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Project Manager

December 4, 2015

Mr. Henry Willems
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C, 11th Floor
625 Broadway
Albany, New York 12233-7014

Subject: **Supplemental Remedial Investigation Work Plan - 137 12th Street**
Former Metropolitan Manufactured Gas Plant (MGP) Site, Brooklyn, NY
NYSDEC Site No. 224046

Dear Mr. Willems:

AECOM, on behalf of National Grid, has prepared this Supplemental Remedial Investigation (RI) Work Plan for the Former Metropolitan manufactured gas plant (MPG) site (the Site), located at 124 - 136 2nd Avenue in Brooklyn, New York. This Work Plan describes work to be performed beneath a portion of the existing building footprint formerly occupied by the Pathmark Supermarket located at 137 12th Street. This area was previously not accessible during the RI Phase of the site but leasehold developments and the temporary vacancy of the Pathmark Supermarket store have now made access to the building possible.

The Metropolitan Gas and Light Company operated the Historic MGP from as early as 1872 until approximately 1895 when it was acquired by The Brooklyn Union Gas Company (BUG), a subsidiary company of National Grid. The MGP ceased operations at the Site sometime between the period of 1928 and 1938. The investigation of the Site is being conducted by AECOM on behalf of National Grid pursuant to a Multi-site Order on Consent and Administrative Settlement with the NYSDEC, Index # A2-0552-0606, executed on February 22, 2007 and modified on August 10, 2007, and in accordance with applicable guidelines of the New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH), the United States Environmental Protection Agency (USEPA), and the National Contingency Plan (NCP). This investigation will be performed in conformance with the previously approved RI Work Plan. Specifics of the RI scope of work are presented in the NYSDEC-approved Remedial Investigation Work Plan (Remedial Investigation Work Plan, Metropolitan Former MGP Works, May 2009) produced by AECOM.

The goal of this Work Plan is to investigate potential former MGP structures beneath the current building to determine soil conditions and develop alternatives for the ongoing Feasibility Study (FS) evaluation.

Background

The site setting, regional geology and hydrogeology, operational history of the Metropolitan MGP, historic structures, post MGP activities, previous MGP investigations and remedial actions, and nature and extent of identified impacts in soil, soil vapor, and groundwater are summarized in the RI Report.

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Subsurface impacts were identified during the RI in close proximity to the existing building . Given the location of the former Pathmark within the existing building and its proximity to the Previously Remediated portion of the former MGP (now occupied by Lowes) and the presence of known potential MGP structures beneath the building footprint, investigation of these areas is required to better develop remedial alternatives for the FS.

Scope of Work

The proposed scope of work includes the advancement of soil borings to investigate potential former MGP structures beneath the building as well as investigate areas near identified impacts outside the building footprint. The investigation methods will be performed in accordance with the Remedial Investigation Work Plan (RIWP), and will include the following:

- Advancement of 15 soil borings to approximately 50 ft bgs.
- Collection of soil samples from each boring for laboratory analyses.
- Surveying of soil borings for location and elevation.
- Management of investigation derived waste (IDW).

Proposed boring locations are shown on Figure 1, along with identified areas of visual impacts in borings adjacent to the Former Pathmark.

The boring locations will be cleared for utilities following National Grid pre-clearance protocols involving geophysical practices and low energy excavation techniques. Once cleared, the soil boring will be advanced by using either rotosonic drilling methods or direct push methods (GeoProbe®). Soil samples for observation and VOC screening by photo-ionization detector (PID) will be collected and logged continuously from the ground surface to boring completion. A minimum of two (2) soil samples will be collected from each boring for laboratory analysis. One sample will be collected from the most impacted interval based on PID readings and field observations. If no impacts are encountered, this sample will be collected from a depth that corresponds horizontally to the impacted interval sampled at adjacent borings. The second sample will be collected from the first clean interval below any observed impacts or the base of the boring. All borings will be advanced to 50 ft bgs, which is the anticipated depth required to obtain vertical delineation of previously identified impacts.

Soil samples will be submitted to a NYSDOH Environmental Laboratory Approval Program (ELAP) Certified laboratory for the following analyses:

- Target Compound List (TCL) Volatile organic compounds (VOCs) by EPA Method 8260B
- TCL Semi-volatile organic compounds (SVOCs) by EPA Method 8270C
- TCL Pesticides (USEPA Method 8081A)
- TCL Herbicides (USEPA Method 8151A)
- PCBs (as aroclors; USEPA Method 8082)
- Target Analyte List (TAL) metals by USEPA 6000-7000 series methods, and
- Free cyanide (extraction by EPA method 9013A and analysis by Microdiffusion, ASTM International method D4282-02).

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IDW waste characterization analysis will be performed to support disposal of drill cuttings and decontamination fluids and include:

Solids

- Extractable Petroleum Hydrocarbons (EPH) or Total Petroleum Hydrocarbons (DRO and GRO) by USEPA Method 8015 modified
- PCBs by USEPA Method 8080
- VOCs by USEPA Method 8260B
- SVOCs by USEPA Method 8270C
- Priority Pollutant Metals by USEPA Method 6010B (Mercury 7470A)
- TCLP Lead by USEPA Method 1311
- Total Sulfur by ASTM D-129

Liquids

- Total Petroleum Hydrocarbons (DRO and GRO) by USEPA Method 8015 modified
- VOCs by USEPA Method 8260B
- RCRA 8 metals by USEPA Method 6010
- Ignitability by USEPA Method 1010A/1020B
- Suspended solids by USEPA Method 160.2

Quality assurance and quality control (QA/QC) samples will be collected and submitted for analyses in accordance with Appendix D of the RIWP. Specifically, field duplicates and matrix spike/matrix spike duplicate (MS/MSD) samples will be collected at a minimum frequency of one per 20 field samples. For the anticipated number of samples for this investigation, two field duplicates and two MS/MSD samples will be collected.

Following completion, the borings will be grouted to the ground surface and the surface restored to match pre-existing conditions of the concrete slab to the extent feasible.

Sincerely,

Brian Bermingham, PE

Cc: C. Doroski (NYSDOH)
P. Cox (AECOM)
A. Prophete (National Grid)

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Table 1
Proposed Pathmark Sub-slab Investigation Sample Location, Rationale, and Analytical Sample Summary
Metropolitan Former MGP, 124-136 Second Avenue, Brooklyn, New York

Location ID	Sample ID	Completion Depth (Ft bgs)	Sample Depth	No. of Samples	Analyses	Rationale
Surface Soil/Subsurface Soil						
PMSB-1	PMSB-1 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Evaluate horizontal extent of impacts noted at Lowes recovery wells to south and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-2	PMSB-2 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Evaluate horizontal extent of impacts noted at Lowes recovery wells to east and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-3	PMSB-3 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Evaluate horizontal extent of impacts noted at Lowes recovery wells to east and SB-16 to the south and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-4	PMSB-4 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Investigate former Relief Holder #4 footprint, evaluate horizontal extent of impacts noted at Lowes recovery wells to east, and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-5	PMSB-5 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Investigate former tar extractor area footprint, evaluate horizontal extent of impacts noted at Lowes recovery wells to east, and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-6	PMSB-6 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Investigate former separating tank area, evaluate horizontal extent of impacts noted at Lowes recovery wells to east and SB-4 to the southwest, and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-7	PMSB-7 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Investigate former generator building footprint, evaluate horizontal extent of impacts noted at Lowes recovery wells to east and SB-9 to the west, and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-8	PMSB-8 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Investigate former oil tank footprint and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-9	PMSB-9 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Investigate former tar tank footprint, evaluate horizontal extent of impacts noted at SB-9 to the west, and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-10	PMSB-10 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Investigate former oil/tar tank footprint, evaluate horizontal extent of impacts noted at SB-9 to the west, and provide data to more accurately develop future use alternatives for the feasibility study.

Table 1
Proposed Pathmark Sub-slab Investigation Sample Location, Rationale, and Analytical Sample Summary
Metropolitan Former MGP, 124-136 Second Avenue, Brooklyn, New York

Location ID	Sample ID	Completion Depth (Ft bgs)	Sample Depth	No. of Samples	Analyses	Rationale
PMSB-11	PMSB-11 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Investigate former tar tank/separator footprint, evaluate horizontal extent of impacts noted at SB-9 to the north, and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-12	PMSB-12 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Investigate soils north of former oil tank area, evaluate soils adjacent to 11th Street Basin, and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-13	PMSB-13 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Investigate soils north of former generator house, evaluate soils adjacent to 11th Street Basin, and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-14	PMSB-14 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Investigate soils adjacent to 11th Street Basin and provide data to more accurately develop future use alternatives for the feasibility study.
PMSB-15	PMSB-15 (depth)	Est. 50 feet max	Zone of worst-case impacts or depth consistent with worst-case impacts at adjacent boring if no impacts noted and first clean or bottom.	2	TCL VOCs, TCL SVOCs, TAL Metals, Free CN, PCBs (as Aroclors), TCL Pesticides & Herbicides	Investigate northern portion of former Relief Holder #4 footprint, evaluate horizontal extent of impacts noted at Lowes recovery wells to east, and provide data to more accurately develop future use alternatives for the feasibility study.

Notes
1. No. - number
2. ID - identification
3. SB - Soil Boring (Subsurface Soil)
4. VOCs - volatile organic compounds
5. SVOCs - semi-volatile organic compounds
6. TCL - Target Compound List
7. TAL - Target Analyte List
8. CN - Cyanide
9. bgs - Below ground surface

Path: P:\Jobs\Rem_Eng\Project Files\National Grid\1765-075 Metropolitan Former MGP\7.2 CADD & GIS\GIS\MXD\Proposed_Pathmark_Sub_Slab_Investigation\MXD\Fig_1_Proposed_Pathmark_Sub_Slab_Investigation.mxd

Lowes
Parking Lot

GOWANUS
CANAL

11th STREET BASIN

Pathmark
1-37 12th Street

MW-22I/MW-22D/SB-22
(12-15)
(15.1-15.2)

Holder #4
Relief Holder (1903, 1909)
Hydrogen Holder (1915)
To Be Coal Bunker (1938)
Coal Bunker (1950)

MW-21D/SB-21
(10-28)
(31-43.5)

Iron Oil
Tank
(1904)

Tar Tank
(1921)

Generators(1904)

SS-3

SS-2

SS-1

Iron Oil Tank (1904)
Iron Tar Tank (1915)

MW-9S/MW-9I/MW-9D/SB-9
(30-45)

Tar Tank on Frame
Support(1915)
Separator (1921)

Separating
Tank(1904)

IA/SV-2

IA/SV-1

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

RW-7
(10-30)
(40-50)

RW-6
(20-45)

RW-29

RW-5
(35-45)

RW-30
(30-45)

RW-4
(25-45)

RW-31
(25-45)

RW-3
(15-20)
(30-45)

RW-32
(10-45)

RW-2
(30-45)

RW-33
(15-20)

RW-1
(40-45)

SB-17
(2-5)
(11-15)
(30-32)

MW-8S/MW-8I/SB-8
(2.5-5.0)
(10-15)
(27-31)
(34-40)

SB-16
(10-13)

Tar Extractors (3) (1909)
Tar Extractors (5) (1921)

MW-4S/MW-4I/SB-4
(31.5-34.0)

MW-4D2

MW-4D1

SB-18

SB-13

TP-1

TP-2

SB-15

MW-3S/MW-3I
/SB-3

12 ST

12 ST

HAMILTON PL

Legend

- Proposed Soil Boring
- RI Monitoring Wells
- RI Soil Borings
- Indoor Air/Soil Vapor
- Surface Sample
- Test Pit
- Tar Saturated
- Coated Material, Lenses
- Staining, Odor
- (12-15) Depth of Observed Impact (Feet Below Grade)
- Current Building Footprint (NYC DOITT 2009)
- Historic MGP Boundary
- Current Site Boundary
- Historic MGP and Current Site Boundary Coincide

Test pit, soil boring, and monitoring well logs are provided in Appendices B and C of the RI Report

AECOM

1 inch = 50 feet
0 25 50 100 Feet

National Grid
Former Metropolitan Works MGP Site
Brooklyn, NY

Proposed Former Pathmark
Sub-Slab Investigation
Sample Locations

DATE: 12/9/2015 | DRWN: JB | FIGURE 1