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Engineers and
Scientists

Remedial System Optimization Investigation

Skillman Street Station Site

Brooklyn, New York
NYSDEC Site #224068

Submitted to:
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Brooklyn, NY 11217

Submitted by:
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May 2023
Project 093080-1.1113

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Qualified Environmental Professional's Certification

I, Melissa Felter, certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the Division of Environmental Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10).

Date: May 11, 2023

Melissa Felter, P.G.
GEI Consultants, Inc.

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Abbreviations and Acronyms

CAMP	Community Air Monitoring Plan
DER	Division of Environmental Remediation
ELAP	Environmental Lab Approval Program
EPA	United States Environmental Protection Agency
FSP	Field Sampling Plan
GEI	GEI Consultants, Inc., P.C.
HASP	Health and Safety Plan
ISMP	Interim Site Management Plan
MGP	Manufactured Gas Plan
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PID	Photoionization Detector
PFAS	Polyfluoroalkyl Substances
PVC	Poly Vinyl Chloride
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
ROD	Record of Decision
RSO	Remedial System Optimization
SC	Site Characterization
SIM	Selected Ion Monitoring
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
USDOT	United State Department of Transportation
VOC	Volatile Organic Compound

1. Introduction

The Brooklyn Union Gas Company, now d/b/a National Grid NY ("National Grid"), entered into an Order on Consent and Administrative Settlement, Index # A2-0552-0606, (the Order) with New York State Department of Environmental Conservation (NYSDEC) in March 2007 (and last amended September 28, 2009). This Order includes investigation and, if necessary, remediation of the Skillman Street Holder Station site (the Site), Site #224068, located in Brooklyn, Kings County, New York (Figure 1). As depicted in Figure 2, the Skillman Street Holder Station occupied Block 1886, Lot 19 and a 10-foot by 90-foot strip (the Bedford Strip) on Lot 44 on the City of New York Tax Map. The Order required that a Site Characterization be performed for the Site.

On behalf of National Grid, GEI Consultants, Inc., P.C. (GEI) completed the Site Characterization (SC), to assess environmental conditions at the Site, in March 2014. The Record of Decision was issued by NYSDEC in March 2015. An Interim Site Management Plan (ISMP) was prepared by GEI and submitted to NYSDEC in March 2017 and was approved by NYSDEC later that same month. A revised ISMP was submitted to NYSDEC in March 2018 and approved by NYSDEC in October 2018. A second revision was submitted in June 2019.

Historically, two gas holders, identified as Holder No. 1 and Holder No. 2, were present at 7 Skillman Street. Holder No. 1 was comprised of three telescoping sections and had a rated capacity of 553,000 cubic feet. The sections were set in a subsurface, open, brick tank with a subgrade concrete foundation. The inner diameter of the tank is approximately 97 feet, and the maximum outside diameter, near the bottom of the tank, is approximately 105 feet. The bottom of the holder tank is approximately 22 feet below the elevation of Skillman Street. The tank had a convex bottom that is shallower in the center than at the perimeter. Holder No. 2 was comprised of three telescoping sections and had a rated capacity of 539,000 cubic feet. The sections were set in an above-ground, open, flat-bottomed, steel tank built on grade with Skillman Street. The inner diameter of the tank was approximately 92 feet, and the maximum outside diameter, at the top of the tank, was approximately 100 feet.

On behalf of National Grid, GEI prepared this Remedial System Optimization (RSO) Investigation Work Plan as required by the Record of Decision (ROD) dated March 2015. The ROD requires this Investigation to determine the nature and extent of impacts at the Site and offsite.

2. Scope of Work

The RSO Investigation will be conducted in accordance with the approved ISMP, Revision 5 dated May 2023, including the Health and Safety Plan (HASP), Quality Assurance Project Plan (QAPP), and Field Sampling Plan (FSP). A Community Air Monitoring Plan (CAMP) will be implemented at the Site during intrusive field activities.

2.1 Soil Borings

Ten soil borings (SSGP-19 through SSGP-28) are proposed for installation, as shown in Figure 2. Soil borings will terminate at approximately 40 feet below grade. If impacts are observed close to 40 feet below grade, the boring will be advanced approximately 5 feet beyond observed visual impacts for the purpose of vertical delineation.

Actual drilling locations will be determined based upon the subsurface utility clearance activities, including a geophysical survey, permanent above-ground structures, and property owner requirements. Each boring location will be hand cleared for utilities to at least 5 feet below grade and will be installed with a Geoprobe rig in accordance with drilling methods and procedures in the FSP.

Following the collection of subsurface soil samples, each subsurface soil boring will be abandoned by tremie grouting the boring from the bottom of the boring to the top. Drilling and sampling equipment will be decontaminated between each sample location as described in the FSP. Soil cuttings and decontamination fluids will be contained within United States Department of Transportation (USDOT) 55-gallon drums and disposed at a National Grid-approved disposal facility.

2.2 Soil Sampling

Three soil samples will be selected for chemical analysis from each boring. The first sample will be collected from the depth interval indicating the greatest degree of contamination from 0 to approximately 5 feet below grade using a hand auger during utility clearance activities to evaluate subsurface soil conditions for determination of potential exposure pathways at the site. A second sample will be collected at the depth interval indicating the greatest degree of contamination to evaluate the magnitude of the observed impacts at each boring. The greatest degree of contamination will be identified by field screening of the borings with a PID, and by visual and olfactory observations. If no impacts are observed at a particular on-site boring location a soil sample will be obtained for analysis at the apparent observed water table. The final sample will be collected beneath impacts, if present, or at the completion of the boring. Each sample will be analyzed for Target Compound List (TCL) VOCs by EPA

Methods 8260D, TCL SVOCs by EPA Method 8270E, and TAL metals by EPA Methods 6000/7000 series. Soil samples collected from soil borings SPGP-19, SPGP-23, SPGP-26, and SPGP-28 will be additionally analyzed for PCBs by EPA Method 8082A, pesticides by EPA Method 8081B, herbicides by EPA Method 8151A, total cyanide by EPA Method 9012B, free cyanide by EPA Method 9016, hexavalent and trivalent chromium by EPA Method 7196A, and NYSDEC 40-list Per- and Polyfluoroalkyl Substances (PFAS) by EPA Method 1633 (Table 1).

Quality Assurance/Quality Control (QA/QC) procedures are detailed within the QAPP. QA/QC samples will include blind duplicate soil samples, Matrix Spike and Matrix Spike Duplicate (MS/MSD) samples, and equipment rinsate blank samples. The quality control samples will be completed at a frequency of 1/20. One trip blank will be included per shipment of samples to the laboratory.

2.3 Temporary Monitoring Point Installation

Two temporary monitoring points will be installed at borings SSGP-21 and SSGP-23. The drill rig will advance casing to the required termination depth of the temporary well. Groundwater sampling will be conducted at the groundwater table, approximately 15 feet below grade and another sampling point will be from approximately 25 to 30 feet below grade. Each temporary monitoring well will be constructed with an approximate 10-foot length of 1-inch diameter; 0.010-inch, slotted poly vinyl chloride (PVC) monitoring well screen. Following the collection of groundwater samples and removal of the temporary well, each boring will be abandoned by tremie grouting the boring from the bottom of the boring to the top.

2.4 Groundwater Sampling

Groundwater samples will be collected from the temporary monitoring points (SSGP-21 and SSGP-23) using low flow methods according to the FSP. All the groundwater samples will be analyzed for TCL VOCs by EPA Method 8260D, TCL SVOCs by EPA Method 8270E, metals by EPA Method 6000/7000 series (filtered and unfiltered), and total cyanide by EPA Method 9012B. The two groundwater samples collected from SPGP-23 will be additionally analyzed for PCBs EPA Method 8082A, pesticides by EPA Method 8081B, herbicides by EPA Method 8151A, hexavalent and trivalent chromium by EPA Method 7196A, 1,4-dioxane by EPA Method 8270E with selected ion monitoring (SIM), and NYSDEC 40-list PFAS by EPA Method 1633 (Table 1).

QA/QC procedures are detailed within the QAPP. The QA/QC sample will include one blind duplicate groundwater sample. One trip blank will be included per shipment of samples to the laboratory.

2.5 Test Pits

Two test pits (SSTP-02 and SSTP-03) are proposed, as shown in Figure 2, to assess the location and integrity of the former gas holder No. 1 tank wall, which may be present in the subsurface of the Site (Table 1).

Each test pit will be photographed and logged by a GEI field representative during excavation. All material removed from the test pit will be placed on polyethylene sheeting. Plastic sheeting and/or other appropriate means to mitigate odor will be provided by the consultant/contractor to control odor emissions that may result from excavating potentially impacted soils. Test pits will be terminated at the limits of the equipment. Field screening of soils for total organic vapors will be conducted with a PID from the ground surface to the entire depth of the excavation.

After the completion of each test pit, the test pit will be backfilled in reverse sequence in which it was excavated, so that materials removed from the bottom of the test pit are placed back at the bottom and materials removed from the top of the test pit are placed back at the top. The test pits will be backfilled in lifts and compacted.

2.6 Survey

The soil boring, test pit and the temporary monitoring point locations will be surveyed following the completion of the field work by a New York State Licensed Land Surveyor. The elevation of each location will be determined to ±0.01 ft and will be tied into the Site benchmark. All locations and elevations will be referenced to the New York State Plane Eastern Zone North American Datum 1983 and North American Vertical Datum 1988.

2.7 Data Validation and Management

The samples will be analyzed by a New York State Environmental Lab Approval Program (ELAP) accredited laboratory. Analytical results will be provided in a New York State Category B data deliverable format. The data will be validated in accordance with New York State Analytical Service Protocols, and a data usability summary report will be prepared documenting the adequacy of the analytical data obtained from the laboratory and discussing any quality control non-compliance issues or limitations on the use of the data.

2.8 Report Preparation

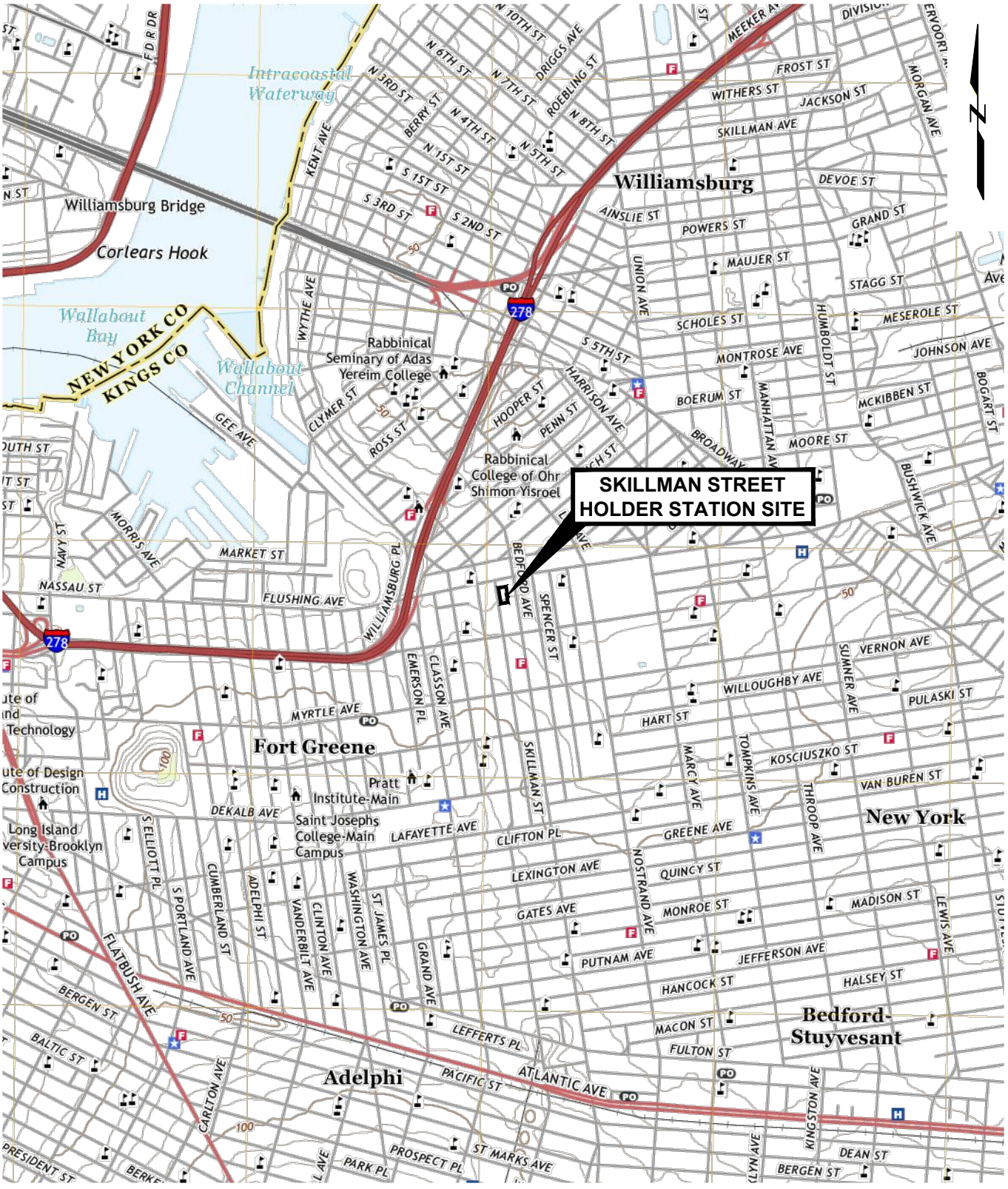
The information collected as part of the RSO Investigation Report will be submitted to NYSDEC following completion of field activities.

3. Schedule

RSO Investigation field activities can commence following NYSDEC and New York State Department of Health (NYSDOH) approval of this work plan, contractor availability, and obtaining property access. We anticipate commencing work as early as May 22, 2023. The following approximate schedule will be finalized following the approval of this Work Plan.

- Drilling/groundwater sampling: planned to be executed from May 22, 2023 through May 31, 2023, pending an access agreement with the property owner.
- Test pits: planned to be executed from June 1, 2023 through June 2, 2023, pending an access agreement with the property owner.
- Submittal of RSO Investigation Report: 16 weeks after completion of drilling and test pits.

Figures



SOURCE:
MAP CREATED WITH BROOKLYN, NY QUADRANGLE,
7.5-MINUTE USGS TOPOGRAPHIC MAP, 2019.

Further Investigation Work Plan
Skillman Street Holder Station
Brooklyn, New York

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SITE LOCATION MAP

Project 093080 | May 2023 | Fig. 1

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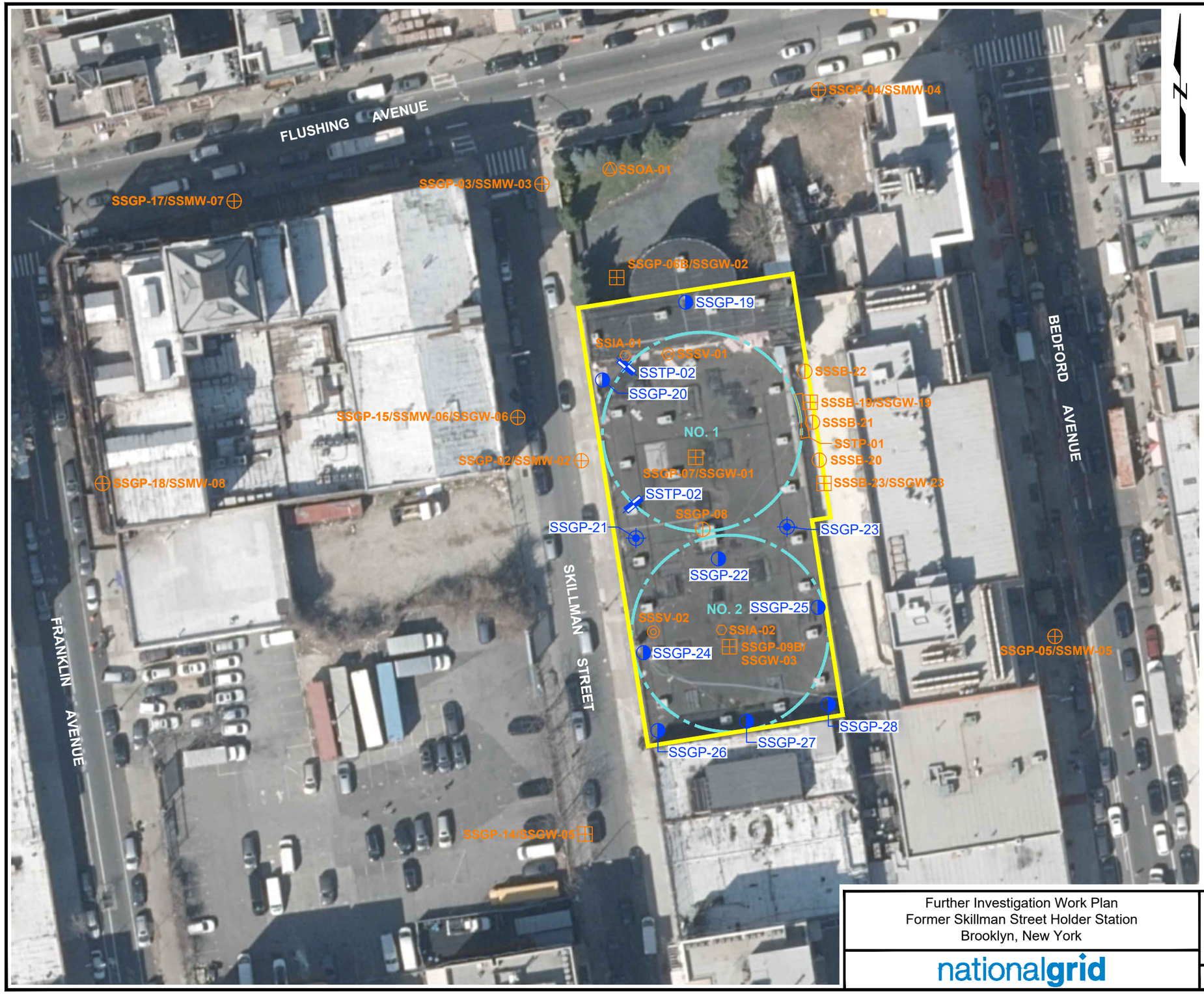

LEGEND:

SITE BOUNDARY(APPROXIMATE)

HISTORICAL GAS HOLDER

PROPOSED SAMPLE LOCATIONS:

SOIL BORING / GROUNDWATER SAMPLING POINT

SOIL BORING

TEST PIT

PREVIOUS SAMPLE LOCATIONS:

SSGP-03/ SSMW-02	SOIL BORING/ MONITORING WELL
SSGP-14/ SSGW-05	SOIL BORING/TEMPORARY GROUNDWATER SAMPLING POINT
SSGP-08	SOIL BORING
SSSV-01	SOIL VAPOR SAMPLE
SSOA-01	OUTDOOR AIR SAMPLE
SSIA-01	INDOOR AIR SAMPLE
SSTP-01	TEST PIT

SOURCES:

1. AERIAL PHOTOGRAPH FROM WORLD IMAGERY LAYER: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY, ACCESSED VIA ACRGIS ONLINE ON 05/03/2023.
2. SURVEY OF SAMPLE LOCATIONS CONDUCTED BY GEI CONSULTANTS, INC. ON 5/31/11, 6/23/11, AND 6/28/13. SURVEY BY NEW YORK STATE LICENSED LAND SURVEYOR NUMBER 050146. HORIZONTAL DATUM: NEW YORK STATE PLANE COORDINATE SYSTEM (NY EAST ZONE), VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM (NAVD)88.
3. INDOOR AND OUTDOOR AIR SAMPLE LOCATIONS WERE NOT SURVEYED AND ARE APPROXIMATE.

0 50' 100'

SCALE: 1" = 50'

Further Investigation Work Plan
Former Skillman Street Holder Station
Brooklyn, New York

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PROPOSED SAMPLE LOCATIONS

Project 093080 | May 2023 | Fig. 2

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Tables

Table 1. Sample Descriptions, Rationale and Analysis
Remedial System Optimization Investigation Work Plan
Skillman Street Former Holder Station
Brooklyn, New York

Sample I.D.	Sample Location	Sample Rationale	Depth of Boring (feet)	Number of Samples		Sample Interval (feet)	VOCs[1] (8260)	SVOCs (8270)	TAL Metals (6000/7000)	Free Cyanide (9016)	Total Cyanide (9012)	Hexavalent & Trivalent Chromium (7196A)	PCBs (8082A)	Pesticide (8081B)	Herbicides (8151A)	PFAS (1633)
				Soil	Groundwater											
Soil Borings																
SSGP-19	North of former gas holder No. 1.	Soil boring to evaluate potential MGP related impacts north of the holder.	40	3	0	Greatest degree of impacts and beneath impacts, or from the observed groundwater table.	X	X	X	X	X	X	X	X	X	X
SSGP-20	Adjacent to the footprint of the former gas holder No. 1.	Soil boring to evaluate potential MGP related impacts observed at SSGP-02.	40	3	0	Greatest degree of impacts and beneath impacts, or from the observed groundwater table.	X	X	X							
SSGP-21	Between the footprints of former gas holders No. 1 and 2.	Soil boring and temprary groundwater sample location to evaluate potential MGP related impacts observed at SSGP-02.	40	3	2	Greatest degree of impacts and beneath impacts, or from the observed groundwater table.	X	X	X							
SSGP-22	Within the footprint of the former gas holder No. 2.	Soil boring to evaluate potential MGP related impacts in soil beneath the former gas holder.	40	3	0	Greatest degree of impacts and beneath impacts, or from the observed groundwater table.	X	X	X							
SSGP-23	Between the footprints of former gas holders No. 1 and 2.	Soil boring and temprary groundwater sample location to evaluate potential MGP related impacts beneath the holder.	40	3	2	Greatest degree of impacts and beneath impacts, or from the observed groundwater table.	X	X	X	X	X	X	X	X	X	X
SSGP-24	Within the footprint of the former gas holder No. 2.	Soil boring to evaluate potential MGP related impacts in soil beneath the former gas holder.	40	3	0	Greatest degree of impacts and beneath impacts, or from the observed groundwater table.	X	X	X							
SSGP-25	Within the footprint of the former gas holder No. 2.	Soil boring to evaluate potential MGP related impacts in soil beneath the former gas holder.	40	3	0	Greatest degree of impacts and beneath impacts, or from the observed groundwater table.	X	X	X							
SSGP-26	Adjacent to the footprint of the former gas holder No. 2.	Soil boring to evaluate potential MGP related impacts in soil beneath the former gas holder.	40	3	0	Greatest degree of impacts and beneath impacts, or from the observed groundwater table.	X	X	X	X	X	X	X	X	X	X
SSGP-27	Within the footprint of the former gas holder No. 2.	Soil boring to evaluate potential MGP related impacts in soil beneath the former gas holder.	40	3	0	Greatest degree of impacts and beneath impacts, or from the observed groundwater table.	X	X	X							
SSGP-28	Adjacent to the footprint of the former gas holder No. 2.	Soil boring to evaluate potential MGP related impacts in soil beneath the former gas holder.	40	3	0	Greatest degree of impacts and beneath impacts, or from the observed groundwater table.	X	X	X	X	X	X	X	X	X	X
Test Pits																
SSTP-02	Within the footprint of the former gas holder.	Test pit to evaluate the location of gas holder No. 1	The approximate groundwater table or practical extent of the equipment	NA	NA	NA										
SSTP-03	Within the footprint of the former gas holder.	Test pit to evaluate the location of gas holder No. 1	The approximate groundwater table or practical extent of the equipment	NA	NA	NA										

Notes:
Chemical analysis test methods specified are from U.S. EPA SW-846 test methods
EPA - Environmental Protection Agency
VOCs - Volatile Organic Compounds
SVOCs - Semivolitile Organic Compounds
TAL - Target Analyte List
PCBs - Polychlorinated Biphenyls
PFAS - Per- and Polyfluoroalkyl Substances