pesticides using Method 8081B, 1,4-dioxane using Method 8270D and a mass spectrometer in selective ion monitoring (SIM) mode, and PFAS using methods based on EPA Method 537.1. The analytical methods used will be as per NYS Analytical Services Protocol (ASP). Data for soil samples collected for waste characterization purposes will be reported with Category A deliverables, and all other soil sample data will be reported with Category B deliverables.

Soil vapor samples will be tested for VOCs using the TO-15 Method. The low-level TO-15 Method with SIM analysis will be used for the indoor air and ambient sample analyses. The analytical methods used will be as per NYS ASP with Category B-equivalent deliverables.

Electronic data deliverables (EDDs) will be prepared and uploaded into the NYSDEC's environmental information management system for all analytical data except waste classification data for soils.

F.6 Quality Assurance/Quality Control Procedures

QA/QC procedures will be utilized during the performance of the remedial work to ensure that the resulting chemical analytical data accurately represent Site conditions. The following sections include descriptions of the QA/QC procedures to be utilized.

➢ Equipment Decontamination Procedures

All non-disposable equipment used during sampling activities will be decontaminated by washing in a potable water and Alconox solution and rinsing in potable water prior to use at each location to reduce the potential for cross contamination. All sampling equipment will be either dedicated disposable equipment or will be decontaminated prior to use at each location. The decontamination procedures utilized for all non-disposable sampling equipment will be as follows:

1. The equipment will be scrubbed in a bath of potable water and low-phosphate detergent (Alconox or Liquinox) followed by a potable water rinse;

2. The equipment will be rinsed with distilled water; and

3. The equipment will be allowed to air dry, if feasible.

In addition, for sampling activities involving PFAS, the following procedures will be followed due to the prevalence of these compounds in consumer products:

- No field clothing or PPE containing Gore-Tex, Tyvek, or fabric softener, will be worn. Any wet weather clothing will be made of polyurethane or PVC only;

- Waterproof field books, plastic clipboards, binders, or hard cover notebooks will not be used. No materials with adhesives (tape, post-it notes, etc.) will be used. Permanent markers (e.g. Sharpies) will not be used (ballpoint pens are acceptable);

- Field personnel will not use cosmetics, moisturizers, hand cream, sunscreen or insect repellent on the day of sampling. Field personnel must wash hands prior to donning nitrile gloves used during sampling;

- All decontamination will be performed using laboratory-provided PFAS-free water, Alconox, and/or Liquinox. Aluminum foil will not be used;

- All field equipment must not contain Teflon or low-density polyethylene materials. All sampling materials must be made from stainless steel, high-density polyethylene, acetate, silicon, or polypropylene; and

- PFAS samples must be maintained in a separate cooler from other types of samples (some sample containers contain PFAS). Coolers containing PFAS samples may be cooled with regular ice only; blue ice packs may not be used.

➢ QA/QC Samples

QA/QC samples will be collected and utilized to evaluate the potential for field or laboratory contamination and to evaluate the laboratory's analytical precision and accuracy. The specific types of QA/QC samples to be collected are described below.

Decontamination procedures will be evaluated by the use of equipment blank samples. These samples consist of aliquots of laboratory-supplied water that are poured over or through the dedicated or decontaminated sampling equipment and then submitted to the laboratory for analysis. An equipment blank sample will be prepared for each day that soil sampling is conducted for delineation or confirmatory purposes at the Site, and for each day that samples are collected for evaluation of imported backfill soil. The equipment blank samples will be analyzed for the same analytes as the primary environmental samples collected that day. The equipment blanks will be labeled in a manner to prevent identification by the analytical laboratory.

Particular care will be taken with the equipment blank samples for PFAS. Laboratory-provided PFAS-free water containing the required preservative will be used to prepare the equipment blank sample for PFAS testing. The filled equipment blank container and the empty container that formerly contained the PFAS-free water must be labeled, placed in individual Zip-lock bags, and returned to the laboratory in the same cooler as the PFAS samples.

Trip blank samples will be utilized to evaluate the potential for VOC cross-contamination between samples in the same cooler or shipping container. Trip blank samples consist of laboratory-provided containers filled with laboratory water or laboratory air that are sealed in sample containers at the laboratory and that are transported to and in the field with the other sample containers. A trip blank will be shipped with each group of soil samples collected for delineation, confirmatory, or imported backfill quality testing, and will be managed in the field and analyzed in the laboratory in the same manner as the primary environmental samples.

Blind duplicate samples will be obtained at a frequency of at least one per every 20 environmental samples and will be used to attest to the precision of the laboratory. A blind duplicate consists of a separate aliquot of sample collected at the same time, in the same manner, and analyzed for the same parameters as the primary environmental sample. The blind duplicate samples are labeled in a manner such that they cannot be identified by the laboratory. The sample results are compared to those of the primary environmental sample to evaluate laboratory analytical precision.

Matrix spike/matrix spike duplicate (MS/MSD) samples will be collected at a frequency of one per 20 environmental soil samples. The purpose of the MS/MSD samples is to confirm the accuracy and precision of laboratory results based on a particular matrix. The MS/MSD results will be evaluated during the preparation of the DUSRs, as discussed below.

- Chain-of-Custody Procedures

For each day of sampling, chain-of-custody (COC) sheets will be completed and submitted to the laboratory with the samples collected that day. A copy of each COC sheet will be retained by the FPM QEP for sample tracking purposes. Each COC sheet will include the project name, the sampler's signature, the sampling locations and intervals, and the analytical parameters requested.

- Data Usability Summary Reports

All chemical analytical results will be evaluated using the sample data packages, sample data summary packages, and case narratives provided by the analytical laboratory. The data evaluation will be performed to verify that the analytical results are of sufficient quality to be relied upon to assess the potential presence of contaminants in the soil vapor, indoor air, and/or soil samples. A data usability summary report (DUSR) will be prepared for each data package for delineation, confirmatory, imported backfill soil, and SVI samples following the “Guidance for the Development of Data Usability Summary Reports” provided by the NYSDEC (Appendix 2B of DER-10). The anticipated DUSR preparer is Richard Baldwin, PG with Ramboll Environ, who is independent from this project.

F.7 Data Evaluation

The data collected will be assembled, reviewed, and evaluated. The soil samples will be used to further assess the nature and extent of contamination in the soil at the Site, to evaluate the quality of soil proposed for import as backfill, or to evaluate the quality of soil to be disposed relative to disposal facility criteria. The soil vapor, indoor air, and ambient air samples will be used to assess the potential for soil vapor intrusion.

APPENDIX G

CITIZEN PARTICIPATION PLAN

FPM

New York State Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
Former Peninsula Hospital Site

51-15 Beach Channel Drive and 50-04 Rockaway Beach Boulevard
Far Rockaway, New York 11691

February 2018

Contents

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Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the Site's investigation and cleanup process.

Applicant: **Peninsula Rockaway Limited Partnership ("Applicant')**
Site Name: **Former Peninsula Hospital Site ("Site")**
Site Address: **51-15 Beach Channel Drive and 50-04 Rockaway Beach Boulevard**
Site County: **Queens County**
Site Number: **C241200**

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These redevelopment uses may include recreation, housing, and businesses.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants that conduct brownfield site investigation and cleanup activities. An Applicant is an entity that has requested to participate in the BCP and has been accepted by the NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When the NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at: http://www.dec.ny.gov/chemical/8450.html.

2. Citizen Participation Activities

Why NYSDEC Involves the Public and Why It Is Important

The NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well-being. The NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision-makers form or adopt final positions.

Involving citizens who are affected and interested in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment;

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process;

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process;

- Ensuring that the NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives within the affected community; and

- Encouraging dialogue to promote information exchanges among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision-making.

This Citizen Participation (CP) Plan provides information about how the NYSDEC will inform and involve the public during the investigation and cleanup of the Site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the Site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the Site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information

The locations of the reports and information related to the Site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may also be placed on the NYSDEC website. If this occurs, the NYSDEC will inform the public in Fact Sheets about the Site and by other means, as appropriate.

Site Contact List

Appendix B contains the Site Contact List. This list has been developed to keep the community informed about, and involved in, the Site's investigation and cleanup process. The Site Contact List will be used periodically to distribute Fact Sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the Site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.

The Site Contact List includes, at a minimum:

- The chief executive officer and planning board chairperson of each county, city, town and village in which the Site is located;
- Residents, owners, and occupants of the Site and properties adjacent to the Site;
- The public water supplier that services the area in which the Site is located;
- Any person who has requested to be placed on the Site Contact List;
- The administrator of any school or day care facility located on or near the Site for purposes of posting and/or dissemination of information at the facility; and
- Location(s) of reports and information.

The Site Contact List will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the Site Contact List upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the Site Contact List may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

CP Activities

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the Site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the Site investigation and cleanup process. The public is informed about these CP activities through Fact Sheets and Notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and Fact Sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contacts with project managers** provide opportunities for the public to contribute information, opinions, and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the Site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the Site Contact List and changes in planned CP activities.

Technical Assistance Grant

The NYSDEC, in consultation with the New York State Department of Health (NYSDOH) must determine if the Site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the Site, as described in Section 5.

If the Site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the Site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the Site, and that its members' health, economic well-being, or enjoyment of the environment may be affected by a release or threatened release of contamination at the Site.

For more information about TAGs, go online at http://www.dec.ny.gov/regulations/2590.html.

A table identifying the citizen participation activities related to this Site's investigation and cleanup program follows on the next page.

Citizen Participation Requirements (Activities)	Timing of Citizen Participation Activities
Application Process:	
• Prepare Site Contact List • Establish document repositories	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to Site Contact List • Conduct 30-day public comment period	When the NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the Site Contact List should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement:	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation (RI)
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• The Applicant Distributes Fact Sheet to Site Contact List about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. Thirty-day public comment period begins/ends as per dates in Fact Sheet.
After Applicant Completes Remedial Investigation:	
• Distribute Fact Sheet that describes RI results to Site Contact List	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute Fact Sheet to Site Contact List about proposed RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty five-day public comment period begins/ends as per dates identified in Fact Sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts Cleanup Action:	
• Distribute Fact Sheet to Site Contact List that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action:	
• Distribute Fact Sheet to Site Contact List that announces that cleanup action has been completed and that summarizes the Final Engineering Report (FER) • Distribute Fact Sheet to Site Contact List announcing issuance of Certificate of Completion (COC)	At the time the NYSDEC approves FER. These two Fact Sheets are combined if possible, if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the Site. Additional major issues of public concern may be identified during the course of the Site's investigation and cleanup process.

The Site is presently developed with a large hospital building that occupies much of the central and northern portions of the property. The hospital was constructed circa 1957-1962 and has been vacant for several years. A small maintenance building was formerly present on the southwest corner of the Site from 1984 until it was removed (between 1994 and 2003).

Buildings and properties utilized for commercial, light industrial, transportation and/or multi-family residential purposes adjoin the Site to the north, west, and south (across Beach Channel Drive, Beach 53rd Street, and Rockaway Beach Boulevard, respectively). The cleanup activities are anticipated to result in Site conditions that are conducive to redevelopment of the Site with residential and commercial uses, which may include housing, health, and retail services that can be utilized by the community. The NYC Department of City Planning Commissioner along with the local Community Board have been placed on the Site Contact List so that the community can be informed and fully participate in the planned investigation and remediation of this Site.

The potential issues of public concern include issues involving the possibility of soil vapor intrusion at the Site and/or at adjoining properties. Contaminants at the Site include the chlorinated solvents Tetrachloroethene (PCE), Trichloroethene (TCE), 1,1,1-trichloroethane (TCA), and Carbon Tetrachloride (CT) in soil vapor at several locations. The source(s) for these contaminants has not yet been identified. Previous investigations at the Site identified these chlorinated solvents in soil vapor at concentrations exceeding NYSDOH guidance and for which mitigation is indicated. The potential for soil vapor intrusion is a concern for future occupants of the Site and current occupants of adjoining properties.

Soil testing performed at the Site has identified soils containing metals and petroleum-related compounds at levels that exceed applicable NYSDEC soil criteria. Additional testing will be performed to more fully evaluate soil conditions. As nearly all of the Site is paved or covered by the existing building, the Site soil is not reasonably accessible to the public at present. However, planned redevelopment activities have the potential to expose Site soil during construction, or to result in exposure of impacted soil at the Site surface.

Groundwater beneath the Site was evaluated during previous investigations and was not found to be impacted by contaminants that exceed the NYSDEC's applicable groundwater standards. However, groundwater conditions have not been fully investigated and the groundwater flow direction has not yet been determined. As the Site vicinity is an urban area that is largely paved or covered by buildings, groundwater is not reasonably accessible to the public. Public water in Queens County is obtained from the NYC water supply system; no Federal public water supply system wells or State wells are within one mile of the Site, and the Site is not located near a wellhead protection area or a groundwater recharge area. Therefore, there is no reasonable potential for public exposure or concern for groundwater.

Significant adverse impacts to traffic, noise, and/or air quality are not anticipated to result from the investigation or cleanup activities. These activities will be performed under work plans approved by the NYSDEC that contain provisions for traffic management as needed and noise and air quality monitoring and mitigation measures such that adverse impacts are avoided. There should be no significant impact to the community during site investigation and clean up.

Public concern for potential environmental impacts is not anticipated during cleanup activities as the public will be informed through the CP process and the activities will be performed under work plans approved by the NYSDEC that contain provisions for monitoring and mitigation measures such that adverse environmental impacts are avoided. There are three wetland/estuarine areas within one-half mile of the Site, including Rockaway Beach (0.25 miles south), Conch Bay (0.25 miles northeast), and Sommerville Basin (0.35 miles west). These areas are separated from the Site by one or more multi-lane streets and/or the MTA Subway A Line; it is not anticipated that the environment in these areas will be impacted by Site activities. No surface water is located on or adjacent to the Site. The Conch Playground is located to the northeast of the Site (across Beach Channel Drive). Other recreational/natural areas, including the Arverne Playground, Cardozo Playground, Rockaway Community Park, and the Dubos Point Wildlife Sanctuary, are close to the Site. However, these areas are also separated from the Site by multiple streets; activities in these areas are not anticipated to be impacted by Site activities.

The Site is located in an Environmental Justice Area. Environmental Justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Environmental justice efforts focus on improving the environment in communities, specifically minority and low-income communities, and addressing disproportionate adverse environmental impacts that may exist in those communities. The Site is located in an area with a significantly large African-American and a sizable Hispanic-American community nearby. Therefore, all future Fact Sheets will be translated into Spanish.

The Applicant has filled out the Scoping Sheet for Major Public Concerns (Appendix E) to help identify if there are any issues involved with the Site.

4. Site Information

Appendix C contains a map identifying the location of the Site.

Site Description

Location: 51-15 Beach Channel Drive and 50-04 Rockaway Beach Boulevard, Far Rockaway, Queens, NY 11691
Setting: Urban
Site size: 8.76 acres

Adjacent properties: The adjoining properties to the north (across Beach Channel Drive) include multi-story residential buildings (north and northwest), and PS 105 and Conch Playground (northeast). Directly adjoining to the northeast is the multi-story Peninsula Nursing Home. Also adjoining to the east (across Beach 50th Street) are car parking lots. Adjoining to the south (across Rockaway Beach Boulevard) are multiple commercial buildings, a church, and an electrical substation. Adjoining the Site to the west (across Beach 53rd Street) are multi-story buildings, including multi-family residences and a nursing care center, and parking lots.

History of Site Use, Investigation, and Cleanup

The Former Peninsula Hospital Site includes two tax lots (presently being merged) with different use histories. The tax lot that includes the hospital is developed with a large hospital building that was constructed in about 1960, operated until the hospital closed 2012, and is now vacant. Development of the hospital included placement of historic fill. The south wing of the hospital building includes the boiler room and hazardous materials and paint storage areas. This portion of the Site also formerly included Underground Storage Tanks (USTs) that were used to supply fuel oil to the hospital boiler room. A small maintenance building was formerly present on the southwest corner of the Site from 1983 until it was removed circa 2000. Prior to the hospital use, this portion of the Site was undeveloped except for the southwestern corner, which was formerly occupied by a small hotel (from prior to 1912 until sometime before 1933), several residences, and three small stores.

The tax lot that includes the former hospital parking lot was undeveloped until about 1960 when the current parking lot was constructed in conjunction with the development of the hospital. The development of this parcel also included placement of historic fill.

Environmental site assessments were performed at the Site in 2015, 2016 and 2017 to identify issues of potential environmental concern. These assessments included soil, groundwater and soil vapor sampling. Environmental remediation conducted at the Site includes removal of the former USTs, together with some associated petroleum-contaminated soil and fuel oil on the groundwater, in 2016.

Soil sampling identified petroleum impacts in proximity to the former fuel oil USTs on the portion of the Site that includes the former hospital. Some of this impacted soil was removed during the tank removals. Semi-Volatile Organic Compounds (SVOCs) and metals (including arsenic, cadmium, copper, chromium, lead, nickel, and zinc) were also identified in historic fill beneath the Site.

Groundwater was sampled throughout the Site and no impacts were found other than fuel oil on the water table in proximity to the former fuel oil USTs. This fuel oil was removed during tank removal activities.

Chlorinated solvents were identified in soil vapor in proximity to the former hospital boiler room, on the southwest portion of the Site near a former maintenance building location, and in proximity to the former hospital building. These detections in soil vapor were at levels for which the NYSDOH guidance stipulates that mitigation for Soil Vapor Intrusion (SVI) may be needed, depending on the levels of these chemicals in indoor air.

In July 2017, the Applicant applied to enter the Site into the NYSDEC's BCP as a Volunteer. The NYSDEC has approved the BCP Application.

5. Investigation and Cleanup Process

Application

The Applicant has applied for and been accepted into New York's BCP as a Volunteer**.** This means that the Applicant was not responsible for the disposal or discharge of the contaminants. The Applicant did not own the Site during disposal or discharge activities and has not engaged in operations that could contribute to contamination at the Site. The Volunteer must fully characterize the nature and extent of contamination onsite, and must conduct a qualitative exposure assessment, a process that characterizes the actual or potential exposures of people, fish, and wildlife to contaminants on the Site and to contamination that has migrated from the Site.

The Applicant in its application proposes that the Site will be used for certain restricted purposes, including restricted residential and commercial uses.

To achieve this goal, the Applicant will conduct cleanup activities at the Site with oversight provided by the NYSDEC. The Brownfield Cleanup Agreement executed by the NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the Site.

Investigation

Although the Applicant has completed partial site investigations before it entered into the BCP, the Applicant will conduct an additional investigation of the Site, which is officially called a "Remedial Investigation" (RI). This RI will be performed with NYSDEC oversight.

The Applicant must develop an RI Work Plan, which is subject to public comment. The existing Site investigation data will be used during the development of the RI Work Plan and the NYSDEC will determine if these data are usable.

The RI has several goals:

1) Define the nature and extent of contamination in soil, groundwater, soil vapor, and any other parts of the environment that may be affected;
2) Identify the source(s) of the contamination;
3) Assess the impact of the contamination on public health and the environment; and
4) Provide information to support the development of a proposed remedy to address the contamination at the Site or the determination that cleanup is not necessary.

When the RI is complete, the Applicant will prepare and submit an RI Report that summarizes the RI procedures and results. This RI Report also will recommend whether cleanup action is needed to address Site-related contamination. The RI Report is subject to review and approval by the NYSDEC.

The NYSDEC will use the information in the RI Report to determine if the Site poses a significant threat to public health or the environment. If the Site poses a significant threat, it must be cleaned up using a remedy selected by the NYSDEC from an analysis of alternatives prepared by the Applicant and approved by the NYSDEC. If the Site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Remedy Selection

When the investigation of the Site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its RI Report that no action is necessary at the Site. In this case, the NYSDEC would make the RI Report available for public comment for 45 days. The NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the RI Report. The NYSDEC would then issue a Certificate of Completion (described below) to the Applicant;

or

2. The Applicant may recommend in its RI Report that action needs to be taken to address Site contamination. After the NYSDEC approves the RI Report, the Applicant may then develop a cleanup plan, officially called a “Remedial Work Plan”. The Remedial Work Plan describes the Applicant’s proposed remedy for addressing contamination related to the Site.

When the Applicant submits a proposed Remedial Work Plan for approval, the NYSDEC will announce the availability of the proposed Remedial Work Plan for public review during a 45-day public comment period.

Cleanup Action

The NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The NYSDOH must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy.

The Applicant may then design and perform the cleanup action to address the Site's contamination. The NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a Final Engineering Report (FER) that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. The NYSDEC will review the FER to be certain that the cleanup is protective of public health and the environment for the intended use of the Site.

Certificate of Completion

When the NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the Site, it will approve the FER. The NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for Site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the Site after it receives a COC.

Site Management

Site management is the last phase of the Site's cleanup program. This phase begins when the COC is issued. Site management may be conducted by the Applicant under NYSDEC oversight, if contamination will remain in place. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the Site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An institutional control is a non-physical restriction on use of the Site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the Site suitable for some, but not all, uses.

An engineering control is a physical barrier or method to manage contamination. Examples include caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that is pumping and treating groundwater. Site management continues until the NYSDEC determines that it is no longer needed.

Appendix A
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the Site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

John Grathwol
Project Manager
NYSDEC
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12223-7016
Tel: (518) 402-9767
Email: john.grathwol@dec.ny.gov

Thomas V. Panzone, MPA
Public Participation Specialist
Office of Communications Services
NYSDEC - Region 2 Office
47-40 21st Street
Long Island City, NY 11101
Tel: (718) 482-4953
Email: thomas.panzone@dec.ny.gov

New York State Department of Health (NYSDOH):

Sarita Wagh
Project Manager
NYSDOH
Empire State Plaza
Corning Tower, Room 1787
Albany, NY 12237
Tel: (518) 402-7860
Email: beei@health.ny.gov

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

The Archives at Queens Library
89-11 Merrick Boulevard
Jamaica, NY 11432
Phone: (718) 990-0700

Queens Community Board #14
1931 Mott Avenue
Far Rockaway, New York 11691
Phone (718) 471-7300

Appendix B
Site Contact List

The Mayor of the City of New York:
Hon. Bill de Blasio
NYC Mayor
City Hall
New York, NY 10007

The New York City Comptroller's Office:
Hon. Scott M. Stringer
NYC Comptroller
1 Centre Street
New York, NY 10007

NYC Public Advocate:
Hon. Letitia James
1 Centre Street,
New York, NY 10007

Queens County Clerk:
Audrey Pheffer
Queens Supreme Court Building
88-11 Sutphin Boulevard
Jamaica, NY 11435

The Queens Borough President
Hon. Melinda Katz
Queens Borough Hall
120-55 Queens Boulevard
Kew Gardens, NY 11424

Planning Agencies:
Marisa Lago, Commissioner
NYC Dept. of City Planning
120 Broadway, 31st Floor
New York, NY 10271

Dan Walsh, Director
NYC Office of Environmental Remediation
100 Gold Street, 2nd Floor
New York, NY 10038

Julie Stein
Bureau of Environmental Planning & Analysis
NYC Dept. of Environmental Protection
96-05 Horace Harding Expressway
Flushing, NY 11373

The Queens Office of the New York City Department of City Planning
120-55 Queens Boulevard, Room 201
Kew Gardens, NY 11424

The public water supplier that services the area where the Site is located:
Hon. Vincent Sapienza, Commissioner
New York City Department of Environmental Protection
59-17 Junction Boulevard, 13th Floor
Flushing, NY 11373

Community Board:
Queens Community Board #14
Jonathan Gaska, District Manager
Delores Orr, Chairwoman
Daniel Mundy, Chairman – Environmental Committee
1931 Mott Avenue
Far Rockaway, New York 11691

Local news media from which the community typically obtains information:
New York Daily News
4 New York Plaza
New York, NY 10004

Spectrum NY1 News
75 Ninth Avenue
New York, NY 10011

New York Post
1211 Avenue of the Americas
New York, NY 10036

Hoy Nueva York
1 MetroTech Center, 18th Floor
Brooklyn, NY 11201

El Diario La Prensa
1 MetroTech Center, 18th Floor
Brooklyn, NY 11201

Rockaway Wave
88-08 Rockaway Beach Boulevard
Rockaway Beach, NY 11693

The Rockaway Times
114-04 Beach Channel Drive
Rockaway, NY 11694

The Queens Examiner
45-23 47th Street
Woodside, NY 11377

Local Elected Officials:

Hon. Donovan Richards Jr.
NYC Council Member, District # 31
234-26 A Merrick Boulevard
Laurelton, NY 11422

Hon. Stacey G. Pheffer-Amato
NYS Assembly District #51
162-38 Cross Bay Boulevard
Howard Beach, NY 11415

Hon. James Sanders, Jr.
NYS Senator District #10
142-01 Rockaway Boulevard
South Ozone Park, NY 11436

Hon. Charles Schumer
U.S. Senator
780 Third Avenue, Suite 2301
New York, NY 10017

Hon. Kirsten Gillibrand
U.S. Senator
780 Third Avenue, Suite 2601
New York, NY 10017

Hon. Gregory Meeks
U.S. House of Representatives
67-12 Rockaway Beach Boulevard
Arverne, NY 11692

Civic, Community, Religious and Educational Institutions:

Queens Chamber of Commerce
Attn: Thomas Grech
7520 Astoria Boulevard, Suite 140
Flushing, NY 11370

Solid Rock SDA Church
52-05 Rockaway Beach Boulevard
Far Rockaway, NY 11691-1134
Attn: Pastor

Rockaway Development & Revitalization Corporation
1920 Mott Avenue #2
Far Rockaway, NY 11691
Email: info@rdrc.org
Tel: 718.327.5300
Fax: 718.327.4990
Kevin W. Alexander, President & CEO

Rockaway Waterfront Alliance
PO Box 900645
Far Rockaway, NY 11690

Carol Conslato, Director
Consolidated Edison Corporate Affairs
59-17 Junction Boulevard, 2nd Floor
Elmhurst, NY 11373

Jazmine Outlaw – President
101st Precinct Police Council
16-12 Mott Avenue
Far Rockaway, NY 11691

FDNY
Battalion 47 Engine 265 Ladder 121
48-06 Rockaway Beach Boulevard
Far Rockaway, NY 11691

Any person who has requested to be placed on the site contact list:

No person has yet requested to be placed on the Site contact list.

The administrator of any school or day care facility located on or near the Site:
PS 105 (The Bay School)
420 Beach 51st Street
Far Rockaway, NY 11691
Administrator: Ms. Laurie Shapiro

JHS 198 (Benjamin N. Cardozo Junior High School)
365 Beach 56th Street
Arverne, NY 11692
Administrator: Ms. Angela Logan

Goldie Maple Academy
3-65 Beach 56th Street
Arverne, NY 11692
Administrator: Ms. Angela Smith

Blanche Community Progress Day Care Service
44-02 Beach Channel Drive
Far Rockaway, NY 11691
Administrator: Ms. Florence Williams

Bethel Mission Loving Day Care
338 Beach 56th Street
Arverne, NY 11692
Administrator: Ms. Dolores Paual

Lucille Rose Day Care Center
148 Beach 59th Street
Arverne, NY 11692
Administrator: Ms. Elaine Short

Residents, Owners and Occupants of the Site and adjacent parcels:
The Applicant is the owner of the parcels comprising the Site, which are presently unoccupied. The Applicant is also the owner of one property to the south. The owners and occupants of adjoining properties are as follows:

Adjoining Property Location	**Owner/Occupant**
➢ Adjoining South	
Commercial Property (electrical substation) Block 15891, Lot 10	Long Island Light Co. (owner and occupant) C/o Brooklyn Union Gas Co. 333 Earle Ovington Blvd., Suite 403 Uniondale, NY 11553

Adjoining Property Location	**Owner/Occupant**
➢ Adjoining South	
Solid Rock SDA Church Block 15891, Lot 21 52-05 Rockaway Beach Boulevard Far Rockaway, NY 11691-1134	Northeastern Conference of the Seventh Day Adventists (owner and occupant of the church)
Royal Seafood, Inc. (wholesale) Block 15857, Lots 7 & 40 50-01 Rockaway Beach Boulevard Far Rockaway, NY 11691	Rockware Industrial, LLC (owner) 619 Palisades Ave. Engelwood Cliffs, NJ 07632 (occupant is the seafood wholesaler noted at left)
Commercial/Industrial Property Block 15857, Lot 42	Peggy Shapiro, LLC (owner) 1 Maiden Lane, 5th Floor New York, NY 10038
	All Star Document & Paper Shredding (occupant) 49-15 Rockaway Beach Boulevard Far Rockaway, NY 11691
➢ Adjoining East (across Beach 50th Street)	
Parking Lot for MTA Bus depot Block 15841, Lots 10 & 14 49-19 Rockaway Beach Blvd.	49-19 Rockaway Beach, LLC (owner) 60 Hempstead Ave., Suite 718 West Hempstead, NY 11552
	MTA Bus (occupant) 2 Broadway New York, NY 10004-2207
Parking Lot/Commercial Property Block 15841, Lot 19	Y-M-G-Y Development Group (owner) 86-25 Lefferts Blvd. Richmond Hill, NY 11418
	DDK Auto Corp. (occupant) 517 West 45th Street, Floor 1 New York, NY 10036-3400

Adjoining Property Location	**Owner/Occupant**
➢ Adjoining Northeast	
Peninsula General Nursing Home Block 15842, Lot 100 53-01 Beach Channel Drive Far Rockaway, NY 11691	Beach 50th Street, LLC (owner) Mark Zafrin c/o Michelman & Robinson, LLP 800 Third Ave., 24th Floor New York, NY 10022 Occupant is the nursing home noted at left.
➢ Adjoining North (across Beach Channel Drive)	
Multi-Family Residential Properties Block 16001, Lot 2	NYC Housing Authority (owner) 250 Broadway, 9th Floor New York, NY 10007 (718) 657-8300 Residents (multiple, occupants) 409 Beach 51st Street Far Rockaway, NY 11691 Residents (multiple, occupants) 51-32 Beach Channel Drive Far Rockaway, NY 11691 Residents (multiple occupants) 51-24 Beach Channel Drive Far Rockaway, NY 11691 Residents (multiple occupants) 410 Beach 54th Street Far Rockaway, NY 11961
PS 105 (The Bay School) & Conch Playground (occupant) Block 15974, Lot 3 420 Beach 51st Street Far Rockaway, NY 11691	NYC Dept. of Parks & Board of Ed. (owners) Parks: The Arsenal Central Park 830 Fifth Avenue New York, NY 10065

Adjoining Property Location	**Owner/Occupant**
➢ Adjoining West (across Beach 53rd Street)	
Multi-Family Residential Properties Block 15890, Lots 64, 66, 69 Ocean Bay Apartments	NYC Housing Authority (owner) 250 Broadway, 9th Floor New York, NY 10007
	Residents (multiple, occupants) Ocean Bay Apartments 53-05 Beach Channel Drive Far Rockaway, NY 11691
	Residents (multiple, occupants) Ocean Bay Apartments 53-01 Beach Channel Drive Far Rockaway, NY 11691
➢ Adjoining West (across Beach 53rd Street)	
Lawrence Nursing Care Center Block 15890, Lot 42 350 Beach 54th Street Far Rockaway, NY 11692	CAR Investments, LLC (owner) PO Box 290 Zeeland, MI 49464-0290 (occupant is nursing home noted at left)
Lawrence Nursing Care Parking Lot Block 15890, Lot 84	Lawrence Nursing Care (owner and occupant) 350 Beach 54th Street Far Rockaway, NY 11692
Multi-Family Residential Property Block 15890, Lot 30	Beach Street Housing Dev. Fund Corp. (owner) C/o Development Associates, Inc. 167 Jefferson Ave. Island Park, NY 11558
	Residents (multiple occupants) 334 Beach 54 Street Far Rockaway, NY 11961
Multi-Family Residential Property Block 15890, Lot 97	Beach 53rd, LLC (owner) 311 Blackheath Road Lido Beach, NY 11561
	Residents (multiple occupants) 3-09 Beach 53 Street

Adjoining Property Location	Far Rockaway, NY 11961 **Owner/Occupant**

- Adjoining West (across Beach 53rd Street)

Vacant Property (no occupant) Block 15890, Lot 8	Wavebrook Assoc., LLC (owner) 30-64 Whitestone Expressway College Point, NY 11354

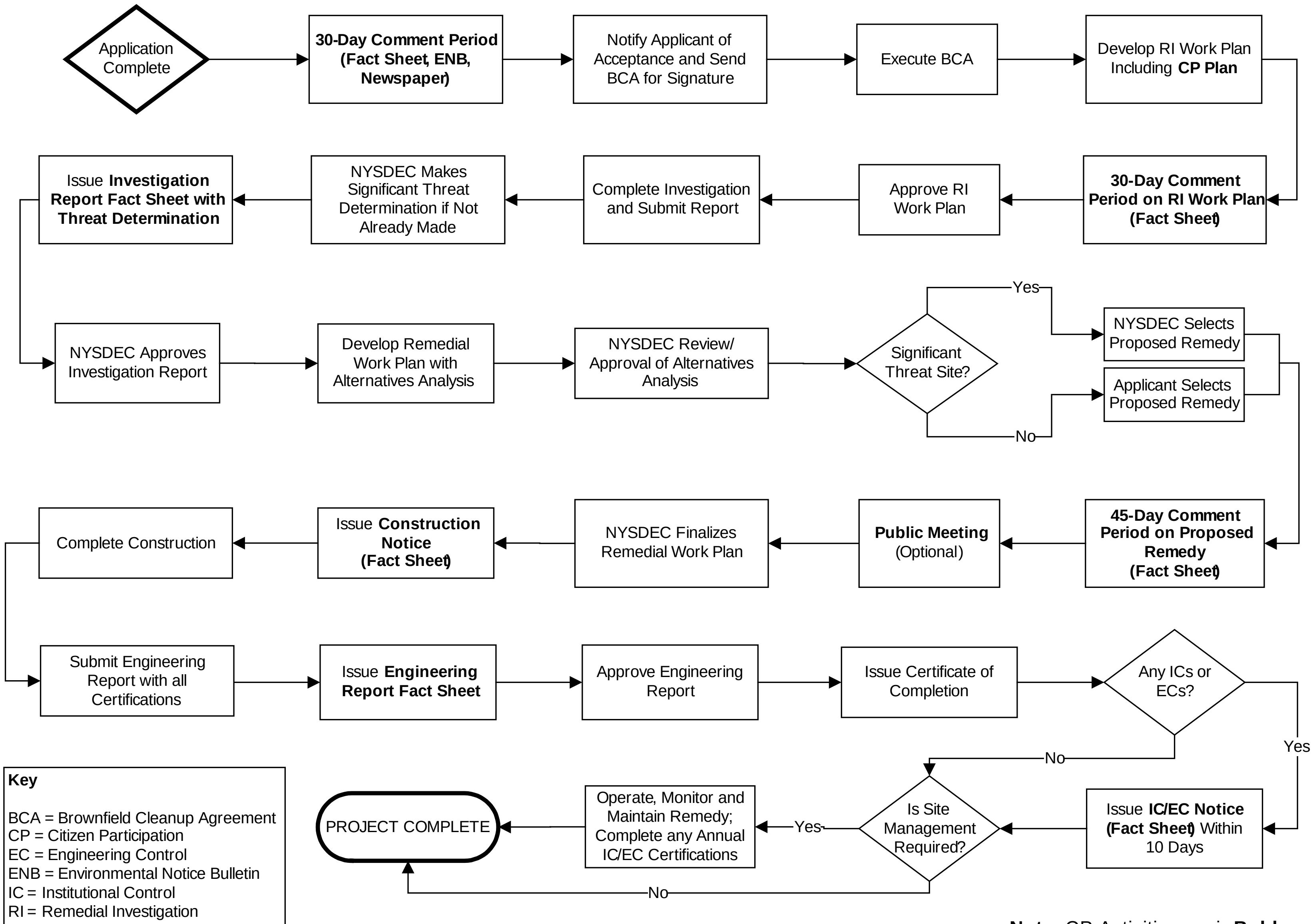
The locations of the local document repositories for the project:

The Archives at Queens Library
89-11 Merrick Boulevard
Jamaica, NY 11432
Phone: (718) 990-0700

Queens Community Board #14
1931 Mott Avenue
Far Rockaway, New York 11691
Phone (718) 471-7300

Appendix C
Site Location Map

Appendix D– Brownfield Cleanup Program Process



Note: CP Activities are in **Bold**

APPENDIX E

SCOPING SHEET FOR MAJOR ISSUES OF CONCERN

Remedial Programs

Scoping Sheet for Major Issues of Public Concern

Instructions

This Scoping Sheet assesses: major issues of public concern; impacts of the site and its remedial program on the community; community interest in the site; information the public needs; and information needed from the public, if applicable.

The information generated helps to plan and conduct required citizen participation (CP) activities, and to choose and conduct additional CP activities, if appropriate. The scoping sheet can be revisited and updated as appropriate during the site's remedial process to more effectively implement the site's CP program.

Note: Use the information as an aid to prepare and update the Major Issues of Public Concern section of the site CP Plan.

General Instructions

- When to prepare: During preparation of the CP Plan for the site. It can be revisited and updated anytime during the site remedial process.
- Fill in site name and other information as appropriate.

Instructions for Numbered Parts

Consider the bulleted issues and questions below and any others that may be appropriate to the site and the community to help complete the five Parts of this Scoping Sheet. Include the issue stakeholders in Parts 1 through 3 and adjust the site's contact list accordingly.

Part 1. List Major Issues of Public Concern and Information the Community Wants.

- Is our health being impacted? (e.g. Are there problems with our drinking water or air? Are you going to test our water, yards, sumps, basements? Have health studies been done?)
- There are odors in the neighborhood. Do they come from the site and are they hazardous?
- Are there restrictions on what we may do (e.g. Can our children play outside? Can we garden? Must we avoid certain areas? Can we continue to recreate (fish, hunt, hike, etc. on/around the site?)
- How and when were the site's contamination problems created?
- What contaminants are of concern and why? How will you look for contamination and find out where it is going? What is the schedule for doing that?
- The site is affecting our property values!
- How can we get more information (e.g. who are the project contacts?)
- How will we be kept informed and involved during the site remedial process?
- Who has been contacted in the community about site remedial activities?
- What has been done to this point? What happens next and when?
- The site is going to be cleaned up for restricted use. What does that mean? We don't want redevelopment on a "dirty" site.

Part 2. List Important Information Needed From the Community, if Applicable.

- Can the community supplement knowledge about past/current uses of the site?
- Does the community have knowledge that the site may be significantly impacting nearby properties, natural resources, etc.?

- Are there activities currently taking place at the site or at nearby properties that may need to be restricted?
- Who may be interested or affected by the site that has not yet been identified?
- Are there unique community characteristics that could affect how information is exchanged?
- Do the community and/or individuals have any concerns they want monitored?
- Does the community have information about other sources in the area for the contamination?

Part 3. List Major Issues and Information That Need to be Communicated <u>to</u> the Community.

- The process and general schedule to investigate, remediate and, if applicable, redevelop the site.
- Current understanding about the site contamination and effects, if any, on public health and the environment.
- Site impacts on the community and any restrictions on the public's use of the site and/or nearby properties.
- Planned CP activities, their schedule, and how they relate to the site's remedial process.
- Ways for the community to obtain/provide information (document repositories, contacts, etc.).

Part 4. Community Characteristics

a. - e. Obtain information from local officials, property owners and residents, site reports, site visits, "windshield surveys," other staff, etc.

f. Has the affected community experienced other **significant** present or past environmental problems unrelated to this site? Such experiences could significantly affect public concerns and perspectives about the site; how the community will relate to project staff; the image and credibility of project staff within the community; and the ways in which project staff communicate with the community.

g. Consider factors such as:

- Is English the primary language of the affected community? If not, provisions should be considered regarding public outreach activities such as fact sheets, meetings, door-to-door visits and other activities to ensure their effectiveness.

- The age demographics of the community. For example, is there a significant number of senior citizens in the community? It may be difficult for some to attend public meetings and use document repositories. This may suggest adopting more direct interaction with the community with activities such as door-to-door visits, additional fact sheets, visits to community and church centers, nursing homes, etc.

- How do people travel about the community? Would most people drive to a public meeting or document repository? Is there adequate public transportation?

Part 5. Affected/Interested Public. Individuals and organizations who need or want information and input can change during the site's remedial process. This need is influenced by real, potential or perceived impacts of the site or the remedial process. Some people may want information and input throughout the remedial process. Others may participate only during specific remedial stages, or may only be interested in particular issues. It is important to revisit this question when reviewing this scoping sheet. Knowing who is interested in the site – and the issues that are important to them – will help in the selection and conduct of appropriate outreach activities, and to identify their timing and the information to be exchanged.

Check all affected/interested parties that apply to the site. **Note: Adjust the site's contact list appropriately.** The following are some ways to identify affected/interested parties:

- Tax maps of adjacent property owners
- Attendees at public meetings
- Telephone discussions
- Letters and e-mails to DER, the remedial party, and other agencies
- Political jurisdictions and boundaries
- Media coverage
- Current/proposed uses of site and/or nearby properties (recreational, commercial, industrial)
- Discussions with community organizations: grass roots organizations, local environmental groups, environmental justice groups, churches, and neighborhood advisory groups

New York State Department of Environmental Conservation
Division of Environmental Remediation

Remedial Programs
Scoping Sheet for Major Issues of Public Concern (see instructions)

Remedial Party: Peninsula Rockaway Limited Partnership

Site Name: Former Peninsula Hospital Site

Site Number: C241200

Site County: Queens

Note: For Parts 1. – 3., the individuals, groups, organizations, businesses, and units of government identified should be added to the site contact list as appropriate.

Part 1. List major issues of public concern and information the community wants. Identify individuals, groups, organizations, businesses, and/or units of government related to the issue(s) and/or information. **Use this information as an aid to prepare or update the Major Issues of Public Concern section of the site Citizen Participation Plan.**
No major issues of public concern have been identified for the Site as per Section 3 of the CP Plan. Potential issues of public concern include soil vapor intrusion and soil exposure.

How were these issues and/or information identified?
Evaluation of existing Site data.

Part 2. List important information needed **from** the community, if applicable. Identify individuals, groups, organizations, businesses, and/or units of government related to the needed information.
No needed information has been identified.

How were these information needs identified?
Not applicable

Part 3. List major issues and information that need to be communicated **to** the community. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and/or information.
No major issues of public concern have been identified for the Site as per Section 3 of the CP Plan. Potential exposure to soil vapor and soil should be communicated, including mitigation and remedial measures if needed.

How were these issues and/or information identified?
Census Demographics.

Part 4. Identify the following characteristics of the affected/interested community. This knowledge will help to identify and understand issues and information important to the community, and ways to effectively develop and implement the site citizen participation plan (mark all that apply):

a. Land use/zoning around site:
☒ **Residential** ☐ **Agricultural** ☒ **Recreational** ☒ **Commercial** ☐ **Industrial**

b. Residential type around site:
☒ **Urban** ☐ **Suburban** ☐ **Rural**

c. Population density around site:
☒ **High** ☐ **Medium** ☐ **Low**

d. Community economic status:
☐ **High** ☒ **Medium** ☐ **Low**

e. Water supply of nearby residences:
☐ **Yes** ☐ **No** ☒ **Public** ☐ **Private Wells** ☐ **Mixed**

f. Other environmental issues significantly impacting affected community?

Provide details if appropriate:
Click here to enter text.

g. Special considerations:
☒ **Language** ☐ **Age** ☐ **Transportation** ☐ **Other**

Explain marked categories in **g.**:
The site is surrounded by large African-American and Hispanic-American populations. Therefore, all future fact sheets will be translated into Spanish.

Part 5. The site contact list must include, at a minimum, the individuals, groups, and organizations identified in the instructions for **Part 5.** Are other individuals, groups, organizations, and units of government affected by, or interested in, the site, or its remedial program? (Mark and identify all that apply, then adjust the site contact list as appropriate.)

☐ **Non-Adjacent Residents/Property Owners:** Click here to enter text.

☒ **Local Officials:** Click here to enter text.

☒ **Media:** Click here to enter text.

☒ **Business/Commercial Interests:** Click here to enter text.

☐ **Labor Group(s)/Employees:** Click here to enter text.

☐ **Indian Nation:** Click here to enter text.

☒ **Citizens/Community Group(s):** Click here to enter text.

☒ **Environmental Justice Group(s):** Click here to enter text.

☒ **Environmental Group(s):** Click here to enter text.

☒ **Civic Group(s):** Click here to enter text.

☒ **Recreational Group(s):** Click here to enter text.

☐ **Other(s):** Click here to enter text.

Date Completed: November 2017

Prepared By: S. Davis, FPM

Reviewed By: Thomas V. Panzone, 2/7/18