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Steven P. Stucker
Lead Engineer
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April 3, 2015

Ms. Elizabeth Lukowski
Remedial Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation, Remedial Bureau C, Section A
625 Broadway, 11th Floor
Albany, NY 12233-7014

Subject: Work Plan for Supplemental Remedial Investigation Activities
Fulton (North Ontario St.) Former MGP Site, Fulton, NY (V00484)

Dear Ms. Lukowski:

Please find enclosed the document entitled, "Supplemental Remedial Investigation Work Plan, Fulton (North Ontario St.) Former MGP Site, Fulton, New York" for review by the New York State Department of Environmental Conservation (NYSDEC). This Supplemental Remedial Investigation (RI) Work Plan was prepared by Brown and Caldwell Associates on behalf of National Grid.

Following review of the enclosed document, please contact me at (315) 428-5652 to discuss any comments the NYSDEC may have on the proposed scope of work.

Sincerely,

FOR:

Steven P. Stucker, C.P.G.
Lead Engineer, Environmental Department

Enclosure

cc: R. Jones - NYSDOH
J. Giordano - National Grid (w/out enclosure)
J. Marolda - Brown and Caldwell
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Supplemental Remedial Investigation Work Plan
Fulton (North Ontario St.) Former MGP
Fulton, New York

Prepared for

Niagara Mohawk Power Corporation
d/b/a National Grid, Syracuse,
New York

April 2015

Supplemental Remedial Investigation Work Plan
Fulton (North Ontario St.) Former MGP
Fulton, New York

Prepared for
Niagara Mohawk Power Corporation d/b/a National Grid
300 Erie Boulevard West
Syracuse, New York 13202

April 2015

Project Number: 147351.001.002

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

James L. Marolda, C.P.G., P.G.
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Table of Contents

List of Tables

List of Figures

List of Abbreviations

ASP	Analytical Services Protocol
ASTM	American Society for Testing and Materials
BC	Brown and Caldwell Associates
bgs	Below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, and isomers of Xylene
CAMP	Community Air Monitoring Plan
CLP	Contract Laboratory Program
DER	Division of Environmental Remediation
DOT	Department of Transportation
DUSR	Data Usability Summary Report
ECO-SSLs	Ecological Soil Screening Levels
EDD	Electronic Data Deliverable
EDR	Environmental Data Resources
ELAP	Environmental Laboratory Approval Program
EM	Electromagnetics
FEMA	Federal Emergency Management Agency
FGLC	Fulton Gas Light Company
FSP	Field Sampling Plan
FWIA	Fish and Wildlife Impact Analysis
FWRIA	Fish and Wildlife Resource Impact Analysis
GC-FID	Gas Chromatograph-Flame Ionization Detector
GPR	Ground-Penetrating Radar
HASP	Health and Safety Plan
I.D.	Inside Diameter
IDW	Investigation-derived Waste
MAH	Monocyclic Aromatic Hydrocarbon
MGP	Manufactured Gas Plant
NAD	North American Datum
NAPL	Non-Aqueous Phase Liquid
NGVD	National Geodetic Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
NYAC	New York Archeological Council
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O.D.	Outside Diameter
PAHs	Polycyclic Aromatic Hydrocarbons
PID	Photoionization Detector

PPE	Personal Protective Equipment
QAPP	Quality Assurance Project Plan
RI	Remedial Investigation
RQD	Rock Quality Designation
SC	Site Characterization
SCO	Soil Cleanup Objectives
SCO-PER	Soil Cleanup Objectives for Protection of Ecological Resources
SHPO	State Historic Preservation Office
SVOCs	Semi Volatile Organic Compounds
TCL	Target Compound List
TOGS	Technical and Operational Guidance Series
USCS	Unified Soil Classification System
USEPA	United Stated Environmental Protection Agency
USGS	United States Geological Survey
VCO	Voluntary Consent Order

Section 1

Introduction

This Supplemental Remedial Investigation (RI) Work Plan describes the scope of work and procedures that will be used to conduct supplemental RI activities at the Fulton (North Ontario St.) Former Manufactured Gas Plant (MGP) Site (hereafter referred to as the "Site"). In an e mail dated November 20, 2014, the New York State Department of Environmental Conservation (NYSDEC) concurred with National Grid's recommendation to conduct additional RI activities at the Site to further evaluate the nature and extent of MGP-related impacts. This recommendation for additional RI Activities was provided in a letter dated May 31, 2013, which accompanied the deliverable entitled "Data Summary Report, Remedial Investigation, Fulton (North Ontario St.) Former MGP Site" (Brown and Caldwell Associates, May 2013) (hereinafter referred to as RI Data Summary Report) which documented data and findings of the RI to date. This Supplemental RI Work Plan was prepared in response to NYSDEC's concurrence with National Grid's recommendation to conduct additional RI activities.

Investigation activities at the Site are being conducted pursuant to the Voluntary Consent Order (VCO) between NYSDEC and Niagara Mohawk Power Corporation, doing business as National Grid, dated January 25, 2002 (Order Index Number D0 0001 0011). This VCO primarily covers former MGPs that are situated on properties not owned by National Grid, but where National Grid has assumed responsibility for former MGP operations.

The specific objectives of the supplemental RI are to:

1. Further evaluate the extent of non-aqueous phase liquid (NAPL) associated with the off-site area (Parcel C Area) west of the Site. It appears that this NAPL may be associated with a possible subsurface structure as indicated by demolition debris (concrete, brick, etc.) encountered in boring B-106, and by a review of historical maps that indicate a circular structure was present in the area during the period of MGP operations.
2. Evaluate whether or not the NAPL observed at or near the top of bedrock surface has entered the bedrock formation underlying the Site and the off-site area to the west.
3. Further evaluate the extent of MGP-related constituents in subsurface soil above applicable soil clean-up objectives (SCOs) as set forth in 6 NYCRR Subpart 375-6.
4. Further evaluate groundwater flow direction and the lateral extent of dissolved-phase, MGP-related constituents in deep overburden groundwater.
5. Further evaluate the potential for sewers beneath adjacent streets to serve as groundwater discharge features, thereby influencing groundwater flow on and adjacent to the Site.
6. Determine the generalized direction of groundwater flow within the bedrock underlying the Site.
7. Assess groundwater quality within bedrock to delineate the vertical extent of dissolved-phase, MGP-related constituents in groundwater.

Section 2.0 provides a summary of the background, geology and history of the Site. Section 3.0 describes the scope of work, including the technical approach and the methods and materials to be used in performing the supplemental RI. Section 4.0 provides the anticipated schedule for completion of the supplemental RI.

Section 2

Background

The Site location and history described below was previously provided in the "Site Characterization/Interim Remedial Measures Work Plan for Site Investigations at the Fulton Non-Owned Former MGP Site" (EECS, January 2004). It is presented again herein with slight modifications. Also provided below is a summary of the investigation findings to-date associated with the Site.

2.1 Site Location and Description

The Site is located at 0 North Ontario Street in the City of Fulton, Oswego County, New York. The coordinates for the property are approximately 43° 19' 41.2" north (latitude) and 76° 25' 0.8" west (longitude). The location of the property is shown on Figure 2-1.

According to City of Fulton Assessors Office's records, the 0 North Ontario Street address is comprised of one parcel owned by Drake Petroleum Company, Inc., successor by merger to Mid-Valley Oil Company, Inc. of North Grosvenordale, Connecticut. The property is identified as Parcel 1-06 on Assessors Office's Map 236.47 and occupies approximately ¾ acre. The 0 North Ontario Street property is zoned for commercial use.

The 0 North Ontario Street property is abutted to the north by North Ontario Street; to the west by Hubbard Street; to the south by another property owned by the Drake Petroleum Company that is currently occupied by a Sunoco service station; and to the east by New York State (NYS) Route 481. The area surrounding the Site is primarily used for industrial and commercial purposes.

The topography of the majority of the Site is generally flat but with a slight decline to the northwest. The ground surface along the western and northern portions of the property slopes sharply downward to Hubbard Street and North Ontario Street, respectively. The elevation of the property varies from approximately 330 feet, National Geodetic Vertical Datum (NGVD) on the eastern portion of the property to about 320 feet NGVD along the western property boundary.

Based on the United States Geological Survey (USGS) 7.5 Minute Series Fulton Quadrangle Topographic Map, the area in the vicinity of the Site is part of the eastern slope of the floodplain for the Oswego River (Site area is designated as Zone C [area of minimal flooding] per 1982 Federal Emergency Management Agency [FEMA] Flood Insurance Rate Map). The Oswego River is located approximately 400 feet west of the Site.

2.2 Site History

The site history presented in this section was collected from several sources including Sanborn Maps provided by Environmental Data Resources (EDR), the Fulton Historical Society, the Fulton Public Library, "Brown's Directory of American Gas Companies 1887-1907, 1908-1911, and 1917-1918", "Survey of Town Gas and By-Product Production and Locations in the U.S. (1880-1950)" prepared by Radian Corporation in 1985, and the City of Fulton Assessors' Office. Additional resources that were researched included the City Directory and aerial photograph archives maintained by EDR. No information pertaining to the former MGP was discovered during the research of these additional resources.

According to the “Historical and Statistical Gazetteer of New York State”, which was published by Heart of the Lakes Publishing in 1980, the Fulton Gas Light Company (FGLC) was organized on June 12, 1858. The first “Brown’s Directory of American Gas Companies”, which was published in 1887, indicated the FGLC manufactured coal gas. The only schematic of the plant found during the research performed by EECS was shown on an 1890 Sanborn Map. This Sanborn Map shows the plant to be located on the northern portion of the current 0 North Ontario Street property. However, by 1890, the former MGP was no longer in operation and the plant was identified as being vacant on the 1890 Sanborn Map. Figure 2-2 shows the structures identified on the 1890 Sanborn Map transposed onto a current Site map.

Records found at the Fulton Historical Society indicate that the FGLC was sold to the Citizens Electric Company in 1889 and operations of the gas plant ceased after that time. “Brown’s Directory of American Gas Companies” contained no further information on the FGLC or for the Citizens Electric Company after 1889. Therefore, the FGLC plant appears to only have operated for approximately 30 years.

As shown on Figure 2-2, the plant consisted of a main building with a number of attached rooms and a gas holder to the west, which had a diameter of approximately 40 feet. The area surrounding the plant was primarily industrialized. The Hunter Arms Company factory was situated on the southern portion of the 0 North Ontario property and the properties located south of the Site. In addition, the eastern portion of the current 0 North Ontario Street property and North Second Street overlie what was, during MGP operations, part of the Oswego Canal.

By 1896, the Hunter Arms Company had also occupied the northern portion of the 0 North Ontario Street property as shown by the 1896 Sanborn Map. The gas holder was apparently dismantled prior to this date as the structure was not shown on the 1896 Sanborn Map. A new building had been built in the same location. In addition, the former MGP building was used for coal storage.

Based on a review of the available Sanborn Maps, the MGP building was demolished sometime between 1911 and 1924. In addition, the Oswego Canal was filled in during this same time period.

No structures have apparently been built on the Site since the Hunter Arms Company factory was demolished sometime before 1960.

2.3 Summary of Previous Site Investigations

The findings from the Site Characterization (SC) as documented in the “Site Characterization Data Summary Report, Fulton (North Ontario St.) Former MGP” (Brown and Caldwell Associates, August 2005) and subsequent SC and RI activities as documented in and the “Data Summary Report, Supplemental Site Characterization, Fulton (North Ontario St.) Former MGP” (Brown and Caldwell Associates, February 2008) and in the RI Data Summary Report are summarized below.

2.3.1 Subsurface Deposits and Stratigraphy

The subsurface materials encountered on the Site generally consist in ascending order of sandstone bedrock, glacial till, and anthropogenic fill.

The unconsolidated overburden at the Site generally consists of approximately 8 to 11 feet of fill and underlying glacial till. In general, the fill is composed of various materials including sand, gravel, coal and demolition debris (e.g., brick and concrete). Finer-grained material (silt and clay), where present in the fill, is typically not the predominant component. Soil descriptions indicate the glacial till is composed of poorly sorted sand with varying amounts of silt and gravel, and is moderately dense.

Based on observations of rock fragments recovered from split spoon samples at refusal depth, the bedrock can be described as a grey/red/green fine to coarse-grained sandstone. This is consistent with regional information, which indicates that the bedrock formation directly underlying the Site is the Grimsby Formation, which consists of red and green sandstone, siltstone, and shale, and tends to be more argillaceous toward the base (Brett, *et al.*, 1995). The sediment that now comprises the Grimsby Formation was deposited during the Early Silurian Period (approximately 440 million years ago). Based on the relative ease of drilling and observations from split-spoon samples, the upper portion of the bedrock surface is weathered to some degree. Samples of the uppermost part of the sandstone that were recovered in split-spoons were capable of being disaggregated by hand (i.e., friable), thus indicating that the cement matrix (e.g., clays, calcite, silica, etc.), which binds the sand grains together was previously weathered and degraded.

The surface of the top of bedrock underlying the Site is somewhat undulatory. The elevation of the bedrock surface varies from approximately 303 to 298 feet NGVD across the Site.

2.3.2 Hydrogeology

Based on water level data from locations positioned on-site, the water table is generally encountered within the till, at approximately 9 to 12 feet below ground surface (bgs). Immediately to the west and north of the Site where the ground surface is at a lower elevation, the water table is encountered at shallower depths (5 to 7 feet bgs), based on data collected from off-site locations (i.e., monitoring wells located within the City of Fulton roadways and wells located on the off-site property to the west of the Site [Parcel C area]). As part of the RI activities, groundwater levels were measured on December 11, 2012 and March 13, 2013. Water table elevation contours developed based on these data indicate that overburden groundwater at the Site flows generally from southeast to the west and northwest across the Site. Water level data from locations with both shallow and deep overburden wells indicate a downward vertical hydraulic gradient. Shallow overburden groundwater from the Site and from the off-site property to the west of the Site (Parcel C area) may discharge, to some degree, to the sewers and/or to the bedding surrounding the sewers under Hubbard Street because the sewer inverts are below the water table in this area (see Figure 3 from RI Data Summary Report [Geological Cross-Section A-A']; however, additional hydraulic gradient data are necessary to confirm the potential groundwater flow influence from the surrounding infrastructure.

The estimated horizontal hydraulic conductivity (K_h) values for the overburden range from 8.3×10^{-3} cm/sec to 2.1×10^{-5} cm/sec. In general, the saturated materials adjacent to the screens for the overburden wells are composed of glacial till. The geometric mean of Kh estimates for the glacial till is 6.8×10^{-4} cm/sec.

2.3.3 Visual/Olfactory Impacts

Figure 2-3 provides a plan view of locations where visual/olfactory indications of impacts, including NAPL/tar and indications of potential purifier waste material, have been observed in overburden soil throughout the course of the SC and RI field activities.

In general, the NAPL/tar encountered occurs as a viscous NAPL or as a hard material (observed at single location [TP-103]). In the subsurface, the viscous NAPL/tar is present as: partially to fully saturating the soils, as a coating on coarser-grained material, or as a seam within the soil matrix. The hard tar was observed as material adhering to a piece of wood in the subsurface. Viscous NAPL/tar was observed within the area of the former gas holder at depths ranging from approximately 22 to 27 feet bgs, and directly outside of this area at shallower depths (8 feet bgs). In the area of the former gas holder, NAPL/tar was observed on top of the bedrock surface. Most of the NAPL/tar observations exhibited tar-like odors and thus, NAPL/tar at these locations may be associated with former MGP operations. However, based on observations and odor noted in soils at B 119, B-121, B-123B, MW-111D, and

MW-112D, some of the impacts encountered appeared to be petroleum-based and are not likely associated with former MGP operations. Environmental forensic results from samples of NAPL/tar-impacted material (discussed below) indicate that coal carbonization was likely the process used at the MGP, which did not require petroleum as a feedstock.

In the off-site area (Parcel C Area) NAPL was identified in soil at a depth of 10.5 feet bgs in boring B-106 and at a depth of 20 feet bgs in the boring for monitoring well MW-111D. Of note, the NAPL observed at MW-111D extends from a depth of 20 feet bgs to the top of bedrock surface located at ±20.5 feet bgs. It appears that this NAPL may be associated with a subsurface structure because demolition debris (concrete, brick, etc.) was encountered in boring B-106 from approximately 10 to 11 feet bgs and a review of historical maps indicates a circular structure was present in the area during the period of MGP operations.

Based on gas chromatograph-flame ionization detector (GC-FID) fingerprint analysis of a soil sample from B-106 collected at a depth of 10.5 feet bgs during the 2007 supplemental SC activities, this NAPL has compositional characteristics indicative of coal tar. Additional GC-FID fingerprint analyses of NAPL/tar impacted material were collected from both the on-site and off-site properties during previous RI activities in order to further evaluate the nature of the off-site impacts. NAPL/tar impacted materials were collected from: on-site boring B-117, located in the area of the former gas holder at a depth of 24 to 25.6 feet bgs; and off site boring MW-111D, located west of Hubbard Street across the street from the former MGP site at a depth of 20 to 20.5 feet bgs. The samples were analyzed for GC/FID (EPA 8100M) for fingerprinting and by GC/MS/SIM (EPA 8270M) for mono- and polycyclic aromatic hydrocarbons (MAHs and PAHs), alkyl PAH homologues and other selected compounds. The results of the analyses indicated the impacts related to coal tar likely derived from the coal carbonization processes of gas manufacturing.

To further assess the potential presence of NAPL at the Site, the concentrations of constituents in groundwater were compared to aqueous solubility of those constituents. A concentration that is above one percent of the solubility limit is considered an indicator that the constituent is potentially present in NAPL form in the vicinity of the well. Concentrations of naphthalene in groundwater samples from well MW-111D were above one percent of the aqueous solubility limit for naphthalene. NAPL was identified the soil adjacent to the well screen at MW-111D. However, no NAPL has been observed to enter the well.

In summary, NAPL was encountered on-site within the area of former MGP operations, primarily in the area of the former gas holder. This NAPL is in close proximity to the bedrock surface and was generally described as being viscous in nature. NAPL was also identified at depth at two locations within the off-site Parcel C Area. The NAPL/tar observed at these locations was described as either a coating on fill materials or as a thin seam or band of stringy/viscous tar within the soil matrix.

Indications of potential purifier waste material (e.g., degraded wood material with burnt/sulfur-like odor) were observed in the interval from approximately 14 to 23 feet bgs at soil boring locations B-117 and B-118, which are both in the area of the former gas holder. Results from the analytical soil samples collected from this interval, however, did not reveal significant concentrations of cyanide, which is often associated with spent purifier waste.

2.3.4 Surface Soil Analytical Results

0- to 2-inch bgs Interval

For the purposes of evaluating the concentrations and areal distribution of potentially MGP-related constituents in surface soil, surface soil samples from the 0- to 2-inch bgs depth interval were collected from eight locations throughout the Site during the previous RI activities. Surface soil samples from this depth interval were also collected from areas selected to be representative of background conditions

(BG-SS-1 through BG-SS-5)and analyzed for comparison to concentrations in on-site surface soils. The NYSDEC photo documented the proposed locations during a November 21, 2012 site visit and reviewed them with the New York State Department of Health (NYSDOH). The locations for the background samples were approved by the NYSDEC in an email dated November 20, 2012. The surface soil samples were analyzed for Target Compound List (TCL) semi-volatile organic compounds (SVOCs) and total cyanide.

The analytical results from the background soil samples are provided in Table 5A from the RI Data Summary Report. Concentrations of one or more PAH compounds were detected above applicable Subpart 375-6 SCOs (Protection of Groundwater, Protection of Ecological Resources, or Protection of Public Health for commercially zoned properties) in one of the five background surface soil samples, BG-SS-2. The concentrations of the PAHs in the four other background samples were below applicable SCOs. Total cyanide was not detected above the applicable SCOs at any background sample location.

Analytical results for the on-site surface soil samples were compared to the applicable Subpart 375-6 SCOs. The concentrations of SVOCs in the on-site samples, including PAHs, were below applicable SCOs (refer to Figure 11 from RI Data Summary Report). The comparison is presented in Table 5B and Figure 11 from the RI Data Summary Report. The range of total PAH concentrations in the background samples (6.2 to 13 mg/kg) was slightly higher than those on Site (0.36 to 5.4 mg/kg). The presence of these PAHs in the on-site and background surface soil samples is not unexpected given the urban setting. Total cyanide was not detected above the applicable SCOs at any on-site or background sample location, and the range of total cyanide concentrations are similar between on-site and background samples.

The results of this surface soil evaluation indicates the following:

1. There are no impacts from the former MGP operations to the 0- to 2-inch bgs surface soils on the Site, and
2. There are no exceedances of applicable SCOs in the 0- to 2-inch bgs surface soils on the Site.

0- to 6-inch bgs Interval

For the purposes of providing data for an ecological assessment (i.e., Steps 1 through 2B of a Fish and Wildlife Resources Impact Analysis [FWRIA]), surface soil samples from the 0- to 6-inch bgs depth interval were collected from eight locations throughout the Site during the RI activities. Surface soil samples from this depth interval were also collected from potential background areas and analyzed for comparison to concentrations in on-site samples. The 0- to 6-inch surface soil samples were analyzed for TCL SVOCs and total cyanide.

The analytical results from the background 0- to 6-inch soil samples are provided in Table 6A from the RI Data Summary Report. The measured concentrations in the samples were compared to Subpart 375-6 SCOs for Protection of Ecological Resources (SCO-PER). Of the potentially site-related constituents detected in the 0- to 6- inch soil samples, SCO-PER values are only available for acenaphthene, benzo(a)pyrene and fluorene. Accordingly, the concentrations were also compared to the Ecological Soil Screening Levels (ECO-SSLs) for PAHs, developed by the United States Environmental Protection Agency (USEPA), which are concentrations of PAHs in soil that are protective of ecological receptors that commonly come into contact with and/or consume biota that live in or on soil (USEPA, 2007). The ECO-SSLs are not cleanup values, but are intended for use in screening sites for identifying constituents of potential concern. The comparisons to the SCO-PER and ECO-SSL criteria are provided in Table 6B and Figure 12 from the RI Data Summary Report. Concentrations shown in bold type on Figure 12 from the RI Data Summary Report indicates concentrations of one or more PAH compounds are above the applicable criteria.

None of the concentrations measured in any of the samples exceeded the SCO-PER criteria.

The concentration of fluoranthene in the 0-6 inch soil samples at two of the six on-site locations slightly exceeded the ECO-SSL criterion designated to screen for potential impact to mammals of 1.1 mg/kg, as follows: SS-1 (1.4 mg/kg) and SS-8 (2 mg/kg, J qualified). The ECO SSL (Mammals) for fluoranthene is also exceeded in background samples BG-SS-1, BG SS 3 and BG-SS-5. In addition, the concentrations of benzo(b)fluoranthene and chrysene were above the ECO-SSL (Mammals) in background samples BG-SS-1 and BG-SS-3, respectively. Thus, although there are some slight exceedances of these criteria, they are not pervasive throughout the Site, and some similar exceedances occur in areas intended to be representative of background conditions rather than being associated with the former MGP.

None of the concentrations measured in any of the samples exceeded the ECO-SSL criterion designated to screen for potential impact to soil invertebrates.

The range of total PAH concentrations in the background samples (5.1 to 14 mg/kg) was slightly higher than those on Site (1.6 to 13 mg/kg). The presence of these PAHs in the on-site and background surface soil samples is not unexpected given the urban setting. Total cyanide concentrations, where detected (low level detections were observed at only two locations [SS-6 and BG-SS-1]) are similar between on-site and background samples.

The results of this 0- to 6-inch surface soil evaluation indicates the following:

1. There are no impacts from the former MGP operations to the 0- to 6-inch bgs surface soils on the Site, and
2. There are no exceedances of applicable SCOs or ECO-SSLs in the 0- to 6-inch bgs surface soils on the Site.

2.3.5 Subsurface Soil Analytical Results

A total of 33 subsurface soil samples from 16 locations were collected and submitted for laboratory analyses during the previous RI activities. The samples were analyzed for benzene, toluene, ethylbenzene and isomers of xylene (BTEX), PAHs, and total cyanide. The results of these analyses were compared to the New York State Subpart 375-6 SCOs for Protection of Public Health for commercially or industrially zoned properties (depending on location), Protection of Ecological Resources, and/or Protection of Groundwater. Figure 2-4 depicts the subsurface soil quality data from the RI and SC activities. At a location, if a concentration of one or more constituents exceeded any one of the above noted SCOs, it is depicted with a red symbol. Locations where no exceedances were observed are depicted with a green symbol.

The concentration of total BTEX compounds measured in soil samples ranged from non-detect to a high of 1,560 mg/kg within the 22- to 24-foot interval sample collected from soil boring B-118, located in the area of the former gas holder. Concentrations of one or more BTEX compounds were detected at concentrations above applicable SCOs in the six samples collected from three locations (B-104, B 117, and B-118), all of which are from the area of the former gas holder (see Figure 2-4). In addition, concentrations of ethylbenzene and total xylenes were detected at concentrations above applicable SCOs in the soil sample collected from MW-111D (located within the off-site Parcel C area), which was submitted for analysis of GC/FID fingerprinting. In general, the soil borings where concentrations were reported above the SCOs are at locations where NAPL was also observed.

Total PAH concentrations ranged from non-detect to a high of 4,895 mg/kg within the 24- to 26 foot interval sample collected from soil boring B-117, located in the area of the former gas holder. The distribution of PAHs in soils is depicted on Figure 2-4. During the SC and RI activities, subsurface soil samples from 12 locations contained concentrations of PAH compounds above one or more of the applicable SCOs (see Figure 2-4). The locations with exceedances of the SCOs for PAHs generally fall within areas impacted by NAPL, primarily in and near the area of the former gas holder.

Total Cyanide was not detected at concentrations above applicable SCOs in any of the RI and SC subsurface soil samples. Figure 2-4 depicts the results of the concentrations of total cyanide in soil from the RI and from the SC activities

In summary, the SCO exceedances for BTEX and PAHs are associated with areas and intervals where NAPL is encountered. The extent of on-site SCO exceedances has been generally defined with the exception of the area south/southeast of soil boring B-122.

2.3.6 Groundwater Analytical Results

Two comprehensive rounds of groundwater sampling were conducted during the RI (December 2012 and March 2013). The groundwater samples were analyzed for BTEX, PAHs, and total cyanide. Results of the analyses were compared to the 6 NYCRR Part 703 standards for Class GA water (groundwater) or, where no such standard exists, the corresponding guidance value from Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1; collectively, these are referred to herein as the Class GA criteria. Concentrations of total BTEX, naphthalene and total cyanide in groundwater for the sampling rounds conducted to date for both the RI and SC activities are posted on Figure 2-5; concentrations that are above the Class GA criteria are shown in bold type on this figure.

The most prevalent constituents detected in overburden groundwater at concentrations above the Class GA criteria were BTEX compounds, naphthalene and total cyanide. These constituents are often associated with MGP-related residuals, but can also be related to non-MGP sources. These constituents are used as indicators for evaluating dissolved-phase impacts in overburden groundwater at the Site. During the sampling rounds completed as part of the RI activities, one or more constituents in the BTEX constituent group and naphthalene were detected at concentrations above the Class GA criteria in samples collected from MW-103D, MW-109D, MW-110D, and MW-111D. The bases of the screens for these wells are positioned immediately above or slightly below the top of bedrock surface. Naphthalene was also detected at concentrations above its applicable guidance value in the sample collected from PZ-1 during the December 2012 sampling event, however, naphthalene was not detected at this location during the March 2013 event, or during previous monitoring events. At MW-109D and MW-111D, associated with the naphthalene exceedance were exceedances of lower solubility PAHs, including acenaphthene, anthracene, fluoranthene, fluorene, phenanthrene, and/or pyrene. Other PAH compounds were detected above the Class GA criteria in samples collected from MW-102, MW-108, and MW-111S. However, elevated levels of these other PAH compounds, which have very low solubilities, may be related to suspended particulates or turbidity entrained in the sample.

Total Cyanide was not detected above its applicable groundwater standard at any location.

In summary, exceedances of BTEX compounds, naphthalene, and locally some lower solubility PAHs were identified in the groundwater samples collected from wells screened at the base of the overburden, just above the top of bedrock. The locations where exceedances were observed are within, downgradient and sidegradient of the area of former MGP operations and where NAPL has been encountered.

2.3.7 Phase IA Cultural Resources Evaluation

A Phase IA cultural resource investigation of the former MGP Site was performed as part of the RI. The purpose of this evaluation was to identify whether or not historical cultural resources are potentially present in areas that may be considered for future remediation activities, to better assess the level of previous ground disturbance of these areas, and to determine if a Phase IB subsurface investigation to verify presence or absence of archeological or historic artifacts is warranted. Phase IA and IB studies are considered Cultural Resource Management investigations as directed by New York State Historic Preservation Office (SHPO).

The Phase IA evaluation was conducted in compliance with the State Environmental Quality Review Act. The archeological investigation was conducted according to New York Archaeological Council (NYAC) 2004 standards (NYAC, 2005).

The archeological investigation of the Site was performed by Panamerican Consultants, Inc. of Buffalo, New York. The report prepared by Panamerican Consultants, Inc. was presented as Appendix C to the RI Data Summary Report. The report identified archeologically sensitive areas on-site and off-site. Specifically, Panamerican identified an area near the northwestern section of the on-site property and extending off-site to the north and west that is sensitive for the presence of both prehistoric and historic period archaeological remains. Panamerican recommended that, in the event that remedial activities involving ground disturbance are to be conducted in this area, then a Phase IB survey should be undertaken to determine if National Register-eligible archaeological deposits are present.

Section 3

Scope of Work

The proposed supplemental RI activities are described below. Specific methods and procedures associated with these supplemental RI activities will be conducted in accordance with the following plans:

- Generic Field Sampling Plan for Site Investigations at Non-Owned Former MGP Sites, (Foster Wheeler, November 2002) (referred to as "FSP").
- Generic Quality Assurance Project Plan for Site Investigations at Non Owned Former MGP Sites, (Foster Wheeler, November 2002) (referred to as "QAPP").
- Generic Health & Safety Plan for Site Investigations at Non Owned Former MGP Sites (Foster Wheeler, November 2002).
- Health and Safety Plan for Remedial Investigation Activities, Fulton (North Ontario St.) Former MGP Site (Brown and Caldwell, March 2015) (referred to as "Health and Safety Plan"). This plan was developed consistent with the Generic Health & Safety Plan for Site Investigations at Non-Owned Former MGP Sites (Foster Wheeler, November 2002).
- DER-10/Technical Guidance for Site Investigation and Remediation (NYSDEC, May 2010).

The scope of work for the supplemental RI is described in the subsections below.

3.1 Preliminary Activities

3.1.1 Property Access Activities

During the SC, the owner of the property that occupies the former MGP Site (Drake Petroleum Company, Inc., successor by merger to Mid-Valley Oil, Inc.) was contacted and an access agreement was established allowing National Grid to conduct investigation activities on the property. Subsequently, an access agreement was also established with the owner of the property located west of Hubbard Street (Black Clawson Converting Machinery, Inc.) prior to the implementation of the supplemental SC activities. The access agreements previously obtained with each property owner will need to be updated to reflect revised expiration dates for the agreements, as well as the proposed supplemental RI scope of work.

Prior to initiating field activities for the supplemental RI, the owners of these properties will be contacted to brief them on the planned activities. As described below, supplemental RI activities are proposed on the property located west of Hubbard Street and within the City roadways and City right-of-ways (Hubbard Street and North Ontario Street). These activities will include the advancement of soil borings, installation of monitoring wells, and groundwater sampling from monitoring wells. Upon approval of this Work Plan, the City of Fulton will be contacted to obtain permission to conduct investigation activities within the City roadways and City right-of-ways and to coordinate temporary road closures (if necessary) to facilitate the field activities.

3.1.2 Historical Document Research

Research of the off-site area (Parcel C Area) west of the Site will be conducted in an effort to further evaluate a potential subsurface structure as indicated by demolition debris (concrete, brick, etc.) encountered in boring B-106 of the SC and by a review of historical maps that indicate a circular structure was present in the area during the period of MGP operations. This research will include obtaining and reviewing available resources such as:

- Maps and Other Cartographic Sources – Sanborn® Fire Insurance maps for areas surrounding the former MGP, historic City plans and atlases, land ownership maps.
- Aerial photographs.
- Historical topographic maps.

3.1.3 Underground Utility Evaluation

As described in Section 2.3.2, shallow overburden groundwater from the Site and from the off-site property to the west of the Site (Parcel C area) may discharge, to some degree, to the sewers and/or to the bedding surrounding the sewers under Hubbard Street because the sewer inverts are below the water table in this area. The City of Fulton's Engineering Department will be visited to obtain records for additional information related to the subsurface utilities. Available drawings depicting the dimensions and configuration of the sewers (storm and sanitary) will be reviewed at the office of the City Engineer. In addition, available information (e.g., as-built drawing, operational data, etc.) related to the sewer pump station that is located near the intersection of Hubbard and Ontario Streets will be reviewed at this time as well. Information obtained during this evaluation as it may relate to shallow overburden groundwater flow will be incorporated into the Site Conceptual Model.

3.2 Field Activities

3.2.1 Utility Mark Outs and Clearance

Prior to conducting the intrusive activities described below, the planned locations for the soil borings, bedrock boring, and monitoring wells will be marked in the field. New York Dig Safely will be contacted to clear subscribed underground utilities, while the City of Fulton will be contacted to clear utilities that they maintain (e.g., sewer and water). The Site property owners will also be requested to identify and locate known on-site private utilities in areas where investigation activities are proposed.

Some of the proposed drilling and sampling locations may be adjusted to provide for adequate clearance from underground and aboveground utilities. In addition, some locations may be modified pending results of the proposed surface geophysics survey discussed below in Section 3.2.2. The final locations for the soil borings, bedrock boring and monitoring wells will be determined in the field following the mark-out of underground utilities.

At each drilling location, clearance of subsurface utilities will be confirmed by physical means (e.g., vacuum soil extraction, hand tools, etc.). Physical clearance will be used to remove the soil at all drilling locations to a depth of approximately five feet bgs.

3.2.2 Surface Geophysical Survey

A non-intrusive surface geophysical survey will be performed on a portion of the off-site property owned by Black Clawson. The area proposed for conducting the surface geophysical survey is depicted on Figure 3-1. The primary objective of the proposed survey is to identify potential remnants of a subsurface structure that may exist in this area based on demolition debris (concrete, brick, etc.) that were encountered in boring B-106 and based on a review of a historical map (1867 Topographical Atlas of Oswego County) that indicates a circular structure was present in the area during the period of MGP operations. The actual extent of the area subject to surface geophysical survey may be modified based on the findings from the historical document research task discussed above in Section 3.1.2, Locations of potential subsurface structures and/or associated piping identified during the survey, if any, will be incorporated into an updated site plan.

The proposed surface geophysical survey will utilize magnetometer, ground-penetrating radar (GPR), and electromagnetics (EM).

3.2.3 Soil Borings

Soil borings are proposed at nine (9) locations (locations B-125 through B-133) at the approximate positions shown on Figure 3-1. As mentioned above, the locations of these borings may be modified based on the utility mark-outs and hand clearance activities and the results of the proposed surface geophysical survey discussed above. The boring locations were selected in order to: 1) further evaluate the extent of NAPL associated with the off-site area (Parcel C Area) west of the Site; 2) further evaluate the extent of MGP-related constituents in soils above applicable SCOs; 3) evaluate subsurface conditions in the area of and outside of a potential circular structure identified on the historical map referenced above; and 4) further evaluate the extent of visual/olfactory impacts encountered at soil boring for MW-101 and soil boring B-119. Information from the borings will also be used to improve the understanding of the stratigraphy and hydrogeologic properties of the overburden. A summary of the technical rationale for locations and depths of the proposed soil borings is presented on Table 3-1.

During the advancement of the proposed soil borings, a Community Air Monitoring Plan (CAMP) will be implemented that meets the requirements of the NYSDOH's Generic CAMP provided in DER-10. The soil borings will be drilled using hollow stem augers and sampled with a two-foot long, two-inch outside diameter (O.D.) split-spoon sampler from ground surface to the top of rock surface. Alternatively, sonic (vibratory) drilling methods may be employed. In the event that this technique is implemented, the borings would be drilled using a four-inch outer barrel and collection of three-inch diameter samples would be performed continuously in five-foot intervals to the top of rock surface. The soil samples will be described in the field to characterize soil type, including grain size, texture, and apparent moisture content. Soil samples will be logged in accordance with the Burmister Soil Classification System and classified using the USCS as per the FSP. The samples will also be field screened for indications of MGP-related impacts or other impacts based on appearance, odors or organic vapor concentration measurements using a photoionization detector (PID). Head-space screening will be conducted using the PID by immediately transferring a representative subsample of the soil to a clean glass jar and sealing its lid with aluminum foil. To allow the sample to equilibrate, it will remain sealed for a period of time (approximately 15 minutes) and then the tip of the PID will be inserted through the foil and the maximum instrument reading will be recorded.

In the event that NAPL is encountered in a boring, and conditions in the boring are such that continued drilling may introduce NAPL into deeper stratigraphic intervals via the borehole (e.g., potentially mobile NAPL perched above a confining layer), measures will be taken to reduce this potential. Advancement of the augers (or the core barrel if sonic drilling is used) may be suspended and temporary steel casing grouted into the borehole to isolate the NAPL from the borehole before advancing further. Alternatively, the boring will be terminated and consideration given to advancing a boring in an alternate location.

Approximately one (1) to two (2) soil samples will be collected from proposed soil borings (B-125 through B-133) and submitted for analysis of benzene, toluene, ethylbenzene and isomers of xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), and total cyanide. The depth interval(s) selected for sampling will be based on visual observations/field screening of the soil samples (biased toward apparent impacts and/or determining the extent of impacts); and/or the results of borings completed during prior investigations (e.g., depth of visual/olfactory impacts or intervals where PAHs in soils were above applicable SCOs). A summary of the planned soil analyses is provided in Table 3-2.

Analysis of soil samples will be conducted by a laboratory certified under the NYSDOH Environmental Laboratory Approval Program (ELAP) to provide Analytical Services Protocol (ASP)/Contract Laboratory Program (CLP) deliverables. The analytical results will be provided to the NYSDEC as an Electronic Data

Deliverable (EDD) formatted to the NYSDEC's required specifications. This will include: 1) populating the NYSDEC EDD with the analytical data; 2) validating the EDD using the database software application EQuIS™ from EarthSoft®, Inc.; and 3) submitting the validated EDD to the NYSDEC.

3.2.4 Overburden Evaluation and Monitoring Well Installation

Overburden monitoring wells are proposed at six locations at the approximate locations shown on Figure 3-1. The selected locations are intended to 1) further evaluate groundwater flow direction and the lateral extent of dissolved-phase, MGP-related constituents in deep overburden groundwater; and 2) further evaluate the potential for sewers beneath adjacent streets to serve as groundwater discharge features, thereby influencing groundwater flow on and adjacent to the Site. The boring for each monitoring well will also be used to further evaluate the stratigraphic characteristics of the overburden, further evaluate extent of NAPL associated with the off-site Parcel C area, and further evaluate soil quality conditions. The intended purpose of each of the monitoring wells is summarized on Table 3-1.

Deep Overburden Groundwater Evaluation

The soil borings advanced for the purposes of installing the deep overburden monitoring wells (MW-113D, MW-114D, MW-115D, and MW-116D) will be drilled using hollow stem augers and sampled with a two-foot long, two-inch O.D. split-spoon sampler from ground surface to top of the bedrock surface (estimated 21 to 25 feet bgs). Alternatively, sonic drilling methods may be employed. In the event that this technique is implemented, the borings would be drilled using a four-inch outer barrel and collection of three-inch diameter samples would be performed continuously in five-foot intervals to the top of rock surface. During the advancement of the proposed soil borings intended for installation of monitoring wells, a CAMP will be implemented as described in Section 3.2.4. The soil samples will be described in the field to characterize soil type, including grain size, texture, and apparent moisture content. Soil samples will be logged in accordance with the Burmister Soil Classification System and classified using the USCS as per the FSP. The samples will also be field screened for indications of MGP-related impacts or other impacts based on appearance, odors or organic vapor concentration measurements using a PID. Head-space screening will be conducted as described above in Section 3.2.3.

Consistent with previously installed deep overburden monitoring wells, the screened interval for each well will be positioned immediately above the top of the bedrock surface. Monitoring well installation procedures are provided in the FSP. The overburden wells will be constructed of two-inch diameter, Schedule 40 PVC well casing with 0.020 inch slot PVC screens and an appropriately-sized filter pack. After a minimum period of 24 hours has passed following well installation to allow for the cement/bentonite grout to set, the wells will be developed. Well development will be conducted in accordance with procedures in the FSP.

Approximately one (1) to two (2) soil samples from select borings intended for installation of monitoring wells will be collected and analyzed for BTEX, PAHs, and total cyanide. The depth interval(s) selected for sampling will be based on visual observations/field screening of the soil samples (biased toward apparent impacts and/or determining the extent of impacts); and/or the results of borings completed during prior investigations (e.g., depth of visual/olfactory impacts or intervals where PAHs in soils were above applicable SCOs). A summary of the planned soil analyses is provided in Table 3-2.

Analysis of soil samples will be conducted by a laboratory certified under the NYSDOH ELAP to provide ASP/CLP deliverables. As described above in Section 3.2.4, the analytical results will be provided to the NYSDEC as an EDD formatted to the NYSDEC's required specifications.

Hydraulic Gradient Well Pair

Based on water level data from wells/piezometers positioned on-site with screens that straddle the water table (MW-101 through MW-103 and PZ-1 through PZ-3), the water table is generally encountered within the till, at approximately 9 to 12 feet bgs. Immediately to the west and north of the Site where the ground surface is at a lower elevation, the water table is encountered at shallower depths (5 to 7 feet bgs), based on data collected from off-site water table well locations (MW-108, MW-109S, MW-110S, MW-111S and MW-112S). Water table elevation contours for December 11, 2012 (see Figure 3-2) indicate that overburden groundwater at the Site flows generally from southeast to the west and northwest across the Site. In the area to the west of the Site, the gradient of the water table greatly decreases, and water table elevations measured in the shallow overburden wells west of Hubbard Street (i.e., MW-111S and MW-112S) are higher than the elevations measured in the wells positioned on the eastern edge of Hubbard Street (i.e., MW-108 and MW-109S), indicating that locally there is a potential eastward component of flow towards Hubbard Street. This indicates that shallow overburden groundwater from the Site and from the off-site property to the west of the Site (Parcel C area) may discharge, to some degree, to the sewers and/or to the bedding surrounding the sewers under Hubbard Street because the sewer inverts are below the water table in this area (see Figure 3-3 [Geological Cross-Section A-A']). However, in order to confirm the potential influence of the sewer on groundwater flow, additional hydraulic gradient data are necessary. Accordingly a hydraulic gradient well pair (comprised of proposed wells MW-118 and MW-119) will be installed on the off-site property to provide for collecting the necessary water level data (see Figure 3-1). Water elevation data collected from the well pair, in conjunction with water elevation data from other wells associated with the Site, will allow for determining a hydraulic gradient between the wells, which in turn will provide data necessary for understanding localized groundwater flow direction in this area. Data from these wells will also be used to further evaluate the lateral extent of dissolved-phase constituents in overburden groundwater.

The wells will be installed with a screened interval that straddles the water table. The soil borings advanced for the purposes of installing the wells will be drilled using hollow stem augers and sampled with a two-foot long, two-inch O.D. split-spoon sampler from ground surface to the target depth indicated in Table 3-1. Alternatively, sonic drilling methods may be employed in an effort to increase sample recovery. In the event that this technique is implemented, the borings would be drilled using a four-inch outer barrel and collection of three-inch diameter samples would be performed continuously in five-foot intervals to the top of rock surface. During the advancement of the proposed soil borings intended for installation of monitoring wells, a CAMP will be implemented as described in Section 3.2.4. The soil samples will be described in the field to characterize soil type, including grain size, texture, and apparent moisture content. Soil samples will be logged in accordance with the Burmister Soil Classification System and classified using the USCS as per the FSP. The samples will also be field screened for indications of MGP-related impacts or other impacts based on appearance, odors or organic vapor concentration measurements using a PID. Head-space screening will be conducted as described above in Section 3.2.3.

Monitoring well installation procedures are provided in the FSP. The overburden wells will be constructed of two-inch diameter, Schedule 40 PVC well casing with 0.020 inch slot PVC screens and an appropriately-sized filter pack. If NAPL is encountered, then a one to two foot long sump will be installed below the screen, if appropriate, as described in the FSP. The length of the sump will be field determined based on subsurface conditions. The base of the sump will not penetrate a low permeability layer (or layer that otherwise forms a capillary barrier) that may be restricting downward migration of NAPL, if encountered, and will not be installed below the top of bedrock surface. The annular space between the sump and formation will be filled with bentonite, cement/bentonite grout, or other suitable, relatively low permeability material. After a minimum period of 24 hours has passed following well installation to allow for the cement/bentonite grout to set, the wells will be developed. Well development will be conducted in accordance with procedures in the FSP.

Approximately one (1) to two (2) soil samples from the boring intended for installation of proposed monitoring well MW-119 will be collected and analyzed for BTEX, PAHs, and total cyanide. Due to the close proximity to the boring intended for installation of proposed monitoring well MW-119, soil samples for laboratory analysis at the boring intended for installation of proposed monitoring well MW-118 are not required. The depth interval(s) selected for sampling soils at MW-119 will be based on visual observations/field screening of the soil samples (biased toward apparent impacts and/or determining the extent of impacts); and/or the results of borings completed during prior investigations (e.g., depth of visual/olfactory impacts or intervals where PAHs in soils were above applicable SCOs). A summary of the planned soil analyses is provided in Table 3-2.

Analysis of soil samples will be conducted by a laboratory certified under the NYSDOH ELAP to provide ASP/CLP deliverables. As described above in Section 3.2.4, the analytical results will be provided to the NYSDEC as an EDD formatted to the NYSDEC's required specifications.

3.2.5 Bedrock Evaluation and Bedrock Monitoring Well Installation

For this phase of RI activities, one bedrock boring (BRB-1) and three (3) bedrock monitoring wells (MW-109R, MW-111R, and MW-117R) are proposed at the approximate locations shown on Figure 3-1 to: 1) Determine whether or not NAPL encountered at or near the top of the bedrock surface during previous investigations has entered the bedrock; 2) Assess groundwater quality within bedrock to delineate the vertical extent of dissolved-phase, MGP-related constituents in groundwater; and 3) Determine the generalized direction of groundwater flow within the bedrock underlying the Site. The intended purpose of each of the bedrock investigation locations is summarized on Table 3-1.

Bedrock Boring

Bedrock boring BRB-1 is proposed at the approximate location shown on Figure 3-1. The purpose of this bedrock boring is to determine whether or not NAPL encountered at or near the top of the bedrock surface during completion of soil borings B-117 and B-118 has entered the bedrock in the area of the former gas holder. The bedrock boring will be advanced approximately 20 feet below the top of rock surface.

Continuous sampling of the soil at the BRB-1 location will be conducted using a two-foot long, two-inch O.D. split spoon sampler. Using 4 ¼-inch inside diameter (I.D.) hollow-stem augers, an 8-inch diameter borehole will be drilled through the overburden and to a depth of approximately one to two feet into competent bedrock. Alternatively, sonic drilling methods may be employed. In the event that this technique is implemented, the borings would be drilled using a four-inch outer barrel and collection of three-inch diameter samples would be performed continuously in five-foot intervals to the top of rock surface. Depending on the subsurface conditions, a temporary casing may be installed to keep the borehole from collapsing and facilitate drilling.

A four-inch diameter steel casing will then be placed in the borehole, extending from the bottom of the borehole (seated one to two feet into competent bedrock) to the ground surface. The casing will then be grouted in place by filling the annular space between the casing and the borehole. Grout will extend from the bottom of the borehole to a few feet below ground surface and consist of a cement/bentonite mixture placed using the tremie method or pressure grouting. The cement/bentonite grout in the annular space will be allowed to set for a minimum period of 24 hours before resuming drilling activities at the borehole location.

Bedrock drilling will resume by means of conventional or wire-line coring techniques using a nominal four-inch O.D. core barrel. Cores will be collected in five-foot intervals to a depth of approximately 20 feet below the top of rock (approximately 45 feet bgs). Core samples will be described in the field to characterize rock type; bedding thicknesses; texture; fracture type, orientation and spacing; structural features in addition to fractures; and other descriptors used to identify the composition of the bedrock. Rock Quality Designation (RQD) will be measured in accordance with American Society for Testing and Materials (ASTM) Standard D6032-08 and recorded for each five-foot interval as an indicator of bedrock competency. The cores will be field screened for indications of MGP-related, or other, impacts based on appearance, odor and organic vapor concentrations as indicated by a PID. Additionally, drilling return water will be observed and screened with a PID for indications that NAPL or other impacts that may be encountered during the drilling process (e.g., sheens, globules of NAPL, etc.).

Bedrock Monitoring Wells

Three bedrock monitoring wells (MW-109R, MW-111R, and MW-117R) are proposed at the approximate locations shown on Figure 3-1. The selected locations are intended to: 1) evaluate whether or not NAPL observed at or near the top of the bedrock surface has entered the bedrock formation underlying the Site; 2) assess groundwater quality within bedrock to delineate the vertical extent of dissolved phase, MGP-related constituents in groundwater; and 3) determine the direction of groundwater flow within in the bedrock underlying the Site. The boring for each monitoring well will also be used to further evaluate the stratigraphic characteristics of the overburden and to evaluate the characteristics of the bedrock.

The soil borings intended for installation of bedrock monitoring wells will initially be sampled with a two-foot long, two inch O.D. split-spoon sampler from ground surface to refusal on bedrock. Alternatively, sonic drilling methods may be employed. In the event that this technique is implemented, the borings would be drilled using a four-inch outer barrel and collection of three-inch diameter samples would be performed continuously in five-foot intervals to the top of rock surface. The samples will be described in the field to characterize soil type, including grain size, texture, and apparent moisture content. Soil samples will be logged in accordance with the Burmister Soil Classification System and classified using the USCS as per the FSP. The samples will also be field screened for indications of MGP-related, or other, impacts based on appearance, odors or organic vapor concentration measurements using a PID as described in section 3.2.3.

An eight-inch diameter borehole will be drilled through the overburden and approximately one to two feet into competent bedrock. Depending on the subsurface conditions, a temporary well casing may be installed to keep the borehole from collapsing and facilitate drilling.

A four-inch diameter steel casing will then be placed in the borehole, extending from the bottom of the borehole (seated one to two feet into competent bedrock) to the ground surface. The casing will then be grouted in place by filling the annular space between the casing and the borehole, from the bottom of the borehole to a few feet bgs, with a cement/bentonite grout using the tremie method or pressure grouting. The cement/bentonite grout in the annular space will be allowed to set for a minimum period of 24 hours before resuming drilling activities at the borehole location.

Bedrock drilling will resume by means of conventional or wire-line coring techniques using a nominal four inch O.D. core barrel. Cores will be collected in 5-foot intervals, to a depth of approximately 20 feet below the top of bedrock surface (approximately 41 to 45 feet bgs). Core samples will be described in the field to characterize rock type; bedding thicknesses; texture; fracture type, orientation and spacing; structural features in addition to fractures; and other descriptors used to identify the composition of the bedrock. RQD will be measured in accordance with ASTM Standard D6032-08 and recorded for each five-foot interval as an indicator of bedrock competency. The cores will be field screened for indications of MGP-related, or other, impacts based on appearance, odor and organic vapor concentrations as indicated by a PID. Additionally, drilling return water will be observed and screened with a PID for indications that NAPL or other impacts that may be encountered during the drilling process (e.g., sheens, globules of NAPL, etc.). Packer pressure testing will be conducted at five-foot intervals following each core run to evaluate changes in hydraulic conductivity versus depth and identify potential water bearing zones. Packer pressure testing will be conducted in accordance with the procedures specified in the FSP.

Coring and packer pressure testing will be used to identify the uppermost water-bearing zone in bedrock. Once this zone is identified, coring and packer testing will continue in five foot intervals in an attempt to evaluate the thickness of the water bearing zone, and to identify a relatively lower permeability interval directly below the water-bearing zone. Following completion of coring and packer testing, borehole geophysical logging will be conducted in the corehole. Specific geophysical parameters that will be recorded during the logging will include natural gamma, fluid temperature, fluid resistivity, spontaneous potential, single point resistance, and caliper. The geophysical data will be used to further evaluate the bedrock conditions and the vertical position of the water-bearing zone.

A two-inch diameter screen and riser casing will be installed inside the four-inch steel casing and nominally four-inch borehole. The wells will be constructed of two inch diameter, Schedule 40 PVC casing with 0.020 inch slot PVC screens with an appropriately-sized filter pack. At well locations where NAPL is encountered, if any, a one to two foot long sump will be installed below the screen, if appropriate, as described in the FSP. In instances where sumps are installed, the annular space between the sump and formation will be filled with bentonite, cement/bentonite grout, or other suitable, relatively low permeability material.

3.2.6 Slug Tests

In-situ hydraulic conductivity tests (i.e., slug tests) will be performed on each monitoring well installed pursuant to this work plan to evaluate the horizontal hydraulic conductivity of the adjacent formation. Rising and/or falling head slug tests will be conducted in accordance with the procedures described in the FSP and the data generated will be input into AQTESOLV® software for hydraulic conductivity calculations using analytical solutions appropriate for the hydrogeologic conditions.

3.2.7 Continuous Water Level Monitoring

Continuous monitoring of water levels in existing overburden wells, overburden and bedrock monitoring wells installed pursuant to this work plan, and in a staff gauge installed in the nearby Oswego River (approximately 400 feet west of site) will be conducted over an extended period (± 1 week). The continuous monitoring will be conducted with pressure transducers equipped with automatic data loggers (e.g., In-Situ Level TROLLS®). The automatic data loggers will be set to record water levels from the pressure transduces every five minutes for approximately one week. A manual water level meter will also be used to measure water levels in the monitoring wells at the beginning and end of the continuous monitoring period. Hourly barometric pressure data and precipitation data for the monitoring period will be obtained from the National Oceanic and Atmospheric Administration (NOAA) meteorological measurement station located closest to the Site. Additionally, barometric pressure will be measured on-Site every 15 minutes using a pressure transducer and automatic data logger configured to measure and record barometric pressure (e.g., In-Situ BaroTROLL®). The continuous water level, barometric and precipitation data will be used to facilitate the evaluation of the interaction between overburden and bedrock groundwater and to assess the continuity of a potential shallow bedrock water-bearing zone, if identified. Further, the continuous monitoring will allow for the identification of other potential influences on groundwater flow, such as local pumping, if any. The data will also be used to assess the degree (if any) to which changes in groundwater levels are influenced by water level fluctuations in the Oswego River.

3.2.8 Groundwater Monitoring and NAPL Gauging

Two (2) rounds of groundwater sampling will be conducted as part of the supplemental RI field activities. For each round, groundwater samples will be collected from the monitoring wells proposed herein and the existing monitoring wells and piezometers. The first round of groundwater sampling will be initiated after at least one week has passed since completion of well development and after water levels in the wells have stabilized. The second round will be conducted approximately three months (one quarter) after the first round, preferably in a time period where the groundwater elevation conditions differ seasonally from the first round. For example, if the first round is conducted during a period when the water table is relatively high, then it is preferable to schedule the second round for a period when the water table is relatively low.

Prior to groundwater sampling, depth to water measurements and NAPL gauging will be conducted on each well planned for sampling and all on-site and off-site wells. In the event that NAPL is detected in a monitoring well, a groundwater sample will not be collected from that well. Groundwater samples will be collected according to the USEPA low flow sampling protocol and in accordance with procedures outlined in the FSP.

The groundwater samples will be submitted for analysis of BTEX, PAHs, and total cyanide. The groundwater samples will also be analyzed in the field for pH, specific conductivity, temperature, turbidity, and dissolved oxygen.

Analysis of groundwater samples will be conducted by a laboratory certified under NYSDOH ELAP to provide ASP/CLP deliverables. As described in Section 3.2.3, the analytical results will be provided to the NYSDEC as an EDD formatted to the NYSDEC's required specifications.

3.2.9 Survey

Each of the borings and monitoring well locations completed as part of the supplemental RI will be surveyed. The survey will include location coordinates, ground surface elevation, and in the case of the wells, top of casing elevation data. Coordinates will be referenced to the State Plane coordinate system for New York using the North American Datum of 1983 (NAD 1983) in units of feet. Elevations will be referenced to the National Geodetic Vertical Datum (NGVD) of 1929 in units of feet. The survey will be performed by a New York licensed surveyor.

3.2.10 Investigation-Derived Waste

Investigation-derived waste (IDW) generated during the supplemental RI activities will include soil cuttings, drilling water, development water, equipment decontamination water, purge water, disposable sampling equipment, and personal protective equipment (PPE). The waste will be containerized in DOT-approved, 55-gallon drums, which will be properly labeled to identify their contents. The appropriate treatment/disposal will be arranged based on the characterization of the waste streams. Treatment/disposal of the IDW will be managed by a licensed, permitted transportation and disposal contractor on National Grid's approved vendor list.

3.3 Data Evaluation and Reporting

Laboratory results for the soil and groundwater samples will be forwarded to a qualified data validator for preparation of a Data Usability Summary Report (DUSR). The DUSR will present a summary of data usability, including a discussion of qualified and rejected data and provide recommendations for resampling/reanalysis, as applicable.

A Supplemental RI Data Summary Report for the Site will be provided to the NYSDEC. The Supplemental RI Data Summary Report will include the following:

- Soil boring logs and well construction diagrams;
- Data generated during the field investigation in EQuIS™ compatible format;
- DUSR and tabular and graphic summaries of the analytical results;
- Updated site plan depicting supplemental RI sampling locations and previous investigation locations;
- Figures presenting the continuous monitoring data;
- Maps of groundwater elevations and interpreted flow directions;
- Hydrogeologic cross-sections depicting subsurface conditions; and
- Other information pertinent to the supplemental RI activities

Accompanying the Supplemental RI Data Summary Report will be conclusions related to the objectives of the Supplemental RI, and an assessment of whether or not the data collected to-date are sufficient to meet the RI objectives for the Site. Also included will be either a recommendation that a RI Report be prepared (if the data collected to-date are sufficient), or recommendations for addressing additional data needs to complete the RI, including human and ecological exposure assessments.

In the event that preparation of a RI Report is recommended and the NYSDEC concurs with this recommendation, a RI Report will be prepared to address the following:

- The identity and characteristics of the source(s) of MGP-related impacts;
- The amount, concentration, phase, location, environmental fate and transport, and other significant characteristics of any MGP-related constituents present;
- Hydrogeologic characteristics, including grain size, hydraulic conductivity of saturated formations monitored, depth to saturated zone, nature of bedrock, hydraulic gradients, proximity to surface water, floodplains, or wetlands;
- Assessment of routes of exposure and potential human receptors via a qualitative human health exposure assessment in accordance with Section 3.1(C)17 and Appendix 3B of the May 2010 DER-10 Technical Guidance for Site Investigation and Remediation; and
- A determination as to whether or not a Fish and Wildlife Resource Impact Analysis (FWRIA) are required based on Appendix 3C of the May 2010 DER 10 Technical Guidance for Site Investigation and Remediation and, if so required, conduct Steps 1 through 2b in accordance with the following DEC guidance documents: 1) Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA); October 1, 1994 (Steps 1 through 2b); and 2) DER 10 Technical Guidance for Site Investigation and Remediation, May 2010.

The RI Report will include the following:

- Pertinent information obtained throughout the implementation of this work plan and previous investigations;
- Descriptions of the work completed under this work plan and previous investigations and the results of that completed work;
- Deviations from this work plan and previous investigations that result from unexpected conditions encountered during the investigation;
- Summary of the overall nature and extent of contamination referencing any exceedances of applicable State standards, criteria, and guidance;
- Summary of any ecological assessments conducted;
- Summary tables of analytical data collected;

- Soil boring logs and well construction diagrams, which will include well development data and field instrument (e.g., PID) readings;
- Groundwater elevation contour maps with flow directions specified;
- Hydrogeologic cross-sections of the Site;
- Figure depicting the elevation contours of the top of bedrock surface;
- Figures illustrating the distribution of constituent concentrations in soils and groundwater, including sample depths; and
- Conclusions which summarize the areas of concern, identify any potentially completed exposure pathways, and recommendations for any future work (e.g., none, additional investigation, or an evaluation of remedial alternatives).

Section 4

Schedule

Following NYSDEC/NYSDOH review and approval of the proposed locations and supplemental RI Work Plan, efforts to establish and/or update the existing property access agreements will commence. Field activities will be initiated after approximately two weeks following execution of the property access agreement(s) and notification of the property owner(s) of the planned supplemental RI activities.

It is anticipated that approximately six (6) to eight (8) weeks will be required to conduct the field activities described in this Supplemental RI Work Plan through completion of: soil borings; bedrock evaluation; monitoring well installations; well development; slug testing; continuous water level monitoring; and the first round of groundwater sampling. As noted in Section 3.2.9, the second round of groundwater sampling will be conducted approximately three (3) months following the first round, preferably in an interval of hydrologic conditions that differs seasonally from the first round. Within approximately six (6) to eight (8) weeks of completion of the second round of groundwater sampling, the laboratory analyses and the DUSR are expected to be complete.

A Supplemental RI Data Summary Report will be submitted approximately 10 weeks after the DUSR for the groundwater samples for the second sampling round is received from the data validator. If following the NYSDEC's review of the Data Summary Report (see Section 3.3), it is determined that the RI is complete, then a schedule for submitting a RI Report will be developed.

Section 5

References

Brett, C.E., Tepper, D.H., Goodman, W.M., LoDuca, S.T., and Eckert, B., 2005. Revised Stratigraphy and Correlations of the Niagaran Provincial Series (Medina, Clinton, and Lockport Groups) in the Type Area of Western New York. U.S. Geological Survey Bulletin 2086.

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EECS, Inc., January 2004. Site Characterization/Interim Remedial Measures Work Plan for Site Investigations at the Fulton Non-Owned Former MGP Site.

Foster Wheeler, November, 2002. Generic Field Sampling Plan for Site Investigations at Non Owned Former MGP Sites.

Foster Wheeler, November 2002. Generic Quality Assurance Project Plan for Site Investigations at Non Owned Former MGP Sites.

Foster Wheeler, November 2002. Generic Health & Safety Plan for Site Investigations at Non Owned Former MGP Sites.

NYSDEC, 2010. DER-10 / Technical Guidance for Site Investigation and Remediation. DEC Program Policy. May 3, 2010.

Tables

TABLE 3-1
RATIONALE FOR SUPPLEMENTAL REMEDIAL INVESTIGATION LOCATIONS
FULTON (NORTH ONTARIO ST.) FORMER MGP SITE
FULTON, NEW YORK

Location ID	Objective(s)	Target Depth[1]
SOIL BORINGS		
B-125	Evaluate subsurface conditions outside of potential circular structure identified on a historical map that was present in the area during the period of MGP operations. Further evaluate the extent of NAPL associated with the off-site area (Parcel C Area) west of the Site. Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs[2].	Advance to top of bedrock surface (estimated 20 feet bgs).
B-126	Evaluate subsurface conditions in the area of a potential circular structure identified on a historical map that was present in the area during the period of MGP operations. Further evaluate the extent of NAPL associated with the off-site area (Parcel C Area) west of the Site. Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs.	Advance to top of bedrock surface (estimated 20 feet bgs).
B-127	Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs. Further evaluate the extent of NAPL associated with the off-site area (Parcel C Area) west of the Site.	Advance to top of bedrock surface (estimated 19 feet bgs).
B-128	Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs. Further evaluate the extent of NAPL associated with the off-site area (Parcel C Area) west of the Site.	Advance to top of bedrock surface (estimated 21 feet bgs).
B-129	Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs.	Advance to top of bedrock surface (estimated 25 feet bgs).
B-130	Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs.	Advance to top of bedrock surface (estimated 25 feet bgs).
B-131	Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs.	Advance to top of bedrock surface (estimated 25 feet bgs).
B-132	Further evaluate the extent of visual/olfactory impacts encountered during completion of soil boring for MW-101.	Advance to top of bedrock surface (estimated 25 feet bgs).
B-133	Further evaluate the extent of visual/olfactory impacts encountered during completion of soil boring B-119.	Advance to top of bedrock surface (estimated 21 feet bgs).

TABLE 3-1
RATIONALE FOR SUPPLEMENTAL REMEDIAL INVESTIGATION LOCATIONS
FULTON (NORTH ONTARIO ST.) FORMER MGP SITE
FULTON, NEW YORK

Location ID	Objective(s)	Target Depth[1]
OVERBURDEN MONITORING WELLS AND SOIL BORINGS		
MW-113D	Further evaluate groundwater flow direction and the lateral extent of dissolved-phase, MGP-related constituents in deep overburden groundwater. Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs. Further evaluate the extent of NAPL associated with the off-site area (Parcel C Area) west of the Site.	*Soil Boring* - advance to top of bedrock surface (estimated 21 feet bgs). *Well* - position base of well screen immediately above top of bedrock surface.
MW-114D	Further evaluate groundwater flow direction and the lateral extent of dissolved-phase, MGP-related constituents in deep overburden groundwater. Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs. Further evaluate the extent of NAPL associated with the off-site area (Parcel C Area) west of the Site.	*Soil Boring* - advance to top of bedrock surface (estimated 21 feet bgs). *Well* - position base of well screen immediately above top of bedrock surface.
MW-115D	Further evaluate groundwater flow direction and the lateral extent of dissolved-phase, MGP-related constituents in deep overburden groundwater.	*Soil Boring* - advance to top of bedrock surface (estimated 23 feet bgs). *Well* - position base of well screen immediately above top of bedrock surface.
MW-116D	Further evaluate groundwater flow direction and the lateral extent of dissolved-phase, MGP-related constituents in deep overburden groundwater.	*Soil Boring* - advance to top of bedrock surface (estimated 25 feet bgs). *Well* - position base of well screen immediately above top of bedrock surface.
MW-118	Further evaluate the potential for sewers beneath adjacent streets to serve as groundwater discharge features, thereby influencing groundwater flow on and adjacent to the Site.	*Soil Boring* - 15 feet bgs. *Well* - straddle water table with screen.
MW-119	Further evaluate the potential for sewers beneath adjacent streets to serve as groundwater discharge features, thereby influencing groundwater flow on and adjacent to the Site. Further evaluate the extent of MGP-related constituents in subsurface soil above applicable SCOs. Further evaluate the extent of NAPL associated with the off-site area (Parcel C Area) west of the Site.	*Soil Boring* - advance to top of bedrock surface (estimated 21 feet bgs). *Well* - straddle water table with screen.

TABLE 3-1
RATIONALE FOR SUPPLEMENTAL REMEDIAL INVESTIGATION LOCATIONS
FULTON (NORTH ONTARIO ST.) FORMER MGP SITE
FULTON, NEW YORK

Location ID	Objective(s)	Target Depth[1]
BEDROCK EVALUATION/BEDROCK MONITORING WELL LOCATIONS		
BRB-1	Determine whether or not NAPL encountered at or near the top of bedrock surface during completion of soil borings B-117 and B-118 has entered the bedrock in the area of the former gas holder.	Advance bedrock boring approximately 20 feet below top of rock surface (estimated 45 feet bgs).
MW-109R	Assess groundwater quality within bedrock to delineate the vertical extent of dissolved-phase, MGP-related constituents in groundwater. Determine the direction of groundwater flow within the bedrock underlying the Site.	Pending findings from coring, packer pressure tests and geophysical logging, complete a well with screen that straddles shallowest encountered water-bearing zone in bedrock. Total depth of bedrock well is anticipated to be less than 20 feet below the top of bedrock surface (estimated 41 feet bgs).
MW-111R	Evaluate whether or not the NAPL observed at or near the top of bedrock surface has entered the bedrock formation underlying the Site. Assess groundwater quality within bedrock to delineate the vertical extent of dissolved-phase, MGP-related constituents in groundwater. Determine the direction of groundwater flow within the bedrock underlying the Site.	Pending findings from coring, packer pressure tests and geophysical logging, complete a well with screen that straddles shallowest encountered water-bearing zone in bedrock. Total depth of bedrock well is anticipated to be less than 20 feet below the top of bedrock surface (estimated 41 feet bgs).
MW-117R	Evaluate whether or not the NAPL observed at or near the top of bedrock surface has entered the bedrock formation underlying the Site. Assess groundwater quality within bedrock to delineate the vertical extent of dissolved-phase, MGP-related constituents in groundwater. Determine the direction of groundwater flow within the bedrock underlying the Site.	Pending findings from coring, packer pressure tests and geophysical logging, complete a well with screen that straddles shallowest encountered water-bearing zone in bedrock. Total depth of bedrock well is anticipated to be less than 20 feet below the top of bedrock surface (estimated 45 feet bgs).

Notes:
(1) - Target depths are estimated based on data from surrounding borings. Adjustments may be required based on field observations.
(2) - Soil Cleanup Objectives (SCOs) as set forth in 6 NYCRR Subpart 375-6.
NAPL - non-aqueous phase liquid
bgs - below ground surface

TABLE 3-2
SUMMARY OF LABORATORY ANALYSES
FULTON (NORTH ONTARIO ST.) FORMER MGP SITE
FULTON, NEW YORK

Media and Sample Type	BTEX Method 8260	PAHs Method 8270	Total Cyanide
Soil Boring Samples (9 borings, 2 Soil samples each)	18	18	18
Duplicate(1)	1	1	1
MS/MSD(1)	1	1	1
Trip Blank(2)	--	--	--
Equipment Blank(1)	1	1	1
Monitoring Well Soil Boring Samples (5 Borings, 2 Soil samples each)	10	10	10
Duplicate(1)	1	1	1
MS/MSD(1)	1	1	1
Trip Blank(2)	--	--	--
Equipment Blank(1)	1	1	1
Groundwater (26 wells, 2 events)(3)	52	52	52
Duplicate(1)	4	4	4
MS/MSD(1)	4	4	4
Trip Blank(2)	±8	--	--
Equipment Blank(1)	4	4	4

Notes:
(1) - Per the QAPP, one duplicate sample, one MS/MSD pair, and one equipment blank will be submitted and analyzed for every Sample Deliver y Group (maximum 20 samples).
(2) - Per the QAPP, one trip blank will be included in every shipment of water samples to be analyzed for VOCs, and subsequently analyzed.
(3) - If NAPL is identified in well, groundwater samples from that well will not be analyzed.

Figures

1/21/2015

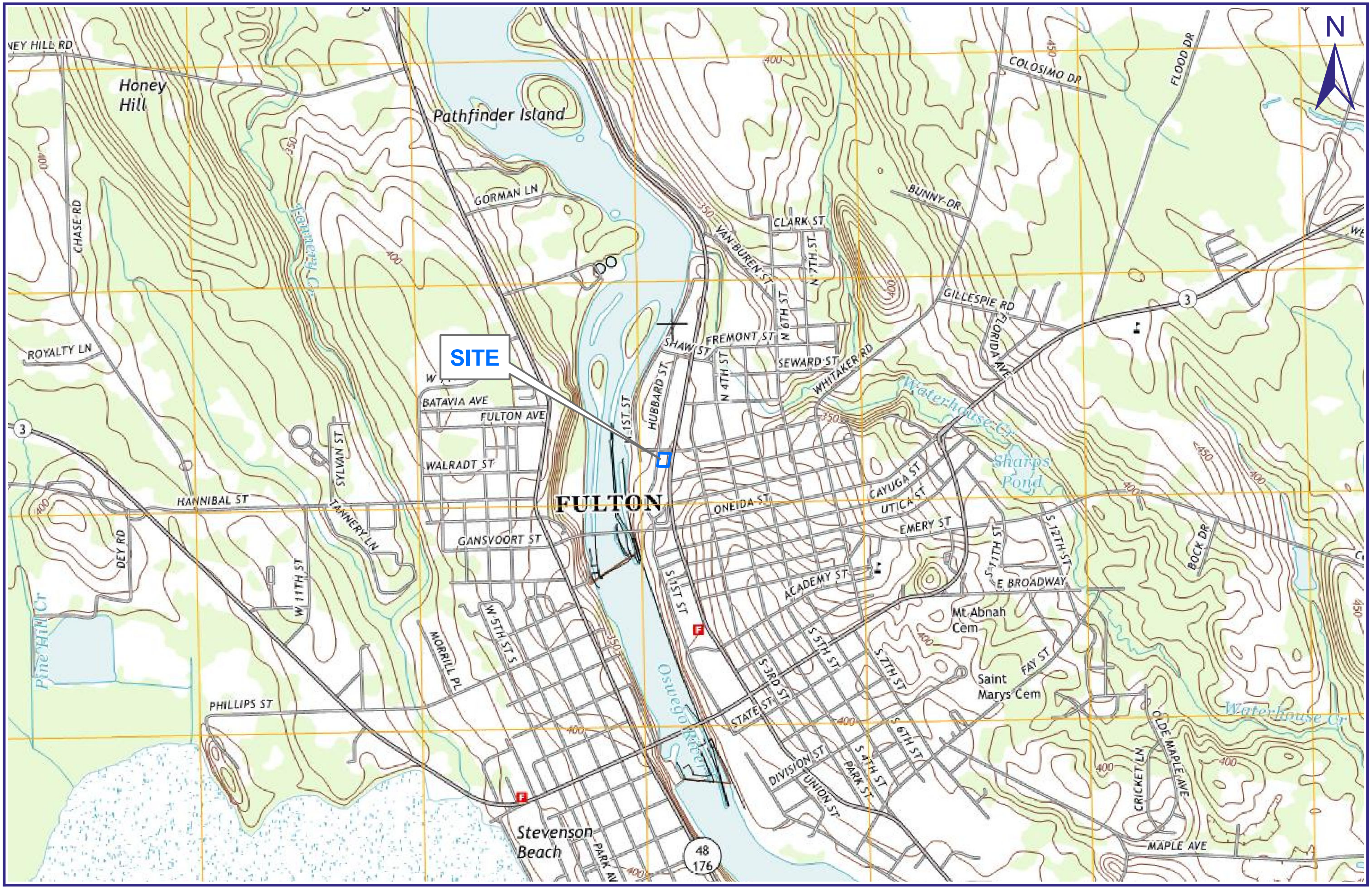

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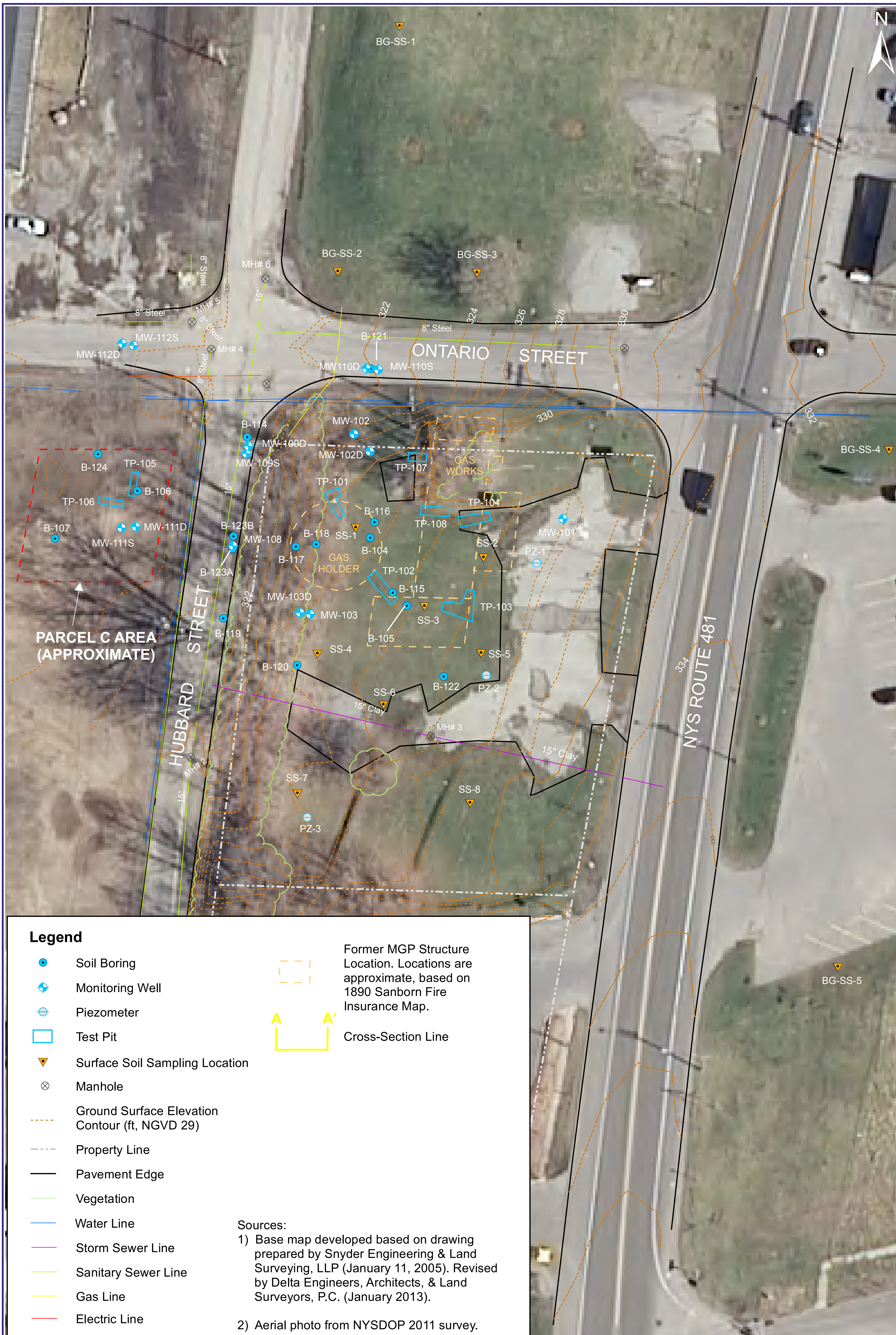
FIGURE 2-1
SITE LOCATION
NATIONAL GRID
FULTON (NORTH ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK

Source: USGS 7.5 Minute Topographic Map
Fulton Quadrangle (2013)

0 1,000 2,000
Feet

Author: BFTaylor Path: P:\GIS\National_Grid\Fulton\Fulton_Site_Location_SRIWP.mxd

1/21/2015

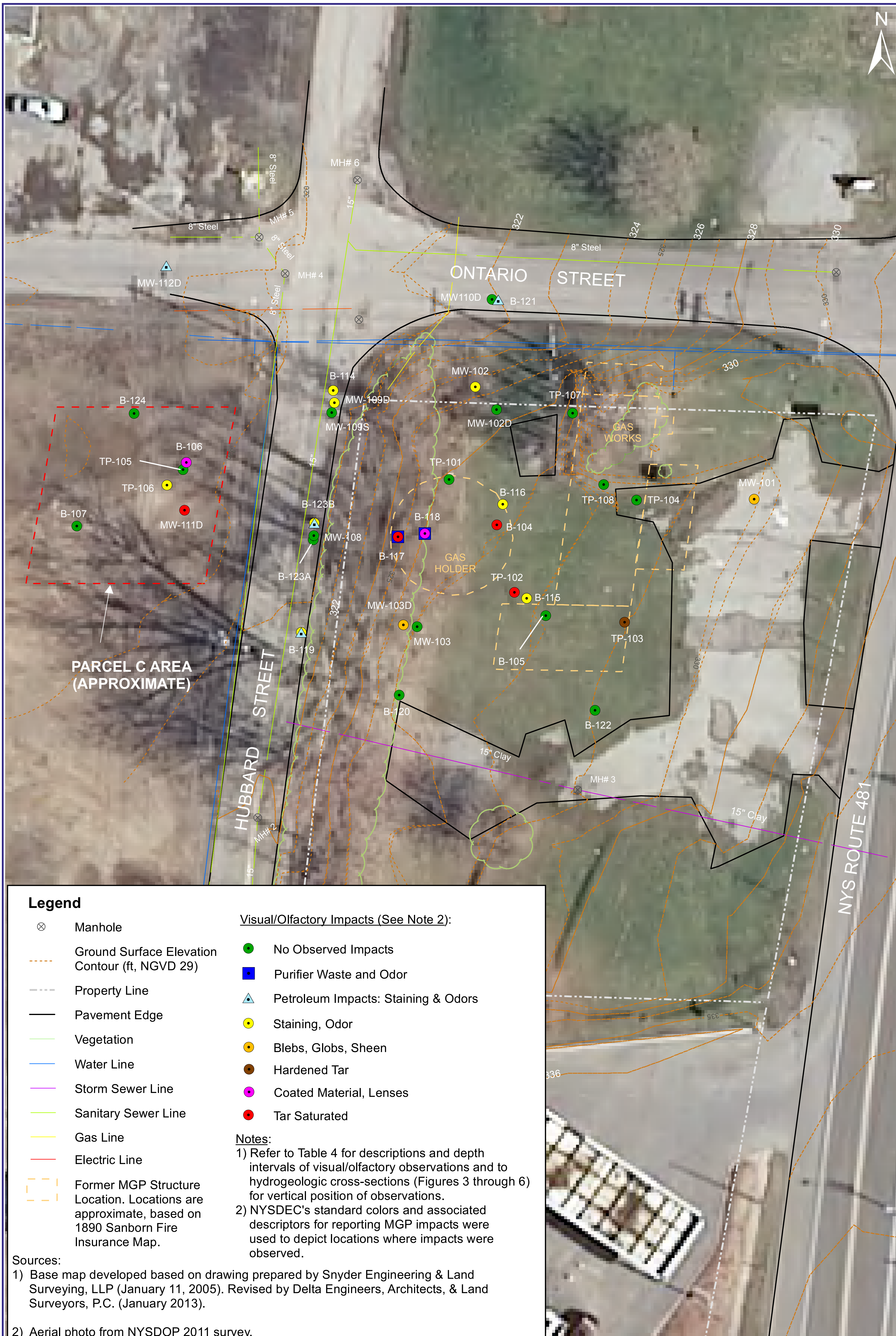


Author: BFTaylor Path: P:\GIS\National_Grid\Fulton\fulton_site_plan_SRIWP.mxd

Brown AND Caldwell

FIGURE 2-2
SITE PLAN
NATIONAL GRID
FULTON (NORTH ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK

0 20 40
Feet



Legend

- ⊗ Manhole
- Ground Surface Elevation Contour (ft, NGVD 29)
- Property Line
- Pavement Edge
- Vegetation
- Water Line
- Storm Sewer Line
- Sanitary Sewer Line
- Gas Line
- Electric Line
- Former MGP Structure Location. Locations are approximate, based on 1890 Sanborn Fire Insurance Map.

Visual/Olfactory Impacts (See Note 2):

- No Observed Impacts
- Purifier Waste and Odor
- Petroleum Impacts: Staining & Odors
- Staining, Odor
- Blebs, Globs, Sheen
- Hardened Tar
- Coated Material, Lenses
- Tar Saturated

Notes:
1) Refer to Table 4 for descriptions and depth intervals of visual/olfactory observations and to hydrogeologic cross-sections (Figures 3 through 6) for vertical position of observations.
2) NYSDEC's standard colors and associated descriptors for reporting MGP impacts were used to depict locations where impacts were observed.

Sources:
1) Base map developed based on drawing prepared by Snyder Engineering & Land Surveying, LLP (January 11, 2005). Revised by Delta Engineers, Architects, & Land Surveyors, P.C. (January 2013).

2) Aerial photo from NYSDOP 2011 survey.

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FIGURE 2-3
VISUAL/OLFACTORY OBSERVATIONS
NATIONAL GRID
FULTON (NORTH ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK

0 30
Feet

Author: BFTaylor Path: P:\GIS\National_Grid\Fulton\fulton_visual_olf_impacts_SRIWP.mxd

Legend

- Monitoring Well: green symbol indicates no exccedance of New York State Part 375 Soil Cleanup Objectives (SCOs); red symbol indicates one or more constituents exceed SCO(s)
- Soil Boring: green symbol indicates no exccedance of SCOs; red symbol indicates one or more constituents exceed SCO(s)
- Test Pit Sample: green symbol indicates no exccedance of SCOs; red symbol indicates one or more constituents exceed SCO(s)
- Soil Boring
- Monitoring Well
- Piezometer
- Test Pit
- Manhole
- Ground Surface Elevation Contour (ft, NGVD 29)
- Property Line
- Pavement Edge
- Vegetation
- Water Line
- Storm Sewer Line
- Sanitary Sewer Line
- Gas Line
- Electric Line
- Former MGP Structure Location. Locations are approximate, based on 1890 Sanborn Fire Insurance Map.

Explanation of terms and abbreviations:
BTEX - Benzene, Toluene, Ethylbenzene, Xylenes
PAHs - Polycyclic Aromatic Hydrocarbons
J - Estimated Concentration
ND - Not Detected
NA - Not Analyzed

Bold Value - Indicates conentration of one or more constituents in a constituent group are above NYS Part 375 SCOs (Protection of Public Health for Commercially or Industrially Zoned Properties [depending on sample location]; Protection of Ecological Resources; and/or Protection of Groundwater)

Results reported in milligrams per kilogram (mg/kg)

* - Table lists the highest concentration from original and duplicate sample

Sources:
1) Base map developed based on drawing prepared by Snyder Engineering & Land Surveying, LLP (January 11, 2005); Revised by Deltal Engineers, Architects, & Land Surveyors, P.C.(January 2013).
2) Aerial photo from NYSDOP 2011 survey

Author: BFTaylor Path: P:\GIS\National_Grid\Fulton\fulton_subsurface_soil_quality_SRIWP_2x3.mxd

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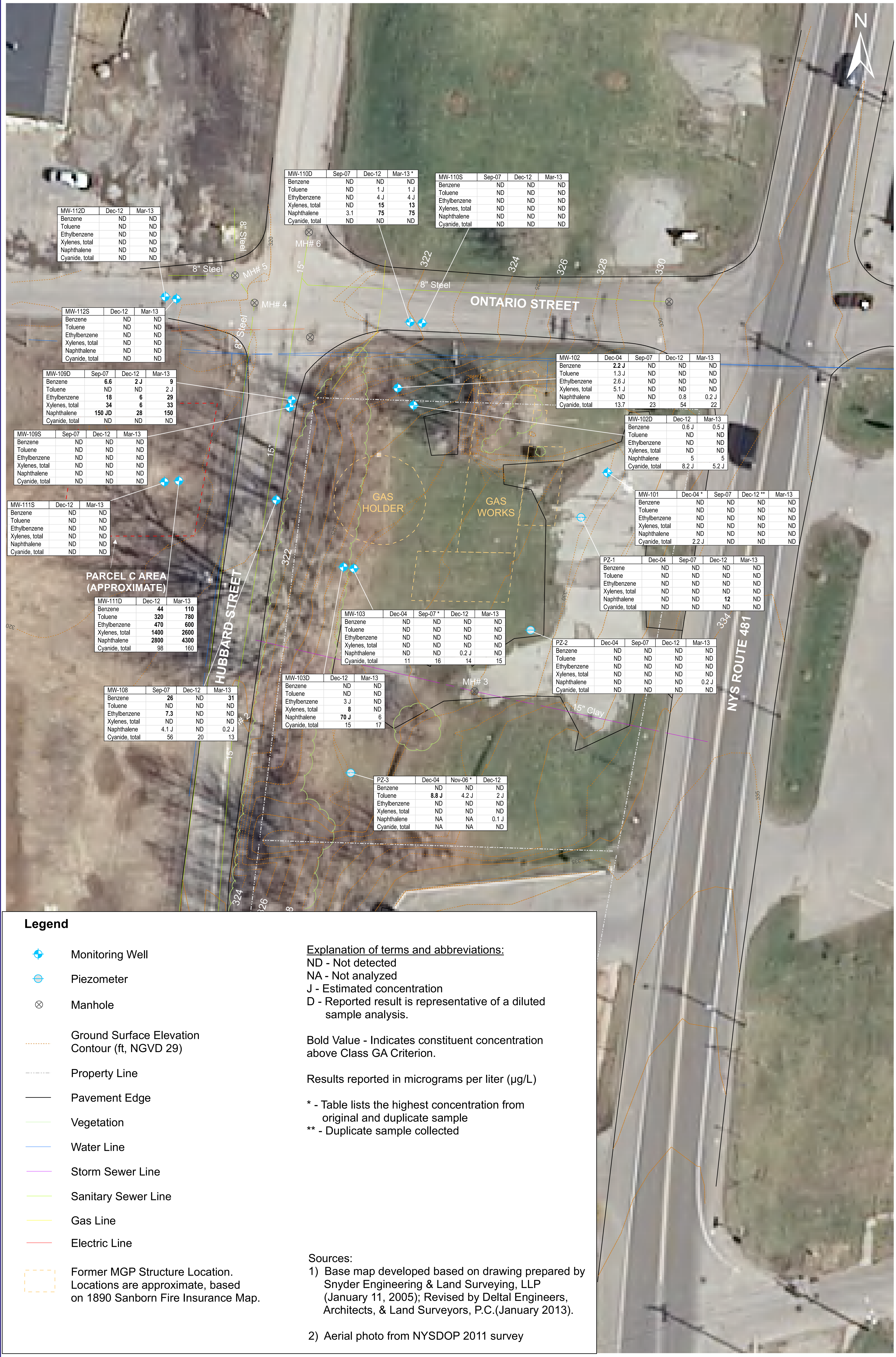
FIGURE 2-4
BTEX, TOTAL PAHs AND TOTAL CYANIDE IN SUBSURFACE SOIL
NATIONAL GRID
FULTON (NORTH ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK

0 20 40
Feet

1/21/2015



MW-110D	Sep-07	Dec-12	Mar-13 *
Benzene	ND	ND	ND
Toluene	ND	1 J	1 J
Ethylbenzene	ND	4 J	4 J
Xylenes, total	ND	**15**	**13**
Naphthalene	3.1	**75**	**75**
Cyanide, total	ND	ND	ND

MW-110S	Sep-07	Dec-12	Mar-13
Benzene	ND	ND	ND
Toluene	ND	ND	ND
Ethylbenzene	ND	ND	ND
Xylenes, total	ND	ND	ND
Naphthalene	ND	ND	ND
Cyanide, total	ND	ND	ND

MW-112D	Dec-12	Mar-13
Benzene	ND	ND
Toluene	ND	ND
Ethylbenzene	ND	ND
Xylenes, total	ND	ND
Naphthalene	ND	ND
Cyanide, total	ND	ND

MW-112S	Dec-12	Mar-13
Benzene	ND	ND
Toluene	ND	ND
Ethylbenzene	ND	ND
Xylenes, total	ND	ND
Naphthalene	ND	ND
Cyanide, total	ND	ND

MW-109D	Sep-07	Dec-12	Mar-13
Benzene	**6.6**	**2 J**	**9**
Toluene	ND	ND	2 J
Ethylbenzene	**18**	**6**	**29**
Xylenes, total	**34**	**6**	**33**
Naphthalene	**150 JD**	**28**	**150**
Cyanide, total	ND	ND	ND

MW-109S	Sep-07	Dec-12	Mar-13
Benzene	ND	ND	ND
Toluene	ND	ND	ND
Ethylbenzene	ND	ND	ND
Xylenes, total	ND	ND	ND
Naphthalene	ND	ND	ND
Cyanide, total	ND	ND	ND

MW-111S	Dec-12	Mar-13
Benzene	ND	ND
Toluene	ND	ND
Ethylbenzene	ND	ND
Xylenes, total	ND	ND
Naphthalene	ND	ND
Cyanide, total	ND	ND

MW-111D	Dec-12	Mar-13
Benzene	**44**	**110**
Toluene	**320**	**780**
Ethylbenzene	**470**	**600**
Xylenes, total	**1400**	**2600**
Naphthalene	**2800**	**4300**
Cyanide, total	98	160

MW-108	Sep-07	Dec-12	Mar-13
Benzene	**26**	ND	**31**
Toluene	ND	ND	ND
Ethylbenzene	**7.3**	ND	ND
Xylenes, total	ND	ND	ND
Naphthalene	4.1 J	ND	0.2 J
Cyanide, total	56	20	13

MW-102	Dec-04	Sep-07	Dec-12	Mar-13
Benzene	**2.2 J**	ND	ND	ND
Toluene	1.3 J	ND	ND	ND
Ethylbenzene	2.6 J	ND	ND	ND
Xylenes, total	5.1 J	ND	ND	ND
Naphthalene	ND	ND	0.8	0.2 J
Cyanide, total	13.7	23	54	22

MW-102D	Dec-12	Mar-13
Benzene	0.6 J	0.5 J
Toluene	ND	ND
Ethylbenzene	ND	ND
Xylenes, total	ND	ND
Naphthalene	5	5
Cyanide, total	8.2 J	5.2 J

MW-101	Dec-04 *	Sep-07	Dec-12 **	Mar-13
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
Cyanide, total	2.2 J	ND	ND	ND

PZ-1	Dec-04	Sep-07	Dec-12	Mar-13
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND
Naphthalene	ND	ND	**12**	ND
Cyanide, total	ND	ND	ND	ND

MW-103	Dec-04	Sep-07 *	Dec-12	Mar-13
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND
Naphthalene	ND	ND	0.2 J	ND
Cyanide, total	11	16	14	15

PZ-2	Dec-04	Sep-07	Dec-12	Mar-13
Benzene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Xylenes, total	ND	ND	ND	ND
Naphthalene	ND	ND	ND	0.2 J
Cyanide, total	ND	ND	ND	ND

MW-103D	Dec-12	Mar-13
Benzene	ND	ND
Toluene	ND	ND
Ethylbenzene	3 J	ND
Xylenes, total	**8**	ND
Naphthalene	**70 J**	6
Cyanide, total	15	17

PZ-3	Dec-04	Nov-06 *	Dec-12
Benzene	ND	ND	ND
Toluene	**8.8 J**	4.2 J	2 J
Ethylbenzene	ND	ND	ND
Xylenes, total	ND	ND	ND
Naphthalene	NA	NA	0.1 J
Cyanide, total	NA	NA	ND

Legend

- Monitoring Well
- Piezometer
- Manhole
- Ground Surface Elevation Contour (ft, NGVD 29)
- Property Line
- Pavement Edge
- Vegetation
- Water Line
- Storm Sewer Line
- Sanitary Sewer Line
- Gas Line
- Electric Line
- Former MGP Structure Location. Locations are approximate, based on 1890 Sanborn Fire Insurance Map.

Explanation of terms and abbreviations:
ND - Not detected
NA - Not analyzed
J - Estimated concentration
D - Reported result is representative of a diluted sample analysis.

Bold Value - Indicates constituent concentration above Class GA Criterion.

Results reported in micrograms per liter (µg/L)

* - Table lists the highest concentration from original and duplicate sample
** - Duplicate sample collected

Sources:
1) Base map developed based on drawing prepared by Snyder Engineering & Land Surveying, LLP (January 11, 2005); Revised by Deltal Engineers, Architects, & Land Surveyors, P.C.(January 2013).

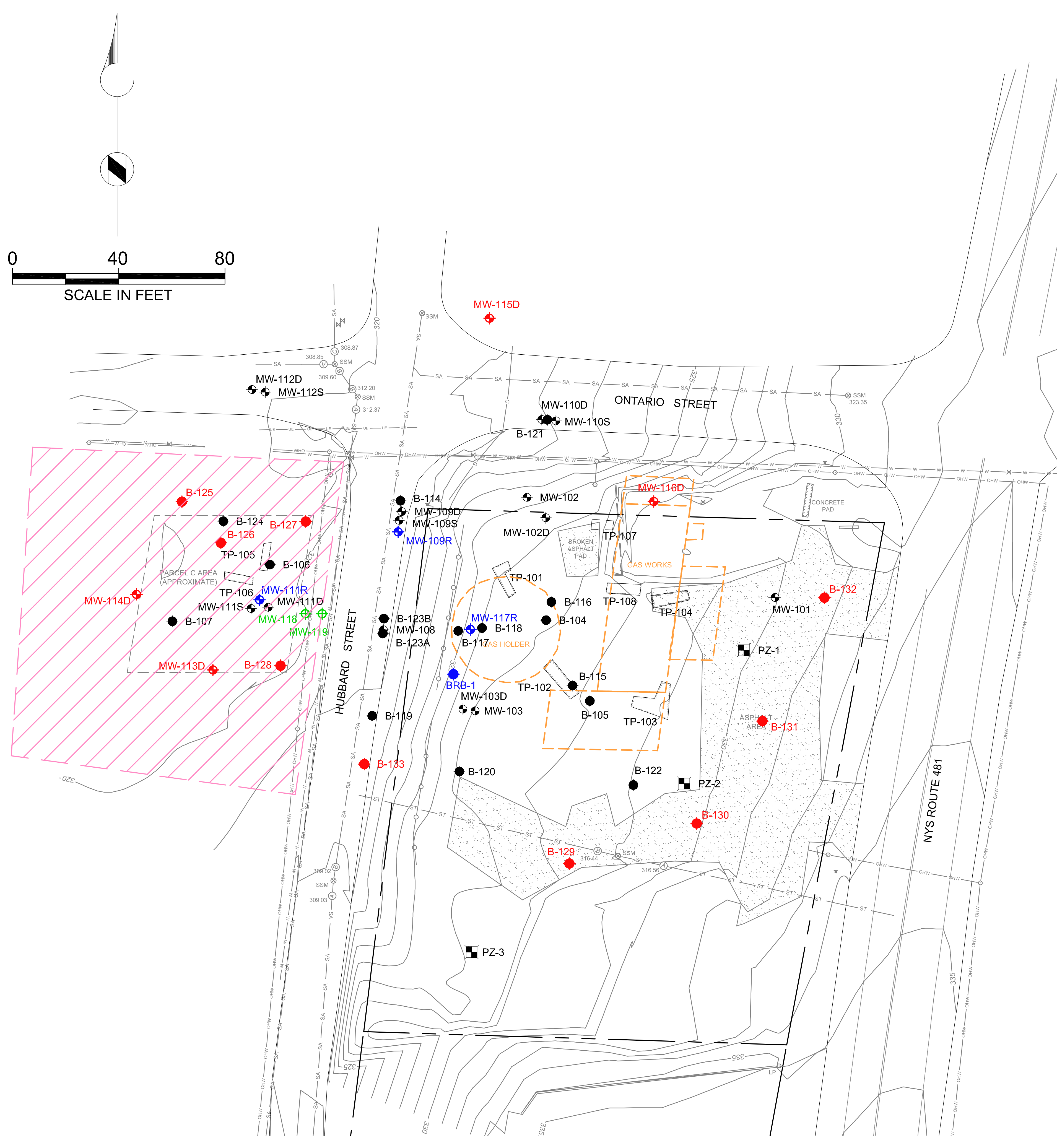
2) Aerial photo from NYSDOP 2011 survey

Author: BFTaylor Path: P:\GIS\National_Grid\Fulton\Fulton_GW_quality_SRIWP_2x3.mxd

Brown AND Caldwell

FIGURE 2-5
BTEX, NAPHTHALENE AND TOTAL CYANIDE IN GROUNDWATER
NATIONAL GRID
FULTON (NORTH ONTARIO ST.) FORMER MGP SITE, FULTON, NEW YORK

0 20 40
Feet



Path: P:\DRAFTING\NATIONAL_GRID\NIMO_FULTON\142247\CADD\2-SHEETS\B-GEOTECHNICAL File Name: FIG-3-1 Plot Date: April 2, 2015 10:21 AM Cadd User: James, Richard

LEGEND:

- PROPERTY LINE
- GROUND SURFACE ELEVATION CONTOUR (FT., NGVD)
- UNDERGROUND ELECTRIC LINE
- OVERHEAD WIRE
- WATER LINE
- SANITARY SEWER
- STORM SEWER
- GAS LINE
- MANHOLE
- POLE
- MW-103 MONITORING WELL
- PZ-3 PIEZOMETER
- B-120 SOIL BORING
- TP-102 TEST PIT
- FORMER MGP STRUCTURE LOCATION. LOCATIONS ARE APPROXIMATE BASED ON 1890 SANBORN FIRE INSURANCE MAP.

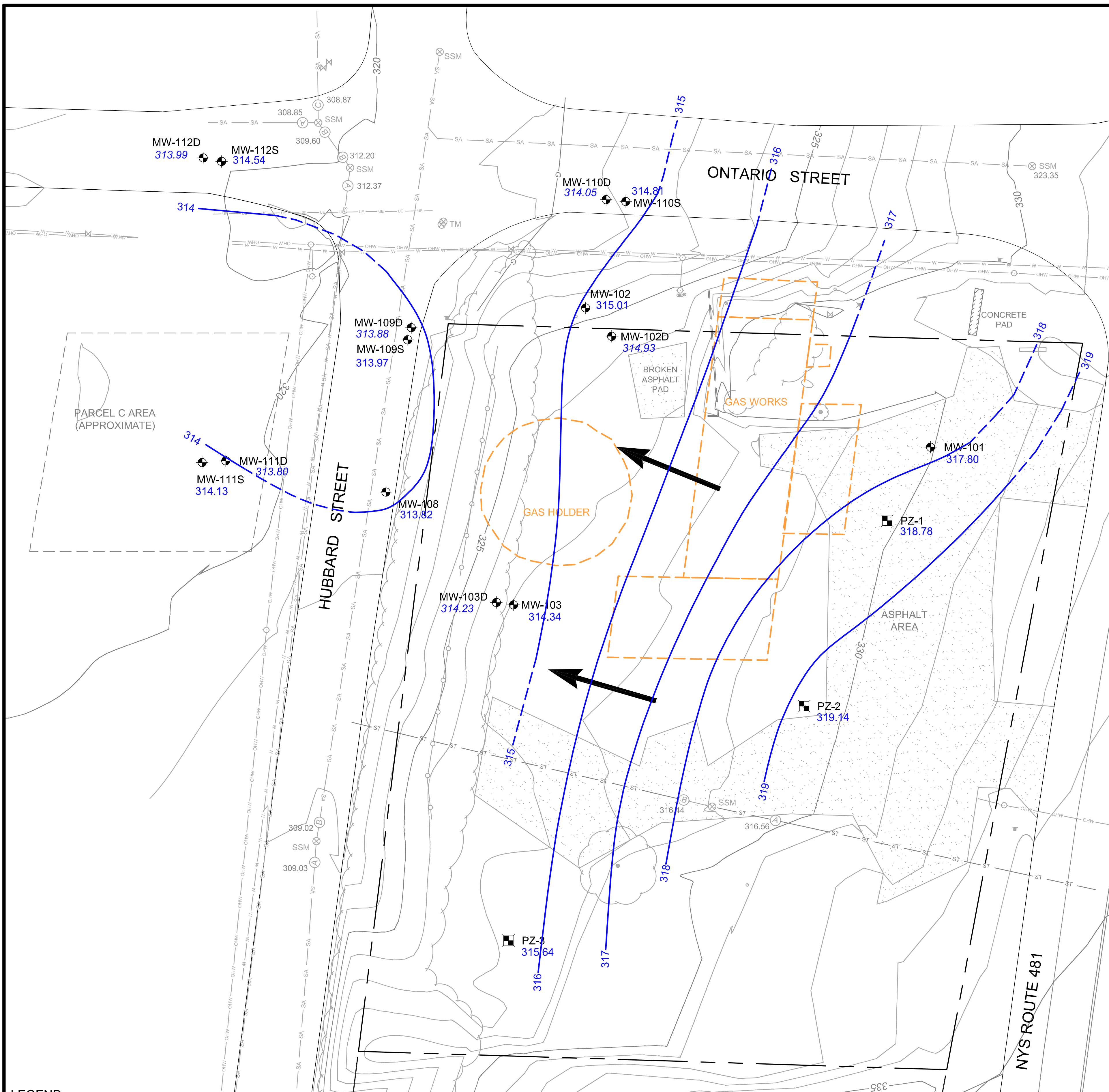
SOURCE:
BASE MAP DEVELOPED BASED ON DRAWING PREPARED BY SNYDER ENGINEERING AND LAND SURVEYING, LLP (JANUARY 11, 2005), REVISED BY DELTA ENGINEERS, ARCHITECTS, AND LAND SURVEYORS, P.C. (JANUARY 2013).

PROPOSED SUPPLEMENTAL REMEDIAL INVESTIGATION LOCATIONS:

- PROPOSED SURFACE GEOPHYSICAL SURVEY AREA
- PROPOSED SOIL BORING
- PROPOSED DEEP OVERBURDEN MONITORING WELL
- PROPOSED BEDROCK BORING
- PROPOSED BEDROCK MONITORING WELL
- PROPOSED HYDRAULIC GRADIENT WELL PAIR (OVERBURDEN)

Brown AND Caldwell	NATIONAL GRID FULTON (NORTH ONTARIO ST.) FORMER MGP SITE FULTON, NEW YORK DATE: April 2, 2015	PROPOSED SUPPLEMENTAL REMEDIAL INVESTIGATION LOCATIONS	FIGURE 3-1

Path: P:\National_Grid\Fulton(N_Ontario_St)\142247_Fulton_Remedial_Investigation\CADD\2-SHEETS\B-GEOTECHNICAL File Name: FIG-8-(Water-Table-Contour) Plot Date: May 16, 2013 4:31 PM Cadd User: James, Richard



LEGEND:

PROPERTY LINE

GROUND SURFACE ELEVATION CONTOUR (FT., NGVD)

UNDERGROUND ELECTRIC

OVERHEARD WIRE

WATER

SANITARY SEWER

STORM WATER

GAS LINE

MANHOLE

POLE

MW-103 MONITORING WELL

PZ-3 PIEZOMETER

FORMER MGP STRUCTURE LOCATION. LOCATIONS ARE APPROXIMATE BASED ON 1890 SANBORN FIRE INSURANCE MAP.

303 WATER TABLE ELEVATION CONTOUR (FT., NGVD) DASHED WHERE INFERRED

314.81 WATER TABLE ELEVATION (FT., NGVD)

314.23 GROUNDWATER ELEVATION (FT., NGVD) FOR WELLS SCREENED BELOW WATER TABLE (WELLS WITH "D" DESIGNATION)

316.56 SEWER INVERT ELEVATION (FT., NGVD)

GENERALIZED DIRECTION OF GROUNDWATER FLOW

SOURCE:
BASEMAP DEVELOPED BASED ON DRAWING PREPARED BY SNYDER ENGINEERING AND LAND SURVEYING, LLP (JANUARY 11, 2005), REVISED BY DELTA ENGINEERS, ARCHITECTS, AND LAND SURVEYORS, P.C. (JANUARY 2013).

0 30 60
SCALE IN FEET

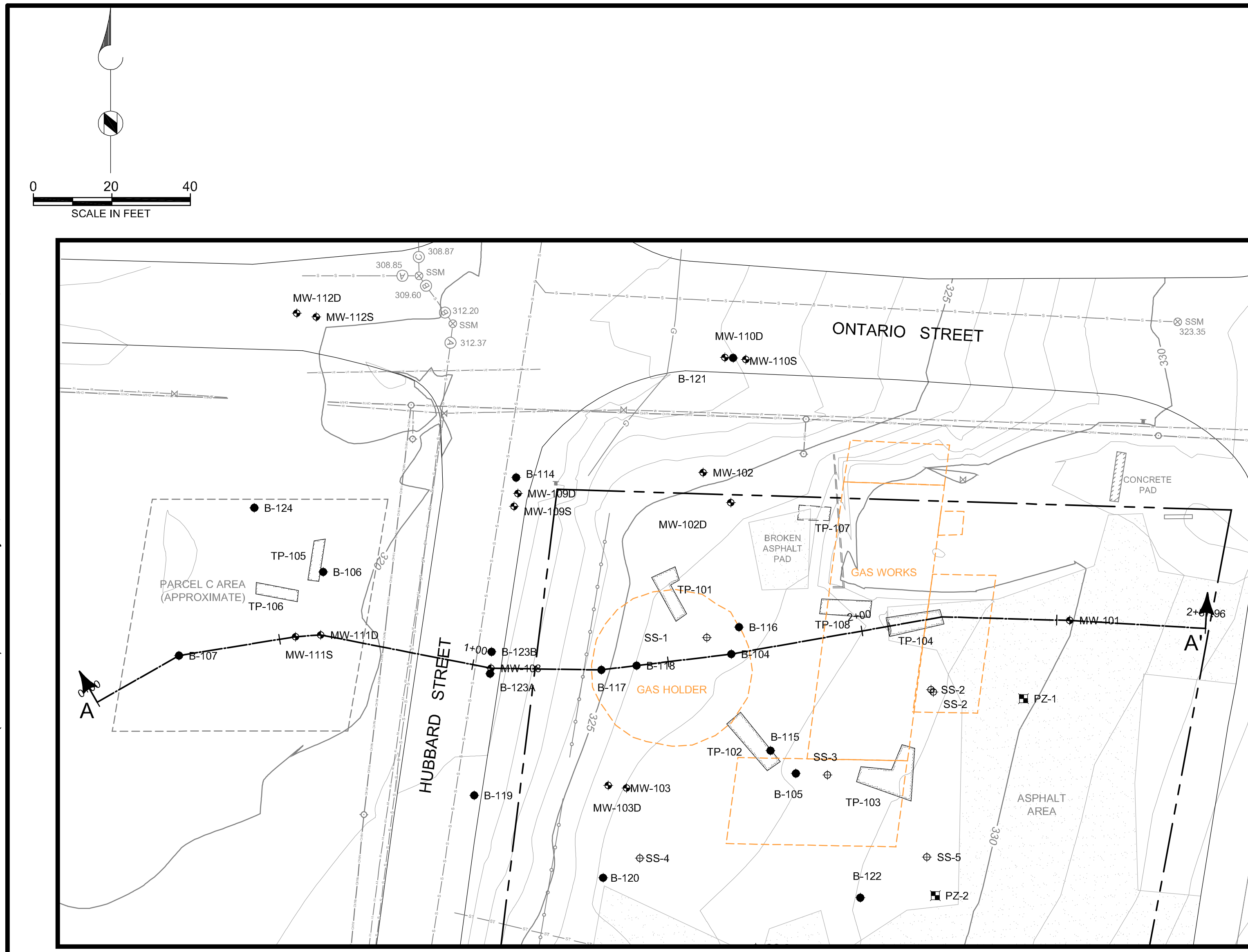
Brown AND Caldwell

NATIONAL GRID
FULTON (NORTH ONTARIO ST.)
FORMER MGP SITE
FULTON, NEW YORK

DATE: May 16, 2013

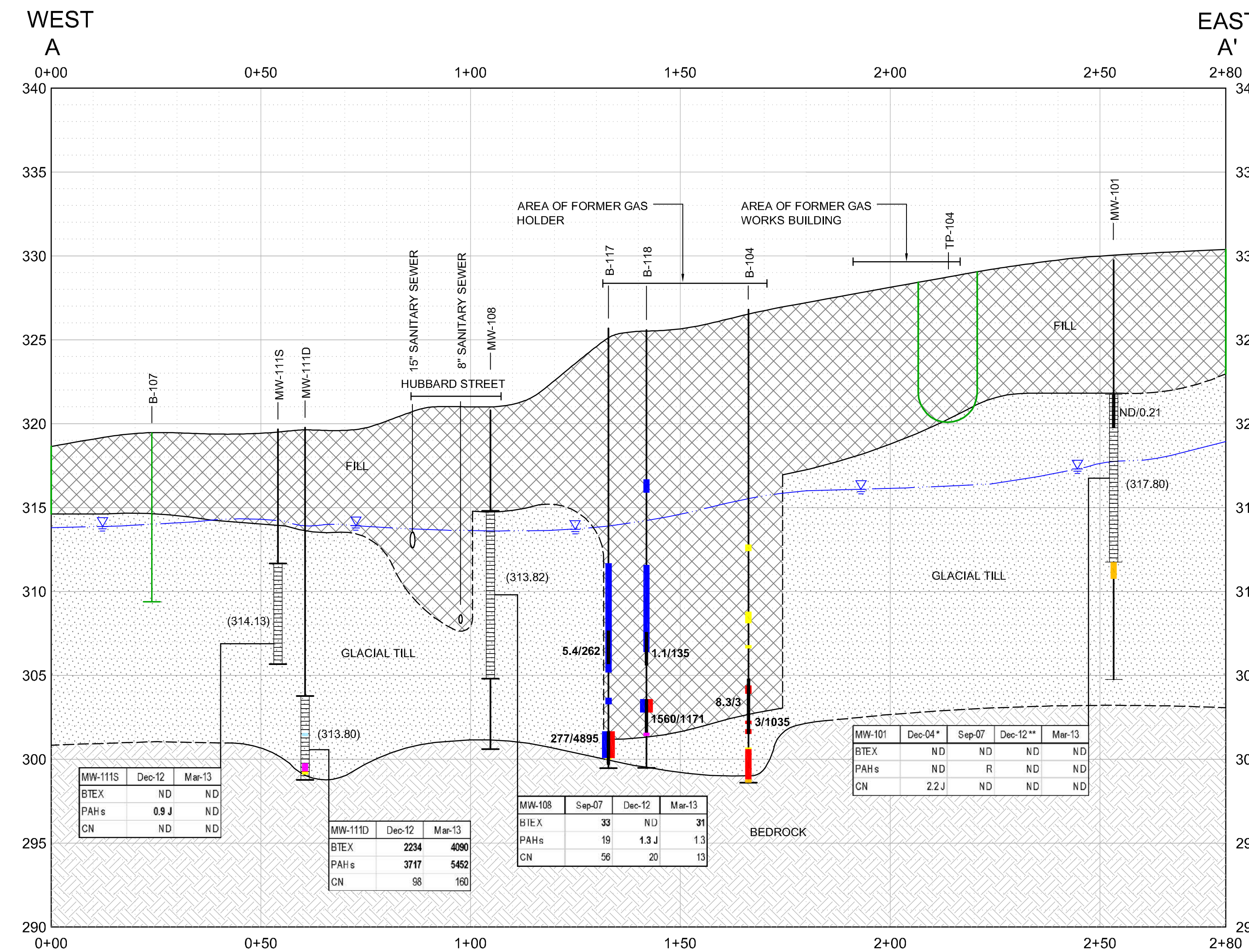
WATER TABLE CONTOUR MAP
DECEMBER 11, 2012

FIGURE
3-2



PARTIAL PLAN

SCALE: 1" = 20'



MW-111S	Dec-12	Mar-13
BTEX	ND	ND
PAHs	**0.9 J**	ND
CN	ND	ND

MW-111D	Dec-12	Mar-13
BTEX	**2234**	**4090**
PAHs	**3717**	**5452**
CN	98	160

MW-108	Sep-07	Dec-12	Mar-13
BTEX	**33**	ND	**31**
PAHs	19	**1.3 J**	1.3
CN	56	20	13

MW-101	Dec-04 *	Sep-07	Dec-12 **	Mar-13
BTEX	ND	ND	ND	ND
PAHs	ND	R	ND	ND
CN	2.2 J	ND	ND	ND

PROFILE

SCALE H: 1" = 20'
V: 1" = 5'

LEGEND:

TP-104 — MONITORING WELL/SOIL BORING TEST PIT IDENTIFICATION AND APPROXIMATE LOCATION

GENERALIZED GROUND SURFACE

277/4895 — TOTAL BTEX/TOTAL PAH(mg/kg) CONCENTRATION WITHIN SAMPLE INTERVAL. BOLD VALUE INDICATES ONE OR MORE CONSTITUENT CONCENTRATIONS ABOVE NYS PART 375 SOIL CLEANUP OBJECTIVES (PROTECTION OF PUBLIC HEALTH-COMMERCIAL ZONING, PROTECTION OF ECOLOGICAL RESOURCES, AND/OR PROTECTION OF GROUNDWATER)

WELL SCREEN INTERVAL

TOTAL DEPTH OF BOREHOLE

WATER TABLE, DECEMBER 11, 2012

(317.80) — GROUNDWATER ELEVATION, DECEMBER 11, 2012

FILL

GLACIAL TILL

BEDROCK

VISUAL/OLFACTORY IMPACTS (SEE NOTE 1):

TAR SATURATED

COATED MATERIAL, LENSES

BLEBS, GLOBS, SHEEN

STAINING, ODOR

PETROLEUM IMPACTS STAINING & ODORS

PURIFIER WASTE AND ODOR

NO OBSERVED IMPACTS

ABBREVIATIONS:

BTEX	BENZENE, TOLUENE, ETHYLBENZENE AND XYLENE ISOMERS
PAHS	POLYCYCLIC AROMATIC HYDROCARBONS
CN	TOTAL CYANIDE
ND	NOT DETECTED
J	ESTIMATED CONCENTRATION
R	RESULT REJECTED AS DETERMINED BY DATA VALIDATOR

MW-111S	Dec-12	Mar-13
BTEX	ND	ND
PAHs	**0.9 J**	ND
CN	ND	ND

GROUNDWATER QUALITY DATA. VALUES REPORTED IN MICROGRAMS PER LITER (µg/L) BOLD VALUE INDICATES ONE OR MORE CONSTITUENTS ARE ABOVE CLASS GA CRITERIA

* HIGHEST CONCENTRATION FROM ORIGINAL GROUNDWATER AND DUPLICATE GROUNDWATER SAMPLE IS POSTED.

** DUPLICATE SAMPLE COLLECTED

NOTE:
1. NYSDEC'S STANDARD COLORS AND ASSOCIATED DESCRIPTORS FOR REPORTING MGP IMPACTS WERE USED TO DEPICT INTERVALS WHERE IMPACTS WERE OBSERVED.

Brown AND Caldwell

DATE: May 28, 2013

NATIONAL GRID
FULTON (NORTH ONTARIO ST.) FORMER MGP SITE
FULTON, NEW YORK

GEOLOGICAL CROSS SECTION A-A'

FIGURE

3-3