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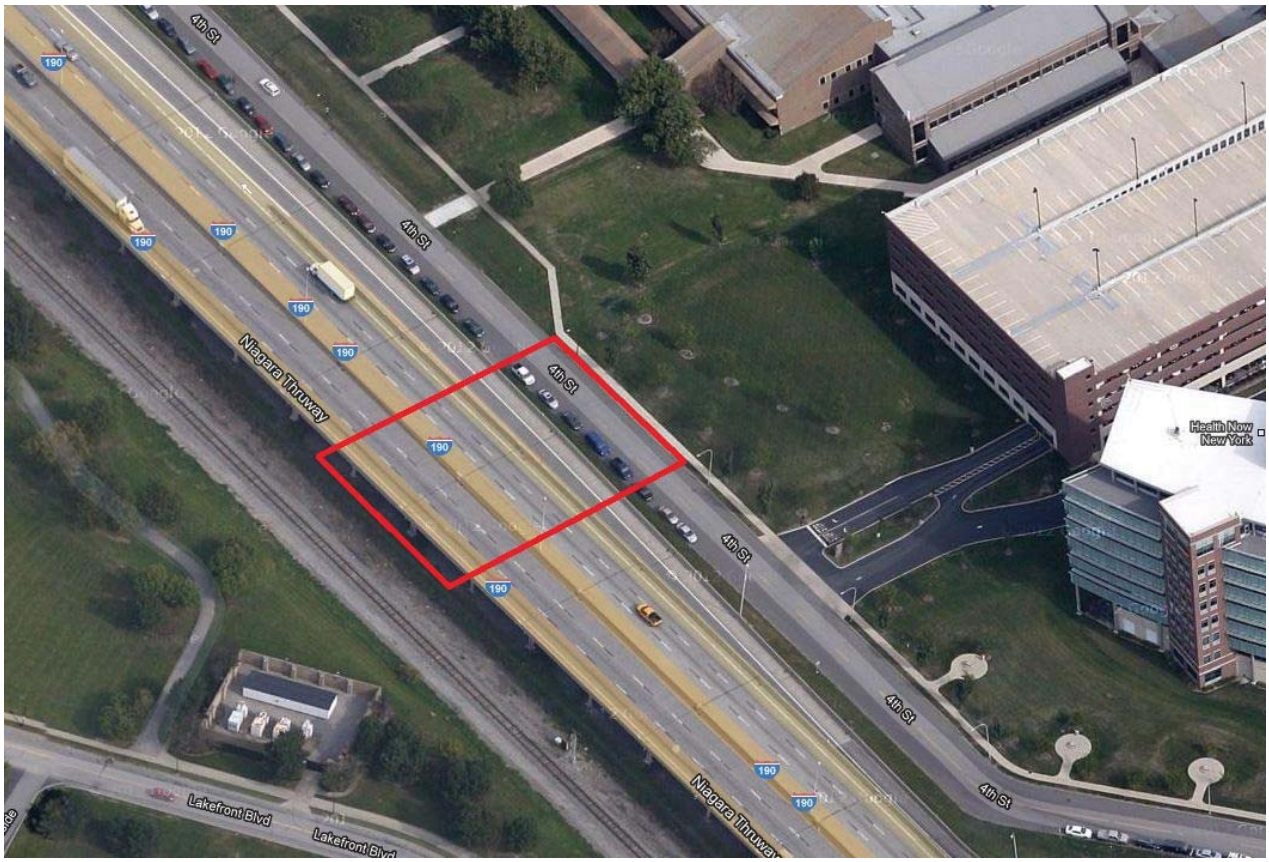
National Fuel Gas Distribution Corporation

Site Characterization Report

Former Buffalo Service Station – Off-Site
Site # C915194A
Buffalo, New York

May 2013; Revised November 2013 and December 2015



ARCADIS

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Site Characterization Report

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Site # C915194A
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National Fuel Gas Distribution Corporation

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Figures

Appendices

Acronyms and Abbreviations

ASP	Analytical Services Protocol
ASTM	American Society for Testing and Materials
BSA	Buffalo Sewer Authority
BTEXT	benzene, toluene, ethylbenzene, and xylenes
CSCOs	Restricted-Use Commercial Soil Cleanup Objectives
DNAPL	Dense Nonaqueous Phase Liquid
DUSRs	Data Usability Summary Reports
ft bgs	feet below ground surface
GPR	ground-penetrating radar
HSA	hollow stem auger
IDW	Investigation-derived waste
ISCOs	Restricted-Use Industrial
LNAPL	Liquid Nonaqueous Phase Liquid
mg/kg	milligrams per kilogram
MGP	Manufactured Gas Plant
NAPL	nonaqueous phase liquid
National Fuel	National Fuel Gas Distribution Corporation
NYCRR	New York City Rules and Regulations
NYS	New York State

NYSDEC	New York State Department of Environmental Conservation
NYSTA	New York State Thruway Authority
PAHs	polycyclic aromatic hydrocarbons
PID	photo ionization detector
ppm	parts per million
QA/QC	Quality Assurance/Quality Control
RI	Remedial Investigation
RSCOs	Restricted-Use Residential Soil Cleanup Objectives
SC	Site Characterization
SC Report	Site Characterization Report
Site	Former Wilkeson Slip/Canal Area
SI	South Interceptor
SVOCs	semi-volatile organic compounds
TAL	Target Analyte List
TCL	Target Compound List
ug/L	micrograms per liter
USEPA	United States Environmental Protection Agency
VOCs	volatile organic compounds called
WPA	Work Progress Administration
WSP	WSP Engineering of New York, P.C.

Executive Summary

This Site Characterization Report (SC Report) summarizes work performed and results obtained for the Site Characterization (SC) field activities at the Former Buffalo Service Station – Off-Site site ("Site") located in Buffalo, Erie County, New York (Figure 1). The Site has also been referred to as the Wilkeson Slip/Canal Area Site. The SC work was conducted by ARCADIS, on behalf of National Fuel, in accordance with the Administrative Consent Order (Index # B9-0695-05-06A) between National Fuel and the New York State Department of Environmental Conservation (NYSDEC). The SC was designed to investigate the potential presence of MGP-related impacts associated with the former Buffalo Service Station (BSS) site that is located adjacent to the eastern edge of the Site. The SC investigation was conducted between January 2012 and August 2013.

The Site is located at the historical confluence of the former Wilkeson Slip and the former Erie Canal, and beneath Fourth Street (Figure 2). The former Erie Canal was filled in the 1930's and the former Wilkeson Slip was filled between 1895 and 1915. The Site is approximately 120 feet by 180 feet and extends from the eastern edge of Fourth Street, under and to the west edge of the New York State (NYS) Interstate I-190 overpass. The portion of the Site that lies beneath Fourth Street is owned by the City of Buffalo, while the portion beneath the I-190 overpass is owned by the New York State Thruway Authority (NYSTA) and/or the State of New York. An approximate 11-foot diameter combined sewer runs parallel with and beneath the northbound lane of the I-190 overpass. A 23-kilovolt electrical line (encased in a concrete duct bank) roughly bisects the Site in the east-west direction. The western boundary of the Site is denoted by a chain-link fence that runs between the Site and the railroad.

The Site is located adjacent to and west of the former BSS site. As shown on Figure 2, Wilkeson Slip was located northwest and adjacent to the former BSS site. Previous investigations and remedial actions at the former BSS site indicated that MGP-related impacts (primarily coal tar) were observed within the limits of the former Wilkeson Slip. These impacts were observed to extend in the direction of the Site and potentially beneath the eastern and western edges of Fourth Street. An excavation (i.e., Fourth Street Utility Corridor Excavation), completed by WSP Engineering of New York, P.C. (WSP) on behalf of QLT Buffalo LLC between June and September 2012, removed the coal tar within the utility corridor (within the former slip) extending to the eastern edge of the Site (i.e., edge of Fourth Street). The limits of the excavation are shown as Cell's A and B on Figure 2. Coal tar was also observed in a soil boring (RB-37) on the western edge of Fourth Street completed during the investigation of the former BSS site in 2003.

The chief chemical constituents typically found in coal tar are the volatile organic compounds (VOCs) benzene, toluene, ethylbenzene, and xylenes (BTEX) and a class of semi-volatile organic compounds (SVOCs) called polycyclic aromatic hydrocarbons (PAHs). Purifier waste is also typically found at former manufactured gas plants sites and this waste often contains elevated levels of cyanide. The overall objective of the SC was to determine whether MGP-related impacts, such as coal tar, purifier waste, and associated chemical constituents, are present in soil and/or groundwater at the Site, and if present, evaluate whether additional investigations are warranted to determine the nature and extent of the impacts.

The SC work consisted of:

- drilling ten soil borings.
- converting four of the soil borings into monitoring wells.
- measuring four rounds of water-level measurements at the new and existing monitoring wells.
- collecting 21 soil samples, up to three from each soil boring, for chemical analysis.
- collecting two rounds of groundwater samples from each new monitoring well for chemical analyses.
- evaluating potential Site-related impacts to the combined sewer beneath Fourth Street.

The key findings of the SC investigations are presented below.

Geology/Hydrogeology

- Two principal overburden geologic units exist beneath the Site: fill and native alluvium. The fill is approximately 6 to 21 feet in thickness, and consists of silt, clay, fine to coarse sand, fine to coarse gravel, slag, and bricks. The alluvium deposit consisting of clay, silt, fine sand, and gravel is approximately 7 to 18 feet thick. Bedrock was encountered at a depth of 21 to 25 feet below ground surface (ft bgs).
- The water table is encountered at approximately 6 to 10 feet below grade. Groundwater flow is generally to the southwest across the Site; however, a groundwater mound with radial flow is observed near northern corner of the Site.

Soil Quality

- The only visual indication of potential impacts observed during the SC was black staining observed in one- to-two foot soil intervals at two soil borings and a trace amount of sheen observed in one other boring. The highest photo ionization detector (PID) reading recorded during the investigation was 14.1 parts per million (ppm). Coal tar was likely observed in a boring (RB-37) completed in 2003 along the western edge of Fourth Street prior to the SC.

- None of the 21 SC soil samples contained VOC concentrations above applicable NYSDEC criteria.

- Only 4 of 21 soil samples collected during the SC contained low levels of PAHs slightly above applicable NYSDEC criteria. The PAHs detected in these samples is attributed to abundant fill resulting from the filling of the former Erie Canal. One sample collected from boring RB-37 (during a previous investigation conducted in 2003) contained elevated levels of PAHs that are likely related to the potential presence of coal tar observed in the sample.

- Metals were detected in all SC soil samples, but only three samples contained concentrations above applicable NYSDEC criteria. The presence of metals in soil is also likely related to the abundant fill resulting from the filling of the former Erie Canal.

- Cyanide was not detected in SC soil samples at concentrations above applicable NYSDEC criteria.

Groundwater Quality

- Three VOCs (benzene, ethylbenzene, and/or xylenes) were detected in groundwater samples from two monitoring wells at concentrations above applicable NYSDEC criteria. These samples were collected from monitoring wells located within or near the approximate eastern half of the Site and within the western limits of the former Wilkeson Slip where coal tar was previously observed. VOCs were not detected above NYSDEC criteria in samples collected from downgradient monitoring wells.

- Acenaphthene, benzo(a)anthracene, and/or naphthalene (all PAH compounds) were detected at concentrations above NYSDEC criteria in groundwater samples from the same two wells that contained VOCs exceedances. Groundwater from the

downgradient wells did not contain concentrations of PAHs above NYSDEC criteria.

- Metals were detected in all collected SC groundwater samples above applicable NYSDEC criteria. The elevated metals concentrations in groundwater are attributed to the presence of abundant fill at the site and/or natural background concentrations.

- No cyanide was detected in groundwater at concentrations above NYSDEC criteria.

Sewer Assessment

The sewer assessment determined that an 11.5-foot diameter combined sewer is located beneath the northbound lane of the I-190 overpass. The sewer was apparently constructed on or near the bedrock surface. Information obtained during the SC suggests that tar is not likely in contact with the sewer, and given the robust construction of the sewer, tar and/or potentially impacted groundwater would not be expected to enter the sewer. Even if tar/impacted groundwater were to enter the sewer, any potential impacts would be negligible because of the large volume of sewage flowing in the sewer and because the sewer does not have a surface water overflow component.

Conclusion

Concentrations of PAHs and metals were detected in certain SC soil samples at levels above applicable NYSDEC criteria. This is not surprising since PAHs are formed during the incomplete combustion of fossil fuels, garbage, or any other organic matter; consequently, PAHs are ubiquitous, especially in urban environments like the City of Buffalo. The presence of PAHs, combined with the absence of visual impacts and elevated non-MGP related metal concentrations, is expected due to the abundant fill resulting from the filling of the former Erie Canal in the Site area. Although the low-level PAHs detected in SC soil samples do not appear to be related to the former MGP, one sample collected from boring RB-37 (during an investigation completed in 2003) contained elevated levels of PAHs that are likely due to the potential presence of coal tar in the sample.

Some BTEX and PAH compounds were detected above applicable NYSDEC criteria in groundwater from two SC monitoring wells located within and near the former Wilkeson Slip. These detections are possibly associated with the dissolution of MGP-related

impacts (principally coal tar) observed beneath the eastern edge of Fourth Street (observed during the Fourth Street Utility Corridor Excavation) and at a soil boring (RB-37) installed at the western edge of Fourth Street during a 2003 investigation. The elevated levels of BTEX and PAHs in groundwater appears to be constrained to the eastern portion of the Site as groundwater sampled in wells downgradient (west) from this area does not contain elevated BTEX or PAH concentrations.

Given the information presented in this SC Report, a small region of residual coal tar from the former BSS site likely remains within the limits of the former slip beneath Fourth Street. Although coal tar may be present beneath Fourth Street, the results of the SC indicate that the tar (and related dissolved-phase impacts from the tar) is not present in the portion of the Site west of Fourth Street (underneath the I-190 overpass). The potential tar may extend from beneath the eastern edge of Fourth Street (from the west side of the Fourth Street Utility Corridor Excavation sheeting) to the western edge of Fourth Street (in the area of soil boring RB-37, drilled in 2003). The tar is not likely to be in contact with an 11.5–foot diameter sewer located beneath the northbound lane of the I-190 overpass and tar and/or impacted groundwater is not likely entering the sewer.

ARCADIS concludes that any potential exposure of humans or wildlife to potential impacts beneath Fourth Street is minimal because any residual coal tar observed within the Site is located approximately 15 to 19 feet below grade. Any such residual is below the reach of normal utility and road maintenance or replacement activities. Furthermore, potable water within the City limits is provided by a public source.

Given the limited extent of MGP-related impacts to soil and groundwater beneath the Site and the lack of potential human or wildlife exposure to these impacts, ARCADIS concludes that a Remedial Investigation (RI) is not warranted for the Site.

1. Introduction

This SC Report summarizes work performed and results obtained for the SC field activities at the Former Buffalo Service Station – Off-Site site ("Site") located in Buffalo, Erie County, New York (Site # C915194A). The Site location is shown on Figure 1. The Site has also been previously referred to as the Wilkeson Slip/Canal Area site. The SC work was conducted by ARCADIS, on behalf of National Fuel, in accordance with the Order on Consent (Index # B9-0695-05-06A) between National Fuel and the NYSDEC. The SC was designed to investigate the potential presence of MGP-related impacts associated with the former Buffalo Service Station (BSS) site that is located adjacent to the eastern edge of the Site.

The SC investigation was conducted between January 2012 and August 2013. The SC activities were implemented in accordance with the following:

- NYSDEC-approved SC Work Plan (ARCADIS, 2011) and the following supporting appendices:
  - Appendix A – Field Sampling Plan (FSP)
  - Appendix B – Quality Assurance Sampling and Analysis Project Plan (QASAPP)
  - Appendix C – Health and Safety Plan (HASP)
  - Appendix D – Dense Nonaqueous Phase Liquid (DNAPL) Contingency Plan (DCP)
  - Appendix E – Community Air Monitoring Plan (CAMP)
- June 18, 2012 Work Plan Addendum (ARCADIS, 2012)
- NYSDEC's June 24, 2013 comments on the May 2013 Draft SC Report
- ARCADIS' July 9, 2013 responses to the NYSDEC June 24, 2013 comments on the Draft SC Report

Note that this SC Report supersedes the Draft SC Report submitted to the NYSDEC in May 2013 and revised SC Report submitted to the NYSDEC in November 2013.

1.1 SC Objectives

The overall objectives of the SC were to:

- Assess whether MGP-related residual materials (primarily coal tar) are present on Site that are related to operation of the former BSS Site that is located adjacent to the eastern edge of the Site.
- Determine whether MGP-related residual materials, if present at the Site, have a potential to pose a significant threat to public health or the environment.
- Determine whether a Remedial Investigation (RI) of the Site is appropriate.

The balance of this section presents the report organization and describes the characteristics of the Site and its history and the previous investigations performed in the Site area.

1.2 Report Organization

The SC Report has been organized into the following sections:

Section	Purpose
Section 1 – Introduction	Provides background information relevant to the development of the SC Report and objectives of the SC investigation.
Section 2 – Site Characterization Activities	Describes the field activities related to the investigation of soil and groundwater.
Section 3 – Site Characterization Findings	Describes the field observations and laboratory results of the SC investigation.
Section 4 – Conclusion	Presents the conclusion and recommendations based on the SC investigation results.
Section 5 – References	Presents a list of the references cited in the SC Report.

1.3 Site Description and History

1.3.1 Site Description

As shown on Figure 2, the Site is approximately 120 feet by 180 feet and extends from the eastern edge of Fourth Street, under and to the west edge of the NYS Interstate I-190 overpass in Buffalo, New York. The portion of the site that lies beneath Fourth Street is owned by the City of Buffalo, while the portion beneath the I-190 overpass is owned by the NYSTA. An approximate 11.5-foot diameter sewer runs parallel with and beneath the northbound lane of the I-190 overpass, bisecting the Site. An approximate 15-inch diameter reinforced concrete storm sewer pipe, situated approximately 1.5 ft bgs, runs parallel with and beneath the northbound lane of Fourth Street in the eastern portion of the Site. A 23-kilovolt electrical line (encased in a concrete duct bank) roughly bisects the site in the east-west direction. The western boundary of the Site is denoted by a chain-link fence that runs between the site and the railroad. Groundwater in the site area is not used as a drinking water supply within the City of Buffalo (Groundwater Technology, 1996).

Site, looking toward Lake Erie. Fourth Street in foreground and I-190 in background.

1.3.2 Site History

Historical use of the Site was determined primarily through a review of available Sanborn Fire Insurance maps and atlas' of the Buffalo, New York area. Based on a review of this information, the Site was historically the location of the confluence between the former Wilkeson Slip and the former Erie Canal. The historical locations of the former Wilkeson Slip and the former Erie Canal are shown on Figure 2. A summary of the information gleaned from the Sanborn maps and the Buffalo, New York atlas' relative to these two features is provided below:

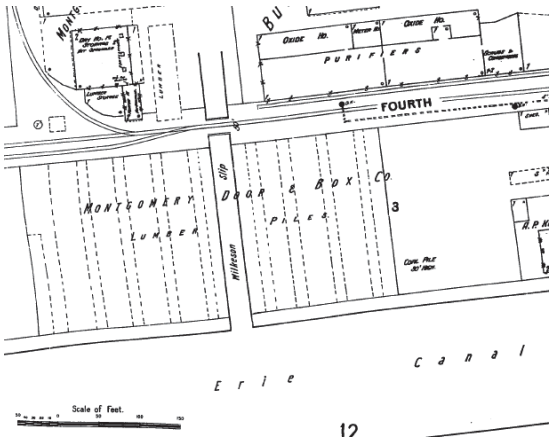
- *1845 Buffalo Atlas*. The former Wilkeson Slip is shown extending east to Jackson Street. The atlas does not show buildings (only streets and waterways).

- *1888 Sanborn Map*. The former Wilkeson Slip is present, but the site is not shown on the map.

- *1891 Buffalo Atlas*. The former Wilkeson Slip and the former Erie Canal are present, and a small portion of the Site (adjacent to the slip and canal) is shown as owned by Buffalo Gas Company; no structures are shown in the site area.

- *1895 Buffalo Atlas*. No change from the 1891 Buffalo Atlas, except that no property owner is shown.

- *1899 Sanborn Map*. The former Wilkeson Slip and the former Erie Canal are present, and a small portion of the Site (adjacent to the slip and canal) is shown as lumber storage and owned by Montgomery Door and Box Company.



1899 Sanborn Map; Notice former location of Fourth Street north of present-day Fourth Street.

- *1915 Buffalo Atlas*. The former Wilkeson Slip has been filled in, but the former Erie Canal is present.

- *1925 Sanborn Map*. The former Erie Canal is present, and a small portion of the Site (adjacent to the slip and canal) is shown as lumber storage and owned by Montgomery Door and Box Company.

- *1951 Sanborn Map*. No structures or ownership information is shown.

The former Erie Canal bed and related canal beds have been the subject of extensive historical waste disposal and filling activity. Based on historical research, activities to fill in the former Erie Canal were undertaken as a Work Progress Administration (WPA) project in the 1930s. The WPA project in the Buffalo area was funded and coordinated by the federal government with involvement from New York

State and the City of Buffalo. The WPA project has been described as filling in and narrowing the channel of the Old Erie Canal[1]. During 1937, the WPA filled the canal bed with "everything they [could] find,"[2] including slag, excess dirt from the high canal banks, and cinders of "riverfront industrial plants."[3]

1.4 Summary of Previous Investigation and Remediation Activities

Numerous investigations and/or remedial projects have been completed on the former BSS site since 1989. Observations made during the pre-design investigation completed in 2003, Brownfield Cleanup Program completed in 2005 and 2006, and Fourth Street Utility Corridor Excavation completed in 2012 provided information suggesting that MGP-related residuals could be present in the Site area. The salient findings of these three activities as they relate to the Site are summarized below.

Pre-Design Investigation (2003)

In August 2003, as part of the pre-design investigation completed by RETEC (RETEC 2004), soil borings RB-36, RB-37, and RB-38 were drilled along the west side of Fourth Street on the Site. The locations of RB-36, RB-37, and RB-38 are shown on Figure 2. No visual impacts were observed in the soil samples collected during the drilling of RB-36 and RB-38, and VOCs were not detected with the PID. During the drilling of RB-37, "hydrocarbon-like odor and sheen" were observed at depths of 12 to 16 ft bgs, and the PID reading was 93.8 ppm for the interval; and at depths of 18 to 19 ft bgs, "visible NAPL blebs, hydrocarbon-like sheen and odor" were observed, and the PID reading was 38.6 ppm for the interval. No visual impact or PID readings were measured from 19 to 21 ft bgs. The boring was terminated at 21 ft bgs.

One soil sample was collected from each of the three soil borings (RB-36, RB-37, and RB-38) for analysis of BTEX, PAHs, and several metals. The sample locations and analytical results for are shown on Figure 6. In the soil sample collected from 15 to 16 ft bgs at RB-36, total BTEX and PAHs were detected at concentrations of 0.046 and 472.1 milligrams per kilogram (mg/kg), respectively. In the sample collected from

[1] Works Progress Administration, Statement of Allotment Detail for Work Project, undated; Works Progress Administration, Statement of Allotment Detail for Work Project, dated March 1, 1936; Work Progress Administration, Project Proposal, dated August 23, 1935; Works Progress Administration, Project Application, dated August 26, 1935; Works Progress Administration, Statement of Project Estimate Detail, dated July 7, 1936; Works Progress Administration, Statement of Project Estimate Detail, dated December 17, 1936.
[2] Courier Express, Forlorn Gutter at City's Door Being Removed, January 10, 1937, section 7, p. 3.
[3] Id.

17.5 to 19.5 ft bgs in RB-37, total BTEX and total PAHs were detected at concentrations of 58.91 and 11,185 mg/kg, respectively. Total BTEX and total PAHs were not detected in the soil sample collected from 13.4 to 15.4 ft bgs in RB-38 (RETEC 2004).

Brownfield Cleanup Program (2005 and 2006)

In 2005 and 2006, a remedial action was completed at the former BSS site under Order on Consent B9-0577-00-05(A). The remedial action included excavation of fill material from the portion of the former Wilkeson Slip located east of the Site (ESC, 2006). The excavation extended from the Waterfront School in a westerly direction to approximately 30 feet from the Site. A sheet-pile wall installed at the western end of the excavation demarcates the western extent of the excavation in the former Wilkeson Slip area at this time.

During the first quarterly groundwater monitoring event in August 2007, nonaqueous phase liquid (NAPL) was measured in a monitoring well installed to the east of the sheet-pile wall (MW-04). The presence of NAPL at MW-04 was evaluated during subsequent quarterly sampling events from August 2007 to May 2009, and NAPL thicknesses of less than 0.01 foot have been measured (WSP 2009b).

Fourth Street Utility Corridor Excavation (2012)

WSP implemented an excavation project (i.e., Fourth Street Utility Corridor Excavation) on behalf of QLT Buffalo LLC in an area located adjacent to the east side of the Site. The project was reportedly completed in general conformance to WSP's *Final Supplemental Work Plan – Fourth Street Utility Corridor Excavation,* dated May 31, 2012. The excavation project was initiated on June 28, 2012, and was substantially completed on September 4, 2012. The excavation project consisted of installation of sheet piling and support structures to allow excavation of soil beneath live, high voltage electrical conduits. The

Looking southeast. Coal tar entering excavation from beneath Fourth Street (on the right).

excavation was split into two “cells”, cells A and B (Figure 2), where the eastern wall of each cell consisted of the sheet pile was that was left in place during the 2005 and 2006 Brownfield Cleanup Program. After removing approximately 6 feet of clean overburden material, the excavation within the sheet piles was advanced down to approximately 18 to 20 ft bgs, where WSP encountered a clay layer. A test pit was excavated through the clay and revealed that the clay was approximately 3 to 5 feet thick and situated on top of bedrock.

At the base of the excavation (i.e. on top of the clay layer), at a gap in the sheet piling beneath the electrical conduit (where no sheet piling could be installed), a material resembling coal tar accompanied by a heavy sheen was observed entering the excavation from beneath Fourth Street. Some investigation by WSP revealed that there was no evidence of the coal tar-like material extending into the clay. With NYSDEC approval, WSP removed approximately 1-foot of clay across the bottom of the excavation area (total excavation depth of 19 to 21’ bgs), then sampled the clay material to document that the remaining clay was not impacted. When the sample results showed that the clay layer was not impacted, WSP filled the excavation from the top of the clay layer up to approximately elevation 576’ (approximately 6’ bgs) with flowable fill material. The remainder of the excavation area was backfilled with clean overburden material that had been staged onsite.

A total of 70 loads (approximately 1,600 tons) of soil were removed from the Cells A and B for off-site disposal.

2. Site Characterization Activities

This section summarizes SC field activities that were implemented by ARCADIS between January 2012 and August 2013. The schedule of the SC activities was longer than anticipated due to permitting and access constraints posed by the property owners (the NYSTA, and others, and City of Buffalo), and due to the construction activities associated with Fourth Street Utility Corridor Excavation. The SC field activities consisted of the following general activities:

- Conducted utility mark-out using DigSafelyNY and surveyed the locations of the marked utilities.
- Conducted a geophysical survey to locate sub-grade structures, possible unknown utilities, and the location of the former Wilkeson Slip and former Erie Canal. The geophysical survey was performed using electromagnetic (EM-31) and ground-penetrating radar (GPR) surveys in accessible areas of the Site.
- Surveyed utility locations and structures identified during the geophysical survey.
- Drilled ten soil borings and converted four soil borings to monitoring wells, seven borings on the NYSTA property and three on the City of Buffalo property.
- Collected 21 subsurface soil samples from soil borings for chemical analysis.
- Collected two rounds of groundwater samples from the four new monitoring wells for chemical analysis and measured hydraulic conductivity data during sampling.
- Measured four rounds of groundwater levels from the four new monitoring wells and two existing monitoring wells associated with the former BSS site.
- Surveyed SC investigation locations relative to a common datum.
- Completed an assessment of the 11.5-foot diameter South Interceptor (SI) combined sewer that runs beneath the northbound lane of the I-190 overpass.

An analytical sample summary, which identifies soil and groundwater samples collected as part of the SC, is included in Table 1. A summary of construction details for the monitoring wells installed as part of the SC is included in Table 2. Groundwater level measurements at monitoring wells are presented in Table 3.

Comprehensive soil and groundwater analytical results for samples collected as part of the SC field activities are presented in Tables 4 and 5.

Three subcontractors provided various services during implementation of the SC field activities, as presented in the following table:

Subcontractor	Office Location	Services Provided
Parratt-Wolff, Inc.	East Syracuse, NY	Drilling
TestAmerica Laboratories	Amherst, NY	Analytical services
McIntosh & McIntosh, P.C	Lockport, NY	Surveying

A description of the above-listed SC field activities is presented below.

2.1 Background Investigation

Several soil borings and monitoring wells completed during the SC were located near utilities and beneath I-190. As such, a background investigation was conducted to evaluate the presence of sub-grade structures prior to drilling the soil borings. In addition, information from the background investigation was used to further evaluate the location of the former Wilkeson Slip and former Erie Canal. The background investigation consisted of the following components:

- Obtaining as-built drawings for I-190 and the utility corridor.

- Conducting a utility mark-out using DigSafelyNY, then surveying the locations of the marked utilities.

- Conducting a geophysical survey to locate sub-grade structures, possible unknown utilities, and the location of the former Wilkeson Slip and former Erie Canal. The geophysical survey was performed using electromagnetic (EM-31) and ground penetrating radar (GPR) surveys in accessible areas of the site. The results of the geophysical investigation are shown on Figure 1 of Appendix C – Results of Geophysical Study. In addition to buried utilities, the geophysical survey identified numerous areas with indications of small and larger metal debris and unknown structures. The areas of metal debris and possible buried structures are not unexpected given the inherent nature of fill. An area of apparent higher conductivity material was observed on the southern side of the former Erie Canal area, this higher conductivity is likely related to the finer grained fill in this area.

- Surveying utility locations and structures identified during the geophysical survey.

- Using subsurface observations made during the Fourth Street Utility Corridor Excavation to confirm the location of the former Wilkeson Slip. The location of the slip was identified by the obvious presence of wooden wall structures (comprised of timbers) located on both sides of the slip. The location of the slip on the Site base map has been adjusted based on these observations.

2.2 Underground Utility Clearance

Prior to starting intrusive activities, the DigSafelyNY was contacted to request utility mark-outs. As discussed above, a follow-up geophysical survey was conducted to assess the presence of buried utilities in the vicinity of each proposed soil boring/monitoring well location. As an added precaution for worker safety and to minimize the potential for damage to subsurface utilities, boring locations were cleared by non-mechanical means (e.g., hand digging and vacuum extraction) to a maximum depth of 5 ft bgs. Each boring location was backfilled with soil cuttings after the manual utility clearance was completed.

2.3 Soil Investigation

The objectives of the soil investigation were to:

- determine if MGP-related and/or non-MGP-related chemical constituents are present in Site soil by collecting, visually characterizing, and analyzing soil samples.

- identify the potential presence of MGP-related (e.g., coal tar, purifier waste) and non-MGP-related residuals (e.g., petroleum, solvents) in soil.

- obtain sufficient information to evaluate the necessity for further action.

The SC soil investigation consisted of the following:

- Completing ten soil borings to characterize subsurface conditions and facilitate collection of subsurface soil samples for laboratory analysis.

- Collecting and submitting 21 subsurface soil samples from the soil borings for laboratory analysis.

The SC soil investigation activities are described below.

2.3.1 Soil Borings

Soil borings were completed to characterize subsurface conditions at the Site and, in some cases, facilitate groundwater monitoring well installation. A total of ten soil borings (AB-01 through AB-5, and AB-C2) were drilled, and four soil borings were converted to monitoring wells (AW-01 though AW-04). Figure 2 shows the location of the soil borings and monitoring wells. Soil borings were drilled to the depth of refusal, which was encountered at approximately 21 to 25 ft bgs.

Soil borings were completed during two mobilizations: 1) between July 30, 2012 and August 6, 2013; and 2) between November 11 and 12, 2013. All soil borings were drilled using hollow stem auger (HSA) drilling methods. Drilling activities were conducted by Parratt-Wolff, Inc. using an IRA300 drilling rig, under the supervision of an ARCADIS field geologist.

The completion of the soil borings followed a consistent methodology, as follows:

- Soil samples were retrieved continuously from grade to the total boring depth using 2-foot-long split spoons or by a hand auger (during the soil boring utility clearance).

- Soil recovered from each sample interval was visually characterized for color, texture, and moisture content. The presence of visible staining and obvious odors were noted. Soil samples were visually characterized and screened for VOCs using a PID.

- Soil samples were selected for laboratory analyses using the methodology described under Section 2.3.2.

- Following completion, borings were backfilled to grade with cement/bentonite grout using a tremie pipe (except for borings completed to facilitate monitoring well installation).

- Drilling pipes and tooling were decontaminated in between soil borings using a steam pressure cleaner, Alconox® detergent, and potable water. Decontamination water was pumped from a constructed temporary decontamination pad into 55-gallon steel drums.

Soil boring logs that document subsurface conditions encountered at each boring location are provided in Appendix A.

2.3.2 Laboratory Analysis of Subsurface Soil Samples

Two soil samples were collected from each of the nine borings and three samples were collected from one boring (AW-03). Samples were submitted to Test America Laboratories of Amherst, New York, a New York State Department of Health-(NYSDOH-) accredited laboratory certified for the selected analysis. Samples were selected for analysis based on the following:

- One sample was collected from the bottom 2 feet of each borehole.
- A second sample was collected from the depth interval showing the greatest apparent degree of impacts based on visual observations and PID readings. If impacts were not observed, the second sample was collected at the approximate water table.
- Duplicate soil samples were collected at two locations, AW-01(5-7 ft bgs) and AW-04(4-8 ft bgs).

Coal tar and purifier wastes are the primarily waste products observed at MGP sites. The chief chemical constituents typically found in coal tar are the VOCs BTEX and a class of SVOCs called PAHs. Purifier waste is also typically found at MGP sites and this waste often contains elevated levels of cyanide. The overall objective of the SC was to determine whether MGP-related impacts, such as coal tar, purifier waste, and associated chemical constituents, are present in soil and/or groundwater at the Site, and if present, evaluate whether additional investigations are warranted to determine the nature and extent of the impact. As such, the suite of chemical analyses for both soil and groundwater (discussed further below) was chosen to incorporate BTEX, PAHs, and cyanide as well as other chemical compounds that may be associated with non-MGP-related impacts (e.g., chlorinated solvents). To that end, soil samples collected during the SC were analyzed for the following constituents:

- Target Compound List (TCL) VOCs (including BTEX) by United States Environmental Protection Agency (USEPA) Method 8260B
- TCL SVOCs (including PAHs) by USEPA Method 8270C

- Target Analyte List (TAL) Metals by USEPA Method 6000/7000
- Total cyanide by USEPA 9012A
- Free cyanide by USEPA extraction Method 9016 and analysis by microdiffusion using American Society for Testing and Materials (ASTM) method D4282-02

Sample analyses followed the NYSDEC Analytical Services Protocol (ASP) (most recent version). Analytical results were reported using NYSDEC ASP Category B data deliverables.

2.4 Groundwater Investigation

The objectives of the groundwater investigation were to:

- characterize the general shape of the water table and develop a preliminary assessment of overburden groundwater flow patterns at the Site.
- assess the hydraulic characteristics of the materials screened by the wells.
- determine the presence/absence of MGP-related constituents dissolved in groundwater and, if present, at what concentrations.

2.4.1 Monitoring Well Installation

Soil borings AW-01 through AW-04 were converted into groundwater monitoring wells (Figure 2). Monitoring well completion logs are provided in Appendix A, and well construction details are summarized in Table 2. The groundwater monitoring wells installed during the SC were constructed as described below:

- At each monitoring well location, a soil boring was completed using HSA drilling methods described above.
- Well screens were positioned to monitor the saturated overburden at the bottom of each soil boring (immediately above the bedrock surface), except for AW-03 which was constructed with a two-foot long sump.
- Wells were constructed using 2-inch inside-diameter, threaded, flush-joint, schedule 40 PVC casing and screen.

- Screens were 10 feet long with 10-slot (0.01-inch) openings.
- The annulus around the well screen was backfilled with #0 silica sand to a minimum height of 2 feet above the top of the screen.
- A bentonite pellet seal with a minimum thickness of 2 feet was placed above the sand pack. The bentonite seal (pellets) was allowed to hydrate before tremie-grouting above the seal.
- Each monitoring well was secured at the surface with a sealed cap (J-plug) and a flush-mounted vault. The J-plug keeps surface water from infiltrating into the well during rain events.
- The concrete seal or pad was sloped slightly to direct water away from the well, and was deep enough to remain stable during freezing and thawing of the ground. The vaults and concrete pads were completed so that they would not pose a trip hazard.

Monitoring wells were developed by ARCADIS on August 7 and December 1, 2012, using pump and surge methods. Prior to development, fluid levels and the total depth for each well were measured to the nearest 0.01 foot using an electronic oil/water interface probe. Neither light non-aqueous phase liquid (LNAPL) nor dense NAPL (DNAPL) was observed in any of the wells during development. For the development of AW-01 and AW-02, dedicated polyethylene tubing and a grundfos submersible pump were used to pump and surge across a short section of the well screen, then lifted to surge sequentially higher sections of the screen until the entire length of the well screen had been developed. AW-03 and AW-04 were developed using a weighted dedicated bailer to surge the well screen and to purge the well. Development continued until a minimum of three well volumes had been evacuated and/or for a maximum of two hours. Purge water was containerized in 55-gallon drums staged at the site for future disposal.

2.4.2 Groundwater Sampling

Monitoring wells AW-01 and AW-02 were sampled on August 22, 2012 and August 27, 2013, and monitoring wells AW-03 and AW-04 were sampled on December 28, 2012 and August 27, 2013. Samples were collected to evaluate the presence/absence of MGP-related constituents dissolved in groundwater. Groundwater samples were collected from monitoring wells using the low-flow sampling techniques described in the FSP. Groundwater sampling logs are provided in Appendix D. Groundwater field parameters measured during purging included

conductivity, dissolved oxygen, oxidation-reduction potential, pH, and temperature. Samples were containerized in laboratory-provided glassware and preserved with ice and laboratory-provided preservative (as required). Quality Assurance/Quality Control (QA/QC) samples consisted of duplicate samples (from AW-01 and AW-03), Matrix Spike/Matrix Spike Duplicate samples, and trip blanks. Consistent with the analytical suite selected for the soil samples, groundwater samples were submitted to Test America of Amherst, New York, for analysis of the following constituents:

- TCL VOCs (including BTEX) by USEPA Method 8260B
- TCL SVOCs (including PAHs) by USEPA Method 8270C
- TAL Metals by USEPA Method 6000/7000
- Total cyanide by USEPA Method 9012A
- Free cyanide by USEPA Method 9016 (only the first sampling round)

2.4.3 Water-Level Measurement

Four comprehensive rounds of groundwater levels were measured at newly installed monitoring wells and existing monitoring wells MW-01 and MW-08 on December 28, 2012, February 18, 2013, March 6, 2013, and August 27, 2013. During each gauging event, the field staff measured the depth to water and the total depth of each monitoring well. The measurements were converted to elevations relative to feet above mean sea level. The water-level measurements are summarized in Table 3.

2.4.4 Specific-Capacity Tests

Specific-capacity test data were collected at each monitoring well during groundwater sampling. These data were used to estimate the hydraulic conductivity of the material screened by each well according to the method described by Walton (1962). The results of the specific-capacity testing are discussed in Section 3.

2.5 Sewer Assessment

A sewer assessment was conducted to determine if the 11.5 foot diameter combined sewer located beneath the I-190 overpass could be impacted by MGP- related residuals (principally, coal tar) from the Site, and whether such impacts (if any) could pose a risk for direct discharge to surface water bodies. As part of this effort, information regarding the construction and function of the sewer was obtained and evaluated in relation to data obtained during the SC fieldwork. The sewer extends

parallel with and beneath the northbound lane of the I-190 overpass, bisecting the Site. Figure 2 shows the location of the sewer relative to the Site.

2.6 Site Survey

Following the completion of each phase of the investigation, McIntosh & McIntosh, P.C. surveyed the locations of the utilities, soil borings, newly installed monitoring wells, and existing monitoring wells MW-01 and MW-08. The monitoring well survey included the location, ground surface, and measuring-point elevation (as defined as the top of inner casing). Horizontal locations were surveyed relative to New York State Plane - West Zone North American Datum (NAD83) and elevations were surveyed relative to the North American Vertical Datum of 1988 (NAVD88).

2.7 Equipment Decontamination

Equipment was decontaminated in accordance with the procedures presented in the FSP. In general, non-disposable equipment, including drilling tools and equipment, were decontaminated prior to first use on site, between each investigation point, and prior to mobilization. A total of two equipment rinse blanks (one during the August drilling program and one during the November drilling program) were submitted for analysis of TCL VOCs, TCL SVOCs, TAL Metals, and total cyanide to evaluate the integrity of the decontamination procedures, as required in the QASAPP.

2.8 IDW Disposal

Investigation-derived waste (IDW) generated during the SC included:

- Drill cuttings
- Drill water
- Polyethylene sheeting from the temporary decontamination pad
- Development and purge water
- Polyethylene tubing and bailers from well sampling and developing
- Spent personal protective equipment (PPE)

IDW was containerized in Department of Transportation- (DOT-) approved 55-gallon steel drums and staged on wooden pallets in a locked shipping container during field activities. Each drum was secured and labeled with the date, contents, contact information, and other relevant information. A total of 10 drums containing soil cuttings, 2 drums containing PPE and polyethylene wastes, and 10 drums containing liquids

were generated during the SC. Waste characterization samples were collected from each waste stream. Based on the results obtained for the analysis of the waste characterization samples, both solid and liquid IDW materials were transported by a National Fuel-approved waste hauler for off-Site disposal as non-hazardous waste.

2.9 Data Usability Summary Reports

ARCADIS prepared Data Usability Summary Reports (DUSRs) of the soil and groundwater analytical data packages following the SC field activities. QA/QC information is contained and examined in the DUSRs. Based on the results of the completed DUSRs, the data collected during the SC is determined generally usable for the purposes of the SC. The analytical summary tables include the data qualifiers identified in the DUSRs. Copies of the DUSRs are provided in Appendix B.

3. Site Characterization Findings

This discussion of the Site Characterization findings is divided into the following sections:

- Site Geology (Section 3.1)
- Groundwater flow and hydrogeologic characterization (Section 3.2)
- Soil Quality (Section 3.3)
- Groundwater Quality (Section 3.4)
- Sewer Assessment (Section 3.5)

3.1 Site Geology

The Site is located approximately 1,000 feet northeast of Lake Erie, near the mouth of the Upper Niagara River. Topographic relief at the Site is flat and the land surface elevation is approximately 580 feet above mean sea level. The SC investigation identified two principal overburden geologic units beneath the Site:

- ***Fill*** – The fill consists of silt, clay, fine to coarse sand, fine to coarse gravel, slag, and bricks. The fill is up to approximately 6 to 21 feet in thickness and consists of silt, clay, fine to coarse sand, fine to coarse gravel, slag, and bricks. The fill thickness is greatest in the area of the 11.5 – foot diameter sewer beneath I-190 overpass. Native soils would have been excavated to allow for construction of the sewer on the bedrock surface.

- ***Alluvium*** – A native alluvial deposit of clay, silt, fine sand, and gravel is observed beneath the fill. The alluvial deposit was observed in every boring completed during the SC, suggesting that the deposit is continuous across the site. As observed during the Fourth Street Utility Corridor Excavation, some areas of this deposit are primarily comprised of clay. The clay-rich areas of the alluvium are expected to be confining with respect to downward DNAPL movement. The thickness of the alluvium ranges from 7 to 18 feet.

Bedrock was encountered at a depth of 21 to 25 ft bgs. Based on a review of geologic mapping, the bedrock beneath the Site area is the Ordovician-aged Onondaga limestone (Rickard, L. V. and Fisher, D. W., 1970.).

The cross-sections on Figures 3 and 4 show the vertical distribution of these units in the Site area. The locations of the cross-sections are shown on Figure 2.

3.2 Groundwater Flow and Hydrogeologic Characterization

The hydrogeology at the Site has been characterized based on information obtained from the four monitoring wells installed as part of the SC. Monitoring wells AW-01, AW-02 and AW-04 were screened in native alluvium and AW-03 was screened partially in fill and native alluvium. Well construction details are summarized in Table 2. As shown in the table below, the hydraulic conductivity measured at the SC monitoring wells varies by two orders of magnitude. This is expected due to the highly variable grains size observed in the fill and underlying alluvium. The hydraulic conductivity measured at monitoring wells AW-01 and AW-02 is approximately two orders of magnitude lower than that of monitoring well AW-03. The hydraulic conductivity measured at these wells is directly proportional to the amount of finer grained material observed in the well screen interval: silt and clay was observed throughout the majority of the well screen at AW-01 and AW-02 and coarse gravel was observed throughout upper 5 feet of the well screen at AW-03. Groundwater movement will favor the more permeable sand and gravel deposits.

Well ID	Screened Interval (ft bgs)	Estimated Hydraulic Conductivity (ft/day)
AW-01	13.5 – 23.5	2.0
AW-02	11 - 21	2.4
AW-03	9 - 19	125
AW-04	12.5 – 22.5	**

Notes:
Hydraulic conductivity values based on specific capacity test data measured on August 22, 2012 and December 28, 2012.
ft bgs = feet below ground surface.
** A hydraulic conductivity value could not be calculated at AW-04 due to an erroneous data set.

Water levels were measured at the four new monitoring wells (AW-01 to AW-04) and two existing monitoring wells (MW-01 and MW-08) on December 28, 2012, February 18, 2013, March 6, 2013, and August 27, 2013 (Table 3). As shown in Table 3, the water table beneath the Site is encountered at approximately 6 to 10 ft bgs, within the fill materials. The water levels measured on February 18, 2013 were converted to elevations and used to prepare the groundwater contours presented on Figure 5. As shown on Figure 5, there is a pronounced groundwater mound near AW-03 and MW-08. The water level at these two wells is approximately 4 feet higher than levels measured at the four other monitoring wells. The same trend was observed during all three measurement rounds, suggesting that the mounding is relatively continuous. The source of the mounding was not identified during this investigation but could be

associated with a leaking water line located adjacent to Fourth Street. As further shown on Figure 5, the water level measured at monitoring well AW-02 (southwest corner of the site) was the lowest during each event. This suggests that overall groundwater flow direction is to the west-southwest. This is not surprising because the nearest surface water body, Niagara River/Lake Erie confluence, is to the west of the Site.

3.3 Soil Quality

3.3.1 Field Observations of Potential Impacts

MGP-related wastes were not observed at any soil boring or monitoring well location installed as part of the SC. The only visual indications of potential impacts (black staining) in the subsurface were observed in soil borings AW-04 at 20 to 21 ft bgs and AB-04 at 10 to 12 ft bgs, on the east side of the Site. A trace sheen was also observed on a soil sample collected from 12.3 to 12.5 ft bgs at soil boring AB-04. The highest PID reading recorded during the investigation was 14.1 ppm at soil boring AW-02 from 18 to 19 ft bgs.

3.3.2 Soil Analytical Results

Up to three soil samples were collected for laboratory analysis from each of the ten soil borings (21 total samples) during the SC. As previously mentioned, the samples were analyzed for TCL VOCs, TCL SVOCs, TAL metals, total cyanide, and free cyanide. The results of these chemical analyses are presented in Table 4 and on Figure 6 in comparison to the NYSDEC Part 375 Restricted-Use Residential Soil Cleanup Objectives (RSCOs) and Restricted-Use Commercial Soil Cleanup Objectives (CSCOs).

As shown in Table 4 and on Figure 6, only four of the 21 soil samples contained concentrations of potential MGP-related constituents (PAHs) exceeding the RSCOs or CSCOs. These four samples were collected from soil borings AB-01 (20-22 ft bgs), AW-02 (18-21 ft bgs), AB-03 (8 -10 ft bgs), and AW-04 (4-8 ft bgs). As further shown in Table 4 and on Figure 6, only concentrations of a few PAH compounds exceeded these SCOs. Total PAH concentrations for these samples ranged from 18 mg/kg at AW-04 (4-8 ft bgs) to 110 mg/kg at AW-02 (18-21 ft bgs).

BTEX and cyanide were not detected at levels exceeding the SCOs. BTEX compounds were detected in 11 of the 21 samples at total BTEX concentrations ranging from 0.0017 mg/kg at AW-01 (5-7 ft bgs) to 0.067 mg/kg at AW-02 (18 -21 ft

bgs). Total cyanide was detected in 8 of the 21 samples at concentrations ranging from 0.62 mg/kg at AB-01 (8-14 ft bgs) to 3.8 mg/kg at AW-04 (4-8 ft bgs).

As shown in Table 4, three of the 21 samples contained arsenic and/or mercury at levels exceeding the RSCOs and CSCOs. These samples were collected from AB-01 (20-22 ft bgs), AW-02 (8-10 ft bgs), and AW-02 (18-21 ft bgs).

3.4 Groundwater Quality

Two rounds of groundwater samples were collected from each of the four new SC monitoring wells. AW-01 and AW-02 were sampled on August 22, 2012 and August 27, 2013, and AW-03 and AW-04 were sampled on December 28, 2012 and August 27, 2013. All samples were analyzed for TCL VOCs, TCL SVOCs, TAL metals, and total cyanide. The samples collected in 2012 were also analyzed for free cyanide. The groundwater sampling results in comparison to NYSDEC TOGS 1.1.1 Class GA Ambient Water Quality Standards and Guidance Values (Class GA Standards and Guidance Values) are presented in Table 5. The groundwater analytical results for common MGP-related constituents (BTEX, PAHs, and cyanide), are show in plan view on Figure 7.

As shown in Table 5, benzene (a VOC) was detected above its Class GA Standard in groundwater sampled from AW-03 during both sampling rounds. Three VOCs (benzene, ethylbenzene, and xylenes) were detected at concentrations above Class GA Standards in samples collected from monitoring well AW--04. AW-04 is located just outside the Fourth Street Utility Corridor Excavation and southeast of the former slip, and AW-03 is located in the approximate terminus of former slip, within the eastern half of the Site. Groundwater sampled from AW-01 and AW-02, which are downgradient from AW-03 and AW-04, did not contain VOCs at concentrations above Class GA Groundwater Standards. The only other VOC detected in groundwater was methylene chloride, which was detected below Class GA Standard in AW-03 during the 2012 sampling round.

Trace concentrations of SVOCs (which include PAHs) were detected in groundwater from each well during both sampling events. Acenaphthene and/or benzo(a)anthracene (both PAHs) were detected in AW-03 during at least one of the sampling rounds at concentrations above the Class GA Guidance Value for these compounds. Naphthalene and phenol were also detected above the Class GA Guidance Values in the groundwater sample collected from AW-04 during the August

27, 2013 round. Groundwater from AW-01 and AW-02 did not contain concentrations of SVOCs above Class GA Standards during either sampling event.

Metals were detected above Class GA Standards in groundwater from each well during both sampling events. Groundwater samples from one or more monitoring wells contained concentrations of barium, iron, magnesium, manganese, and sodium above the Class GA Standards.

Trace levels of total cyanide were detected in AW-01, AW-03, and AW-04, but at concentrations below the Class GA Standard of 200 ug/L. Free cyanide was detected in the duplicate sample collected from AW-03, but at a concentration well below the Class GA Standard.

3.5 Sewer Assessment

An evaluation was conducted to determine if the 11.5 foot diameter combined sewer located beneath the I-190 overpass could be impacted by MGP- related residuals (principally, coal tar) from the Site, and whether such impacts (if any) could pose a risk for direct discharge to surface water bodies. As part of this effort, information regarding the construction and function of the sewer was obtained and evaluated. The results of the sewer assessment were previously presented in a September 25, 2013 letter to the NYSDEC and have since been updated based on new information provided by the City of Buffalo in February 2015. A summary of the information reviewed is presented below.

Much of the information regarding the sewer was gleaned from:

- Drawings obtained from the Buffalo Sewer Authority (BSA) for the South Interceptor (SI), titled *Buffalo Sewer Authority Intercepting Sewer, Division H, Canal Section*, dated April 1936.

- Drawings from the City of Buffalo titled *Waterfront Redevelopment Project No. N.Y. R-35, Utility Replacement Contract, 1975*.

A copy of the drawings is included as Appendix E. It should be noted that the documents obtained from the BSA and City and reviewed for this assessment are assumed to represent as-built conditions. Additional information that supplements the design drawings is also provided based on ARCADIS' institutional knowledge of the BSA's combined sewer system. ARCADIS provides engineering consulting services to

the BSA including hydraulic modeling associated with the development of the BSA's long term control plan (LTCP) for combined sewer overflows (CSOs). In addition to the sewer information, knowledge obtained during the subsurface SC activities and soil excavation activities completed during the Fourth Street Utility Corridor Excavation was also considered.

The following bullets summarize the relevant information from these sources.

- The sewer that runs beneath the northbound lane of the I-190 overpass and through the Site is named the South Interceptor (SI). The SI collects sanitary and storm water runoff (i.e., combined sewer) from the southwest portion of the City of Buffalo. The SI was constructed in the late 1930s within the eastern edge of the Former Erie Canal.

- The SI begins at Charles Street, flows northward, and terminates at Breckenridge Street, where it joins the North Interceptor. From this junction, the sewer runs west beneath the Black Rock Canal to Bird Island (a.k.a., Squaw Island), where is terminates at the BSA Sewage Treatment Plant. The total length of the SI is approximately 6 miles with roughly 2.5 miles of the interceptor downstream from the Site.

- The SI is not constructed with outfalls to surface water bodies (i.e., Niagara River/Lake Erie/Black Rock Canal) because the SI does not have an overflow component. All flow within the SI reaches the BSA Sewage Treatment Plant on Bird Island.

- The Site area is located near Station 70 on Sheet No. 8 of the design drawings (Appendix E).

- The SI is approximately 11.5 feet in diameter and the invert of the sewer in the Site area is approximately 19 feet below grade. The design drawings show that the SI was likely constructed with a top section and bottom section that are 18-inches in thickness. The joints between the sections consist of 10-gauge copper plates with an asphalt coating. The bottom of the SI is constructed on or near the bedrock surface.

- The design drawings indicate that in the area of the Site, the bottom of the pipe is approximately 3 feet lower than the original bedrock surface, suggesting that a portion of the bedrock was removed during installation of the SI.

- As further shown on the design drawings, the sections of the SI that are incised in the bedrock were designed and presumably constructed with an under-drain system that ties into drain sumps. The BSA and ARCADIS could not determine the purpose of the under-drain system, but ARCADIS suspects that the drains may have been used to dewater the open excavations during sewer installation. The BSA could not confirm whether the drain sumps still exist.

- Comparing the water surface elevation in the SI during average flow conditions (as obtained from system modeling associated with the LTCP) with the groundwater elevation at the Site obtained during the SC fieldwork, the sewage in the SI is approximately 6 feet below the water table during average sewer flow conditions.

- Based on communications with the BSA, the BSA has never visually inspected the section of the SI in the Site area.

4. Summary and Conclusions

This section presents conclusions that are supported by the SC investigation results discussed in Section 3. As summarized in Section 1, the objectives of the SC investigation include:

- Assess whether MGP-related residual materials are present at the Site that are related to operation of the former BSS site.
- Determine whether MGP-related residual materials, if present at the Site, have a potential to pose a significant threat to public health or the environment.
- Determine whether a Remedial Investigation of the Site is appropriate.

The results of the SC investigation activities described in this report satisfy these objectives as discussed further below.

4.1 Summary of SC Activities

The SC field investigations consisted of:

- Conducting a background investigation consisting of a utility mark-out, reviewing as-built drawings, and a geophysical survey.
- Drilling ten soil borings: seven on the NYSTA property and three on the City of Buffalo property.
- Converting four soil borings to monitoring wells AW-01 through AW-04.
- Collecting up to three soil samples from each soil boring (total of 21 soil samples and 2 duplicate samples) for analysis of TCL VOCs, TCL SVOCs, TAL Metals, total cyanide, and free cyanide.
- Collecting two rounds of groundwater samples from each of the four new monitoring wells for analysis of TCL VOCs, TCL SVOCs, TAL Metals, total cyanide, and free cyanide.

- Measuring water levels at monitoring wells AW-01 through AW-04, MW-01, and MW-08 on December 28, 2012, February 18, 2013, March 3, 2013, and August 27, 2013.

- Conducting an assessment of the 11.5-foot diameter sewer beneath the northbound lane of the I-190 overpass to evaluate the potential for Site-related impacts to the sewer.

- Surveying all SC investigation locations relative to a common datum.

Soil borings were drilled to bedrock refusal at approximately 21 to 25 feet below grade, depending on location. Each of the four monitoring wells was installed using schedule 40 PVC and 10-foot long, 0.01-inch slotted well screens. The bottoms of the well screens were positioned above the bedrock surface. The locations of the soil borings and monitoring wells are shown on Figure 2. Soil boring and monitoring well construction logs are provided in Appendix A.

Collected soil and groundwater samples were analyzed for:

- VOCs by USEPA Method 8260B

- SVOCs by USEPA Method 8270C

- TAL Metals by USEPA Method 6000/7000

- total cyanide by USEPA Method 9012A

- free cyanide by USEPA extraction Method 9016 and analysis by microdiffusion using ASTM method D4282-02

4.2 Summary of SC Findings

The relevant findings of the SC investigation are summarized below, including a summary discussion of the Site setting and history, geologic and hydrogeologic conditions, soil sampling results, and groundwater sampling results.

4.2.1 Site Setting and History

The Site was historically the confluence of the former Wilkeson Slip and the former Erie Canal and Fourth Street. The former Erie Canal was filled in in the 1930's by the WPA, and the former Wilkeson Slip was filled in between 1895 and 1915. The Site is approximately 120 feet by 180 feet and extends from the eastern edge of Fourth Street, under and to the southwest edge of the NYS Interstate I-190 overpass in Buffalo, New York. The portion of the Site that lies beneath Fourth Street is owned by the City of Buffalo, while the portion beneath the I-190 overpass is owned by the NYSTA. An approximate 11.5-foot diameter sewer runs parallel with and beneath the northbound lane of the I-190 overpass, bisecting the Site. An approximate 15-inch diameter reinforced concrete storm sewer pipe, situated approximately 1.5 ft bgs, runs parallel with and beneath the northbound lane of Fourth Street in the eastern portion of the Site. A 23-kilovolt electrical line (encased in a concrete duct bank) roughly bisects the site in the east-west direction. The western boundary of the Site is denoted by a chain-link fence that runs between the site and the railroad.

The Site is located adjacent to the western edge of the former BSS site. As shown on Figure 2, Wilkeson Slip is located northwest and adjacent to the former BSS site. Previous investigations and remedial actions at the former BSS site indicated that MGP-related impacts (primarily coal tar) were observed within the limits of the former Wilkeson Slip. These impacts were observed to extend in the direction of the Site and potentially beneath the eastern edge of Fourth Street (i.e., beneath the Site). An excavation (i.e., Fourth Street Utility Corridor Excavation) completed by WSP on behalf of QLT Buffalo LLC between June and September 2012 removed the coal tar within the slip extending to the edge of the Site (i.e., edge of Fourth Street). The limits of the excavation are shown as Cell's A and B on Figure 2.

4.2.2 Geologic and Hydrogeologic Conditions

The SC identified two principal geologic units beneath the Site: a fill unit underlain by an alluvial deposit. The fill unit is up to approximately 6 to 21 feet in thickness, and consists of silt, clay, fine to coarse sand, fine to coarse gravel, slag, and bricks. The native alluvial deposit consisting of clay, silt, fine sand, and gravel is approximately 7 to 18 feet thick. Bedrock was encountered at a depth of 21 to 25 ft bgs.

The water table is encountered at approximately 6 to 10 ft bgs. Groundwater flow is generally to the southwest across the Site in the direction of the Niagara River/Lake

Erie confluence. A groundwater mound with somewhat radial flow is observed near MW-08 and AW-03, suggesting a possible water line leak in the area.

4.2.3 Field Observations of Potential Impacts

The only visual indications of potential impacts to the subsurface observed during the SC was black staining in soil boring AW-04 at 20 to 21 ft bgs and soil boring AB-04 at 10 to 12 ft bgs grade and trace sheen at AB-04 from 12.3 to 12.5 ft bgs, at the eastern edge of the Site. Although obvious MGP-related impacts (i.e., coal tar, MGP-like odors, purifier waste) were not observed during the SC activities, MGP-related impacts were observed during previous investigations/ remedial activities completed at/near the Site, as follows:

- Observations made during the 2012 Fourth Street Utility Corridor Excavation (excavation limits shown on Figure 2 as Cells A and B) suggest that coal tar is located beneath Fourth Street (and within the limits of the slip). Coal tar was observed to enter the excavation at approximately 18 ft bgs from beneath the eastern edge of Fourth Street. Coal tar was not observed outside the west and east edges of the slip during the excavation. In addition, coal tar was observed within the excavation at approximately 15 to 18 ft bgs above an approximately 3 to 5 foot thick clay unit (assumed to be the native alluvium). The clay unit lies directly on the bedrock surface. Coal tar was not observed below the clay surface.

- Observations at one boring (RB-37; Figure 2) completed in 2003 in connection with the investigation of the Former BSS site indicate that coal tar is potentially located in an isolated region along the western edge of Fourth Street. During the drilling of RB-37, “hydrocarbon-like odor and sheen” was observed at depths of 12 to 16 ft bgs and “visible NAPL blebs” were observed from 18 to 19 ft bgs. In addition, as shown on Figure 6, elevated levels of PAHs were detected in an analytical sample collected from the soil interval containing these impacts.

4.2.4 Soil Analytical Results

Soil sampling analytical results are presented in Table 4 in comparison to the RSCOs and CSCOs. The soil analytical results for the typical MGP-related constituents (BTEX, PAHs, and cyanide) are shown in plan view on Figure 6. A summary of the soil sampling results is provided below.

- None of the soil samples contained VOC concentrations above the SCOs.

- Four soil samples collected from soil borings AB-01, AW-02, AB-03, and AW-04 contained trace concentrations of PAHs slightly above applicable SCOs. The highest levels of PAHs were detected in the interval above the bedrock in the two westernmost (farthest from the former slip) soil borings. The other two samples were collected from within the fill material.

- Metals were detected in all soil samples, but only three samples contained concentrations above SCOs. These soil samples were also collected from the westernmost soil borings.

- Total or free cyanide were not detected in soil samples at concentrations above SCOs.

4.2.5 Groundwater Analytical Results

The groundwater sampling results in comparison to NYSDEC Class GA Standards and Guidance Values are presented in Table 5. The groundwater analytical results for the typical MGP-related constituents (BTEX, PAHs, and cyanide) are show in plan view on Figure 7. A summary of the groundwater sampling results is provided below.

- One VOC (benzene) was detected at a concentration above Class GA Standards in samples collected from monitoring well AW-03. Three VOCs (benzene, ethylbenzene, and xylenes) were detected at concentrations above Class GA Standards in samples collected from monitoring well AW--04. AW-04 is located just outside the Fourth Street Utility Corridor Excavation and southeast of the former slip, and AW-03 is located in the approximate terminus of former slip, within the eastern half of the Site. Groundwater sampled from AW-01 and AW-2, which are downgradient from AW-03 and AW-04, did not contain VOCs above Class GA Groundwater Standards.

- Acenaphthene and benzo(a)anthracene were detected in groundwater from AW-03 at concentrations above the Class GA Guidance Values. Naphthalene and phenol were detected in groundwater from AW-04 at concentrations above the Class GA Guidance Values. PAHs were not detected at concentrations above Class GA Standards or Guidance Values in groundwater samples collected from wells AW-01 and AW-02.

- Metals were detected in all groundwater samples above Class GA Standards. The metals detected include: barium, iron, magnesium, manganese, and sodium.

- Total and/or free cyanide was detected in groundwater from AW-01, AW-03, and AW-04, but at concentrations well below the NYSDEC Class GA Standard.

4.3 Sewer Assessment

The following conclusions are made based on the information reviewed and assumptions made during the assessment of the 11.5- foot diameter SI:

- *The SI is Relatively "Water Tight"*: The SI is a semi-elliptical structure formed with a top and bottom section that are constructed with 18-inches of reinforced concrete, and the joints between the sections are sealed with a 10-gauge copper plate and asphalt coating. This construction is substantial compared to a brick-and-mortar structure that is often associated with sewers of this age. The SI is likely relatively "water-tight" compared to typical brick-and-mortar type structures. A review of the groundwater contours presented on Figure 7 indicates that the Site groundwater table is not depressed in the area of the SI. This indicates that, if the SI was collecting groundwater, it is not having a significant effect on the groundwater level. This further implies that the amount of groundwater collected by the SI in the Site area (if any) is likely negligible.

- *Coal Tar should not be in Contact with the Sewer*: Since the sewer is located in an area of the Site where coal tar has not been observed, it is not likely that coal tar is in contact with the sewer. In the unlikely event that coal tar or impacted groundwater were to enter the SI, the volume of sewage flowing through the SI especially during wet weather would overwhelm any potential influence the coal tar may have on the quality of water in the sewer (which is likely already impacted by general sewage waste).

- *Site Impacts Would Not Be Discharged to a Surface Water Without Treatment*: Since the SI does not have a CSO between the Site and the BSA Sewage Treatment Plant on Bird Island, any potential coal tar entering the SI would not be discharged to a surface water body (i.e., Black Rock Canal) but rather would receive some form of treatment at the BSA's treatment plant.

4.4 Conclusion

Concentrations of PAHs and metals were detected in 4 of 21 SC soil samples at levels above applicable NYSDEC criteria. This is not surprising since PAHs are formed during the incomplete combustion of fossil fuels, garbage, or any other organic matter; consequently, PAHs are ubiquitous, especially in urban environments like the City of Buffalo. The presence of PAHs, combined with the absence of visual impacts and elevated non-MGP related metal concentrations, is expected due to the abundant fill resulting from the filling of the former Erie Canal in the Site area. Although the low-level PAHs detected in SC soil samples do not appear to be related to the former MGP, one sample collected from boring RB-37 (during an investigation completed in 2003) contained elevated levels of PAHs that are likely due to the potential presence of coal tar observed in the sample.

Some BTEX and/or PAH compounds were detected above Class GA Standards in groundwater from two SC monitoring wells located within and near the former Wilkeson Slip (i.e., AW-03 and AW-04, east portion of the Site). These detections are possibly associated with the dissolution of MGP-related impacts (principally coal tar) observed beneath the eastern edge of Fourth Street (observed during the Fourth Street Utility Corridor Excavation) and at soil boring RB-37 (installed at the western edge of Fourth Street during a 2003 investigation). The elevated levels of BTEX and PAHs in groundwater appears to be constrained to the eastern portion of the Site as groundwater sampled in wells downgradient (west) from this area does not contain elevated BTEX or PAH concentrations.

Given the information presented in this SC Report, it is possible that a small region of residual coal tar remains within the limits of the former slip beneath Fourth Street. Although coal tar may be present beneath Fourth Street, the results of the SC indicate that the tar (and related dissolved-phase impacts from the tar) is not present in the portion of the Site west of Fourth Street (underneath the I-190 overpass). The potential tar may extend from beneath the eastern edge of Fourth Street (from the west side of the Fourth Street Utility Corridor Excavation sheeting) to the western edge of Fourth Street (area around RB-37). Information obtained during the SC suggests that tar should not be in contact with the 11.5–foot diameter SI sewer located beneath the northbound lane of the I-190 overpass because tar has not been observed in the area below the overpass. Design drawings and information obtained from the BSA suggest that if tar or impacted groundwater were to enter the sewer (which is not likely), any impacts would be negligible due to the volume of sewage

flowing through the sewer and because the sewer does not have a surface water overflow component.

ARCADIS concludes that any potential exposure of humans or wildlife to potential impacts beneath Fourth Street is minimal because any residual coal tar located within the former slip is located approximately 15 to 19 feet beneath a heavily traveled street, which adjoins the underpass to the NYSTA 190 North. Any such residual is below the reach of normal utility and road maintenance or replacement activities. Furthermore, potable water within the City limits is provided by a public source.

Given the limited extent of MGP-related impacts to soil and groundwater beneath the Site and the lack of potential human or wildlife exposure to these impacts, ARCADIS concludes that a Remedial Investigation (RI) is not warranted for the Site.

5. References

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ARCADIS

Tables

Table 1
Sample Summary

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Matrix	Location ID	Depth Range (feet)	Date Collected	TCL VOCs	TCL SVOCs	TAL Metals	Free Cyanide	Total Cyanide
Groundwater	AW-01	13.5-23.5	8/22/2012	X	X	X	X	X
	AW-01 (DUP)	13.5-23.5	8/22/2012	X	X	X	X	X
	AW-01	13.5-23.5	8/27/2013	X	X	X	NA	X
	AW-02	11-21	8/22/2012	X	X	X	X	X
	AW-02	11-21	8/27/2013	X	X	X	NA	X
	AW-03	9-19	12/28/2012	X	X	X	X	X
	AW-03 (DUP)	9-19	12/28/2012	X	X	X	X	X
	AW-03	9-19	8/27/2013	X	X	X	NA	X
	AW-03(DUP)	9-19	8/27/2013	X	X	X	NA	X
	AW-04	12.5-22.5	12/28/2012	X	X	X	NA	X
	AW-04	12.5-22.5	8/27/2013	X	X	X	X	X
Subsurface Soil	AB-01	8-14	8/2/2012	X	X	X	X	X
	AB-01	20-22	8/2/2012	X	X	X	X	X
	AB-02	8-10	8/3/2012	X	X	X	X	X
	AB-02	20-22	8/3/2012	X	X	X	X	X
	AB-03	8-10	8/6/2012	X	X	X	X	X
	AB-03	20-22.5	8/6/2012	X	X	X	X	X
	AB-04	10-12	8/3/2012	X	X	X	X	X
	AB-04	18-21	8/3/2012	X	X	X	X	X
	AB-05	9.5-10.8	8/1/2012	X	X	X	X	X
	AB-05	22-25	8/1/2012	X	X	X	X	X
	AB-C2	8-11	8/6/2012	X	X	X	X	X
	AB-C2	22-24	8/6/2012	X	X	X	X	X
	AW-01	5-7	8/2/2012	X	X	X	X	X
	AW-01 (DUP)	5-7	8/2/2012	X	X	X	X	X
	AW-01	20-22.5	8/2/2012	X	X	X	X	X
	AW-02	8-10	8/2/2012	X	X	X	X	X
	AW-02	18-21	8/2/2012	X	X	X	X	X
	AW-03	4-8	11/11/2012	X	X	X	X	X
	AW-03	18-20	11/11/2012	X	X	X	X	X
	AW-03	20-22	11/11/2012	X	X	X	X	X
	AW-04	22-22.5	11/11/2012	X	X	X	X	X
	AW-04	4-8	11/11/2012	X	X	X	X	X
	AW-04 (DUP)	4-8	11/11/2012	X	X	X	X	X

Notes:
Depth range is feet below ground surface.
Depth range for groundwater samples is equivalent to the monitoring well screened interval
DUP: Duplicate sample collected at this location.
SVOCs: Semi-Volatile Organic Compounds.
TAL: Target Analyte List.
TCL: Target Compound List.
VOCs: Volatile Organic Compounds.
NA: Not Analyzed.

Table 2
Monitoring Well Construction Details

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID	Date Completed	Well Diameter (in.)	Casing / Screen Type	Screen Slot Size (in.)	Screen Length (ft.)	Screened Interval (ft. bgs)	
						Top	Bottom
AW-01	8/2/2012	2	PVC	0.01	10.0	13.5	23.5
AW-02	8/3/2012	2	PVC	0.01	10.0	11.0	21.0
AW-03	11/11/2012	2	PVC	0.01	10.0	9.0	19.0
AW-04	11/12/2012	2	PVC	0.01	10.0	12.5	22.5

Notes:
Depths of screened interval are feet below ground surface (ft. bgs).
ft.: feet.
in.: inches.
PVC: polyvinyl chloride.

Table 3
Groundwater Elevations

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Well ID	Measuring Point Elevation	Depth to Water (ft. below measuring point)	Groundwater Elevation	Depth to Water (ft. below measuring point)	Groundwater Elevation	Depth to Water (ft. below measuring point)	Groundwater Elevation	Depth to Water (ft. below measuring point)	Groundwater Elevation
		12/28/2012		2/18/2013		3/6/2013		8/27/2013	
AW-01	580.21	9.40	570.81	9.14	571.07	9.34	570.87	8.38	571.83
AW-02	580.22	9.45	570.77	9.38	570.84	9.41	570.81	8.90	571.32
AW-03	581.44	6.79	574.65	6.54	574.90	6.49	574.95	6.55	574.89
AW-04	581.95	10.71	571.24	10.12	571.83	10.56	571.39	9.57	572.38
MW-01	581.04	10.50	570.54	9.80	571.24	9.96	571.08	8.98	572.06
MW-08	583.44	8.32	575.12	7.65	575.79	7.70	575.74	9.00	574.44

Notes:
Elevations are referenced to NAVD 88.

Table 4
Summary of Soil Sample Analytical Results

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID:		Restricted	Restricted	AB-01	AB-01	AB-02	AB-02	AB-03	AB-03-	AB-04	AB-04	AB-05	AB-05	AB-C2
Sample Depth(Feet):		Use SCOs	Use SCOs	8 - 14	20 - 22	8 - 10	20 - 22	8 - 10	20 - 22.5	10 - 12	18 - 21	9.5 - 10.8	22 - 25	8 - 11
Date Collected:	Units	Residential	Commercial	08/02/12	08/02/12	08/03/12	08/03/12	08/06/12	08/06/12	08/03/12	08/03/12	08/01/12	08/01/12	08/06/12
Volatile Organics														
1,1,1-Trichloroethane	mg/kg	100	500	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,1,2,2-Tetrachloroethane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,1,2-trichloro-1,2,2-trifluoroethane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,1,2-Trichloroethane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,1-Dichloroethane	mg/kg	26	240	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,1-Dichloroethene	mg/kg	100	500	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,2,4-Trichlorobenzene	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0022 J	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,2-Dibromo-3-chloropropane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,2-Dibromoethane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,2-Dichlorobenzene	mg/kg	100	500	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,2-Dichloroethane	mg/kg	3.1	30	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,2-Dichloropropane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,3-Dichlorobenzene	mg/kg	49	280	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
1,4-Dichlorobenzene	mg/kg	13	130	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0015 J	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
2-Butanone	mg/kg	100	500	0.029 U	0.13 J	0.03 U	0.031 U	0.026 U	0.023 J	0.26 U	0.029 U	0.0069 J	0.15	0.016 J
2-Hexanone	mg/kg	- -	- -	0.029 U	0.3 U	0.03 U	0.031 U	0.026 U	0.031 U	0.26 U	0.029 U	0.031 U	0.03 U	0.031 U
4-Methyl-2-pentanone	mg/kg	- -	- -	0.029 U	0.3 U	0.03 U	0.031 U	0.0026 J	0.031 U	0.26 U	0.029 U	0.031 U	0.03 U	0.031 U
Acetone	mg/kg	100	500	0.029 UB	0.39	0.011 J	0.019 J	0.011 J	0.015 J	0.093 J	0.0095 J	0.04 UB	0.03 UB	0.039
Benzene	mg/kg	4.8	44	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0011 J	0.0062 U	0.0059 U	0.0063 U
Bromodichloromethane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Bromoform	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Bromomethane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 UJ	0.0061 UJ	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 UJ
Carbon Disulfide	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Carbon Tetrachloride	mg/kg	2.4	22	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Chlorobenzene	mg/kg	100	500	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Chloroethane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 UJ	0.0061 UJ	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 UJ
Chloroform	mg/kg	49	350	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Chloromethane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
cis-1,2-Dichloroethene	mg/kg	100	500	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
cis-1,3-Dichloropropene	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Cyclohexane	mg/kg	- -	- -	0.011	0.023 J	0.001 J	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Dibromochloromethane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Dichlorodifluoromethane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 UJ	0.0061 UJ	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 UJ
Ethylbenzene	mg/kg	41	390	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0015 J	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Isopropylbenzene	mg/kg	- -	- -	0.0057 U	0.053 J	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Methyl acetate	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0049 J	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Methyl tert-butyl ether	mg/kg	100	500	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Methylcyclohexane	mg/kg	- -	- -	0.013	0.056 J	0.002 J	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Methylene Chloride	mg/kg	100	500	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U

See Notes on Page 9.

Table 4
Summary of Soil Sample Analytical Results

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID: / Sample Depth(Feet): / Date Collected:	Units	Restricted Use SCOs Residential	Restricted Use SCOs Commercial	AB-01 8 - 14 08/02/12	AB-01 20 - 22 08/02/12	AB-02 8 - 10 08/03/12	AB-02 20 - 22 08/03/12	AB-03 8 - 10 08/06/12	AB-03- 20 - 22.5 08/06/12	AB-04 10 - 12 08/03/12	AB-04 18 - 21 08/03/12	AB-05 9.5 - 10.8 08/01/12	AB-05 22 - 25 08/01/12	AB-C2 8 - 11 08/06/12
Volatile Organics (Cont.)														
Styrene	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Tetrachloroethene	mg/kg	19	150	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.00072 J	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Toluene	mg/kg	100	500	0.0017 J	0.06 U	0.0059 U	0.0062 J	0.0012 J	0.0061 U	0.053 U	0.0036 J	0.0062 U	0.0059 U	0.0063 U
trans-1,2-Dichloroethene	mg/kg	100	500	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
trans-1,3-Dichloropropene	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Trichloroethene	mg/kg	21	200	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Trichlorofluoromethane	mg/kg	- -	- -	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 UJ	0.0061 UJ	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 UJ
Vinyl Chloride	mg/kg	0.9	13	0.0057 U	0.06 U	0.0059 U	0.0063 U	0.0052 U	0.0061 U	0.053 U	0.0058 U	0.0062 U	0.0059 U	0.0063 U
Xylenes (total)	mg/kg	100	500	0.0012 J	0.12 UB	0.012 U	0.013 U	0.0083 J	0.012 UB	0.11 U	0.012 U	0.012 U	0.012 U	0.013 UB
Total BTEX	mg/kg	- -	- -	0.0029 J	ND	ND	0.0062 J	0.011 J	ND	ND	0.0047 J	ND	ND	ND
Total VOCs	mg/kg	- -	- -	0.0269 J	0.652 J	0.014 J	0.0252 J	0.02902 J	0.0429 J	0.093 J	0.0142 J	0.0069 J	0.15	0.055 J
Semivolatile Organics														
1,1'-Biphenyl	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.031 J	0.2 U	0.21 U	0.2 U	1.1 U
2,2'-Oxybis(1-Chloropropane)	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
2,4,5-Trichlorophenol	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
2,4,6-Trichlorophenol	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
2,4-Dichlorophenol	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
2,4-Dimethylphenol	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
2,4-Dinitrophenol	mg/kg	- -	- -	3.8 U	4.8 U	3.9 U	0.42 U	7 U	0.4 U	0.41 U	0.39 U	0.41 U	0.39 U	2.1 U
2,4-Dinitrotoluene	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
2,6-Dinitrotoluene	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
2-Chloronaphthalene	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
2-Chlorophenol	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
2-Methylnaphthalene	mg/kg	- -	- -	1.9 U	0.46 J	2 U	0.22 U	3.6 U	0.2 U	0.037 J	0.2 U	0.21 U	0.2 U	1.1 U
2-Methylphenol	mg/kg	100	500	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
2-Nitroaniline	mg/kg	- -	- -	3.8 U	4.8 U	3.9 U	0.42 U	7 U	0.4 U	0.41 U	0.39 U	0.41 U	0.39 U	2.1 U
2-Nitrophenol	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
3,3'-Dichlorobenzidine	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
3-Nitroaniline	mg/kg	- -	- -	3.8 U	4.8 U	3.9 U	0.42 U	7 U	0.4 U	0.41 U	0.39 U	0.41 U	0.39 U	2.1 U
4,6-Dinitro-2-methylphenol	mg/kg	- -	- -	3.8 U	4.8 U	3.9 U	0.42 U	7 U	0.4 U	0.41 U	0.39 U	0.41 U	0.39 U	2.1 U
4-Bromophenyl-phenylether	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
4-Chloro-3-Methylphenol	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
4-Chloroaniline	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
4-Chlorophenyl-phenylether	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
4-Methylphenol	mg/kg	100	500	3.8 U	4.8 U	3.9 U	0.42 U	7 U	0.4 U	0.41 U	0.39 U	0.41 U	0.39 U	2.1 U
4-Nitroaniline	mg/kg	- -	- -	3.8 U	4.8 U	3.9 U	0.42 U	7 U	0.4 U	0.41 U	0.39 U	0.41 U	0.39 U	2.1 U
4-Nitrophenol	mg/kg	- -	- -	3.8 U	4.8 U	3.9 U	0.42 U	7 U	0.4 U	0.41 U	0.39 U	0.41 U	0.39 U	2.1 U
Acenaphthene	mg/kg	100	500	1.9 U	1.1 J	2 U	0.22 U	3.6 U	0.014 J	3.9	0.2 U	0.21 U	0.2 U	1.1 U
Acenaphthylene	mg/kg	100	500	1.9 U	0.22 J	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Acetophenone	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Anthracene	mg/kg	100	500	1.9 U	1.3 J	2 U	0.22 U	0.28 J	0.2 U	2.7	0.2 U	0.21 U	0.2 U	1.1 U

See Notes on Page 9.

Table 4
Summary of Soil Sample Analytical Results

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID: / Sample Depth(Feet): / Date Collected:	Units	Restricted Use SCOs Residential	Restricted Use SCOs Commercial	AB-01 8 - 14 08/02/12	AB-01 20 - 22 08/02/12	AB-02 8 - 10 08/03/12	AB-02 20 - 22 08/03/12	AB-03 8 - 10 08/06/12	AB-03- 20 - 22.5 08/06/12	AB-04 10 - 12 08/03/12	AB-04 18 - 21 08/03/12	AB-05 9.5 - 10.8 08/01/12	AB-05 22 - 25 08/01/12	AB-C2 8 - 11 08/06/12
Semivolatile Organics (Cont.)														
Atrazine	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Benzaldehyde	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Benzo(a)anthracene	mg/kg	1	5.6	0.29 J	3.4	2 U	0.22 U	1.1 J	0.2 U	1.2	0.2 U	0.21 U	0.028 J	1.1 U
Benzo(a)pyrene	mg/kg	1	1	0.27 J	**3.1**	2 U	0.015 J	**1.1 J**	0.025 J	0.65	0.2 U	0.022 J	0.026 J	1.1 U
Benzo(b)fluoranthene	mg/kg	1	5.6	0.45 J	4.6	2 U	0.018 J	1.4 J	0.025 J	0.98	0.2 U	0.035 J	0.039 J	0.062 J
Benzo(g,h,i)perylene	mg/kg	100	500	1.9 U	1 J	2 U	0.22 U	0.56 J	0.2 U	0.17 J	0.2 U	0.21 U	0.2 U	1.1 U
Benzo(k)fluoranthene	mg/kg	3.9	56	0.18 J	1.8 J	2 U	0.011 J	0.48 J	0.017 J	0.41	0.2 U	0.016 J	0.016 J	1.1 U
bis(2-Chloroethoxy)methane	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
bis(2-Chloroethyl)ether	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
bis(2-Ethylhexyl)phthalate	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	1.8 J	0.094 J	0.1 J	0.2 U	0.21 U	0.29	1.1 U
Butylbenzylphthalate	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Caprolactam	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Carbazole	mg/kg	- -	- -	1.9 U	0.47 J	2 U	0.22 U	3.6 U	0.2 U	0.31	0.2 U	0.21 U	0.2 U	1.1 U
Chrysene	mg/kg	3.9	56	0.29 J	3.3	0.13 J	0.017 J	1.2 J	0.025 J	0.91	0.2 U	0.026 J	0.03 J	1.1 U
Dibenzo(a,h)anthracene	mg/kg	0.33	0.56	1.9 U	0.43 J	2 U	0.22 U	0.21 J	0.2 U	0.069 J	0.2 U	0.21 U	0.2 U	1.1 U
Dibenzofuran	mg/kg	59	350	1.9 U	0.7 J	2 U	0.22 U	3.6 U	0.2 U	2.7	0.2 U	0.21 U	0.2 U	1.1 U
Diethylphthalate	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Dimethylphthalate	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Di-n-Butylphthalate	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Di-n-Octylphthalate	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.0077 J	0.2 U	0.21 U	0.2 U	1.1 U
Fluoranthene	mg/kg	100	500	0.52 J	7.2	0.16 J	0.031 J	2.2 J	0.031 J	5.3	0.2 U	0.039 J	0.044 J	1.1 U
Fluorene	mg/kg	100	500	1.9 U	1.2 J	2 U	0.22 U	3.6 U	0.2 U	4	0.2 U	0.21 U	0.2 U	1.1 U
Hexachlorobenzene	mg/kg	1.2	6	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Hexachlorobutadiene	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Hexachlorocyclopentadiene	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Hexachloroethane	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.5	5.6	1.9 U	0.98 J	2 U	0.22 U	0.49 J	0.2 U	0.17 J	0.2 U	0.21 U	0.012 J	1.1 U
Isophorone	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Naphthalene	mg/kg	100	500	1.9 U	2.1 J	2 U	0.22 U	3.6 U	0.2 U	0.057 J	0.2 U	0.21 U	0.2 U	1.1 U
Nitrobenzene	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
N-Nitroso-di-n-propylamine	mg/kg	- -	- -	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
N-Nitrosodiphenylamine	mg/kg	- -	- -	1.9 U	2.5 U	2 U*	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Pentachlorophenol	mg/kg	6.7	6.7	3.8 U	4.8 U	3.9 U	0.42 U	7 U	0.4 U	0.41 U	0.39 U	0.41 U	0.39 U	2.1 U
Phenanthrene	mg/kg	100	500	0.41 J	5.6	2 U	0.015 J	1.6 J	0.2 U	1.1	0.2 U	0.025 J	0.03 J	1.1 U
Phenol	mg/kg	100	500	1.9 U	2.5 U	2 U	0.22 U	3.6 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	1.1 U
Pyrene	mg/kg	100	500	0.39 J	5.6	2 U	0.028 J	1.8 J	0.03 J	3.3	0.2 U	0.03 J	0.035 J	1.1 U
Total PAHs	mg/kg	- -	- -	2.8 J	43.39 J	0.29 J	0.135 J	12.42 J	0.167 J	24.953 J	ND	0.193 J	0.26 J	0.062 J
Total SVOCs	mg/kg	- -	- -	2.8 J	44.56 J	0.29 J	0.135 J	14.22 J	0.261 J	28.1017 J	ND	0.193 J	0.55 J	0.062 J

See Notes on Page 9.

Table 4
Summary of Soil Sample Analytical Results

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID: / Sample Depth(Feet): / Date Collected:	Units	Restricted Use SCOs Residential	Restricted Use SCOs Commercial	AB-01 8 - 14 08/02/12	AB-01 20 - 22 08/02/12	AB-02 8 - 10 08/03/12	AB-02 20 - 22 08/03/12	AB-03 8 - 10 08/06/12	AB-03- 20 - 22.5 08/06/12	AB-04 10 - 12 08/03/12	AB-04 18 - 21 08/03/12	AB-05 9.5 - 10.8 08/01/12	AB-05 22 - 25 08/01/12	AB-C2 8 - 11 08/06/12
Inorganics														
Aluminum	mg/kg	- -	- -	7,390 J	8,690 J	6,500 J	11,600 J	3,300 J	11,700 J	7,550 J	6,450 J	5,230 J	3,210 J	8,520 J
Antimony	mg/kg	- -	- -	15.9 U	2.1 J	18.5 U	20 U	0.72 J	17.7 U	19.2 U	17.7 U	18.7 U	19.7 U	20.7 U
Arsenic	mg/kg	16	16	5.9	**25.8**	4.9	6	4.7	4.7	4.7	2.1 J	2.8	1.9 J	3.1
Barium	mg/kg	400	400	61.8 J	230 J	57.6 J	70.9 J	45.9 J	99.3 J	56 J	75.2 J	35 J	31.8 J	53.1 J
Beryllium	mg/kg	72	590	0.42	0.59	0.36	0.55	0.26	0.61	0.61	0.32	0.34	0.19 J	0.54
Cadmium	mg/kg	4.3	9.3	0.26	3.3	0.3	0.27	0.27	0.22 J	0.35	0.24	0.21 J	0.21 J	0.34
Calcium	mg/kg	- -	- -	65,000 J	35,200 J	107,000 J	69,400 J	152,000 J	48,900 J	11,200 J	60,000 J	2,300 J	86,800 J	3,670 J
Chromium	mg/kg	- -	- -	18.9 J	54.3 J	14.8 J	16.1 J	10.6 J	17.2 J	13.4 J	10.5 J	11.8 J	9.1 J	13.4 J
Cobalt	mg/kg	- -	- -	7.5	8.6	6.3	10.1	3.3	9.6	7.7	5.6	8.6	3.4	9.4
Copper	mg/kg	270	270	18.7	154	18.2	18.5	26.9	18.7	25.4	13	15.1	7.3	23.3
Iron	mg/kg	- -	- -	15,400 J	19,500 J	21,400 J	18,200 J	13,500 J	18,000 J	14,800 J	11,000 J	9,890 J	7,060 J	21,800 J
Lead	mg/kg	400	1,000	83 J	932 J	54.2 J	23.7 J	148 J	22.7 J	43.3 J	13.4 J	25.5 J	8.4 J	14.5 J
Magnesium	mg/kg	- -	- -	13,200	11,600	49,300	25,900	23,400	18,200	4,710	26,700	2,450	29,100	3,640
Manganese	mg/kg	2,000	10,000	317	309	443	534	250	407	203	420	96.5	232	243
Mercury	mg/kg	0.81	2.8	0.2	**4.4**	0.16	0.015 J	0.21	0.046	0.034	0.022 U	0.013 J	0.014 J	0.031
Nickel	mg/kg	310	310	19.3	37.9	17.3	23.8	11.2	22.5	23.3	12.8	19.9	8	25.6
Potassium	mg/kg	- -	- -	1,360 J	1,120 J	1,730 J	2,690 J	764 J	2,440 J	606 J	1,310 J	688	892 J	976 J
Selenium	mg/kg	180	1,500	4.2 U	1.8 J	4.9 U	5.3 U	4.6 U	4.7 U	5.1 U	4.7 U	5 U	5.2 U	5.5 U
Silver	mg/kg	180	1,500	0.53 U	5.6	0.62 U	0.67 U	0.58 U	0.59 U	0.64 U	0.59 U	0.62 U	0.66 U	0.69 U
Sodium	mg/kg	- -	- -	996	2,330	1,400	649	1,090	1,220	546	403	108 J	376	343
Thallium	mg/kg	- -	- -	6.4 U	0.52 J	7.4 U	8 U	0.4 J	0.35 J	7.7 U	7.1 U	7.5 U	7.9 U	8.3 U
Vanadium	mg/kg	- -	- -	16.2 J	19.5 J	14.7 J	22.5 J	8.4 J	23.6 J	19.5 J	15.2 J	13.4 J	10.3 J	17.3 J
Zinc	mg/kg	10,000	10,000	94.6 J	865 J	165 J	64.6 J	137 J	63.6 J	73.7 J	49.9 J	59.2 J	40 J	71.5 J
Miscellaneous														
Cyanide	mg/kg	27	27	0.62 J	1.6	1.1 U	1.1 U	1 U	1.2 U	1.1 U	1.2 U	1.1 U	1.1 U	1.2 U
Cyanide, Free	mg/kg	- -	- -	0.12 J	0.24 J	0.13 J	0.87	0.53 UB	0.62 UB	0.71	0.56 U	0.46 J	0.55 U	0.93 UB
Percent Moisture	%	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Percent Solids	%	- -	- -	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Page 9.

Table 4
Summary of Soil Sample Analytical Results

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID: / Sample Depth(Feet): / Date Collected:	Units	Restricted Use SCOs Residential	Restricted Use SCOs Commercial	AB-C2 22 - 24 08/06/12	AW-01 5 - 7 08/02/12	AW-01 20 - 22.5 08/02/12	AW-02 8 - 10 08/02/12	AW-02 18 - 21 08/02/12	AW-03 4 - 8 11/11/12	AW-03 18 - 20 11/11/12	AW-03 20 - 22 11/11/12	AW-04 4 - 8 11/12/12	AW-04 22 - 22.5 11/12/12
Volatile Organics													
1,1,1-Trichloroethane	mg/kg	100	500	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
1,1,2,2-Tetrachloroethane	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
1,1,2-trichloro-1,2,2-trifluoroethane	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
1,1,2-Trichloroethane	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
1,1-Dichloroethane	mg/kg	26	240	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
1,1-Dichloroethene	mg/kg	100	500	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 UJ]	0.0057 U
1,2,4-Trichlorobenzene	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
1,2-Dibromo-3-chloropropane	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
1,2-Dibromoethane	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
1,2-Dichlorobenzene	mg/kg	100	500	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 UJ]	0.0057 U
1,2-Dichloroethane	mg/kg	3.1	30	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
1,2-Dichloropropane	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
1,3-Dichlorobenzene	mg/kg	49	280	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
1,4-Dichlorobenzene	mg/kg	13	130	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
2-Butanone	mg/kg	100	500	0.2	0.028 U [0.027 U]	0.0084 J	0.031 U	0.061 J	0.029 U	0.027 U	0.028 U	0.031 U [0.027 U]	0.028 U
2-Hexanone	mg/kg	- -	- -	0.027 U	0.028 U [0.027 U]	0.033 U	0.031 U	0.31 UJ	0.029 U	0.027 U	0.028 U	0.031 U [0.027 U]	0.028 U
4-Methyl-2-pentanone	mg/kg	- -	- -	0.027 U	0.028 U [0.027 U]	0.033 U	0.031 U	0.31 UJ	0.029 U	0.027 U	0.028 U	0.031 U [0.027 U]	0.028 U
Acetone	mg/kg	100	500	0.027 U	0.013 J [0.014 J]	0.033	0.02 J	0.23 J	0.03	0.027 U	0.0066 J	0.031 U [0.027 U]	0.028 U
Benzene	mg/kg	4.8	44	0.0055 U	0.0056 U [0.0054 U]	0.002 J	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0029 J	0.0069 [0.0055 UJ]	0.0073
Bromodichloromethane	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Bromoform	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Bromomethane	mg/kg	- -	- -	0.0055 UJ	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Carbon Disulfide	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Carbon Tetrachloride	mg/kg	2.4	22	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Chlorobenzene	mg/kg	100	500	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 UJ]	0.0057 U
Chloroethane	mg/kg	- -	- -	0.0055 UJ	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Chloroform	mg/kg	49	350	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Chloromethane	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
cis-1,2-Dichloroethene	mg/kg	100	500	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 UJ]	0.0057 U
cis-1,3-Dichloropropene	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Cyclohexane	mg/kg	- -	- -	0.0055 U	0.0021 J [0.0018 J]	0.00093 J	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Dibromochloromethane	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Dichlorodifluoromethane	mg/kg	- -	- -	0.0055 UJ	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Ethylbenzene	mg/kg	41	390	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.027	0.034	0.029 J [0.002 J]	0.0059
Isopropylbenzene	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.024 J	0.0059 U	0.0099	0.017	0.0013 J [0.0055 U]	0.0016 J
Methyl acetate	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Methyl tert-butyl ether	mg/kg	100	500	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Methylcyclohexane	mg/kg	- -	- -	0.0055 U	0.0027 J [0.002 J]	0.0065 U	0.0062 U	0.016 J	0.0059 UJ	0.0053 UJ	0.0057 UJ	0.0062 UJ [0.0055 UJ]	0.0057 UJ
Methylene Chloride	mg/kg	100	500	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0031 J	0.0027 J	0.0057 U	0.0062 U [0.0037 J]	0.0057 U

See Notes on Page 9.

Table 4
Summary of Soil Sample Analytical Results

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID: / Sample Depth(Feet): / Date Collected:	Units	Restricted Use SCOs Residential	Restricted Use SCOs Commercial	AB-C2 22 - 24 08/06/12	AW-01 5 - 7 08/02/12	AW-01 20 - 22.5 08/02/12	AW-02 8 - 10 08/02/12	AW-02 18 - 21 08/02/12	AW-03 4 - 8 11/11/12	AW-03 18 - 20 11/11/12	AW-03 20 - 22 11/11/12	AW-04 4 - 8 11/12/12	AW-04 22 - 22.5 11/12/12
Volatile Organics (Cont.)													
Styrene	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Tetrachloroethene	mg/kg	19	150	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.00089 J	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 UJ]	0.0057 U
Toluene	mg/kg	100	500	0.0055 U	0.0017 J [0.0022 J]	0.00068 J	0.0062 U	0.062 UJ	0.0011 J	0.0036 J	0.0065	0.0049 J [0.0055 UJ]	0.0057 U
trans-1,2-Dichloroethene	mg/kg	100	500	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 UJ]	0.0057 U
trans-1,3-Dichloropropene	mg/kg	- -	- -	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Trichloroethene	mg/kg	21	200	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 UJ]	0.0057 U
Trichlorofluoromethane	mg/kg	- -	- -	0.0055 UJ	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Vinyl Chloride	mg/kg	0.9	13	0.0055 U	0.0056 U [0.0054 U]	0.0065 U	0.0062 U	0.062 UJ	0.0059 U	0.0053 U	0.0057 U	0.0062 U [0.0055 U]	0.0057 U
Xylenes (total)	mg/kg	100	500	0.011 UB	0.011 UB [0.011 UB]	0.013 U	0.012 U	0.067 J	0.012 U	0.011 U	0.011 U	0.0011 J [0.011 U]	0.0054 J
Total BTEX	mg/kg	- -	- -	ND	0.0017 J [0.0022 J]	0.00268 J	ND	0.067 J	0.0011 J	0.0306 J	0.0434 J	0.0419 J [0.002 J]	0.0186 J
Total VOCs	mg/kg	- -	- -	0.2	0.0195 J [0.02 J]	0.04501 J	0.02089 J	0.398 J	0.0342 J	0.0432 J	0.067 J	0.0432 J [0.0057 J]	0.0202 J
Semivolatile Organics													
1,1'-Biphenyl	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	0.32 J	0.028 J	0.012 J	0.2 U	1 U [0.077 J]	0.2 U
2,2'-Oxybis(1-Chloropropane)	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
2,4,5-Trichlorophenol	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
2,4,6-Trichlorophenol	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
2,4-Dichlorophenol	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
2,4-Dimethylphenol	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.099 J
2,4-Dinitrophenol	mg/kg	- -	- -	0.36 U	3.7 U [7.2 U]	0.43 U	2 U	5.2 U	0.4 U	0.38 U	0.39 U	2 U [1.8 UJ]	0.38 U
2,4-Dinitrotoluene	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
2,6-Dinitrotoluene	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
2-Chloronaphthalene	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
2-Chlorophenol	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
2-Methylnaphthalene	mg/kg	- -	- -	0.19 U	0.1 J [3.7 U]	0.22 U	1 U	2.9	0.098 J	0.0071 J	0.2 U	0.066 J [0.28 J]	0.2 U
2-Methylphenol	mg/kg	100	500	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
2-Nitroaniline	mg/kg	- -	- -	0.36 U	3.7 U [7.2 U]	0.43 U	2 U	5.2 U	0.4 U	0.38 U	0.39 U	2 U [1.8 U]	0.38 U
2-Nitrophenol	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
3,3'-Dichlorobenzidine	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
3-Nitroaniline	mg/kg	- -	- -	0.36 U	3.7 U [7.2 U]	0.43 U	2 U	5.2 U	0.4 U	0.38 U	0.39 U	2 U [1.8 U]	0.38 U
4,6-Dinitro-2-methylphenol	mg/kg	- -	- -	0.36 U	3.7 U [7.2 U]	0.43 U	2 U	5.2 U	0.4 U	0.38 U	0.39 U	2 U [1.8 U]	0.38 U
4-Bromophenyl-phenylether	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
4-Chloro-3-Methylphenol	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
4-Chloroaniline	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
4-Chlorophenyl-phenylether	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
4-Methylphenol	mg/kg	100	500	0.36 U	3.7 U [7.2 U]	0.43 U	2 U	5.2 U	0.4 U	0.38 U	0.39 U	2 U [1.8 U]	0.38 U
4-Nitroaniline	mg/kg	- -	- -	0.36 U	3.7 U [7.2 U]	0.43 U	2 U	5.2 U	0.4 U	0.38 U	0.39 U	2 U [1.8 U]	0.38 U
4-Nitrophenol	mg/kg	- -	- -	0.36 U	3.7 U [7.2 U]	0.43 U	2 U	5.2 U	0.4 U	0.38 U	0.39 U	2 U [1.8 U]	0.38 U
Acenaphthene	mg/kg	100	500	0.19 U	0.087 J [3.7 U]	0.017 J	1 U	2.9	0.14 J	0.41	0.12 J	0.18 J [0.97]	0.013 J
Acenaphthylene	mg/kg	100	500	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	0.89 J	0.04 J	0.0062 J	0.2 U	0.16 J [0.2 J]	0.2 U
Acetophenone	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Anthracene	mg/kg	100	500	0.19 U	0.2 J [3.7 U]	0.027 J	1 U	3.5	0.26	0.075 J	0.011 J	0.69 J [2]	0.2 U

See Notes on Page 9.

Table 4
Summary of Soil Sample Analytical Results

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID: / Sample Depth(Feet): / Date Collected:	Units	Restricted Use SCOs Residential	Restricted Use SCOs Commercial	AB-C2 22 - 24 08/06/12	AW-01 5 - 7 08/02/12	AW-01 20 - 22.5 08/02/12	AW-02 8 - 10 08/02/12	AW-02 18 - 21 08/02/12	AW-03 4 - 8 11/11/12	AW-03 18 - 20 11/11/12	AW-03 20 - 22 11/11/12	AW-04 4 - 8 11/12/12	AW-04 22 - 22.5 11/12/12
Semivolatile Organics (Cont.)													
Atrazine	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Benzaldehyde	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Benzo(a)anthracene	mg/kg	1	5.6	0.19 U	0.58 J [3.7 U]	0.11 J	1 U	**9**	0.86	0.078 J	0.2 U	1.4 [3.7]	0.013 J
Benzo(a)pyrene	mg/kg	1	1	0.0094 J	0.69 J [0.71 J]	0.11 J	1 U	**8.8**	1	0.16 J	0.096 J	**1.6 [3.7]**	0.2 U
Benzo(b)fluoranthene	mg/kg	1	5.6	0.014 J	1 J [0.84 J]	0.11 J	0.065 J	**13**	1.3	0.2	0.13 J	1.9 [4.5]	0.12 J
Benzo(g,h,i)perylene	mg/kg	100	500	0.19 U	0.28 J [0.47 J]	0.058 J	1 U	2.8	0.36 J	0.025 J	0.2 U	0.34 J [1.3]	0.2 U
Benzo(k)fluoranthene	mg/kg	3.9	56	0.0088 J	0.38 J [0.36 J]	0.057 J	1 U	4.6	0.57	0.047 J	0.0073 J	1.1 [2.3]	0.0033 J
bis(2-Chloroethoxy)methane	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
bis(2-Chloroethyl)ether	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
bis(2-Ethylhexyl)phthalate	mg/kg	- -	- -	0.43	1.9 U [3.7 U]	0.14 J	1 U	2.7 U	0.65	0.13 J	0.16 J	1 U [0.95 U]	1.4
Butylbenzylphthalate	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Caprolactam	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Carbazole	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	0.69 J	0.098 J	0.17 J	0.097 J	0.11 J [0.62 J]	0.2 U
Chrysene	mg/kg	3.9	56	0.015 J	0.55 J [0.6 J]	0.088 J	1 U	8	0.75	0.072 J	0.014 J	1.4 [3.3]	0.0052 J
Dibenzo(a,h)anthracene	mg/kg	0.33	0.56	0.19 U	1.9 U [3.7 U]	0.028 J	1 U	**0.63 J**	0.23	0.2 U	0.2 U	**0.8 J [0.94 J]**	0.2 U
Dibenzofuran	mg/kg	59	350	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	1.3 J	0.084 J	0.22	0.043 J	0.13 J [0.65 J]	0.008 J
Diethylphthalate	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Dimethylphthalate	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Di-n-Butylphthalate	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Di-n-Octylphthalate	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.15 J	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Fluoranthene	mg/kg	100	500	0.19 U	1.1 J [1.2 J]	0.15 J	1 U	17	1.4	0.15 J	0.021 J	2.6 J [8.1 J]	0.0039 J
Fluorene	mg/kg	100	500	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.3 J	0.13 J	0.19 J	0.027 J	0.27 J [1.1 J]	0.0083 J
Hexachlorobenzene	mg/kg	1.2	6	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Hexachlorobutadiene	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Hexachlorocyclopentadiene	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Hexachloroethane	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Indeno(1,2,3-cd)pyrene	mg/kg	0.5	5.6	0.19 U	0.26 J [0.4 J]	0.058 J	1 U	2.4 J	0.38	0.14 J	0.2 U	0.89 J [1.6]	0.2 U
Isophorone	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Naphthalene	mg/kg	100	500	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	6.6	0.83	0.067 J	0.042 J	0.16 J [0.36 J]	1.2
Nitrobenzene	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
N-Nitroso-di-n-propylamine	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
N-Nitrosodiphenylamine	mg/kg	- -	- -	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Pentachlorophenol	mg/kg	6.7	6.7	0.36 U	3.7 U [7.2 U]	0.43 U	2 U	5.2 U	0.4 U	0.38 U	0.39 U	2 U [1.8 U]	0.38 U
Phenanthrene	mg/kg	100	500	0.19 U	0.81 J [0.8 J]	0.053 J	1 U	12	0.87	0.22	0.032 J	1.6 J [6.8 J]	0.011 J
Phenol	mg/kg	100	500	0.19 U	1.9 U [3.7 U]	0.22 U	1 U	2.7 U	0.2 U	0.2 U	0.2 U	1 U [0.95 U]	0.2 U
Pyrene	mg/kg	100	500	0.19 U	0.84 J [1 J]	0.15 J	1 U	13 J	1.1	0.1 J	0.019 J	1.9 J [7.1 J]	0.2 U
Total PAHs	mg/kg	- -	- -	0.0472 J	6.877 J [6.38 J]	1.016 J	0.065 J	110.32 J	10.318 J	1.9473 J	0.5193 J	17.056 J [48.25 J]	1.3777 J
Total SVOCs	mg/kg	- -	- -	0.4772 J	6.877 J [6.38 J]	1.156 J	0.065 J	112.63 J	11.328 J	2.4793 J	0.8193 J	17.296 J [49.597 J]	2.8847 J

See Notes on Page 9.

Table 4
Summary of Soil Sample Analytical Results

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID: / Sample Depth(Feet): / Date Collected:	Units	Restricted Use SCOs Residential	Restricted Use SCOs Commercial	AB-C2 22 - 24 08/06/12	AW-01 5 - 7 08/02/12	AW-01 20 - 22.5 08/02/12	AW-02 8 - 10 08/02/12	AW-02 18 - 21 08/02/12	AW-03 4 - 8 11/11/12	AW-03 18 - 20 11/11/12	AW-03 20 - 22 11/11/12	AW-04 4 - 8 11/12/12	AW-04 22 - 22.5 11/12/12
Inorganics													
Aluminum	mg/kg	- -	- -	2,290 J	5,740 J [5,200 J]	9,960 J	11,600 J	8,780 J	10,100	4,190	6,220	6,000 J [10,500 J]	9,160
Antimony	mg/kg	- -	- -	16.8 U	16.9 U [16.4 U]	18.6 U	16.8 U	4.3 J	97 J	16.1 UJ	19.4 UJ	17.2 UJ [16.7 UJ]	18.8 UJ
Arsenic	mg/kg	16	16	2.7	5.5 [4.8]	4.9	4.9	**34**	15.4	2.8	3.2	6.2 [5.4]	4.2
Barium	mg/kg	400	400	23.5 J	48.2 J [47.2 J]	77.2 J	78.6 J	357 J	81 J	48.9 J	64.6 J	55.8 J [143 J]	91 J
Beryllium	mg/kg	72	590	0.13 J	0.4 [0.51]	0.5	0.58	0.59	0.59	0.2 J	0.3	0.47 [1.9]	0.47
Cadmium	mg/kg	4.3	9.3	0.27	0.64 [0.35]	0.22 J	0.24	2.6	0.45	0.25	0.22 J	0.38 [0.4]	0.27
Calcium	mg/kg	- -	- -	106,000 J	75,700 J [75,100 J]	37,900 J	22,900 J	18,600 J	28,900	53,300	61,400	103,000 [90,500 J]	83,900
Chromium	mg/kg	- -	- -	5.1 J	13.1 J [10.7 J]	15.3 J	17.8 J	74.9 J	21	6.7	9.9	8.8 [7.9]	14
Cobalt	mg/kg	- -	- -	2.4	5.8 [4.6]	8.8	11	9.9	5.3	3.7	5.3	4.9 [4.9]	7.5
Copper	mg/kg	270	270	5.6	18.4 [18.7]	16.1	18.4	213	25.6	8.4	11.7	17.8 [19.6]	16.7
Iron	mg/kg	- -	- -	5,740 J	16,000 J [12,700 J]	16,000 J	18,000 J	22,100 J	12,100	8,100	11,200	12,000 [12,600 J]	16,900
Lead	mg/kg	400	1,000	4.7 J	124 J [93 J]	27.2 J	19.3 J	2,640 J	949	9.8	11.3	45.5 [47.1]	15.9
Magnesium	mg/kg	- -	- -	26,300	28,100 [30,700]	11,800	11,900	8,760	10,500	25,100	26,500	38,600 J [17,900 J]	36,300
Manganese	mg/kg	2,000	10,000	187	496 [341]	302	374	297	323	325	386	525 J [950 J]	555
Mercury	mg/kg	0.81	2.8	0.018 J	0.055 [0.074]	0.096	**4.5**	**6.4**	0.092 J	0.024 UJ	0.023 UJ	0.035 J [0.062 J]	0.024 UJ
Nickel	mg/kg	310	310	5.8	14.6 [14.8]	19.9	25.7	46.8	13	7.9	11.3	13.4 [14.9]	16.4
Potassium	mg/kg	- -	- -	724 J	1,000 J [848 J]	1,500 J	1,590 J	1,010 J	1,410 J	1,160 J	1,740 J	1,060 J [1,110 J]	2,550 J
Selenium	mg/kg	180	1,500	4.5 U	4.5 U [1.2 J]	5 U	4.5 U	2.1 J	5.1 U	4.3 U	5.2 U	4.6 U [1.1 J]	5 U
Silver	mg/kg	180	1,500	0.56 U	0.56 U [0.55 U]	0.62 U	0.56 U	4.1	0.64 U	0.54 U	0.65 U	0.57 U [0.56 U]	0.63 U
Sodium	mg/kg	- -	- -	248	359 [305]	451	447	670	487	328	394	252 [423]	288
Thallium	mg/kg	- -	- -	6.7 U	6.8 U [6.5 U]	0.42 J	6.7 U	9.4 U	7.7 U	6.4 U	7.8 U	6.9 U [6.7 U]	7.5 U
Vanadium	mg/kg	- -	- -	7.8 J	17.8 J [11.4 J]	20.7 J	23.1 J	19.6 J	28.5	11.6	16.2	12 [11.1]	19.5
Zinc	mg/kg	10,000	10,000	68.1 J	168 J [84.2 J]	59.7 J	77.4 J	1,730 J	171 J	58.6 J	53.3 J	70.7 J [74.7 J]	60.2 J
Miscellaneous													
Cyanide	mg/kg	27	27	1 U	1.2 [0.63 J]	1.2 U	1.2 U	1.5	0.98 J	0.82 J	0.87 J	3.8 [2.4]	0.81 J
Cyanide, Free	mg/kg	- -	- -	0.69 UB	0.42 J [0.49 U]	0.34 J	1.3	1.7	0.52 J	2.5 U	0.27 J	0.13 J [0.18 J]	0.14 J
Percent Moisture	%	- -	- -	NA	NA	NA	NA	NA	18	15	16	18 [11]	16
Percent Solids	%	- -	- -	NA	NA	NA	NA	NA	82	85	84	82 [89]	84

See Notes on Page 9.

Table 4
Summary of Soil Sample Analytical Results

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Notes:
Restricted Use SCO Residential: NYSDEC 6 NYCRR Part 375 Restricted Use Soil Cleanup Objectives for Protection of Residential Use.
Bold font and shading indicates that the sample result exceeds the NYSDEC 6 NYCRR Part 375 Restricted Use Soil Cleanup Objectives for Protection of Commercial Use.
Results reported in milligrams per kilogram (mg/kg); also expressed as parts per million (ppm).
[ ] Bracketed results represent a duplicate sample.
B: Analyte was also detected in the associated method blank.
J: Indicates an estimated value.
ND: None detected.
U: The compound was analyzed for but not detected. The associated value is the compound quantitation limit.

Table 5
Summary of Groundwater Sample Analytical Results

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Standards and Guidance Values	Units	AW-01 08/22/12	AW-01 08/27/13	AW-02 08/22/12	AW-02 08/27/13	AW-03 12/28/12	AW-03 08/27/13	AW-04 12/28/12	AW-04 08/27/13
Volatile Organics										
1,1,1-Trichloroethane	5	ug/L	1 U [1 U]	3.3 U	1 U	3.3 U	5 U [5 U]	3.3 U [3.3 U]	5 U	8.2 U
1,1,2,2-Tetrachloroethane	5	ug/L	1 U [1 U]	0.84 U	1 U	0.84 U	5 U [5 U]	0.84 U [0.84 U]	5 U	2.1 U
1,1,2-trichloro-1,2,2-trifluoroethane	5	ug/L	1 U [1 U]	1.2 U	1 U	1.2 U	5 U [5 U]	1.2 U [1.2 U]	5 U	3.1 U
1,1,2-Trichloroethane	1	ug/L	1 U [1 U]	0.92 U	1 U	0.92 U	5 U [5 U]	0.92 U [0.92 U]	5 U	2.3 U
1,1-Dichloroethane	5	ug/L	1 U [1 U]	1.5 U	1 U	1.5 U	5 U [5 U]	1.5 U [1.5 U]	5 U	3.8 U
1,1-Dichloroethene	5	ug/L	1 U [1 U]	1.2 U	1 U	1.2 U	5 U [5 U]	1.2 U [1.2 U]	5 U	2.9 U
1,2,4-Trichlorobenzene	5	ug/L	1 U [1 U]	1.6 U	1 U	1.6 U	5 U [5 U]	1.6 U [1.6 U]	5 U	4.1 U
1,2-Dibromo-3-chloropropane	0.04	ug/L	1 U [1 U]	1.6 UJ	1 U	1.6 UJ	5 U [5 U]	1.6 UJ [1.6 UJ]	5 U	3.9 UJ
1,2-Dibromoethane	0.0006	ug/L	1 U [1 U]	2.9 U	1 U	2.9 U	5 U [5 U]	2.9 U [2.9 U]	5 U	7.3 U
1,2-Dichlorobenzene	3	ug/L	1 U [1 U]	3.2 U	1 U	3.2 U	5 U [5 U]	3.2 U [3.2 U]	5 U	7.9 U
1,2-Dichloroethane	0.6	ug/L	1 U [1 U]	0.84 U	1 U	0.84 U	5 U [5 U]	0.84 U [0.84 U]	5 U	2.1 U
1,2-Dichloropropane	1	ug/L	1 U [1 U]	2.9 U	1 U	2.9 U	5 U [5 U]	2.9 U [2.9 U]	5 U	7.2 U
1,3-Dichlorobenzene	3	ug/L	1 U [1 U]	3.1 U	1 U	3.1 U	5 U [5 U]	3.1 U [3.1 U]	5 U	7.8 U
1,4-Dichlorobenzene	3	ug/L	1 U [1 U]	3.4 U	1 U	3.4 U	5 U [5 U]	3.4 U [3.4 U]	5 U	8.4 U
2-Butanone	50	ug/L	10 U [10 U]	5.3 U	10 U	5.3 U	50 U [50 U]	5.3 U [5.3 U]	50 U	13 U
2-Hexanone	50	ug/L	5 U [5 U]	5 U	5 U	5 U	25 U [25 U]	5 U [5 U]	25 U	12 U
4-Methyl-2-pentanone	- -	ug/L	5 U [5 U]	8.4 U	5 U	8.4 U	25 U [25 U]	8.4 U [8.4 U]	25 U	21 U
Acetone	50	ug/L	10 U [10 U]	12 U	10 U	12 U	50 U [50 U]	12 U [12 U]	50 U	30 U
Benzene	1	ug/L	**0.58 J [0.55 J]**	1.6 U	1 U	1.6 U	**12 [12]**	**4.8 [4.9]**	**170**	**310**
Bromodichloromethane	50	ug/L	1 U [1 U]	1.6 UJ	1 U	1.6 U	5 U [5 U]	1.6 U [1.6 U]	5 U	3.9 U
Bromoform	50	ug/L	1 U [1 U]	1 UJ	1 U	1 UJ	5 U [5 U]	1 UJ [1 UJ]	5 U	2.6 UJ
Bromomethane	5	ug/L	1 U [1 UJ]	2.8 UJ	1 U	2.8 U	5 U [5 U]	2.8 U [2.8 U]	5 U	6.9 U
Carbon Disulfide	60	ug/L	1 U [1 U]	0.76 UJ	1 U	0.76 UJ	5 U [5 U]	0.76 UJ [0.76 UJ]	5 U	1.9 UJ
Carbon Tetrachloride	5	ug/L	1 U [1 U]	1.1 U	1 U	1.1 U	5 U [5 U]	1.1 U [1.1 U]	5 U	2.7 U
Chlorobenzene	5	ug/L	1 U [1 U]	3 U	1 U	3 U	5 U [5 U]	3 U [3 U]	5 U	7.5 U
Chloroethane	5	ug/L	1 U [1 U]	1.3 UJ	1 U	1.3 U	5 U [5 U]	1.3 U [1.3 U]	5 U	3.2 U
Chloroform	7	ug/L	1 U [1 U]	1.4 U	1 U	1.4 U	5 U [5 U]	1.4 U [1.4 U]	5 U	3.4 U
Chloromethane	5	ug/L	1 U [1 U]	1.4 UJ	1 U	1.4 U	5 U [5 U]	1.4 U [1.4 U]	5 U	3.5 U
cis-1,2-Dichloroethene	5	ug/L	1 U [1 U]	3.2 U	1 U	3.2 U	5 U [5 U]	3.2 U [3.2 U]	5 U	8.1 U
cis-1,3-Dichloropropene	0.4	ug/L	1 U [1 U]	1.4 U	1 U	1.4 U	5 U [5 U]	1.4 U [1.4 U]	5 U	3.6 U
Cyclohexane	- -	ug/L	1 U [1 U]	0.72 UJ	1 U	0.72 UJ	5 U [5 U]	0.72 UJ [0.72 UJ]	5 U	1.8 UJ
Dibromochloromethane	50	ug/L	1 U [1 U]	1.3 UJ	1 U	1.3 U	5 U [5 U]	1.3 U [1.3 U]	5 U	3.2 U
Dichlorodifluoromethane	5	ug/L	1 U [1 U]	2.7 U	1 U	2.7 U	5 U [5 U]	2.7 U [2.7 U]	5 U	6.8 U
Ethylbenzene	5	ug/L	1 U [1 U]	3 U	1 U	3 U	5 U [5 U]	3 U [3 U]	**4 J**	**36**
Isopropylbenzene	5	ug/L	1 U [1 U]	3.2 U	1 U	3.2 U	5 U [5 U]	3.2 U [3.2 U]	5 U	7.9 U
Methyl acetate	- -	ug/L	1 U [1 U]	2 U	1 U	2 U	5 U [5 U]	2 U [2 U]	5 U	5 U
Methyl tert-butyl ether	10	ug/L	1 U [1 U]	0.64 U	1 U	0.64 U	5 U [5 U]	0.64 U [0.64 U]	5 U	1.6 U
Methylcyclohexane	- -	ug/L	1 U [1 U]	0.64 U	1 U	0.64 U	5 U [5 U]	0.64 U [0.64 U]	5 U	1.6 U
Methylene Chloride	5	ug/L	1 U [1 U]	1.8 U	1 U	1.8 U	**4.3 J [3 J]**	1.8 U [1.8 U]	5 U	4.4 U
Styrene	5	ug/L	1 U [1 U]	2.9 U	1 U	2.9 U	5 U [5 U]	2.9 U [2.9 U]	5 U	7.3 U

See Notes on Page 4.

Table 5
Summary of Groundwater Sample Analytical Results

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Standards and Guidance Values	Units	AW-01 08/22/12	AW-01 08/27/13	AW-02 08/22/12	AW-02 08/27/13	AW-03 12/28/12	AW-03 08/27/13	AW-04 12/28/12	AW-04 08/27/13
Volatile Organics (Cont.)										
Tetrachloroethene	5	ug/L	1 U [1 U]	1.4 U	1 U	1.4 U	5 U [5 U]	1.4 U [1.4 U]	5 U	3.6 U
Toluene	5	ug/L	1 U [1 U]	2 U	1 U	2 U	5 U [5 U]	2 U [2 U]	5 U	5.1 U
trans-1,2-Dichloroethene	5	ug/L	1 U [1 U]	3.6 U	1 U	3.6 U	5 U [5 U]	3.6 U [3.6 U]	5 U	9 U
trans-1,3-Dichloropropene	0.4	ug/L	1 U [1 U]	1.5 U	1 U	1.5 U	5 U [5 U]	1.5 U [1.5 U]	5 U	3.7 U
Trichloroethene	5	ug/L	1 U [1 U]	1.8 U	1 U	1.8 U	5 U [5 U]	1.8 U [1.8 U]	5 U	4.6 U
Trichlorofluoromethane	5	ug/L	1 U [1 U]	3.5 U	1 U	3.5 U	5 U [5 U]	3.5 U [3.5 U]	5 U	8.8 U
Vinyl Chloride	2	ug/L	1 U [1 U]	3.6 U	1 U	3.6 U	5 U [5 U]	3.6 U [3.6 U]	5 U	9 U
Xylenes (total)	5	ug/L	2 U [2 U]	2.6 U	2 U	2.6 U	10 U [10 U]	2.6 U [2.6 U]	10 U	**8.9 J**
Total BTEX	- -	ug/L	**0.58 J [0.55 J]**	ND	ND	ND	**12 [12]**	**4.8 [4.9]**	**174 J**	**354.9 J**
Total VOCs	- -	ug/L	**0.58 J [0.55 J]**	ND	ND	ND	**16.3 J [15 J]**	**4.8 [4.9]**	**174 J**	**354.9 J**
Semivolatile Organics										
1,1'-Biphenyl	5	ug/L	4.7 U [4.7 U]	0.62 U	4.8 U	0.6 U	**4.5 J [4.4 J]**	**1.2 J [1.1 J]**	4.7 U	0.62 U
2,2'-Oxybis(1-Chloropropane)	5	ug/L	4.7 U [4.7 U]	0.49 U	4.8 U	0.48 U	5 U [5 U]	0.49 U [0.5 U]	4.7 U	0.49 U
2,4,5-Trichlorophenol	- -	ug/L	4.7 U [4.7 U]	0.45 U	4.8 U	0.44 U	5 U [5 U]	0.45 U [0.46 U]	4.7 U	0.45 U
2,4,6-Trichlorophenol	- -	ug/L	4.7 U [4.7 U]	0.58 U	4.8 U	0.57 U	5 U [5 U]	0.57 U [0.59 U]	4.7 U	0.58 U
2,4-Dichlorophenol	5	ug/L	4.7 U [4.7 U]	0.48 U	4.8 U	0.47 U	5 U [5 U]	0.48 U [0.49 U]	4.7 U	0.48 U
2,4-Dimethylphenol	50	ug/L	4.7 U [4.7 U]	0.47 U	4.8 U	0.46 U	5 U [5 U]	0.47 U [0.48 U]	**11 J**	**14**
2,4-Dinitrophenol	10	ug/L	9.4 U [9.4 U]	2.1 U	9.6 U	2.1 U	9.9 U [9.9 U]	2.1 U [2.1 U]	9.5 U	2.1 U
2,4-Dinitrotoluene	5	ug/L	4.7 U [4.7 U]	0.42 U	4.8 U	0.41 U	5 U [5 U]	0.42 U [0.43 U]	4.7 U	0.42 U
2,6-Dinitrotoluene	5	ug/L	4.7 U [4.7 U]	0.38 UJ	4.8 U	0.37 UJ	5 U [5 U]	0.38 UJ [0.39 UJ]	4.7 U	0.38 UJ
2-Chloronaphthalene	10	ug/L	4.7 U [4.7 U]	0.43 U	4.8 U	0.43 U	5 U [5 U]	0.43 U [0.44 U]	4.7 U	0.43 U
2-Chlorophenol	- -	ug/L	4.7 U [4.7 U]	0.5 U	4.8 U	0.49 U	5 U [5 U]	0.5 U [0.51 U]	4.7 U	0.5 U
2-Methylnaphthalene	- -	ug/L	4.7 U [4.7 U]	0.57 U	4.8 U	0.56 U	**39 [41]**	0.56 U [0.58 U]	**1.6 J**	0.57 U
2-Methylphenol	- -	ug/L	4.7 U [4.7 U]	0.38 U	4.8 U	0.37 U	5 U [5 U]	0.38 U [0.39 U]	4.7 UJ	0.38 U
2-Nitroaniline	5	ug/L	9.4 U [9.4 U]	0.4 U	9.6 U	0.39 U	9.9 U [9.9 U]	0.4 U [0.41 U]	9.5 U	0.4 U
2-Nitrophenol	- -	ug/L	4.7 U [4.7 U]	0.45 U	4.8 U	0.44 U	5 U [5 U]	0.45 U [0.46 U]	4.7 U	0.45 U
3,3'-Dichlorobenzidine	5	ug/L	4.7 U [4.7 U]	0.38 U	4.8 U	0.37 U	5 U [5 U]	0.38 U [0.39 U]	4.7 U	0.38 U
3-Nitroaniline	5	ug/L	9.4 U [9.4 U]	0.45 UJ	9.6 U	0.44 UJ	9.9 U [9.9 U]	0.45 UJ [0.46 UJ]	9.5 U	0.45 UJ
4,6-Dinitro-2-methylphenol	- -	ug/L	9.4 U [9.4 U]	2.1 U	9.6 U	2 U	9.9 U [9.9 U]	2.1 U [2.1 U]	9.5 U	2.1 U
4-Bromophenyl-phenylether	- -	ug/L	4.7 U [4.7 U]	0.43 UJ	4.8 U	0.42 UJ	5 U [5 U]	0.42 UJ [0.44 UJ]	4.7 U	0.43 UJ
4-Chloro-3-Methylphenol	- -	ug/L	4.7 U [4.7 U]	0.43 U	4.8 U	0.42 U	5 U [5 U]	0.42 U [0.44 U]	4.7 U	0.43 U
4-Chloroaniline	5	ug/L	4.7 U [4.7 U]	0.56 UJ	4.8 U	0.55 UJ	5 U [5 U]	0.55 UJ [0.57 UJ]	4.7 U	0.56 UJ
4-Chlorophenyl-phenylether	- -	ug/L	4.7 U [4.7 U]	0.33 U	4.8 U	0.32 U	5 U [5 U]	0.33 U [0.34 U]	4.7 U	0.33 U
4-Methylphenol	- -	ug/L	9.4 U [9.4 U]	0.34 U	9.6 U	0.33 U	9.9 U [9.9 U]	0.34 U [0.35 U]	9.5 U	0.34 U
4-Nitroaniline	5	ug/L	9.4 U [9.4 U]	0.24 UJ	9.6 U	0.23 UJ	9.9 U [9.9 U]	0.24 UJ [0.24 UJ]	9.5 U	0.24 UJ
4-Nitrophenol	- -	ug/L	9.4 U [9.4 U]	1.4 U	9.6 U	1.4 U	9.9 U [9.9 U]	1.4 U [1.5 U]	9.5 U	1.4 U
Acenaphthene	20	ug/L	**2.2 J [2 J]**	**2.7 J**	**1.1 J**	**3.3 J**	**81 [80]**	**43 [41]**	**1.9 J**	**1.8 J**
Acenaphthylene	- -	ug/L	4.7 U [4.7 U]	0.36 U	4.8 U	0.35 U	**0.78 J [0.75 J]**	**0.39 J [0.4 J]**	4.7 U	0.36 U
Acetophenone	- -	ug/L	4.7 U [4.7 U]	0.51 U	4.8 U	0.5 U	**5 U [0.96 J]**	4.7 UB [0.52 U]	4.7 U	4.7 UB
Anthracene	50	ug/L	4.7 U [4.7 U]	0.26 U	4.8 U	**0.32 J**	**7.9 [8.3]**	**5.4 [5]**	4.7 U	0.26 U

See Notes on Page 4.

Table 5
Summary of Groundwater Sample Analytical Results

Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Standards and Guidance Values	Units	AW-01 08/22/12	AW-01 08/27/13	AW-02 08/22/12	AW-02 08/27/13	AW-03 12/28/12	AW-03 08/27/13	AW-04 12/28/12	AW-04 08/27/13
Semivolatile Organics (Cont.)										
Atrazine	7.5	ug/L	4.7 U [4.7 U]	0.43 U	4.8 U	0.43 U	5 U [5 U]	0.43 U [0.44 U]	4.7 U	0.43 U
Benzaldehyde	- -	ug/L	4.7 U [4.7 U]	**0.43 J**	4.8 U	**0.31 J**	5 U [5 U]	**0.44 J [0.41 J]**	4.7 U	**0.42 J**
Benzo(a)anthracene	0.002	ug/L	4.7 U [4.7 U]	0.34 U	4.8 U	0.33 U	5 U [5 U]	**0.35 J [0.36 J]**	4.7 U	0.34 U
Benzo(a)pyrene	- -	ug/L	4.7 U [4.7 U]	0.44 U	4.8 U	0.44 U	5 U [5 U]	0.44 U [0.45 U]	4.7 U	0.44 U
Benzo(b)fluoranthene	0.002	ug/L	4.7 U [4.7 U]	0.32 U	4.8 U	0.31 U	5 U [5 U]	0.32 U [0.33 U]	4.7 U	0.32 U
Benzo(g,h,i)perylene	- -	ug/L	4.7 U [4.7 U]	0.33 UJ	4.8 U	0.32 U	5 U [5 U]	0.33 U [0.34 U]	4.7 U	0.33 U
Benzo(k)fluoranthene	0.002	ug/L	4.7 U [4.7 U]	0.69 U	4.8 U	0.68 U	5 U [5 U]	0.69 U [0.71 U]	4.7 U	0.69 U
bis(2-Chloroethoxy)methane	5	ug/L	4.7 U [4.7 U]	0.33 U	4.8 U	0.32 U	5 U [5 U]	0.33 U [0.34 U]	4.7 U	0.33 U
bis(2-Chloroethyl)ether	- -	ug/L	4.7 U [4.7 U]	0.38 U	4.8 U	0.37 U	5 U [5 U]	0.38 U [0.39 U]	4.7 U	0.38 U
bis(2-Ethylhexyl)phthalate	5	ug/L	4.7 U [4.7 U]	1.7 U	4.8 U	1.7 U	5 U [5 U]	4.7 UB [1.7 U]	4.7 U	1.7 U
Butylbenzylphthalate	50	ug/L	4.7 U [4.7 U]	0.4 U	4.8 U	0.39 U	5 U [5 U]	0.4 U [0.41 U]	4.7 U	0.4 U
Caprolactam	- -	ug/L	4.7 U [4.7 U]	2.1 U	4.8 U	2 U	5 UJ [5 UJ]	2.1 U [2.1 U]	4.7 UJ	2.1 U
Carbazole	- -	ug/L	4.7 U [4.7 U]	0.28 U	4.8 U	**0.71 J**	**10 [11]**	**4.7 [4.8]**	4.7 U	0.28 U
Chrysene	0.002	ug/L	4.7 U [4.7 U]	0.31 U	4.8 U	0.31 U	5 U [5 U]	0.31 U [0.32 U]	4.7 U	0.31 U
Dibenzo(a,h)anthracene	- -	ug/L	4.7 U [4.7 U]	0.4 UJ	4.8 U	0.39 U	5 U [5 U]	0.4 U [0.41 U]	4.7 U	0.4 U
Dibenzofuran	- -	ug/L	9.4 U [9.4 U]	0.48 U	9.6 U	**0.79 J**	**41 [40]**	**17 [16]**	9.5 U	0.48 U
Diethylphthalate	50	ug/L	4.7 U [4.7 U]	0.21 U	4.8 U	0.2 U	5 U [5 U]	0.21 U [0.21 U]	4.7 U	0.21 U
Dimethylphthalate	50	ug/L	4.7 U [4.7 U]	0.34 U	4.8 U	0.33 U	5 U [5 U]	0.34 U [0.35 U]	4.7 U	0.34 U
Di-n-Butylphthalate	50	ug/L	4.7 U [4.7 U]	**0.4 J**	4.8 U	**0.48 J**	5 U [5 U]	**0.51 J [0.66 J]**	4.7 U	**0.57 J**
Di-n-Octylphthalate	50	ug/L	**1.9 J [4.7 U]**	0.44 U	4.8 U	0.44 U	5 U [5 U]	0.44 U [0.45 U]	4.7 U	0.44 U
Fluoranthene	50	ug/L	4.7 U [4.7 U]	0.38 U	4.8 U	**1.6 J**	**6.7 [6.6]**	**6.2 [5.9]**	4.7 U	0.38 U
Fluorene	50	ug/L	4.7 U [4.7 U]	0.34 U	4.8 U	**0.9 J**	**47 [45]**	**23 [23]**	4.7 U	0.34 U
Hexachlorobenzene	0.04	ug/L	4.7 U [4.7 U]	0.48 U	4.8 U	0.47 U	5 U [5 U]	0.48 U [0.49 U]	4.7 U	0.48 U
Hexachlorobutadiene	0.5	ug/L	4.7 U [4.7 U]	0.64 U	4.8 U	0.63 U	5 U [5 U]	0.64 U [0.66 U]	4.7 U	0.64 U
Hexachlorocyclopentadiene	5	ug/L	4.7 U [4.7 U]	0.56 U	4.8 U	0.55 U	5 U [5 U]	0.55 U [0.57 U]	4.7 U	0.56 U
Hexachloroethane	5	ug/L	4.7 U [4.7 U]	0.56 U	4.8 U	0.55 U	5 U [5 U]	0.55 U [0.57 U]	4.7 U	0.56 U
Indeno(1,2,3-cd)pyrene	0.002	ug/L	4.7 U [4.7 U]	0.44 UJ	4.8 U	0.44 U	5 U [5 U]	0.44 U [0.45 U]	4.7 U	0.44 U
Isophorone	50	ug/L	4.7 U [4.7 U]	0.41 U	4.8 U	0.4 U	5 U [5 U]	0.4 U [0.42 U]	4.7 U	0.41 U
Naphthalene	10	ug/L	4.7 U [4.7 U]	0.72 U	**1.4 J**	0.7 U	**4.9 J [4.6 J]**	0.71 U [0.73 U]	**3.6 J**	**12**
Nitrobenzene	0.4	ug/L	4.7 U [4.7 U]	0.27 U	4.8 U	0.27 U	5 U [5 U]	0.27 U [0.28 U]	4.7 U	0.27 U
N-Nitroso-di-n-propylamine	- -	ug/L	4.7 U [4.7 U]	0.51 U	4.8 U	0.5 U	5 U [5 U]	0.51 U [0.52 U]	4.7 U	0.51 U
N-Nitrosodiphenylamine	50	ug/L	4.7 U [4.7 U]	0.48 U	4.8 U	0.47 U	5 U [5 U]	0.48 U [0.49 U]	4.7 U	0.48 U
Pentachlorophenol	1	ug/L	9.4 U [9.4 U]	2.1 U	9.6 U	2 U	9.9 U [9.9 U]	2.1 U [2.1 U]	9.5 U	2.1 U
Phenanthrene	50	ug/L	4.7 U [4.7 U]	4.7 UB	4.8 U	4.6 UB	**45 [46]**	**23 [23]**	4.7 U	0.42 U
Phenol	1	ug/L	4.7 U [4.7 U]	0.37 U	4.8 U	0.36 U	5 U [5 U]	0.37 U [0.38 U]	4.7 U	**4.1 J**
Pyrene	50	ug/L	4.7 U [4.7 U]	0.32 U	**0.59 J**	**0.74 J**	**3.7 J [3.6 J]**	**2.4 J [2.6 J]**	4.7 U	0.32 U
Total PAHs	- -	ug/L	**2.2 J [2 J]**	**2.7 J**	**3.09 J**	**6.86 J**	**235.98 J [235.85 J]**	**103.74 J [101.26 J]**	**7.1 J**	**17.9 J**
Total SVOCs	- -	ug/L	**4.1 J [6.7 J]**	**3.53 J**	**3.09 J**	**9.15 J**	**291.48 J [292.21 J]**	**127.59 J [124.23 J]**	**18.1 J**	**32.89 J**

See Notes on Page 4.

Table 5
Summary of Groundwater Sample Analytical Results

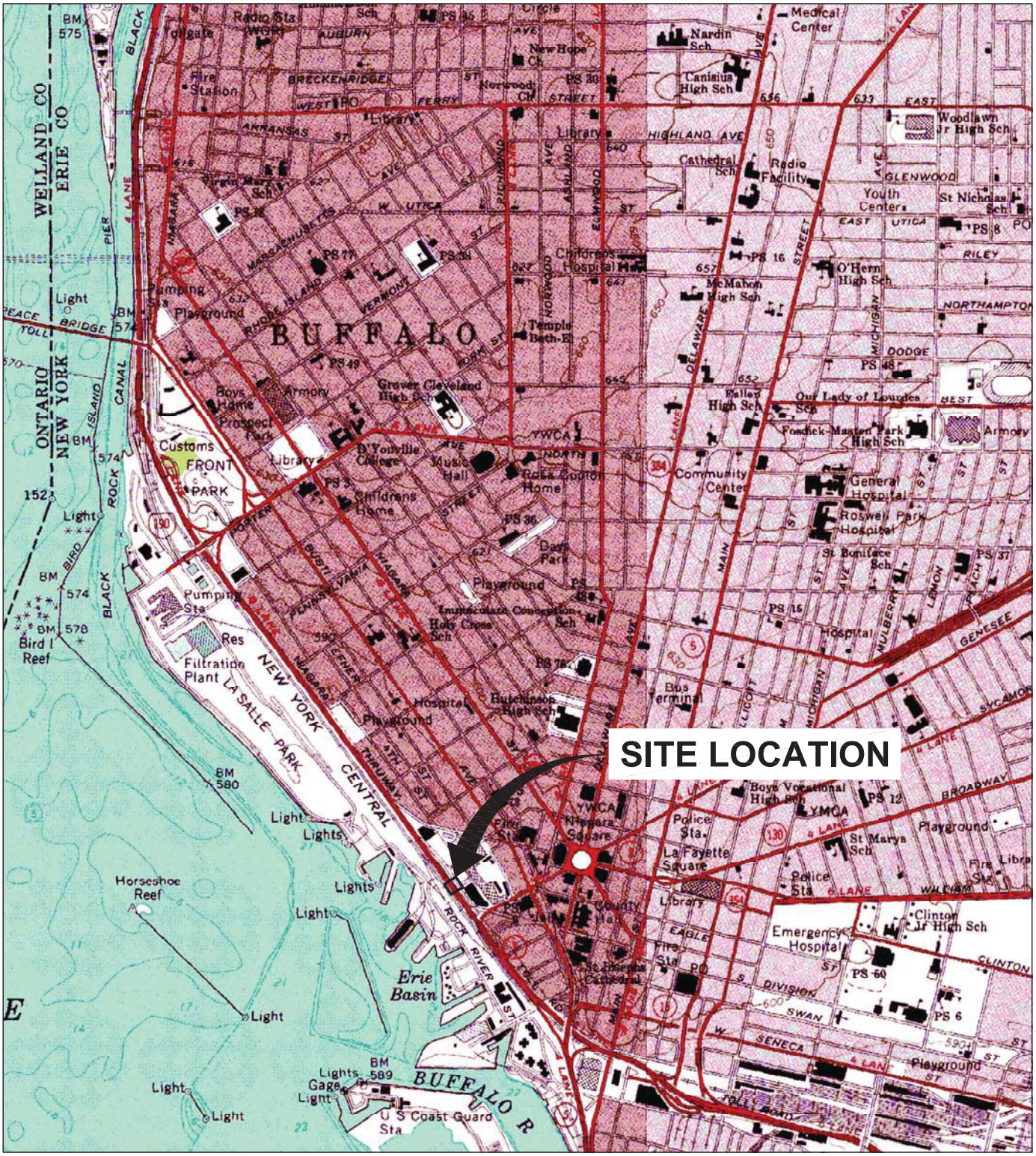
Site Characterization
National Fuel Gas Distribution Corporation
Former Buffalo Service Station - Off-Site
Buffalo, NY

Location ID: / Date Collected:	NYSDEC TOGS 1.1.1 Standards and Guidance Values	Units	AW-01 08/22/12	AW-01 08/27/13	AW-02 08/22/12	AW-02 08/27/13	AW-03 12/28/12	AW-03 08/27/13	AW-04 12/28/12	AW-04 08/27/13
Inorganics										
Aluminum	- -	mg/L	**0.071 J [0.086 J]**	0.06 U	**0.3**	**0.11 J**	0.2 U [0.2 U]	0.06 U [0.06 U]	**2.2**	**0.064 J**
Antimony	0.003	mg/L	0.02 U [0.02 U]	0.0068 U	0.02 U	0.0068 U	0.02 U [0.02 U]	0.0068 U [0.0068 U]	0.02 U	0.0068 U
Arsenic	0.025	mg/L	0.01 U [0.01 U]	0.0056 U	0.01 U	0.0056 U	**0.0085 J [0.0058 J]**	**0.0076 J [0.0056 U]**	0.01 U	0.0056 U
Barium	1	mg/L	**0.052 [0.052]**	**0.051**	**1.8**	**0.53**	**0.094 [0.094]**	**0.063 [0.063]**	**1.1**	**0.7**
Beryllium	0.003	mg/L	0.002 U [0.002 U]	0.0003 U	0.002 U	0.0003 U	0.002 U [0.002 U]	0.0003 U [0.0003 U]	0.002 U	0.0003 U
Cadmium	0.005	mg/L	**0.001 U [0.00053 J]**	0.0005 U	0.001 U	0.0005 U	0.001 U [0.001 U]	0.0005 U [0.0005 U]	0.001 U	0.0005 U
Calcium	- -	mg/L	**294 [301]**	**344**	**376**	**183**	**373 [372]**	**245 [243]**	**453**	**374**
Chromium	0.05	mg/L	0.004 U [0.004 U]	**0.0018 J**	**0.0019 J**	**0.0015 J**	**0.0025 J [0.0028 J]**	**0.0021 J [0.0022 J]**	**0.0046**	**0.0023 J**
Cobalt	- -	mg/L	**0.004 U [0.00071 J]**	**0.00071 J**	**0.0039 J**	0.00063 U	**0.00068 J [0.004 U]**	0.00063 U [0.00063 U]	**0.00094 J**	0.00063 U
Copper	0.2	mg/L	**0.01 U [0.0022 J]**	**0.002 J**	**0.0031 J**	**0.002 J**	**0.0024 J [0.01 U]**	**0.0016 U [0.0017 J]**	**0.0037 J**	**0.0024 J**
Iron	0.3	mg/L	**15.1 [15.3]**	**11.9**	**7.6**	0.32 UB	**15.5 [15.4]**	**16.3 [16.1]**	**15.9**	**14.1**
Lead	0.025	mg/L	0.005 U [0.005 U]	0.003 U	**0.0095**	0.003 U	0.005 U [0.005 U]	0.003 U [0.003 U]	0.005 U	0.003 U
Magnesium	35	mg/L	**19.6 [19.7]**	**19.9**	**68.2**	**32**	**23 [22.8]**	**13.8 [13.6]**	**83.2**	**64.4**
Manganese	0.3	mg/L	**0.77 [0.78]**	**0.8**	**0.71**	**0.38**	**1.4 [1.4]**	**0.76 [0.75]**	**0.83**	**0.75**
Mercury	0.0007	mg/L	0.0002 U [0.0002 U]	0.00012 U	0.0002 U	0.00012 U	0.0002 U [0.0002 U]	0.00012 U [0.00012 U]	0.0002 U	0.00012 U
Nickel	0.1	mg/L	0.01 U [0.01 U]	0.0013 U	0.01 U	0.0013 U	0.01 U [0.01 U]	0.0013 U [0.0013 U]	**0.0026 J**	0.0013 U
Potassium	- -	mg/L	**9.7 [9.7]**	**11.4**	**19.5**	**16.3**	**11.4 [11.2]**	**10.1 [10]**	**49.8**	**46.8**
Selenium	0.01	mg/L	0.015 U [0.015 U]	0.0087 U	0.015 U	0.0087 U	0.015 U [0.015 U]	0.0087 U [0.0087 U]	0.015 U	0.0087 U
Silver	0.05	mg/L	0.003 U [0.003 U]	0.0017 U	0.003 U	0.0017 U	0.003 U [0.003 U]	0.0017 U [0.0017 U]	0.003 U	0.0017 U
Sodium	20	mg/L	**498 [504]**	**521**	**8,090**	**764**	**352 [351]**	**341 [337]**	**649**	**631**
Thallium	0.0005	mg/L	0.02 U [0.02 U]	0.01 U	0.02 U	0.01 U	0.02 U [0.02 U]	0.01 U [0.01 U]	0.02 U	0.01 U
Vanadium	- -	mg/L	**0.0041 J [0.0047 J]**	**0.0025 J**	**0.0042 J**	0.0015 U	**0.0036 J [0.0037 J]**	**0.0029 J [0.0028 J]**	**0.0091**	**0.0057**
Zinc	2	mg/L	**0.0034 J [0.0026 J]**	0.0015 U	**0.014**	0.01 UB	**0.0024 J [0.0024 J]**	0.01 UB [0.01 UB]	**0.011**	0.01 UB
Miscellaneous										
Cyanide	0.2	mg/L	**0.088 J [0.063 J]**	**0.087**	0.02 UBJ	0.005 U	**0.11 [0.093 J]**	**0.11 [0.1]**	**0.011 J**	**0.064**
Cyanide, Free	- -	mg/L	0.002 UB [0.002 UB]	NA	0.002 U	NA	**0.005 U [0.0016 J]**	NA	0.005 U	NA

Notes:
NYSDEC TOGS 1.1.1 Water Standards and Guidance Value exceedances are shaded.
ug/L - micrograms per liter; mg/L = milligrams per liter.
Bolded values are detected.
[ ] Bracketed results represent a duplicate sample.
B: Analyte was also detected in the associated method blank.
J: Indicates an estimated value.
ND: None detected.
U: The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
NA: Not Available/Not Applicable.

ARCADIS

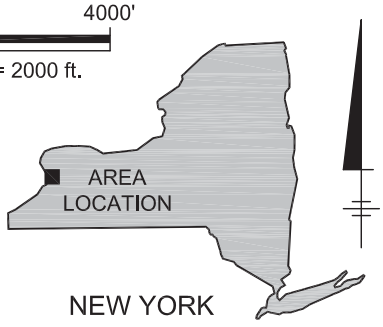
Figures



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUADS., BUFFALO NW, NY-ON, AND BUFFALO NE, 1965.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



FORMER BUFFALO SERVICE STATION - OFF-SITE
BUFFALO, NEW YORK
SITE CHARACTERIZATION

SITE LOCATION MAP

ARCADIS

FIGURE
1

CITY:SYRACUSE, NY DIV/GROUP:ENV/IM-DV DB:D. HOWES, R. ALLEN LD:(Opt) PIC:(Opt) PM:S. POWLIN TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
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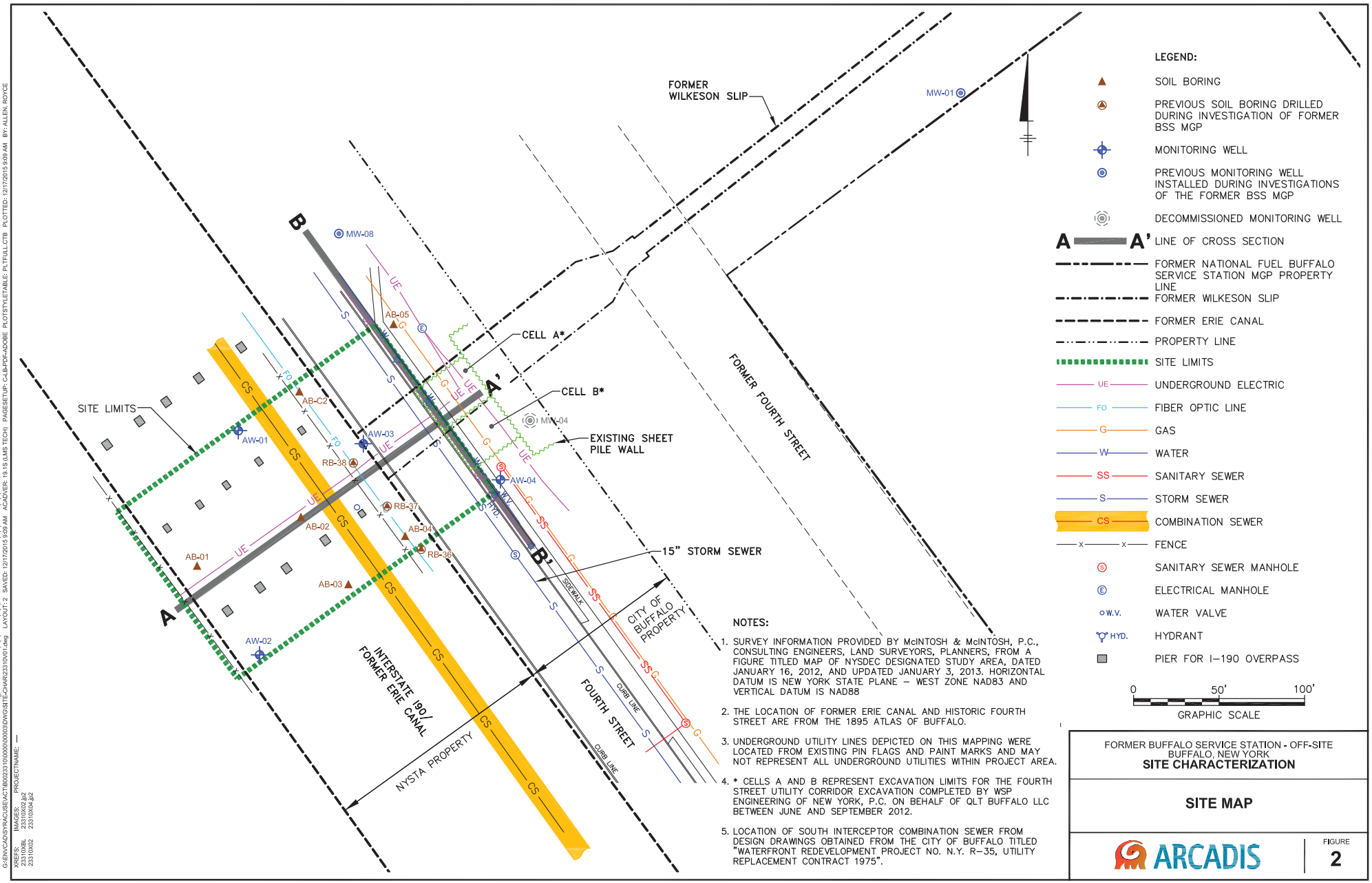
QUADs.jpg



NOTES:

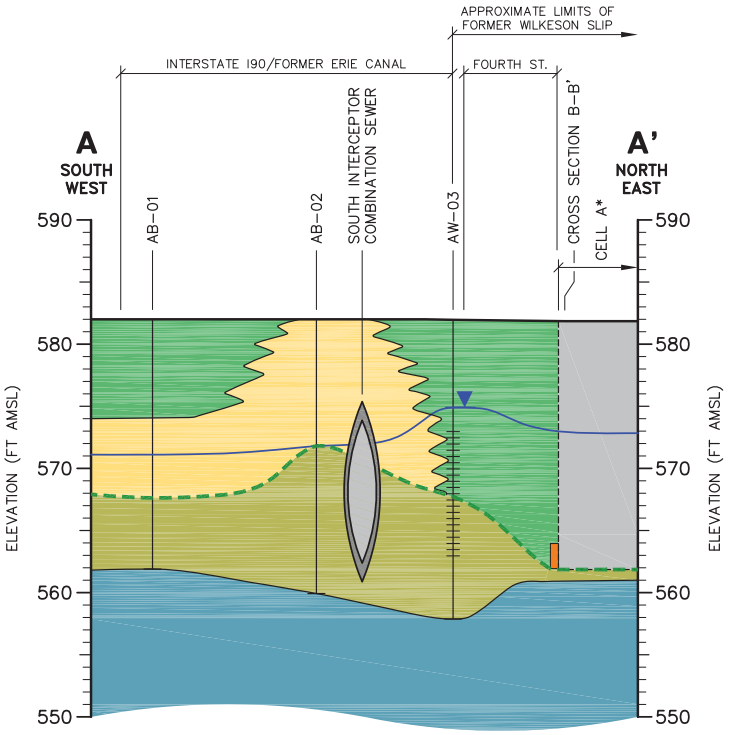
1. SURVEY INFORMATION PROVIDED BY McINTOSH & McINTOSH, P.C., CONSULTING ENGINEERS, LAND SURVEYORS, PLANNERS, FROM A FIGURE TITLED MAP OF NYSDEC DESIGNATED STUDY AREA, DATED JANUARY 16, 2012, AND UPDATED JANUARY 3, 2013. HORIZONTAL DATUM IS NEW YORK STATE PLANE – WEST ZONE NAD83 AND VERTICAL DATUM IS NAD88
2. THE LOCATION OF FORMER ERIE CANAL AND HISTORIC FOURTH STREET ARE FROM THE 1895 ATLAS OF BUFFALO.
3. UNDERGROUND UTILITY LINES DEPICTED ON THIS MAPPING WERE LOCATED FROM EXISTING PIN FLAGS AND PAINT MARKS AND MAY NOT REPRESENT ALL UNDERGROUND UTILITIES WITHIN PROJECT AREA.
4. * CELLS A AND B REPRESENT EXCAVATION LIMITS FOR THE FOURTH STREET UTILITY CORRIDOR EXCAVATION COMPLETED BY WSP ENGINEERING OF NEW YORK, P.C. ON BEHALF OF QLT BUFFALO LLC BETWEEN JUNE AND SEPTEMBER 2012.
5. LOCATION OF SOUTH INTERCEPTOR COMBINATION SEWER FROM DESIGN DRAWINGS OBTAINED FROM THE CITY OF BUFFALO TITLED "WATERFRONT REDEVELOPMENT PROJECT NO. N.Y. R-35, UTILITY REPLACEMENT CONTRACT 1975".

FORMER BUFFALO SERVICE STATION - OFF-SITE
BUFFALO, NEW YORK
SITE CHARACTERIZATION

SITE MAP

ARCADIS

FIGURE
2



LEGEND:

- AB-01 — WELL OR BORING ID
- GROUND SURFACE
- GROUNDWATER ELEVATION (2/18/13)
- LITHOLOGIC CONTACT (DASHED WHERE INFERRED)
- FILL AND NATIVE SOIL CONTACT
- SCREEN
- BOTTOM OF BORING
- COAL TAR
- FINE TO COARSE SAND AND GRAVEL
- SILT AND SAND
- SILT AND CLAY
- ONONDAGA LIMESTONE

NOTE:

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VERTICAL EXAGGERATION = 5X

0 10' 20'

VERTICAL SCALE

0 50' 100'

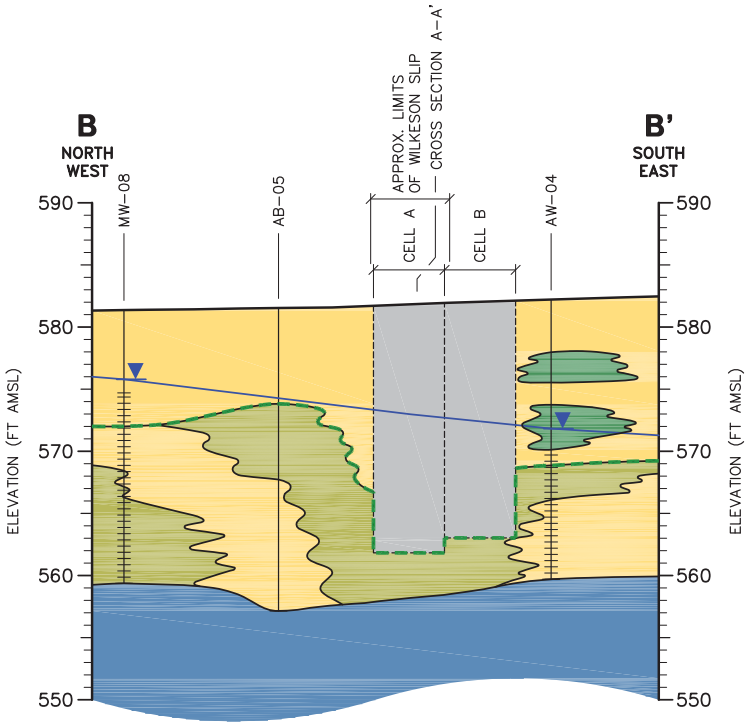
HORIZONTAL SCALE

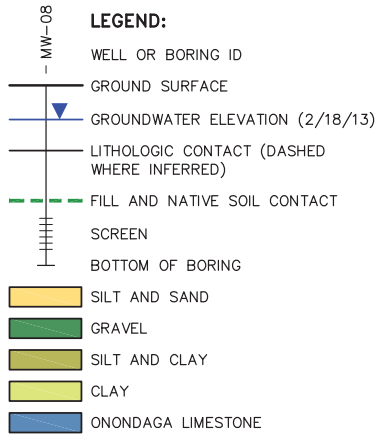
FORMER BUFFALO SERVICE STATION - OFF-SITE
BUFFALO, NEW YORK
SITE CHARACTERIZATION

CROSS SECTION A-A'

ARCADIS

FIGURE
3





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VERTICAL EXAGGERATION = 5X

0 10' 20'

VERTICAL SCALE

0 50' 100'

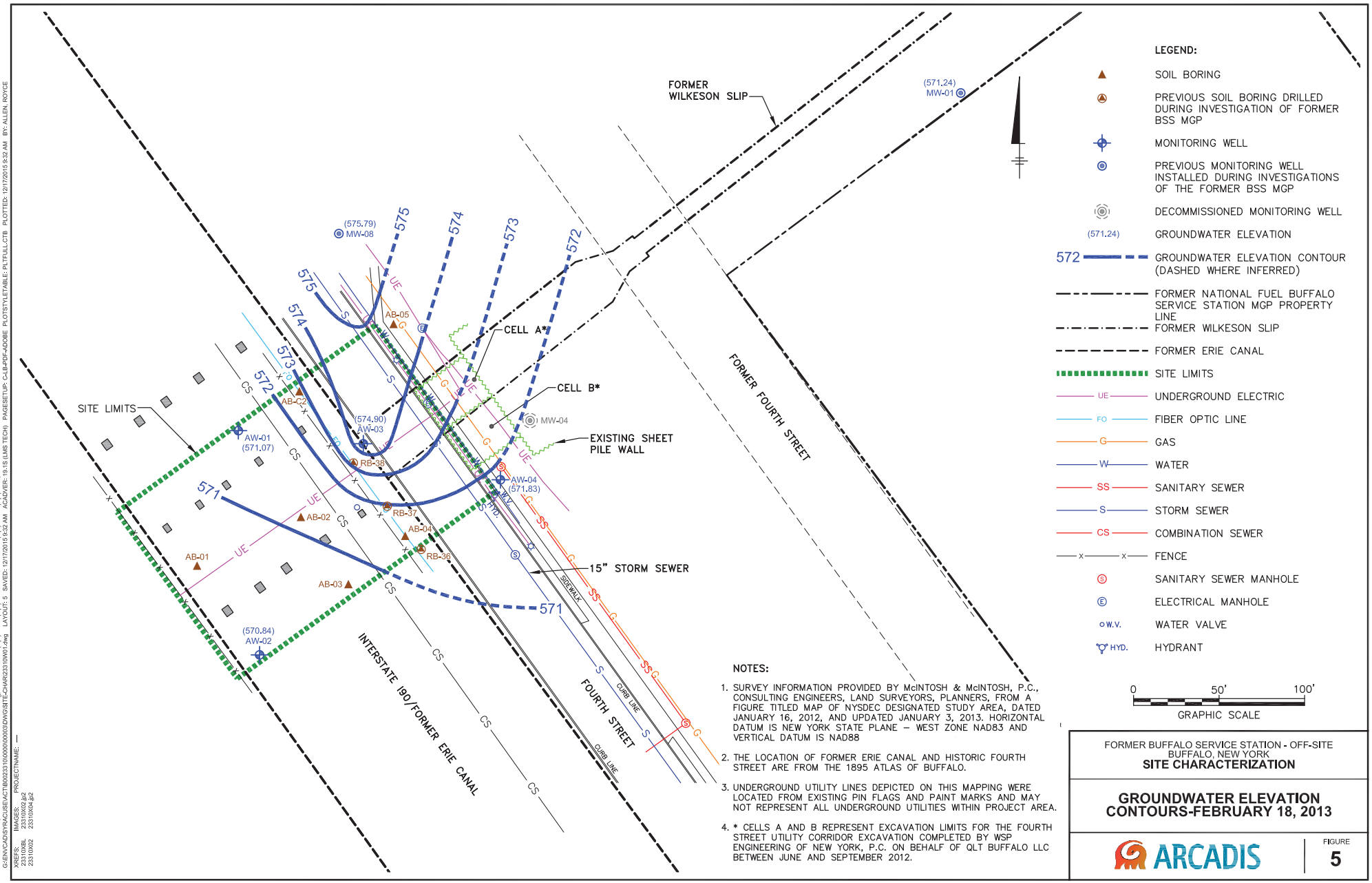
HORIZONTAL SCALE

FORMER BUFFALO SERVICE STATION - OFF-SITE
BUFFALO, NEW YORK
SITE CHARACTERIZATION

CROSS SECTION B-B'

ARCADIS

FIGURE
4



LEGEND:

- SOIL BORING
- PREVIOUS SOIL BORING DRILLED DURING INVESTIGATION OF FORMER BSS MGP
- MONITORING WELL
- PREVIOUS MONITORING WELL INSTALLED DURING INVESTIGATIONS OF THE FORMER BSS MGP
- DECOMMISSIONED MONITORING WELL
- (571.24) GROUNDWATER ELEVATION
- 572 GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)
- FORMER NATIONAL FUEL BUFFALO SERVICE STATION MGP PROPERTY LINE
- FORMER WILKESON SLIP
- FORMER ERIE CANAL
- SITE LIMITS
- UE UNDERGROUND ELECTRIC
- FO FIBER OPTIC LINE
- G GAS
- W WATER
- SS SANITARY SEWER
- S STORM SEWER
- CS COMBINATION SEWER
- FENCE
- Ⓢ SANITARY SEWER MANHOLE
- Ⓔ ELECTRICAL MANHOLE
- W.V. WATER VALVE
- HYD. HYDRANT

0 50' 100'
GRAPHIC SCALE

NOTES:

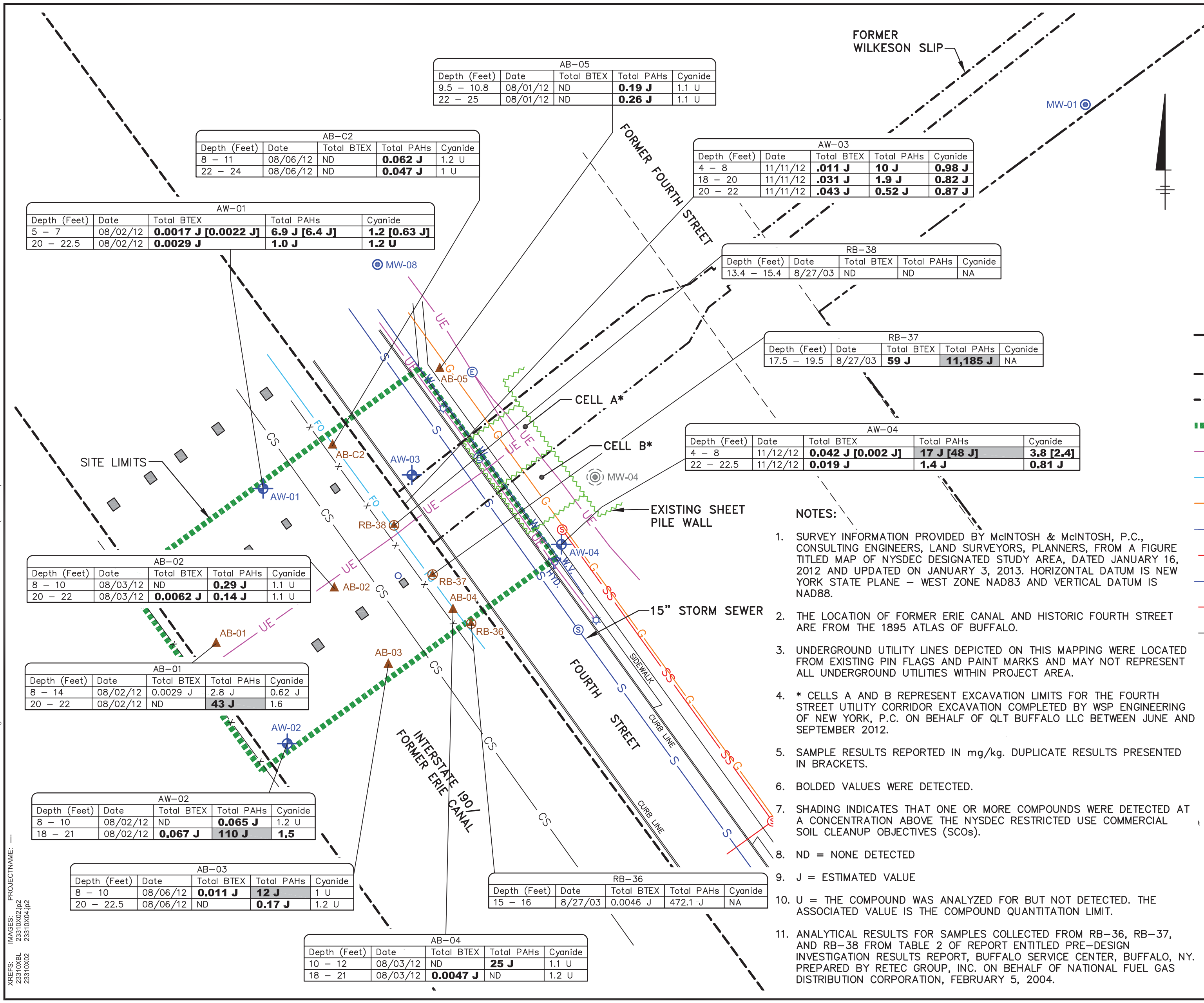
1. SURVEY INFORMATION PROVIDED BY McINTOSH & McINTOSH, P.C., CONSULTING ENGINEERS, LAND SURVEYORS, PLANNERS, FROM A FIGURE TITLED MAP OF NYSDEC DESIGNATED STUDY AREA, DATED JANUARY 16, 2012, AND UPDATED JANUARY 3, 2013. HORIZONTAL DATUM IS NEW YORK STATE PLANE – WEST ZONE NAD83 AND VERTICAL DATUM IS NAD88
2. THE LOCATION OF FORMER ERIE CANAL AND HISTORIC FOURTH STREET ARE FROM THE 1895 ATLAS OF BUFFALO.
3. UNDERGROUND UTILITY LINES DEPICTED ON THIS MAPPING WERE LOCATED FROM EXISTING PIN FLAGS AND PAINT MARKS AND MAY NOT REPRESENT ALL UNDERGROUND UTILITIES WITHIN PROJECT AREA.
4. * CELLS A AND B REPRESENT EXCAVATION LIMITS FOR THE FOURTH STREET UTILITY CORRIDOR EXCAVATION COMPLETED BY WSP ENGINEERING OF NEW YORK, P.C. ON BEHALF OF QLT BUFFALO LLC BETWEEN JUNE AND SEPTEMBER 2012.

FORMER BUFFALO SERVICE STATION - OFF-SITE
BUFFALO, NEW YORK
SITE CHARACTERIZATION

GROUNDWATER ELEVATION CONTOURS-FEBRUARY 18, 2013

ARCADIS

FIGURE 5



AB-05

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
9.5 – 10.8	08/01/12	ND	**0.19 J**	1.1 U
22 – 25	08/01/12	ND	**0.26 J**	1.1 U

AB-C2

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
8 – 11	08/06/12	ND	**0.062 J**	1.2 U
22 – 24	08/06/12	ND	**0.047 J**	1 U

AW-01

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
5 – 7	08/02/12	**0.0017 J [0.0022 J]**	**6.9 J [6.4 J]**	**1.2 [0.63 J]**
20 – 22.5	08/02/12	**0.0029 J**	**1.0 J**	**1.2 U**

AW-03

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 8	11/11/12	**.011 J**	**10 J**	**0.98 J**
18 – 20	11/11/12	**.031 J**	**1.9 J**	**0.82 J**
20 – 22	11/11/12	**.043 J**	**0.52 J**	**0.87 J**

RB-38

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
13.4 – 15.4	8/27/03	ND	ND	NA

RB-37

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
17.5 – 19.5	8/27/03	**59 J**	**11,185 J**	NA

AW-04

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
4 – 8	11/12/12	**0.042 J [0.002 J]**	**17 J [48 J]**	**3.8 [2.4]**
22 – 22.5	11/12/12	**0.019 J**	**1.4 J**	**0.81 J**

AB-02

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
8 – 10	08/03/12	ND	**0.29 J**	1.1 U
20 – 22	08/03/12	**0.0062 J**	**0.14 J**	1.1 U

AB-01

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
8 – 14	08/02/12	0.0029 J	2.8 J	0.62 J
20 – 22	08/02/12	ND	**43 J**	1.6

AW-02

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
8 – 10	08/02/12	ND	**0.065 J**	1.2 U
18 – 21	08/02/12	**0.067 J**	**110 J**	**1.5**

AB-03

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
8 – 10	08/06/12	**0.011 J**	**12 J**	1 U
20 – 22.5	08/06/12	ND	**0.17 J**	1.2 U

AB-04

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
10 – 12	08/03/12	ND	**25 J**	1.1 U
18 – 21	08/03/12	**0.0047 J**	ND	1.2 U

RB-36

Depth (Feet)	Date	Total BTEX	Total PAHs	Cyanide
15 – 16	8/27/03	0.0046 J	472.1 J	NA

LEGEND:

- SOIL BORING
- PREVIOUS SOIL BORING DRILLED DURING INVESTIGATION OF FORMER BSS MGP
- MONITORING WELL
- PREVIOUS MONITORING WELL INSTALLED DURING INVESTIGATIONS OF THE FORMER BSS MGP
- DECOMMISSIONED MONITORING WELL
- FORMER NATIONAL FUEL BUFFALO SERVICE STATION MGP PROPERTY LINE
- FORMER WILKESON SLIP
- FORMER ERIE CANAL
- SITE LIMITS
- UE — UNDERGROUND ELECTRIC
- FO — FIBER OPTIC LINE
- G — GAS
- W — WATER
- SS — SANITARY SEWER
- S — STORM SEWER
- CS — COMBINATION SEWER
- x — FENCE
- SANITARY SEWER MANHOLE
- ELECTRICAL MANHOLE
- W.V. — WATER VALVE
- HYD. — HYDRANT

NOTES:

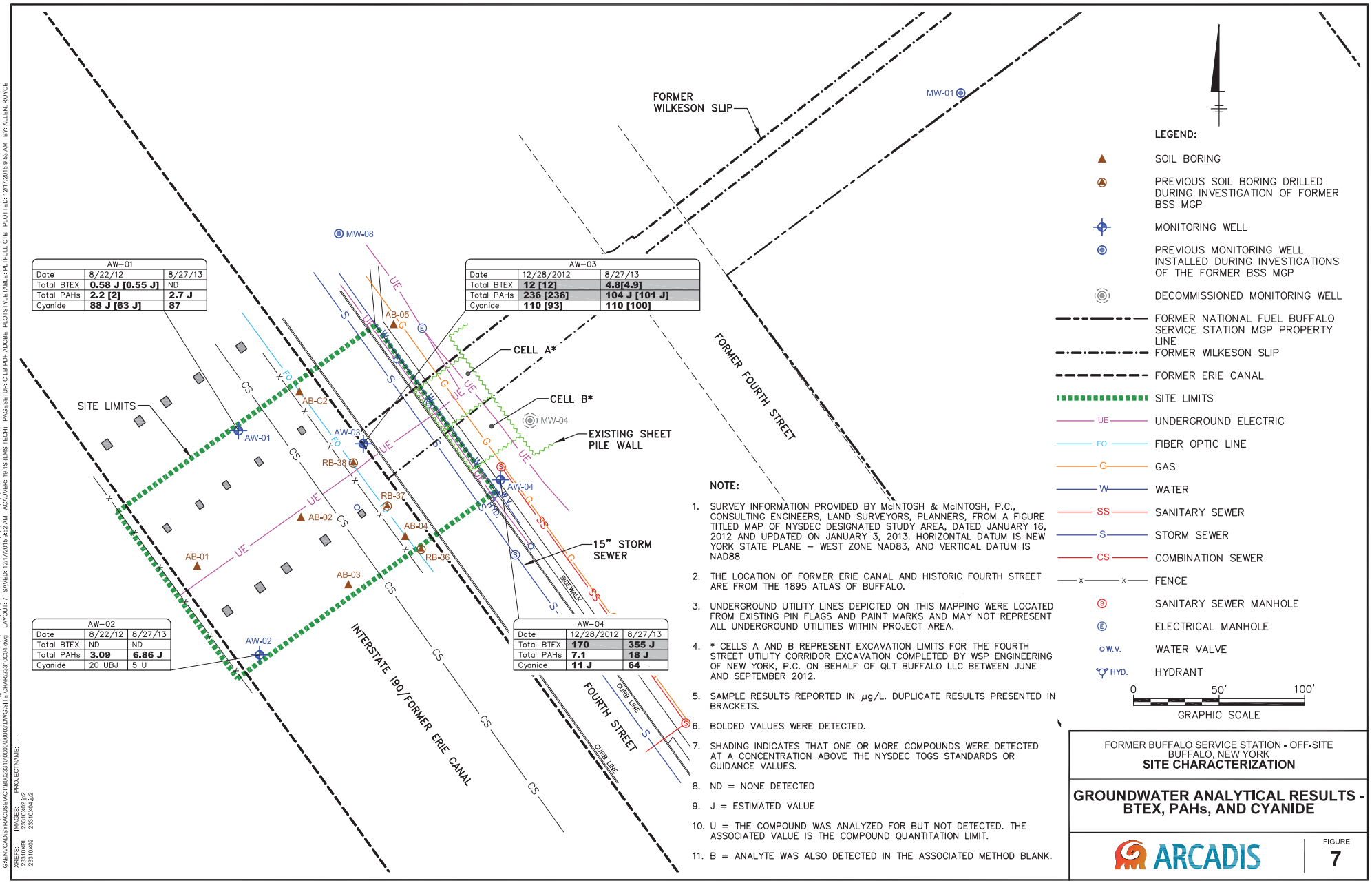
1. SURVEY INFORMATION PROVIDED BY McINTOSH & McINTOSH, P.C., CONSULTING ENGINEERS, LAND SURVEYORS, PLANNERS, FROM A FIGURE TITLED MAP OF NYSDEC DESIGNATED STUDY AREA, DATED JANUARY 16, 2012 AND UPDATED ON JANUARY 3, 2013. HORIZONTAL DATUM IS NEW YORK STATE PLANE – WEST ZONE NAD83 AND VERTICAL DATUM IS NAD88.
2. THE LOCATION OF FORMER ERIE CANAL AND HISTORIC FOURTH STREET ARE FROM THE 1895 ATLAS OF BUFFALO.
3. UNDERGROUND UTILITY LINES DEPICTED ON THIS MAPPING WERE LOCATED FROM EXISTING PIN FLAGS AND PAINT MARKS AND MAY NOT REPRESENT ALL UNDERGROUND UTILITIES WITHIN PROJECT AREA.
4. * CELLS A AND B REPRESENT EXCAVATION LIMITS FOR THE FOURTH STREET UTILITY CORRIDOR EXCAVATION COMPLETED BY WSP ENGINEERING OF NEW YORK, P.C. ON BEHALF OF QLT BUFFALO LLC BETWEEN JUNE AND SEPTEMBER 2012.
5. SAMPLE RESULTS REPORTED IN mg/kg. DUPLICATE RESULTS PRESENTED IN BRACKETS.
6. BOLDED VALUES WERE DETECTED.
7. SHADING INDICATES THAT ONE OR MORE COMPOUNDS WERE DETECTED AT A CONCENTRATION ABOVE THE NYSDEC RESTRICTED USE COMMERCIAL SOIL CLEANUP OBJECTIVES (SCOs).
8. ND = NONE DETECTED
9. J = ESTIMATED VALUE
10. U = THE COMPOUND WAS ANALYZED FOR BUT NOT DETECTED. THE ASSOCIATED VALUE IS THE COMPOUND QUANTITATION LIMIT.
11. ANALYTICAL RESULTS FOR SAMPLES COLLECTED FROM RB-36, RB-37, AND RB-38 FROM TABLE 2 OF REPORT ENTITLED PRE-DESIGN INVESTIGATION RESULTS REPORT, BUFFALO SERVICE CENTER, BUFFALO, NY. PREPARED BY RETEC GROUP, INC. ON BEHALF OF NATIONAL FUEL GAS DISTRIBUTION CORPORATION, FEBRUARY 5, 2004.

FORMER BUFFALO SERVICE STATION - OFF-SITE
BUFFALO, NEW YORK
SITE CHARACTERIZATION

SOIL ANALYTICAL RESULTS - BTEX, PAHs, AND CYANIDE

ARCADIS

FIGURE 6



LEGEND:

- SOIL BORING
- PREVIOUS SOIL BORING DRILLED DURING INVESTIGATION OF FORMER BSS MGP
- MONITORING WELL
- PREVIOUS MONITORING WELL INSTALLED DURING INVESTIGATIONS OF THE FORMER BSS MGP
- DECOMMISSIONED MONITORING WELL
- FORMER NATIONAL FUEL BUFFALO SERVICE STATION MGP PROPERTY LINE
- FORMER WILKESON SLIP
- FORMER ERIE CANAL
- SITE LIMITS
- UE — UNDERGROUND ELECTRIC
- FO — FIBER OPTIC LINE
- G — GAS
- W — WATER
- SS — SANITARY SEWER
- S — STORM SEWER
- CS — COMBINATION SEWER
- X — X — FENCE
- S — SANITARY SEWER MANHOLE
- E — ELECTRICAL MANHOLE
- W.V. — WATER VALVE
- HYD. — HYDRANT

0 50' 100'

GRAPHIC SCALE

NOTE:

1. SURVEY INFORMATION PROVIDED BY McINTOSH & McINTOSH, P.C., CONSULTING ENGINEERS, LAND SURVEYORS, PLANNERS, FROM A FIGURE TITLED MAP OF NYSDEC DESIGNATED STUDY AREA, DATED JANUARY 16, 2012 AND UPDATED ON JANUARY 3, 2013. HORIZONTAL DATUM IS NEW YORK STATE PLANE – WEST ZONE NAD83, AND VERTICAL DATUM IS NAD88
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4. * CELLS A AND B REPRESENT EXCAVATION LIMITS FOR THE FOURTH STREET UTILITY CORRIDOR EXCAVATION COMPLETED BY WSP ENGINEERING OF NEW YORK, P.C. ON BEHALF OF QLT BUFFALO LLC BETWEEN JUNE AND SEPTEMBER 2012.
5. SAMPLE RESULTS REPORTED IN µg/L. DUPLICATE RESULTS PRESENTED IN BRACKETS.
6. BOLDED VALUES WERE DETECTED.
7. SHADING INDICATES THAT ONE OR MORE COMPOUNDS WERE DETECTED AT A CONCENTRATION ABOVE THE NYSDEC TOGS STANDARDS OR GUIDANCE VALUES.
8. ND = NONE DETECTED
9. J = ESTIMATED VALUE
10. U = THE COMPOUND WAS ANALYZED FOR BUT NOT DETECTED. THE ASSOCIATED VALUE IS THE COMPOUND QUANTITATION LIMIT.
11. B = ANALYTE WAS ALSO DETECTED IN THE ASSOCIATED METHOD BLANK.

FORMER BUFFALO SERVICE STATION - OFF-SITE
BUFFALO, NEW YORK
SITE CHARACTERIZATION

GROUNDWATER ANALYTICAL RESULTS - BTEX, PAHs, AND CYANIDE

ARCADIS

FIGURE 7

ARCADIS

Appendix A

Soil Boring and Monitoring Well Construction Logs

Date Start/Finish: 7/31-8/2/2012
Drilling Company: Parratt Wolff, Inc.
Driller's Name: Layne Pech
Drilling Method: Hollow Stem Auger
Sampling Method: 2" / 3" x 2' Split Spoon
Rig Type: Truck Mounted IRA300/Percussion Hammer

Northing: 1051493.38
Easting: 1067397.49
Casing Elevation: NA

Borehole Depth: 22' bgs
Surface Elevation: 579.88' AMSL

Descriptions By: Nicholas (Klaus) Beyrle

Well/Boring ID: **AB-01**

Client: National Fuel

Location: Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	580	NA	0-2	NA	0.0			Dark gray to black fine to coarse SAND and very fine to medium subrounded to subangular GRAVEL, little Silt, little-trace Boulders. [FILL]	
		NA	2-4	NA	0.0			Trace Brick fragments at 2-4' bgs.	
5	575	NA	4-5	NA	NA				
		NA	5-6	0.1	NA			NO RECOVERY. ROCK in spoon tip.	
		1	6-8	0.0	NA				
		2	8-10	0.4	0.0			Brown CLAY, some Silt, little fine to medium Gravel, wet. Water table at 8' bgs. [FILL]	Borehole tremie-grouted to grade with cement/bentonite grout.
10	570	3	10-12	0.3	0.0			Gray broken ROCK fragments, wet. [FILL]	
		4	12-14	0.8	0.0			Brown CLAY and fine to coarse GRAVEL, soft, wet. [FILL]	
15	565	5	14-16	0.3	1.3			Very coarse angular GRAVEL covered in brown Silty CLAY. Black/dark gray Clayey SILT in tip of shoe, slight odor.	

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 8-14' bgs as AB-01 (8-14) and from 20-21' bgs as AB-01 (20-21) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

ARCADIS
Infrastructure, environment, buildings

Client: National Fuel

Well/Boring ID: **AB-01**

Borehole Depth: 22' bgs

Site Location:
Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		6	16-18	0.6	0.0			Black to dark gray Clayey SILT and medium to very coarse angular GRAVEL, trace Fiber, soft, slight odor, moist.	
		7	18-20	1.0	0.0			Black/dark gray/gray Clayey SILT, trace Rootlets and Fiber, soft, low plasticity, moist.	Borehole tremie-grouted to grade with cement/bentonite grout.
20	560	8	20-22	0.8	1.6			Broken pieces of ROCK (Bedrock), spoon abandonment was at 20.5' bgs (top of weathered rock) and the tone of hammer changed at 21.6' bgs (competent bedrock).	
								End of boring at 22' bgs.	
25	555								
30	550								
35	545								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 8-14' bgs as AB-01 (8-14) and from 20-21' bgs as AB-01 (20-21) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

Date Start/Finish: 7/31-8/3/2012
Drilling Company: Parratt Wolff, Inc.
Driller's Name: Layne Pech
Drilling Method: Hollow Stem Auger
Sampling Method: 2" / 3" x 2' Split Spoon
Rig Type: Truck Mounted IRA300/Percussion Hammer

Northing: 1051521.84
Easting: 1067458.21
Casing Elevation: NA

Borehole Depth: 22.2' bgs
Surface Elevation: 580.33' AMSL

Descriptions By: Nicholas (Klaus) Beyrle

Well/Boring ID: **AB-02**

Client: National Fuel

Location: Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	580	NA	0-2	NA	0.0			Dark brown SILT and very fine SAND, little Clay and fine to medium angular Gravel, trace medium to very coarse Gravel, moist to dry. [FILL]	
		NA	2-4	NA	0.0			Trace red Brick fragments at 2-4' bgs.	
		NA	4-5	NA	0.0				
5	575	NA	5-6	0.0	NA			NO RECOVERY. Rock in spoon tip.	
		1	6-8	0.4	0.0			Broken ROCK fragments, wet. Water table at 8' bgs. [FILL]	
		2	8-10	0.8	0.0			Brown broken ROCK fragments covered in brown SILT, some Clay and very fine to medium angular Gravel, wet. [FILL]	Borehole tremie-grouted to grade with cement/bentonite grout.
10	570	3	10-12	0.8	0.0			Brown CLAY, little Silt, trace very fine to fine Sand, soft, moist to wet.	
		4	12-14	1.4	0.0				
15	565	5	14-16	0.7	0.0			Stiff, Sand is absent at 14-16' bgs.	

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 8-10' bgs as AB-02 (8-10) and from 20-22' bgs as AB-02 (20-22) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

ARCADIS
Infrastructure, environment, buildings

Client: National Fuel

Well/Boring ID: **AB-02**

Borehole Depth: 22.2' bgs

Site Location:
Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		6	16-18	0.6	0.0			Brown SILT, trace Clay, very fine Sand and very coarse angular Gravel, fine to medium angular Gravel in tip of shoe.	
		7	18-20	1.4	0.0			Brown SILT, trace Clay, very fine Sand and very coarse angular Gravel.	Borehole tremie-grouted to grade with cement/bentonite grout.
20	560	8	20-22	0.7	0.0			Dark gray broken ROCK fragments.	
		9	22-22.2	0.2	0.0			BEDROCK. Spoon refusal at 22.2' bgs.	
								End of boring at 22.2' bgs.	
25	555								
30	550								
35	545								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 8-10' bgs as AB-02 (8-10) and from 20-22' bgs as AB-02 (20-22) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

Date Start/Finish: 7/31-8/6/2012
Drilling Company: Parratt Wolff, Inc.
Driller's Name: Layne Pech
Drilling Method: Hollow Stem Auger
Sampling Method: 2" / 3" x 2' Split Spoon
Rig Type: Truck Mounted IRA300/Percussion Hammer

Northing: 1051482.58
Easting: 1067485.96
Casing Elevation: NA

Borehole Depth: 22.5' bgs
Surface Elevation: 580.35' AMSL

Descriptions By: Nicholas (Klaus) Beyrle

Well/Boring ID: **AB-03**

Client: National Fuel

Location: Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	580	NA	0-2	NA	NA			Fine to very coarse angular GRAVEL. [FILL]	
		NA	2-4	NA	NA			Very little matrix amid all the rocks.	
		NA	4-5	NA	NA				
5	575	NA	5-6	NA	0.0			Brown/black medium to fine SAND and SILT, some very fine to medium subangular Gravel, trace very coarse Gravel, Rock in tip of shoe. [FILL]	
		1	6-8	0.9	1.6			ROCK in spoon tip.	
		2	8-10	0.8	0.0			Brown SILT, trace Clay, wet. Water at 8' bgs. [FILL]	Borehole tremie-grouted to grade with cement/bentonite grout.
10	570	3	10-12	0.5	0.0			Dark brown Clayey SILT, little to trace very fine to medium subrounded to subangular Gravel, low plasticity, soft, moist. [FILL]	
		4	12-14	0.7	0.0			COAL. [FILL] Black FRAGMENTS. [FILL]	
15	565	5	14-16	0.4	0.0			Brown CLAY, high plasticity, stiff, moist.	

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 8-10' bgs as AB-03 (8-10) and from 20-22.5' bgs as AB-03 (20-22.5) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

Client: National Fuel

Well/Boring ID: **AB-03**

Borehole Depth: 22.5' bgs

Site Location:
Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		6	16-18	1.1	0.0			Brown CLAY, high plasticity, stiff, moist. Stiff at 16-16.3' bgs and 16.5-16.6' bgs, otherwise medium stiff at 16-18' bgs.	
		7	18-20	0.7	0.0			Stff between 18-20' bgs.	Borehole tremie-grouted to grade with cement/bentonite grout.
20	560	8	20-22	1.4	0.0			Brown CLAY, high plasticity, stiff, moist. Color of CLAY is brown to black at 20.3-21' bgs, white at 21-21.1' bgs and brown at 21.1-21.5' bgs.	
		9	22-22.5	0.5	0.0			Piece of broken rock (BEDROCK). Spoon refusal at 22.5' bgs.	
								End of boring at 22.5' bgs.	
25	555								
30	550								
35	545								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 8-10' bgs as AB-03 (8-10) and from 20-22.5' bgs as AB-03 (20-22.5) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

Date Start/Finish: 8/1-8/3/2012
Drilling Company: Parratt Wolff, Inc.
Driller's Name: Layne Pech
Drilling Method: Hollow Stem Auger
Sampling Method: 2" / 3" x 2' Split Spoon
Rig Type: Truck Mounted IRA300/Percussion Hammer

Northing: 1051510.80
Easting: 1067519.16
Casing Elevation: NA

Borehole Depth: 21' bgs
Surface Elevation: 581.79' AMSL

Descriptions By: Nicholas (Klaus) Beyrle

Well/Boring ID: **AB-04**

Client: National Fuel

Location: Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 580	NA	0-2	NA	NA			Dark brown fine to coarse SAND, SILT and very fine to medium angular GRAVEL. [FILL]	
	NA	2-4	NA	NA				
	NA	4-5	NA	NA				
5	NA	5-6	0.5	0.0			Brown fine to coarse SAND and stiff very fine to medium subrounded to subangular GRAVEL, some Silt, moist to dry. [FILL]	
575	1	6-8	0.5	0.0			Brown/gray SILT, trace Clay and Gravel, soft, moist.	
	2	8-10	2.0	0.0			Dark brown SILT, some Organic material, trace Wood pieces.	
							Gray/black-gray SILT, medium soft, vein of stained material (2.3 mm wide and 0.2' long), odor at 9.8-10' bgs.	
10	3	10-12	1.6	0.0			Gray/black-gray SILT, medium soft, trace areas of black staining with odor, some stains connect to form "veins" ranging from 2-4 mm wide, longest one is 0.2', moist.	
570							Gray Silt, little trace Clay, no staining, moist at 11.4-11.6' bgs.	
	4	12-14	0.9	0.0			Trace sheen on water at 12.3-12.45' bgs.	
							Dark brown Clayey SILT, trace Rootlets and very fine Sand, soft, moist.	
15	5	14-16	1.0	0.0			Gray very fine SAND and SILT.	

Borehole tremie-grouted to grade with cement/bentonite grout.

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 10-12' bgs as AB-04 (10-12) and from 18-21' bgs as AB-04 (18-21) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

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Client: National Fuel

Well/Boring ID: **AB-04**

Borehole Depth: 21' bgs

Site Location:
Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	565	6	16-18	0.6	0.0			Brown/pink to brown Clayey SILT and very fine SAND, trace very fine to medium subangular Gravel, medium soft, moist.	
		7	18-20	1.2	0.0			Brown/pink-brown SILT, some Clay, little very fine Sand, firm, low plasticity, moist.	Borehole tremie-grouted to grade with cement/bentonite grout.
20		8	20-21	0.7	0.0			Brown and gray mottled alternating layers of Silty CLAY and SILT. Silty CLAY layers are approximately 0.02' thick. Brown Clayey SILT, Rock fragments in the tip of shoe, moist at 20.5-20.7' bgs.	
	560							Spoon refusal at 21' bgs, bedrock at 21' bgs is confirmed by sending auger down the borehole. End of boring at 21' bgs.	
25									
	555								
30									
	550								
35									

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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 10-12' bgs as AB-04 (10-12) and from 18-21' bgs as AB-04 (18-21) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

Date Start/Finish: 7/31-8/1/2012
Drilling Company: Parratt Wolff, Inc.
Driller's Name: Layne Pech
Drilling Method: Hollow Stem Auger
Sampling Method: 2" / 3" x 2' Split Spoon
Rig Type: Truck Mounted IRA300/Percussion Hammer

Northing: 1051634.58
Easting: 1067512.36
Casing Elevation: NA

Borehole Depth: 25' bgs
Surface Elevation: 580.88' AMSL

Descriptions By: Nicholas (Klaus) Beyrle

Well/Boring ID: **AB-05**

Client: National Fuel

Location: Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 580	1	0-2	NA	NA			Coarse GRAVEL and ROAD base on top of geotech fabric. [FILL]	
							CONCRETE. [FILL]	
	2	2-4	NA	NA			Dark gray SILT, little Clay, trace very fine to fine Gravel, hard, dense, moist to dry. [FILL]	
	3	4-5	NA	NA				
5 / 575	4	5-6	NA	NA			No descriptions recorded.	
	5	6-8	0.0	NA			No Recovery.	
	6	8-10	0.1	0.0			Dark gray medium to coarse SAND and Clayey SILT, trace fine to medium rounded Gravel, moist.	Borehole tremie-grouted to grade with cement/bentonite grout.
10 / 570	7	10-12	1.6	0.0			Dark gray SILT, trace Clay, wet at 10-10.8' bgs, saturated at 10.8-11.6' bgs. Water at 10.8' bgs. Loose between 12-12.8' bgs.	
	8	12-14	2.0	0.0			Black SILT and ORGANIC material, trace Rootlets. Gray very fine to fine SAND, wet. Gray fine SAND, saturated.	
15 / 565	9	14-16	2.0	0.0			Brown with gray mottled CLAY, semi-soft, moist.	

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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 9.5-10.8' bgs as AB-05 (9.5-10.8) and from 22-25' bgs as AB-05 (22-25) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

Client: National Fuel

Well/Boring ID: **AB-05**

Borehole Depth: 25' bgs

Site Location:
Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		10	16-18	2.0	0.0			Gray very fine to fine SAND and SILT, dilatent, saturated.	
		11	18-20	0.6	0.0			Gray fine to very fine SAND and SILT, dilatent, saturated.	
20	560							Brown CLAY, trace Silt, medium stiff.	Borehole tremie-grouted to grade with cement/bentonite grout.
		12	20-22	2.0	0.0			Light gray fine to medium SAND and SILT, little to trace very fine to medium rounded Gravel, soft, moist.	
		13	22-24	0.8	0.0				
		14	24-25	0.0	0.0			ROCK fragments, gray fine to medium SAND and SILT. Refusal at 25' bgs. BEDROCK at 25' bgs.	
25	555							End of boring at 25' bgs.	
30	550								
35	545								

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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 9.5-10.8' bgs as AB-05 (9.5-10.8) and from 22-25' bgs as AB-05 (22-25) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

Date Start/Finish: 8/1-8/6/2012
Drilling Company: Parratt Wolff, Inc.
Driller's Name: Layne Pech
Drilling Method: Hollow Stem Auger
Sampling Method: 2" / 3" x 2' Split Spoon
Rig Type: Truck Mounted IRA300/Percussion Hammer

Northing: 1051595.26
Easting: 1067457.28
Casing Elevation: NA

Borehole Depth: 24.2' bgs
Surface Elevation: 581.63' AMSL

Descriptions By: Nicholas (Klaus) Beyrle

Well/Boring ID: **AB-C2**

Client: National Fuel

Location: Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 581	NA	0-2	NA	0.0			TOPSOIL. [FILL] Coarse ASPHALT and ROCK debris. [FILL]	
580	NA	0-2	NA	0.0			CONCRETE. [FILL]	
	NA	2-4	NA	0.0			Brown Clayey SILT, little to trace fine to medium angular Gravel, trace Boulders, moist to dense. [FILL]	
5	NA	4-5	NA	0.0				
	NA	5-6	0.9	0.0			Brown fine to coarse SAND and fine to medium subangular GRAVEL, little Silt, dry. [FILL]	
575	1	6-8	2.0	0.0			Gray SILT, little to trace Clay, trace orange mottling, stiff, moist. Medium stiff at 6.78' bgs. At 7.3, 0.5" wide layer of black Organic material (rootlets).	
	2	8-10	0.2	0.0				Borehole tremie-grouted to grade with cement/bentonite grout.
10	3	10-12	1.7	0.0			Gray SILT, trace Clay, soft, low plasticity, moist. Wet at 11.4-11.7' bgs. Water at 11' bgs.	
570	4	12-14	1.7	0.0			Little to trace very fine SAND, trace Rootlets, moist to wet at 12-14' bgs.	
15	5	14-16	1.8	1.3				

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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 8-11' bgs as AB-C2 (8-11) and from 22-24' bgs as AB-C2 (22-24) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

Client: National Fuel

Well/Boring ID: **AB-C2**

Borehole Depth: 24.2' bgs

Site Location:
Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	565	6	16-18	1.4	0.0			Gray SILT, trace Clay, soft, low plasticity, moist.	
								Brown SILT, wet.	
		7	18-20	1.1	0.0			Red, brown and gray mottled Silty CLAY, stiff, low plasticity.	
20		8	20-22	2.0	0.0				Borehole tremie-grouted to grade with cement/bentonite grout.
	560							Brown/gray to brown very fine to medium SAND and medium to very coarse rounded GRAVEL, moist.	
		9	22-24	1.8	0.0				
		10	24-24.2	0.2	NA			ROCK fractured. Spoon refusal at 24.2' bgs.	
25								End of boring at 24.2' bgs.	
	555								
30									
	550								
35									

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 8-11' bgs as AB-C2 (8-11) and from 22-24' bgs as AB-C2 (22-24) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

Date Start/Finish: 8/1-8/2/2012
Drilling Company: Parratt Wolff, Inc.
Driller's Name: Layne Pech
Drilling Method: Hollow Stem Auger
Sampling Method: 2" / 3" x 2' Split Spoon
Rig Type: Truck Mounted IRA300/Percussion Hammer

Northing: 1051573.06
Easting: 1067421.63
Casing Elevation: 580.21' AMSL

Borehole Depth: 23.5' bgs
Surface Elevation: 580.57' AMSL

Descriptions By: Nicholas (Klaus) Beyrle

Well/Boring ID: **AW-01**

Client: National Fuel

Location: Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	580	NA	0-2	NA	0.0			Coarse GRAVEL/ASPHALT. [FILL]
								COBBLES (Limestone). [FILL]
		NA	2-4	NA	NA			Mainly large COBBLES and BRICK, very little matrix of dark gray/brown fine to coarse Sand and Silt and very fine to medium gravel, moist to dry. [FILL]
		NA	4-5	NA	NA			
5	575	NA	5-7	2.0	0.0			Gray very fine to coarse angular GRAVEL and medium to coarse SAND, trace fine Sand and Silt, dry. [FILL]
								Brown very fine to medium SAND, trace fine to medium rounded Gravel, dry to moist. [FILL]
		1	7-8	0.0	NA			Brown/tan brown CLAY, trace Silt and very fine Gravel, plasticity, medium stiff, moist. [FILL]
								NO RECOVERY.
		2	8-10	0.0	NA			NO RECOVERY. Rock in tip of shoe. [FILL]
10	570	3	10-12	0.05	0.0			Brown very fine to medium GRAVEL and fine to coarse SAND, dry. Water on rods at about 10' bgs. [FILL]
		4	12-14	0.3	0.0			Brown very fine to medium GRAVEL and fine to coarse SAND, some Silt, little to trace Clay, brittle, dry. Spoons are pushing material out of way easily. [FILL]
15	565	5	14-16	0.3	0.0			Brown CLAY, some Silt, trace very fine Sand and fine to medium Gravel, moist.

Well/Boring Construction

- Steel flushmount cover
- Locking J-Plug
- Concrete Pad (0-0.5' bgs)
- Sand Drain (0.5-1.5' bgs)
- Neat Cement Grout (1.5-9.5' bgs)
- 2" Sch 40 PVC Riser (0.5-13.5' bgs)
- Bentonite Pellets (9.5-11.5' bgs)
- #0 Silica Sand Pack (11.5-23.5' bgs)
- 2" Sch 40 PVC 0.010" Slot Screen (13.5-23.5' bgs)

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Infrastructure, environment, buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 5-7' bgs as AW-01 (5-7) and from 20-22.5' bgs as AW-01 (20-22.5) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

Client: National Fuel

Well/Boring ID: **AW-01**

Borehole Depth: 23.5' bgs

Site Location:
Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
								Brown CLAY, some Silt, trace very fine Sand and fine to medium Gravel, moist.	
		6	16-18	1.3	0.0			Brown/Black varved SILT, trace very fine Sand and Clay, medium stiff, moist.	#0 Silica Sand Pack (11.5-23.5' bgs)
		7	18-20	1.4	0.0			Brown/gray CLAY, trace Silt and fine to medium rounded Gravel, soft, moist.	2" Sch 40 PVC 0.010" Slot Screen (13.5-23.5' bgs)
20	560	8	20-22	0.4	0.0				
		9	22-23.5	0.6	0.0			Broken ROCK fragments. Spoon refusal at 22.5' bgs. Augers sent down to 23.5' bgs, BEDROCK at 23.5' bgs.	
								End of boring at 23.5' bgs.	
25	555								
30	550								
35	545								

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 5-7' bgs as AW-01 (5-7) and from 20-22.5' bgs as AW-01 (20-22.5) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

Date Start/Finish: 7/31-8/2/2012
Drilling Company: Parratt Wolff, Inc.
Driller's Name: Layne Pech
Drilling Method: Hollow Stem Auger
Sampling Method: 2" / 3" x 2' Split Spoon
Rig Type: Truck Mounted IRA300/Percussion Hammer

Northing: 1051442.05
Easting: 1067434.05
Casing Elevation: 580.22' AMSL

Borehole Depth: 21' bgs
Surface Elevation: 580.50' AMSL

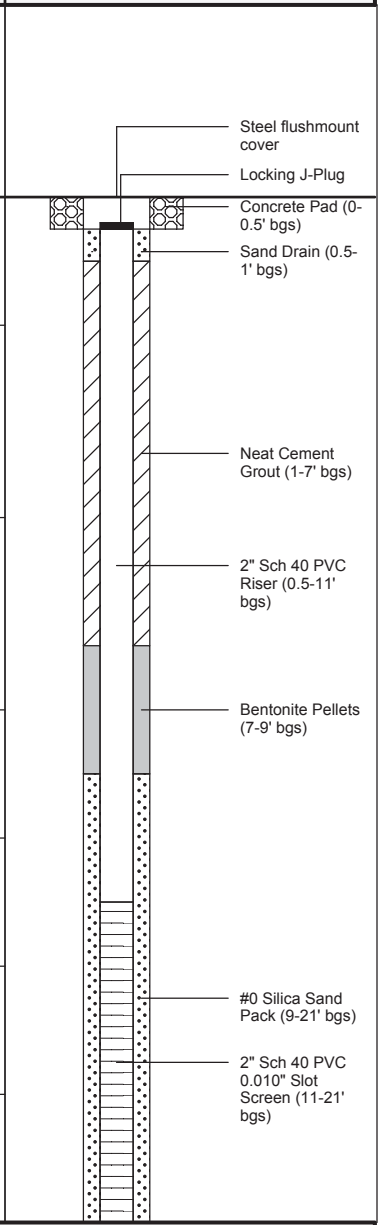
Descriptions By: Nicholas (Klaus) Beyrle

Well/Boring ID: **AW-02**

Client: National Fuel

Location: Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0	580	NA	0-2	NA	0.0			Dark brown to black CLAY and SILT, some fine to coarse angular Gravel, trace Boulders. Coarse GRAVEL and ASPHALT between 0-1' bgs. [FILL]
		NA	2-4	NA	0.0			Dark brown to black fine to coarse SAND and fine to very coarse GRAVEL, trace Silt, dry to moist. [FILL]
5		NA	4-5	NA	0.0			
	575	NA	5-6	0.25	0.0			ROCK fragments in tip of shoe, dry. [FILL]
		1	6-8	0.2	0.0			
		2	8-10	1.1	0.0			Black Silty CLAY, trace medium to fine angular Gravel, soft, medium plasticity, moist. [FILL]
10	570	3	10-12	0.2	0.0			Brown CLAY, fine to coarse angular Gravel, wet. Water table at 10' bgs.
		4	12-14	1.6	0.0			Brown CLAY, some Silt, little to trace fine to medium angular Gravel, trace medium sand between 12.5-12.9' bgs, soft.
15	565	5	14-16	2.0	6.4			Brown between14-14.3' bgs and black between 14.3-16' bgs Clayey SILT, trace very fine Sand and tiny Fibers throughout, soft, slight odor, moist.



Well/Boring Construction

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 8-10' bgs as AW-02 (8-10) and from 18-21' bgs as AW-02 (18-21) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

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Client: National Fuel

Well/Boring ID: **AW-02**

Borehole Depth: 21' bgs

Site Location:
Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		6	16-18	1.4	4.8			Brown at 14-14.3' bgs and black at 14.3-16' bgs Clayey SILT, trace very fine Sand and tiny Fibers throughout, soft, slight odor, moist. Piece of wood in shoe, smells like Pine at 16-17.1' bgs.	#0 Silica Sand Pack (9-21' bgs)
		7	18-20	1.0	14.1			No wood, trace fine fibers still present at 18-20' bgs.	2" Sch 40 PVC 0.010" Slot Screen (11-21' bgs)
20	560	8	20-21	0.4	9.6			Some of the fibers are little longer and appear to be wood. Spoon refusal at 21' bgs.	
								End of boring at 21' bgs.	
25	555								
30	550								
35	545								

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Samples collected from 8-10' bgs as AW-02 (8-10) and from 18-21' bgs as AW-02 (18-21) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

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Date Start/Finish: 11/11/12
Drilling Company: Parrott Wolff
Driller's Name: Shawn Bodah
Drilling Method: Direct Push
Sampling Method: 2" / 3" x 2' Split Spoon
Rig Type: Truck Mounted Geoprobe

Northing: 1051565.39
Easting: 1067494.69
Casing Elevation: 581.44' AMSL

Borehole Depth: 23.5' bgs
Surface Elevation: 581.96' AMSL

Descriptions By: Jeff Brayer

Well/Boring ID: **AW-03**

Client: National Fuel

Location: Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
0							
580	1	NA	NA	0.0			Brown crushed CONCRETE, SLAG-like material and SAND, some Silt and Organics, moist. [FILL]
							Brown crushed CONCRETE, SLAG-like material and SAND, some Silt and Cobble, moist. [FILL] Hard digging.
5							Dark brown coarse GRAVEL, some medium Sand and Slag-like material, trace Silt, moist. [FILL]
575	2	6-8	0.3	0.0			Coarse angular GRAVEL and coarse SAND, Shale rock fragments, wet at 6.2' bgs. [FILL]
	3	8-10	1.2	0.0			Fine to coarse GRAVEL, some Slag-like material and medium Shale rock fragments, wet. [FILL]
10	4	10-12	0.7	0.0			Red to brown fine to coarse GRAVEL, angular SLAG-like material (pitted and brittle), fine SAND and angular SHALE rock fragments. [FILL]
570	5	12-14	0.3	0.0			
15	6	14-16	0.9	0.0			Clayey SILT and black PLASTIC, some Organic (plant matter) and Wood, trace fine Sand.

Well/Boring Construction

- Steel Flush Mount Curb Box
- Locking J-Plug
- Sand Drain
- Cement/ Bentonite Grout (1-4' bgs)
- 2" Sch 40 PVC Riser (0.5-9' bgs)
- Bentonite (4-7' bgs)
- #0 Silica Sand Pack (7-19' bgs)
- 2" Sch 40 PVC 0.01" Slot Screen (9-19' bgs)

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Analytical samples were collected: AW-03 (4-8), AW-03 (18-20) and AW-03 (20-22) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

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Client: National Fuel

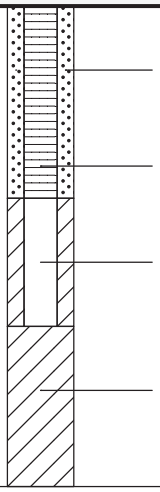
Well/Boring ID: **AW-03**

Borehole Depth: 23.5' bgs

Site Location:
Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
	565	7	16-18	0.2	0.0			SHALE (rock fragments) and ORGANIC, Rock stuck in split spoon.
		8	18-20	1.9	3.2			Brown Silty CLAY, low plasticity, solvent-like smell. Red-brown Silty CLAY and medium SAND, laminated with Sand lense from 19.5' - 20.0' bgs, solvent-like smell.
20		9	20-22	2.0	0.4			Brown Silty CLAY, trace Gravel at 22.0' bgs, petroleum-like odor. Brown CLAY, lamination of medium Sand, trace Gravel at 22' bgs, stiff, Shale rock stuck in split spoon shoe.
	560	10	22-24	1.0	0.2			
								Refusal at 23.5' bgs
25								
	555							
30								
	550							
35								

Well/Boring Construction



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Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Analytical samples were collected: AW-03 (4-8), AW-03 (18-20) and AW-03 (20-22) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

Date Start/Finish: 11/12/12
Drilling Company: Parrott Wolff
Driller's Name: Shawn Bodah
Drilling Method: Direct Push
Sampling Method: 2" / 3" x 2' Split Spoon
Rig Type: Truck Mounted Geoprobe

Northing: 1051544.36
Easting: 1067574.83
Casing Elevation: 581.95' AMSL

Borehole Depth: 22.5' bgs
Surface Elevation: 582.19' AMSL

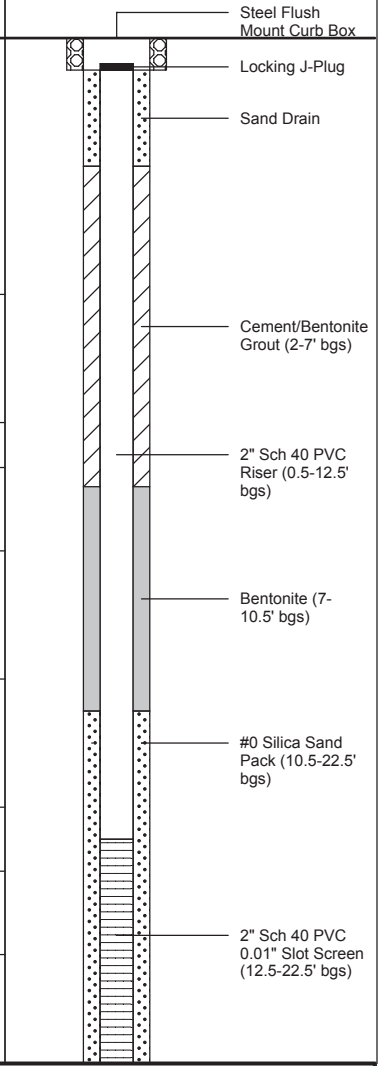
Descriptions By: Jeff Brayer

Well/Boring ID: **AW-04**

Client: National Fuel

Location: Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH / ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description
585							
0							
	1	NA	NA	0.0			SILT and coarse SAND, red Brick (pieces), Clay pipe fragments and Organic material, moist. [FILL]
580							Coarse Gravel/Slag-like material.
							Dark brown coarse GRAVEL, some medium Sand and Slag like-material, trace Silt, moist. [FILL]
5							
	2	6-8	2.0	0.0			SILT, black Organic layer, trace Clay, wet.
575							Brown to yellow fine Silty SAND.
	3	8-10	0.5	0.0			Medium to coarse GRAVEL, some fine to coarse Sand, trace Silt.
10							
	4	10-12	2.0	0.0			Grey to red-brown fine to coarse GRAVEL, fine to medium Sand, trace Wood fibers, wet.
570							
	5	12-14	2.0	0.0			Brown fine Silty SAND and ORGANIC (wood and straw).
							Black SILT, trace fine Sand and Organic (plant fibers and immature peat).
	6	14-16	1.6	0.0			Black SILT and CLAY, trace brown to red fine Sand and Silt, medium plasticity, wet.
15							



Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Analytical samples were collected: AW-04 (4-8) and AW-04 (22-22.5) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.

ARCADIS
Infrastructure, environment, buildings

Client: National Fuel

Well/Boring ID: **AW-04**

Borehole Depth: 22.5' bgs

Site Location:
Former Wilkson Slip/Canal Area
Buffalo, NY

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
		7	16-18	2.0	0.0			Black to brown SAND and SILT, laminated medium to fine Sand, Silt, and Organic (fibers).	#0 Silica Sand Pack (10.5-22.5' bgs)
	565							Black to brown CLAY, some Silt, high plasticity.	
		8	18-20	2.0	0.0			Brown SAND and SILT, wet.	
20									2" Sch 40 PVC 0.01" Slot Screen (12.5-22.5' bgs)
		9	20-22	2.0	0.0			Brown SAND and SILT, vertical seams of black Sand, discoloration, wet.	
								Brown SILT, trace fine Sand.	
	560	10	22-24	0.5	8.5	X		Red-brown CLAY, laminated Silt, Bedrock in tip of sampler, stiff, gasoline/fuel oil-like odor.	
								Refusal at 22.5' bgs	
25									
	555								
30									
	550								
35									

ARCADIS
Infrastructure, environment, buildings

Remarks: bgs = below ground surface; NA = Not Applicable/Available; AMSL = Above Mean Sea Level

Analytical samples were collected: AW-04 (4-8) and AW-04 (22-22.5) for analysis of TCL VOC, TCL SVOC, Cyanide, Free Cyanide, Mercury, TAL Metals.

Soil boring was hand-cleared to 5' bgs prior to drilling.