Final Engineering Report

Former Carol Cleaners Site
Staten Island
Richmond County, New York
Site No. 2-43-020

JULY 27, 2023
PROJECT NUMBER 209-4213307

PRESENTED TO

Brookfield Properties
350 N Orleans Street, Suite 300
Chicago, IL 60654

SUBMITTED BY

Cornerstone Engineering and Geology, PLLC
100 Crystal Run Road, Suite 101
Middletown, NY 10941

P +1.877.294.9070
F +1.877.845.1456
tetratech.com

REPORT CERTIFICATION

Final Engineering Report

Former Carol Cleaners Site
Staten Island, Richmond County, NY

I, Erich Zimmerman, certify that I am currently a NYS registered professional engineer and that this Final Engineering Report was prepared in accordance with applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10) and that remedial activities were performed in accordance with the DER-approved 2018 Remedial Design Report and any DER-approved modifications.

The material and data in this report were prepared under the supervision and direction of the undersigned.

Cornerstone Engineering and Geology, PLLC

Erich Zimmerman, P.E. Date

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It is a violation of Article 145 of the New York State Education Law; unless acting under the direction of a licensed Professional Engineer who affixes signature, date, seal and the words "altered by"; for any person to alter this document in any way.

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
CAMP	Community Air Monitoring Plan
cis-1,2-DCE	cis-1,2-dichloroethylene
CPP	Community Participation Plan
CVOCs	chlorinated volatile organics
DER	Division of Environmental Remediation
DNAPL	dense non-aqueous phase
DUSR	Data Usability Summary Report
EC	Engineering Control
EE	Environmental Easement
EWP	Excavation Work Plan
FER	Final Engineering Report
FS	Feasibility Study
ft/d	feet per day
GWQS	groundwater quality standard
HASP	Health and Safety Plan
IC	Institutional Control
IRM	Interim Remedial Measure
JRW	JRW Bioremediation, LLC
LBGES	Leggette, Brashears & Graham Engineering Services
MNA	monitored natural attenuation
msl	mean sea level
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OM&M	Operation, Maintenance and Monitoring
OSHA	Occupational Safety and Health Administration
P.E. or PE	Professional Engineer
PCE	tetrachloroethylene
PID	Photoionization Detector
ppm	parts per million
QAPP	Quality Assurance Project Plan

Acronyms/Abbreviations	Definition
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SCG	Standards, Criteria and Guidelines
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SSD	Sub-slab Depressurization
TAL	Target Analyte List
TCE	trichloroethylene
UIC	Underground Injection Control
USEPA	United States Environmental Protection Agency
VC	vinyl chloride
VOC	volatile organic compounds

1.0 BACKGROUND AND SITE DESCRIPTION

This Final Engineering Report (FER) is a required element of the remedial program for the Former Carol Cleaners Site located in Staten Island, New York (hereinafter referred to as the "site"). See Figure 1. The site is currently in the New York State (NYS) Inactive Hazardous Waste Disposal Site Remedial Program, Site No. 2-43-020, which is administered by the New York State Department of Environmental Conservation (NYSDEC or Department).

Brookfield Properties (Brookfield; formerly The Rouse Company) entered into an Order on Consent on October 4, 2002 (last amended on November 4, 2011) with the NYSDEC to remediate the site. The site location and boundaries of this site are shown on Figure 2. The boundaries of the site are more fully described in the metes and bounds site description that is part of the Environmental Easement (EE) provided in Appendix B.

After completion of the remedial work, some contamination was left at this site, which is hereafter referred to as "remaining contamination". Institutional and Engineering Controls (ICs and ECs) have been incorporated into the site remedy to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the Richmond County Clerk, requires compliance with this FER and all ECs and ICs placed on the site.

This FER was prepared by Tetra Tech (Tt), on behalf of Brookfield Properties, in accordance with the requirements of the NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010, and the guidelines provided by the NYSDEC. An electronic copy of this FER with all supporting documentation is included as Appendix A.

1.1 SITE LOCATION AND DESCRIPTION

The site is located in Staten Island, Richmond County, New York and is identified as Block 2400 and Lot 300 on the Richmond County Tax Map (Figure 2). The EE portion of the site is an approximately 1.821-acre area and is bounded by The Crossings Center to the north, Platinum Avenue to the south, Marsh Avenue to the east, and Ring Road to the west (Figure 2). The owner of the site parcel(s) at the time of issuance of this FER is Brookfield Properties Retail.

1.2 PHYSICAL SETTING

1.2.1 Land Use

The site consists of the following: a commercial mall building and associated parking areas. The site is zoned commercial and is currently utilized for commercial uses. Site occupants include a nail salon and an ice cream store with other commercial operators further north within the Crossings Center.

The properties adjoining the site and, in the neighborhood, surrounding the site include primarily commercial and residential properties. The properties immediately south of the site include commercial properties; the properties immediately north of the site include commercial properties; the properties immediately east of the site include residential properties; and the properties to the west of the site include commercial properties.

1.2.2 Geology and Hydrogeology

The prevailing depths to groundwater and bedrock at the site range from about 8 feet below grade (ft bg) to 14 ft bg, and 12 ft bg to 28 ft bg, respectively. The naturally occurring geologic materials at the site consist mainly of fine-grained deposits of clay, silt and fine sand (overburden), which are underlain by bedrock. The corresponding bedrock surface generally slopes downwards in elevation from the vicinity of monitoring Well MW-1 where the

bedrock elevation is 31 feet above mean sea level (msl) towards the southwest, proximal to monitoring well MW-16 where the bedrock elevation is 2 feet above msl. The generally southwestward slope of the bedrock surface is locally accentuated by several buried “channels” in the bedrock surface in the vicinity of Platinum Avenue. These channels are anticipated to impart a localized influence on the groundwater flow in the overburden.

Boring and monitoring-well logs were used to prepare a hydrogeologic cross-section that illustrates the vertical distribution (stratigraphy) of encountered geologic and hydrogeologic features across the site. The cross-section illustrates the general slope of the bedrock surface from northeast to southwest, and a similar slope in groundwater surface. The cross-section also illustrates the increase in thickness of the naturally occurring overburden materials (primarily fine sand and silt) from northeast to southwest. The geologic cross section is provided as Figure 3. A groundwater contour map from the most recent groundwater sampling round is provided as Figure 4. Groundwater elevation data are provided in Table 1. Groundwater monitoring well construction logs are provided in Appendix C.

1.3 INVESTIGATION AND REMEDIAL HISTORY

The following is a summary of the remedial history of the site and summary of the available project records to document key investigative and remedial milestones for the site. Full titles for each of the reports referenced below are provided in the reference section.

Following the NYSDEC issuance of the Order on Consent in 2002, Leggette, Brashears & Graham Engineering Services (LBGES) conducted an Interim Remedial Measure (IRM) investigation, followed by a Remedial Investigation (RI), on behalf of GGP. The IRM investigation and RI focused on identifying and locating the general source area and extent of tetrachloroethylene (PCE) and related chlorinated volatile organics (CVOCs) detected in the subsurface environment at the site. The investigative work addressed the following: 1) delineating the horizontal and vertical extent of CVOCs in soil and groundwater in the vicinity of the Carol Cleaners and Tumble Dry Cleaners (aka Damowa Laundry & Dry Cleaning) facilities; 2) assessing migration pathways for detected constituents; and 3) determining whether dense non-aqueous phase liquid (DNAPL) existed at the potential release location.

The IRM investigation and RI results indicated that the “source area” roughly corresponded to a parking/driveway area of broken-up asphalt at the rear of the Carol Cleaners tenant space [near existing monitoring well MW-3 (Figure 2)]. Based on the IRM and RI results, it was determined that no remediation of the overburden (soil) material was warranted due to: 1) the singular encounter of a slightly elevated PCE concentration detected at a depth above the groundwater surface at only one location; 2) the comparatively lower concentrations of PCE [all below the respective NYSDEC “TAGM” objective of 1.4 parts per million (ppm)] detected in the immediately surrounding overburden; 3) the prevailing composition of the overburden (primarily fine sand and silt); 4) the absence of CVOC DNAPL; and 5) the isolation afforded by the prevalence of primarily impervious surfaces (e.g., roofs, parking lot, walkways) at the Site.

Results of groundwater sampling rounds conducted between 1995 and 2011 indicated the presence of dissolved PCE and one or more related CVOCs [trichloroethylene (TCE), cis-1,2-dichloroethylene (cis-1,2-DCE) and vinyl chloride (VC)] at concentrations above their respective NYSDEC groundwater/surface-water standards, as defined by 6 NYCRR Part 703, at several of the on-site and off-site monitoring wells. Groundwater monitoring also did not identify any potential DNAPL in the local groundwater bearing formations underlying the site. The groundwater flow direction, in conjunction with the distribution of the respective CVOCs dissolved in groundwater at the site, support the conclusions that the apparent source area occurs proximal to the Carol Cleaners tenant space, and the resulting plume extended off-site towards Platinum Avenue. The investigation also indicated that contaminant flow may have been influenced by the route of local subsurface utilities.

Based on in-situ hydraulic ("slug") testing conducted at several on-site monitoring wells, it was determined that the hydraulic conductivity of the overburden at the site is low to moderate [0.4 feet per day (ft/d) to 30 ft/d]. These values, along with the relatively consistent hydraulic gradient exhibited by the local groundwater, support the characterization that CVOC plume movement through on-site overburden is expected to occur at a slow rate, which in turn affords the potential for natural degradation (e.g., biologically-driven reductive dechlorination) of the respective constituents to occur. The analytical results for groundwater samples collected since 1995 indicate that PCE related to the on-site source area is clearly undergoing reductive dechlorination (i.e., breakdown to TCE, cis-1,2-DCE, and VC), which substantiates the occurrence of natural degradation at the site. The occurrence of natural degradation of PCE has been further corroborated by the general detection of methane, ethane, and/or ethene in groundwater samples collected from most of the monitoring wells in the plume area.

The RI report associated with the previously completed investigations was submitted to the NYSDEC in October 2011, followed in November 2011 by the Feasibility Study (FS) associated with the identification of potential future remedial activities. The FS established the Remedial Action Objectives (RAOs) for the site and identified in-situ bioremediation as the proposed selected remedial technology. The Record of Decision (ROD) for the site was issued in March 2012 and required completion of a pilot study prior to the implementation of any full-scale remedial efforts. As per the ROD, a workplan for a Pilot Study (the Workplan) to evaluate in-situ bioremediation as a possible remedial technology was submitted to and approved by the NYSDEC in September 2013. In addition, the ROD indicated that any indoor air impacts potentially resulting from existing conditions and/or future remedial efforts as identified in the RI and FS would need to be addressed prior to beginning the pilot study.

The results of the April 2006 and February 2008 indoor air and sub-slab air sampling, summarized in the RI report submitted in 2008, indicated that PCE and related CVOCs had impacted the indoor air in the Babies R Us space, and the adjacent strip mall spaces occupied by SI Shoe Repair, Carol Cleaners, Mon Amie Nails and Carvel (the focus area). The areas where indoor air impacts appear to be greatest generally coincided with areas corresponding to the nearby groundwater plume. Based on the detected concentrations and respective New York State Department of Health (NYSDOH) guidelines, an SSD system was installed to mitigate these impacts.

The initial round of post-mitigation heating season indoor air sampling results indicated that concentrations of PCE and related CVOCs still exceeded their respective NYSDOH guidelines within multiple tenant spaces. Additional investigation into the cause of the persistent elevated PCE and related CVOC concentrations determined that the dry cleaning tenant (French Cleaning by Carol) occupying the Carol Cleaners tenant space was using equipment which was emitting PCE into the indoor air at concentrations in exceedance of the respective NYSDOH guideline. The tenant was subsequently vacated from the property by GGP. Follow-up indoor air sampling indicated that PCE vapor remained an indoor air issue at the Carvel tenant space. As a result, an additional SSD suction point was installed within the Carvel tenant space in February 2015. Subsequent heating season indoor air sampling at the Carvel tenant space indicated compliance with the respective NYSDOH guidelines.

The SSD system is currently operating and maintaining depressurization of the targeted tenant spaces. The SSD system is inspected weekly by Brookfield representatives and, as of the November 14, 2022 was operating at normal vacuums, with each of the three SSDS fans achieving the specified vacuum confirming effective depressurization. The as-built drawing for the SSDS is provided in Appendix D.

As part of baseline groundwater monitoring activities, grab samples of standing water were obtained from several catch basins at the site during October 2016. Analytical results indicated that chlorinated VOCs (primarily PCE and cis-1,2-dichloroethene) were identified in several catch basins at concentrations above NYSDEC Surface water and/or groundwater standards, with a maximum detected PCE concentration of 272 micrograms per liter. In response to the detection of PCE in the standing water samples collected from the stormwater system, and in connection with the Interim Site Management Plan (Interim SMP) activities identified for the site, stormwater system cleaning activities were initiated in November 2016. The cleaning activities involved the removal of

sediment from each of the accessible catch basins associated with the on-site stormwater system. Approximately two to three feet of sediment was encountered at each of the accessed catch basins. Sediment was removed and placed into roll off boxes for subsequent characterization and disposal. Based on the results of waste characterization sampling, approximately 22 tons of non-hazardous sediment was transported to Cycle Chem in Elizabeth, New Jersey, and approximately 11.5 tons of sediment was transported to Michigan Disposal, Inc. in Belleville, Michigan for disposal as hazardous waste.

Eighteen (18) soil borings (SWB-1 through SWB-18) were advanced in June 2017 using a Geoprobe® rig. The borings were advanced at locations intended to assess the potential for CVOC-impacts to soil from on-site subsurface utility routes, specifically storm water lines, and as such were advanced in the parking areas on the eastern and southern sides of The Crossings Mall building proximal to storm drain catch basins (Figure 5).

The borings were mostly advanced to the top of bedrock with completion depths ranging from approximately 3 to 19 feet below grade (ft bg). Soil samples were continuously collected from the respective boreholes using a macro-core device with dedicated, disposable, clear-acetate sleeves. The respective soil boring logs are provided in Appendix E. The overburden materials encountered at each of the boring locations were consistent with those encountered during previous on-site subsurface explorations elsewhere at the Site. The naturally occurring materials generally consisted of fine-grained deposits of clay, silt, and fine sand with varying amounts of gravel. A total of thirty-six (36) soil samples were collected for subsequent laboratory analyses at depths corresponding to immediately above the encountered groundwater surface (typically about 5 ft bg) and/or above refusal at each boring location.

The analytical results for the respective soil samples did not indicate the occurrence of any of the CVOCs of interest at concentrations in exceedance of the respective NYSDEC Restricted Use Commercial Soil Cleanup Objectives (SCOs). No evidence of DNAPL was encountered at any of the boring locations. Based on the results of the soil sampling efforts, the implementation of sub-slab vapor sampling at the nearby tenant spaces was not warranted. Historical soil sampling results are provided in Appendix F.

In-situ bioremediation pilot testing was conducted between November 2014 and October 2015 in accordance with the approved Work Plan. The injectant (WILCLEAR PLUS®) was a sodium lactate mixture consisting of a blend of fatty acids and fermentables (e.g., sodium lactate) manufactured by JRW Bioremediation, LLC (JRW). WILCLEAR PLUS® is designed specifically for bioremediation use, and is a light to dark brown, low viscosity, miscible liquid with a pH between 6 and 8. It is manufactured from food-grade ingredients, primarily fatty acids and fermentables, which eventually get consumed by natural microbes in the subsurface and groundwater. The injectant was mixed with 9 parts of water to one part of sodium lactate to facilitate the injection process. Once the reductive dechlorination (anaerobic driven) process is completed, only the innocuous end products consisting of carbon dioxide, ethene, ethane, water, and chloride ions remain in the groundwater. Following completion, a Pilot Test Summary Report was prepared and submitted to the NYSDEC in December 2015. The Pilot Test Summary Report was approved by the NYSDEC on April 13, 2016, and a Full-Scale Remedial Design Work Plan was prepared and submitted to the NYSDEC in May 2016. The Full-Scale Remedial Design Work Plan was approved by the NYSDEC on June 29, 2016.

The full-scale remediation commenced in October 2018 following the previously discussed storm drain investigation/remediation activities using Monitoring Wells MW-3, MW-5, MW-7, MW-16 through MW-24 as injection wells. The injectant (treatment solution) used in connection with the full-scale remedial activities is the same product used during the pilot test. The injectant (WILCLEAR PLUS®) is a sodium lactate mixture consisting of a blend of fatty acids and fermentables (e.g., sodium lactate) manufactured by JRW Bioremediation, LLC (JRW). WILCLEAR PLUS® is designed specifically for bioremediation use, and is a light to dark brown, low viscosity, miscible liquid with a pH between 6 and 8. This product is manufactured from food-grade ingredients, primarily fatty acids and fermentables, which eventually get consumed by natural microbes in the subsurface and groundwater. The injectant was mixed with 9 parts of water to one part of sodium lactate to facilitate the injection

process. Once the reductive dechlorination (anaerobic driven) process is completed, only the innocuous end products consisting of carbon dioxide, ethene, ethane, water, and chloride ions remain in the groundwater.

2.0 SUMMARY OF SITE REMEDY

2.1 REMEDIAL ACTION OBJECTIVES

The RAOs for the site as listed in the March 28, 2012 Record of Decision are as follows:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

3.0 DESCRIPTION OF REMEDIAL ACTIONS PERFORMED

3.1 GOVERNING DOCUMENTS

3.1.1 Site Specific Health & Safety Plan (HASP)

The previously-approved Health and Safety Plan prepared in connection with activities previously completed at the Site, were followed as part of the RDR work activities.

All remedial work performed under this Remedial Action was in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA. The Health and Safety Plan (HASP) was complied with for all remedial and invasive work performed at the Site.

3.1.2 Site Management Plan (SMP)

The site contains residual contamination left after completion of the remedial action (soil source removal). Engineering and institutional controls have been incorporated into the site remedy to control exposure to remaining contamination during the use of the site to ensure protection of public health and the environment. The engineering and institutional controls along with operations maintenance and monitoring requirements are documented in the SMP.

3.1.3 Quality Assurance Project Plan (QAPP)

The previously-approved QAPP prepared in connection with activities previously completed at the Site, were followed as part of the RDR work activities. The QAPP describes the specific policies, objectives, organization, functional activities and quality assurance/ quality control activities designed to achieve the project data quality objectives.

All sampling conducted during the remedial investigation phase and remedial action (long term monitoring) phase was conducted in accordance with the QAPP. The plan also managed performance of the RI/RA tasks through designed and documented QA/QC methodologies applied in the field and in the lab. The plan provided a detailed description of the observation and testing activities that were used to monitor sampling quality and confirm that sampling was done in conformance with the remediation objectives and specifications.

3.1.4 Community Air Monitoring Plan (CAMP)

The previously-approved Community Air Monitoring Program (CAMP) prepared in connection with activities previously completed at the Site, were followed as part of the RDR work activities. The CAMP was utilized to guide real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when ground intrusive activities were conducted at the site. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. Appropriate air monitoring in accordance with the CAMP was conducted during injection activities, installation of new wells and during the sampling of all monitoring wells.

3.1.5 Community Participation Plan (CPP)

As noted in the 2003 OM&M Manual, the limited nature of the OM&M Work Plan obviates the need for citizen participation in the implementation of the remedy at the Carol Cleaners. Carol Cleaners will periodically undertake the preparation and distribution of fact sheets to adjacent property owners and other interest groups as determined to be necessary by the NYSDEC.

4.0 REMEDIAL PROGRAM ELEMENTS

4.1 CONTRACTORS AND CONSULTANTS

- Tetra Tech is the Engineer of Record responsible for inspecting/certifying the remedial work conducted at the site.
- Active Environmental under the guidance of JRW Bioremediation, LLC (JRW) performed all follow up injections at the Site.
- Submit Drilling Co. under the guidance of WSP - Installed all soil borings during the RD phase.
- AmeriDrill, Inc. under the guidance of WSP - Installed all monitoring wells required for long term monitoring under the RD.
- Tetra Tech - performed all sampling and reporting required by the SMP.

4.2 SITE PREPARATION

A complete list of agency approvals required by the RAWP is included in Appendix G. This list includes a citation of the law, statute or code to be complied with, the originating agency, and a contact name and phone number in that agency.

4.3 GENERAL SITE CONTROLS

The site is an active shopping center. All contaminated media at the site (soil and ground water) are below asphalt pavement, concrete building foundations, and de minimis landscaped areas covered with a clean soil buffer. As such, the site is open with no access controls to the site deemed necessary.

4.4 NUISANCE CONTROLS

Due to the minimally invasive nature of the selected remedy, (monitored natural attenuation the no nuisance control plan (i.e., truck wash and egress, housekeeping, dust control, odor control, etc.) was deemed necessary.

4.5 COMMUNITY AIR MONITORING PLAN (CAMP) RESULTS

Air monitoring was conducted with a PID in the breathing zone downwind of the work site during any drilling and sampling activities. No PID readings above background concentrations were ever detected during site monitoring.

4.6 REPORTING

Progress reports were prepared by WSP on a monthly basis during the ground water sampling conducted in accordance with the RAWP. All progress reports have been previously submitted to NYSDEC. The digital photo taking during the RA is included in electronic format in Appendix H.

5.0 MATERIALS REMOVAL

5.1 REMEDIAL PERFORMANCE SAMPLING

Follow up injections were conducted in December 2018, October 2019 and October 2020. The 2018 and 2019 injection events consisted of injecting 4,400 gallons of sodium lactate solution, while the 2020 injection round consisted of injecting 2,200 gallons of sodium lactate solution. Injection locations and amounts are summarized on the following table:

Injection Locations and Quantity Injected – 2018 Through 2020

Injection Well	10/2018 Injection Event Quantity	12/2018 Injection Event Quantity	10/2019 Injection Event Quantity	10/2020 Injection Event Quantity
MW-3	400	400	400	250
MW-5	400	320	300	350
MW-7	360	400	300	400
MW-16	360	320	450	375
MW-17	360	370	500	425
MW-18	360	400	500	400
MW-19	360	430	500	0
MW-20	360	350	400	0
MW-21	360	350	400	0
MW-22	360	360	400	0
MW-23	360	400	125	0
MW-24	360	300	125	0
Totals	**4,400**	**4,400**	**4,400**	**2,200**

The initial baseline pre-injection groundwater sampling round was conducted in October 2016. The baseline sampling event consisted of sampling all monitoring wells for VOCs, metals, dissolved metals, nitrite, nitrate, sulfate, methane, ethane, ethene, carbon dioxide, chemical oxygen demand, biological oxygen demand, total organic carbon, and alkalinity. Additional field analyses included dissolved oxygen, oxidation-reduction potential, pH, temperature and specific conductance. Follow-up post-injection sampling on a quarterly basis generally consisted of sampling fifteen monitoring wells for the above-referenced analyses and three monitoring wells for VOCs and metals only. The table below summarizes the sampling pre- and post-injection sampling regimen.

Pre- and Post-Injection Groundwater Sampling Summary

Monitoring Well ID	Injection Monitoring		
	Pre-Injection Baseline	Monitoring Wells Within Treatment Area	Monitoring Wells Outside Treatment Area
MW-1	X	---	---
MW-2	X	---	X
MW-3 (Zone 1 injection)	X	X (injection)	---
MW-3D	X	X	---
MW-4	X	X	---
MW-5 (Zone 1 injection)	X	X (injection)	---
MW-6R	X	---	X
MW-7 (Zone 2 injection)	X	X (injection)	---
MW-8	X	X	---
MW-9 (Abandoned)	---	---	---
MW-10	X	---	X
MW-11	X	---	---
MW-12	X	---	---
MW-13	X	---	---
MW-14	X	---	---
MW-15	X	---	---
MW-16 (Zone 3 injection)	X	X (injection)	---
MW-17 (Zone 3 injection)	X	X (injection)	---
MW-18 (Zone 3 injection)	X	X (injection)	---
MW-19 (Zone 3 injection)	X	X (injection)	---
MW-20 (Zone 2 injection)	X	X (injection)	---
MW-21 (Zone 2 injection)	X	X (injection)	---
MW-22 (Zone 2 injection)	X	X (injection)	---
MW-23 (Zone 2 injection)	X	X (injection)	---
MW-24 (Zone 2 injection)	X	X (injection)	---

Post-injection quarterly groundwater sampling rounds commenced in January 2019 following the second injection event that occurred in December 2018. The pre- and post-injection quarterly groundwater sampling data are summarized in Tables 2. Based on the data, the sodium lactate injections have been successful, as CVOC

concentrations have significantly decreased. Specifically, the previously elevated source area monitoring wells, MW-3, MW-4 and MW-5 have exhibited a decrease in PCE concentrations when comparing the pre- and post-injection laboratory analyses. Monitoring well MW-3 exhibited a decrease in PCE concentrations from 8,340 ug/l in July 2004 (pre-injection baseline of 89 ug/l in July 2017) to 1.0 ug/l in September 2021. Monitoring well MW-4 exhibited a decrease in PCE concentrations from 8,810 ug/l in April 2008 (pre-injection baseline of 1.4 ug/l in July 2017) to non-detect in September 2021. Monitoring well MW-5 exhibited a decrease in PCE concentrations from 72.4 ug/l in September 2009 (pre-injection baseline of 4.2 ug/l in July 2017) to non-detect in September 2021. The latest sampling round shows that PCE and TCE are either non-detect or below the NYSDEC groundwater standards in monitoring wells that are part of the monitoring program. The concentration of PCE breakdown products (such as TCE, DCE and VC) tended to increase early in the injection process followed by a subsequent decrease to below the NYS groundwater quality standard (GWQS), or to below the laboratory detection limit. This is an expected result of the reductive dichlorination process. Based on the data, the sodium lactate injections have been successful at reducing the CVOC concentrations associated with the former Carol Cleaners.

The NYSDEC/NYSDOH recently requested that Brookfield conduct an investigation to assess the potential offsite migration of PCE-impacted groundwater from the former Carol Cleaners to the Pergament Mall property located south of Platinum Avenue. Tetra Tech mobilized to the site on July 26, 2022 to perform groundwater sampling. Groundwater samples were collected from a total of nine (9) on-site monitoring wells and submitted to SGS Laboratory (SGS) in Dayton, New Jersey. Samples were obtained from monitoring wells MW-3, MW-3D, MW-5, MW-7, MW-8, MW-17, MW-18, MW-19, and MW-23. All nine (9) groundwater samples were analyzed for Volatile Organic Compounds (VOCs) by USEPA Method 8260, TAL Metals (both filtered and unfiltered), Nitrate/Nitrite, Sulfate, Hardness, Alkalinity, Chemical Oxygen Demand, Biochemical Oxygen Demand, Total Organic Carbon, Carbon Dioxide, Methane, Ethane, and Ethene.

Groundwater sampling was conducted on the Pergament Mall property on July 28 and 29, 2022, and consisted of the installation of temporary groundwater sampling points. Tetra Tech attempted to collect samples from 10 locations within the Pergament Mall parking area; however, only three locations could be completed as temporary well locations due to subsurface refusal (thought to be a concrete slab). Each temporary well was constructed with a 1-inch diameter PVC riser and a 5-feet length of slotted screen. Groundwater samples were collected from the three wells using a peristaltic pump after purging three well volumes. The collected groundwater samples were analyzed for VOCs via EPA Method 8260 and one trip blank was submitted each day for VOC analysis. Each temporary well was removed after sampling was completed and the borehole (along with the other 7 attempted locations) filled with cuttings and/or a bentonite hole plug per NYSDEC requirements. The backfilled boreholes were covered with asphalt patch. Purge water generated from this sampling event was discharged to a carbon bucket prior to release on site. Results of this work were submitted under separate cover to the NYSDEC and NYSDOH.

During this sampling event, the only constituent of concern detected on the former Carol Cleaners Site (north of Platinum Avenue) at a concentration above New York Groundwater Quality Standards (GWQS) was Vinyl Chloride. It was identified in MW-3 and MW-8 at concentrations of 3.0 ug/l and 2.2 ug/l, respectively, which is above the GWQS of 2.0 ug/l for this constituent.

The highest concentration of vinyl chloride was identified in MW-19 just south of Platinum Avenue, at a concentration of 16.1 ug/l. MW-19 also exceeded the GWQS of 5.0 ug/l for cis-1,2-Dichloroethene with a result of 27.8 ug/l. There were no additional exceedances of the GWQS for VOCs in samples obtained from existing monitoring wells.

Tetrachloroethene, Trichloroethene and cis-1,2-Dichloroethene were each detected in two of the three temporary wells (TW-9 and TW-1) at concentrations above the GWQS of 5 ug/l for these constituents, with the exception of TCE at TW-9. No chlorinated constituents were detected in temporary well TW-7, which is located closest to the former Corniche Dry Cleaners on the Pergament Mall property.

Well Location	PCE	TCE	Cis-1,2-DCE
TW-1	23.3	7.6	12.7
TW-9	7.5	3.7	13.7

Results provided in ug/l

5.2 CONTAMINATION REMAINING AT THE SITE

5.2.1 Soil

Based on analytical results for eighty-nine soil samples collected on and off-site between 2002 and 2011 near the suspected “source area”, only one exceedance of the NYSDEC SCOs was encountered for PCE and related CVOCs (Soil Boring B-1).

In June 2017, eighteen (18) soil borings (SWB-1 through SWB-18) were advanced using a Geoprobe® rig at locations intended to assess the potential for CVOC-impacts to soil from on-site subsurface utility routes, specifically storm water lines, and as such were advanced in the parking areas on the eastern and southern sides of The Crossings Mall building proximal to storm drain catch basins (Figure 5).

The analytical results for the respective soil samples did not indicate the occurrence of any of the CVOCs of interest at concentrations in exceedance of the respective NYSDEC Restricted Use Commercial SCOs.

The extent and degree of PCE-impacted soil at the site is minimal, localized, and does not appear to be acting as a continuing source of groundwater impacts. The soil in the corresponding area is effectively capped, as the entire property is covered by asphalt, concrete, and the footprint of the mall building. As such, this FER assumes the use of this cap to address the impacted soil is an appropriate Institutional Control (IC) for the Site.

5.2.2 Groundwater

The source of PCE and related CVOC contamination at the site appears to be related to a historic point source discharge event associated with activities at the former Carol Cleaners tenant space. Based on historical distribution of PCE and related breakdown products (TCE, cis-1,2-DCE, and VC) in groundwater, the corresponding plume generally followed the local direction of groundwater flow, which is southwesterly from the site towards Platinum Avenue.

A summary of historical CVOC-impacted groundwater sampling results is provided in Table 2. Figure 6 depicts the extent of the PCE plume in July 2017, which represents pre-injection conditions. More recent post-injection groundwater sampling results show that PCE and TCE have been remediated to below their respective GQSs on site as shown in the most recent groundwater sampling data from the post-injection quarterly sampling rounds conducted between January 2019 and Sept 2021 (Figures 7A & 7B). The remaining CVOC concentrations are associated with daughter break-down constituents, mainly cis-1,2-DCE and vinyl chloride. Figures 7A and 7B show the most recent CVOC distribution in the monitoring wells that are part of the injection monitoring program. Table 2 summarizes the historical CVOC impacted groundwater concentrations over time. Table 3 summarizes the anaerobic bioremediation indicator parameters over time. The data in this table confirm the decrease in PCE and TCE concentrations on site, the increase and subsequent decrease in break-down constituent concentrations at the various monitoring wells that are part of the monitoring program.

Water samples previously collected from the eastern and southern portions of the on-site storm drain catch basin system indicated the presence of PCE and related CVOCs at concentrations above their respective GQSs. In response to the detection of PCE in the standing water samples collected from the stormwater system, and in

connection with the Interim Site Management Plan (Interim SMP) activities identified for the Site, stormwater system cleaning activities were initiated in November 2016. The cleaning activities involved the removal of sediment from each of the accessible catch basins associated with the on-site stormwater system. Impacted sediment and standing water was identified and removed from the system. Approximately two to three feet of sediment was encountered at each of the accessed catch basins. Subsequent stormwater system investigation activities included the installation of three monitoring wells along the eastern side of The Crossings building proximal to the most impacted catch basins. These monitoring wells did not exhibit CVOC-impacts in groundwater in this area of the Site.

5.2.3 Soil Vapor

CVOC impacted groundwater, proximal to the Carol Cleaners, acted as a source for CVOCs in the soil vapor (the air spaces between particles) in the unsaturated (vadose) zone beneath the building slab. Through pressure differences between the indoor building space and the unsaturated zone, the PCE and related CVOC vapors are able to migrate through preferential pathways such as cracks and foundation holes into indoor air. The analytical results for indoor air and sub-slab air samples collected at the mall building in 2006 and 2008 indicated that VOCs were present at concentrations above NYSDOH Air Matrix guidance values, indicating the potential need for reducing exposure to PCE and TCE at the breathing level. Historical analytical results for indoor air and sub-slab air samples are provided in Appendix I.

A sub-slab depressurization (SSD) system was installed at the Crossings between March and April 2014. The SSD system became operational in April 2014. Indoor air sampling following start-up of the system indicated that the Carvel tenant space required additional action. As a result, the SSD system was modified in February 2015 to include installation and connection to a new suction point in the Carvel tenant space. Indoor air sampling following installation of the additional suction point indicated compliance with the respective NYSDOH Air Matrix Guidelines.

The SSD system was shut down on May 5, 2022 in preparation for subsequent indoor air and sub-slab vapor sampling, and due to damage suffered during building renovation activities. Indoor air and sub-slab vapor sampling were performed during June 2022, and the results of this work indicated that chlorinated VOCs were detected in several sub-slab and indoor air sampling locations; however, detected compounds were not identified at concentrations above “No Further Action” guidance values within Air Matrices A, B and C. The SSD system was repaired on August 18, 2022, and fan inspections conducted since that time indicate the system is operating as intended. Two additional indoor air/sub-slab vapor sampling events are planned for the 2023 to confirm the efficacy of the existing SSD system.

6.0 ENGINEERING CONTROLS

6.1 COVER (OR CAP)

Exposure to remaining contamination at the site is prevented by a cover system placed over the site. This cover system is comprised of existing asphalt-covered roads and parking lot, concrete-covered sidewalks, and concrete building slabs.

Based on analytical results for soil samples collected on and off-site near the suspected “source area”, only one soil sample exhibited an exceedance of the NYSDEC SCOs for PCE of 1.4 milligram per kilogram (mg/kg) at Soil Boring B-1 with a concentration of 2.05 mg/kg at a depth of approximately 6 feet below grade.

Most of the Site is covered with buildings and asphalt paving. In order to prevent exposure to any residual soil contamination, the EC for this Site is the existing buildings and pavement.

Figure 8 presents the location of the cover system and applicable demarcation layers.

6.2 SUB-SLAB DEPRESSURIZATION SYSTEM

The SSD system was permitted by the New York City Department of Buildings (NYCDOB) on February 19, 2014. The SSD system began operating in April 2014 and was supplemented with the incorporation of a new suction point at the Carvel tenant space in February 2015. Currently, the SSD system uses three suction points in the former Carol Cleaners space, three suction points in the former baby supply retail store (Babies R Us), and one suction point in the ice cream store (Carvel), all of which occupy the southern end of The Crossings building which parallels Platinum Avenue. The associated blowers (fans) are located on the roof of the building and the vacuum gages are located on the building’s southern wall which faces Platinum Avenue.

Procedures for operating and maintaining the SSD system are documented in the Operation and Maintenance Plan in the Site Management Plan. An as-built drawing of the SSDS prepared by Leggett, Brashears & Graham, Inc. is included in Appendix D. Figure 8 shows the location of the ECs for the site. The SSDS will remain in-place and operational until permission to discontinue its use is granted in writing by the NYSDEC project manager in consultation with the NYSDOH project manager.

6.3 MONITORED NATURAL ATTENUATION

In-situ lactate injections have been conducted to address impacted groundwater at the site as detailed in the Full-Scale Remedial Design Workplan submitted to the NYSDEC in May 2016 and approved by the NYSDEC on June 29, 2016. The USEPA Underground Injection Control (UIC) Authorization-By-Rule issued in connection with the full-scale treatment effort is included as Appendix G.

The sodium lactate injections have had the desired effect of stimulating accelerated monitored natural attenuation (MNA). Most of the CVOC concentrations observed in the sampling data from the site monitoring well network is either non-detect or below the applicable NYSDEC groundwater standards. Should additional injection treatments be required to address CVOC exceedances, up to 2,200 gallons of sodium lactate solution may be injected into the selected injection wells identified within Section 2.3 to aid in the continued reductive dichlorination of impacted groundwater. This portion of the site is located in a non-groundwater use area. Accelerating MNA and monitoring groundwater constituent concentrations has been selected as the appropriate remedy to protect human health at this site.

6.4 STORM WATER SYSTEM MANAGEMENT

In 2016, accumulated sediment and associated CVOC-impacted material were removed from the storm water system. As part of the operations and maintenance of the site under the SMP, the stormwater system was monitored for accumulation of sediment by conducting visual inspections at the catch basins located between monitoring wells MW-6R and MW-20. If excessive sediment accumulation is observed, the storm drain basins will be cleared of accumulated sediment and debris.

6.5 CRITERIA FOR COMPLETION OF REMEDIATION/ TERMINATION OF REMEDIAL SYSTEMS

Generally, remedial processes are considered completed when monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.4 of NYSDEC DER-10. Unless waived by the NYSDEC, confirmation samples of applicable environmental media are required before terminating any remedial actions at the site. Confirmation samples require Category B deliverables and a Data Usability Summary Report (DUSR).

As discussed below, the NYSDEC may approve termination of a groundwater monitoring program. When a remedial party receives this approval, the remedial party will decommission all site-related monitoring, injection and recovery wells per NYSDEC CP-43 policy.

The remedial party will also conduct any needed site restoration activities, such as asphalt patching and decommissioning treatment system equipment. In addition, the remedial party will conduct any necessary restoration of vegetation coverage, trees and wetlands, and will comply with NYSDEC and United States Army Corps of Engineers regulations and guidance. Also, the remedial party will ensure that no ongoing erosion is occurring on the site.

6.5.1 Cover

The cover system (or cap) is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in accordance with the SMP.

6.5.2 Sub-Slab Depressurization (SSD) System

The active SSD system will not be discontinued unless prior written approval is granted by the NYSDEC and NYSDOH.

Based on the lack of CVOC-impacted soil and the observed decrease in CVOC concentrations in groundwater proximal to the on-site buildings as a result of the recent groundwater bioremediation activities, testing of the sub-slab vapor and indoor air located in the premises that have the active SSD system in use will be conducted to determine the need for on-going operation of the SSD system. This includes shutting down the system for a period of 30 days subsequent to authorization from the NYSDEC and then conducting the testing by having sub-slab and indoor air samples collected from the Carvel, former Carol Cleaners, and former Babies R Us tenant spaces. A total of two heating season sampling events will be conducted, one during the fall (November to December) and one in the winter (January to March).

If monitoring data indicate that the SSD system may no longer be required, a proposal to discontinue the SSD system will be submitted by the remedial party to the NYSDEC and NYSDOH.

6.5.3 Monitoring Wells associated with Monitored Natural Attenuation

Groundwater monitoring activities to assess natural attenuation will continue, as determined by the NYSDEC project manager in consultation with NYSDOH project manager, until residual groundwater concentrations are found to be consistently below GQSs, the site SCGs, or have become asymptotic at an acceptable level over an extended period. In the event that monitoring data indicate that monitoring for natural attenuation may no longer be required (i.e., two consecutive annual sampling rounds that exhibit groundwater sample results at or below the respective NYS TOGs for the CVOCs of concern – PCE, TCE, cis-1,2-DCE and VC), a proposal to discontinue the monitoring will be submitted by the remedial party. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment and/or control measures will be evaluated.

6.5.4 Monitoring Wells associated with Bioremediation

Groundwater monitoring activities to assess Bioremediation will continue, as determined by the NYSDEC and the NYSDOH, until residual groundwater concentrations are found to be consistently below NYS GQSs or the site SCGs or have become asymptotic at an acceptable level over an extended period. If monitoring data indicate that monitoring may no longer be required, a proposal to discontinue the remedy will be submitted by the remedial party. Monitoring will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant levels become asymptotic at a level that is not acceptable to the NYSDEC, additional injections, source removal, treatment and/or control measures will be evaluated.

7.0 INSTITUTIONAL CONTROLS

7.1 GENERAL

Since remaining contamination exists at the site, IC and ECs are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the site. The IC/EC Plan was one component of the SMP and was subject to revision by the NYSDEC project manager. A copy of the approved SMP can be found in Appendix J.

This plan provides:

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

7.2 INSTITUTIONAL CONTROLS

A series of ICs is required by the ROD to: (1) implement, maintain and monitor Engineering Control systems; (2) prevent future exposure to remaining contamination; and (3) limit the use and development of the site to commercial and industrial uses only. Adherence to these ICs on the site is required by the Environmental Easement and will be implemented under the SMP. ICs identified in the Environmental Easement may not be discontinued without an amendment to or extinguishment of the Environmental Easement. The IC boundaries are shown on Figure 8. These ICs are:

- The Controlled Area (property, specifically a portion thereof) may be used for commercial and industrial use.
- All ECs must be operated and maintained as specified in this SMP.
- All ECs must be inspected at a frequency and in a manner defined in this SMP.
- The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the NYSDOH or the Richmond 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;
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP.
- Data and information pertinent to site management of the Controlled Area must be reported at the frequency and in a manner as defined in this SMP.
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP.
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP.

- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP.
- 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 the Environmental Easement.
- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on Figure 8, and any potential impacts that are identified must be monitored or mitigated;
- Vegetable gardens and farming on the site are prohibited; and
- An evaluation shall be performed to determine the need for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible.

8.0 REFERENCES

6 NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.

NYSDEC DER-10 – “Technical Guidance for Site Investigation and Remediation”.

NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).

TABLES

TABLE 1

CAROL CLEANERS - THE CROSSINGS
GGP STATEN ISLAND MALL, LLC.
STATEN ISLAND, NEW YORK

Summary of Monitoring Well Construction and Groundwater Elevation Data - September 28, 2021

Well ID[1]	Date Completed	Injection Zone[1]	Total Depth (ft bg) [2]	Depth to Bedrock (ft bg)	Flush-Mount Rim Elevation (ft amsl) [3]	Top of PVC Elevation (ft amsl)	Screen Setting Interval (ft bg)	Depth to Water (ft bg)	Groundwater Elevation (ft amsl)
MW-1	7/26/1995	---	13.5	13.5	44.58	44.28	8.5-13.5	---	#VALUE!
MW-2	7/26/1995	---	12.0	12.0	37.97	37.74	7.0-12.0	7.77	29.97
MW-3	**7/28/1995**	**Zone 1**	**14.8**	**13.0**	**32.59**	**32.12**	**9.8-14.8**	**6.55**	**25.57**
MW-3D[4]	5/26/2006	---	43.5	25.0	32.85	32.46	35.5-43.5	---	#VALUE!
MW-4	7/27/1995	---	14.6	17.0	33.02	32.68	9.6-14.6	7.90	24.78
MW-5	**7/27/1995**	**Zone 1**	**14.0**	**14.0**	**31.98**	**31.60**	**9.0-14.0**	**8.05**	**23.55**
MW-6R[5]	9/23/2002	---	15.0	13.0	35.16	34.85	10.0-15.0	7.12	27.73
MW-7	**9/24/2002**	**Zone 2**	**15.0**	**13.0**	**32.35**	**32.05**	**10.0-15.0**	**7.46**	**24.59**
MW-8	9/24/2002	---	15.0	13.0	31.86	31.31	10.0-15.0	8.05	23.26
MW-9[6]	10/31/2002	---	16.0	15.0	31.30	31.06	11.0-16.0	---	---
MW-10	5/26/2006	---	20.0	19.0	34.53	34.21	15.0-20.0	7.81	26.40
MW-11	3/12/2008	---	17.0	16.0	31.19	30.71	12.0-17.0	NC	#VALUE!
MW-12	3/11/2008	---	18.0	17.0	32.13	31.77	13.0-18.0	NC	#VALUE!
MW-13	3/11/2008	---	18.0	17.0	33.81	33.38	13.0-18.0	NC	#VALUE!
MW-14	3/11/2008	---	17.0	16.0	32.23	31.67	12.0-17.0	---	#VALUE!
MW-15	3/12/2008	---	17.0	16.2	36.97	36.51	12.0-17.0	---	#VALUE!
MW-16[4]	**7/22/2011**	**Zone 3**	**28.0**	**28.0**	**29.72**	**29.46**	**23.0-28.0**	**8.72**	**20.74**
MW-17[4]	**7/22/2011**	**Zone 3**	**26.0**	**26.0**	**30.47**	**30.05**	**21.0-26.0**	**9.13**	**20.92**
MW-18[4]	**7/22/2011**	**Zone 3**	**20.5**	**20.5**	**31.05**	**30.67**	**15.5-20.5**	**9.29**	**21.38**
MW-19[4]	**7/22/2011**	**Zone 3**	**20.5**	**20.5**	**32.37**	**31.82**	**15.5-20.5**	**10.27**	**21.55**
MW-20	**8/26/2016**	**Zone 2**	**25.5**	**25.5**	**29.79**	**29.53**	**20.5-25.5**	**8.33**	**21.20**
MW-21	**8/24/2016**	**Zone 2**	**17.0**	**17.0**	**30.48**	**30.19**	**12.0-17.0**	**8.30**	**21.89**
MW-22	**8/24/2016**	**Zone 2**	**14.5**	**14.5**	**31.65**	**31.31**	**9.5-14.5**	**8.15**	**23.16**
MW-23	**8/25/2016**	**Zone 2**	**10.0**	**10.0**	**33.43**	**33.05**	**5.0-10.0**	**5.73**	**27.32**
MW-24	**8/25/2017**	**Zone 2**	**11.0**	**11.0**	**33.90**	**33.28**	**6.0-11.0**	**8.64**	**24.64**
MW-25	6/29/2017	---	13.0	13.0	41.87	41.41	8.0-13.0	---	#VALUE!
MW-26	6/28/2017	---	14.0	14.0	39.18	38.77	9.0-14.0	---	#VALUE!
MW-27	6/28/2017	---	10.0	10.0	34.47	34.10	5.0-10.0	NC	#VALUE!
MW-28	6/29/2017	---	22.5	22.5	29.06	28.69	17.5-22.5	---	#VALUE!
MW-29	6/29/2017	---	24.0	24.0	31.57	31.28	19.0-24.0	NC	#VALUE!

NOTES:
Bolded monitoring wells are used for injections.
(1) See Figure 2 for locations. Monitoring wells and proposed injection/monitoring wells completed with 4-inch diameter, Schedule 40 PVC riser and screen, and flush-mount surface casings except where noted.
(2) Feet below ground surface.
(3) Feet above mean sea level.
(4) Constructed with 2-inch diameter, Schedule 40 PVC riser and screen.
(5) Replacement for Monitoring Well MW-6 (installed 7/28/1995).
(6) Monitoring Well MW-9 was abandoned with approval from the NYSDEC on June 7, 2017.

TABLE 2

THE CROSSINGS
GGP STATEN ISLAND MALL, LLC.
STATEN ISLAND, NEW YORK

Summary of Metals Exceedances and Field Parameters for Treatment Zone Monitor Wells - January 2013 Pre-Injection through 2021 - Zone 1 Injection Wells

Well ID[1]	MW-3																MW-5														NYSDEC Class GA Groundwater Standards
Date Sampled	01/30/13	01/20/15	04/07/15	06/30/15	10/07/15	10/05/16	01/10/19	04/18/19	07/18/19	10/24/19	01/29/20	04/21/20	07/07/20	10/20/20	03/18/21	05/27/21	01/30/13	01/20/15	04/09/15	06/30/15	10/07/15	10/06/16	01/09/19	04/18/19	07/18/19	10/29/19	01/28/20	04/21/20	07/07/20	10/23/20	03/19/21	05/27/21	
Constituent																															
Total Metals																															
Aluminum	<100	167	129	<200[4]	<200[4]	<200[4]	10,800 [4]	272	<400 [4]	ND (2000) c	<2000	<2000	225	<1000	<1000	<200	<100	1,310	--	257	3,380	2,220	1,630	<200	<200	1090	805	1310	339	<10000	<2000	<1000	100
Barium	<200	<200	269	316	352	257	<2,000 [4]	<200	<400 [4]	ND (2000) c	<2000	<2000	<200	<1000	<1000	<200	<200	<200	826	314	<200	<200	<200	<200	<200	<200	<1000	<200	<200	<200	<10000	<2000	<1000	1,000
Cobalt	<5.0	<5.0	<5.0	<50[4]	<50[4]	<50[4]	<500 [4]	<50	<100 [4]	ND (500) c	<500	<500	<50	<250	<250	<50	<5.0	5.9	97.8	<50[4]	<50[4]	<50[4]	<50	<50	<50	<250	<50	<50	<50	<2500	<500	<250	5
Iron	307	1,710	2,260	2,780	1,530	540	135,000 [4]	23,600	10,300 [4]	12500 c	9520	9070	7510	5460	16800	896	194	8,190	12,000	4,410	2,530	3,210	6,010	25,500	13,200	7040	12000	7860	14400	39500	33900	41300	300/500[3]
Manganese	155	1,600	7,940	3,660	1,190	429	9,070 [4]	3,010	1,780 [4]	2270 c	1630	1900	1620	1140	593	87.7	<15	11,800	35,700	13,500	2,480	865	813	5,110	4,020	719	1800	958	3000	3340	4100	7200	300/500[3]
Nickel	13.9	<10	<10	<10	<10	<10	613 [4]	15	24.4 [4]	ND (100) c	<100	<100	34.4	<50	<50	<10	<10	14.3	100	20.9	47.1	28	16.7	<10	<10	<50	<10	11.2	<10	<500	<100	<50	100
Sodium	133,000	150,000	217,000	169,000	210,000	191,000	7,570,000 [4]	535,000	276,000 [4]	454000 c	397000	567000	639000	526000	211000	38300	177,000	280,000	2,420,000	1,430,000	494,000	379,000	368,000	658,000	586,000	406000	289000	251000	282000	3880000	1990000	1680000	20,000
Dissolved Metals																															
Aluminum	<100	<100	<100	<200[4]	<200[4]	<200[4]	9,410 [4]	<200	<200	ND (2000) c	<2000	<1000	<200	<200	<1000	<200	<100	<100	<200[4]	<200[4]	1,250	521	205	<200	<200	<1000	<200	<200	<200	<1000	<2000	<2000	100
Barium	<200	<200	247	285	325	223	<2,000 [4]	<200	<200	ND (2000) c	<2000	<1000	<200	<200	<1000	<200	<200	<200	802	311	<200	<200	<200	<200	<200	<1000	<200	<200	<200	<1000	<2000	<2000	1,000
Cobalt	<5.0	<5.0	<5.0	<50[4]	<50[4]	<50[4]	<500 [4]	<50	<50	ND (500) c	<500	<250	<50	<50	<250	<50	<5.0	6	106	<50[4]	<50[4]	<50[4]	<50	<50	<50	<250	<50	<50	<50	<250	<500	<500	5
Iron	<100	<100	<100	<100	<100	<100	117,000 [4]	14,700	6,480	7730 c	3210	2720	1970	2780	1380	120	<100	1,350	4,290	229	1,050	978	3,490	<100	418	5660	981	917	242	35400	20300	8710	300/500[3]
Manganese	<15	1,470	7,420	3,700	1,390	491	7,700 [4]	3,450	1,680	2030 c	1360	1040	1330	703	283	18.1	<15	13,600	35,000	13,500	2,350	662	796	4,810	3,970	653	1580	815	2360	2990	3330	6820	300/500[3]
Nickel	<10	<10	<10	<10	<10	<10	545 [4]	13.6	17.2	ND (100) c	<100	<50	25.6	24.6	<50	<10	<10	14.2	134	19.4	59	18.4	12.4	<10	<10	<50	<10	<10	<10	88.5	<100	<100	100
Sodium	138,000	143,000	208,000	160,000	193,000	180,000	7,000,000 [4]	615,000	359,000	443000 c	386000	317000	588000	360000	274000	21200	172,000	325,000	2,390,000	1,430,000	518,000	380,000	397,000	652,000	620,000	389000	276000	200000	282000	4120000	1870000	1700000	20,000
Nitrates and Nitrites (mg/L)[5]																															
Nitrogen, Nitrate	1.6	<0.11	<0.11	<0.11	0.15	-	0.23	<0.15	<0.11	290 h	0.31	0.25	<0.15	<10	<0.11	0.24	1.3	<0.11	0.13	<0.11	1.5	-	<0.11	<0.11	<0.11	0.15	<0.11	<0.11	<0.11	<3	26.9	<0.11	10 (total)
Nitrogen, Nitrate + Nitrite	1.6	<0.10	<0.10	0.1	0.15	-	0.23	<0.10	<0.10	290	0.31	0.26	0.11	<0.1	<0.1	0.28	1.3	<0.10	0.31	<0.10	1.5	-	<0.10	<0.10	<0.10	0.15	0.16	<0.1	<0.1	<2	26.9	<0.1	
Nitrogen, Nitrite	<0.010	<0.010	<0.010	<0.010	<0.002	-	<0.010	<0.050	<0.010	ND (100)	<0.01	0.01	0.055	10	<0.01	0.04	<0.010	<0.010	0.18	<0.010	<0.002	-	<0.01	<0.010	<0.010	<0.05	0.06	<0.01	<0.01	<1	<1	<0.01	
Field Parameters																															
pH (s.u.)[6]	8.18	8.37	6.94	7.71	8.39	8.37	6.68	6.63	7.8	7.18	7.29	7.32	7.44	6.84	6.18	8.37	6.38	7.86	7.47	7.22	6.57	7.05	6.94	6.99	8.95	6.4	6.89	7.03	6.74	6.43	7.04	7.05	6.5 - 8.5
Specific Conductivity (mS/cm)[7]	1.27	1.35	2.1	1.67	1.91	1.5	19	2.52	1.76	2.39	2.36	1.56	2.17	1.63	1.36	1.5	0.559	1.53	0.76	7.76	2.44	2.27	1.46	3.22	3.1	1.69	1.41	1.07	1.39	10.6	2.95	2.27	--
Turbidity (NTU)[8]	15.9	24	11.11	6.9	2.5	5.4	709	44	57.7	51.6	50.5	14.5	14.3	10.3	3.1	5.4	28.4	10	1	16.9	4.1	36.7	19.8	20.7	10.15	83.2	51.5	30.8	4.4	428	320	367	5
Dissolved Oxygen (mg/L)	1.66	0.51	10.31	6.11	0.33	6.9	4.48	0.95	1.65	0	7.48	4.45	0	0.68	7.72	6.9	4.2	3.79	3.71	0.98	0.97	0	4.52	0.5	1.61	0	9.79	2.75	0	0.49	4.85	0	--
Temperature (°C)[9]	16.18	14.74	14.26	19.33	23.45	23.39	13.23	13.76	22.59	22.58	13.74	15.25	20.04	21.6	23.24	23.39	12.96	12.05	10.58	19.2	21.39	23.9	13.39	12.05	22.75	21.87	11.32	13.65	19.95	21.04	25.83	23.9	--
REDOX (mV)[10]	157	-42	-199	-231	-60	-37	-236	-53	-112	-62	-86	-101	-148	-114	-112	-37	199	-9	-26	-130	105	168	-92	-80	-105	-35	-83	-82	-78	-122	-145	-168	--

NOTES:

[1] See Figure 2.

[2] All concentrations are presented in micrograms per liter (ug/L) unless otherwise specified. Bold and red values indicate the concentrations which exceed the respective NYSDEC Groundwater Standards.

[3] The groundwater standard for beryllium is 11 ug/L when hardness is less than 75 ppm (mg/L) and 1,100 ug/L when hardness is greater than 75 ppm (mg/L).

[3] The individual groundwater standard for iron and manganese is 300 ug/L and the total groundwater standard for iron and manganese concentrations combined is 500 ug/L.

[4] The detection limit is raised due to dilution required for possible matrix interference.

[5] There is no Class A groundwater standard for this constituent.

[5] Milligrams per liter (mg/L).

[6] Standard units (s.u.).

[7] Microsiemens per centimeter (mS/cm).

[8] Nephelometric turbidity units (NTU).

[9] Degrees Celcius (°C).

[10] Millivolts (mV).

TABLE 2

THE CROSSINGS
GGP STATEN ISLAND MALL, LLC.
STATEN ISLAND, NEW YORK

Summary of Metals Exceedances and Field Parameters for Treatment Zone Monitor Wells - January 2013 Pre-Injection through 2020 - Zone 2 Injection Wells

Well ID[1]	MW-7													MW-20												MW-21												MW-22				MW-23				MW-24								NYSDEC Class GA Groundwater Standards
Date Sampled	01/30/13	10/07/15	10/06/16	01/09/19	04/17/19	07/18/19	10/25/19	01/28/20	04/21/20	07/07/20	10/23/20	03/17/21	05/26/21	10/04/16	01/08/19	04/17/19	07/23/19	10/29/19	01/28/20	04/21/20	07/08/20	10/20/20	03/16/21	05/26/21	10/06/16	01/09/19	04/17/19	07/23/19	10/29/19	01/28/20	04/21/20	07/08/20	10/20/20	03/17/21	05/26/21	10/06/16	01/09/19	03/17/21	05/26/21	10/05/16	01/08/19	03/18/21	05/28/21	10/05/16	01/08/19	04/17/19	07/18/19	10/25/19	01/29/20	04/21/20	07/07/20	10/20/20	03/18/21	05/28/21	
Constituent																																																				
Total Metals																																																				
Aluminum	<100	<200 [4]	<200	**16,800** [4]	**2,330** [4]	**<2,000** [4]	<10000	<2000	<2000	<200	<2000	<1000	<2000	<200	<2,000 [4]	**432** [4]	<400	<200	<10000	<2000	<2000	<2000	<200	<200	<200	**1,620**	**344**	**247**	94500	23300	19400	12500	11700	870	409	<200	5,800 [4]	<1000	<200	**1,090**	<2,000 [4]	<200	<200	**1,580**	<200	**1,780**	**8,400**	9050	1590	372	6660	1880	740	795	**100**
Barium	203	<200	<200	<2,000 [4]	<1,000 [4]	<2,000 [4]	<10000	<2000	<2000	<200	<2000	<1000	<2000	551	<2,000 [4]	780 [4]	784	479	<10000	<2000	<2000	<2000	<200	479	320	<200	<200	<200	<10000	<10000	<2000	<2000	<2000	<200	722	246	<2,000 [4]	269	338	275	<200	<200	<200	<400	<200	<200	<200	<200	<200	<200	<200	<200	**1,000**
Cobalt	<5.0	<50	<50	<500 [4]	<250 [4]	<500 [4]	<2500	<500	<500	<50	<500	<250	<500	<50	<500 [4]	<100	<100	<50	<2500	<500	<500	<500	<50	<50	<50	<50	<50	<50	<2500	<500	<500	<500	<500	<50	<50	<50	<500 [4]	<250	<50	<50	<50	<50	<50	<100	<50	<50	<50	<50	<50	<50	<50	<50	**5**
Iron	286	208	**264**	**215,000** [4]	**161,000** [4]	**54,100** [4]	26600	16900	11500	9660	14100	27200	10500	<100	**47,000** [4]	**52,900** [4]	43,700	1040	53400	30800	18000	9320	3380	1040	<100	**9,770**	**3,330**	**5,820**	75700	36500	33000	36000	23600	7200	531	179	**545,000** [4]	24800	27500	**1,460**	**41,800** [4]	1830	899	**6,030**	**548**	**2,440**	**4,930**	5560	1250	394	5090	1390	922	699	**300/500**[9]
Manganese	<15	<15	<15	**10,400** [4]	**14,100** [4]	**5,990** [4]	3320	2270	1180	1720	712	825	<150	204	**14,700** [4]	**10,600** [4]	9,460	262	3110	2270	2080	925	536	262	288	**565**	**388**	**1,190**	9270	4830	4660	4890	2680	1110	35.1	**635**	**56,100** [4]	6030	9040	238	**13,800** [4]	1180	1120	147	**518**	**330**	**147**	193	46	33.4	176	57.9	46.6	24.6	**300/500**[9]
Nickel	<10	<10	<10	**609** [4]	**913** [4]	**362** [4]	<500	156	<100	31.7	<100	151	197	<10	**280** [4]	**200** [4]	113	<10	<500	183	<100	<100	<10	<10	<10	17	<10	<10	<500	<500	<100	<100	<50	10.7	<10	<10	**907** [4]	<50	<10	25	**921** [4]	<10	<10	258	39.2	31.6	**32.1**	37.6	<10	<10	40.9	19.3	<10	11.1	**100**
Sodium	**167,000**	**164,000**	**186,000**	**10,900,000**	**4,840,000**	**1,850,000** [4]	1360000	1290000	567000	385000	708000	3680000	3710000	**238,000**	**1,320,000** [4]	**1,060,000**	1,050,000	394000	2360000	1920000	1380000	740000	229000	394000	**225,000**	**93,100**	**582,000**	**130,000**	4950000	1870000	1530000	1270000	707000	892000	36300	**259,000**	**7,580,000**	5390000	4560000	**120,000**	**1,260,000**	141000	156000	**193,000**	**158,000**	**299,000**	**95,200**	156000	3180000	107000	79100	93700	408000	186000	**20,000**
Dissolved Metals																																																				
Aluminum	<100	<200	<200	**15,500** [4]	<400 [4]	<400 [4]	<10000	<2000	<1000	<1000	<200	<1000	<2000	<200	<2,000 [4]	<400 [4]	<200	<200	<2000	<1000	<2000	<1000	<200	<200	<200	<200	<200	<200	<10000	<2000	<1000	<2000	<200	<200	<200	<200	4,380 [4]	<1000	<200	<200	<2,000 [4]	<200	<200	<200	<200	**<200**	<200	<200	<200	<200	<200	<200	<200	**100**
Barium	<200	<200	<200	<2,000 [4]	<400 [4]	<400 [4]	<10000	<2000	<1000	<1000	<200	<1000	<2000	536	<2,000 [4]	<400 [4]	347	453	<2000	<1000	<2000	<1000	<200	453	311	<200	<200	<200	<10000	<2000	<1000	<2000	<200	<200	<200	327	<2,000 [4]	<1000	543	231	<2,000 [4]	254	319	252	<200	<200	<200	<200	<200	<200	<200	<200	<200	**1,000**
Cobalt	<5.0	<50	<50	<500 [4]	<129 [4]	<100 [4]	<2500	<500	<250	<50	<250	<500	<500	<50	<500 [4]	<100 [4]	<50	<50	<500	<250	<500	<250	<50	<50	<50	<50	<50	<50	<2500	<500	<250	<500	<50	<50	<50	<50	<500 [4]	<250	<50	<50	<500 [4]	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	**5**
Iron	<100	<100	<100	**215,000** [4]	**97,100** [4]	**25,600** [4]	17100	16400	5070	3450	13000	12300	8910	<100	**40,000** [4]	**6,930** [4]	10,600	110	20400	7680	7000	1780	2450	110	<100	**1,310**	**451**	**1,600**	59600	14200	13100	22600	7770	343	159	<100	**452,000** [4]	1030	1300	<100	**35,300** [4]	<100	<100	<100	<100	**<100**	<100	<100	<100	<100	<100	<100	<100	**300/500**[9]
Manganese	<15	<15	<15	**10,600** [4]	**17,300** [4]	**4,300** [4]	2580	2280	898	1350	657	627	<150	204	**14,100** [4]	**10,800** [4]	9,200	256	2180	1660	1720	1040	519	256	268	**491**	**405**	**1,410**	6920	3600	3600	3930	969	1160	31.7	**581**	**44,300** [4]	5410	8770	172	**13,000** [4]	1260	1110	<15	**495**	<15	**<15**	<15	<15	<15	<15	<15	<15	**300/500**[9]
Nickel	<10	<10	<10	**604** [4]	**563** [4]	**248** [4]	<500	152	74	26.7	59.2	139	181	<10	**262** [4]	**196** [4]	82.9	<10	135	122	<100	54	<10	<10	<10	<10	<10	<10	<500	<100	<50	<100	10.5	10.5	<10	<10	**736** [4]	<50	<10	<10	**857** [4]	<10	<10	<10	32.4	<10	**12.2**	10.4	<10	<10	<10	<10	<10	**100**
Sodium	**164,000**	**167,000**	**178,000**	**10,600,000**	**3,160,000**	**2,100,000** [4]	1220000	1350000	486000	355000	810000	3880000	3580000	**232,000**	**1,270,000** [4]	**1,180,000**	995,000	375000	1630000	1630000	1240000	907000	229000	375000	**221,000**	**90,000**	**634,000**	**131,000**	5840000	1640000	1560000	1090000	266000	913000	36900	**258,000**	**6,230,000**	4980000	4520000	**118,000**	**1,160,000**	149000	155000	**186,000**	**151,000**	**343,000**	**106,000**	156000	3220000	103000	73400	93400	424000	179000	**20,000**
Field Parameters																																																				
pH (s.u.)[10]	8.18	8.55	8.31	6.7	6.61	8.33	7.3	7.13	7.56	7.23	**5.74**	7.09	**6.31**	**8.62**	**6.18**	7.09	**8.02**	6.73	7.26	7.26	7.4	6.98	**6.39**	6.62	**9.31**	6.6	7.02	6.95	6.79	7.19	7.28	7.18	**6.29**	**6.11**	7.35	**8.86**	6.53	7.1	7.06	7.21	**5.47**	**6.3**	7.21	**8.9**	7.69	7.78	8.39	7.66	7.69		7.66	7.04	7.42	7.9	**6.5 - 8.5**
Specific Conductivity (mS/cm)[7]	1.27	1.6	1.95	22.2	9.3	7.49	5.88	5.81	1.53	1.77	2.6	1.46	1.95	3.12	5.15	5.75	5.62	19	7.95	6.71	4.9	3.94	3.1	3.12	2.41	0.745	3.59	0.308	18.6	7.39	5.84	4.97	1.66	2.79	2.41	2.56	20.2	3.33	2.56	1.54	4.77	1.6	1.54	1.89	0.845	1.68	0.856	0.802	1.93		0.802	0.684	1.94	1.89	--
Turbidity (NTU)[8]	**15.9**	6	**18.4**	**830**	**142**	**241**	**156**	**106**	**330**	**30.1**	**114**	**114**	**181**	4.4	**338**	**200**	**184**	**695**	**569**	**314**	**64.8**	**34.5**	**68.1**	4.4	0	**142**	**34.5**	**12.8**	**>999**	**>999**	**>999**	**359**	**448**	**11.4**	0	**11.2**	**372**	**32.4**	**11.2**	**49.6**	**168**	**10.5**	**49.6**	**33.1**	**51.3**	**72.8**	**294**	**371**	**194**		**371**	**247**	0	**33.1**	**5**
Dissolved Oxygen (mg/L)	1.66	0.78	0	3.87	1.83	2.29	0	7.89	4.98	0	0.25	5.63	0	2.3	3.31	1.79	2.31	0	1.9	2.5	2.42	3.25	5.95	2.3	1.29	6.93	10.53	2.94	0	1.75	5.48	0.25	0.79	8.53	1.29	0.83	1.95	5.64	0.83	0	12.36	1.29	0	4.45	11.01	10.69	4.66	7.5	6.85		7.5	5.5	3.46	4.45	--
Temperature (°C)[6]	16.18	23.1	23	14.41	13.74	22.97	23.19	12.34	14.9	20.96	21.84	27.95	23	19.97	12.76	14.59	14.65	21.01	14.62	15.29	18.41	19.89	20.81	19.97	21.48	11.63	13.36	20.3	21.94	12.14	14.92	20.06	21.4	19.73	21.48	23.89	12.57	27.3	23.89	25.22	13.05	24.7	25.22	24.32	12.78	14.47	22.84	22.38	12.18		22.38	21.79	26.55	24.32	--
REDOX (mV)[10]	157	40	243	-243	-88	-179	-143	-102	-125	-136	-21	-173	-24	146	-26	-136	-152	-84	-190	-157	-171	-144	-115	-146	-78	-14	-65	24	-132	-130	-138	-172	-69	-10	-78	85	-193	-133	-85	251	-115	-116	-51	116	-81	197	-43	239	-40		239	97	-99	-116	--

NOTES:
(1) See Figure 2.
(2) All concentrations are presented in micrograms per liter (ug/L) unless otherwise specified. Bold and red values indicate the concentrations which exceed the respective NYSDEC Groundwater Standards.
(3) The groundwater standard for beryllium is 11 ug/L when hardness is less than 75 ppm (mg/L) and 1,100 ug/L when hardness is greater than 75 ppm (mg/L).
(4) The individual groundwater standard for iron and manganese is 300 ug/L and the total groundwater standard for iron and manganese concentrations combined is 500 ug/L.
(4) The detection limit is raised due to dilution required for possible matrix interference.
(5) There is no Class A groundwater standard for this constituent.
(6) Milligrams per liter (mg/L).
(9) Standard units (s.u.).
(7) Microsiemens per centimeter (mS/cm).
(8) Nephelometric turbidity units (NTU).
(9) Degrees Celcius (°C).
(10) Millivolts (mV).

TABLE 2

THE CROSSINGS
GGP STATEN ISLAND MALL, LLC.
STATEN ISLAND, NEW YORK

Summary of Metals Exceedances and Field Parameters for Treatment Zone Monitor Wells - January 2013 Pre-Injection through 2020 - Zone 3 Injection Wells

Well ID[1]	MW-9						MW-11						MW-12												MW-13												
Date Sampled	01/29/13	01/21/15	04/07/15	06/29/15	10/06/15	10/04/16	01/29/13	01/21/15	04/06/15	06/29/15	10/06/15	10/10/2016	01/29/13	01/20/15	04/06/15	06/29/15	10/06/15	10/10/2016	4/17/2019	7/23/2019	10/28/2019	1/30/2020	4/22/2020	7/9/2020	10/20/2020	01/29/13	01/19/15	04/06/15	06/29/15	10/06/15	10/04/16	04/17/19	07/23/19	10/28/19	01/29/20	04/22/20	07/09/20	10/20/20	NYSDEC Class GA Groundwater Standards
Constituent																																					
Total Metals																																					
Aluminum	675	1,830	1,410	1,220	886	NS	1,310	371	3,520	219	487	869	899	593	435	<200	2,620	210	<200	<200	<10000	<10000	<2000	<2000	<2000	528	<100	207	<200	<200	NS	213	8760					409	**100**
Barium	<200	311	207	<200	<200	NS	<200	201	231	238	284	233	<200	<200	212	365	263	254	294	281	<10000	<10000	<2000	<2000	<2000	<200	<200	217	299	252	NS	<200	534					211	**1000**
Cobalt	<5.0	<250	<5.0	<50	<50	NS	<5.0	<50	<5.0	<50	<50	<50	<5.0	<5.0	<5.0	<50	<50	<50	<50	<50	<2500	<2500	<500	<500	<500	<5.0	<5.0	<5.0	<50	<50	NS	<50	<50					<50	**5**
Iron	6,910	18,600	7,240	5,740	4,500	NS	2,010	522	6,610	272	644	1,760	1,680	1,590	1,960	2,180	6,440	2,400	8,160	4,400	240000	123000	102000	50300	31600	1,270	206	677	889	1,930	NS	14,800	47,300					7790	**300/500[3]**
Manganese	624	1,210	733	724	438	NS	928	139	1,770	542	579	872	1,680	2,630	3,360	4,240	3,450	3,150	4,200	2,660	27900	13500	17100	7730	5460	356	116	745	2,330	2,170	NS	10,400	12,600					2360	**300/500[3]**
Nickel	<10	<50	12	<10	<10	NS	62	11.4	100	23.8	28.9	40.7	15	10	23	<10	29	<10	<10	<10	540	<500	<100	<100	<100	29.9	<10	20.1	12	19	NS	17.5	345.0					20.2	**100**
Sodium	398,000	2,210,000	587,000	118,000	85,900	NS	157,000	224,000	209,000	251,000	330,000	282,000	248,000	261,000	314,000	394,000	355,000	328,000	440,000	462,000	5490000	1700000	1380000	1150000	1270000	334,000	289,000	323,000	405,000	212,000	NS	516,000	553,000					267000	**20,000**
Dissolved Metals																																					
Aluminum	<100	--	--	--	<200	NS	<100	--	--	--	<200	<200	140	--	--	--	<200	<200	<200	<200	<10000	<2000	<1000	<200	<200	146	--	--	--	<200	NS	<200	<200					<200	**100**
Barium	<200	--	--	--	<200	NS	<200	--	--	--	267	238	<200	--	--	--	266	247	249	256	<10000	<2000	<1000	237	<200	<200	--	--	--	235	NS	<200	211					<200	**1000**
Cobalt	<5.0	--	--	--	<50	NS	<5.0	--	--	--	<50	<50	<5.0	--	--	--	<50	<50	<50	<50	<2500	<500	<250	<50	<50	<5.0	--	--	--	<50	NS	<50	<50					<50	**5**
Iron	<100	--	--	--	241	NS	<100	--	--	--	<100	<100	158	--	--	--	122	<100	157	<100	224000	96400	59900	32200	1560	<100	--	--	--	<100	NS	8,220	212					<100	**300/500[3]**
Manganese	419	--	--	--	475	NS	<15	--	--	--	377	271	1,540	--	--	--	3,470	3,150	3,700	2,470	26200	13400	15000	7010	4780	<15	--	--	--	1,830	NS	11,600	10,000					1890	**300/500[3]**
Nickel	<10	NA	NA	NA	<10	NS	<10	NA	NA	NA	17.2	16.8	<10	NA	NA	NA	<10	<10	<10	<10	<500	122	84	46.9	35.9	<10	NA	NA	NA	<10	NS	13.2	10					<10	**100**
Sodium	423,000	NA	NA	NA	92,400	NS	180,000	NA	NA	NA	312,000	321,000	269,000	NA	NA	NA	373,000	327,000	427,000	460,000	5170000	1370000	1490000	1200000	1330000	386,000	NA	NA	NA	216,000	NS	563,000	496,000					258000	**20000**
Field Parameters																																					
pH (s.u.)[6]	7.29	7.62	9.72	6.22	7.23	NS	7.29	8.15	8.15	7.28	6.7	8.52	7	8.72	6.7	6.85	7.24	7.93	7.43	7.9	6.49	6.5	6.8	6.95	6.76	7.41	9.11	6.74	6.85	7.21	NS	7.22	7.95	7.1	7.28	7.14	7.52	7.18	**6.5 - 8.5**
Specific Conductivity (mS/cm)[7]	3.38	14.8	5.65	0.77	0.301	NS	0.828	2.07	2.07	2.38	2.64	2.55	2.51	3.08	3.57	3.94	3.38	3.05	3.71	3.38	15.4	7.25	6.78	6.36	6.7	3.01	2.47	3.15	3.73	2.1	NS	4.4	3.26	3.92	7.56	3.37	2.06	1.46	--
Turbidity (NTU)[8]	74.4	77	41	199	145	NS	83.6	4	4	8.7	4	73.9	72.9	0	0.4	3.92	65	9.7	64.4	49.6	503	172	167	41.1	41	26.1	0	0	5.5	0.2	NS	72.6	49.6	38.4	127	73.6	29.3	35	**5**
Dissolved Oxygen (mg/L)	2.27	0	0	2.05	0.31	NS	9.26	1.9	1.9	8.13	1.83	4.22	0	4.54	4.49	3.48	0.13	1.34	1.06	2.7	0	9.55	3.63	0	1.44	6.07	0.52	10.57	7.25	7.3	NS	1.13	2.7	6.34	0.53	2.78	4.87	3	--
Temperature (°C)[9]	13.25	11.88	13.21	19.26	25.67	NS	13.15	11.36	11.36	18.42	21.12	21.25	12.57	11.64	11.66	17.94	22.29	23.04	13.07	21.41	21.35	10.82	13.81	20.65	21.38	11.91	11.96	10.97	18.41	20.74	NS	13.27	21.41	20.76	11.64	11.81	20.81	20.5	--
REDOX (mV)[10]	81	136	-94	3	-21	NS	156	87	87	145	186	132	11	45	-22	-71	-60	-13	-79	-109	-90	-78	-113	-148	-129	157	60	85	-15	-9	NS	-99	-109	-55	-25	-90	-96	-68	--

NOTES:

[1] See Figure 2.

[2] All concentrations are presented in micrograms per liter (ug/L) unless otherwise specified. Bold and red values indicate the concentrations which exceed the respective NYSDEC Groundwater Standards.

[3] The individual groundwater standard for iron and manganese is 300 ug/L and the total groundwater standard for iron and manganese concentrations combined is 500 ug/L.

[4] The detection limit is raised due to dilution required for possible matrix interference.

[5] Milligrams per liter (mg/L).

[6] Standard units (s.u.).

[7] Microsiemens per centimeter (mS/cm).

[8] Nephelometric turbidity units (NTU).

[9] Degrees Celcius (°C).

[10] Millivolts (mV).

TABLE 2

THE CROSSINGS
GGP STATEN ISLAND MALL, LLC.
STATEN ISLAND, NEW YORK

Summary of Metals Exceedances and Field Parameters for Treatment Zone Monitor Wells - January 2013 Pre-Injection through 2020 - Monitor Wells within Treatment Area

Well ID[1]	MW-3D																MW-4												MW-8												NYSDEC Class GA Groundwater Standards
Date Sampled	**02/01/13**	**01/20/15**	**04/07/15**	**06/30/15**	**10/07/15**	**10/05/16**	**01/10/19**	**04/18/19**	**07/18/19**	**10/25/19**	**01/29/20**	**04/21/20**	**07/07/20**	**10/20/20**	**03/18/21**	**05/27/21**	**01/30/13**	**01/20/15**	**04/07/15**	**06/30/15**	**10/07/15**	**10/05/16**	**01/08/19**	**04/18/19**	**07/18/19**	**10/29/19**	**01/28/20**	**04/21/20**	**07/07/20**	**10/23/20**	**03/19/21**	**05/27/21**	**01/30/13**	**10/07/15**	**10/06/16**	**01/08/19**	**04/17/19**	**07/18/19**	**10/29/19**	**01/28/20**	**04/21/20**	**07/07/20**	**10/23/20**	**03/17/21**	**05/26/21**	
Constituent																																									
Total Metals																																									
Aluminum	<100	<100	<100	<200[4]	<200[4]	<200	<200	<200	<200	<200	<200	<200	<200	<200	**384**	<200	<100	**218**	**315**	<200[4]	<200[4]	<200	**8,160**	<400[4]	<1,000 (4)	**18200**	<10000	<2000	<2000	<2000	<2000	<200	**139**	**473**	<200	<200	<200	<200	**36100**	<2000	<2000	**516**	**265**	<1000	<2000	**100**
Barium	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	**1,910**	667	796	**1,090**	411	<2,000	595[4]	<1,000 (4)	<10000	<10000	2120	<2000	<2000	<2000	<200	340	350	427	345	335	526	<10000	<2000	<2000	271	<200	<1000	<2000	**1,000**
Cobalt	<5.0	<5.0	<5.0	<50[4]	<50[4]	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<5.0	**15.4**	**7**	<50[4]	<50[4]	<50	<500	<100[4]	<250 (4)	<2500	<2500	<500	<500	<500	<500	<50	<5.0	<50	<50	<50	<50	<50	<2500	<500	<500	<50	<50	<250	<500	**5**
Iron	190	223	204	<100	<100	<100	<100	<100	**393**	250	124	**475**	221	**326**	**2380**	**486**	**118**	**4,660**	**4,640**	**5,060**	**5,610**	**3,290**	**228,000**	**76000**[4]	**44,400 (4)**	93400	250000	210000	168000	19200	42600	3290	**285**	**441**	**273**	121	131	158	**58300**	**21300**	**13800**	**11900**	**3850**	**9930**	**9800**	**300/500**[3]
Manganese	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	51.9	15.3	**1,100**	**21,700**	**14,100**	**11,100**	**10,700**	**6,080**	**66,700**	**40600**[4]	**21,400 (4)**	18200	53400	48100	37100	2080	4000	246	**1,450**	**831**	**1,100**	**1,330**	**2,480**	**3,650**	**123000**	**14300**	**8320**	**16300**	**1080**	**859**	**1430**	**300/500**[3]
Nickel	<10	<10	10.8	<10	<10	<10	<10	<10	15.1	<10	<10	13	<10	<10	11.8	<10	11.5	**130**	46.5	13.1	14.3	12.2	**2,220**	**390**[4]	**103,000 (4)**	905	1050	1170	555	200	464	68.5	<10	<10	<10	<10	13.5	21.2	**2500**	**171**	<100	19.2	22.2	<50	<100	**100**
Sodium	**97,800**	**125,000**	**371,000**	**184,000**	**139,000**	**121,000**	**143,000**	**343,000**	**134,000**	**143000**	**52300**	**67900**	**91200**	**89500**	**162000**	**166000**	**146,000**	**262,000**	**325,000**	**360,000**	**540,000**	**266,000**	**10,700,000**	**1,730,000**	**2,130,000 (4)**	**9640000**	**9560000**	**7550000**	**7020000**	**1770000**	**5490000**	**644000**	**212,000**	**248,000**	**263,000**	**250,000**	**296,000**	**334,000**	**6250000**	**753000**	**479000**	**718000**	**376000**	**296000**	**530000**	**20,000**
Dissolved Metals																																									
Aluminum	<100	<100	<100	<200[4]	<200[4]	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<100	<100	**228**	<200[4]	<200[4]	<200	**7,550**	<400[4]	<400 (4)	<10000	<10000	<1000	<2000	<1000	<2000	<2000	<100	<200	<200	<200	<200	<200	<10000	<2000	<1000	<200	<200	<1000	<2000	**100**
Barium	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	**2,080**	588	757	998	387	<2,000	<400[4]	<400 (4)	<10000	<10000	1800	<2000	<1000	<2000	<2000	321	305	407	339	321	597	<10000	<2000	<1000	<200	<200	<1000	<2000	**1,000**
Cobalt	<5.0	<5.0	<5.0	<50[4]	<50[4]	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<5.0	**5.6**	<5.0	<50[4]	<50[4]	<50	<500	<100[4]	<100 (4)	<2500	<2500	<250	<500	<250	<500	<500	<5.0	<50	<50	<50	<50	<50	<2500	<500	<250	<50	<50	<250	<500	**5**
Iron	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	**236**	**2,820**	**201**	**370**	**620**	**215,000**	**31100**[4]	**12,400 (4)**	87500	182000	181000	152000	17700	42900	20000	<100	132	<100	<100	<100	<100	**49500**	**8980**	**2330**	**710**	**3500**	**3090**	**<1000**	**300/500**[3]
Manganese	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	<15	56.9	**18,600**	**9,910**	**9,750**	**8,500**	**4,200**	**62,600**	**35300**[4]	**19,100 (4)**	16500	38900	46900	34700	1960	3980	1730	543	**533**	**557**	**1,050**	**2,220**	**5,920**	**107000**	**12600**	**7020**	**15600**	**1060**	**753**	**1500**	**300/500**[3]
Nickel	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	**114**	24.5	<10	11.2	<10	**2,050**	**345**[4]	**96 (4)**	790	685	978	432	128	465	507	<10	<10	<10	<10	11.4	54.7	2140	114	<50	21.4	19.6	<50	<100	**100**
Sodium	**98,300**	**125,000**	**417,000**	**192,000**	**138,000**	**114,000**	**132,000**	**339,000**	**133,000**	140000	53000	66700	108000	101000	166000	153000	**148,000**	**310,000**	**323,000**	**384,000**	**544,000**	**258,000**	**10,100,000**	**1,600,000**	**2,120,000 (4)**	9200000	7100000	6570000	6400000	1760000	5870000	4790000	**211,000**	**253,000**	**269,000**	**256,000**	**317,000**	**328,000**	**5400000**	**701000**	**424000**	**738000**	**408000**	**316000**	**664000**	**20,000**
Nitrates and Nitrites (mg/L)[5]																																									
Nitrogen, Nitrate	0.26	<0.11	<0.11	<0.11	<0.10	--	<0.11	0.57	0.26	0.13	1.2	0.87	0.81	0.99	1.2	1.1	1.2	<0.11	<0.11	<0.11	<0.10	--	0.39	<0.11	<0.11	0.96	<0.6	<0.15	0.26	<2	<11	<0.2	<0.010	2.9	--	2.1	1.4	0.53	<25	<0.11	0.11	<0.15	<0.6	<0.11	<0.15	
Nitrogen, Nitrate + Nitrite	0.28	<0.10	<0.10	<0.10	<0.10	--	<0.10	0.57	0.26	0.15	1.2	0.87	0.81	0.99	1.2	1.1	1.2	<0.10	<0.10	<0.10	<0.10	--	0.39	<0.10	<0.10	0.96	0.27	<0.1	0.26	<1	<10	0.13	1.5	<0.0020	--	2.1	1.4	0.54	0.42	<0.1	0.11	<0.1	<0.1	<0.1	**10 (total)**
Nitrogen, Nitrite	0.16	0.019	<0.010	0.013	0.0088	--	0.025	<0.010	<0.010	0.019	0.01	<0.01	<0.01	<0.01	<0.01	0.024	<0.012	<0.010	<0.010	<0.010	<0.002	--	<0.010	<0.010	<0.010	<0.5	<0.5	<0.05	<0.1	<1	<1	<0.1	1.5	2.9	--	<0.010	<0.010	<0.010	<25	<0.01	<0.01	<0.05	<0.5	<0.01	<0.05	
Field Parameters																																									
pH (s.u.)[6]	**10.52**	**9.88**	**9.72**	**9.63**	**9.23**	**10.45**	**10.03**	**9.46**	**10.95**	**10.32**	**10.05**	**9.88**	**10.21**	**9.58**	**6.02**	**10.45**	6.96	**8.62**	7.35	6.98	7.66	8.15	6.78	6.66	8.21	6.86	**6.09**	6.79	7.03	**6.07**	7.29	8.15	8.18	8.39	7.27	7.94	7.32	8.1	6.68	7.11	7.03	7.2	**6.2**	7.24	6.27	**6.5 - 8.5**
Specific Conductivity (mS/cm)[7]	0.556	0.615	3.18	1.33	0.701	0.607	0.589	1.93	0.98	0.531	0.581	0.575	0.561	0.537	0.8	0.607	0.71	3.35	3.13	4.17	4.54	1.4	23.2	9.11	8.12	20.6	20.2	16.9	17.2	5.5	2.61	1.4	1.27	1.91	2.93	1.95	2.57	2.81	15.9	3.71	3.31	3.54	1.73	2.4	2.93	--
Turbidity (NTU)[8]	**38.1**	2	0	2.7	0.3	3.7	1.5	**42.5**	**14.8**	1.7	**69.2**	**11.3**	4	**18.2**	2.6	3.7	1.9	**38.7**	**51.54**	**6.5**	3.6	1	**541**	**107**	**193**	**654**	**376**	**260**	**211**	**347**	**332**	1	**15.9**	2.5	**15.7**	4.7	**7.4**	**15.5**	**452**	**434**	**156**	**74.1**	**96.7**	**76.2**	**65.7**	**5**
Dissolved Oxygen (mg/L)	0	0	0.17	1.18	1.21	0	5.85	3.58	1.93	0	5.52	4.81	4.69	8.87	7.3	0	0.28	2.49	0.15	1.2	0.22	1	2.78	3.31	2.21	0	1.48	1.16	0	0.41	5.9	1	1.66	0.33	0	2.38	1.16	6.35	0	3.62	0.91	4.88	1.15	1.88	0	--
Temperature (°C)[9]	14.44	15.03	16.91	18.84	19.88	20.85	11.84	15.98	22.46	10.17	15.09	16.7	19	18.56	21.09	20.85	14.68	12.5	11.68	17.87	22.06	23	13.33	12.21	22.75	21.41	11.41	13.31	20.85	20.75	20.99	23	16.18	23.45	23.56	14.93	12.98	22.22	21.47	10.85	13.67	21.68	21.22	22.22	23.56	--
REDOX (mV)[10]	44	-278	-158	-156	85	68	-85	66	-69	64	-221	-94	-107	-34	-70	68	140	-89	-196	-153	-161	-60	-178	-83	-176	-139	-170	-140	-167	-68	-138	-60	157	-60	259	15	-42	-20	-164	-101	-115	-124	-20	-136	-25	--

NOTES:

[1] See Figure 2.

[2] All concentrations are presented in micrograms per liter (ug/L) unless otherwise specified. Bold and red values indicate the concentrations which exceed the respective NYSDEC Groundwater Standards.

[3] The groundwater standard for beryllium is 11 ug/L when hardness is less than 75 ppm (mg/L) and 1,100 ug/L when hardness is greater than 75 ppm (mg/L).

[3] The individual groundwater standard for iron and manganese is 300 ug/L and the total groundwater standard for iron and manganese concentrations combined is 500 ug/L.

[4] The detection limit is raised due to dilution required for possible matrix interference.

[5] There is no Class A groundwater standard for this constituent.

[5] Milligrams per liter (mg/L).

[6] Standard units (s.u.).

[7] Microsiemens per centimeter (mS/cm).

[8] Nephelometric turbidity units (NTU).

[9] Degrees Celcius (°C).

[10] Millivolts (mV).

TABLE 3

THE CROSSINGS
GGP STATEN ISLAND MALL, LLC.
STATEN ISLAND, NEW YORK

Summary of Reductive Dechlorination Indicator Parameters
January 2013 Pre-Injection through September 2021 Post-Injection

Well ID[1]	Date	Methane	Ethane	Ethene	Acetone	MEK[11]	Sulfate	Carbon Dioxide	BOD[2]	COD[3]	TOC[4]	Alkalinity
		Concentration (ug/L)[5]					Concentration (mg/L)[6]					
Injection Wells - Zone 1												
MW-3	1/30/2013	0.15	ND	ND	ND	ND	31.3	291	<4.5	<20	1.3	228
	1/20/2015	20.7	0.13	1	ND	ND	28	1.72	15	47.6	13.5	227
	4/7/2015	38.8	0.22	1.5	ND	ND	<10	3,700	201	279	92.7	492
	6/30/2015	5.1	ND	0.93	5.0 J	ND	10.9	3,630	26.8	71.3	19.9	433
	10/7/2015	ND	ND	ND	ND	ND	26.4	933	<3.4	<20	2.5	227
	10/6/2016	9	ND	0.43	ND	ND	33.6	980	<3.4	<20	1.3	245
	1/10/2019	66.1	ND	ND	ND	ND	323	147,000	>7,030 [10]	57,600	<500 [10]	7,460 [10]
	4/18/2019	9,010	ND	ND	278	776	<2.0	37,800	2,460	2,020	774	704
	7/18/2019	4,450	ND	ND	ND	ND	11.7	37,900	<270	13,000	86	NA
	10/25/2019	3,040	ND	ND	ND	ND	2.3	22,700	ND	475	72	ND
	1/29/2020	3,380	ND	ND	ND	ND	ND	11,400	168	381	137	ND
	4/21/2020	2,640	ND	ND	ND	ND	5.5	8,330	120	359	84	590
	7/7/2020	3,340	0.67	ND	ND	ND	3.5	6,350	353	269	97	600
	10/20/2020	2,630	0.8	ND	ND	ND	ND	6,340	31	179	96	523
	3/18/2021	3,800	ND	ND	ND	ND	6.3	3,960	50	134	45	273
	5/27/2021	2,090	6.25	42.2	ND	ND	21.1	1,440	66	28	12	205
	9/29/2021	1,330	66	1.2	ND	ND	ND	1,610	ND	84	ND	233
MW-5	1/30/2013	ND	ND	ND	ND	ND	35.4	3,090	<3.4	<20	3.4	141
	1/20/2015	77.3	ND	ND	7.9 J	ND	ND	16.5	<43	181	68.3	830
	4/7/2015	5.9	ND	ND	ND	ND	ND	7,200	<5.0	<20	8.6	178
	6/30/2015	0.32	ND	ND	ND	ND	39.9	10,600	<3.4	75.9	20	360
	10/7/2015	ND	ND	ND	ND	ND	50.2	8,400	<5.0	82.5	27.9	406
	10/6/2016	22.4	ND	ND	ND	ND	25.5	9,680	<3.4	36	11.9	299
	1/9/2019	12.4	ND	ND	7.1 J	7.4 J	4.1	17,900	89.7	237	76.5	564
	4/18/2019	9880	ND	1.1	8.4 J	9.7 J	9.2	15,700	50.6	73	19.6	351
	7/18/2019	6210	ND	0.61	ND	ND	17	25,300	<200	50.2	13.6	NA
	10/29/2019	4820	ND	0.72	30	171	5.4	44,700	222	863	181	ND
	1/28/2020	8580	ND	ND	ND	ND	13.7	12,900	158	63.5	18.5	ND
	4/21/2020	608	ND	ND	ND	ND	19.4	8,240	167	43.6	7.8	265
	7/7/2020	656	ND	ND	ND	ND	22	8,230	263	ND	5	136
	10/23/2020	685	ND	ND	ND	554		139,000	1550	7760	5460	3500
	3/19/2021	5910	ND	ND	358	1,470	5.8	37,100	334	1240	408	3750
	5/27/2021	4730	0.33	ND	266	767	7.8	10,100	141	521	228	1970
	9/29/2021	6,820	0.8	ND	15	ND	ND	8,020	ND	86	ND	505
Injection Area - Zone 2												
MW-7	1/30/2013	0.39	ND	ND	4.8 J	ND	37	182	<3.4	<20	1.5	238
	10/7/2015	ND	ND	ND	ND	ND	32.2	454	<2.0	<20	1.6	197
	10/6/2016	ND	ND	ND	ND	ND	33	865	<3.4	<20	1.1	223
	1/9/2019	0.26	ND	ND	39.3 J	501	419	152,000	>6,600 [10]	56,800	13,100	10,200
	4/17/2019	5,470	ND	0.54	144	1,590	2.9	91,300	>6,860	17,600	4,180	2,590
	7/18/2019	6,050	ND	ND	329	2,800	<2.0	63,000	<2,700	14,600	1,170	NA
	10/25/2019	5,850	ND	ND	ND	ND	3.9	34,600	ND	1,430	259	ND
	1/28/2020	4,140	ND	ND	ND	ND	6	17,100	362	809	260	ND
	4/21/2020	2,590	ND	ND	ND	ND	3.4	9,440	191	256	101	563
	7/7/2020	2,540	ND	1.6	ND	ND	7.3	4,010	338	114	44	312
	10/23/2020	1,170	ND	1.2	59	103	ND	118,000	1,560	7,530	1,020	918
	3/17/2021	7,610	ND	ND	797	3,250	4	37,200	232	2,930	771	5,100
	5/26/2021	4,890	ND	ND	1,100	4,320	91.5	13,800	140	1,670	737	5,060
	9/28/2021	5,200	ND	ND	ND	ND	ND	22,700	4	627	215	5,290
MW-20	10/4/2016	7.5	0.43	ND	ND	ND	36.4	4,110	<2.0	<20	2.6	327
	1/8/2019	2,270	ND	ND	232	243	10.1	97,700	4,160	5,700	1,830	1,870
	4/17/2019	11,000	ND	ND	390	735	<2.0	68,700	917	1,930	619	1,750
	7/23/2019	8,890	ND	ND	ND	ND	8.5	48,500	<330	511	177	1,890
	10/29/2019	473	ND	ND	71	145	246	140,000	15,100	28,600	11,000	ND
	1/28/2020	7,070	ND	ND	1,380	3,140	2.2	33,900	2,410	2,670	1,210	ND
	4/21/2020	3,050	ND	ND	ND	ND	2.7	24,200	373	1,330	500	3,960
	7/8/2020	1,840	ND	ND	ND	ND	ND	27,400	128	829	235	2,050
	10/20/2020	5,300	ND	0.68	ND	ND	5.9	20,800	36	308	120	1,400
	3/16/2021	5,580	ND	1.4	14	ND	6.6	13,600	121	142	40	178
	5/26/2021	1,240	ND	3.99	ND	ND	36.3	2,000	3	78	27	392
	9/30/2021	73	ND	ND	6.6	ND	27	4,240	1	28	15	342
MW-21	10/6/2016	2.3	ND	ND	ND	ND	40.8	1,400	<3.4	<20	1.4	252
	1/9/2019	296	ND	ND	21.7	20.9	13.5	7,710	81.7	131	13.2	130 [10]
	4/17/2019	3,500	ND	ND	7.4 J	12	12.3	10,800	18.4	70.3	14.9	118
	7/23/2019	2,550	ND	ND	9.1 J	ND	8.5	20,700	<330	97.5	23.7	138
	10/29/2019	937	ND	ND	36	194	114	89,900	15200	28200	12100	ND
	1/28/2020	4,980	ND	ND	592	3,480	ND	31,800	2770	2570	1520	ND
	4/21/2020	3,520	ND	ND	368	728	3.9	6,540	373	1230	358	2500
	7/8/2020	6,520	ND	ND	ND	ND	ND	33,800	123	878	276	2050
	10/20/2020	6,400	ND	ND	8	ND	18.7	24,500	19.8	308	96.5	373
	3/17/2021	4,220	ND	ND	ND	ND	8.9	19,400	396	179	30.5	823
	5/26/2021	1,110	ND	ND	ND	ND	24.3	7,140	1	38	17	62
	9/29/2021	1,270	ND	ND	ND	ND	17.1	5,990	ND	51	15	286
MW-22	10/6/2016	2.8	ND	ND	ND	ND	39.7	1,210	<3.4	24	1.1	256
	1/9/2019	15	ND	ND	ND	805 J	59	126,000	>6,610 [10]	24500	21400	9,300 [10]
	3/17/2021	8,590	ND	ND	ND	ND	13.1	14,200	146	147	43	413
	5/26/2021	3,020	ND	ND	ND	ND	28.3	9,550	35	53	14	269
	9/29/2021	2,050	ND	ND	4.5	ND	11.1	6,430	13	51	16	234
MW-23	10/5/2016	4	ND	ND	ND	ND	27.3	3,080	<3.4	<20	<1.0	241
	1/8/2019	5,980	ND	ND	518	970	7.2	75,900	>2,210 [10]	4410	1450	1,860 [10]
	3/18/2021	437	ND	ND	ND	ND	27	2,040	227	31.6	1.8	119
	5/28/2021	189	ND	ND	ND	ND	27.4	1,310	76	28	3	215
	9/28/2021	277	ND	ND	ND	ND	ND	1,170	ND	ND	4	204
MW-24	10/5/2016	ND	ND	ND	ND	ND	49.2	796	<3.4	<20	<1.0	223
	1/8/2019	1,360	ND	ND	ND	805 J	1,450	2,910	<6.9	33.4	13.1	363 [10]
	4/17/2019	0.82	ND	ND	ND	ND	31.4	2,470	<5.0	<20	5.4	271
	7/18/2019	1.40	ND	ND	ND	ND	10.6	2,560	<100	23.8	5.7	NA
	10/25/2019	0.13	ND	ND	ND	ND	90.2	2,090	ND	39.6	6.1	ND
	1/29/2020	ND	ND	ND	ND	ND	21.9	925	6	ND	4.7	ND
	4/21/2020	ND	ND	ND	ND	ND	24.5	1,030	2	ND	4.3	261
	7/7/2020	ND	ND	ND	ND	ND	14.1	881	88	ND	7	175
	10/20/2020	0.33	ND	ND	ND	ND	71.7	1,050	ND	22.9	8.4	246
	3/18/2021	ND	ND	ND	ND	ND	14.8	461	168	42.1	2.1	135
	5/28/2021	ND	ND	ND	ND	ND	22.3	1,180	146	33	5	269
	9/29/2021	1	ND	ND	ND	ND	ND	1,170	ND	144	ND	238
Injection Area - Zone 3												
MW-9	1/29/2013	3.6	ND	ND	ND	ND	39.5	319	<5.0	<20	3.4	243
	10/6/2015	ND	ND	ND	ND	ND	<10	1,770	<3.4	<20	5.1	61.7
	10/4/2016	NS[7]	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
		WELL MW-9 ABANDONED										
MW-11	1/29/2013	1.8	ND	ND	ND	ND	36.6	526	<5.0	<20	2	253
	10/6/2015	2.7	ND	ND	ND	ND	<10	4,790	<2.0	<20	2.5	315
	10/10/2016	451	0.28	ND	ND	ND	27.3	329	<3.4	<20	2	307
MW-12	1/29/2013	62.1	ND	ND	ND	ND	40	1,290	<5.0	<20	4.9	426
	10/6/2015	0.92	ND	ND	ND	ND	20.1	14,500	<3.4	<20	5.8	316
	10/10/2016	415	1	ND	ND	ND	22.2	10,000	<3.4	45.6	5.7	321
	4/17/2019	744	0.31	ND	ND	ND	25.5	10,100	917	40.5	5.4	377
	7/23/2019	1320	0.54	ND	ND	ND	22.2	13,300	24	30	6.8	456
	10/28/2019	2.8	ND	ND	229	199	202	150,000	14000	29500	8720	ND
	1/30/2020	3990	ND	ND	376	538	ND	50,200	2210	3690	1310	ND
	4/22/2020	2860	ND	ND	595	701	ND	53,000	1430	2100	394	2,300
	7/9/2020	3960	ND	ND	140	210	ND	50,200	203	561	140	2,150
	10/20/2020	1470	ND	ND	ND	ND	ND	48,700	15.4	308	99.3	1,870
MW-13	1/29/2013	2.9	ND	ND	ND	ND	43	759	<5.0	<20	3.2	342
	10/6/2015	2.4	ND	ND	ND	ND	12.6	1,870	<2.0	<20	3.7	299
	10/4/2016	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/17/2019	8,300	ND	1.2	8.3 J	8.4 J	13.6	16,600	57.6	122	40.2	482
	7/23/2019	10,800	0.92	ND	11	13	10.7	18,300	<330	25	14.8	444
	10/28/2019	4,740	0.51	ND	ND	ND	18.9	17,300	54.2	90.9	19.3	ND
	1/29/2020	3,890	ND	ND	ND	ND	11.3	8,890	15.7	147	46.9	ND
	4/22/2020	3,720	1.1	ND	ND	ND	28.9	7,170	4.5	59	11.4	445
	7/9/2020	4,820	1.1	ND	7	ND	6.6	3,720	7.8	ND	12.8	369
	10/20/2020	2,690	0.83	ND	ND	ND	26.7	5,240	9.3	68.6	13.9	325

TABLE 3

THE CROSSINGS
GGP STATEN ISLAND MALL, LLC.
STATEN ISLAND, NEW YORK

Summary of Reductive Dechlorination Indicator Parameters
January 2013 Pre-Injection through September 2021 Post-Injection

Well ID[1]	Date	Methane	Ethane	Ethene	Acetone	MEK[11]	Sulfate	Carbon Dioxide	BOD[2]	COD[3]	TOC[4]	Alkalinity
		Concentration (ug/L)[5]					Concentration (mg/L)[6]					
Monitor Wells within Treatment Area												
MW-3D	2/1/2013	0.96	ND	ND	ND	ND	10.4	ND	<3.4	<20	<1.0	229
	1/20/2015	40.5	ND	0.25	ND	ND	ND	ND	46	76.2	21.1	249
	4/7/2015	11.4	ND	0.29	ND	ND	10.7	ND	8.6	27.8	8.7	181
	6/30/2015	0.21	ND	ND	ND	ND	<10	ND	<3.4	<20	1.8	203
	10/7/2015	ND	ND	ND	ND	ND	<10	ND	<2.0	<20	1.5	211
	10/5/2016	0.98	ND	ND	ND	ND	10.4	ND	<3.4	<20	<1.0	268
	1/10/2019	3.7	ND	ND	ND	ND	8.3	ND	<3.4	<20	4.2	257
	4/18/2019	0.33	ND	ND	ND	ND	13.4	ND	16.3	29.7	1.6	143
	7/18/2019	6.7	ND	ND	ND	ND	10.8	ND	<3.4	<20	1	NA
	10/25/2019	6.7	ND	ND	ND	ND	11.5	ND	ND	ND	ND	ND
	1/29/2020	4.7	ND	ND	ND	ND	6.7	ND	2.7	ND	1.5	ND
	4/21/2020	2.2	ND	ND	ND	ND	8.3	ND	1.5	ND	1.2	116
	7/7/2020	3.6	ND	ND	ND	ND	10.4	ND	ND	ND	1.2	224
	10/20/2020	4.1	ND	ND	ND	ND	11.2	ND	ND	ND	1.7	174
	3/18/2021	0.18	ND	ND	ND	ND	9.2	ND	3	31.6	1.2	105
	5/27/2021	ND	ND	ND	ND	ND	15.2	ND	ND	ND	3.1	170
MW-4	1/30/2013	2	0.26	ND	ND	ND	35.6	1,730	<3.4	<20	1.3	241
	1/20/2015	40.8	2.9	7.3	ND	ND	ND	4.66	108	143	61.6	380
	4/7/2015	48.8	1.2	4	ND	ND	<10	4,840	273	354	94	426
	6/30/2015	21.2	ND	2.3	ND	ND	<10	8,350	>227	1,490	158	578
	10/7/2015	12.1	ND	ND	26	41.9	16.5	13,000	16	52.5	18.1	521
	10/5/2016	1,340	0.28	14.4	ND	ND	30.8	7,940	4.7	<20	3.4	332
	1/8/2019	957	ND	ND	ND	356 J	298	157,000	7,520	57,600	23,500	13,400
	4/18/2019	5,250	ND	ND	430	1,190	<2.0	108,000	6,530	2,280	2,480	2,370
	7/18/2019	4970	ND	ND	435	1,390	16.6	71,900	2,720	14,300	1,210	NA
	10/29/2019	560	ND	ND	72	272	318	136,000	15,100	28,200	16,400	ND
	1/28/2020	4830	ND	ND	1,720	10,300	3.3	64,000	17,000	10,700	11,900	ND
	4/21/2020	3890	ND	ND	1,910	8,140	ND	57,800	14,800	47,500	9,740	10,300
	7/7/2020	6470	ND	ND	1,810	8,300	ND	14,800	15,700	19,500	6,320	9,350
	10/23/2020	1700	ND	ND	39	462	ND	104,000	4,910	7,530	2,650	2,130
	3/19/2021	7270	ND	ND	913	5,840	ND	54,700	6,370	8,440	5,270	8,080
	5/27/2021	5,230	ND	ND	947	4250	ND	16,400	4,060	10,500	5,880	11,200
	9/29/2021	2,360	ND	ND	1510	8120	ND	34,400	14,400	12,300	6,300	11,600
MW-8	1/30/2013	4.9	ND	ND	ND	ND	41.3	1,340	<3.4	<20	1.1	227
	10/7/2015	ND	ND	ND	ND	ND	33.2	3,690	<3.4	<20	4	192
	10/6/2016	22.7	ND	ND	ND	ND	39.2	4,940	<3.4	26.4	1	224
	1/9/2019	16.8	ND	ND	ND	ND	29	2,250	<5.0	30.6	3.5	202
	4/17/2019	9.8	ND	ND	ND	ND	31.7	5,740	<5.0	37.8	6.7	192
	7/18/2019	19	ND	ND	ND	ND	31.8	8,960	ND	23.8	3.8	ND
	10/29/2019	0.45	ND	ND	171	84	262	33,000	15100	29500	8090	ND
	1/28/2020	6340	ND	ND	252	718	ND	25,800	657	904	313	ND
	4/21/2020	4500	ND	ND	23	39	3.3	10,200	312	210	91.9	705
	7/7/2020	5860	ND	ND	ND	ND	3.7	6,100	68	107	38	528
	10/23/2020	200	ND	ND	31	22	ND	14,700	257	1060	521	453
	3/17/2021	9520	ND	ND	22	ND	3.2	11,100	632	189	43.4	1200
	5/26/2021	5900	ND	ND	10	ND	17.7	5,730	24.8	309	103	1200
	9/29/2021	2,980	ND	ND	ND	ND	ND	6,290	34	434	102	1,000
Monitor Wells Outside Treatment Area												
MW-1	2/1/2013	5.7	ND	ND	ND	ND	49.7	1,890	<3.4	40.9	4.3	305
	10/8/2015	ND[8]	ND	ND	ND	ND	44.1	6,350	<2.0	<20	2	263
	10/4/2016	ND	ND	ND	ND	ND	52.1	6,700	116	182	45.4	256
MW-2[9]	2/1/2013	8.2	ND	ND	48.3	ND	60.8	259	117	904	74.8	29.2
	10/8/2015	17.6	ND	ND	4.1 J	ND	11.4	6,200	25.3	74.2	32	408
	10/4/2016	4370	ND	ND	ND	ND	<10	4,290	8.4	67.2	58.6	210
	1/9/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/29/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/29/2020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/22/2020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/8/2020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/21/2020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	3/17/2021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	5/24/2021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/30/2021	1670	0.32	ND	15	ND	ND	6,000	ND	48.1	676	485
MW-6R	2/1/2013	ND	ND	ND	ND	ND	35.4	156	<3.4	<20	2.1	270
	10/7/2015	ND	ND	ND	ND	ND	32.8	567	<2.0	<20	1.9	194
	10/5/2016	ND	ND	ND	ND	ND	30.3	749	<3.4	<20	3.3	166
	1/9/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/29/2020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/22/2020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/8/2020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/21/2020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	3/18/2021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	5/24/2021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/29/2021	0	ND	ND	ND	ND	ND	362	ND	ND	3	172
MW-10	1/31/2013	0.89	ND	ND	ND	ND	48.2	611	<3.4	<20	2.4	294
	10/8/2015	ND	ND	ND	ND	ND	44.2	1,200	<2.0	<20	1.5	258
	10/5/2016	1.2	ND	ND	ND	ND	44.8	1,730	<2.0	<20	1.2	280
	1/9/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/19/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/18/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/25/2019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1/29/2020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/22/2020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/8/2020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10/21/2020	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	3/17/2021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	5/24/2021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/30/2021	2	ND	ND	6.1	ND	31.6	2,550	ND	ND	10	240
MW-14	1/31/2013	27.9	ND	ND	ND	ND	48.4	3,950	<3.4	<20	3.5	261
	10/8/2015	ND	ND	ND	ND	ND	43.3	8,330	<3.4	<20	2.9	290
	10/4/2016	4.3	ND	ND	ND	ND	38.2	15,000	<3.4	<20	59.4	301
MW-15	1/28/2013	0.39	ND	ND	ND	ND	50	701	<5.0	<20	2.1	364
	10/8/2015	ND	ND	ND	ND	ND	43.1	2,670	<2.0	<20	1.8	302
	10/4/2016	1.8	ND	ND	ND	ND	39.1	2,990	<2.0	<20	2.3	308
MW-16	1/31/2013	0.17	ND	ND	ND	ND	40.5	1,580	<3.4	<20	2.4	265
	10/8/2015	ND	ND	ND	ND	ND	35.7	4,510	<2.0	<20	1.7	218
	10/7/2016	ND	ND	ND	ND	ND	37.9	4,870	<3.4	<20	1.5	253
	1/9/2019	1,670	ND	ND	ND	882 J	<20[10]	181,000	>7,000[10]	645	<200[10]	3,900[10]
	4/17/2019	8,660	ND	0.34	325	473	3.1	69,700	2,910	4,390	928	2,150
	7/23/2019	8,840	ND	ND	204	365	7.2	64,500	<410	1,090	154	3,750
	10/28/2019	2,420	ND	0.5	108	491	211	122,000	14,200	28,200	9940	ND
	1/30/2020	3,930	ND	ND	1,020	3,790	ND	38,900	10,700	25,600	5760	ND
	4/22/2020	3,780	ND	ND	669	1,790	ND	33,200	2,340	6,360	1790	853
	7/9/2020	4,750	ND	ND	ND	ND	ND	37,200	225	1,390	550	3,950
	10/22/2020	5,810	ND	ND	ND	ND	2.7	20,900	34	894	263	2,520
	3/16/2021	9,120	ND	ND	ND	ND	5.3	25,400	289	667	23.4	2,870
	5/25/2021	1,590	0.43	ND	7.4	ND	6.8	8,970	48	690	193	2,140
	9/30/2021	6,220	0.82	ND	ND	ND	9.4	16,600	7	99	101	453

TABLE 3

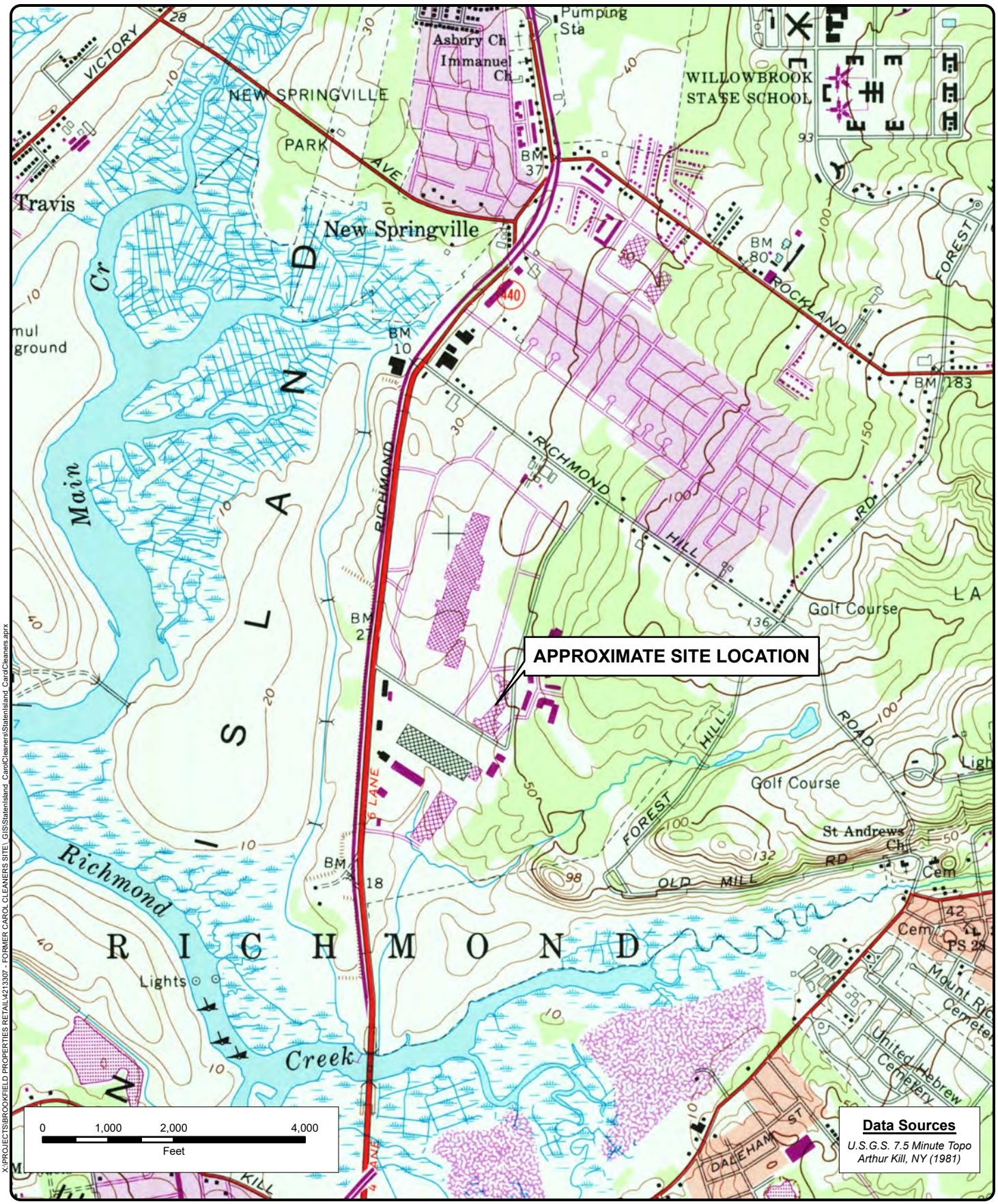
THE CROSSINGS
GGP STATEN ISLAND MALL, LLC.
STATEN ISLAND, NEW YORK

Summary of Reductive Dechlorination Indicator Parameters
January 2013 Pre-Injection through September 2021 Post-Injection

Well ID[1]	Date	Methane	Ethane	Ethene	Acetone	MEK[11]	Sulfate	Carbon Dioxide	BOD[2]	COD[3]	TOC[4]	Alkalinity
		Concentration (ug/L)[5]					Concentration (mg/L)[6]					
MW-17	1/31/2013	1.1	ND	ND	ND	ND	38.9	607	<3.4	<20	1.1	237
	10/8/2015	1.4	ND	ND	ND	ND	28.6	1,650	<2.0	<20	1.6	240
	10/7/2016	8.6	ND	ND	ND	ND	35.7	2,380	<3.4	<20	1.3	268
	1/10/2019	979	ND	ND	ND	86	<10 [10]	34,200	856	1,460	518	4,460 [10]
	4/18/2019	5,390	ND	ND	213	492	23.6	28,500	2,380	1,300	773	1,990
	7/23/2019	7,640	ND	2.8	54	402	12.3	47,900	<410	724	105	1,930
	10/28/2019	1,950	ND	2.4	ND	141	258.0	148,000	14,100	29,100	7610	ND
	1/30/2020	5,900	ND	20.2	1,470	9,450	ND	49,600	17,200	46,400	7260	ND
	4/23/2020	4,690	4	8.1	1,100	4,910	3.2	33,200	3,690	8,690	2690	2,910
	7/9/2020	6,340	9.8	2.9	440	1,460	6.7	25,900	380	1,190	284	ND
	10/22/2020	6,590	3.7	5.5	79	968	ND	59,300	1,560	7,760	2050	1,990
	3/16/2021	8,390	12.3	ND	ND	28	5.6	26,000	89	1,090	38.1	3,100
	5/25/2021	6,460	24.5	2	5.7	ND	8.6	5,670	40	809	189	2,210
	9/30/2021	6,840	19.7	3.09	ND	ND	8.6	9,360	2	91	28	499
MW-18	1/31/2013	68.5	ND	ND	ND	ND	38.7	3,500	<3.4	<20	2.4	262
	10/8/2015	0.27	ND	ND	ND	ND	38.9	8,810	<2.0	25.6	6.6	356
	10/7/2016	18.7	ND	ND	ND	ND	29.8	9,000	<3.4	33.6	2.1	254
	1/10/2019	467	0.26	1.8	ND	641	<10 [10]	183,000	>2,340 [10]	13,100	<100 [10]	2,940 [10]
	4/18/2019	6,810	2.4	1.7	241	754	8.1	98,800	2,330	1,380	544	2,120
	7/23/2019	9,350	3.6	ND	ND	6.9 J	12.0	51,500	<330	100	25.9	613
	10/28/2019	2,000	0.24	ND	468	3,630	22.6	82,600	9,900	18,200	5120	ND
	1/30/2020	4,870	ND	ND	485	2,530	ND	30,600	1,540	1,760	426	ND
	4/23/2020	4,230	1.2	ND	21	89	ND	29,500	363	126	254	2,450
	7/9/2020	6,210	1.6	ND	ND	ND	9.6	17,300	60	119	64.5	915
	10/22/2020	2,150	1.9	0.74	ND	ND	26.1	4,600	5	28	7.3	343
	3/16/2021	2,310	1.1	0.61	ND	ND	28.5	1,420	100	55	7.1	355
	5/25/2021	1,560	1.4	1.4	ND	ND	33.8	1,180	29	61	7	265
	9/30/2021	1,580	1.4	1.1	ND	ND	31	1,780	ND	25	6	263
MW-19	1/30/2013	ND	ND	ND	ND	ND	32.3	882	<3.4	<20	1.2	205
	10/8/2015	2.1	ND	ND	ND	ND	24.2	4,270	<2.0	<20	2.9	268
	10/7/2016	92.6	0.41	ND	ND	ND	30.6	2,950	<3.4	26.4	1.8	280
	1/10/2019	2,000	ND	ND	300	734	<20 [10]	189,000	>7,920 [10]	12,900	<200 [10]	4,460 [10]
	4/18/2019	11,000	ND	6.3	178	769	<2.0	53,900	1,920	1,160	408	1,670
	7/23/2019	8,820	ND	ND	13	26	7.2	39,500	<330	255	37.6	888
	10/28/2019	3,380	ND	0.32	ND	230	187.0	85,700	14,000	30,000	9850	ND
	1/30/2020	5,160	ND	ND	2,870	17,400	5.9	41,400	11,200	23,800	7880	ND
	4/23/2020	4,820	0.3	ND	1,180	6,790	13.9	27,000	1,340	2,830	1130	5,400
	7/9/2020	6,140	0.56	0.56	13	66	7.5	19,100	105	585	183	1,520
	10/22/2020	7,130	1.6	3	ND	14	48.8	8,430	27	198	88	893
	3/16/2021	9,690	1.5	ND	ND	ND	19.5	5,620	128	311	94.5	628
	5/25/2021	6,740	1	ND	ND	ND	21.7	2,200	19	104	30	360
	10/1/2021	1,970	0.69	ND	9.2	ND	18.1	2,310	9	86	17	337

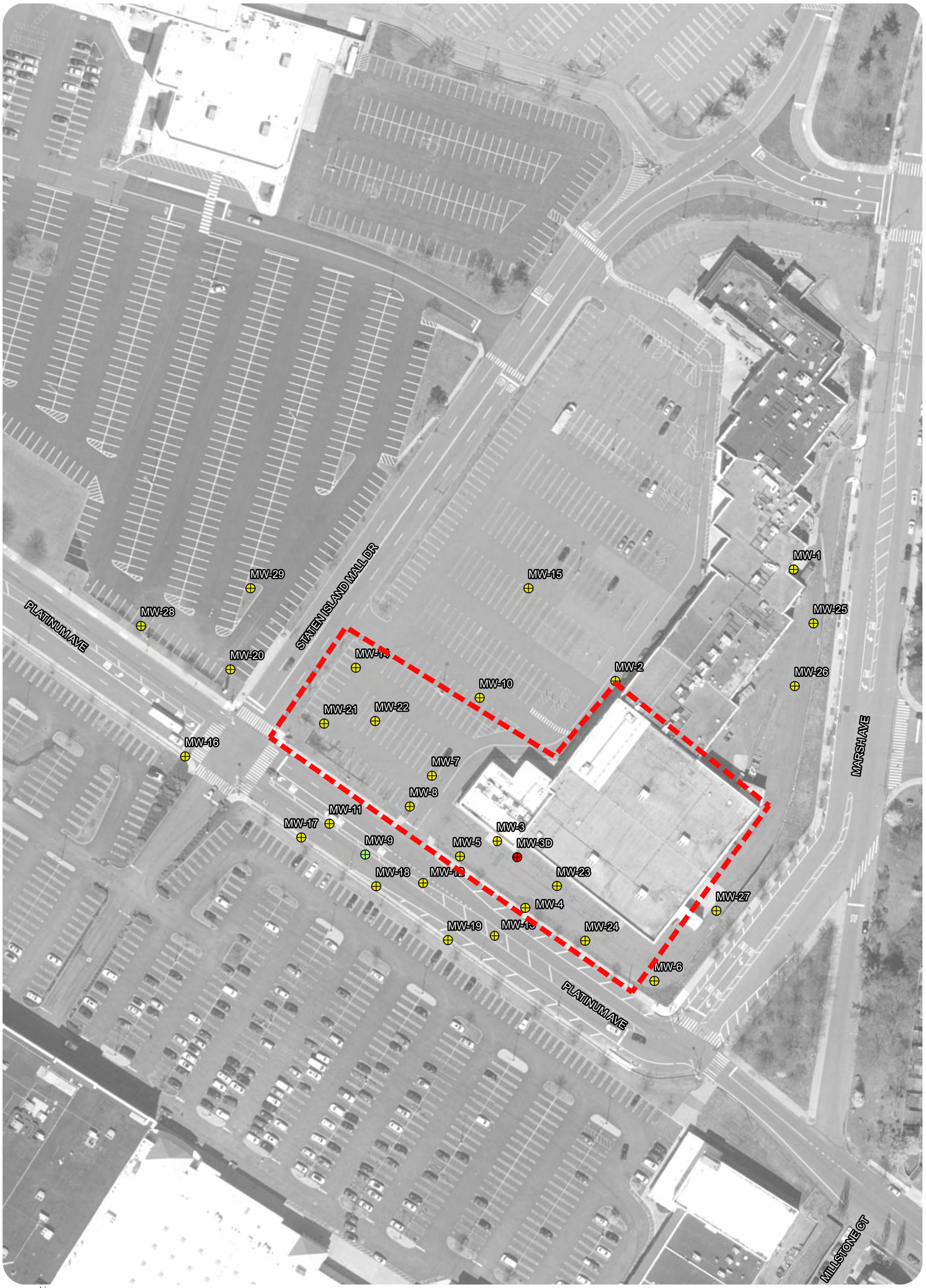
Notes:
[1] See Figure 2.
[2] BOD - Biological Oxygen Demand.
[3] COD - Chemical Oxygen Demand.
[4] TOC - Total Organic Carbon.
[5] Micrograms per liter.
[6] Milligrams per liter.
[7] NS - Not Sampled. MW-9 and MW-13 were not accessible due to street paving activities at the time of sampling.
[8] ND - Not Detected.
[9] Monitor Well MW-2 is located within the perimeter zone upgradient of the source area. This monitor well routinely exhibits microbiological activity.
[10] Elevated sample detection limit due to difficult sample matrix (sodium lactate content required 3 separate dilutions)
[11] MEK - 2-Butanone

FIGURES



X:\PROJECTS\BROOKFIELD PROPERTIES RETAIL\4213307 - FORMER CAROL CLEANERS SITE_GIS\StatenIsland_CarolCleaners\StatenIsland_CarolCleaners.aprx

PREPARED BY: AGB APPROVED BY: MGA DATE CREATED: 7/14/2021	TETRA TECH PREPARED BY: TETRATECH This drawing represents intellectual property of Tetra Tech. Any modification to the original by other than Tetra Tech personnel violates its original purpose and as such is rendered void. Tetra Tech will not be held liable for any changes made to this document without express written consent of the originator.	GGP STATEN ISLAND MALL, LLC CARL CLEANERS - THE CROSSINGS STATEN ISLAND, NEW YORK **SITE LOCATION**	FIGURE NO. **1** PROJECT NO. 4201222



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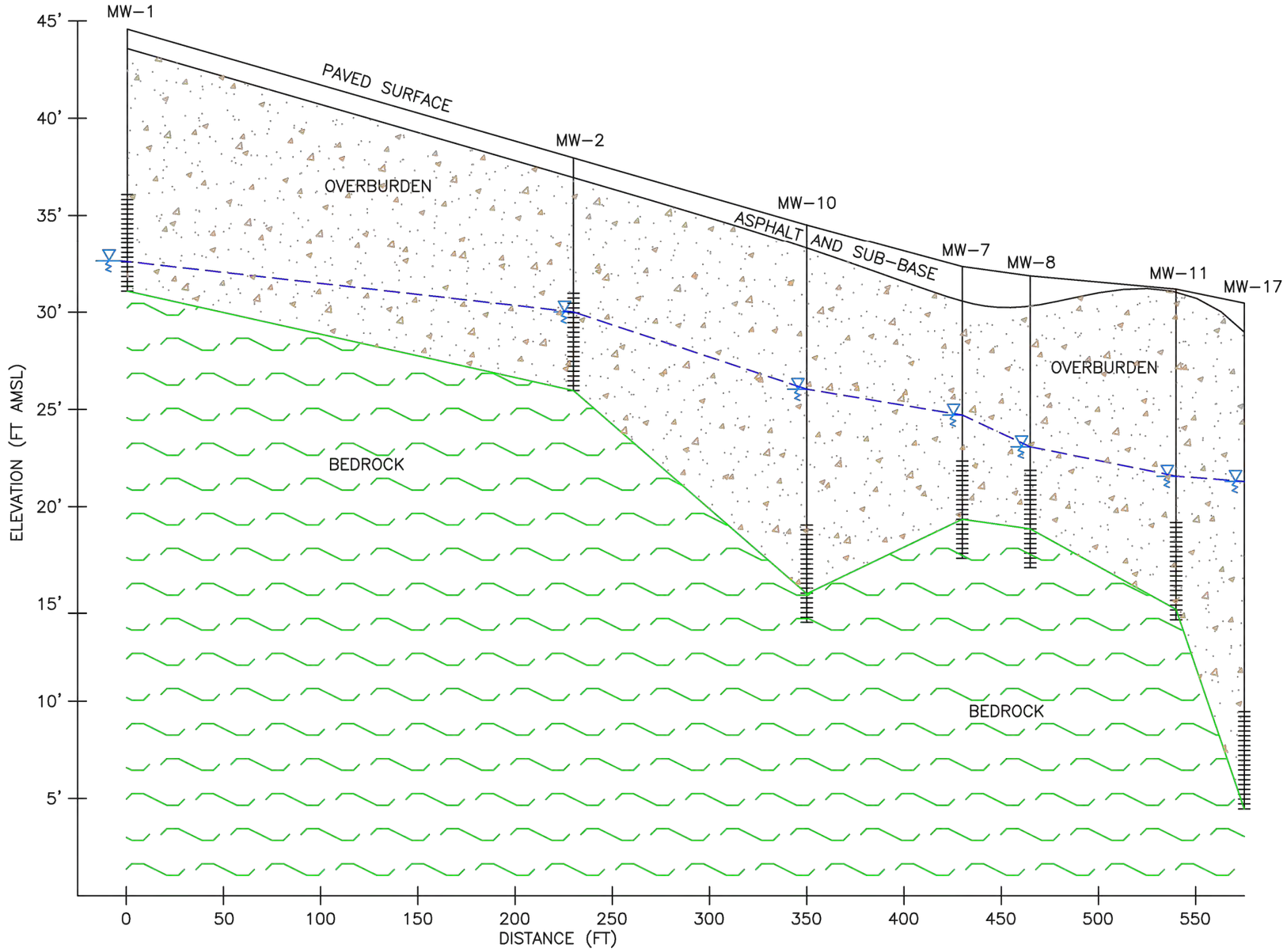
STATEN ISLAND, NEW YORK

SITE PLAN

FIGURE NO. 2
PROJECT NO. 4201222



LEGEND

SCREENED INTERVAL

GROUNDWATER ELEVATION

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY

DATE OF ISSUE

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GEOLOGIC CROSS SECTION

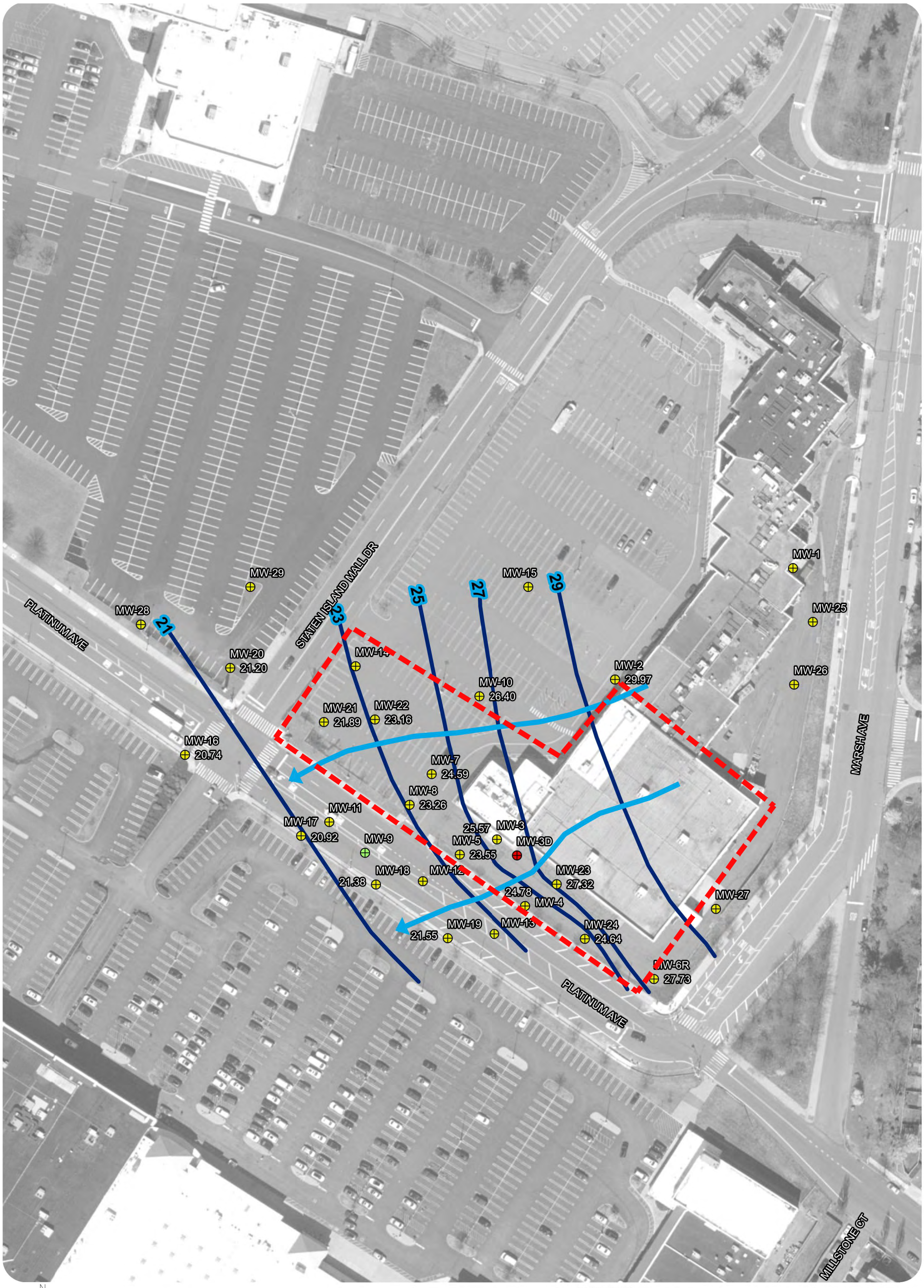
SHEET NO.

3

PROJECT NO.
4201222

File: \\tt.local\ceg\625\PROJECTS\BROOKFIELD PROPERTIES RETAIL\4213307 - FORMER CAROL CLEANERS SITE_Project Drawings\Border.dwg Layout: ANSI-B-L User: JISS.PHILIP May 30, 2023 - 11:59am

1" 1/2" 0" 1"



N

0 50 100 200

FEET

1" = 100'

LEGEND

- ABANDONED
- BEDROCK
- OVERBURDEN
- Site Boundary
- GROUNDWATER ELEVATION CONTOURS (FTAMSL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

DATE OF ISSUE

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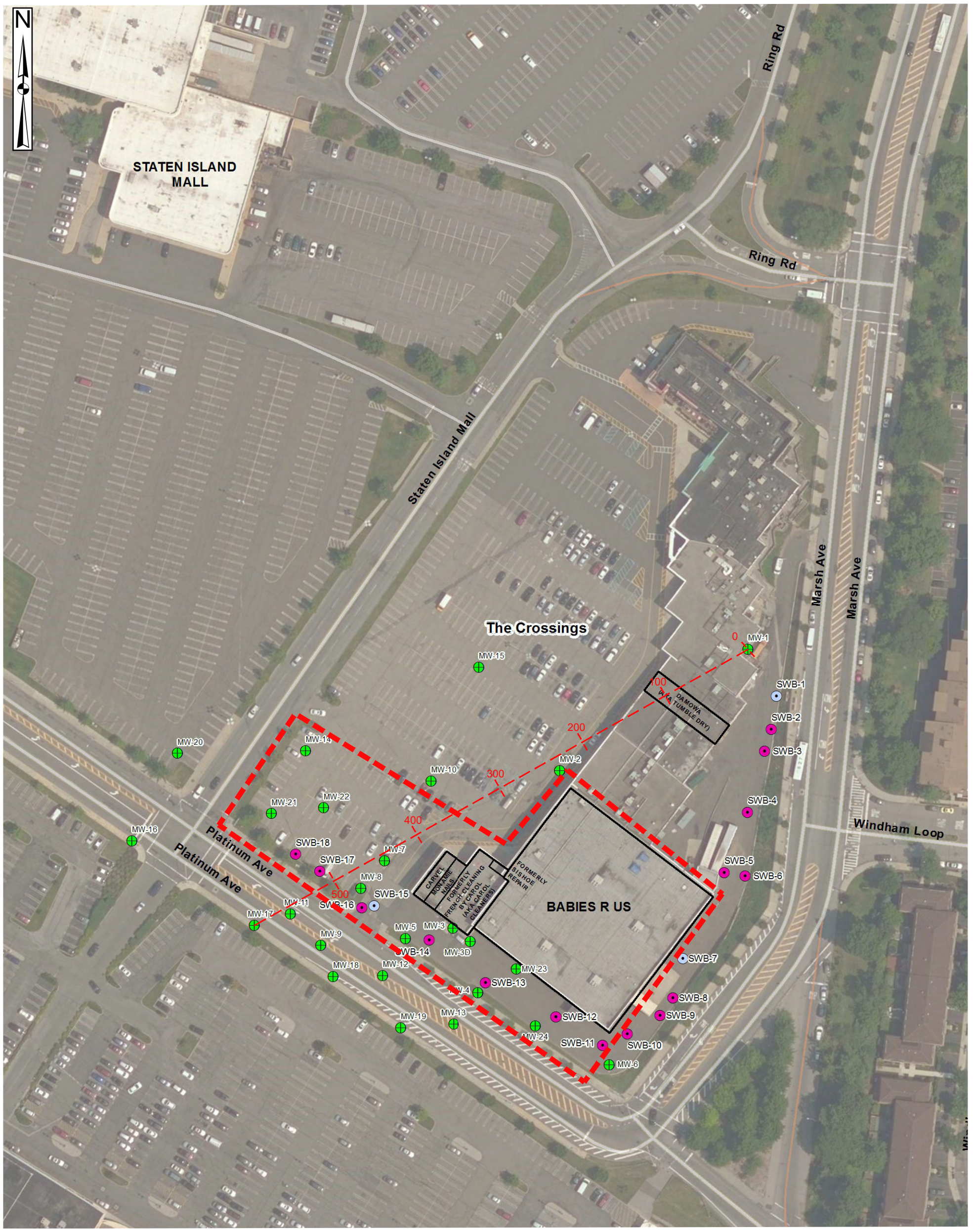
STATEN ISLAND, NEW YORK

GROUNDWATER CONTOURS AND FLOW DIRECTION - SEPT 28, 2021

FIGURE NO. 4

PROJECT NO. 4201222



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STATEN ISLAND, NEW YORK

HISTORICAL SOIL BORING LOCATIONS ASSOCIATED WITH CATCH BASIN INVESTIGATION

FIGURE NO.
5
PROJECT NO.
4201222

Legend

- MW-1 ND = Monitor Well with ID and Concentration in ppb
- MW-3D 1.5 = Bedrock Monitor Well with ID and Concentration in ppb
- MW-9 = Abandoned Monitor Well
- CB-4 = Stormwater System Component with Arrow Indicating Direction of Flow

PCE Concentration Contour (ppb)

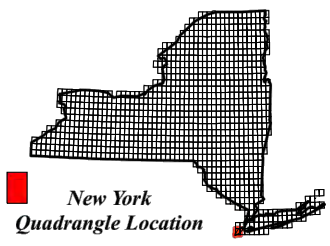
- ≥1
- ≥5
- ≥10
- ≥100

= Approximate Groundwater Flow Direction

— — Site Boundary

Notes: ND = Non-detect; NS = Not Sampled; J = Estimated Value; MW-3D is completed in bedrock and was not used for contours.

100 50 0 100 Feet



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_____ DESIGNED BY _____ APPROVED BY _____

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STATEN ISLAND, NEW YORK

PCE ISOPLETH MAP
JULY 2017

FIGURE NO. **6**
PROJECT NO. 4201222

File: \\tt.local\ceg\625\PROJECTS\BROOKFIELD PROPERTIES RETAIL\4213307 - FORMER CAROL CLEANERS SITE_Project Drawings\Border.dwg Layout: Figure 6 User: JISS.PHILIP May 31, 2023 - 12:40pm

MW-10	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/18/2017	ND	ND	0.53 J	ND	ND
1/9/2019	ND	ND	ND	ND	ND
4/19/2019	ND	ND	ND	ND	ND
7/18/2019	ND	ND	ND	ND	ND
10/25/2019	ND	ND	ND	ND	ND
1/29/2020	ND	ND	ND	ND	ND
4/22/2020	ND	ND	ND	ND	ND
7/8/2020	ND	ND	ND	ND	ND
10/21/2020	ND	ND	ND	ND	ND
3/17/2021	ND	ND	ND	ND	ND
5/24/2021	ND	ND	ND	ND	ND
9/30/2021	ND	ND	ND	ND	ND

MW-7	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/19/2017	**29.7**	0.68 J	ND	ND	ND
1/9/2019	ND	ND	ND	ND	ND
4/17/2019	ND	ND	ND	ND	ND
7/18/2019	ND	ND	ND	ND	ND
10/25/2019	ND	ND	ND	ND	ND
1/28/2020	ND	ND	ND	ND	ND
4/21/2020	ND	ND	ND	ND	1.7
7/7/2020	ND	ND	1.8	ND	1.8
10/23/2020	ND	0.96 J	ND	ND	ND
3/17/2021	ND	ND	ND	ND	ND
5/26/2021	ND	ND	ND	ND	ND
9/28/2021	ND	ND	ND	ND	ND

MW-2	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/18/2017	ND	ND	0.65 J	ND	ND
1/9/2019	ND	ND	ND	ND	0.95 J
4/19/2019	ND	ND	ND	ND	0.94 J
7/18/2019	ND	ND	ND	ND	1.2
10/29/2019	ND	ND	ND	ND	1.2
1/29/2020	ND	ND	ND	ND	ND
4/22/2020	ND	ND	ND	ND	ND
7/8/2020	ND	ND	ND	ND	ND
10/21/2020	ND	ND	ND	ND	ND
3/17/2021	ND	ND	ND	ND	ND
5/24/2021	ND	ND	ND	ND	ND
9/30/2021	ND	ND	ND	ND	ND

MW-3	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/19/2017	**89**	**91.4**	**132**	1.7	**24.9**
1/10/2019	ND	ND	ND	ND	ND
4/18/2019	ND	1.5 J	**5.6**	ND	ND
7/18/2019	ND	ND	ND	ND	ND
10/25/2019	ND	ND	ND	ND	ND
1/29/2020	ND	ND	ND	ND	ND
4/21/2020	4.1	1.7	1.4	ND	ND
7/7/2020	ND	ND	1.3 J	ND	ND
10/20/2020	ND	ND	2.1	ND	ND
3/18/2021	ND	1.5	3.6	ND	ND
5/27/2021	ND	0.58 J	4.6	4.3	**5.2**
9/29/2021	1	ND	0.55	ND	ND

MW-3D	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/19/2017	1.5	0.77 J	ND	ND	ND
1/10/2019	**5.4**	0.60 J	0.78 J	ND	ND
4/18/2019	3.4	ND	0.65 J	ND	ND
7/18/2019	2.9	ND	0.77 J	ND	ND
10/25/2019	**6.3**	ND	0.75 J	ND	ND
1/29/2020	3.7	ND	ND	ND	ND
4/21/2020	2.9	ND	ND	ND	ND
7/7/2020	4.6	ND	0.52 J	ND	ND
10/20/2020	3.3	ND	ND	ND	ND
3/18/2021	3	ND	ND	ND	ND
5/27/2021	2.8	ND	ND	ND	ND

MW-8	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/20/2017	**24**	3.2	1.6	ND	ND
1/9/2019	**17.2**	2	0.87 J	ND	ND
4/17/2019	**31.5**	3.2	1.2	ND	ND
7/18/2019	**32.3**	3.1	1.3	ND	ND
10/29/2019	ND	ND	ND	ND	ND
1/28/2020	ND	3.8	**11.4**	ND	**2.5**
4/21/2020	ND	0.81 J	0.83 J	ND	**8.2**
7/7/2020	ND	ND	2.3	ND	**10.4**
10/23/2020	ND	ND	ND	ND	ND
3/17/2021	ND	ND	ND	ND	ND
5/26/2021	ND	ND	ND	ND	ND
9/29/2021	ND	ND	ND	ND	ND

MW-5	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/19/2017	4.2	**5.2**	4.8	ND	ND
1/9/2019	4.3	2.2	2.1	ND	ND
4/18/2019	ND	ND	**5.5**	ND	ND
7/18/2019	ND	ND	**6.5**	ND	0.62 J
10/29/2019	ND	3.1	**6.6**	ND	0.84 J
1/28/2020	ND	ND	2.3	ND	ND
4/21/2020	ND	ND	1.3	ND	ND
7/7/2020	ND	0.97 J	**6.5**	ND	ND
10/23/2020	ND	ND	ND	ND	ND
3/19/2021	ND	ND	ND	ND	ND
5/27/2021	ND	ND	0.63	ND	ND
9/29/2021	ND	ND	2.7	ND	ND

MW-4	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/18/2017	1.4	2.8	**23.7**	4.7	**16.7**
1/8/2019	ND	ND	ND	ND	ND
4/18/2019	ND	ND	**20.6**	ND	ND
7/18/2019	ND	ND	ND	ND	ND
10/29/2019	ND	ND	ND	ND	ND
1/28/2020	ND	ND	ND	ND	ND
4/21/2020	ND	ND	**6.0 J**	ND	ND
7/7/2020	ND	ND	**8.5 J**	ND	ND
10/23/2020	ND	ND	1.5 J	ND	ND
3/19/2021	ND	ND	ND	ND	ND
5/27/2021	ND	ND	ND	ND	ND
9/29/2021	ND	ND	ND	ND	ND

MW-6R	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/17/2017	ND	ND	ND	ND	ND
1/9/2019	ND	ND	ND	ND	ND
4/19/2019	ND	ND	ND	ND	ND
7/18/2019	ND	ND	ND	ND	ND
10/25/2019	ND	ND	ND	ND	ND
1/29/2020	ND	ND	ND	ND	ND
4/22/2020	ND	ND	ND	ND	ND
7/8/2020	ND	ND	ND	ND	ND
10/21/2020	ND	ND	ND	ND	ND
3/18/2021	ND	ND	ND	ND	ND
5/24/2021	ND	ND	ND	ND	ND
9/29/2021	ND	ND	ND	ND	ND

N

0 50 100 200

FEET

1" = 100'

NOTES:

1. PARAMETERS SAMPLED INCLUDE TETRACHLOROETHENE (PERC), TRICHLOROETHENE (TCE), CIS-1,2-DICHLOROETHENE (cis-1,2-DCE), TRANS-1,2-DICHLOROETHENE (trans-1,2-DCE), AND VINYL CHLORIDE (VC).

2. CONCENTRATIONS MEASURED IN ug/L.

3. BOLDED VALUES INDICATE EXCEEDANCES.

LEGEND

- ABANDONED
- BEDROCK
- OVERBURDEN
- Site Boundary

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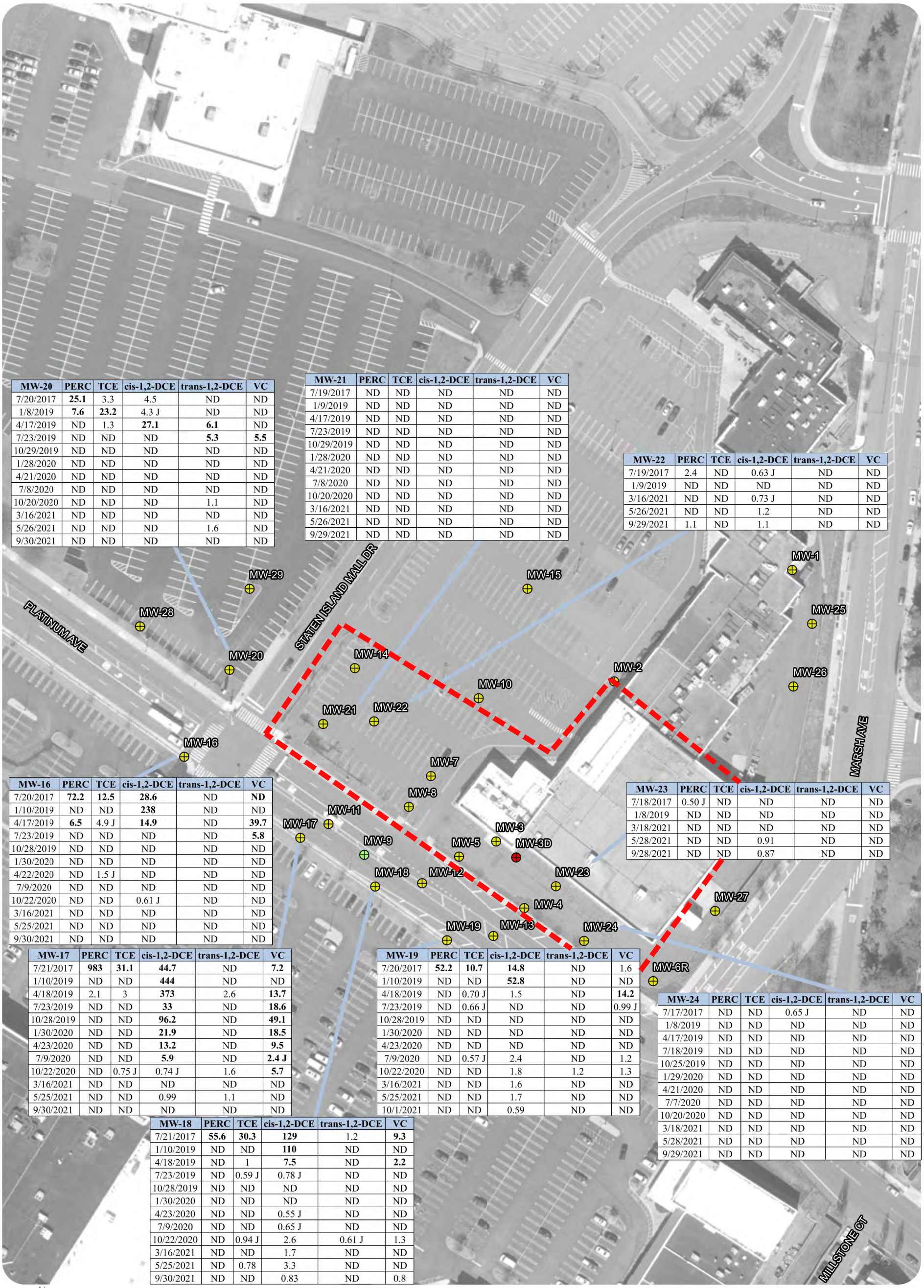
QUARTERLY CVOC MONITORING DATA

FIGURE NO. **7A**

PROJECT NO. 4201222



MW-20	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/20/2017	**25.1**	3.3	4.5	ND	ND
1/8/2019	**7.6**	**23.2**	4.3 J	ND	ND
4/17/2019	ND	1.3	**27.1**	**6.1**	ND
7/23/2019	ND	ND	ND	**5.3**	**5.5**
10/29/2019	ND	ND	ND	ND	ND
1/28/2020	ND	ND	ND	ND	ND
4/21/2020	ND	ND	ND	ND	ND
7/8/2020	ND	ND	ND	ND	ND
10/20/2020	ND	ND	ND	1.1	ND
3/16/2021	ND	ND	ND	ND	ND
5/26/2021	ND	ND	ND	1.6	ND
9/30/2021	ND	ND	ND	ND	ND

MW-21	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/19/2017	ND	ND	ND	ND	ND
1/9/2019	ND	ND	ND	ND	ND
4/17/2019	ND	ND	ND	ND	ND
7/23/2019	ND	ND	ND	ND	ND
10/29/2019	ND	ND	ND	ND	ND
1/28/2020	ND	ND	ND	ND	ND
4/21/2020	ND	ND	ND	ND	ND
7/8/2020	ND	ND	ND	ND	ND
10/20/2020	ND	ND	ND	ND	ND
3/16/2021	ND	ND	ND	ND	ND
5/26/2021	ND	ND	ND	ND	ND
9/29/2021	ND	ND	ND	ND	ND

MW-22	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/19/2017	2.4	ND	0.63 J	ND	ND
1/9/2019	ND	ND	ND	ND	ND
3/16/2021	ND	ND	0.73 J	ND	ND
5/26/2021	ND	ND	1.2	ND	ND
9/29/2021	1.1	ND	1.1	ND	ND

MW-16	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/20/2017	**72.2**	**12.5**	**28.6**	ND	**ND**
1/10/2019	ND	ND	**238**	ND	ND
4/17/2019	**6.5**	4.9 J	**14.9**	ND	**39.7**
7/23/2019	ND	ND	ND	ND	**5.8**
10/28/2019	ND	ND	ND	ND	ND
1/30/2020	ND	ND	ND	ND	ND
4/22/2020	ND	1.5 J	ND	ND	ND
7/9/2020	ND	ND	ND	ND	ND
10/22/2020	ND	ND	0.61 J	ND	ND
3/16/2021	ND	ND	ND	ND	ND
5/25/2021	ND	ND	ND	ND	ND
9/30/2021	ND	ND	ND	ND	ND

MW-23	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/18/2017	0.50 J	ND	ND	ND	ND
1/8/2019	ND	ND	ND	ND	ND
3/18/2021	ND	ND	ND	ND	ND
5/28/2021	ND	ND	0.91	ND	ND
9/28/2021	ND	ND	0.87	ND	ND

MW-17	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/21/2017	**983**	**31.1**	**44.7**	ND	**7.2**
1/10/2019	ND	ND	**444**	ND	ND
4/18/2019	2.1	3	**373**	2.6	**13.7**
7/23/2019	ND	ND	**33**	ND	**18.6**
10/28/2019	ND	ND	**96.2**	ND	**49.1**
1/30/2020	ND	ND	**21.9**	ND	**18.5**
4/23/2020	ND	ND	**13.2**	ND	**9.5**
7/9/2020	ND	ND	**5.9**	ND	**2.4 J**
10/22/2020	ND	0.75 J	0.74 J	1.6	**5.7**
3/16/2021	ND	ND	ND	ND	ND
5/25/2021	ND	ND	0.99	1.1	ND
9/30/2021	ND	ND	ND	ND	ND

MW-19	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/20/2017	**52.2**	**10.7**	**14.8**	ND	1.6
1/10/2019	ND	ND	**52.8**	ND	ND
4/18/2019	ND	0.70 J	1.5	ND	**14.2**
7/23/2019	ND	0.66 J	ND	ND	0.99 J
10/28/2019	ND	ND	ND	ND	ND
1/30/2020	ND	ND	ND	ND	ND
4/23/2020	ND	ND	ND	ND	ND
7/9/2020	ND	0.57 J	2.4	ND	1.2
10/22/2020	ND	ND	1.8	1.2	1.3
3/16/2021	ND	ND	1.6	ND	ND
5/25/2021	ND	ND	1.7	ND	ND
10/1/2021	ND	ND	0.59	ND	ND

MW-24	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/17/2017	ND	ND	0.65 J	ND	ND
1/8/2019	ND	ND	ND	ND	ND
4/17/2019	ND	ND	ND	ND	ND
7/18/2019	ND	ND	ND	ND	ND
10/25/2019	ND	ND	ND	ND	ND
1/29/2020	ND	ND	ND	ND	ND
4/21/2020	ND	ND	ND	ND	ND
7/7/2020	ND	ND	ND	ND	ND
10/20/2020	ND	ND	ND	ND	ND
3/18/2021	ND	ND	ND	ND	ND
5/28/2021	ND	ND	ND	ND	ND
9/29/2021	ND	ND	ND	ND	ND

MW-18	PERC	TCE	cis-1,2-DCE	trans-1,2-DCE	VC
7/21/2017	**55.6**	**30.3**	**129**	1.2	**9.3**
1/10/2019	ND	ND	**110**	ND	ND
4/18/2019	ND	1	**7.5**	ND	**2.2**
7/23/2019	ND	0.59 J	0.78 J	ND	ND
10/28/2019	ND	ND	ND	ND	ND
1/30/2020	ND	ND	ND	ND	ND
4/23/2020	ND	ND	0.55 J	ND	ND
7/9/2020	ND	ND	0.65 J	ND	ND
10/22/2020	ND	0.94 J	2.6	0.61 J	1.3
3/16/2021	ND	ND	1.7	ND	ND
5/25/2021	ND	0.78	3.3	ND	ND
9/30/2021	ND	ND	0.83	ND	0.8

N

0 50 100 200

FEET

1" = 100'

NOTES:

1. PARAMETERS SAMPLED INCLUDE TETRACHLOROETHENE (PERC), TRICHLOROETHENE (TCE), CIS-1,2-DICHLOROETHENE (cis-1,2-DCE), TRANS-1,2-DICHLOROETHENE (trans-1,2-DCE), AND VINYL CHLORIDE (VC).

2. CONCENTRATIONS MEASURED IN ug/L.

3. BOLDED VALUES INDICATE EXCEEDANCES.

LEGEND

- ABANDONED
- BEDROCK
- OVERBURDEN
- Site Boundary

DATE OF ISSUE

DRAWN BY _____ CHECKED BY _____

DESIGNED BY _____ APPROVED BY _____

cornerstone PLLC

GGP STATEN ISLAND MALL, LLC
FORMER CAROL CLEANERS SITE
STATEN ISLAND, NEW YORK

QUARTERLY CVOC MONITORING DATA

FIGURE NO.

7B

PROJECT NO.

4201222

Legend

- Monitor Well with ID
- SSD System Blower Location (on roof)
- SSD System Suction Point (in slab)
- SSD System Magnahelic Gage
- Catch Basin
- General Layout
- Environmental Easement Area
- Unpaved Areas within Environmental Easement Area

1, 2, 3, 4, 5, 6 Points of Bearing from Schedule A

100 50 0 100 Feet

NOTES:

1. INFORMATION SHOWN HEREIN WAS TAKEN FROM A DRAWING PREPARED BY LEGGETTE, BRASHEARS & GRAHAM, INC. DATED 10/07/2016, AND INCLUDED WITHIN CAROL CLEANERS EASEMENT WITH RECORDED DATED OF JUNE 6, 2016 AND SIGNED BY ROBERT W. SCHICK, DIRECTOR OF DIVISION OF ENVIRONMENTAL REMEDIATION, ON PAGE 6 PRESENTS SCHEDULE A.

DATE OF ISSUE _____ DRAWN BY _____ CHECKED BY _____
DESIGNED BY _____ APPROVED BY _____

cornerstone PLLC

GGP STATEN ISLAND MALL, LLC
FORMER CAROL CLEANERS SITE
STATEN ISLAND, NEW YORK

INSTITUTIONAL AND ENGINEERING CONTROLS

FIGURE NO. **8**

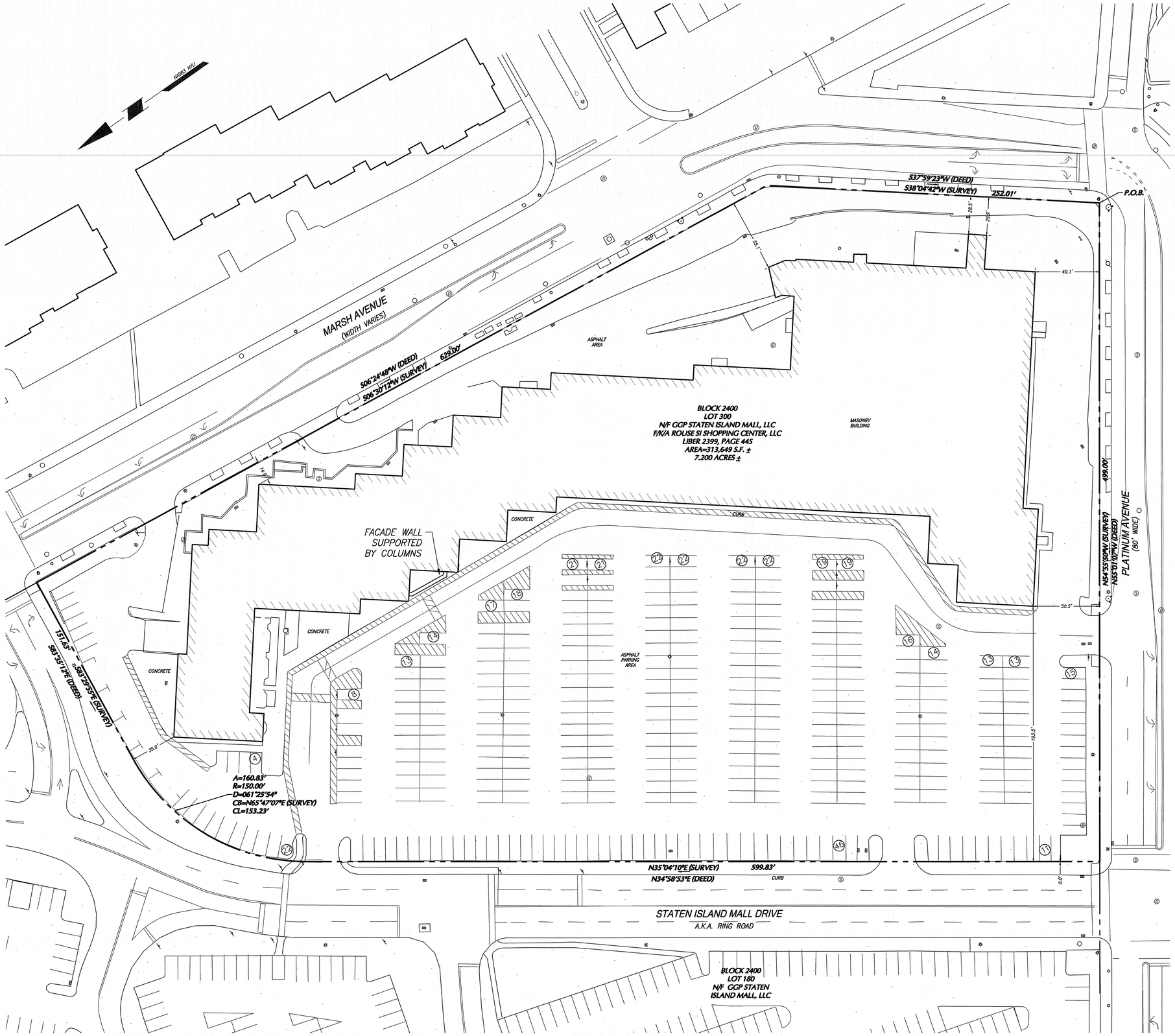
PROJECT NO. 4201222

File: \\tt.local\ceg\625\PROJECTS\BROOKFIELD PROPERTIES RETAIL\4213307 – FORMER CAROL CLEANERS SITE_Project Drawings\Border.dwg Layout: Figure 8 User: JISS.PHILIP May 31, 2023 – 12:45pm

APPENDICES

APPENDIX A DIGITAL COPY OF THE FER

APPENDIX B EASEMENT AND METES AND BOUNDS DESCRIPTION



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 NEW YORK ENVIRONMENTAL CONSERVATION LAW. THE ENGINEERING AND INSTITUTIONAL CONTROLS FOR THIS EASEMENT ARE SET FORTH IN THE SITE MANAGEMENT PLAN (SMP). A COPY OF THE SMP MUST BE OBTAINED BY ANY PARTY WITH AN INTEREST IN THE PROPERTY. THE SMP CAN BE OBTAINED FROM THE NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION, DIVISION OF ENVIRONMENTAL REMEDIATION, SITE CONTROL SECTION, 625 BROADWAY, ALBANY, NY 12233 OR AT "derweb@dec.ny.gov".

0 5 10 METERS

30 0 15 30 SCALE IN FEET

NOTES

1. THIS SURVEY IS BASED UPON EXISTING PHYSICAL CONDITIONS FOUND AT THE SUBJECT SITE, DEED INFORMATION AND THE FOLLOWING REFERENCES:
   - A. TITLE REPORT:
     BY: FIDELITY NATIONAL TITLE INSURANCE COMPANY
     DATE: 04/02/2015
     TITLE NO. 15-7406-35840-SI
   - B. MAP TITLED "ALTA/ACSM LAND TITLE SURVEY PREPARED FOR: GGP, GENERAL GROWTH PROPERTIES, INC., STATEN ISLAND MALL, 2655 RICHMOND AVENUE, BOROUGH OF STATEN ISLAND, COUNTY OF RICHMOND, STATE OF NEW YORK" DATED 7/28/2011 AND LAST REVISED 8/31/11 PREPARED BY MILLMAN SURVEY, INC.
   - C. AERIAL PHOTOGRAMMETRY PREPARED BY PROMAPS, JOB NO. 366912 DATE OF PHOTOGRAPHY 11-06-12.
   - D. MAP ENTITLED "BOUNDARY AND TOPOGRAPHIC SURVEY, STATEN ISLAND MALL, BLOCK NO. 2400, LOTS 7, 180 & 300, BOROUGH OF STATEN ISLAND, CITY OF NEW YORK, RICHMOND COUNTY, NEW YORK" PREPARED BY LANGAN AND DATED JANUARY 30, 2013.
   - E. THE DIGITAL TAX MAP OF THE CITY OF NEW YORK.
     http://gis.nyc.gov/taxmap/map.htm
2. THE SURVEYED PROPERTY IS SUBJECT TO BUT NOT LIMITED TO THE FOLLOWING FACTS AS REVEALED BY THE HEREON REFERENCED INFORMATION. THE INFORMATION SHOWN HEREON DOES NOT CONSTITUTE A TITLE SEARCH BY THE SURVEYOR. ALL INFORMATION THAT MAY AFFECT THE QUALITY OF TITLE TO BOTH THE SUBJECT AND ADJOINING PARCELS SHOULD BE VERIFIED BY AN ACCURATE AND CURRENT TITLE REPORT.

   SURVEY RELATED SCHEDULE B EXCEPTIONS:

   5 EASEMENT CONTAINED IN THE INSTRUMENTS RECORDED IN LIBER 2100 CP1 – EASEMENT AFFECTS LANDS EAST OF MARSH AVENUE, DOES NOT AFFECT SURVEYED PROPERTY;

   6 AMENDED AND RESTATED CONSTRUCTION, OPERATION AND RECIPROCAL AGREEMENT RECORDED IN REEL 3638 PAGE 84, AS AMENDED IN REEL 13853 PAGE 24 – BLANKET, AFFECTS SURVEYED PROPERTY;

   7 EASEMENT IN FAVOR OF NEW YORK TELEPHONE COMPANY IN REEL 4933 PAGE 277 – CANNOT PLOT;

   8 AGREEMENT RECORDED IN LIBER 2399 CP 466 – CANNOT PLOT;

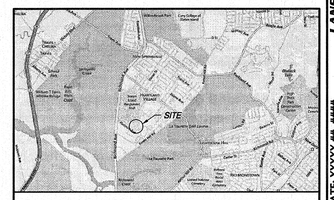
   9 NOTICE OF ORDER OF AGREEMENT IN REEL 14176 PAGE 334 – BLANKET, AFFECTS SURVEYED PROPERTY;
3. THE MERIDIAN OF THIS SURVEY IS REFERENCED TO NEW YORK STATE PLANE COORDINATE SYSTEM NAD 1983, NY LONG ISLAND. MERIDIAN ESTABLISHED USING GPS METHODS.
4. STREET NAMES AND R.O.W WIDTHS, BLOCK AND LOT NUMBERS AS PER MAPS REFERENCED IN NOTE 1.
5. PLANIMETRIC AND TOPOGRAPHIC INFORMATION SHOWN HEREON HAS BEEN OBTAINED FROM GROUND SURVEYS BY LANGAN ENGINEERING, ENVIRONMENTAL, SURVEYING AND LANDSCAPE ARCHITECTURE, D.P.C. FIELD WORK COMPLETED DURING THE MONTH OF DECEMBER 2012 AND APRIL 2015.
6. OFFSETS (IF SHOWN) ARE FOR SURVEY REFERENCES ONLY AND ARE NOT TO BE USED IN CONSTRUCTION OF ANY TYPE.
7. AS PER THE "NATIONAL FLOOD INSURANCE PROGRAM FIRM MAP ENTITLED FLOOD INSURANCE RATE MAP CITY OF NEW YORK, PANEL 308 OF 457, COMMUNITY PANEL NUMBER 360497030SF REVISED DATE SEPTEMBER 5, 2007" THE ENTIRE SUBJECT PROPERTY LIES WITHIN ZONE X, AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.
8. UNLESS SPECIFICALLY NOTED HEREON, STORM AND SANITARY SEWER INFORMATION (INCLUDING PIPE INVERT, PIPE MATERIAL, AND PIPE SIZE) WAS OBSERVED AND MEASURED AT FIELD LOCATED STRUCTURES MANHOLES / CATCH BASINS, ETC). CONDITIONS CAN VARY FROM THOSE ENCOUNTERED AT THE TIMES WHEN AND LOCATIONS WHERE DATA IS OBTAINED. DESPITE MEETING THE REQUIRED STANDARD OF CARE, THE SURVEYOR CANNOT, AND DOES NOT WARRANT THAT PIPE MATERIAL AND/OR PIPE SIZE THROUGHOUT THE PIPE RUN ARE THE SAME AS THOSE OBSERVED AT EACH STRUCTURE, OR THAT THE PIPE RUN IS STRAIGHT BETWEEN THE LOCATED STRUCTURES.

   ADDITIONAL UTILITY (WATER, GAS, ELECTRIC ETC.) DATA MAY BE SHOWN FROM FIELD LOCATED SURFACE MARKINGS (BY OTHERS), EXISTING STRUCTURES, AND/OR FROM EXISTING DRAWINGS,

   UNLESS SPECIFICALLY NOTED HEREON, THE SURVEYOR HAS NOT EXCAVATED TO PHYSICALLY LOCATE THE UNDERGROUND UTILITIES. THE SURVEYOR MAKES NO GUARANTEES THAT THE SHOWN UNDERGROUND UTILITIES ARE EITHER IN SERVICE, ABANDONED OR SUITABLE FOR USE, NOR ARE IN THE EXACT LOCATION OR CONFIGURATION INDICATED HEREON.

   PRIOR TO ANY DESIGN OR CONSTRUCTION, THE PROPER UTILITY AGENCIES MUST BE CONTACTED FOR VERIFICATION OF UTILITY TYPE AND FOR FIELD LOCATIONS.

   UNLESS NOTED BELOW SUPPLEMENTAL DOCUMENTS WERE NOT USED TO COMPILE THE SUBSURFACE UTILITY INFORMATION SHOWN HEREON.
9. THIS IS TO CERTIFY THAT THERE ARE NO STREAMS NOR NATURAL WATERCOURSES ON THE PROPERTY AS SHOWN ON THIS SURVEY.
10. UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.
11. THIS SURVEY IS NOT VALID WITHOUT THE INKED SEAL OF THE PROFESSIONAL.



PROJECT LOCATION MAP

SCALE: 1" = 2,000'

LEGEND (NOT SHOWN TO SCALE)

- HYDRANT
- STREET LIGHT
- AREA LIGHT
- SIGNAL POLE
- POLE
- ANCHOR POLE
- MANHOLE (TYPE AS LABELED)
- WATER VALVE
- GAS VALVE
- UNKNOWN VALVE
- CATCH BASIN
- SPOT ELEVATION
- CLEAN OUT
- TREE
- SIGN
- BOLLARD
- TRANSFORMER
- MONITOR WELL
- EP — EDGE OF PAVEMENT
- SWS — SINGLE WHITE STRIPE
- DYS — DOUBLE YELLOW STRIPE
- BC — BITUMINOUS CURB
- SC — STONE CURB
- CC — CONCRETE CURB
- GC — GRANITE CURB
- DW — DETECTABLE WARNING
- EW — EDGE OF WALK
- BIT — BITUMINOUS
- CNC — CONCRETE
- ENC — ENCROACHES
- CLR — CLEARS
- WD — WOOD
- CP — CONCRETE PAD
- OVERHEAD WIRE
- GUIDE RAIL WOOD
- GUIDE RAIL METAL
- TREE LINE
- CHAINLINK FENCE
- STOCKADE FENCE
- IRON FENCE
- EASEMENT LINE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- 177 — CONTOUR LINE
- G — GAS MARK OUT LINE
- W — WATER MARK OUT LINE
- E — ELECTRIC MARK OUT LINE
- T — COMMUNICATION MARK OUT LINE
- S — SANITARY MARK OUT LINE
- D — DRAINAGE MARK OUT LINE
- RE — REFERENCE UTILITY LINE (TYPE AS NOTED) – PLOTTED FROM EXISTING MAPPING

WRITTEN DESCRIPTION
BLOCK 2400 LOT 300
BOROUGH OF STATEN ISLAND
CITY OF NEW YORK
COUNTY OF RICHMOND
NEW YORK

BEGINNING at a point being the intersection of the northerly line of Platinum Avenue (80 feet wide) and the westerly line of Marsh Avenue (various widths) and running, thence

1. Along said northerly line of Platinum Avenue, North 54°55'50" West, a distance of 499.00 feet to a point; thence
2. North 35°04'10" East, a distance of 599.83 feet to a point of curvature; thence
3. Northeasterly along a curve to the right, having an arc distance of 160.83 feet, a radius of 150.00 feet and a central angle of 61°25'54" and being subtended by a chord which bears North 65°47'07" East 153.23 feet to a point; thence
4. South 83°29'55" East, a distance of 151.63 feet to a point on the aforementioned westerly line of Marsh Avenue; thence
5. Along said westerly line of Marsh Avenue, South 06°30'12" West, a distance of 629.00 feet to a point; thence
6. Still along said westerly line of Marsh Avenue, South 38°04'42" West, a distance of 252.01 feet to the point or place of BEGINNING.

Encompassing an area of 7.200 acres, more or less.

TO:

1. GGP STATEN ISLAND MALL, LLC F/K/A ROUSE SI SHOPPING CENTER, LLC, SUCCESSOR BY MERGER TO ROUSE SI SHOPPING CENTER
2. FIDELITY NATIONAL TITLE INSURANCE COMPANY

"I HEREBY STATE THAT THIS PLAN IS BASED ON A FIELD SURVEY MADE BY ME OR UNDER MY IMMEDIATE SUPERVISION IN ACCORDANCE WITH NYSPLS CODE OF PRACTICE FOR LAND SURVEYS, AND TO THE BEST OF MY PROFESSIONAL KNOWLEDGE, INFORMATION AND BELIEF, AND IN MY PROFESSIONAL OPINION, CORRECTLY REPRESENTS THE CONDITIONS FOUND ON THE DATE OF THE FIELD SURVEY AT THE SUBJECT PROPERTY" AND

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 3, 4, 8, 9, 11(a), 14, AND 15, OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED ON 11-06-12 AND FIELD VERIFIED DURING APRIL 2015.

Date:

Signature:

STATE OF NEW YORK — PAUL D. FISHER — LICENSED LAND SURVEYOR

PAUL D. FISHER
PROFESSIONAL LAND SURVEYOR
NY LIC. No. 050784-1

05/09/15	REVISE PER NEW TITLE REPORT	1
Date	Description	No.
REVISIONS		

LANGAN
River Drive Center 1, 618 River Drive, Elmwood Park, NJ 07407
T: 201.794.6900 F: 201.794.0366 www.langan.com
NEW JERSEY NEW YORK VIRGINIA CALIFORNIA
PENNSYLVANIA CONNECTICUT FLORIDA
ABU DHABI ATHENS DOHA
DUBAI ISTANBUL
Langan Engineering and Environmental Services, Inc.
Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan International LLC
Collectively known as Langan

Project	STATEN ISLAND MALL 280 PLATINUM AVENUE BLOCK No. 2400, LOT No. 300 BOROUGH OF STATEN ISLAND CITY OF NEW YORK RICHMOND COUNTY NEW YORK
Drawing Title	ALTA/ACSM LAND TITLE SURVEY
Project No.	100320901
Date	03/14/2013
Scale	1" = 30'
Drawn By	BP
Submission Date	X
Drawing No.	VL-101
Sheet	1 of 1

SUBMISSION DATE: XXXX ##, ####
PROJECT No. 100320901
LANGAN

Filename: \\Langan.com\data\EP\data9\100320901\Civil 3D\100320901-V-EX01.01 - Lot 300 Outbound.dwg Date: 5/11/2015 Time: 09:04 User: whoogsteen Style Table: Langan.stb Layout: ARCH-BL

Office of the
Richmond County Clerk
130 Stuyvesant Place
Staten Island, NY 10301

Hon. Stephen J. Fiala, County Clerk

ACS-000000000515495-000000000686140-010

Recording and Endorsement Cover Page

Document Type: EASEMENT COMMERCIAL
Document Page Count: 10

PRESENTER:	RETURN TO:
FIDELITY NATIONAL TITLE INSURANCE	FIDELITY NATIONAL TITLE INSURANCE
485 LEXINGTON AVENUE	485 LEXINGTON AVENUE
18TH FLOOR	18TH FLOOR- 35840-SI
NEW YORK,NY 10017	NEW YORK,NY 10017

PROPERTY DATA # OF BLOCKS 1 # OF LOTS 1

Block	Lot	Unit
2400	300	Entire Lot

PARTIES

GRANTOR	GRANTEE
GGP STATEN ISLAND MALL, LLC	THE PEOPLE OF THE STATE OF NEW YORK THROUGH
110 NORTH WACKER DRIVE	COMMISSIONER OF THE DEC
	625 BROADWAY
CHICAGO,IL 60606	NEW YORK,NY 12233

SUPPORTING DOCUMENTS

RPT
TP-584

PAYMENT DETAIL

Make Checks Payable to:

Richmond County Clerk:	55.00 Recording Fees
Total Payments For This Document:	55.00

FEES PAID

AG JUN 29 2016

EXAM _____ DATE _____

RECORDED IN RICHMOND COUNTY

JUN 30 2016

COUNTY CLERK

LAND DOC# 610219
23Z-EASEMENT
RETT: 7669 $.00
RPT: 7669 $.00
06/30/2016 11:16:03 A.M.
RECEIPT: 29655 FEE: $55.00
RICHMOND COUNTY CLERK

ENVIRONMENTAL EASEMENT GRANTED PURSUANT TO ARTICLE 71, TITLE 36 OF THE NEW YORK STATE ENVIRONMENTAL CONSERVATION LAW

THIS INDENTURE made this 13th day of June, 2016, between Owner(s) GGP Staten Island Mall, LLC f/k/a Rouse SI Shopping Center, LLC, having an office at 2655 Richmond Avenue, Staten Island, New York 10314, County of Richmond, 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 280 Platinum Avenue in the City of New York, County of Richmond and State of New York, known and designated on the tax map of the New York City Department of Finance as tax map parcel number: Block 2400 Lot 300, being a portion of the property conveyed to Grantor by deed dated November 1, 1980 and recorded in the Richmond County Clerk's Office in Liber and Page 2399/445. The property subject to this Environmental Easement (the "Controlled Property") comprises approximately 1.821 +/- acres, and is hereinafter more fully described in the Land Title Survey dated October 14, 2015 prepared by Paul D. Fisher, PLS of Langan Engineering and Environmental Services, Inc., 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 Order on Consent Index Number: R2-20111017-719, 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:

Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv)

(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 New York City Department of Health and Mental Hygiene 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 Residential or Restricted Residential purposes as defined in 6NYCRR 375-1.8(g)(2)(i) and (ii), 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 b 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: 243020
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.

Remainder of Page Intentionally Left Blank

IN WITNESS WHEREOF, Grantor has caused this instrument to be signed in its name.

GGP Staten Island Mall, LLC:

By: _____

Print Name: Marvin J. Levine

Title: Authorized Signatory Date: 6-7-2016

Grantor's Acknowledgment

STATE OF ~~NEW YORK~~ Illinois)
) ss:
COUNTY OF Cook)

On the 7th day of June, in the year 20 16, before me, the undersigned, personally appeared Marvin J Levine, 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~~ Illinois, County of Cook

OFFICIAL SEAL
KATYA R LEWANDOWSKA
NOTARY PUBLIC - STATE OF ILLINOIS
MY COMMISSION EXPIRES:10/30/16

OFFICIAL SEAL
KATYA R LEWANDOWSKA
NOTARY PUBLIC - STATE OF ILLINOIS
MY COMMISSION EXPIRES:10/30/16

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 13th day of June, in the year 2016, 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

David J. Chiusano
Notary Public, State of New York
No. 01CH5032146
Qualified in Schenectady County
Commission Expires August 22, 2018

SCHEDULE "A" PROPERTY DESCRIPTION

Beginning at the intersection of the southerly line of Staten Island Mall Drive (a.k.a. Ring Road), and the northerly line of Platinum Avenue (80' wide) and running, thence:

1. Along said southerly line of Staten Island Mall Drive, North 35°04'10" East, a distance of 141.65 feet to a point; thence
2. Leaving said southerly line, South 52°02'15" East, a distance of 261.99 feet to a point on the interior corner of a masonry building; thence
3. Along the westerly face of said masonry building North 38°02'56" East, a distance of 111.16 feet, to a point; thence
4. South 51°57'58" East, a distance of 189.16 feet to a point on the easterly face of said masonry building; thence
5. Along the said easterly face of masonry building and crossing a paved parking area, South 38°03'01" West, a distance of 229.96 feet to a point on the northerly line of Platinum Avenue; thence
6. Along said northerly line of Platinum Avenue, North 54°55'50" West, a distance of 444.38 feet the Point of Beginning.

Encompassing an area of 79,329 square feet or 1.821 acres.

N

STATEN ISLAND MALL

Ring Rd

Ring Rd

Staten Island Mall

The Crossings

Marsh Ave

Marsh Ave

Windham Loop

Platinum Ave

Platinum Ave

Millstone Ct

MW-1 - ND
MW-15 - ND
MW-20
MW-14 - 0.29
MW-10 - ND
MW-2 - ND
MW-21
MW-22
MW-16 - 72.6
MW-7 - 9.5
MW-8 - 29.1
CB-8A - NS
CB-8 - NS
MW-17 - 1,050
MW-11 - 318
MW-9 - 219
MW-5 - 41.1
MW-3 - 478
MW-3D - (3.4)
MW-18 - 315
MW-12 - 125
MW-23
CB-6 - NS
MW-4 - 886
MW-13 - 857
MW-19 - 313
MW-24
CB-4 - NS
CB-3 - NS
CB-2 - NS
CB-1 - NS
MW-6 - NS

FORMERLY SI SHOE REPAIR

CARVEL MONKAMIE NAILS

FORMERLY FRENCH CLEANING BY CAROL

CCGBR76
CCEANTECH 225
BRUGBRTG
Carol Cleaners Gages
Babies R Us Gages

BABIES R US

bing

© 2016 Microsoft Corporation

Legend

- Monitor Well with ID
- SSD System Blower Location (on roof)
- SSD System Suction Point (in slab)
- SSD System Magnahelic Gage
- Catch Basin
- General Layout
- Environmental Easement Area
- Unpaved Areas within Environmental Easement Area

100 50 0 100
Feet

New York
Quadrangle Location

BASE SOURCE: 2015 BING MAPS AERIAL

THE CROSSINGS
GGP STATEN ISLAND MALL, LLC
STATEN ISLAND, NEW YORK

INSTITUTIONAL AND ENGINEERING CONTROLS

Source:
LBG ENGINEERING SERVICES, PC
Professional Groundwater and Environmental Services
600 East Crescent Avenue, Suite 200
Upper Saddle River, New Jersey 07458
(201) 818-0700 www.lbgweb.com

DATE: 10/07/16

FILE: B:\Carol Cleaners\GIS\maps\ | DRAWN BY: ZT | CHECKED BY: CS | FIGURE: 6

Legend

- Monitor Well with ID
- SSD System Blower Location (on roof)
- SSD System Suction Point (in slab)
- SSD System Magnahelic Gage
- Catch Basin
- General Layout
- Environmental Easement Area
- Unpaved Areas within Environmental Easement Area

100 50 0 100 Feet

1, 2, 3, 4, 5, 6 Points of Bearing from Schedule A

NOTES:

1. INFORMATION SHOWN HEREIN WAS TAKEN FROM A DRAWING PREPARED BY LEGGETTE, BRASHEARS & GRAHAM, INC. DATED 10/07/2016, AND INCLUDED WITHIN CAROL CLEANERS EASEMENT WITH RECORDED DATED OF JUNE 6, 2016 AND SIGNED BY ROBERT W. SCHICK, DIRECTOR OF DIVISION OF ENVIRONMENTAL REMEDIATION, ON PAGE 6 PRESENTS SCHEDULE A.

ERICH ZIMMERMAN, P.E.

05/18/2023

NY PE License No. 081831-01 Date

cornerstone PLLC

GGP STATEN ISLAND MALL, LLC
FORMER CAROL CLEANERS SITE
STATEN ISLAND, NEW YORK

PREPARED BY: LBG ENGINEERING SERVICES, PC
INSTITUTIONAL AND ENGINEERING CONTROLS

FIGURE NO.

PROJECT NO. 4201222

File: \\tt.local\ceg\625\PROJECTS\BROOKFIELD PROPERTIES RETAIL\4213307 - FORMER CAROL CLEANERS SITE_Project Drawings\Brookfiled AS BUILT.dwg Layout: ANSI-B-P (2) User: JISS.PHILIP May 18, 2023 - 2:54pm

APPENDIX C GROUNDWATER MONITORING WELL CONSTRUCTION LOGS

GEOLOGIC LOG

Leggette, Brashears & Graham, Inc.
600 East Crescent Avenue, Suite 200
Upper Saddle River, New Jersey 07458
www.lbgweb.com

OWNER: GGP Staten Island Mall

WELL NO.: MW-25

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue Staten Island, New York	**SCREEN TYPE:** PVC	**DIAMETER:** 4”
	SLOT NO.: 20	**SETTING:** 8’-13’
DATE COMPLETED: 6/29/2017	**SAND PACK SIZE:** #2	
DRILLING COMPANY: AmeriDrill	**SETTING:** 7’-13’	
	CASING TYPE: PVC	**DIAMETER:** 4”
DRILLING METHOD: Hollow Stem Auger	**SETTING:** 0-13’	
SAMPLING METHOD: Split Spoon, 140 lb hammer	**SEAL TYPE:** Bentonite	
OBSERVER: SS, MK	**SETTING**: 7’-8’	
REFERENCE POINT (RP): Grade	**BACKFILL TYPE**: Cement Grout	
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**	
SURFACE COMPLETION: Flush Mount	**DEVELOPMENT METHOD**: Submersible Pump	
	DURATION: 1 Hour **ESTIMATED YIELD:** 1 gpm	
COMMENTS:		
ABBREVIATIONS: c = Coarse, m = Medium, f = Fine, SS = Split Spoon, C = Cuttings		

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	C	N/A		First 5’ was soft dig, not representative of
					overburden.
5	7	SS	5-6-7-10	1.1	Red Brown f SAND; with silt; some subangular
					to angular f m c gravel; few weathered bedrock
					at 1.1’; moist. PID=4.4 at 5.7’
7	10	C	N/A		Brown Red f Sand and Silt; with f m c
					subrounded gravel.
10	12	SS	17-18	1.1	Red Brown Silt and f m c Sand; some f m
					subrounded-subangular gravel; little weathered
					bedrock at 11.9’; moist.
12	15	C	N/A		Red Brown Silt and f m c Sand; some f m c

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					subrounded-subangular gravel; moist.
					-EOB, Bedrock at 13’-

GEOLOGIC LOG

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600 East Crescent Avenue, Suite 200
Upper Saddle River, New Jersey 07458
www.lbgweb.com

OWNER: GGP Staten Island Mall

WELL NO.: MW-26

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue Staten Island, New York	**SCREEN TYPE:** PVC	**DIAMETER:** 4”
	SLOT NO.: 20	**SETTING:** 9-14’
DATE COMPLETED: 6/28/2017	**SAND PACK SIZE:** #2	
DRILLING COMPANY: AmeriDrill	**SETTING:** 8-14’	
	CASING TYPE: PVC	**DIAMETER:** 4”
DRILLING METHOD: Hollow Stem Auger	**SETTING:** 0-14’	
SAMPLING METHOD: Split Spoon, 140 lb hammer	**SEAL TYPE:** Bentonite	
OBSERVER: SS, MK	**SETTING**: 8-9’	
REFERENCE POINT (RP): Grade	**BACKFILL TYPE**: Cement Grout	
ELEVATION OF RP:	**STATIC WATER LEVEL:**	**DATE:**
SURFACE COMPLETION: Flush Mount	**DEVELOPMENT METHOD**: Submersible Pump	
	DURATION: 1 Hour	**ESTIMATED YIELD:** 1 gpm
COMMENTS:		
ABBREVIATIONS: c = Coarse, m = Medium, f = Fine, SS = Split Spoon, C = Cuttings		

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	C	N/A		Soft dig, fill.
5	7	SS	9-9-22-22	2.0	5-6’ Red Brown Silt and f Sand; with f m c
					subangular gravel; tight; dry.
					6-7’ Weathered Bedrock; at 6.6’ bedrock
					cobble.
7	10	C	N/A		Light Brown Silt and f Sand; some f m c
					subrounded gravel.
10	12	SS	11-12-20-39	2.0	10-12’ Red Brown Silt and f m c Sand; with
					m c subangular-angular gravel; cobble at 10.9’;
					bedrock cobble at 11.6’; slightly moist. PID=0.3
					at 10’; PID= 1.2 at 12’

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
12	15	C	N/A		12-13.5’ Red Brown Silt and f Sand; with f m c
					subrounded-rounded gravel. Trace green
					bedrock sand.
					13.5-14’ Weathered Bedrock; very moist.
					-EOB Bedrock at 14’-

GEOLOGIC LOG

Leggette, Brashears & Graham, Inc.
600 East Crescent Avenue, Suite 200
Upper Saddle River, New Jersey 07458
www.lbgweb.com

OWNER: GGP Staten Island Mall

WELL NO.: MW-27

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: 280 Marsh Avenue Staten Island, New York	**SCREEN TYPE:** PVC	**DIAMETER:** 4”
	SLOT NO.: 20	**SETTING:** 5-10’
DATE COMPLETED: 6/28/2017	**SAND PACK SIZE:** #2	
DRILLING COMPANY: AmeriDrill	**SETTING:** 4-10’	
	CASING TYPE: PVC	**DIAMETER:** 4”
DRILLING METHOD: Hollow Stem Auger	**SETTING:** 0-10’	
SAMPLING METHOD: Split Spoon, 140 lb hammer	**SEAL TYPE:** Bentonite	
OBSERVER: SS, MK	**SETTING**: 3-4’	
REFERENCE POINT (RP): Grade	**BACKFILL TYPE**: Cement Grout	
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**	
SURFACE COMPLETION: Flush Mount	**DEVELOPMENT METHOD**: Submersible Pump	
	DURATION: 1 Hour **ESTIMATED YIELD:** 1 gpm	
COMMENTS:		
ABBREVIATIONS: c = Coarse, m = Medium, f = Fine, SS = Split Spoon, C = Cuttings		

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					Did not collect samples. The soil is not
					representative of the areas geology. It is backfill
					from SWB-8.
					-EOB Bedrock at 10’-

GEOLOGIC LOG

Leggette, Brashears & Graham, Inc.
600 East Crescent Avenue, Suite 200
Upper Saddle River, New Jersey 07458
www.lbgweb.com

OWNER: GGP Staten Island Mall

WELL NO.: MW-28

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue Staten Island, New York	**SCREEN TYPE:** PVC **DIAMETER:** 4”
	SLOT NO.: 20 **SETTING:** 17.5-22.5’
DATE COMPLETED: 6/29/2017	**SAND PACK SIZE:** #2
DRILLING COMPANY: AmeriDrill	**SETTING:** 16.5-22.5’
	CASING TYPE: PVC **DIAMETER:** 4”
DRILLING METHOD: Hollow Stem Auger	**SETTING:** 0-22.5’
SAMPLING METHOD: Split Spoon, 140 lb hammer	**SEAL TYPE:** Bentonite
OBSERVER: SS, MK	**SETTING**: 16.5-17.5’
REFERENCE POINT (RP): Grade	**BACKFILL TYPE**: Cement Grout
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION: Flush Mount	**DEVELOPMENT METHOD**: Submersible Pump
	DURATION: ~1 Hour **ESTIMATED YIELD:** 1 gpm
COMMENTS:	
ABBREVIATIONS: c = Coarse, m = Medium, f = Fine, SS = Split Spoon, C = Cuttings	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	C	N/A		Soft dig, fill material.
5	7	SS	10-12-17-10	0.3	Red Brown Clay and Silt; with f subrounded
					to subangular gravel; saturated.
7	10	C	N/A		7-9’ Red Brown Clay and Silt; with f
					subrounded to subangular gravel; moist
					9-10’ Dark Brown Clay and Silt; with organic
					material
10	12	SS	4-5-7-9	1.6	10-11’ Grey Brown Silt and f m c Sand; little
					f m c subrounded gravel.
					11-11.3’ Grey Brown Silt and f m c Sand; little
					f m c subrounded gravel; little organic matter;

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					clay pockets.
					11.3-12’ Red Brown f m c Sand and Silt; with
					f m c subangular to subround gravel; moist.
12	15	C	N/A		Brown Red Clay and Silt; some f m c sand;
					moist.
15	17	SS	2-11	1.2	15-17’ Fill material; Brown Red f m c SAND;
					little cobble; saturated.
17	20	C	N/A		Brown Red Clay and Silt; little f m c sand;
					moist.
20	22	SS	4-9-11-13	0.8	Red Brown Silt and Clay; with f m c subangular
					gravel.
22	25	C	N/A		Brown Red SILT; with f m c sand.
					-EOB Bedrock at 22.5’-

GEOLOGIC LOG

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Upper Saddle River, New Jersey 07458
www.lbgweb.com

OWNER: GGP Staten Island Mall

WELL NO.: MW-29

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue Staten Island, New York	**SCREEN TYPE:** PVC	**DIAMETER:** 4”
	SLOT NO.: 20	**SETTING:** 19-24’
DATE COMPLETED: 6/29/2017	**SAND PACK SIZE:** #2	
DRILLING COMPANY: AmeriDrill	**SETTING:** 18-24’	
	CASING TYPE: PVC	**DIAMETER:** 4”
DRILLING METHOD: Hollow Stem Auger	**SETTING:** 0-24’	
SAMPLING METHOD: Split Spoon, 140 lb hammer	**SEAL TYPE:** Bentonite	
OBSERVER: SS, MK	**SETTING**: 18-19’	
REFERENCE POINT (RP): Grade	**BACKFILL TYPE**: Cement Grout	
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**	
SURFACE COMPLETION: Flush Mount	**DEVELOPMENT METHOD**: Submersible Pump	
	DURATION: 1 Hour **ESTIMATED YIELD:** 1 gpm	
COMMENTS:		
ABBREVIATIONS: c = Coarse, m = Medium, f = Fine, SS = Split Spoon, C = Cuttings		

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	C	N/A		Soft dig, fill material.
5	7	SS	6-7-6-8	2.0	5-6.2’ Brown Red Silt and f Sand; with f m c
					subangular gravel; little clay; little weathered
					bedrock.
					6.2-7’ Dark Brown f Sand and Silt; some f m
					angular gravel; some organic material; slightly
					moist; tight.
7	10	C	N/A		Red Brown Clay and Silt; with f sand; some
					f m c subangular gravel; moist.
10	12	SS	3-12-17-11	1.5	10-10.8’ Brown Red Clay and Silt; with f sand;
					some f m angular gravel; slightly moist; tight.

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					10.8-11.0’ Dark Brown f Sand and Silt; some
					f m angular gravel; some organic material;
					slightly moist; tight.
					11-12’ Red Brown f m c SAND; with silt and
					f m c angular gravel; moist; little weathered
					bedrock.
12	15	C	N/A		Red Brown Clay and Silt; with f sand; some
					f m c subangular gravel; moist.
15	17	SS	3-4-15-15	1.8	15-15.2’ Dark Brown f Sand and Silt; some
					f m angular gravel; some organic material;
					slightly moist; tight.
					15.2-16.0’ Red Brown CLAY; with silt some
					f m c subangular to subround gravel; very tight;
					moist.
					16-17’ Red Brown f m c Sand and f m c
					subround to subangular Gravel; saturated.
17	20	C	N/A		Red Brown Silt; with clay; little organic material;
					some f rounded gravel; slightly moist.
20	22	SS	7-7-9-50/40	1.55	Red Brown Clay and Silt; with f m c angular to
					subangular gravel; little f m c sand; moist; tight.
					SS came up saturated; drillers were sending
					down water.
22	25	C	N/A		Red Brown Clay and Silt; with f m c sand;
					moist.
					-EOB Bedrock at 24’-

GEOLOGIC LOG

Leggette, Brashears & Graham, Inc.
600 East Crescent Avenue, Suite 200
Upper Saddle River, New Jersey 07458
www.lbgweb.com

OWNER: GGP Staten Island Mall

WELL NO.: MW-25

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue Staten Island, New York	**SCREEN TYPE:** PVC **DIAMETER:** 4"
	SLOT NO.: 20 **SETTING:** 8'-13'
DATE COMPLETED: 6/29/2017	**SAND PACK SIZE:** #2
DRILLING COMPANY: AmeriDrill	**SETTING:** 7'-13'
	CASING TYPE: PVC **DIAMETER:** 4"
DRILLING METHOD: Hollow Stem Auger	**SETTING:** 0-13'
SAMPLING METHOD: Split Spoon, 140 lb hammer	**SEAL TYPE:** Bentonite
OBSERVER: SS, MK	**SETTING:** 7'-8'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cement Grout
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION: Flush Mount	**DEVELOPMENT METHOD:** Submersible Pump
	DURATION: 1 Hour **ESTIMATED YIELD:** 1 gpm
COMMENTS:	
ABBREVIATIONS: c = Coarse, m = Medium, f = Fine, SS = Split Spoon, C = Cuttings	

DEPTH (FEET) FROM	TO	SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	5	C	N/A		First 5' was soft dig, not representative of
					overburden.
5	7	SS	5-6-7-10	1.1	Red Brown f SAND; with silt; some subangular
					to angular f m c gravel; few weathered bedrock
					at 1.1'; moist. PID=4.4 at 5.7'
7	10	C	N/A		Brown Red f Sand and Silt; with f m c
					subrounded gravel.
10	12	SS	17-18	1.1	Red Brown Silt and f m c Sand; some f m
					subrounded-subangular gravel; little weathered
					bedrock at 11.9'; moist.
12	15	C	N/A		Red Brown Silt and f m c Sand; some f m c

OWNER: GGP Staten Island Mall	
WELL NO.: MW-25	PAGE: 2 OF 2 PAGES

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					subrounded-subangular gravel; moist.
					-EOB, Bedrock at 13'-

GEOLOGIC LOG

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600 East Crescent Avenue, Suite 200
Upper Saddle River, New Jersey 07458
www.lbgweb.com

OWNER: GGP Staten Island Mall

WELL NO.: MW-26

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue Staten Island, New York	**SCREEN TYPE:** PVC **DIAMETER:** 4"
	SLOT NO.: 20 **SETTING:** 9-14'
DATE COMPLETED: 6/28/2017	**SAND PACK SIZE:** #2
DRILLING COMPANY: AmeriDrill	**SETTING:** 8-14'
	CASING TYPE: PVC **DIAMETER:** 4"
DRILLING METHOD: Hollow Stem Auger	**SETTING:** 0-14'
SAMPLING METHOD: Split Spoon, 140 lb hammer	**SEAL TYPE:** Bentonite
OBSERVER: SS, MK	**SETTING:** 8-9'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cement Grout
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION: Flush Mount	**DEVELOPMENT METHOD:** Submersible Pump
	DURATION: 1 Hour **ESTIMATED YIELD:** 1 gpm
COMMENTS:	
ABBREVIATIONS: c = Coarse, m = Medium, f = Fine, SS = Split Spoon, C = Cuttings	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	C	N/A		Soft dig, fill.
5	7	SS	9-9-22-22	2.0	5-6' Red Brown Silt and f Sand; with f m c
					subangular gravel; tight; dry.
					6-7' Weathered Bedrock; at 6.6' bedrock
					cobble.
7	10	C	N/A		Light Brown Silt and f Sand; some f m c
					subrounded gravel.
10	12	SS	11-12-20-39	2.0	10-12' Red Brown Silt and f m c Sand; with
					m c subangular-angular gravel; cobble at 10.9';
					bedrock cobble at 11.6'; slightly moist. PID=0.3
					at 10'; PID= 1.2 at 12'

OWNER: GGP Staten Island Mall

WELL NO.: MW-26

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
12	15	C	N/A		12-13.5' Red Brown Silt and f Sand; with f m c
					subrounded-rounded gravel. Trace green
					bedrock sand.
					13.5-14' Weathered Bedrock; very moist.
					-EOB Bedrock at 14'-

GEOLOGIC LOG

Leggette, Brashears & Graham, Inc.
600 East Crescent Avenue, Suite 200
Upper Saddle River, New Jersey 07458
www.lbgweb.com

OWNER: GGP Staten Island Mall

WELL NO.: MW-27

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: 280 Marsh Avenue Staten Island, New York	**SCREEN TYPE:** PVC **DIAMETER:** 4"
	SLOT NO.: 20 **SETTING:** 5-10'
DATE COMPLETED: 6/28/2017	**SAND PACK SIZE:** #2
DRILLING COMPANY: AmeriDrill	**SETTING:** 4-10'
	CASING TYPE: PVC **DIAMETER:** 4"
DRILLING METHOD: Hollow Stem Auger	**SETTING:** 0-10'
SAMPLING METHOD: Split Spoon, 140 lb hammer	**SEAL TYPE:** Bentonite
OBSERVER: SS, MK	**SETTING:** 3-4'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cement Grout
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION: Flush Mount	**DEVELOPMENT METHOD:** Submersible Pump
	DURATION: 1 Hour **ESTIMATED YIELD:** 1 gpm
COMMENTS:	
ABBREVIATIONS: c = Coarse, m = Medium, f = Fine, SS = Split Spoon, C = Cuttings	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					Did not collect samples. The soil is not
					representative of the areas geology. It is backfill
					from SWB-8.
					-EOB Bedrock at 10'-

GEOLOGIC LOG

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OWNER: GGP Staten Island Mall

WELL NO.: MW-28

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue Staten Island, New York	**SCREEN TYPE:** PVC **DIAMETER:** 4"
	SLOT NO.: 20 **SETTING:** 17.5-22.5'
DATE COMPLETED: 6/29/2017	**SAND PACK SIZE:** #2
DRILLING COMPANY: AmeriDrill	**SETTING:** 16.5-22.5'
	CASING TYPE: PVC **DIAMETER:** 4"
DRILLING METHOD: Hollow Stem Auger	**SETTING:** 0-22.5'
SAMPLING METHOD: Split Spoon, 140 lb hammer	**SEAL TYPE:** Bentonite
OBSERVER: SS, MK	**SETTING:** 16.5-17.5'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cement Grout
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION: Flush Mount	**DEVELOPMENT METHOD:** Submersible Pump
	DURATION: ~1 Hour **ESTIMATED YIELD:** 1 gpm
COMMENTS:	
ABBREVIATIONS: c = Coarse, m = Medium, f = Fine, SS = Split Spoon, C = Cuttings	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	C	N/A		Soft dig, fill material.
5	7	SS	10-12-17-10	0.3	Red Brown Clay and Silt; with f subrounded
					to subangular gravel; saturated.
7	10	C	N/A		7-9' Red Brown Clay and Silt; with f
					subrounded to subangular gravel; moist
					9-10' Dark Brown Clay and Silt; with organic
					material
10	12	SS	4-5-7-9	1.6	10-11' Grey Brown Silt and f m c Sand; little
					f m c subrounded gravel.
					11-11.3' Grey Brown Silt and f m c Sand; little
					f m c subrounded gravel; little organic matter;

OWNER: GGP Staten Island Mall

WELL NO.: MW-28 **PAGE:** 2 **OF** 2 **PAGES**

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					clay pockets.
					11.3-12' Red Brown f m c Sand and Silt; with
					f m c subangular to subround gravel; moist.
12	15	C	N/A		Brown Red Clay and Silt; some f m c sand;
					moist.
15	17	SS	2-11	1.2	15-17' Fill material; Brown Red f m c SAND;
					little cobble; saturated.
17	20	C	N/A		Brown Red Clay and Silt; little f m c sand;
					moist.
20	22	SS	4-9-11-13	0.8	Red Brown Silt and Clay; with f m c subangular
					gravel.
22	25	C	N/A		Brown Red SILT; with f m c sand.
					-EOB Bedrock at 22.5'-

GEOLOGIC LOG

Leggette, Brashears & Graham, Inc.
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Upper Saddle River, New Jersey 07458
www.lbgweb.com

OWNER: GGP Staten Island Mall

WELL NO.: MW-29

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue Staten Island, New York	**SCREEN TYPE:** PVC	**DIAMETER:** 4"
	SLOT NO.: 20	**SETTING:** 19-24'
DATE COMPLETED: 6/29/2017	**SAND PACK SIZE:** #2	
DRILLING COMPANY: AmeriDrill	**SETTING:** 18-24'	
	CASING TYPE: PVC	**DIAMETER:** 4"
DRILLING METHOD: Hollow Stem Auger	**SETTING:** 0-24'	
SAMPLING METHOD: Split Spoon, 140 lb hammer	**SEAL TYPE:** Bentonite	
OBSERVER: SS, MK	**SETTING:** 18-19'	
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cement Grout	
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**	
SURFACE COMPLETION: Flush Mount	**DEVELOPMENT METHOD:** Submersible Pump	
	DURATION: 1 Hour **ESTIMATED YIELD:** 1 gpm	
COMMENTS:		
ABBREVIATIONS: c = Coarse, m = Medium, f = Fine, SS = Split Spoon, C = Cuttings		

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	C	N/A		Soft dig, fill material.
5	7	SS	6-7-6-8	2.0	5-6.2' Brown Red Silt and f Sand; with f m c
					subangular gravel; little clay; little weathered
					bedrock.
					6.2-7' Dark Brown f Sand and Silt; some f m
					angular gravel; some organic material; slightly
					moist; tight.
7	10	C	N/A		Red Brown Clay and Silt; with f sand; some
					f m c subangular gravel; moist.
10	12	SS	3-12-17-11	1.5	10-10.8' Brown Red Clay and Silt; with f sand;
					some f m angular gravel; slightly moist; tight.

OWNER: GGP Staten Island Mall

WELL NO.: MW-29 **PAGE:** 2 **OF** 2 **PAGES**

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					10.8-11.0' Dark Brown f Sand and Silt; some
					f m angular gravel; some organic material;
					slightly moist; tight.
					11-12' Red Brown f m c SAND; with silt and
					f m c angular gravel; moist; little weathered
					bedrock.
12	15	C	N/A		Red Brown Clay and Silt; with f sand; some
					f m c subangular gravel; moist.
15	17	SS	3-4-15-15	1.8	15-15.2' Dark Brown f Sand and Silt; some
					f m angular gravel; some organic material;
					slightly moist; tight.
					15.2-16.0' Red Brown CLAY; with silt some
					f m c subangular to subround gravel; very tight;
					moist.
					16-17' Red Brown f m c Sand and f m c
					subround to subangular Gravel; saturated.
17	20	C	N/A		Red Brown Silt; with clay; little organic material;
					some f rounded gravel; slightly moist.
20	22	SS	7-7-9-50/40	1.55	Red Brown Clay and Silt; with f m c angular to
					subangular gravel; little f m c sand; moist; tight.
					SS came up saturated; drillers were sending
					down water.
22	25	C	N/A		Red Brown Clay and Silt; with f m c sand;
					moist.
					-EOB Bedrock at 24'-

MW-28
N 635659.99
E 584766.67
GRADE EL. 29.06
PVC EL. 28.69

REF: NAD83

MW-29
N 635698.25
E 584883.72
GRADE EL. 31.57
PVC EL. 31.28

MW-16
N 635523.920
E 584811.789
GRADE EL. 29.72
PVC EL 29.46

MW-20
N 635611.877
E 584862.831
GRADE EL. 29.79
PVC EL. 29.53

CB
EL. 29.44

MW-14
N 635612.138
E 584996.270
GRADE EL. 32.23
PVC EL. 31.67

SB 8
N 635475.929
E 584928.623
GRADE EL. 30.87

CB
EL. 29.91

MW-21
N 635552.252
E 584958.476
GRADE EL. 30.48
PVC EL. 30.19

MW-17
N 635435.119
E 584939.484
GRADE EL. 30.47
PVC EL. 30.05

MW-22
N 635556.833
E 585017.991
GRADE EL. 31.65
PVC EL. 31.31

MW-11
N 635439.976
E 584979.639
GRADE EL. 31.19
PVC EL. 30.71

MW-15
N 635699.984
E 585179.178
GRADE EL. 36.97
PVC EL. 36.51

MW-8
N 635466.785
E 585054.151
GRADE EL. 31.86
PVC EL. 31.31

MW-9
N 635406.552
E 585012.175
GRADE EL. 31.30
PVC EL. 31.06

MW-10
N 635579.947
E 585127.788
GRADE EL. 34.53
PVC EL. 34.21

MW-7
N 635495.781
E 585079.136
GRADE EL. 32.35
PVC EL. 32.05

CB 8
EL. 30.47

MW-18
N 635380.194
E 585019.466
GRADE EL. 31.05
PVC EL. 30.67

SB 6
N 635443.864
E 585060.348
GRADE EL. 30.38

CB 8A
EL. 30.59

MW-12
N 635374.608
E 585077.204
GRADE EL. 32.13
PVC EL. 31.77

MW-2
N 635590.694
E 585263.954
GRADE EL. 37.97
PVC EL. 37.74

MW-5
N 635414.101
E 585101.476
GRADE EL. 31.98
PVC EL. 31.60

MW-3
N 635424.863
E 585150.454
GRADE EL. 32.59
PVC EL. 32.12

MW-19
N 635328.223
E 585093.432
GRADE EL. 32.37
PVC EL. 31.82

MW-3D
N 635410.928
E 585170.391
GRADE EL. 32.85
PVC EL. 32.46

MW-13
N 635323.911
E 585152.318
GRADE EL. 33.81
PVC EL. 33.38

CB 6
EL. 32.61

MW-23
N 635383.273
E 585211.324
GRADE EL. 33.43
PVC EL. 33.05

STATEN ISLAND MALL

SB 9
N 635312.536
E 585166.447
GRADE EL. 34.09

MW-4
GRID N:635365.373
GRID E:585177.033
GRADE EL. 33.02
PVC EL. 32.68

SB 6
N 635371.445
E 585188.570
GRADE EL. 32.71

MW-24
N 635325.771
E 585242.689
GRADE EL. 33.90
PVC EL. 33.28

MW-1
N 635718.820
E 585461.919
GRADE EL. 44.58
PVC EL. 44.28

SB 4
N 635641.675
E 585484.932
GRADE EL. 41.04

MW-25
N 635664.48
E 585482.28
GRADE EL. 41.87
PVC EL. 41.41

SB 5
N 635527.077
E 585378.914
GRADE EL. 37.49

MW-26
N 635597.34
E 585462.59
GRADE EL. 39.18
PVC EL. 38.77

CB 4
EL. 40.88

SB 10
N 635269.014
E 585228.645
GRADE EL. 35.47

SB 1
N 635307.952
E 585308.150
GRADE EL. 34.80

SB 3
N 635483.329
E 585456.225
GRADE EL. 34.48

SB 11
N 635239.736
E 585271.341
GRADE EL. 36.34

MW-6R
N 635280.268
E 585315.573
GRADE EL. 35.16
PVC EL. 34.85

CB 1
EL. 34.73

SB 2
N 635338.015
E 585367.294
GRADE EL. 34.60

MW-27
N 635358.68
E 585380.63
GRADE EL. 34.47
PVC EL. 34.10

CB 2
EL. 34.21

CB 3
EL. 34.17

GRAPHIC SCALE
40 0 20 40 80
1" = 40'

HORIZONTAL DATUM IS BASED ON NAD 83.
VERTICAL DATUM IS NAVD88.

MONITORING WELL & SOIL BORING LOCATIONS FOR

STATEN ISLAND MALL
STATEN ISLAND , NY

C:\Land Projects 3\11-55 LBG Staten Island Mall\dwg\11-55 LBG Staten Island Mall.dwg 8/9/2017 6:18:18 AM EDT

REF: NAD83

CB
GRATE EL. 29.44

CB-1
N 635531.87
E 584948.67
GRATE EL. 29.95
INV IN EL. 23.91
INV OUT EL. 23.28
BOTTOM EL. 23.12

174'

CB-3
N 635455.35
E 585061.61
GRATE EL. 30.68
INV IN EL. 25.96
INV OUT EL. NOT VISIBLE
BOTTOM EL. 23.46

CB-2
N 635446.57
E 585058.53
GRATE EL. 30.46
INV IN EL. 25.96
INV OUT EL. NOT VISIBLE
BOTTOM EL. 23.46

146'

CB-19
N 636042.46
E 585432.53
GRATE EL. 44.77
INV OUT EL. 41.77
BOTTOM EL. 39.60

108'

CB-18
N 635967.39
E 585514.08
GRATE EL. 48.60
INV IN NOT VISIBLE
INV OUT EL. 40.43
BOTTOM EL. 40.35

45'

CB-17
N 635921.69
E 585513.31
GRATE EL. 44.98
INV IN NOT VISIBLE
INV OUT EL. 40.19
BOTTOM EL. 37.90

52'

CB-15
N 635856.48
E 585497.45
GRATE EL. 45.44
INV IN NOT VISIBLE
INV OUT EL. 39.43
BOTTOM EL. 37.11

CB-16
NOT FOUND

CB-14
N 635805.13
E 585474.41
GRATE EL. 45.08
INV IN NOT VISIBLE
INV OUT EL. 38.96
BOTTOM EL. 36.08

42'

CB-13
N 635761.25
E 585480.56
GRATE EL. 45.30
INV IN NOT VISIBLE
INV OUT EL. 38.05
BOTTOM EL. 35.72

113'

CB-4
N 635366.36
E 585185.82
GRATE EL. 32.61
INV IN EL. 28.69
INV OUT EL. 28.69
BOTTOM EL. 26.44

138'

MH-11
N 635517.15
E 585380.74
RIM EL. 37.17
INV OUT EL. 31.50
BOTTOM EL. 31.21

CB-10
N 635513.37
E 585421.85
GRATE EL. 34.22
INV OUT EL. 31.89
BOTTOM EL. 31.64

84'

156'

CB-12
N 635644.65
E 585488.42
GRATE EL. 40.93
INV IN EL. 35.93
INV OUT EL. 35.85
BOTTOM EL. 33.51

CB-5
N 635302.63
E 585312.46
GRATE EL. 34.74
INV IN EL. 30.24
INV OUT EL. 30.24
BOTTOM EL. 27.74

71'

24'

105'

165'

CB-6
N 635338.15
E 585376.56
GRATE EL. 34.21
INV IN EL. 30.46
INV OUT EL. 30.46
BOTTOM EL. 28.63

CB-7
N 635361.18
E 585363.01
GRATE EL. 34.16
INV IN EL. 30.66
INV OUT EL. 30.60
BOTTOM EL. 28.95

MH-8
N 635448.40
E 585423.27
RIM EL. 34.96
INV OUT EL. 30.96
BOTTOM EL. 29.88

CB-9
N 635485.58
E 585461.98
GRATE EL. 34.16
INV IN EL. 30.91
INV OUT EL. 30.83
BOTTOM EL. 30.16

STATEN ISLAND MALL

GRAPHIC SCALE

40 0 20 40 80

1" = 40'

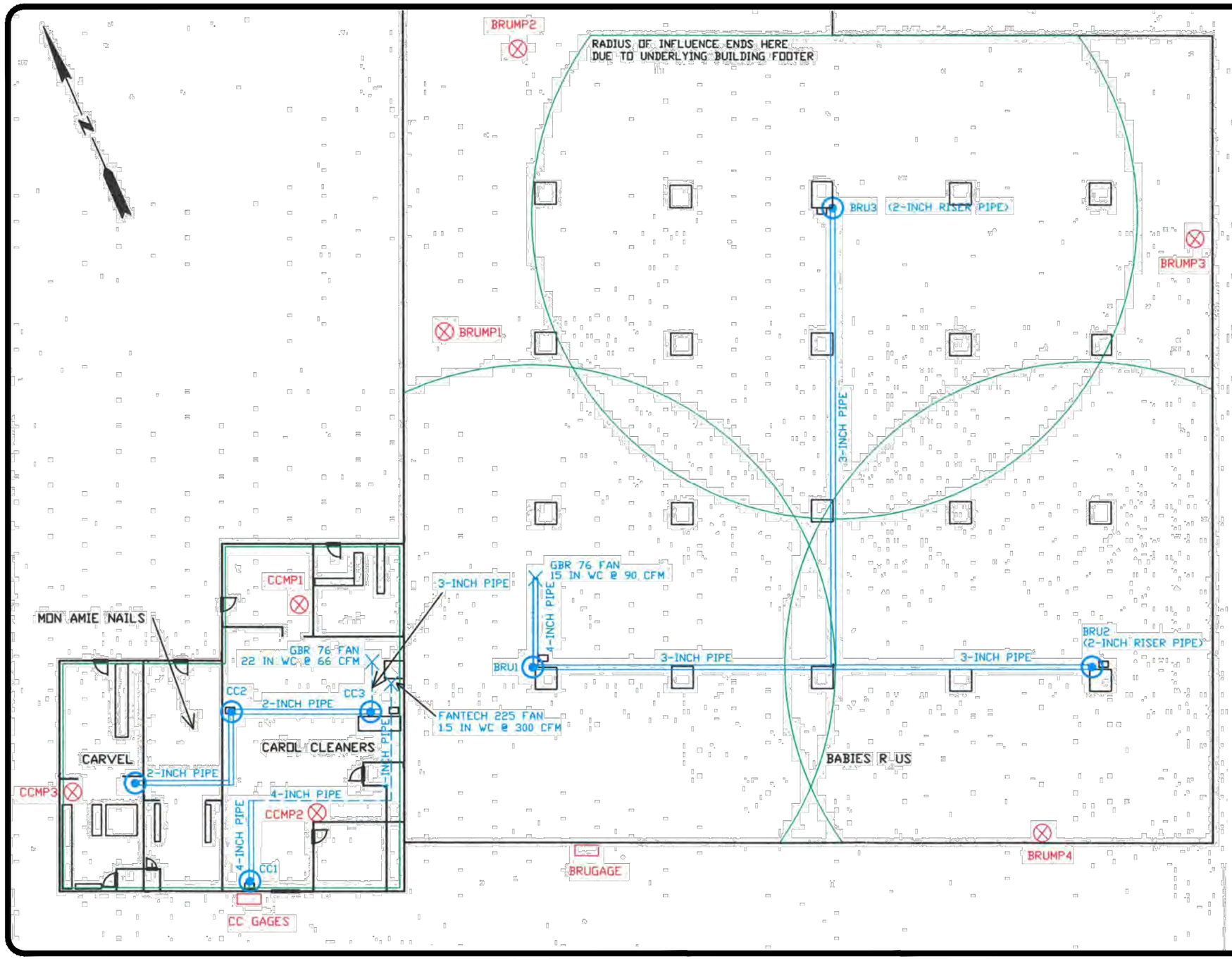
HORIZONTAL DATUM IS BASED ON NAD 83.
VERTICAL DATUM IS NAVD88.

CATCH BASIN LOCATIONS FOR

STATEN ISLAND MALL
STATEN ISLAND , NY

C:\Land Projects 3\16-87 LBG Staten Island Mall CB\dwg\16-87 LBG Staten Island Mall CB.dwg 12/22/2016 1:41:28 PM EST

APPENDIX D SSDS - AS-BUILD



LEGEND

- CC1 — SUCTION POINT LOCATION WITH DESIGNATION
- TEST LOCATION WITH DESIGNATION
- PVC PIPING
- PIPING LOCATED ON ROOF OF BUILDING
- GBR 76 FAN — LOCATION OF FAN ON ROOF OF BUILDING WITH TYPE
- PROPOSED EFFECTIVE RADIUS OF INFLUENCE EXERTED BY BLOWER FAN
- MAGNAHELIC GAGE LOCATION

NOTES:

1. INFORMATION SHOWN HEREIN WAS TAKEN FROM A DRAWING PREPARED BY LEGGETTE, BRASHEARS & GRAHAM, INC. DATED 2/18/2015, AND INCLUDED WITHIN A FINAL ENGINEERING DESIGN REPORT SUBMITTED BY WSP DATED 6/26/2018 AND STAMPED BY WILLIAM K. BECKMAN, P.E., NYS PE #063219-1

0 23
FEET

ERICH ZIMMERMAN, P.E.

STATE OF NEW YORK — ERICH ZIMMERMAN — 081831 — LICENSED PROFESSIONAL ENGINEER

N.Y.P.E. Lic. No. 081831-01 Date 05/18/2023

cornerstone PLLC

GGP STATEN ISLAND MALL, LLC
FORMER CAROL CLEANERS SITE
STATEN ISLAND, NEW YORK

SUB SLAB DEPRESSURIZATION SYSTEM AS-BUILT

PREPARED BY: LBG ENGINEERING SERVICES, PC

SHEET NO.

PROJECT NO. 4201222

APPENDIX E SOIL BORING LOGS

GEOLOGIC LOG

Leggette, Brashears & Graham, Inc.
6 Arrow Road, Suite 103
Ramsey, New Jersey 07446
www.lbgweb.com

OWNER: Rouse

BORING NO.: B-1

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/17/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**S`EAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	4.4	1-2-1-1	0.8	Red Brown MF SAND, and Silt, little cmf Gravel (wet)
4	6	6.8	2-2-2-3	0.9	Red Brown MF SAND, some Silt, trace f Gravel (wet)
6	8	6.6	2-1-4-1	1.4	Red Brown SILT, and f Sand, little cmf Gravel (wet, ndcc)
8	10		17-21-25-30	0.0	No Recovery
10	12	1.2	12-20-30-45	2.0	Red Brown SILT, some mf Sand, little cmf Gravel (piece of weathered bedrock at bottom of spoon) (moist)
12	11.5	0.4	100/4"	1.7	Red Brown SILT, some mf Sand, little cmf Gravel (very dense, wet, ndcc) - drill refusal
					EOB bedrock at 11.5'

GEOLOGIC LOG

Leggette, Brashears & Graham, Inc.
6 Arrow Road, Suite 103
Ramsey, New Jersey 07446
www.lbgweb.com

OWNER: Rouse

BORING NO.: B-2

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/17/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**
COMMENTS:	

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	3.1	8-11-13-15	1.7	Red Brown MF SAND, and Silt, some cmf Gravel (dense)
4	6	4.5	22-27-24-22	0.8	Red Brown SILT, some f Sand, trace f Gravel (moist, ndcc)
6	8	4.7	25-29-20-18	0.2	Red Brown F SAND, and Silt, trace cmf Gravel (moist)
8	10	5.0	13-11-8-9	1.3	Red Brown SILT, some cmf Gravel, some mf Sand (wet)
10	12	4.2	5-10-11-25	1.2	Red Brown SILT, some cmf Gravel, some mf Sand (moist, dense, pieces of weathered bedrock)
12	14	1.7	35-45-42-58	1.6	Red Brown MF SAND, and cmf Gravel, little Silt (moist, very dense, pieces of weathered bedrock)
14	16	0.1	36-27-22-29	1.5	Red Brown SILT, and cmf Gravel, some mf Sand--grading to CMF SAND (wet)

GEOLOGIC LOG

Leggette, Brashears & Graham, Inc.
6 Arrow Road, Suite 103
Ramsey, New Jersey 07446
www.lbgweb.com

OWNER: Rouse

BORING NO.: B-3

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/18/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**S`EAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	1.0	40-24-42-31	1.1	CMF GRAVEL, and Red Brown Sand, trace Silt
4	6	1.7	26-40-22-21	0.7	Red Brown F SAND, and cmf Gravel, some Silt (dry)
6	8	1.1	23-100/1"	0.2	CMF GRAVEL, and Red Brown mf Sand, trace Silt (dry)
8	10	0.7	7-11-14-13	1.8	Red Brown Silt, and mf Sand, little mf Gravel (wet)
10	12	4.2	15-18-30-30	1.8	Red Brown Silt, and mf Sand, little mf Gravel (moist, dense)
12	14	6.1	48-52-28-42	2.0	Red Brown F SAND, and cmf Gravel, little Silt (ndcc, wet)
14	16	0.3	8-10-11-14	2.0	Red Brown Clayey Silt (1st 8"), 6" of cmf SAND, 5" of dense SILT, 2" of weathered bedrock
16	18	1.3	47-61-54-100/2"	2.0	Red Brown CMF SAND, trace Silt, last 4" is bedrock (ndcc, moist)
					EOB @ 18'

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OWNER: Rouse

BORING NO.: B-4

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/18/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**S`EAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**
COMMENTS:	

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.1	17-33-35-35	1.2	Red Brown MF SAND, and cmf Gravel, some Silt (dry)
4	6	0.0	19-24-15-18	1.6	Red Brown F SAND, and Silt, some cmf Gravel (dry, dense)
6	8	0.0	25-31-20-22	1.2	Red Brown SILT, and f SAND, trace f Gravel (moist)
8	10	0.0	25-55-23-40	1.4	Red Brown SILT, and f SAND, trace f Gravel (moist)
10	12	3.2	100/2"	0.1	Red Brown SILT, and f Sand, somr mf Gravel (moist, dense, ndcc)
12	14	0.0	35-69-100/3"	1.1	Red Brown MF SAND, and mf Gravel, some Silt (loose, wet)
14	14.1	1.1	100/2"	0.1	Red Brown SILT, and mf Sand, and weathered Bedrock (very dense, ndcc)
					EOB @ 14' —Drill Refusal

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BORING NO.: B-5

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/17/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**S`EAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**
COMMENTS:	

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	2.4	1-4-7-13	0.75	Red Brown MF SAND, some Silt, trace Gravel (wet, ndcc)
4	6	19.0	10-10-13-8	2.0	Red Brown SILT, and mf Sand, some Gravel (wet)
6	8	55.6	10-18-7-5	2.0	Red Brown SILT, and mf Sand, some Gravel (wet, ndcc)
8	10	36.6	17-19-16-11	1.0	Red Brown Silty CLAY, some cmf Gravel, little Sand (moist)
10	11.5	63.0	33-45-100/3"	1.2	Red Brown SILT, little cmf Sand, little Gravel
					EOB - bedrock @ 11.5' - drill refusal

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BORING NO.: B-6

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/17/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**
COMMENTS:	

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	1.6	5-7-16-20	1.2	Red Brown SILT, some mf Sand, trace f Gravel (moist)
4	6	1.5	9-45-54-60	0.6	Red Brown Clayey SILT, some cmf Sand, some cmf Gravel (moist)
6	8	3.3	45-41-44-38	1.2	Red Brown mf SAND, and cmf Gravel, some Silt (moist to wet last 1", ndcc)
8	10	1.8	20-16-18-15	0.7	Red Brown SILT, some cmf Gravel, some mf Sand (very moist)
10	12	1.5	24-24-15-20	1.2	Red Brown SILT, some cmf Gravel, some mf Sand (moist, pieces of weathered bedrock))
					EOB - bedrock @ 12 ft.

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BORING NO.: B-7

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/18/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**
COMMENTS:	

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.6	4-2-3-2	0.2	Red Brown SILT, little f Sand, trace f Gravel
4	6	0.4	12-7-14-10	1.0	Red Brown F SAND, and Silt, trace f Gravel (moist)
6	8	62	8-10-31-42	1.3	Red Brown SILT, little f Sand, trace f Gravel (moist, ndcc)
8	10	1.4	30-25-31-29	0.1	Red Brown F SAND, and Silt, trace f Gravel (moist)
10	12	5.1	10-20-24-41	1.8	Red Brown Clayey SILT, little mf Gravel, little mf Sand (weathered pieces of bedrock in last 3", wet, ndcc)
12	12.5	3.3	100/1"	0.1	Red Brown SILT, some mf Gravel, little f Sand (ndcc)
					EOB - bedrock @ 12.5' - - - Drill Refusal

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BORING NO.: B-8

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/18/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.1	19-19-45-100/4"	1.5	Red Brown F SAND, and cmf Gravel, some Silt (dry)
4	6	0.0	100/5"	0.5	Red Brown SILT, some cmf Gravel, little f Sand (very moist, dense, last 2" = Gravel)
6	8	0.0	22-11-6-9	1.6	Red Brown F SAND, and Silt, little mf Gravel (moist)
8	10	0.3	24-15-17-9	1.8	Red Brown SILT, and f Sand, little f Gravel (moist)
10	11	9.8	17-36-100/4"	1.5	Red Brown Clayey SILT, and f Sand, little mf Gravel (moist, ndcc)
					EOB - bedrock @ 11' —Drill Refusal

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BORING NO.: B-9

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/19/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**S`EAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	11.5	12-17-14-20	1.5	Red Brown SILT, and mf Sand, trace mf Gravel (moist)
4	6	20.2	7-7-14-20	1.8	Red Brown F SAND, and Silt, little cmf Gravel (moist)
6	8	38.7	10-7-10-20	1.2	Red Brown F SAND, and Silt, little cmf Gravel (moist, ndcc)
8	10	0.4	12-17-15-21	1.3	Red Brown F SAND, and Silt, little cmf Gravel (moist)
10	11.5	1.2	22-35-100/5"	1.8	Red Brown F SAND, and Silt, trace mf Gravel (very dense, ndcc)
					Drill refusal @ 11.5 ft. - Bedrock - EOB

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BORING NO.: B-10

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/18/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	8.7	8-10-17-20	1.7	Red Brown F SAND, and Silt, trace f Gravel (dry, dense, ndcc)
4	6	2.8	16-20-15-15	1.4	Red Brown SILT, and f Sand, some cmf Gravel (very moist)
6	8	2.6	19-24-55-60	1.4	Red Brown F SAND, and Silt, little cmf Gravel (dry to very moist, dense, ndcc)
8	10	0.1	9-18-30-22	1.9	Red Brown F SAND, and Silt, trace mf Gravel (moist)
10	12	0.0	23-20-25-29	2.0	Red Brown SILT, and mf Sand, trace cmf Gravel (dense, moist)
12	14	0.1	21-33-55-35	2.0	Red Brown (very dense) SILT grading to CMF (loose) SAND (wet)
14	14.5	1.3	100/5"	0.4	Red Brown SILT, and f Sand, little mf Gravel (dense, moist, ndcc)
					EOB @ 14.5' - - - Bedrock

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SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/18/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**
COMMENTS:	

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.2	9-23-24-24	1.7	Red Brown CMF SAND, some cmf Gravel, little Silt (dry)
4	6	0.3	28-25-22-20	1.1	Red Brown F SAND, and cmf Gravel, some Silt (dry, very dense)
6	8	17.9	23-21-33-35	1.0	Red Brown F SAND, and Silt, little cmf Gravel (moist to wet, ndcc)
8	10	0.9	41-37-33-40	2.0	Red Brown F SAND, and Silt, trace f Gravel (moist, dense)
10	12	1.1	27-26-37-41	1.8	Red Brown SILT, and f Sand, some mf Gravel (very dense, ndcc)
12	12.5	0.4	45-100/2"	0.3	Red Brown SILT, and f Sand, some mf Gravel (very dense, moist, ndcc)
					EOB - bedrock @ 12.5' - - - Drill Refusal

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BORING NO.: B-12

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SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/19/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	2.3	15-13-12-12	1.8	Red Brown SILT, and F Sand, trace f Gravel (moist)
4	6	4.7	8-16-22-15	2.0	Red Brown SILT, and F Sand, trace f Gravel (moist)
6	8	5.8	17-35-28-22	1.0	Red Brown F SAND, and Silt, trace fine Gravel (moist to wet, ndcc)
8	10	0.5	20-22-34-45	1.5	Red Brown F SAND, some cmf Gravel, little Silt (very dense, wet)
10	12	0.2	20-25-27-34	2.0	Red Brown F SAND, some cmf Gravel, little Silt (very dense, wet)
12	12.5	0.0	29-73-100/3"	1.0	CMF GRAVEL, and cmf Sand, some Silt (wet, weathered bedrock, ndcc)
					Drill refusal @ 12.5 ft. - Bedrock - EOB

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BORING NO.: B-13

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/20/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	7.3	12-14-25-38	1.7	Red Brown MF SAND, and Silt, little mf Gravel (dry, dense, ndcc)
4	6	4.1	18-26-32-28	2.0	Red Brown MF SAND, and mf Gravel, some Silt (dry)
6	8	0.4	20-30-25-20	1.2	Red Brown F SAND, and Silt, trace mf Gravel (very moist, dense, ndcc)
8	10	0.2	29-40-61-55	1.5	Red Brown F SAND, and Silt, little mf Gravel (very dense)
10	12	0.3	28-30-22-30	2.0	Red Brown F SAND, and Silt, little mf Gravel (very dense)
12	13.5	1.4	74-78-100/2"	1.2	Red Brown F SAND, and cmf Gravel (weathered bedrock), little Silt (very dense, ndcc)
					EOB @ 13.5- - - Bedrock @ 13.5 ft.

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BORING NO.: B-14

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SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/20/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** 9' **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.0	10-12-9-20	2.0	Red Brown F SAND, some Silt, trace cmf Gravel (dry)
4	6	0.1	19-20-23-18	2.0	Red Brown CM(+)F, trace Silt (dry)
6	8	0.3	15-20-21-23	1.8	Red Brown MF(+) SAND, little Silt, trace f Gravel (very moist)
8	10	0.7	15-16-12-22	1.8	Red Brown Silt, some F Sand, trace f Gravel (moist)
10	12	4.3	16-14-20-25	1.9	Red Brown MF(+) Sand, some Silt, little mf Gravel (wet, ndcc)
12	13.5	0.0	35-27-100/1"	1.5	Red Brown CM(+)F SAND, and cmf Gravel, little Silt (wet, ndcc)
					EOB @ 13.5'

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BORING NO.: B-15

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SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/19/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.3	3-7-10-17	2.0	Red Brown SILT, and F Sand, little f Gravel (dense, dry)
4	6	0.7	7-10-62-45	0.8	Same (moist)
6	8	1.3	47-18-16-11	0.7	Same (wet, ndcc)
8	10	0.2	25-43-65-100/1"	1.3	Red Brown MF SAND, some cmf Gravel, little Silt (dense, wet)
10	12	0.0	29-33-61-32	1.0	1st 18" = Silt (loose, mucky), last 6" = F SAND, and Silt, little mf Gravel
12	14	0.0	38-60-100/2"	1.0	Red Brown F SAND, and Silt, some mf Gravel (very dense, moist)
14	16	0.0	33-65-29-24	2.0	Red Brown MF Sand, some MF Gravel, little Silt (very dense)
16	18	0.1	18-36-51-35	2.0	Red Brown loose CMF SAND, grading to very dense Silt with pieces of bedrock
18	19.5	0.5	12-29-32-100/3"	1.1	Red Brown MF SAND, and cmf Gravel, some Silt (dense, ndcc)
					Split Spoon refusal @ 19.5 ft. - Bedrock - EOB

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OWNER: Rouse

BORING NO.: B-16

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/19/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.3	15-13-18-29	1.7	Red Brown Silt, and f Sand, trace f Gravel (very dense, dry)
4	6	0.5	22-15-18-25	0.8	Red Brown MF SAND, little mf Gravel, little Silt (dry)
6	8	1.2	30-35-18-24	1.5	Red Brown MF SAND, trace f Gravel & Silt (loose, moist, ndcc)
8	10	0.1	13-30-43-47	1.4	Red Brown SILT, and mf Sand, little mf Gravel (wet, dense)
10	12	0.0	50-53-67-100/5"	2.0	Red Brown CMF SAND (loose) grading to F SAND (very dense), and cmf Gravel
12	13.5	0.3	75-100/4"	1.2	Red Brown F SAND, some Silt, little f Gravel (dry, very dense, ndcc)
					EOB - bedrock @ 13.5- - - Drill Refusal

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BORING NO.: B-17

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/18/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.1	5-20-8-11	1.8	Red Brown F SAND, some cm Gravel, little Silt (dry)
4	6	0.0	13-14-13-15	2.0	Red Brown CMF SAND (moist)
6	8	0.0	8-12-11-15	1.8	Red Brown F SAND, and Silt, trace f Gravel (very moist)
8	10	0.0	6-14-12-27	1.5	Red Brown CMF SAND, little Silt (loose, wet)
10	12	0.3	24-27-30-24	1.6	Red Brown F SAND, and Silt, trace f Gravel (ndcc, wet)
12	14	0.0	100/1"	0.1	Red Brown SILT, some mf Gravel, some f Sand (wet, dense)
14	15.5	0.9	36-34-22-31	1.5	Red Brown CMF SAND (loose, wet, ndcc)
					EOB - bedrock @ 15.5'

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BORING NO.: B-18

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/20/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.0	4-6-6-25	1.8	Red Brown F SAND, some cmf Gravel, little Silt (dry)
4	6	0.4	100/5"	0.2	Red Brown F SAND, and cmf Gravel, trace Silt (moist, ndcc)
6	8	0.0	40-35-26-28	1.5	Red Brown MF SAND, and cmf Gravel (some weathered Bedrock), trace Silt, (dry, ndcc)
8	9.5	0.0	44-45-51-100/5"	1.6	Red Brown MF SAND, some cmf Gravel (some weathered Bedrock), trace Silt, (moist, ndcc)
					EOB - bedrock @ 9.5' - drill refusal

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BORING NO.: B-19

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/20/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**
COMMENTS:	

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.0	8-8-11-12	1.8	Red Brown MF SAND, some mf Gravel, little Silt (dry)
4	6	0.0	13-33-29-27	0.9	Red Brown MF SAND, and cmf Gravel (some weathered Bedrock), little Silt, (dry)
6	8	0.0	8-29-21-55	1.5	Red Brown MF SAND, and cmf Gravel (some weathered Bedrock), little Silt, (dry, ndcc)
8	8.5	0.0	46-100/5"	1.0	Red Brown MF SAND, and cmf Gravel (some weathered Bedrock), little Silt, (dry, very dense, ndcc)
					EOB - bedrock @ 8.5'

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BORING NO.: B-20

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SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/20/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**
COMMENTS:	

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.0	12-17-14-8	1.6	Red Brown F SAND, some cmf Gravel, little Silt (dry)
4	6	0.0	7-9-71-47	2.0	Red Brown F SAND, and cmf Gravel, trace Silt (moist)
6	8	0.2	22-24-35-31	1.8	Red Brown MF SAND, and cmf Gravel (some weathered Bedrock), trace Silt, (dry, ndcc)
8	8.5	0.0	25-100/5"	1.4	Red Brown MF SAND, some cmf Gravel (some weathered Bedrock), trace Silt, (moist, ndcc)
					EOB - bedrock @ 8.5'

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BORING NO.: B-21

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SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/23/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.7	20-20-33-36	1.1	Red Brown F SAND, and cmf Gravel, some Silt (dense, dry, ndcc)
4	6	0.1	34-37-51-51	1.2	Red Brown MF SAND, some Silt, little cmf Gravel (dense, moist)
6	8	0.0	29-24-11-22	1.0	Red Brown F SAND, and Silt, trace f Gravel (moist, ndcc)
8	10	0.0	30-28-69-52	1.2	Red Brown F SAND, and cmf Gravel, some Silt (moist)
10	12	0.0	25-45-54-43	1.5	Red Brown MF SAND, some Silt, little cmf Gravel (moist)
12	12.5	0.0	47-41-76-100/5"	1.6	Red Brown F SAND, and Silt, some mf Gravel (very dense, moist, ndcc)
					EOB - bedrock @ 12.5 ft

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BORING NO.: B-22

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/23/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.9	10-18-18-12	1.3	Red Brown SILT, and f Sand, trace cmf Gravel (dry, ndcc)
4	6	0.4	13-14-19-12	0.9	Red Brown SILT, and f Sand, trace cmf Gravel (dry)
6	8	0.5	18-7-8-12	1.2	Red Brown SILT, and f Sand, trace cmf Gravel (very moist)
8	10	0.4	15-12-19-28	1.5	Red Brown MF SAND, and Silt, little cmf Gravel (moist)
10	12	1.2	19-32-100/5"	1.4	Red Brown MF SAND, and Silt, little mf Gravel (moist, very dense, ndcc)
12	12.5	0.0	77-103/5"	1.0	Red Brown SILT, and mf Sand, little mf Gravel (very dense, wet, ndcc)
					EOB @ 12.5' - Drill Refusal - Bedrock

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OWNER: Rouse

BORING NO.: B-23

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SITE LOCATION: Staten Island, NY

DATE COMPLETED: 9/23/02

DRILLING COMPANY: Summit

DRILLING METHOD: Hollow Stem Auger

SAMPLING METHOD: Split Spoon

OBSERVER: R. Wade Watkins

REFERENCE POINT (RP): Ground Surface

ELEVATION OF RP:

SURFACE COMPLETION:

SCREEN TYPE: **DIAMETER:**

SLOT NO.: **SETTING:**

SAND PACK SIZE:

SETTING:

CASING TYPE: **DIAMETER:**

SETTING:

SEAL TYPE:

SETTING:

BACKFILL TYPE:

STATIC WATER LEVEL: **DATE:**

DEVELOPMENT METHOD:

DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.0	11-12-28-35	[illegible]	Red Brown MF SAND, and Silt, little cmf Gravel (dry)
4	6	0.0	20-18-21-21	[illegible]	Red Brown MF SAND, and Silt, little cmf Gravel (dry)
6	8	0.0	19-8-10-16	[illegible]	Red Brown SILT, some cmf Gravel, little f Sand (very moist)
8	10	0.0	9-5-8-10	[illegible]	Red Brown Silty CLAY, grading to F SAND, some mf Gravel, little Silt (moist, ndcc)
10	12	0.0	5-16-8-12	2.0	Red Brown MF SAND, some cmf Gravel (weathered bedrock), some Silt (very moist)
12	14	0.0	11-9-30-34	1.7	Red Brown MF SAND, some cmf Gravel (weathered bedrock), some Silt (wet)
14	16	0.0	100/2"	0.2	Red Brown MF SAND, some cmf Gravel (weathered bedrock), some Silt (wet, ndcc)
16	16.5	0.0	30-100/5"	0.7	Red Brown CMF SAND, and cmf Gravel (wet, ndcc)
					EOB - bedrock @ 16.5' - Drill Refusal

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BORING NO.: B-24

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SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 9/23/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**SEAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.6	17-9-21-18	0.6	Brown SILT with grey and red mottling, little cmf Sand, trace cmf Gravel (dry, elastic in some places, ndcc)
4	6	0.1	27-25-28-27	1.8	Red Brown with grey mottles F Sand, and Silt, little mf Gravel (moist, ndcc)
6	8	0.0	23-21-16-11	2.0	Red Brown Silt, and mf Sand, trace mf Gravel (moist)
8	10	0.0	24-18-13-14	1.5	Red Brown Silt, and mf Sand, trace mf Gravel (moist)
10	12	0.0	10-9-11-15	1.0	Red Brown F SAND, and cmf Gravel, some Silt (moist)
12	14	0.0	28-2-2-2	0.5	Red Brown Silt, and cmf Gravel, some mf Sand (wet)
14	16	0.0	10-12-1-3	0.5	CMF GRAVEL, and Silt, some cmf Sand (wet)
16	17.5	0.0	2-1-13-42	0.7	Red Brown CM(+)F SAND, and cmf Gravel (wet, ndcc)
					EOB - bedrock @ 17.5' - Spoon Refusal

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OWNER: Rouse

BORING NO.: B-25

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, NY	**SCREEN TYPE:** **DIAMETER:**
	SLOT NO.: **SETTING:**
DATE COMPLETED: 10/31/02	**SAND PACK SIZE:**
DRILLING COMPANY: Summit	**SETTING:**
	CASING TYPE: **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:**
SAMPLING METHOD: Split Spoon	**S`EAL TYPE:**
OBSERVER: R. Wade Watkins	**SETTING:**
REFERENCE POINT (RP): Ground Surface	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** **DATE:**
SURFACE COMPLETION:	**DEVELOPMENT METHOD:**
	DURATION: **ESTIMATED YIELD:**

COMMENTS:

ABBREVIATIONS: SS = split spoon C(c) = coarse M(m) = medium F(f) = fine GS = ground surface EOB = end of boring NDCC = no dye (Sudan IV) color change to indicate DNAPL

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID VALUE (ppm)	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	2				Augured through asphalt and sub-base
2	4	0.4	10-9-15-20	1.5	Red Brown MF SAND, some Silt, little mf Gravel (moist, ndcc)
4	6	0.3	13-17-20-18	1.2	Red Brown MF SAND, some Silt, little mf Gravel (moist, ndcc)
6	8	3.8	15-21-29-100/3"	1.0	Red Brown F SAND, and Silt, some cmf Gravel (very moist, ndcc))
8	10	0.4	16-13-7-7	1.0	Red Brown Clayey SILT, little f Sand, little cmf Gravel (wet)
10	12	0.4	16-17-23-20	1.7	Red Brown MF SAND, and Silt, some cmf Gravel (wet)
12	14	0.2	91-100/1"	1.7	Red Brown CMF SAND, and Silt (dense), some mf Gravel (wet)
14	15.5	0.4	45-63-87-89	1.0	CM GRAVEL, and cmf Sand, some Silt (weathered bedrock, wet, ndcc)
					EOB @ 15.5' - Bedrock

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OWNER: General Growth Properties

WELL NO.: B-26

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** PVC **DIAMETER:** 1"
	SLOT NO.: #10 **SETTING:** 7 – 12'
DATE COMPLETED: 5/11/06	**SAND PACK SIZE:** N/A
DRILLING COMPANY: S_2C_2, Inc.	**SETTING:** N/A
	CASING TYPE: PVC **DIAMETER:** 1"
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** 0 – 7'
SAMPLING METHOD: Macro-Core w/ Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Jonas Holliss	**SETTING:** N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE:** Bentonite
ELEVATION OF RP:	**STATIC WATER LEVEL:** 10.69' **DATE:** 5/11/06
SURFACE COMPLETION: PVC removed, boring filled with bentonite, asphalt on top.	**DEVELOPMENT METHOD:** Purge
	DURATION: 20 min **ESTIMATED YIELD:** < 1 gal
COMMENTS: Temporary Well point installed for single round of ground-water sampling	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	0.4	0		Black asphalt, dry
0.4	0.75	0		Gray GRAVEL sub-grade
0.75	2.1	0		Red brown f SAND and silt; dry
2.1	3.2	0		Gray brown SILT; little clay; moist; mottled near 3'
3.2	4.2	0		Light red brown f SAND and silt; little clay; moist
4.2	4.4	0		Gray cm SAND; dry
4.4	8.9	0		Red brown mf SAND; some silt; little clay; little gravel; wet at 7'
8.9	9.3	0		Dark gray brown SILTY CLAY; moist
9.3	9.5	0		Dark gray brown c SAND and gravel; dry
9.5	11	0		Red brown f SAND; some silt; little clay; trace gravel; wet
11	12	0		Red brown CLAY; moist; (non-reactive with Sudan IV) – refusal at 12'
				E.O.B. at 12'

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OWNER: General Growth Properties

WELL NO.: B-27

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** PVC **DIAMETER:** 1"
	SLOT NO.: #10 **SETTING:** 9.8 – 14.8'
DATE COMPLETED: 5/11/06	**SAND PACK SIZE:** N/A
DRILLING COMPANY: S_2C_2, Inc.	**SETTING:** N/A
	CASING TYPE: PVC **DIAMETER:** 1"
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** 0 – 9.8'
SAMPLING METHOD: Macro-Core w/ Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Jonas Holliss	**SETTING:** N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE:** Bentonite
ELEVATION OF RP:	**STATIC WATER LEVEL:** 10.42' **DATE:** 5/11/06
SURFACE COMPLETION: PVC removed, boring filled with Bentonite, asphalt on top.	**DEVELOPMENT METHOD:** Purge
	DURATION: 20 min **ESTIMATED YIELD:** < 1 gal
COMMENTS: Temporary Well point installed for single round of ground-water sampling	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	0.4	0		Black asphalt; dry
0.4	1.5	0		Light gray GRAVEL sub-grade; dry
1.5	1.8	0		Black GRAVEL sub-grade; moist
1.8	3.0	0		Brown mf SAND; some silt; little gravel; moist
3.0	3.1	0		Red crushed brick; dry
3.1	4.5	0		Red brown mf SAND and silt; some clay; little gravel; moist
4.5	4.7	0		Gray brown GRAVEL sluff
4.7	5.2	0		Brown f SAND; clean; moist
5.2	5.9	0		Orange brown f SAND; moist
5.9	8.0	0		Red brown mf SAND and silt; some clay; little gravel; moist
8.0	9.4	0		Red brown SILTY CLAY; wet at 8'

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DEPTH (FEET)		PID (ppm)	RECOVERY (feet)	DESCRIPTION
FROM	TO			
9.4	9.5	0		Red brown cm SAND; clean; wet
9.5	9.7	0		Red brown SILTY CLAY; wet
9.7	9.8	0		Red brown cm SAND; clean; wet
9.8	10.0	0		Red brown SILTY CLAY; wet
10.0	10.2	0		Red brown cm SAND; some silt; wet
10.2	12.0	0		Red brown mf SAND; some silt; little clay; little gravel; wet
12.0	14.8	0		Red brown mf SAND; some silt; little clay; little gravel; trace cobbles; wet (non-reactive with Sudan IV); hit refusal (bedrock) at 14.8'
				E.O.B. at 14.8'

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OWNER: General Growth Properties.

WELL NO.: B-28

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** PVC **DIAMETER:** 1"
	SLOT NO.: #10 **SETTING:** 8 – 13'
DATE COMPLETED: 5/11/06	**SAND PACK SIZE:** N/A
DRILLING COMPANY: S_2C_2, Inc.	**SETTING:** N/A
	CASING TYPE: PVC **DIAMETER:** 1"
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** 0 – 8'
SAMPLING METHOD: Macro-Core w/ Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Jonas Holliss	**SETTING:** N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE:** Bentonite
ELEVATION OF RP:	**STATIC WATER LEVEL:** 11.62' **DATE:** 5/11/06
SURFACE COMPLETION: PVC removed, boring filled with Bentonite, asphalt on top.	**DEVELOPMENT METHOD:** Purge
	DURATION: 20 min **ESTIMATED YIELD:** < 1 gal
COMMENTS: Temporary Well point installed for single round of ground-water sampling	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	0.4	0		Black asphalt; dry
0.4	1.1	0		Gray GRAVEL sub-base; dry
1.1	2.8	0		Red brown f SAND; some silt; little gravel; dry
2.8	3.3	0		Dark gray CLAYEY SILT; moist
3.3	5.3	0		Gray brown CLAYEY SILT; moist
5.3	6.0	0		Brown f SAND; little gravel; moist
6.0	9.5	0		Red brown mf SAND and silt; some gravel; little clay; moist; wet at 9.3'
9.5	9.9	0		Red brown cm SAND; clean; wet
9.9	13.0	0		Red brown f SAND and silt; some clay; trace gravel; wet (non reactive to Sudan IV) – refusal (bedrock) at 13'
				E.O.B. at 13'

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** PVC **DIAMETER:** 1"
	SLOT NO.: #10 **SETTING:** 8 – 13'
DATE COMPLETED: 5/11/06	**SAND PACK SIZE:** N/A
DRILLING COMPANY: S_2C_2, Inc.	**SETTING:** N/A
	CASING TYPE: PVC **DIAMETER:** 1"
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** 0 – 8'
SAMPLING METHOD: Macro-Core w/ Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Jonas Holliss	**SETTING:** N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE:** Bentonite
ELEVATION OF RP:	**STATIC WATER LEVEL:** 12.10' **DATE:** 5/11/06
SURFACE COMPLETION: PVC removed, boring filled with Bentonite, asphalt on top.	**DEVELOPMENT METHOD:** Purge
	DURATION: 20 min **ESTIMATED YIELD:** < 1 gal

COMMENTS: Temporary Well point installed for single round of ground-water sampling

ABBREVIATIONS: C = Coarse, M = Medium, F = Fine

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	0.8	0		Black asphalt; dry
0.8	1.1	0		Light gray GRAVEL sub-base; dry
1.1	1.6	0		Dark gray brown SILT; some f sand; moist
1.6	2.3	0		Brown f SAND and silt; dry
2.3	2.5	0		Dark gray brown SILT and f sand; moist
2.5	2.8	0		Light gray brown SILTY CLAY; moist
2.8	3.6	0		Red brown CLAY; some silt; moist
3.6	4.4	0		Red brown SILT and f sand; moist
4.4	5.7	0		Red brown f SAND and silt; some clay; trace gravel; moist
5.7	5.9	0		Gray brown SILTY CLAY; moist
5.9	7.3	0		Red brown f SAND and silt; some clay; trace gravel; moist

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DEPTH (FEET)		PID (ppm)	RECOVERY (feet)	DESCRIPTION
FROM	TO			
7.3	8.0	0		Red brown siltstone BOULDER; dry
8.0	8.8	0		Light gray GRAVEL sluff
8.8	9.3	0		Red brown CLAY; some silt; moist
9.3	10.3	0		Red brown mf SAND and silt; some clay; wet at 9.3'
10.3	10.6	0		Red siltstone COBBLE
10.6	12.0	0		Red brown SILT; some f sand; some clay; wet
12.0	13.0	0		Red brown SILT and f sand; some clay; little gravel; wet (non-reactive to Sudan IV) – refusal (bedrock) at 13'
				E.O.B. at 13'

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WELL NO.: B-30

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** PVC **DIAMETER:** 1"
	SLOT NO.: #10 **SETTING:** 10 – 15'
DATE COMPLETED: 5/11/06	**SAND PACK SIZE:** N/A
DRILLING COMPANY: S_2C_2, Inc.	**SETTING:** N/A
	CASING TYPE: PVC **DIAMETER:** 1"
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** 0 – 10'
SAMPLING METHOD: Macro-Core w/ Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Jonas Holliss	**SETTING:** N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE:** Bentonite
ELEVATION OF RP:	**STATIC WATER LEVEL:** 14.11' **DATE:** 5/11/06
SURFACE COMPLETION: PVC removed, boring filled with Bentonite, asphalt on top.	**DEVELOPMENT METHOD:** Purge
	DURATION: 20 min **ESTIMATED YIELD:** < 1 gal

COMMENTS: This boring was done on a 15 degree (from vertical) angle to get under Carvel. Temporary Well point installed for single round of ground-water sampling

ABBREVIATIONS: C = Coarse, M = Medium, F = Fine

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.2	0		Black asphalt; dry
1.2	1.9	0		Light gray GRAVEL sub-grade and wood fill; dry
1.9	4.4	0		Red brown mf SAND and silt; some clay; dry
4.4	11.3	0		Red brown mf SAND and silt; some clay; little gravel; moist; wet at 8.3'
11.3	12.0	0		Red brown mf SAND and silt; trace gravel; moist
12.0	15.0	0		Red brown mf SAND; little gravel; little silt; wet (non-reactive to Sudan IV) – refusal (bedrock) at 15'
				E.O.B. at 15'

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WELL NO.: B-31

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** PVC **DIAMETER:** 1"
	SLOT NO.: #10 **SETTING:** 11 – 16'
DATE COMPLETED: 5/11/06	**SAND PACK SIZE:** N/A
DRILLING COMPANY: S_2C_2, Inc.	**SETTING:** N/A
	CASING TYPE: PVC **DIAMETER:** 1"
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** 0 – 11'
SAMPLING METHOD: Macro-Core w/ Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Jonas Holliss	**SETTING:** N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE:** Bentonite
ELEVATION OF RP:	**STATIC WATER LEVEL:** 11.12' **DATE:** 5/11/06
SURFACE COMPLETION: PVC removed, boring filled with Bentonite, asphalt on top.	**DEVELOPMENT METHOD:** Purge
	DURATION: 20 min **ESTIMATED YIELD:** < 1 gal

COMMENTS: This boring was done on a 30 degree (from vertical) angle to get under Mon Amiee Nails. Temporary Well point installed for single round of ground-water sampling

ABBREVIATIONS: C = Coarse, M = Medium, F = Fine

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.2	0		Black asphalt; dry
1.2	1.6	0		Brown mf SAND; moist
1.6	1.8	0		Wood fill
1.8	2.0	0		Gray COBBLES; dry
2.0	5.0	0		Brown mf SAND and silt; moist
5.0	5.4	0		Green and brown SILT and f sand; some clay; wet at 5'
5.4	6.4	0		Red brown f SAND and silt; some clay; little gravel; siltstone cobble at 5.8'; wet
6.4	6.5	0		Light orange brown SILT; dry
6.5	8.0	0		Red brown f SAND and silt; wet
8.0	12.0	0		Red brown f SAND and silt; little gravel; wet

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DEPTH (FEET)		PID (ppm)	RECOVERY (feet)	DESCRIPTION
FROM	TO			
12.0	16.0	0		Red brown f SAND and silt; little gravel; wet (non-reactive with Sudan IV) – refusal (bedrock) at 16'
				E.O.B. at 16'

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** PVC **DIAMETER:** 1"
	SLOT NO.: #10 **SETTING:** 7 – 12'
DATE COMPLETED: 5/11/06	**SAND PACK SIZE:** N/A
DRILLING COMPANY: S_2C_2, Inc.	**SETTING:** N/A
	CASING TYPE: PVC **DIAMETER:** 1"
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** 0 – 7'
SAMPLING METHOD: Macro-Core w/ Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Jonas Holliss	**SETTING:** N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE:** Bentonite
ELEVATION OF RP:	**STATIC WATER LEVEL:** 7.86' **DATE:** 5/12/06
SURFACE COMPLETION: PVC removed, boring filled with Bentonite, asphalt on top.	**DEVELOPMENT METHOD:** Purge
	DURATION: 20 min **ESTIMATED YIELD:** < 1 gal
COMMENTS: Temporary Well point installed for single round of ground-water sampling	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET)		PID (ppm)	RECOVERY (feet)	DESCRIPTION
FROM	TO			
0.0	0.8	0		Black asphalt; dry
0.8	1.7	0		Black GRAVEL sub-grade; dry
1.7	2.1	0		Light gray GRAVEL sub-grade; wet
2.1	5.5	0		Red brown f SAND and silt; little clay; moist
5.5	5.8	0		Red brown mf SAND; clean; moist
5.8	6.0	0		Red brown f SAND; clean; wet at 5.8'
6.0	6.9	0		Red brown f SAND and silt; some clay; wet
6.9	7.0	0		Orange brown GRAVEL and c sand; wet
7.0	8.8	0.2		Red brown f SAND and silt; some clay; wet
8.8	9.2	0		Red brown GRAVEL and silt; wet
9.2	10.7	0		Red brown f SAND and silt; some clay; wet

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DEPTH (FEET)		PID (ppm)	RECOVERY (feet)	DESCRIPTION
FROM	TO			
10.7	10.9	0		Dark brown cm SAND and silt; wet
10.9	12.0	0		Red brown f SAND and silt; some clay; wet (non-reactive to Sudan IV) – refusal (bedrock) at 12'
				E.O.B. at 12'

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: N/A **SETTING:** N/A
DATE COMPLETED: 5/12/06	**SAND PACK SIZE:** N/A
DRILLING COMPANY: S_2C_2, Inc.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push – Hand-held	**SETTING:** N/A
SAMPLING METHOD: Macro-Core w/ Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Jonas Holliss	**SETTING:** N/A
REFERENCE POINT (RP): Dry Cleaner Floor	**BACKFILL TYPE:** Bentonite
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Borehole backfilled with bentonite and top covered with concrete	**DEVELOPMENT METHOD:** N/A
	DURATION: **ESTIMATED YIELD:**

COMMENTS: Borehole drilled through floor in Dry Cleaners. Bedrock not reached due to equipment limitations. The floor is approximately 4.8' above the asphalt directly outside of the building.

ABBREVIATIONS: C = Coarse, M = Medium, F = Fine

DEPTH (FEET) FROM	TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	0		Concrete and sub-grade
1.0	1.8	0		Orange brown m SAND; clean; dry
1.8	4.3	0		Red brown f SAND and silt; some clay; little gravel; moist
4.3	4.4	0		Dark gray GRAVEL (quartz and basalt); dry
4.4	4.7	0		Brown f SAND and silt; little clay; dry
4.7	5.0	0		Light brown SILT and f sand; little clay; dry
5.0	7.0	0		Light brown SILT and f sand; orange iron-staining and mottling at 6.3-6.7'; dry (non-reactive to Sudan IV)
7.0	7.5	0		Red brown mf SAND; little silt; dry
7.5	8.0	0		Red brown mf SAND; some clay; moist

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DEPTH (FEET)		PID (ppm)	RECOVERY (feet)	DESCRIPTION
FROM	TO			
8.0	9.2	0		Red brown CLAY; little f sand; trace gravel; moist
9.2	10.0	0		Red brown SILT and clay; little f sand; moist
10.0	13.0	0		Red brown SILT and clay; some f sand; moist (non-reactive to Sudan IV) – Driller could not get deeper due to physical limitations of hand equipment.
				E.O.B. at 13'

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OWNER: Rouse Staten Island Mall

BORING ID: SB-1

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: NA **SETTING:** N/A
DATE COMPLETED: 5/12/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** NA
SAMPLING METHOD: Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Eric S Ricci	**SETTING**: N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE**:
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:** N/A
SURFACE COMPLETION Asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:** N/A
COMMENTS:	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	2.6	3.5	Black Asphalt and Subbase; dry
1.0	3.0	2.2		Red/brown F-M SAND; little silt; dry to moist
3.0	4.0	0.7		Red/brown F-M SAND; little silt; very moist
4.0	5.0	0.3		Red/brown F-M SAND; some silt; very moist at 4.5’
5.0	6.0	0.3	2.1	Red/brown F-M SAND; some silt; very moist
6.0	6.5	0.3		Red/brown F-M SAND; some silt; little clay; very moist
6.5	8.0	0.3		Red/brown F SAND and M-C rounded gravel; some silt; saturated
				Refusal at 8.0’, E.O.B.

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OWNER: Rouse Staten Island Mall

BORING ID: SB-2

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: NA **SETTING:** N/A
DATE COMPLETED: 5/12/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** NA
SAMPLING METHOD: Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Eric S Ricci	**SETTING**: N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE**:
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:** N/A
SURFACE COMPLETION: Asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:** N/A
COMMENTS:	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	2.9	4.6	Black and gray Gravel and Asphalt; dry
1.0	2.0	1.4		Fill; Red/brown F SAND and SILT; dry
2.0	3.0	0.0		Red/brown F SAND; little F-M-C subrounded gravel; dry
3.0	5.0	0.0		Red/brown SAND; some F-M-C subrounded gravel; dry
5.0	6.0	0.0		Red/brown SAND; with gray cobble; moist
				Refusal at 6.0', E.O.B.

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OWNER: Rouse Staten Island Mall

BORING ID: SB-3

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: NA **SETTING:** N/A
DATE COMPLETED: 5/12/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** NA
SAMPLING METHOD: Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Eric S Ricci	**SETTING**: N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE**:
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:** N/A
SURFACE COMPLETION: Asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:** N/A
COMMENTS:	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	0.5		Black Asphalt and Subbase; dry
1.0	3.0	0.0		Red/brown F SAND and SILT; with gray sub angular pebbles; dry
				Refusal at 3.0', E.O.B.

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OWNER: Rouse Staten Island Mall

WELL NO.: SB-4

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: N/A **SETTING:** N/A
DATE COMPLETED: 5/12/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** N/A
SAMPLING METHOD: Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Eric S Ricci	**SETTING**: N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:** N/A
SURFACE COMPLETION: Asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:** N/A
COMMENTS:	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	0.0	1.2	Black Asphalt and Subbase; dry
1.0	5.0	40.0		Red/brown F SAND and SILT; with F-M-C subangular gravel; dry * Cobble lodged in macro core at 1.2’
5.0	5.5	2.8	2.8	Red/brown F SAND and SILT; very moist
5.5	6.0	1.0		Red/brown F SAND and SILT; saturated
6.0	7.0	0.2		Red/brown F SAND and SILT; trace clay with brown mottling; saturated
7.0	8.5	0.3		Red/brown F SAND and SILT; trace clay; very tight; saturated
8.5	9.0	0.1		Red/brown F SAND and SILT; very tight; some F-M-C gravel; saturated
				Refusal at 9.0’, E.O.B.

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WELL NO.: SB-5

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: N/A **SETTING:** N/A'
DATE COMPLETED: 5/12/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** N/A
SAMPLING METHOD: Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Eric S Ricci	**SETTING**: N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:** N/A
SURFACE COMPLETION: Asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:** N/A
COMMENTS:	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	0.5	3.3	Black Asphalt and Subbase; dry
1.0	3.5	2.0		Red/brown F SAND and SILT; with F-M-C subrounded gravel; dry
3.5	5.0	5.3		Red/brown F SAND; with F-M-C subrounded gravel; moist
5.0	6.0	16.0	3.2	Red/brown F SAND and SILT; F-M-C gravel; moist
6.0	7.5	4.8		Red/brown F SAND and SILT; F-M-C gravel; very moist
7.5	8.5	4.2		Red/brown F SAND and SILT; M-C gravel; very tight; moist
				Refusal at 8.5', E.O.B.

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	OWNER: Rouse Staten Island Mall
	WELL NO.: SB-6
	PAGE: 1 **of** 1 **PAGES**
SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: N/A **SETTING:** N/A'
DATE COMPLETED: 5/12/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** N/A
SAMPLING METHOD: Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Eric S Ricci	**SETTING**: N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:** N/A
SURFACE COMPLETION: Asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:** N/A
COMMENTS:	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	0.3	4.3	Black Asphalt and Subbase; dry
1.0	4.0	16.7		Brown F-M SAND and SILT; F-M-C subangular gravel; little gray clay seams; tight; dry
4.0	5.0	9.1		Red/brown F SAND and SILT; some M-C subrounded gravel; some grey brown clay pockets (possibly varved); tight; moist
5.0	6.5	2.9	2.4	Red/brown F SAND and SILT; with F-M rounded gravel; trace cobbles; very moist
6.5	7.5	3.7		Red/brown F SAND and SILT; with F-M rounded gravel; trace cobbles; very tight; slightly moist
7.5	9.0	--		*Cobble in shoe at 7.5
				Refusal at 9.0', E.O.B.

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OWNER: Rouse Staten Island Mall

WELL NO.: SB-7

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: Platinum Ave, Staten Island NY	**SCREEN TYPE:** N/A **DIAMETER:**
	SLOT NO.: N/A **SETTING:**
DATE COMPLETED: 7/20/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:** N/A
SAMPLING METHOD: Split spoon	**SEAL TYPE:** N/A
OBSERVER: Spiros Zois	**SETTING**: N/A
REFERENCE POINT (RP): grade	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:**
COMMENTS:	
ABBREVIATIONS: SS = split spoon C = cuttings F-M-C = Fine, Medium, Coarse	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	Airknife	-	-	0 – 0.5’ Asphalt; PID= 0.0 0.5 – 2’ Subbase (large angular gravel w/ fines); PID= 0.6 2 – 5’ Light brown F SILT; some F sand; w/ subangular F-M-C rounded gravel; dry; PID= 3.0 @ 5 ft.
5	7	SS	11-16-16-15	0.8	Red/brown SILT and F SAND; with F-M-C rounded gravel; some clay; moist at 7’; PID= 0.0
7	9	SS	18-15-11-28	1.1	7 – 8’ Red/brown SILT and F-M SAND; with F-M-C rounded gravel; saturated; PID= 0.0 8 – 9’ Red/brown F-M-C SAND; with F-M-C rounded gravel; some silt; saturated; PID= 0.0
9	11	SS	4-5-8-12	1.2	Red/brown SILT; some F-M-C sand; some F-M-C gravel; some clay; very moist; PID= 0.2 @ 9’ and 0.0 from 9.5’ – 11’

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
11	13	SS	27-20-32-50/5	1.2	11 - 12' Red/brown SILT and CLAY; with F rounded gravel; very tight; moist; PID= 0.0 12 - 12.5' Red/brown SILT and CLAY; with F-M rounded gravel; some F-M Sand; tight; moist; PID=0.0 12.5 – 13' Red/brown SILT and F-M SAND; with F-M-C rounded gravel; some clay; saturated; PID= 0.0
13	15	SS	5-19-24-48	1.0	M-C SAND; w/ F-M-C gravel; some cobbles; little fines; saturated; PID= 0.0
15	16	SS	28-15/4	0.5	Red/brown SILT and F SAND; with F rounded gravel; tight; moist; PID= 0.0
16	17	SS	50-50/1	0.2	Rock fragments (boulder or bedrock)
					AUGER REFUSAL @ 17', E.O.B.

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OWNER: Rouse Staten Island Mall	
WELL NO.: SB-8	
PAGE: 1 **of** 2 **PAGES**	
SITE LOCATION: Platinum Ave, Staten Island NY	**SCREEN TYPE:** N/A **DIAMETER:**
	SLOT NO.: N/A **SETTING:**
DATE COMPLETED: 7/21/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:** N/A
SAMPLING METHOD: Split spoon	**SEAL TYPE:** N/A
OBSERVER: Spiros Zois	**SETTING**: N/A
REFERENCE POINT (RP): grade	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:**
COMMENTS:	
ABBREVIATIONS: SS = split spoon C = cuttings F-M-C = Fine, Medium, Coarse	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	Airknife	-	-	0 – 1’ Asphalt; PID= 0.0 1 – 3’ Subbase; PID= 0.0 3 – 5’ Light brown SILT and F SAND; some F-M-C rounded gravel; dry; PID= 0.0
5	7	SS	18-19-28-32	0.7	Red/brown SILT and F SAND; some F subrounded gravel; moist; PID= 0.0
7	9	SS	17-13-11-14	0.3	Red/brown SILT and F SAND; some F subrounded gravel; saturated; PID= 0.0
9	11	SS	50/2	0.0	No Recovery
11	13	SS	8-15-20-22	1.3	Red/brown C SAND and F-M-C GRAVEL; with red/brown fines; saturated; PID= 0.0
13	15	SS	22-29-20-15	1.3	F-M SAND; saturated; PID= 0.0

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
15	17	SS	3-6-5-30	1.3	15 – 16.5' F-M SAND; with fines; some F-M-C rounded gravel; saturated; PID= 0.0 ½" wood fiber layer (construction debris) @ 16'. 16.5 – 17' Weathered Rock in SILT with CLAY; PID= 0.0
17	18	SS	25-100/4	0.3	17 – 18' F-M SAND; with wood fibers; saturated; PID= 0.0 18' Bedrock
					AUGER REFUSAL @ 18', E.O.B.

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OWNER: Rouse Staten Island Mall

WELL NO.: SB-9

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: Platinum Ave, Staten Island NY	**SCREEN TYPE:** N/A **DIAMETER:**
	SLOT NO.: N/A **SETTING:**
DATE COMPLETED: 7/20/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:** N/A
SAMPLING METHOD: Split spoon	**SEAL TYPE:** N/A
OBSERVER: Spiros Zois	**SETTING**: N/A
REFERENCE POINT (RP): grade	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:**
COMMENTS:	
ABBREVIATIONS: SS = split spoon C = cuttings F-M-C = Fine, Medium, Coarse	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	Airknife	-	-	0 – 1’ Asphalt; PID= 0.0 1 – 3’ Subbase (large stone); PID= 0.0 3 – 5’ Light brown SILT and F SAND; some F-M-C subrounded gravel; dry; PID= 0.0
5	7	SS	10-17-12-8	1.0	Red/brown SILT; some F-M-C subangular to subrounded gravel; slightly moist; PID= 0.0
7	9	SS	5-7-5-8	0.9	Red/brown SILT and F-M-C subangular to subrounded GRAVEL; some cobbles; moist; PID= 0.0
9	11	SS	10-19-5-5	0.5	Red/brown SILT and F-M Sand; trace F rounded gravel; saturated; PID= 0.0
11	13	SS	11-28-20-50/4	0.4	Red/brown SILT; some F rounded gravel; very tight; barely moist; PID= 0.0

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
13	15	SS	50/3	0	No Recovery
15	17	SS	50/4	0.3	No Recovery; Weathered Rock
					AUGER REFUSAL @ 16', E.O.B.

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OWNER: Rouse Staten Island Mall

WELL NO.: SB-10

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: Platinum Ave, Staten Island NY	**SCREEN TYPE:** N/A **DIAMETER:**
	SLOT NO.: N/A **SETTING:**
DATE COMPLETED: 7/21/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:** N/A
SAMPLING METHOD: Split spoon	**SEAL TYPE:** N/A
OBSERVER: Spiros Zois	**SETTING**: N/A
REFERENCE POINT (RP): grade	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:**
COMMENTS:	
ABBREVIATIONS: SS = split spoon C = cuttings F-M-C = Fine, Medium, Coarse	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	Airknife	-	-	0 – 1’ Asphalt; PID= 0.0 1 – 3’ Subbase (large stone); PID= 0.0 3 – 5’ Light brown SILT and F SAND; some F-M-C subrounded gravel; dry; PID= 0.0
5	7	SS	7-17-32-19	0	No Recovery, lost split spoon nose in hole.
7	9	SS	23-27-12-8	0.5	Red/brown SILT and F SAND; some F-M-C subrounded gravel; very moist; PID= 0.0
9	11	SS	19-9-5-9	0.9	Red/brown SILT and F SAND; some F-M subrounded gravel; little cobbles; saturated; PID= 0.0
11	13	SS	15-24-31-50/4	0.6	Red/brown SILT and F-M SAND; some F rounded gravel; some C subrounded gravel and cobbles; saturated; PID= 0.0

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WELL NO.:	SB-10 **PAGE:** 2 **OF** 2 **PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
13	15	SS	100/3	0.1	13 – 13.5' Cobble in nose of spoon; smear of clayey SILT and F SAND Weathered Rock
15	17	SS	100/0	0	No Recovery; Bedrock
					AUGER REFUSAL @ 15.25', E.O.B.

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OWNER: Rouse Staten Island Mall	
WELL NO.: SB-11	
PAGE: 1 **of** 2 **PAGES**	
SITE LOCATION: Platinum Ave, Staten Island NY	**SCREEN TYPE:** N/A **DIAMETER:**
	SLOT NO.: N/A **SETTING:**
DATE COMPLETED: 7/21/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:** N/A
SAMPLING METHOD: Split spoon	**SEAL TYPE:** N/A
OBSERVER: Spiros Zois	**SETTING**: N/A
REFERENCE POINT (RP): grade	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:**
COMMENTS:	
ABBREVIATIONS: SS = split spoon C = cuttings F-M-C = Fine, Medium, Coarse	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	Airknife	-	-	0 – 1’ Asphalt; PID= 0.0 1 – 3’ Subbase (large stone); PID= 0.0 3 – 5’ Light brown SILT and F SAND; some F-M-C subrounded gravel; dry; PID= 0.0
5	7	SS	31-28-30-33	0.9	Red/brown SILT and F SAND; some F-M-C subangular to subrounded gravel and cobbles; slightly moist; PID= 3.5 @ 5’
7	9	SS	10-12-7-7	1.3	Red/brown SILT and F SAND; some F-M-C subrounded gravel and cobbles; moist; PID= 1.5 @ 7’ and 0.0 @ 9’
9	11	SS	15-50/4	0.2	Red/brown SILT and F SAND; some F-M subrounded gravel; little cobbles; very moist; PID= 0.0
11	13	SS	50/4	0.1	Red/brown SILT; some F rounded gravel; very tight; barely moist; PID= 0.0

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
13	15	SS	75-85-109-122	1.0	13 – 14.5' Red/brown SILT and F-M-C SAND; some F rounded gravel; saturated; PID= 0.0 14.5 – 15' Weathered bedrock; some Red/brown SILT and F SAND
					AUGER REFUSAL @ 15', E.O.B.

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OWNER: Rouse Staten Island Mall

BORING ID: SB-1

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: NA **SETTING:** N/A
DATE COMPLETED: 5/12/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** NA
SAMPLING METHOD: Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Eric S Ricci	**SETTING**: N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE**:
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:** N/A
SURFACE COMPLETION Asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:** N/A
COMMENTS:	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	2.6	3.5	Black Asphalt and Subbase; dry
1.0	3.0	2.2		Red/brown F-M SAND; little silt; dry to moist
3.0	4.0	0.7		Red/brown F-M SAND; little silt; very moist
4.0	5.0	0.3		Red/brown F-M SAND; some silt; very moist at 4.5’
5.0	6.0	0.3	2.1	Red/brown F-M SAND; some silt; very moist
6.0	6.5	0.3		Red/brown F-M SAND; some silt; little clay; very moist
6.5	8.0	0.3		Red/brown F SAND and M-C rounded gravel; some silt; saturated
				Refusal at 8.0’, E.O.B.

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OWNER: Rouse Staten Island Mall

BORING ID: SB-2

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: NA **SETTING:** N/A
DATE COMPLETED: 5/12/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** NA
SAMPLING METHOD: Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Eric S Ricci	**SETTING**: N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE**:
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:** N/A
SURFACE COMPLETION: Asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:** N/A
COMMENTS:	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	2.9	4.6	Black and gray Gravel and Asphalt; dry
1.0	2.0	1.4		Fill; Red/brown F SAND and SILT; dry
2.0	3.0	0.0		Red/brown F SAND; little F-M-C subrounded gravel; dry
3.0	5.0	0.0		Red/brown SAND; some F-M-C subrounded gravel; dry
5.0	6.0	0.0		Red/brown SAND; with gray cobble; moist
				Refusal at 6.0', E.O.B.

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OWNER: Rouse Staten Island Mall

BORING ID: SB-3

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: NA **SETTING:** N/A
DATE COMPLETED: 5/12/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** NA
SAMPLING METHOD: Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Eric S Ricci	**SETTING**: N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE**:
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:** N/A
SURFACE COMPLETION: Asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:** N/A
COMMENTS:	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	0.5		Black Asphalt and Subbase; dry
1.0	3.0	0.0		Red/brown F SAND and SILT; with gray sub angular pebbles; dry
				Refusal at 3.0', E.O.B.

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OWNER: Rouse Staten Island Mall

WELL NO.: SB-4

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: N/A **SETTING:** N/A
DATE COMPLETED: 5/12/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** N/A
SAMPLING METHOD: Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Eric S Ricci	**SETTING**: N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:** N/A
SURFACE COMPLETION: Asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:** N/A
COMMENTS:	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	0.0	1.2	Black Asphalt and Subbase; dry
1.0	5.0	40.0		Red/brown F SAND and SILT; with F-M-C subangular gravel; dry * Cobble lodged in macro core at 1.2’
5.0	5.5	2.8	2.8	Red/brown F SAND and SILT; very moist
5.5	6.0	1.0		Red/brown F SAND and SILT; saturated
6.0	7.0	0.2		Red/brown F SAND and SILT; trace clay with brown mottling; saturated
7.0	8.5	0.3		Red/brown F SAND and SILT; trace clay; very tight; saturated
8.5	9.0	0.1		Red/brown F SAND and SILT; very tight; some F-M-C gravel; saturated
				Refusal at 9.0’, E.O.B.

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OWNER: Rouse Staten Island Mall

WELL NO.: SB-5

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SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: N/A **SETTING:** N/A'
DATE COMPLETED: 5/12/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** N/A
SAMPLING METHOD: Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Eric S Ricci	**SETTING**: N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:** N/A
SURFACE COMPLETION: Asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:** N/A
COMMENTS:	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	0.5	3.3	Black Asphalt and Subbase; dry
1.0	3.5	2.0		Red/brown F SAND and SILT; with F-M-C subrounded gravel; dry
3.5	5.0	5.3		Red/brown F SAND; with F-M-C subrounded gravel; moist
5.0	6.0	16.0	3.2	Red/brown F SAND and SILT; F-M-C gravel; moist
6.0	7.5	4.8		Red/brown F SAND and SILT; F-M-C gravel; very moist
7.5	8.5	4.2		Red/brown F SAND and SILT; M-C gravel; very tight; moist
				Refusal at 8.5', E.O.B.

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	OWNER: Rouse Staten Island Mall
	WELL NO.: SB-6
	PAGE: 1 **of** 1 **PAGES**
SITE LOCATION: Staten Island, New York	**SCREEN TYPE:** N/A **DIAMETER:** N/A
	SLOT NO.: N/A **SETTING:** N/A'
DATE COMPLETED: 5/12/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:** N/A
DRILLING METHOD: Geoprobe Direct Push	**SETTING:** N/A
SAMPLING METHOD: Acetate Sleeve	**SEAL TYPE:** N/A
OBSERVER: Eric S Ricci	**SETTING**: N/A
REFERENCE POINT (RP): Ground Level	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:** N/A
SURFACE COMPLETION: Asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:** N/A
COMMENTS:	
ABBREVIATIONS: C = Coarse, M = Medium, F = Fine	

DEPTH (FEET) FROM	DEPTH (FEET) TO	PID (ppm)	RECOVERY (feet)	DESCRIPTION
0.0	1.0	0.3	4.3	Black Asphalt and Subbase; dry
1.0	4.0	16.7		Brown F-M SAND and SILT; F-M-C subangular gravel; little gray clay seams; tight; dry
4.0	5.0	9.1		Red/brown F SAND and SILT; some M-C subrounded gravel; some grey brown clay pockets (possibly varved); tight; moist
5.0	6.5	2.9	2.4	Red/brown F SAND and SILT; with F-M rounded gravel; trace cobbles; very moist
6.5	7.5	3.7		Red/brown F SAND and SILT; with F-M rounded gravel; trace cobbles; very tight; slightly moist
7.5	9.0	--		*Cobble in shoe at 7.5
				Refusal at 9.0', E.O.B.

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OWNER: Rouse Staten Island Mall

WELL NO.: SB-7

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: Platinum Ave, Staten Island NY	**SCREEN TYPE:** N/A **DIAMETER:**
	SLOT NO.: N/A **SETTING:**
DATE COMPLETED: 7/20/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:** N/A
SAMPLING METHOD: Split spoon	**SEAL TYPE:** N/A
OBSERVER: Spiros Zois	**SETTING**: N/A
REFERENCE POINT (RP): grade	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:**
COMMENTS:	
ABBREVIATIONS: SS = split spoon C = cuttings F-M-C = Fine, Medium, Coarse	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	Airknife	-	-	0 – 0.5’ Asphalt; PID= 0.0 0.5 – 2’ Subbase (large angular gravel w/ fines); PID= 0.6 2 – 5’ Light brown F SILT; some F sand; w/ subangular F-M-C rounded gravel; dry; PID= 3.0 @ 5 ft.
5	7	SS	11-16-16-15	0.8	Red/brown SILT and F SAND; with F-M-C rounded gravel; some clay; moist at 7’; PID= 0.0
7	9	SS	18-15-11-28	1.1	7 – 8’ Red/brown SILT and F-M SAND; with F-M-C rounded gravel; saturated; PID= 0.0 8 – 9’ Red/brown F-M-C SAND; with F-M-C rounded gravel; some silt; saturated; PID= 0.0
9	11	SS	4-5-8-12	1.2	Red/brown SILT; some F-M-C sand; some F-M-C gravel; some clay; very moist; PID= 0.2 @ 9’ and 0.0 from 9.5’ – 11’

OWNER:	Rouse Staten Island Mall
WELL NO.:	SB-7 **PAGE:** 2 **OF** 2 **PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
11	13	SS	27-20-32-50/5	1.2	11 - 12' Red/brown SILT and CLAY; with F rounded gravel; very tight; moist; PID= 0.0 12 - 12.5' Red/brown SILT and CLAY; with F-M rounded gravel; some F-M Sand; tight; moist; PID=0.0 12.5 – 13' Red/brown SILT and F-M SAND; with F-M-C rounded gravel; some clay; saturated; PID= 0.0
13	15	SS	5-19-24-48	1.0	M-C SAND; w/ F-M-C gravel; some cobbles; little fines; saturated; PID= 0.0
15	16	SS	28-15/4	0.5	Red/brown SILT and F SAND; with F rounded gravel; tight; moist; PID= 0.0
16	17	SS	50-50/1	0.2	Rock fragments (boulder or bedrock)
					AUGER REFUSAL @ 17', E.O.B.

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OWNER: Rouse Staten Island Mall	
WELL NO.: SB-8	
PAGE: 1 **of** 2 **PAGES**	
SITE LOCATION: Platinum Ave, Staten Island NY	**SCREEN TYPE:** N/A **DIAMETER:**
	SLOT NO.: N/A **SETTING:**
DATE COMPLETED: 7/21/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:** N/A
SAMPLING METHOD: Split spoon	**SEAL TYPE:** N/A
OBSERVER: Spiros Zois	**SETTING**: N/A
REFERENCE POINT (RP): grade	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:**
COMMENTS:	
ABBREVIATIONS: SS = split spoon C = cuttings F-M-C = Fine, Medium, Coarse	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	Airknife	-	-	0 – 1’ Asphalt; PID= 0.0 1 – 3’ Subbase; PID= 0.0 3 – 5’ Light brown SILT and F SAND; some F-M-C rounded gravel; dry; PID= 0.0
5	7	SS	18-19-28-32	0.7	Red/brown SILT and F SAND; some F subrounded gravel; moist; PID= 0.0
7	9	SS	17-13-11-14	0.3	Red/brown SILT and F SAND; some F subrounded gravel; saturated; PID= 0.0
9	11	SS	50/2	0.0	No Recovery
11	13	SS	8-15-20-22	1.3	Red/brown C SAND and F-M-C GRAVEL; with red/brown fines; saturated; PID= 0.0
13	15	SS	22-29-20-15	1.3	F-M SAND; saturated; PID= 0.0

OWNER:	Rouse Staten Island Mall
WELL NO.:	SB-8 **PAGE:** 2 **OF** 2 **PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
15	17	SS	3-6-5-30	1.3	15 – 16.5' F-M SAND; with fines; some F-M-C rounded gravel; saturated; PID= 0.0 ½" wood fiber layer (construction debris) @ 16'. 16.5 – 17' Weathered Rock in SILT with CLAY; PID= 0.0
17	18	SS	25-100/4	0.3	17 – 18' F-M SAND; with wood fibers; saturated; PID= 0.0 18' Bedrock
					AUGER REFUSAL @ 18', E.O.B.

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OWNER: Rouse Staten Island Mall

WELL NO.: SB-9

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: Platinum Ave, Staten Island NY	**SCREEN TYPE:** N/A **DIAMETER:**
	SLOT NO.: N/A **SETTING:**
DATE COMPLETED: 7/20/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:** N/A
SAMPLING METHOD: Split spoon	**SEAL TYPE:** N/A
OBSERVER: Spiros Zois	**SETTING**: N/A
REFERENCE POINT (RP): grade	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:**
COMMENTS:	
ABBREVIATIONS: SS = split spoon C = cuttings F-M-C = Fine, Medium, Coarse	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	Airknife	-	-	0 – 1’ Asphalt; PID= 0.0 1 – 3’ Subbase (large stone); PID= 0.0 3 – 5’ Light brown SILT and F SAND; some F-M-C subrounded gravel; dry; PID= 0.0
5	7	SS	10-17-12-8	1.0	Red/brown SILT; some F-M-C subangular to subrounded gravel; slightly moist; PID= 0.0
7	9	SS	5-7-5-8	0.9	Red/brown SILT and F-M-C subangular to subrounded GRAVEL; some cobbles; moist; PID= 0.0
9	11	SS	10-19-5-5	0.5	Red/brown SILT and F-M Sand; trace F rounded gravel; saturated; PID= 0.0
11	13	SS	11-28-20-50/4	0.4	Red/brown SILT; some F rounded gravel; very tight; barely moist; PID= 0.0

OWNER:	Rouse Staten Island Mall
WELL NO.:	SB-9 **PAGE:** 2 **OF** 2 **PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
13	15	SS	50/3	0	No Recovery
15	17	SS	50/4	0.3	No Recovery; Weathered Rock
					AUGER REFUSAL @ 16', E.O.B.

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OWNER: Rouse Staten Island Mall

WELL NO.: SB-10

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: Platinum Ave, Staten Island NY	**SCREEN TYPE:** N/A **DIAMETER:**
	SLOT NO.: N/A **SETTING:**
DATE COMPLETED: 7/21/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:** N/A
SAMPLING METHOD: Split spoon	**SEAL TYPE:** N/A
OBSERVER: Spiros Zois	**SETTING**: N/A
REFERENCE POINT (RP): grade	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:**
COMMENTS:	
ABBREVIATIONS: SS = split spoon C = cuttings F-M-C = Fine, Medium, Coarse	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	Airknife	-	-	0 – 1’ Asphalt; PID= 0.0 1 – 3’ Subbase (large stone); PID= 0.0 3 – 5’ Light brown SILT and F SAND; some F-M-C subrounded gravel; dry; PID= 0.0
5	7	SS	7-17-32-19	0	No Recovery, lost split spoon nose in hole.
7	9	SS	23-27-12-8	0.5	Red/brown SILT and F SAND; some F-M-C subrounded gravel; very moist; PID= 0.0
9	11	SS	19-9-5-9	0.9	Red/brown SILT and F SAND; some F-M subrounded gravel; little cobbles; saturated; PID= 0.0
11	13	SS	15-24-31-50/4	0.6	Red/brown SILT and F-M SAND; some F rounded gravel; some C subrounded gravel and cobbles; saturated; PID= 0.0

OWNER:	Rouse Staten Island Mall
WELL NO.:	SB-10 **PAGE:** 2 **OF** 2 **PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
13	15	SS	100/3	0.1	13 – 13.5' Cobble in nose of spoon; smear of clayey SILT and F SAND Weathered Rock
15	17	SS	100/0	0	No Recovery; Bedrock
					AUGER REFUSAL @ 15.25', E.O.B.

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OWNER: Rouse Staten Island Mall	
WELL NO.: SB-11	
PAGE: 1 **of** 2 **PAGES**	
SITE LOCATION: Platinum Ave, Staten Island NY	**SCREEN TYPE:** N/A **DIAMETER:**
	SLOT NO.: N/A **SETTING:**
DATE COMPLETED: 7/21/11	**SAND PACK SIZE:** N/A
DRILLING COMPANY: Summit Drilling Co.	**SETTING:** N/A
	CASING TYPE: N/A **DIAMETER:**
DRILLING METHOD: Hollow Stem Auger	**SETTING:** N/A
SAMPLING METHOD: Split spoon	**SEAL TYPE:** N/A
OBSERVER: Spiros Zois	**SETTING**: N/A
REFERENCE POINT (RP): grade	**BACKFILL TYPE**: N/A
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: asphalt patch	**DEVELOPMENT METHOD**: N/A
	DURATION: N/A **ESTIMATED YIELD:**
COMMENTS:	
ABBREVIATIONS: SS = split spoon C = cuttings F-M-C = Fine, Medium, Coarse	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	Airknife	-	-	0 – 1’ Asphalt; PID= 0.0 1 – 3’ Subbase (large stone); PID= 0.0 3 – 5’ Light brown SILT and F SAND; some F-M-C subrounded gravel; dry; PID= 0.0
5	7	SS	31-28-30-33	0.9	Red/brown SILT and F SAND; some F-M-C subangular to subrounded gravel and cobbles; slightly moist; PID= 3.5 @ 5’
7	9	SS	10-12-7-7	1.3	Red/brown SILT and F SAND; some F-M-C subrounded gravel and cobbles; moist; PID= 1.5 @ 7’ and 0.0 @ 9’
9	11	SS	15-50/4	0.2	Red/brown SILT and F SAND; some F-M subrounded gravel; little cobbles; very moist; PID= 0.0
11	13	SS	50/4	0.1	Red/brown SILT; some F rounded gravel; very tight; barely moist; PID= 0.0

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WELL NO.:	SB-11 **PAGE:** 2 **OF** 2 **PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
13	15	SS	75-85-109-122	1.0	13 – 14.5' Red/brown SILT and F-M-C SAND; some F rounded gravel; saturated; PID= 0.0 14.5 – 15' Weathered bedrock; some Red/brown SILT and F SAND
					AUGER REFUSAL @ 15', E.O.B.

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-1

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Back of building, parallel to Marsh Ave.
DATE COMPLETED: 6/1/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 14'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:**9.46 ftbtopvc **DATE:** 6/1/2017
SURFACE COMPLETION: Temporary Well	

COMMENTS: Stick up: 1' ag

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million ftbtopvc = Feet below top of PVC, ag= Above Grade

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	1.1	0-5'Asphalt and Subbase, no recovery after.
5	10	MC	N/A	1.4	5-10'Red Brown Silt and f Sand; f m c
					subround gravel; some cobbles; very moist.
10	15	MC	N/A	3.15	10-12' Highly weathered rock; red brown Silt
					and f Sand; with f m rounded gravel; some f m
					gravel and cobbles (weathered bedrock);
					moist.
					12-14' Weathered Bedrock; Red Brown SILT
					with f m gravel and cobble (weathered
					bedrock); moist; tight.
					-EOB Refusal at 14'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-2

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Back of building, parallel to Marsh Ave.
DATE COMPLETED: 6/1/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 13'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	

COMMENTS:

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million

DEPTH (FEET) FROM	DEPTH (FEET) TO	SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
0	5	MC	N/A	2.0	0-1' Asphalt and Subbase.
					1-5' Red Brown Silt and f Sand; with f m c
					subangular gravel; barley moist.
5	10	MC	N/A	2.3	5-6' Red Brown Silt and f Sand; with f m c
					subangular gravel; little cobble; barley moist;
					tight.
					6-6.5' Weathered Bedrock Cobble.
					6.5-10' Red Brown Silt and f Sand; with f m c
					subangular gravel and weathered bedrock;
					some cobbles; dry; at 10' weathered bedrock
					cobble.

OWNER: GGP Staten Island Mall

BORING NO.: SWB-2 **PAGE: 2 OF 2 PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
10	15	MC	N/A	2.3	10-10.5' Weather Bedrock Cobble.
					10.5-13' Red Brown Silt and f Sand; with f m c
					subangular gravel and weathered bedrock;
					some cobbles; dry; at 13' weathered bedrock
					cobble.
					-EOB Refusal at 15'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-3

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Back of building, parallel to Marsh Ave.
DATE COMPLETED: 6/1/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 13'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	

COMMENTS:

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	3.4	0-1' Asphalt and Subbase.
					1-3' Red Brown f m c Sand and Silt; with
					subangular f m c gravel; very tight; slightly
					moist.
					3-5' Weathered Bedrock; cobble at 5'.
5	10	MC	N/A	4.0	5-10' Red Brown f Sand and Silt; f m c
					subangular gravel and weathered bedrock;
					tight; moist; bedrock cobble at 7.5'.
10	15	MC	N/A	1.8	10-12.5' Red Brown f Sand and Silt; f m c
					subangular f m c gravel; very tight; slightly
					moist.

OWNER: GGP Staten Island Mall

BORING NO.: SWB-3

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					12.5-13' Weathered Bedrock.
					-EOB Refusal at 15'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-4

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Back of building, parallel to Marsh Ave.
DATE COMPLETED: 6/1/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 8'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	

COMMENTS:

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	2.3	0-1' Asphalt and Subbase.
					1-5' Red Brown Silt and f Sand; with f m c
					gravel and cobbles; subround weathered
					bedrock; tight; moist; cobble at 2'.
5	10	MC	N/A	2.4	5-7' Red Brown Silt and f Sand; with f m c
					gravel and cobbles; subround weathered
					bedrock; tight; moist.
					7-8' Weathered Bedrock; c gravel and cobbles.
					-EOB Refusal at 8'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-5

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Back of building, parallel to Marsh Ave.
DATE COMPLETED: 6/1/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 5'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	
COMMENTS:	
ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	4.1	0-0.8' Asphalt and Subbase.
					0.8-4.2' Red Brown f m Sand and Silt; with
					f m c subrounded gravel; little f m c cobbles;
					tight; barley moist.
					4.2-5' Weathered Bedrock; green f Sand
					and Silt; with f m c gravel and cobbles; barely
					moist.
					-EOB Refusal at 5'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-6

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Back of building, parallel to Marsh Ave.
DATE COMPLETED: 5/31/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 3'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	
COMMENTS:	
ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	2.5	0-0.8' Asphalt and Subbase.
					0.8-1.5' Red Brown Silt and f Sand; some
					f subround gravel; little clay; moist.
					1.5'-3.0' Light Brown Silt and f Sand; with
					f m c subangular gravel; weathered bedrock
					cobbles; tight; dry.
					-EOB Refusal at 3'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-7

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Back of building, parallel to Marsh Ave.
DATE COMPLETED: 6/1/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 10'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:** 7.39 ftbtopvc **DATE:** 6/1/2017
SURFACE COMPLETION: Temporary Well	

COMMENTS: Stickup height: 3.25' ag

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million ftbtopvc = Feet below top of PVC, ag= Above Grade

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	3.5	0-1' Asphalt and Subbase.
					1-1.5' Red Brown f m c Sand and Silt; with
					f m c subangular gravel; dry.
					1.5-5' Red Brown f m c Sand and Silt; with
					f m c subangular gravel; cobble at 1.5';
					little weathered bedrock; tight; moist.
5	10	MC	N/A	4.1	5-6.5' f m c GRAVEL; with f m c sand and silt;
					saturated; cobble at 6.5'.
					6.5-10' Red Brown Silt and Clay; with
					f m c sand; little subround f m c gravel; little
					weathered bedrock.
					-EOB Refusal at 10'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-8

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Back of building, parallel to Marsh Ave.
DATE COMPLETED: 6/1/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 10'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	
COMMENTS:	
ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	3.7	0-1' Asphalt and Subbase.
					1-5' Red Brown Silt and f Sand; some f m c
					subangular gravel; some weathered bedrock;
					weathered bedrock cobble at 2.5' and 5'.
					At 1.2' PID=1.2
5	10	MC	N/A	3.2	Red Brown Silt and f Sand; some f m c
					subangular gravel; some weathered bedrock;
					tight; from 5-8' moist; from 8-10' dry. At 5'
					bedrock cobble.
					-EOB Refusal at 10'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-9

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Back of building, parallel to Marsh Ave.
DATE COMPLETED: 5/31/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 6'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	

COMMENTS:

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	4.5	0-1' Asphalt and Subbase. At 0' PID=0.8
					1-5' Red Brown Silt and f Sand; with f m c
					subround-subangular gravel; little cobbles;
					some weathered bedrock; tight; moist.
5	10	MC	N/A	1	5-6' Red Brown Silt and f Sand; with f m c
					subround-subangular gravel; little cobbles;
					weathered bedrock; tight; dry.
					-EOB Refusal at 6'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-10

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Back of building, parallel to Marsh Ave.
DATE COMPLETED: 6/2/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 12'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	

COMMENTS:

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	4.1	0-2' Asphalt and Subbase. At 0' PID=4.1; At 1'
					PID=0.3; At 3' PID=1.5
					2-3' Red Brown f m c Sand and Silt; with f m c
					angular gravel; tight; slightly moist.
					3-5' Red Brown f m c Sand and Silt; with f m c
					angular gravel; tight; slightly moist.
5	10	MC	N/A	4.8	5-7' Red Brown f m c Sand and Silt; with f m c
					angular gravel; little weathered bedrock; tight;
					slightly moist.
					7-10' Red Brown f m c Sand and Silt; with
					f m c angular gravel; with weathered bedrock;

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BORING NO.: SWB-10 **PAGE: 2 OF 2 PAGES**

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DEPTH (FEET) FROM	DEPTH (FEET) TO	SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
					tight; slightly moist.
10	15	MC	N/A	1.2	10-11' Red Brown f m c Sand and Silt; with
					f m c angular gravel; with weathered bedrock;
					some clay; tight; slightly moist.
					11-12' Light Brown Silt and Clay; some f m c
					rounded gravel; some gravel and cobbles
					(weathered bedrock); little f sand; from
					11.5-12' saturated.
					-EOB Refusal at 12'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-11

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Parallel to Platinum Ave
DATE COMPLETED: 5/31/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 12'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	

COMMENTS:

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	2.7	0-1.0' Asphalt and Subbase.
					1.0-2.5' Red Brown f SAND; some silt; little
					f rounded gravel; dry.
					2.5-5.0' Red Brown f Sand and Silt; with f m c
					subround gravel; some cobbles; tight; moist.
5	10	MC	N/A	4.4	5-6' Red Brown f Sand and Silt; with f m c
					subround gravel; some cobbles; tight; very
					moist.
					6-7' Red Brown f Sand and Silt; with f m c
					subangular gravel and cobble; very tight;
					moist.

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BORING.: SWB-11 **PAGE: 2 OF 2 PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					7-10' Red Brown f m Sand and Silt; with
					f m c subangular gravel; weathered bedrock;
					tight; dry; cobble at 7'.
10	15	MC	N/A	1.2	10-12' Red Brown f m Sand and Silt; with
					f m c subangular gravel; weathered bedrock;
					tight; dry.
					-EOB Refusal at 12'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-12

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Parallel to Platinum Ave
DATE COMPLETED: 6/2/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 14'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	

COMMENTS:

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	4.2	0-1' Asphalt and Subbase; At 0' PID= 0.3
					1-2' Red Brown f m c Sand and Silt; with
					m c subangular gravel.
					2-4' Red Brown f m c SAND; with little silt;
					tight.
					4-5' Red Brown f m c Sand and Silt; tight;
					slightly moist.
5	10	MC	N/A	1.0	5-10' Red Brown f m c Sand and Silt; tight;
					slightly moist; cobble at 7.5'.
10	15	MC	N/A	2.0	10-12' Reddish Brown SILT; with some f m c
					sand and subrounded-subangular f m c gravel;

OWNER: GGP Staten Island Mall	
BORING NO.: SWB-12	**PAGE:** 2 **OF** 2 **PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					very tight; slightly moist.
					12-14' Reddish Brown f m c Sand and Silt;
					with weathered bedrock.
					-EOB Refusal at 14'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-13

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Parallel to Platinum Ave
DATE COMPLETED: 5/31/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 18'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	

COMMENTS:

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	3.3	0-0.5' Asphalt and Subbase. At 0' PID=0.5
					0.5-3.5' Light Brown SILT; some f sand; little
					f rounded gravel; tight; moist.
					3.5-5.0' Red Brown SILT; with f sand; some
					f m rounded gravel; tight; moist.
5	10	MC	N/A	3.1	5-10' Red Brown SILT; with f sand; with; f m
					round-subround gravel; moist; tight; cobble at
					9'. At 8' PID= 0.4
10	15	MC	N/A	4.9	10-15' Red Brown SILT; with f sand; with; f m c
					round-subround gravel; tight; moist; cobble at
					13'; weathered bedrock at 14'.

OWNER: GGP Staten Island Mall

BORING NO.: SWB-13 **PAGE: 2 OF 2 PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
15	20	MC	N/A	1.5	15-18' Red Brown SILT; with f sand; with;
					f m c round-subround gravel; tight; dry;
					weathered bedrock; slight sulfur smell.
					-EOB Refusal at 18'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-14

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Parallel to Platinum Ave
DATE COMPLETED: 5/31/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 19'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE**: Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	

COMMENTS:

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	5.0	0-0.5' Asphalt and Subbase.
					0.5-4.0' Fill material. Red Brown SILT; with
					f m sand; some f m rounded gravel; tight;
					moist.
					4-5' Red Brown f m Sand and Silt; very
					wet.
5	10	MC	N/A	4.4	5-6' Fill material; Red Brown Silt and f m Sand;
					with f m subround gravel; little clay; very moist.
					6-9' Red Brown Silt and f Sand; f m round
					gravel; tight; saturated to 7.5'; moist from
					7.5-9'. At 5' PID=1.2; At 6' PID=0.1;

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BORING NO.: SWB-14 **PAGE: 2 OF 2 PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					At 8' PID=0.2
					9-10' f m c Sand and Silt; some f m rounded
					gravel; little clay; very moist. At 9' PID=0.1'; At
					10' PID=10.6
10	15	MC	N/A	4.1	10-11' Red Brown f m c SAND; some silt;
					saturated. At 10' PID=23.8
					11.0-13.8' Red Brown Silt and Clay; with
					f m c subround gravel; little f sand; very tight;
					moist. At 11' PID=0.5; At 12' PID=0.2
					13.8-15' Red Brown Silt and f m Sand; with
					m rounded gravel; moist; cobble at 14.8-15.0
15	20	MC	N/A	4.8	15-17' Red Brown f m c SAND; some silt;
					some f m gravel; saturated.
					17-19' Red Brown SILT; with f m
					subrounded gravel; some clay; tight ; moist.
					-EOB Refusal at 19'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-15

PAGE: 1 of 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Parallel to Platinum Ave
DATE COMPLETED: 6/2/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 14.5'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:**
ELEVATION OF RP:	**STATIC WATER LEVEL:**8.35ftbtopvc **DATE:** 6/2/2017
SURFACE COMPLETION: Temporary Well	

COMMENTS: Stickup height: 1' ag

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million ftbtopvc= Feet Below Top of PVC, ag= Above Grade

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	3.0	0-2' Asphalt and Subbase.
					2-5' Fill material; Brown Silt and f m c
					Sand; with some f m subrounded gravel.
5	10	MC	N/A	2.9	5-10' Red Brown f m c Sand and Silt; some
					f m c subrounded gravel; tight; moist.
10	15	MC	N/A	3.5	10.0-12.5' Red Brown Clay and Silt; with f m
					rounded gravel; tight; moist.
					12.5-14.5' Red Brown Silt and f m Sand; with
					f m c gravel and cobbles (weathered bedrock);
					At 14.3-14.5' f m c sand and gravel seem;
					saturated at 14' (could be water from top)

OWNER: GGP Staten Island Mall	
BORING NO.: SWB-15	**PAGE:** 2 **OF** 2 **PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					At 13.0-13.5' Cobbles.
					-EOB Refusal at 14.5'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-16

PAGE: 1 **of** 1 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Parallel to Platinum Ave
DATE COMPLETED: 6/2/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 13'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	

COMMENTS:

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	2.3	0-2.5' Asphalt and Subbase.
					2.5-5.0' Brown SILT; some f m c subangular
					cobbles and gravel; some clay; tight; moist.
5	10	MC	N/A	1.0	5-10' Red Brown Silt and f Sand; with f m c
					subrounded gravel; moist.
10	15	MC	N/A	0.9	10-10.5' f m c SAND; with silt; with f m
					rounded gravel; (could be sluff from higher
					material).
					10.5-13' Silt and Clay; with subangular to
					subround f m c gravel and cobbles; saturated
					(might be water from top).
					-EOB Refusal at 13'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-17

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Parallel to Platinum Ave
DATE COMPLETED: 6/2/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 18'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	

COMMENTS:

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	2.3	0-1' Asphalt and Subbase.
					1-5' Fill material; Brown Silt and f Sand; some
					brick; concrete; wood.
5	10	MC	N/A	2.5	5-10' Red Brown f m c Sand and Silt; with
					subround-subangular f m c gravel; with
					little pockets of grey clay; tight; moist.
10	15	MC	N/A	4.0	10-14' Red Brown f m c Sand and Silt with
					pockets of grey clay; little subrounded f m
					gravel.
					14-15' Red Brown Silt and f m c Sand with
					pockets of grey clay; little subrounded f m c

OWNER: GGP Staten Island Mall

BORING NO.: SWB-17 **PAGE:** 2 **OF** 2 **PAGES**

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DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					gravel.
15	20	MC	N/A	2.2	15-18' Red Brown f m c Sand and Silt; with
					some f m c rounded to subrounded gravel and
					cobbles; tight; moist.
					-EOB Refusal at 18'-

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OWNER: GGP Staten Island Mall

SOIL BORING NO.: SWB-18

PAGE: 1 **of** 2 **PAGES**

SITE LOCATION: 280 Marsh Avenue, Staten Island Mall, New York	**BORING LOCATION:** Parallel to Platinum Ave
DATE COMPLETED: 6/2/2017	
DRILLING COMPANY: Cascade	
DRILLING METHOD: Geoprobe	
SAMPLING METHOD: 5' Macro Cores	
OBSERVER: M.Karban, S. Zois	**TOTAL DEPTH OF BORING:** 14'
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Cuttings
ELEVATION OF RP:	**STATIC WATER LEVEL:** N/A **DATE:**
SURFACE COMPLETION: Asphalt Patch	

COMMENTS:

ABBREVIATIONS: MC = Macro Core, c = Coarse, m = Medium, f = fine, EOB = End of Boring, ppm = parts per million

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
0	5	MC	N/A	2.6	0-1' Asphalt and Subbase.
					1-4.8' Fill material; Grey f Sand and Silt; small
					organics.
					4.8-5.0' Brown f SAND fill.
5	10	MC	N/A	3.4	5-9' Red Brown f Sand and Silt; with f m c
					subangular gravel; little subangular cobble.
					9-10' Red Brown Clay and Silt; with f m c
					subangular gravel; tight; slightly moist.
10	15	MC	N/A	3.4	10-12' Red Brown Clay and Silt; with f m c
					subangular gravel; tight; slightly moist.
					12-15' f m c SAND; little f subround gravel;

OWNER: GGP Staten Island Mall

BORING NO.: SWB-18 **PAGE: 2 OF 2 PAGES**

Leggette, Brashears & Graham, Inc. www.lbgweb.com

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	RECOVERY (feet)	DESCRIPTION
FROM	TO				
					little silt.
15	20	MC	N/A	3.9	15-16' f m c SAND; little f subround gravel;
					little silt.
					16-17.5' Red Brown f Sand and Silt; with f m c
					subangular gravel.
					17.5-17.8' Weathered Bedrock.
					17.8-19' Red Brown f Sand and Silt; with f m c
					subangular gravel; with weathered bedrock;
					moist.
					-EOB Refusal at 19'-

APPENDIX F SITE WIDE ENDPOINT LABORATORY REPORTS

APPENDIX G AGENCY APPROVALS

Type or print all information. See reverse for instructions. OMB No. 2040-0042 Approval Expires 4/30/07

INVENTORY OF INJECTION WELLS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF GROUND WATER AND DRINKING WATER

(This information is collected under the authority of the Safe Drinking Water Act)

1. DATE PREPARED *(Year, Month, Day)*: 13-05-21

2. FACILITY ID NUMBER: S24-3-020

PAPERWORK REDUCTION ACT NOTICE

The public reporting burden for this collection of information is estimated at about 0.5 hour per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Chief, Information Policy Branch, 2136, U.S. Environmental Protection Agency, 401 M Street, SW, Washington, DC 20460, and to the Office of Management and Budget, Paperwork Reduction Project, Washington, DC 20503.

3. TRANSACTION TYPE *(Please mark one of the following)*

- ☐ Deletion
- ☐ First Time Entry
- ☐ Entry Change
- ☐ Replacement

4. FACILITY NAME AND LOCATION

A. NAME *(last, first, and middle initial)*: Carol Cleaners, Staten Island Mall

B. STREET ADDRESS/ROUTE NUMBER: 280 Marsh Avenue

C. LATITUDE

DEG	MIN	SEC
40	34	41.4

D. LONGITUDE

DEG	MIN	SEC
74	09	52.4

E. TOWNSHIP/RANGE

TOWNSHIP	RANGE	SECT	1/4 SECT
NA*	NA	NA	NA

F. CITY/TOWN: Staten Island

G. STATE: New York

H. ZIP CODE: 10314

I. NUMERIC COUNTY CODE: 085

J. INDIAN LAND *(mark "x")*: ☐ Yes ☐ No

5. LEGAL CONTACT:

A. TYPE *(mark "x")*: ☒ Owner ☐ Operator

B. NAME *(last, first, and middle initial)*: Kelly Webb

C. PHONE *(area code and number)*: (410) 992-6581

D. ORGANIZATION: General Growth Properties, Inc.

E. STREET/P.O. BOX: 10440 Little Patuxent Parkway, Suite 1000

F. CITY/TOWN: Columbia

G. STATE: Maryland

H. ZIP CODE: 21044

I. OWNERSHIP *(mark "x")*

- ☒ PRIVATE
- ☐ PUBLIC
- ☐ SPECIFY OTHER
- ☐ STATE
- ☐ FEDERAL

6. WELL INFORMATION:

A. CLASS AND TYPE		B. NUMBER OF WELLS		C. TOTAL NUMBER OF WELLS	D. WELL OPERATION STATUS				
		COMM	NON-COMM		UC	AC	TA	PA	AN
5	G		10	10	10				
				0					
				0					
				0					
				0					
				0					
				0					

COMMENTS *(Optional)*:

"Injection Wells" will actually be temporary well points (IP-1 through IP-10) advanced via direct push Geoprobe.

* Non-Applicable - New York State is "Not Part of the National Public Land Surveys System (PLSS)".

KEY:

DEG = Degree
MIN = Minute
SEC = Second
SECT = Section
1/4 SECT = Quarter Section
COMM = Commercial
NON-COMM = Non-Commercial
AC = Active
UC = Under Construction
TA = Temporarily Abandoned
PA = Permanently Abandoned and Approved by State
AN = Permanently Abandoned and not Approved by State

SECTION 1. DATE PREPARED: Enter date in order of year, month, and day.

SECTION 2. FACILITY ID NUMBER: In the first two spaces, insert the appropriate U.S. Postal Service State Code. In the third space, insert one of the following one letter alphabetic identifiers:

D - DUNS Number,
G - GSA Number, or
S - State Facility Number.

In the remaining spaces, insert the appropriate nine digit DUNS, GSA, or State Facility Number. For example, A Federal facility (GSA - 123456789) located in Virginia would be entered as : VAG123456789.

SECTION 3. TRANSACTION TYPE: Place an "x" in the applicable box. See below for further instructions.

Deletion. Fill in the Facility ID Number.
First Time Entry. Fill in all the appropriate information.
Entry Change. Fill in the Facility ID Number and the information that has changed.
Replacement.

SECTION 4. FACILITY NAME AND LOCATION:

A. Name. Fill in the facility's official or legal name.
B. Street Address. Self Explanatory.
C. Latitude. Enter the facility's latitude (all latitudes assume North Except for American Samoa).
D. Longitude. Enter the facility's longitude (all longitudes assume West except Guam).
E. Township/Range. Fill in the complete township and range. The first 3 spaces are numerical and the fourth is a letter (N,S,E,W) specifying a compass direction. A township is North or South of the baseline, and a range is East or West of the principal meridian (e.g., 132N, 343W).
F. City/Town. Self Explanatory.
G. State. Insert the U.S. Postal Service State abbreviation.
H. Zip Code. Insert the five digit zip code plus any extension.

SECTION 4. FACILITY NAME & LOCATION (CONT'D.):

I. Numeric County Code. Insert the numeric county code from the Federal Information Processing Standards Publication (FIPS Pub 6-1) June 15, 1970, U.S. Department of Commerce, National Bureau of Standards. For Alaska, use the Census Division Code developed by the U.S. Census Bureau.
J. Indian Land. Mark an "x" in the appropriate box (Yes or No) to indicate if the facility is located on Indian land.

SECTION 5. LEGAL CONTACT:

A. Type. Mark an "x" in the appropriate box to indicate the type of legal contact (Owner or Operator). For wells operated by lease, the operator is the legal contact.
B. Name. Self Explanatory.
C. Phone. Self Explanatory.
D. Organization. If the legal contact is an individual, give the name of the business organization to expedite mail distribution.
E. Street/P.O. Box. Self Explanatory.
F. City/Town. Self Explanatory.
G. State. Insert the U.S. Postal Service State abbreviation.
H. Zip Code. Insert the five digit zip code plus any extension.
I. Ownership. Place an "x" in the appropriate box to indicate ownership status.

SECTION 6. WELL INFORMATION:

A. Class and Type. Fill in the Class and Type of injection wells located at the listed facility. Use the most pertinent code (specified below) to accurately describe each type of injection well. For example, 2R for a Class II Enhanced Recovery Well, or 3M for a Class III Solution Mining Well, etc.
B. Number of Commercial and Non-Commercial Wells. Enter the total number of commercial and non-commercial wells for each Class/Type, as applicable.
C. Total Number of Wells. Enter the total number of injection wells for each specified Class/Type.
D. Well Operation Status. Enter the number of wells for each Class/Type under each operation status (see key on other side).

CLASS I Industrial, Municipal, and Radioactive Waste Disposal Wells used to inject waste below the lowermost Underground Source of Drinking Water (USDW).

TYPE		
	1I	Non-Hazardous Industrial Disposal Well.
	1M	Non-Hazardous Municipal Disposal Well.
	1H	Hazardous Waste Disposal Well injecting below the lowermost USDW.
	1R	Radioactive Waste Disposal Well.
	1X	Other Class I Wells.

CLASS II Oil and Gas Production and Storage Related Injection Wells.

TYPE		
	2A	Annular Disposal Well.
	2D	Produced Fluid Disposal Well.
	2H	Hydrocarbon Storage Well.
	2R	Enhanced Recovery Well.
	2X	Other Class II Wells.

CLASS III Special Process Injection Wells.

TYPE		
	3G	*In Situ* Gassification Well
	3M	Solution Mining Well.

CLASS III (CONT'D.)

TYPE		
	3S	Sulfur Mining Well by Frasch Process.
	3T	Geothermal Well.
	3U	Uranium Mining Well.
	3X	Other Class III Wells.

CLASS IV Wells that inject hazardous waste into/above USDWs.

TYPE		
	4H	Hazardous Facility Injection Well.
	4R	Remediation Well at RCRA or CERCLA site.

CLASS V Any Underground Injection Well not included in Classes I through IV.

TYPE		
	5A	Industrial Well.
	5B	Beneficial Use Well.
	5C	Fluid Return Well.
	5D	Sewage Treatment Effluent Well.
	5E	Cesspools (non-domestic).
	5F	Septic Systems.
	5G	Experimental Technology Well.
	5H	Drainage Well.
	5I	Mine Backfill Well.
	5J	Waste Discharge Well.

PAPERWORK REDUCTION ACT The public reporting and record keeping burden for this collection of information is estimated to average 0.5 hours per response. Burden means the total time, effort, or financial resource expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW., Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed forms to this address.

Type or print all information. See reverse for instructions. OMB No. 2040-0042 Approval Expires 4/30/07

INVENTORY OF INJECTION WELLS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF GROUND WATER AND DRINKING WATER

(This information is collected under the authority of the Safe Drinking Water Act)

1. DATE PREPARED *(Year, Month, Day)*: 13-05-21

2. FACILITY ID NUMBER: S24-3-020

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DEG	MIN	SEC
40	34	41.4

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DEG	MIN	SEC
74	09	52.4

E. TOWNSHIP/RANGE

TOWNSHIP	RANGE	SECT	1/4 SECT
NA*	NA	NA	NA

F. CITY/TOWN: Staten Island

G. STATE: New York

H. ZIP CODE: 10314

I. NUMERIC COUNTY CODE: 085

J. INDIAN LAND *(mark "x")*: ☐ Yes ☒ No

5. LEGAL CONTACT:

A. TYPE *(mark "x")*: ☒ Owner ☐ Operator

B. NAME *(last, first, and middle initial)*: Kelly Webb

C. PHONE *(area code and number)*: (410) 992-6581

D. ORGANIZATION: General Growth Properties, Inc.

E. STREET/P.O. BOX: 10440 Little Patuxent Parkway, Suite 1000

F. CITY/TOWN: Columbia

G. STATE: Maryland

H. ZIP CODE: 21044

I. OWNERSHIP *(mark "x")*

- ☒ PRIVATE
- ☐ PUBLIC
- ☐ SPECIFY OTHER
- ☐ STATE
- ☐ FEDERAL

6. WELL INFORMATION:

A. CLASS AND TYPE		B. NUMBER OF WELLS		C. TOTAL NUMBER OF WELLS	D. WELL OPERATION STATUS				
		COMM	NON-COMM		UC	AC	TA	PA	AN
5	G		10	10	10				
				0					
				0					
				0					
				0					
				0					
				0					

COMMENTS *(Optional)*:

"Injection Wells" will actually be temporary well points (IP-1 through IP-10) advanced via direct push Geoprobe.

* Non-Applicable - New York State is "Not Part of the National Public Land Surveys System (PLSS)".

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S - State Facility Number.

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TYPE		
	2A	Annular Disposal Well.
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	2H	Hydrocarbon Storage Well.
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	2X	Other Class II Wells.

CLASS III Special Process Injection Wells.

TYPE		
	3G	*In Situ* Gassification Well
	3M	Solution Mining Well.

CLASS III (CONT'D.)

TYPE		
	3S	Sulfur Mining Well by Frasch Process.
	3T	Geothermal Well.
	3U	Uranium Mining Well.
	3X	Other Class III Wells.

CLASS IV Wells that inject hazardous waste into/above USDWs.

TYPE		
	4H	Hazardous Facility Injection Well.
	4R	Remediation Well at RCRA or CERCLA site.

CLASS V Any Underground Injection Well not included in Classes I through IV.

TYPE		
	5A	Industrial Well.
	5B	Beneficial Use Well.
	5C	Fluid Return Well.
	5D	Sewage Treatment Effluent Well.
	5E	Cesspools (non-domestic).
	5F	Septic Systems.
	5G	Experimental Technology Well.
	5H	Drainage Well.
	5I	Mine Backfill Well.
	5J	Waste Discharge Well.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

JUL 11 2013

RECEIVED
JUL 15 2013
LBG - NJ

Kelly Webb
General Growth Properties, Inc.
10440 Little Patuxent Parkway, Suite 1000
Columbia, MD 21044

Re: Underground Injection Control (UIC) Program Regulation
Carol Cleaners, Staten Island Mall (**Reference UICID: 13NY08534013**)
280 Marsh Avenue
Staten Island, NY 10314
Richmond County
Authorization to Inject

Dear Ms. Webb:

This letter serves to inform you that the U.S. Environmental Protection Agency ("EPA") is in receipt of inventory information addressing wells authorized by rule located at the above-referenced facility in accordance with 40 Code of Federal Regulations ("CFR") §144.26. The operation of the following Underground Injection Control wells are authorized by rule, pursuant to 40 CFR §144.24:

Injection of sodium lactate (a blend of non-toxic fatty acids and fermentables) into ten (10) temporary well points (IP-1 through IP-10) advanced via direct push Geoprobe. The New York State Department of Environmental Conservation ("NYSDEC") Class 2 Inactive Hazardous Waste Disposal Site ("IHWDS") Number is 24-3-020.

Should any conditions change in the operation of any of the wells listed above (such as injectate composition, closure of the well, injection of cooling water greater than 150 degrees Fahrenheit, construction of additional wells, etc.) you are required to notify this office within five (5) days. Any accidental spills into a well should be reported within twenty-four (24) hours after the event. Change in operation information should be addressed to:

Nicole Foley Kraft, Chief
Ground Water Compliance Section
United States Environmental Protection Agency
290 Broadway, 20th Floor
New York, NY 10007-1866
Re: 13NY08534013
Attn: Lisa Kim Pelcyger

Should you own or operate **other** facilities using underground injection wells, please use the enclosed inventory form (EPA Form 7520-16) and instructions, copy for multiple facilities, and submit them to the address listed above. These documents can also be found on the internet at:

http://www.epa.gov/safewater/uic/pdfs/7520-16.pdf
http://www.epa.gov/region02/water/compliance/supplemental_instructions_inventory.pdf
http://www.epa.gov/region02/water/compliance/wellclasstypetable_inventoryc_form

Failure to respond to this letter truthfully and accurately within the time provided may subject you to sanctions authorized by federal law. Please also note that all information submitted by you may be used in an administrative, civil judicial or criminal action. In addition, making a knowing submission of materially false information to the U.S. Government may be a criminal offense.

Should you have any questions, please contact Lisa Kim Pelcyger of my staff at (212) 637-4225 or **kim.lisa@epa.gov**.

Sincerely,

Nicole Foley Kraft, Chief
Ground Water Compliance Section

Enclosure

cc: Robert Elburn
NYSDEC, Region 2
1 Hunter's Point Plaza
Long Island City, NY 11101

Christine Stokes, Senior Engineer
Leggette, Brashears & Graham, Inc.
600 East Crescent Avenue, Suite 200
Upper Saddle River, NJ 07458

APPENDIX H PHOTOGRAPHS

APPENDIX I INDOOR AIR/SUB-SLAB SAMPLING RESULTS

REF: NAD83

STATEN ISLAND MALL DRIVE

LEGEND

- ⊕ AIR SAMPLING LOCATION 2006 & 2008
- ▨ SUB-SLAB AIR SAMPLING LOCATION 2006 & 2008
- J ESTIMATED VALUE

ALL CONCENTRATIONS IN UNITS OF MICROGRAMS PER CUBIC METER (ug/m3)

RED CONCENTRATIONS REPRESENT EXCEEDANCE OF NYSDOH INDOOR AIR GUIDE VALUES IN 2006/2008
NO SUB-SLAB NYSDOH AIR GUIDE VALUES EXISTED IN 2006/2008

▨ CARVEL	PCE	TCE
4/2006	140	6.2
2/2008	76	3.1 J

▨ MON AMIE	PCE	TCE
4/2006	130	39
2/2008	23	7.6

▨ CAROL	PCE	TCE
4/2006	190	120
2/2008	79	53

▨ BABIES R US	PCE	TCE
4/2006	76	<1.1
2/2008	20	ND

⊕ CARVEL	PCE	TCE
4/2006	27	2.1 J
2/2008	9.63	0.752 J

⊕ MON AMIE	PCE	TCE
4/2006	810	11
4/2006	33	<1.1
4/2006	410	<1.1
2/2008	45.7 J	1.83

⊕ SI SHOE	PCE	TCE
4/2006	14	590
2/2008	33.9	285

⊕ BABIES R US	PCE	TCE
4/2006	120	27
4/2006	140	<1.1
4/2006	170	1.3 J
2/2008	5.56	0.699

⊕ OUTDOOR	PCE	TCE
4/2006	20	<1.1
2/2008	12.8 J	0.376 J

CARVEL

MON AMIE NAILS

FRENCH CLEANING BY CAROL (AKA CAROL CLEANERS)

SI SHOE REPAIR

BABIES R US

DAMOWA LAUNDRY CENTER (AKA TUMBLE DRY CLEANERS)

PLATINUM AVENUE

MARSH AVENUE

0 70

SCALE IN FEET

DRAFT

GGP STATEN ISLAND MALL, LLC
STATEN ISLAND, NEW YORK

SUB-SLAB AND AIR SAMPLING RESULTS 2006 & 2008

PREPARED BY:
LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Groundwater and Environmental Services
600 E. Crescent Ave
Upper Saddle River, New Jersey
(201) 818-0700

Rouse/SUB SLAB RESULTS	DRAWN BY: JAM	CHECKED BY: CS	DATE: 1/28/12
			FIGURE:

APPENDIX J ELECTRONIC COPY OF APPROVED SMP