PROPOSED REMEDIAL ACTION PLAN

NFG – Hornell MGP
State Superfund Project
Hornell, Steuben County
Site No. 851032
February 2018

Prepared by
Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the above referenced site. The disposal of hazardous wastes at the site has resulted in threats to public health and the environment that would be addressed by the remedy proposed by this Proposed Remedial Action Plan (PRAP). The disposal of hazardous wastes at this site, as more fully described in Section 6 of this document, has contaminated various environmental media. The proposed remedy is intended to attain the remedial action objectives identified for this site for the protection of public health and the environment. This PRAP identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for the preferred remedy.

The New York State Inactive Hazardous Waste Disposal Site Remedial Program (also known as the State Superfund Program) is an enforcement program, the mission of which is to identify and characterize suspected inactive hazardous waste disposal sites and to investigate and remediate those sites found to pose a significant threat to public health and environment.

The Department has issued this document in accordance with the requirements of New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York; (6 NYCRR) Part 375. This document is a summary of the information that can be found in the site-related reports and documents in the document repository identified below.

SECTION 2: CITIZEN PARTICIPATION

The Department seeks input from the community on all PRAPs. This is an opportunity for public participation in the remedy selection process. The public is encouraged to review the reports and documents, which are available at the following repository:

Hornell Public Library
64 Genesee Street
Hornell, NY 14843
Phone: (607) 324-1210

A public comment period has been set from:

02/28/2018 to 03/30/2018

A public meeting is scheduled for the following date:

03/20/2018 at 7:00 PM

Public meeting location:

V.F.W. Post 2250, 245 Canisteo Street, Hornell, NY 14843

At the meeting, the findings of the remedial investigation (RI) and the feasibility study (FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP.

Written comments may also be sent through 03/30/2018 to:

William Wu
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
william.wu@dec.ny.gov

The Department may modify the proposed remedy or select another of the alternatives presented in this PRAP based on new information or public comments. Therefore, the public is encouraged to review and comment on the proposed remedy identified herein. Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the Department's final selection of the remedy for this site.

Receive Site Citizen Participation Information By Email

Please note that the Department's Division of Environmental Remediation (DER) is "going paperless" relative to citizen participation information. The ultimate goal is to distribute citizen participation information about contaminated sites electronically by way of county email listservs. Information will be distributed for all sites that are being investigated and cleaned up in a particular county under the State Superfund Program, Environmental Restoration Program, Brownfield Cleanup Program, Voluntary Cleanup Program, and Resource Conservation and Recovery Act Program. We encourage the public to sign up for one or more county listservs at http://www.dec.ny.gov/chemical/61092.html

SECTION 3: <u>SITE DESCRIPTION AND HISTORY</u>

Location: The former Hornell MGP site is located along Franklin Street, near the corner of Canisteo and Franklin Streets at the southwest side of the downtown area of Hornell, New York.

Site Features: The site runs east-west along the south side of Franklin Street. The eastern-most edge abuts Canisteo Street. The site is generally flat-lying and does not have any surface water features present.

The eastern third of the site is currently developed as part of a hotel property, with a portion of the building and parking areas present on the property. The central and western portion of the site is a grassy vacant lot.

Current Zoning and Land Use: The site is zoned as commercial. The western side of the site is bordered by a parcel owned by the City of Hornell, which is used as a gas regulator station by National Fuel Gas.

To the north and east across Franklin and Canisteo Streets, respectively, the site is bordered by commercial properties. Single-family residential properties are found to the northwest, and directly bordering the site to the south.

Past Use of the Site:

The site was used for the production of manufactured gas from approximately 1873 to 1932. The gas manufacturing processes involved the heating of coal and/or petroleum products to produce a gas mixture. Once cooled and purified, the gas was distributed through a local pipeline network throughout the city of Hornell. The gas was used for heating and cooking in much the same way that natural gas is used today. In the early years, the gas was also used for lighting in homes and in streetlights.

The availability of cheaper natural gas from nearby wells caused the plant to close for a lengthy period in the early 1900s. A second phase of gas manufacturing activity began in 1926, but only lasted a few years. By 1932, the plant was inactive, and the gas holders on the site were used only for storage of natural gas.

Thereafter, the site was used for natural gas storage and distribution until about the early 1950s, when the last gas holder was removed from the site.

The site has remained generally vacant. Circa 1947, the site was used for used truck sales. A hotel occupying a small portion of the site was built after the Hornell Industrial Development Agency acquired the property in 1993 for development.

During the December 2010 Remedial Investigation field work, the excavation of a test pit along the northwest side of the site was expanded to remove soil and small amounts of tar which was exposed at the ground surface. The surface soil was removed over an area of approximately 10 feet by 10 feet, and to a depth of 2 feet.

Site Geology and Hydrogeology: The surficial geology is made up of three subsurface soil units; man-made fill underlain by an alluvial unit of silt and clay, which is underlain by glacial outwash sand and gravel.

The fill unit is between 4 and 10 feet thick, and contains occasional brick, ash and cinders. Beneath the fill, but above the water table, is a mixed silt unit with some amounts of clay and sand approximately 5 to 8 feet thick. Beginning at 7 to 14 feet bgs and extending to the base of all site borings (generally 30 feet) is a sand and gravel unit. The sand and gravel unit is expected to extend downward to bedrock. Since no contamination was found at depth beneath the site, the depth to bedrock has not been verified, but it is estimated, from US Geological Survey (USGS) reports, to be at least 100 feet bgs at the site.

The site is located approximately 2,100 feet northwest of the Canisteo River. There are no natural surface water connections between the site and the river. The Canisteo River flows from north to south through the eastern side of the city of Hornell.

This site is located above a high permeability sand and gravel aquifer. The water table is present at approximately 14 feet bgs. One monitoring well within former Gas Holder A, the westernmost gas holder, found groundwater at approximately 10 feet bgs, which appears to be perched water based on water levels beneath the rest of the site. The direction of groundwater flow is to the south and east. No confining units were observed to separate multiple groundwater zones.

A site location map is attached as Figure 1.

SECTION 4: LAND USE AND PHYSICAL SETTING

The Department may consider the current, intended, and reasonably anticipated future land use of the site and its surroundings when evaluating a remedy for soil remediation. For this site, alternatives (or an alternative) that restrict(s) the use of the site to commercial use (which allows for industrial use) as described in Part 375-1.8(g) are/is being evaluated in addition to an alternative which would allow for unrestricted use of the site.

A comparison of the results of the investigation to the appropriate standards, criteria and guidance values (SCGs) for the identified land use and the unrestricted use SCGs for the site contaminants is included in the Tables for the media being evaluated in Exhibit A.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include:

National Fuel Gas Distribution Corporation

The Department and National Fuel Gas entered into an Order on Consent and Administrative Settlement (Index No. A8-0634-02-10) on October 21, 2010, which obligates National Fuel Gas to implement a full remedial program for the Hornell MGP site.

SECTION 6: SITE CONTAMINATION

6.1: Summary of the Remedial Investigation

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- air
- groundwater
- soil
- soil vapor
- indoor air
- crawl space air
- sub-slab vapor

6.1.1: Standards, Criteria, and Guidance (SCGs)

The remedy must conform to promulgated standards and criteria that are directly applicable or that are relevant and appropriate. The selection of a remedy must also take into consideration guidance, as appropriate. Standards, Criteria and Guidance are hereafter called SCGs.

To determine whether the contaminants identified in various media are present at levels of concern, the data from the RI were compared to media-specific SCGs. The Department has developed SCGs for groundwater, surface water, sediments, and soil. The NYSDOH has developed SCGs for drinking water and soil vapor intrusion. The tables found in Exhibit A list the applicable SCGs in the footnotes. For a full listing of all SCGs see: http://www.dec.ny.gov/regulations/61794.html

6.1.2: RI Results

The data have identified contaminants of concern. A "contaminant of concern" is a hazardous waste that is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The nature and extent of contamination and environmental media requiring action are summarized in Exhibit A. Additionally, the RI Report contains a full discussion of the data. The contaminant(s) of concern identified at this site is/are:

- coal tar
- polycyclic aromatic hydrocarbons (PAHS), total
- benzo(a)anthracene
- benzo(a)pyrene
- benzo(b)fluoranthene
- cyanides
- benzo[k]fluoranthene
- chrysene
- dibenz[a,h]anthracene
- indeno(1,2,3-CD)pyrene
- benzene, toluene, ethylbenzene, xylenes (BTEX)
- naphthalene

As illustrated in Exhibit A, the contaminant(s) of concern exceed the applicable SCGs for:

- groundwater
- soil

6.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before issuance of the Record of Decision.

There were no IRMs performed at this site during the RI.

6.3: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts may include existing and potential future exposure pathways to fish and wildlife receptors, wetlands, groundwater resources, and surface water.

Based upon the resources and pathways identified and the toxicity of the contaminants of ecological concern at this site, a Fish and Wildlife Resources Impact Analysis (FWRIA) was deemed not necessary for the Site.

Nature and Extent of Contamination: Based upon investigations conducted to date, the primary contaminant of concern is coal tar. Surface soils were analyzed for BTEX (benzene, toluene, ethylbenzene, and xylenes), PAHs (polycyclic aromatic hydrocarbons), metals, and total cyanide. Sub-surface soils were analyzed for VOCs (volatile organic compounds), SVOCs (semi-volatile organic compounds), metals, total cyanide, and free cyanide. One test pit sample was tested for PCBs. Groundwater was tested for VOCs, SVOCs, metals, total cyanide, and free cyanide. Soil vapor and indoor air was tested for VOCs.

Soil - Surface soil samples (0-2”) were collected from 15 locations. Individual PAHs were detected at concentrations greater than the commercial soil cleanup objectives (SCOs) in 11 of the 13 surface soil samples on commercial parcels. A surface soil sample obtained on the off-site gas regulator parcel, west of the site, contained total PAHs of 1,033 parts per million (ppm). This result, about two orders of magnitude greater than surrounding results, was not found to be representative of the surface soils in the area. Another surface soil sample right next to the elevated result, contained a total PAH concentration of 24 ppm, which is comparable to the rest of the surface soil sample results throughout the site. On-site total PAH surface soil values ranged from 10 ppm to 41 ppm. For the two surface soil samples on the residential parcel west of the gas regulator, one PAH, indeno[1,2,3-cd]pyrene, was detected at 0.54 ppm in one sample, slightly exceeding the residential SCO of 0.5 ppm. Arsenic was detected at concentrations greater than the commercial SCO in 8 of the 13 commercial surface soil samples. Arsenic was detected at 21 ppm, greater than the residential SCO of 16 ppm, in one of the two residential surface soil samples west of the gas regulator. Lead was measured above the residential SCO in one surface soil sample on the residential property west of the gas regulator parcel. Cyanide was not detected above the unrestricted SCO in any of the surface soil samples. BTEX was not detected in any of the surface soil samples. Attached Figure 3 illustrates the surface soil sample locations and results.

Subsurface soil containing visible coal tar mixed in the soil matrix, and/or containing contaminant concentrations greater than commercial use SCOs, is present in the central area of the site. The most visibly impacted interval was from 4 to 20 feet below ground surface (bgs). Some of the tar has moved downward to depths of approximately 30 feet. However, no contamination has been found at depths which would threaten to reach bedrock.

Coal tar identified in the subsurface appears to be migrating off-site in the deeper subsurface soils in one small location, south of the original gas works beneath an adjacent residential property. A zone one-foot thick (29-30 feet bgs) containing tar coatings on sand and gravel grains was found in a soil boring performed on a residential parcel south of the site. Additionally, PAHs exceeding residential use SCOs and soil with MGP-like odors were observed in another boring (10-14 feet bgs), located on the same residential parcel, just outside the southern site boundary. These impacts were not found to extend further south to borings immediately adjacent to two residences on Albion Street.

Where detected, the total BTEX concentrations ranged up to 1,059 ppm, with benzene exceeding commercial SCOs, in a subsurface sample (14-16 ft bgs) located near the former retorts and purifier. Where detected, total PAH concentrations ranged from non-detect to approximately 39,000 ppm. The highest concentration of PAHs exceeded the commercial SCO of 500 ppm total PAHs in a sample of coal tar-impacted soil collected 4.5 ft bgs in the former purifier area. One subsurface sample had arsenic concentrations exceeding the commercial SCO of 16 ppm (27 ppm at a soil boring between the former purifier area and Gas Holder A, next to the former storage area, 12-13 ft bgs). Six subsurface samples had total cyanide concentrations exceeding the commercial

SCO of 27 ppm (highest concentration of 173 ppm in the former purifier area, 4.5 ft bgs, same sample with highest total PAH concentration).

No site-related contamination was found below 15 ft bgs beneath Franklin Street. No olfactory or visual impacts were recorded in this area and depth interval, nor were any site-related contaminants detected above unrestricted SCOs in this area and depth interval.

Groundwater - Impacted groundwater is localized around the areas with observed coal tar impacted soil. The greatest concentrations of contaminants are in the central-western area of the site (see Figure 2). Groundwater impacts do extend to the south of the site boundary; however, groundwater impacts are not present near the residences along Albion Street. The highest concentrations of total BTEX and total PAHs detected were 5,981 parts per billion (ppb) and 1,625 ppb, respectively, at a monitoring well located in the western area of the site within the former purifier area, to the west of former Gas Holder A. Total cyanide was detected in two wells at concentrations greater than the NYSDEC groundwater standard of 200 ppb. One off-site well on the hotel property detected 330 ppb of total cyanide. Another well on the off-site gas regulator parcel detected up to 3,300 ppb of total cyanide, with a previous sample at that location showing 1,200 ppb of total cyanide.

Soil Vapor, Sub-slab Vapor, Crawl Space Air & Indoor Air – Soil vapor samples were collected from on-site and off-site locations to evaluate the nature and extent of site-related contamination in this medium. Total BTEX concentrations were found in on-site soil vapor samples at concentrations up to 1,665 $\mu g/m^3$ (micrograms per cubic meter) at SV5, located near the southern property line of the site and consistent with the finding of soil and groundwater impacts at this location. Naphthalene was found in off-site soil vapor samples at concentrations up to 110 $\mu g/m^3$; however, resampling at this location yield a result of 10 $\mu g/m^3$ of naphthalene. The next highest concentration of naphthalene found in soil vapor was 30 $\mu g/m^3$ in SV9, adjacent to the residential structure on an Albion Street residential parcel adjacent and south of the site.

Sub-slab vapor, crawl space air, indoor air, and outdoor air samples were collected at two off-site locations to determine whether actions are needed to address exposures related to soil vapor intrusion. Two outdoor air samples were collected and indicated total BTEX concentrations up 8.88 $\mu g/m^3$. Two indoor air samples were collected and the results were comparable with total BTEX concentrations of 4.77 $\mu g/m^3$ and 9.21 $\mu g/m^3$. Sub-slab vapor and crawl space air samples (two total) yielded concentrations of total BTEX at 47 $\mu g/m^3$ and 1.3 $\mu g/m^3$. Overall, based on the sampling results, no actions were indicated as being needed in any of the buildings tested and no additional sampling of off-site buildings is needed.

6.4: Summary of Human Exposure Pathways

This human exposure assessment identifies ways in which people may be exposed to site-related contaminants. Chemicals can enter the body through three major pathways (breathing, touching or swallowing). This is referred to as *exposure*.

The site is not fenced and persons who enter the site could contact contaminants in the soil by walking on the soil, digging or otherwise disturbing the soil. People are not coming into contact with the contaminated groundwater because the area is served by a public water supply that is not affected by this contamination. Volatile organic compounds in soil vapor (air spaces within the soil) may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Sampling at off-site locations indicates soil vapor intrusion is not a concern for off-site buildings or for a portion of a building that is on the site. However, in other parts of the site, the potential exists for the inhalation of site contaminants due to soil vapor intrusion for any future on-site development.

6.5: Summary of the Remediation Objectives

The objectives for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. The goal for the remedial program is to restore the site to pre-disposal conditions to the extent feasible. At a minimum, the remedy shall eliminate or mitigate all significant threats to public health and the environment presented by the contamination identified at the site through the proper application of scientific and engineering principles.

The remedial action objectives for this site are:

Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

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

Soil Vapor

RAOs for Public Health Protection

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

SECTION 7: SUMMARY OF THE PROPOSED REMEDY

To be selected, the remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. The remedy must also attain the remedial action objectives identified for the site, which are presented in Section 6.5. Potential remedial alternatives for the Site were identified, screened and evaluated in the FS report.

A summary of the remedial alternatives that were considered for this site is presented in Exhibit B. Cost information is presented in the form of present worth, which represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved. A summary of the Remedial Alternatives Costs is included as Exhibit C.

The basis for the Department's proposed remedy is set forth at Exhibit D.

The proposed remedy is referred to as the in-situ solidification (ISS) of subsurface soil with pre-excavation remedy.

The estimated present worth cost to implement the remedy is $4,210,000. The cost to construct the remedy is estimated to be $4,000,000 and the estimated average annual cost is $13,300.

The elements of the proposed remedy are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows;

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals; and

- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Excavation

On-site soils will be excavated to an average depth of approximately 10 feet for off-site disposal to create sufficient space such that soils that undergo in-situ solidification (ISS), described in remedial element no. 3, are below the frost line.

Off-site soils beneath a portion of Franklin Street which exceed 500 ppm total PAHs will be excavated to a depth of approximately 15 ft bgs and transported off-site for disposal. The street and sidewalk will be restored back to service after the backfilling of the excavation. The upper one-foot of soil exceeding 500 ppm total PAHs on the off-site Gas Regulator parcel will be excavated and transported off-site for disposal.

Underground piping or other structures associated with a source of contamination, such as the foundation of the original former MGP building, will be excavated and removed. The foundation and contents of Gas Holder A will be removed by a 14-ft deep excavation. Any other obstructions or debris that would inhibit ISS would be removed and disposed of off-site.

Approximately 6,500 cubic yards of contaminated soil will be removed from the site and off-site areas described above. The extent of these excavations are shown on Figure 6.

3. In-Situ Solidification

In-situ solidification (ISS) will be implemented in an approximately 0.45-acre area located in the west-central area of the site, as indicated on Figure 7. The treatment zone will generally extend to approximately 21 feet below grade to address contaminant sources, with a few areas extending as deep as 23 and 26 feet below grade to address deeper contaminant sources. The treatment criteria are contaminant source areas that include soil above 15 ft bgs containing total PAHs exceeding 500 ppm, and grossly contaminated soil, as defined in 6 NYCRR Part 375-1.2(u), below 15 ft bgs. ISS is a process that binds the soil particles in place creating a low permeability mass. The contaminated soil will be mixed in place together with solidifying agents (typically Portland cement) or other binding agents using an excavator or augers. The soil and binding agents are mixed to produce a solidified mass resulting in a low permeability monolith. The solidified mass will then be covered with a cover system as described in remedial element no. 4 to prevent direct exposure to the solidified mass. The resulting solid matrix reduces or eliminates mobility of contamination and reduces or eliminates the matrix as a source of groundwater contamination.

4. Backfill

On-site soil which does not exceed the above treatment criteria may be used below the cover system described in remedy element no. 5 to backfill the excavation to the extent that a sufficient volume of on-site soil is available and establish the designed grades at the site. Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to complete the backfilling of the excavation and establish the designed grades at the site and off-site areas. The site will be re-graded to accommodate installation of a cover system as described in remedy element no. 5.

5. Cover System

A site cover will be required to allow for commercial use of the site and on the off-site Gas Regulator parcel in areas where the upper one foot of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is to be used it will be a minimum of one foot of soil placed over a demarcation layer, with the upper six inches of soil of sufficient quality to maintain a vegetative layer. Soil cover material, including any fill material brought to the site, will meet the SCOs for cover material for the use of the site as set forth in 6 NYCRR Part 375-6.7(d). Substitution of other materials and components may be allowed where such components already exist or are a component of the tangible property to be placed as part of site redevelopment. Such components may include, but are not necessarily limited to: pavement, concrete, paved surface parking areas, sidewalks, building foundations and building slabs.

Where the soil cover is required over the ISS treatment area, it will consist of a minimum of four feet of soil meeting the SCOs for commercial use. For areas where solidified material underlies the cover, the solidified material itself will serve as the demarcation layer due to the nature of the material.

6. Monitored Natural Attenuation

Groundwater contamination (remaining after active remediation) will be addressed with monitored natural attenuation (MNA). Groundwater will be monitored for site related contamination and also for MNA indicators which will provide an understanding of the (biological activity) breaking down the contamination. It is anticipated that contamination will decrease by an order of magnitude in a reasonable period of time (5 to 10 years). Reports of the attenuation will be provided at 5 and 10 years, and active remediation will be proposed if it appears that natural processes alone will not address the contamination. The contingency remedial action will depend on the information collected, but it is currently anticipated that In-Situ Chemical Oxidation (ISCO) would be the expected contingency remedial action.

7. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for commercial or industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or County DOH; and
- require compliance with the Department approved Site Management Plan.

8. Site Management Plan

A Site Management Plan is required, which includes the following:

a.) an Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the site and details the steps and media-specific requirements necessary to ensure the following institutional and engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in remedy element no. 7, and an agreement with the off-site property owners to implement any necessary site management on the off-site properties.

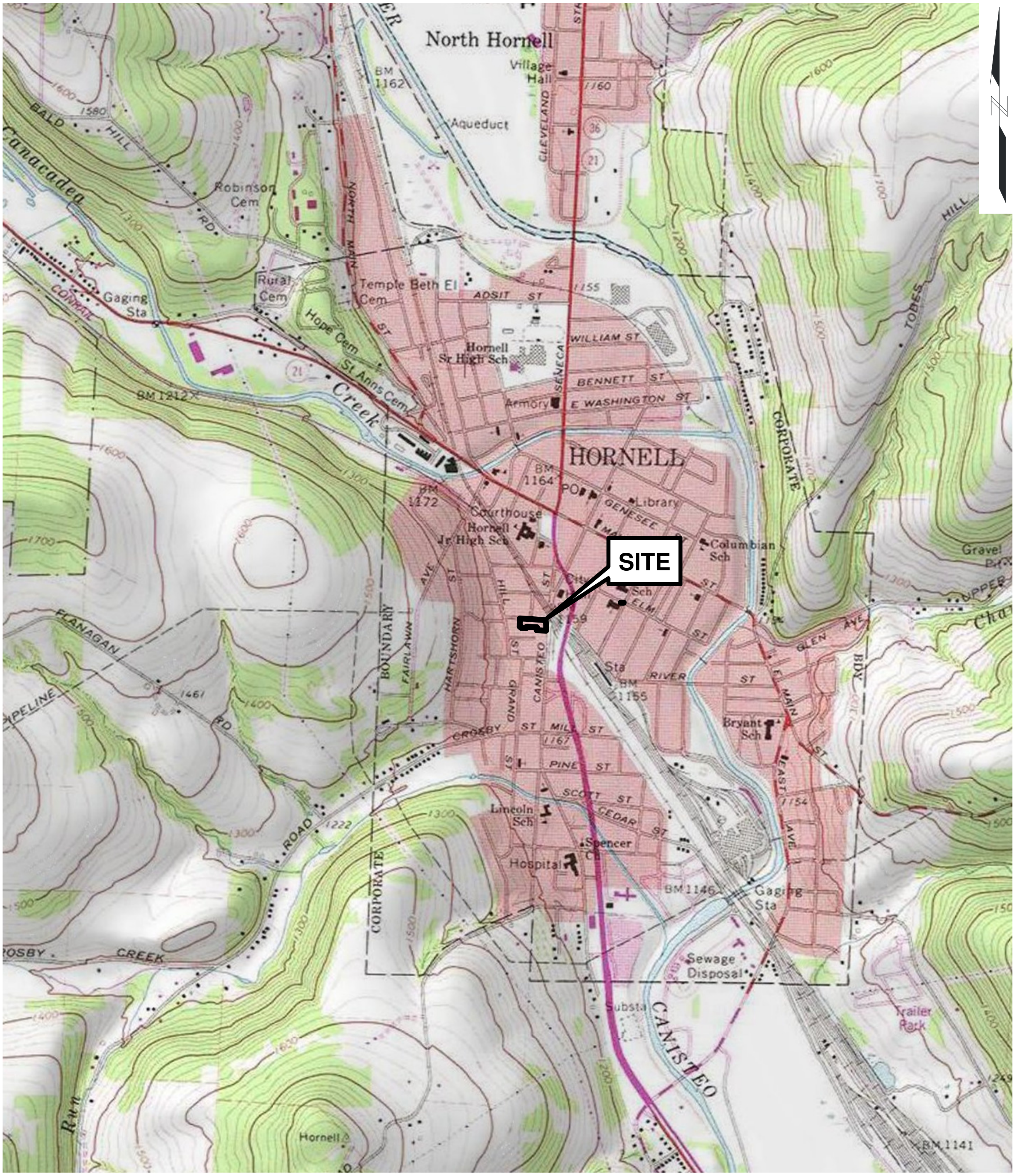
Engineering Controls: The cover system discussed in remedy element no. 5

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- descriptions of the provisions of the environmental easement including any land use, and groundwater use restrictions;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 5 above will be placed in any areas where the upper one foot of exposed surface soil exceed the applicable soil cleanup objectives (SCOs);
- a provision for evaluation of the potential for soil vapor intrusion for any buildings developed on the site, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- maintaining site access controls and Department notifications; and
- the steps necessary for the periodic reviews and certification of the institutional and engineering controls.

b.) a Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater to assess the performance and effectiveness of the remedy;
- monitoring for vapor intrusion for any buildings on the site, as may be required by the Institutional and Engineering Control Plan discussed above; and
- a schedule of monitoring and frequency of submittals to the Department.



SOURCE:

0 2,000 4,000
SCALE: 1" = 2000'

Feasibility Study Report Hornell Former MGP Site Hornell, New York	GEI Consultants	SITE LOCATION MAP
National Fuel Gas Distribution Company	Project 1412830	December 2017 Fig. 1

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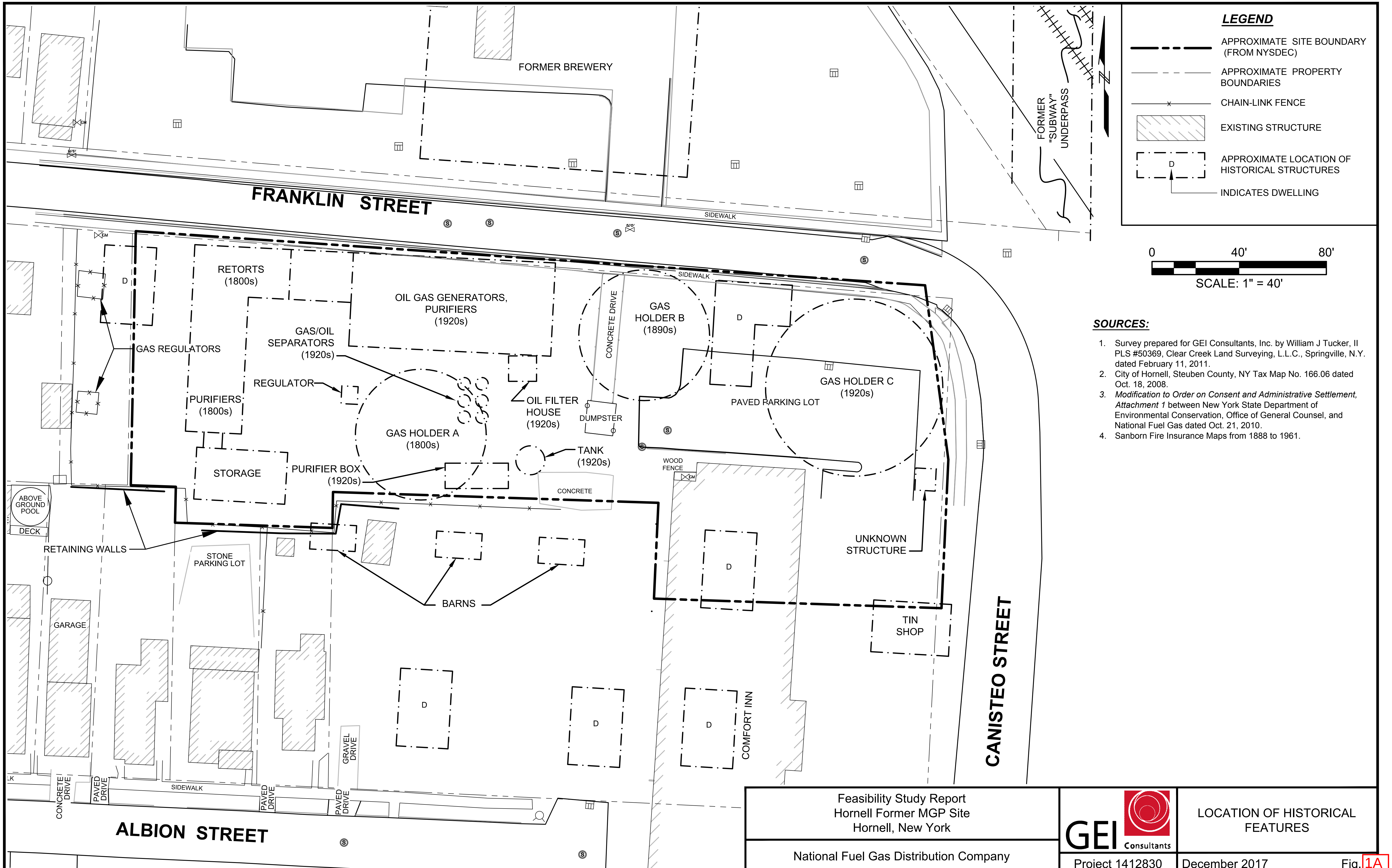

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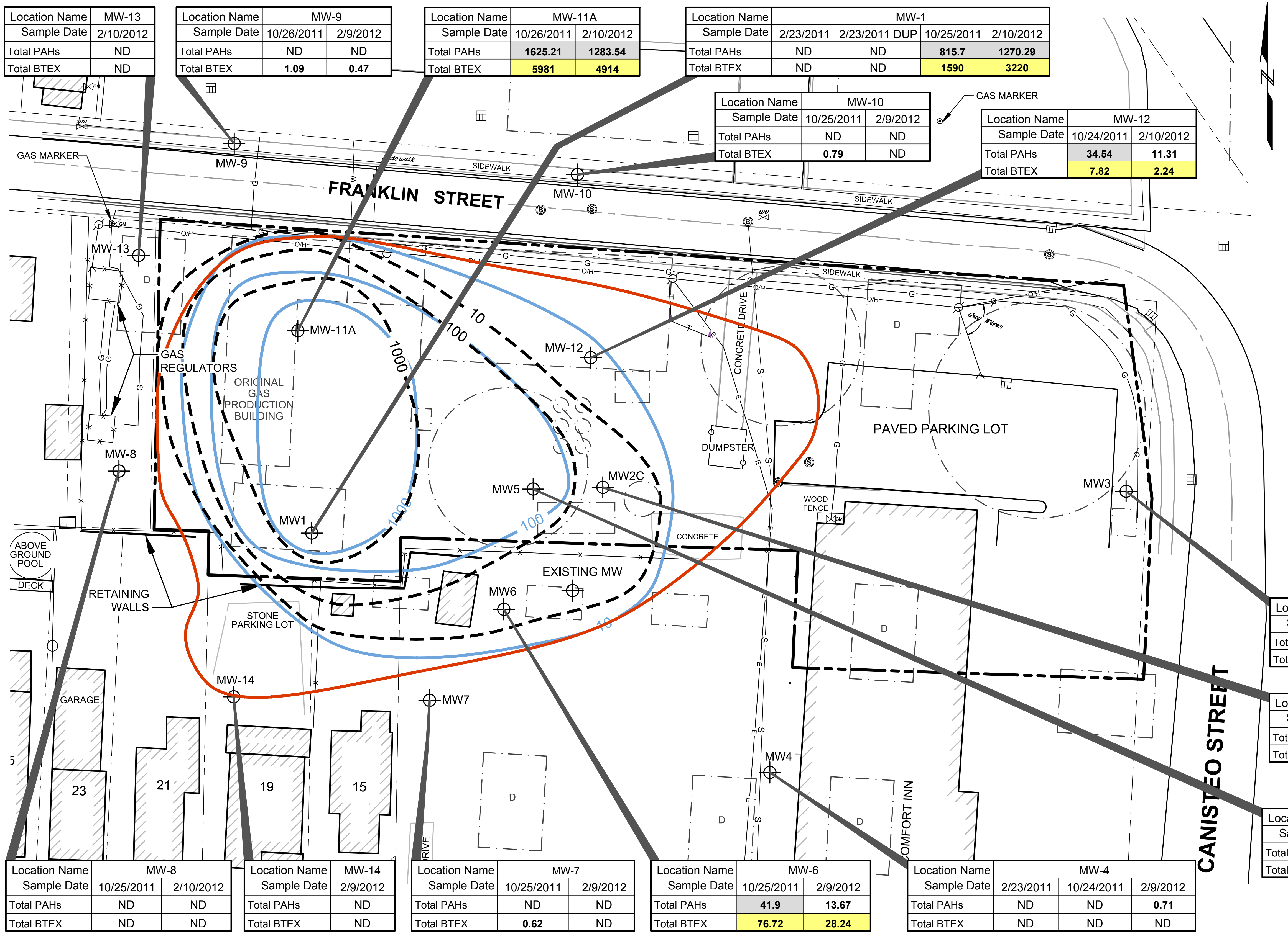

Location Name	MW-13
Sample Date	2/10/2012
Total PAHs	ND
Total BTEX	ND

Location Name	MW-9	
Sample Date	10/26/2011	2/9/2012
Total PAHs	ND	ND
Total BTEX	1.09	0.47

Location Name	MW-11A	
Sample Date	10/26/2011	2/10/2012
Total PAHs	1625.21	1283.54
Total BTEX	5981	4914

Location Name	MW-1			
Sample Date	2/23/2011	2/23/2011 DUP	10/25/2011	2/10/2012
Total PAHs	ND	ND	815.7	1270.29
Total BTEX	ND	ND	1590	3220

Location Name	MW-10	
Sample Date	10/25/2011	2/9/2012
Total PAHs	ND	ND
Total BTEX	0.79	ND

Location Name	MW-12	
Sample Date	10/24/2011	2/10/2012
Total PAHs	34.54	11.31
Total BTEX	7.82	2.24

Location Name	MW-3		
Sample Date	2/23/2011	10/24/2011	2/10/2012
Total PAHs	ND	ND	ND
Total BTEX	ND	ND	ND

Location Name	MW-2C		
Sample Date	2/23/2011	10/25/2011	2/9/2012
Total PAHs	0.47	27.68	61.25
Total BTEX	ND	31.8	65.8

Location Name	MW-5			
Sample Date	2/10/2012	2/10/2012 DUP	10/25/2011	10/25/2011 DUP
Total PAHs	580.19	682.6	556.9	508.2
Total BTEX	259	249	304	326

Location Name	MW-8	
Sample Date	10/25/2011	2/10/2012
Total PAHs	ND	ND
Total BTEX	ND	ND

Location Name	MW-14
Sample Date	2/9/2012
Total PAHs	ND
Total BTEX	ND

Location Name	MW-7	
Sample Date	10/25/2011	2/9/2012
Total PAHs	ND	ND
Total BTEX	0.62	ND

Location Name	MW-6	
Sample Date	10/25/2011	2/9/2012
Total PAHs	41.9	13.67
Total BTEX	76.72	28.24

Location Name	MW-4		
Sample Date	2/23/2011	10/24/2011	2/9/2012
Total PAHs	ND	ND	0.71
Total BTEX	ND	ND	ND

LEGEND

- APPROXIMATE SITE BOUNDARY (FROM NYSDEC)
- APPROXIMATE PROPERTY BOUNDARIES
- CHAIN-LINK FENCE
- 15 — EXISTING STRUCTURE & HOUSE NUMBER
- D — APPROXIMATE LOCATION OF HISTORICAL STRUCTURES
- INDICATES DWELLING

REMEDIAL INVESTIGATION SAMPLE LOCATIONS

- MW1 — MONITORING WELL LOCATION

ANALYTICAL DATA BOX LEGEND

PAHs	POLYCYCLIC AROMATIC HYDROCARBONS
BTEX	BENZENE, TOLUENE, ETHYLBENZENE, XYLENES
ND	NOT DETECTED
11.802	INDICATES DETECTED COMPOUND IN MICROGRAMS PER LITER (µg/L)
34.54 / 7.82	ONE OR MORE INDIVIDUAL COMPOUND(S) EXCEED WATER QUALITY STANDARD OR GUIDANCE VALUES
	PAH ISOPLETH FOR 2/2012 DATA
	BTEX ISOPLETH FOR 2/2012 DATA
	ESTIMATED EXTENT OF GROUNDWATER EXCEEDING WATER QUALITY STANDARDS OR GUIDANCE VALUES

SOURCES:

1. Survey prepared for GEI Consultants, Inc. by William J Tucker, II PLS #50369, Clear Creek Land Surveying, L.L.C., Springville, N.Y. dated February 11, 2011.
2. City of Hornell, Steuben County, NY Tax Map No. 166.06 dated Oct. 18, 2008.
3. *Modification to Order on Consent and Administrative Settlement, Attachment 1* between New York State Department of Environmental Conservation, Office of General Counsel, and National Fuel Gas dated Oct. 21, 2010.
4. Sanborn Fire Insurance Maps from 1888 to 1961.

0 40' 80'

SCALE: 1" = 40'

Feasibility Study Report
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National Fuel Gas Distribution Company

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Project 1412830

ESTIMATED EXTENTS OF AMBIENT WATER QUALITY STANDARDS IN GROUNDWATER

December 2017

Fig. 2

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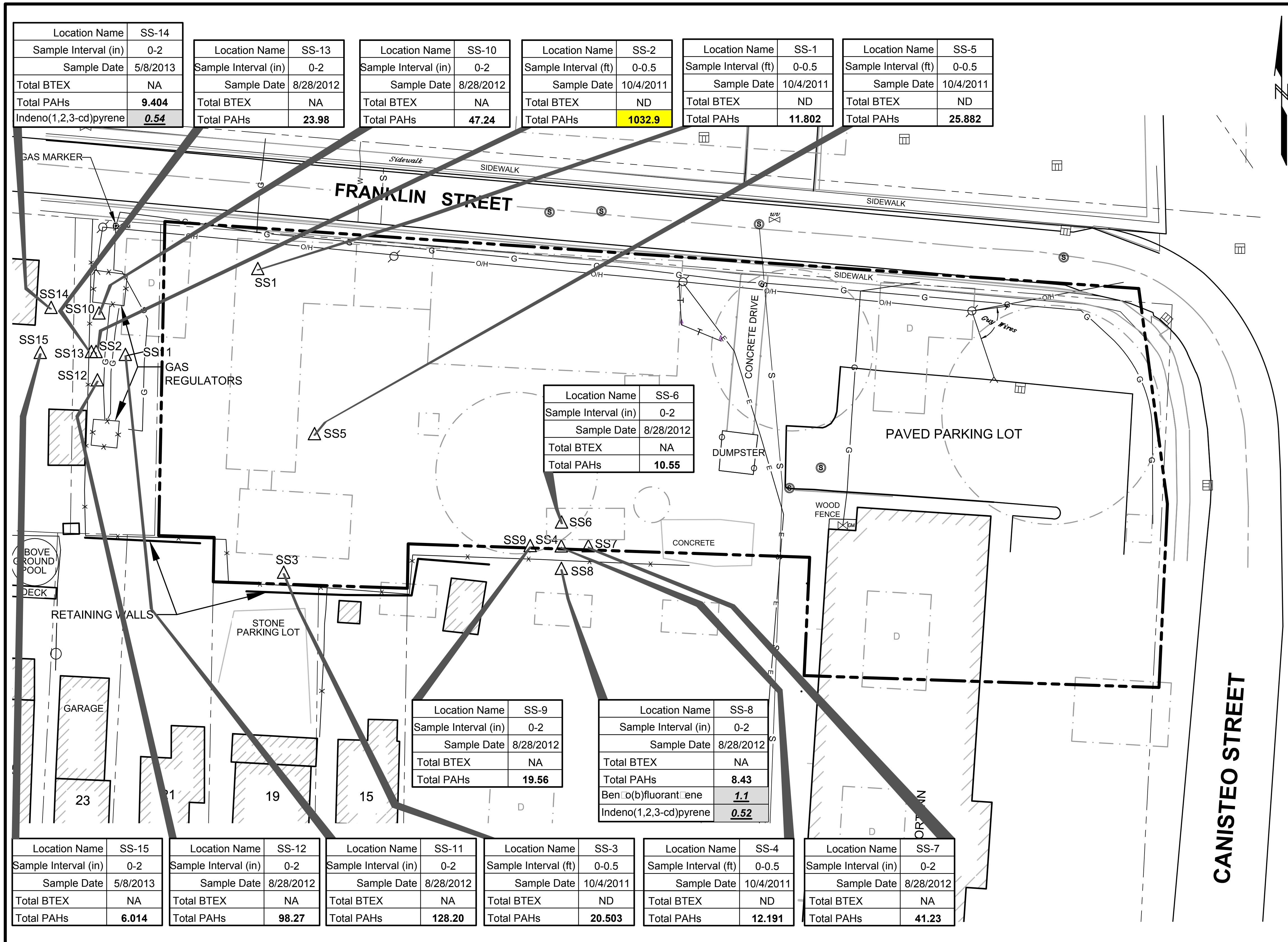

Location Name	SS-14
Sample Interval (in)	0-2
Sample Date	5/8/2013
Total BTEX	NA
Total PAHs	**9.404**
Indeno(1,2,3-cd)pyrene	**0.54**

Location Name	SS-13
Sample Interval (in)	0-2
Sample Date	8/28/2012
Total BTEX	NA
Total PAHs	**23.98**

Location Name	SS-10
Sample Interval (in)	0-2
Sample Date	8/28/2012
Total BTEX	NA
Total PAHs	**47.24**

Location Name	SS-2
Sample Interval (ft)	0-0.5
Sample Date	10/4/2011
Total BTEX	ND
Total PAHs	**1032.9**

Location Name	SS-1
Sample Interval (ft)	0-0.5
Sample Date	10/4/2011
Total BTEX	ND
Total PAHs	**11.802**

Location Name	SS-5
Sample Interval (ft)	0-0.5
Sample Date	10/4/2011
Total BTEX	ND
Total PAHs	**25.882**

Location Name	SS-6
Sample Interval (in)	0-2
Sample Date	8/28/2012
Total BTEX	NA
Total PAHs	**10.55**

Location Name	SS-9
Sample Interval (in)	0-2
Sample Date	8/28/2012
Total BTEX	NA
Total PAHs	**19.56**

Location Name	SS-8
Sample Interval (in)	0-2
Sample Date	8/28/2012
Total BTEX	NA
Total PAHs	**8.43**
Ben□o(b)fluorant□ene	**1.1**
Indeno(1,2,3-cd)pyrene	**0.52**

Location Name	SS-15
Sample Interval (in)	0-2
Sample Date	5/8/2013
Total BTEX	NA
Total PAHs	**6.014**

Location Name	SS-12
Sample Interval (in)	0-2
Sample Date	8/28/2012
Total BTEX	NA
Total PAHs	**98.27**

Location Name	SS-11
Sample Interval (in)	0-2
Sample Date	8/28/2012
Total BTEX	NA
Total PAHs	**128.20**

Location Name	SS-3
Sample Interval (ft)	0-0.5
Sample Date	10/4/2011
Total BTEX	ND
Total PAHs	**20.503**

Location Name	SS-4
Sample Interval (ft)	0-0.5
Sample Date	10/4/2011
Total BTEX	ND
Total PAHs	**12.191**

Location Name	SS-7
Sample Interval (in)	0-2
Sample Date	8/28/2012
Total BTEX	NA
Total PAHs	**41.23**

LEGEND

- APPROXIMATE SITE BOUNDARY (FROM NYSDEC)
- APPROXIMATE PROPERTY BOUNDARIES
- CHAIN-LINK FENCE
- 15 — EXISTING STRUCTURE & HOUSE NUMBER
- D — APPROXIMATE LOCATION OF HISTORICAL STRUCTURES
- INDICATES DWELLING

REMEDIAL INVESTIGATION SAMPLE LOCATIONS

- SS1 — SURFACE SOIL SAMPLE LOCATION

ANALYTICAL DATA BOX LEGEND

BTEX	BENZENE, TOLUENE, ETHYLBENZENE, XYLENES
PAHs	POLYCYCLIC AROMATIC HYDROCARBONS
ND	NOT DETECTED
NA	NOT ANALYZED
11.802	INDICATES DETECTED COMPOUND MILLIGRAMS PER KILOGRAM (mg/kg)
1032.9	INDICATES CONCENTRATION EXCEEDS 500 mg/kg TOTAL PAH CLEANUP CRITERIA
0.54	INDICATES CONCENTRATION EXCEEDS RESIDENTIAL SCOs

SOURCES:

1. Survey prepared for GEI Consultants, Inc. by William J Tucker, II PLS #50369, Clear Creek Land Surveying, L.L.C., Springville, N.Y. dated February 11, 2011.
2. City of Hornell, Steuben County, NY Tax Map No. 166.06 dated Oct. 18, 2008.
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0 40 80

SCALE, FEET

REMEDIAL INVESTIGATION REPORT
HORNELL FORMER MGP SITE
HORNELL, NEW YORK

NATIONAL FUEL GAS DISTRIBUTION COMPANY

GEI Consultants

Project 102260-1008

SURFACE SOIL ANALYTICAL RESULTS

June 2014

Figure 3

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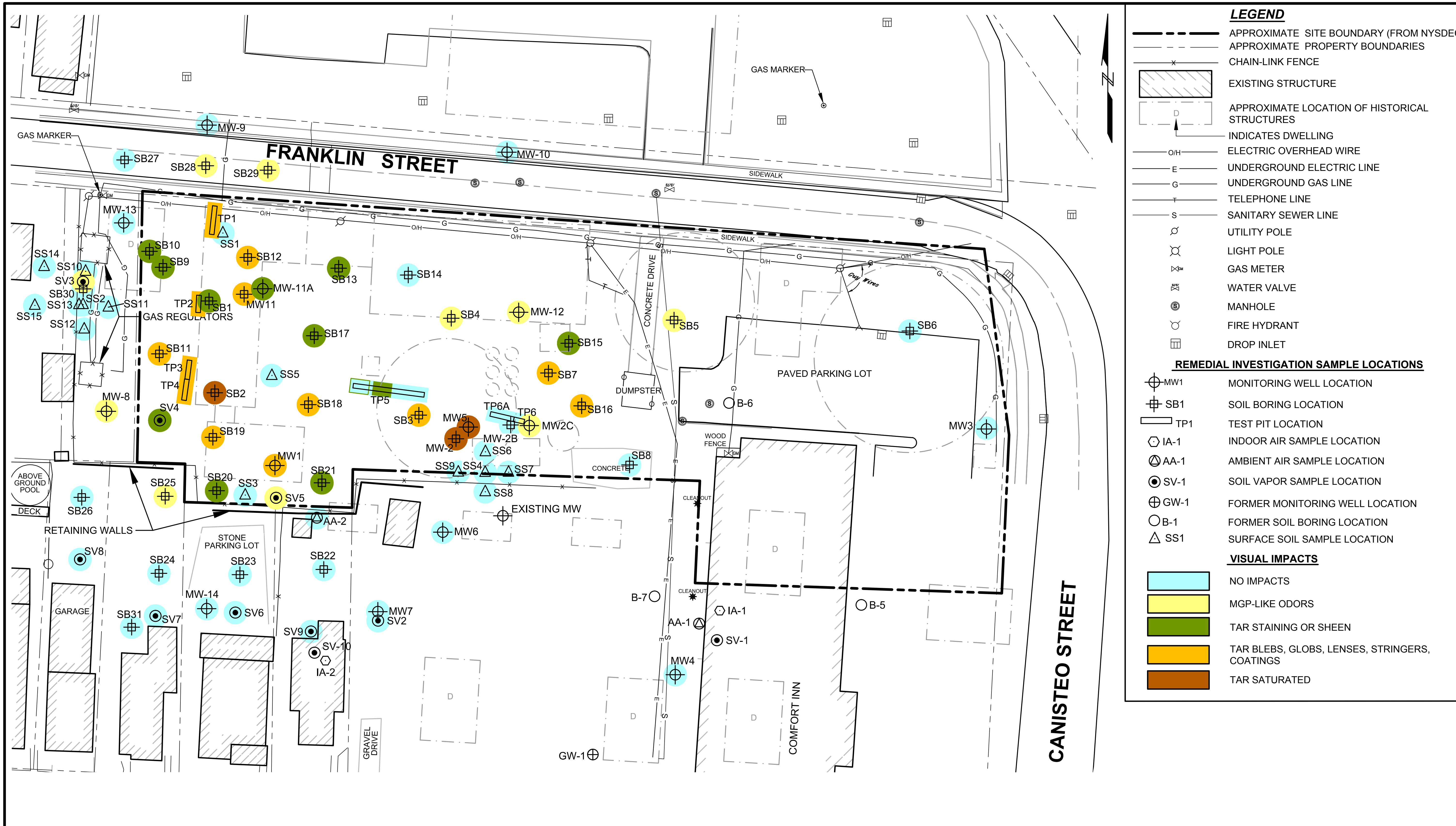

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REMEDIAL INVESTIGATION REPORT
HORNELL FORMER MGP SITE
HORNELL, NEW YORK

NATIONAL FUEL GAS DISTRIBUTION COMPANY

GEI Consultants

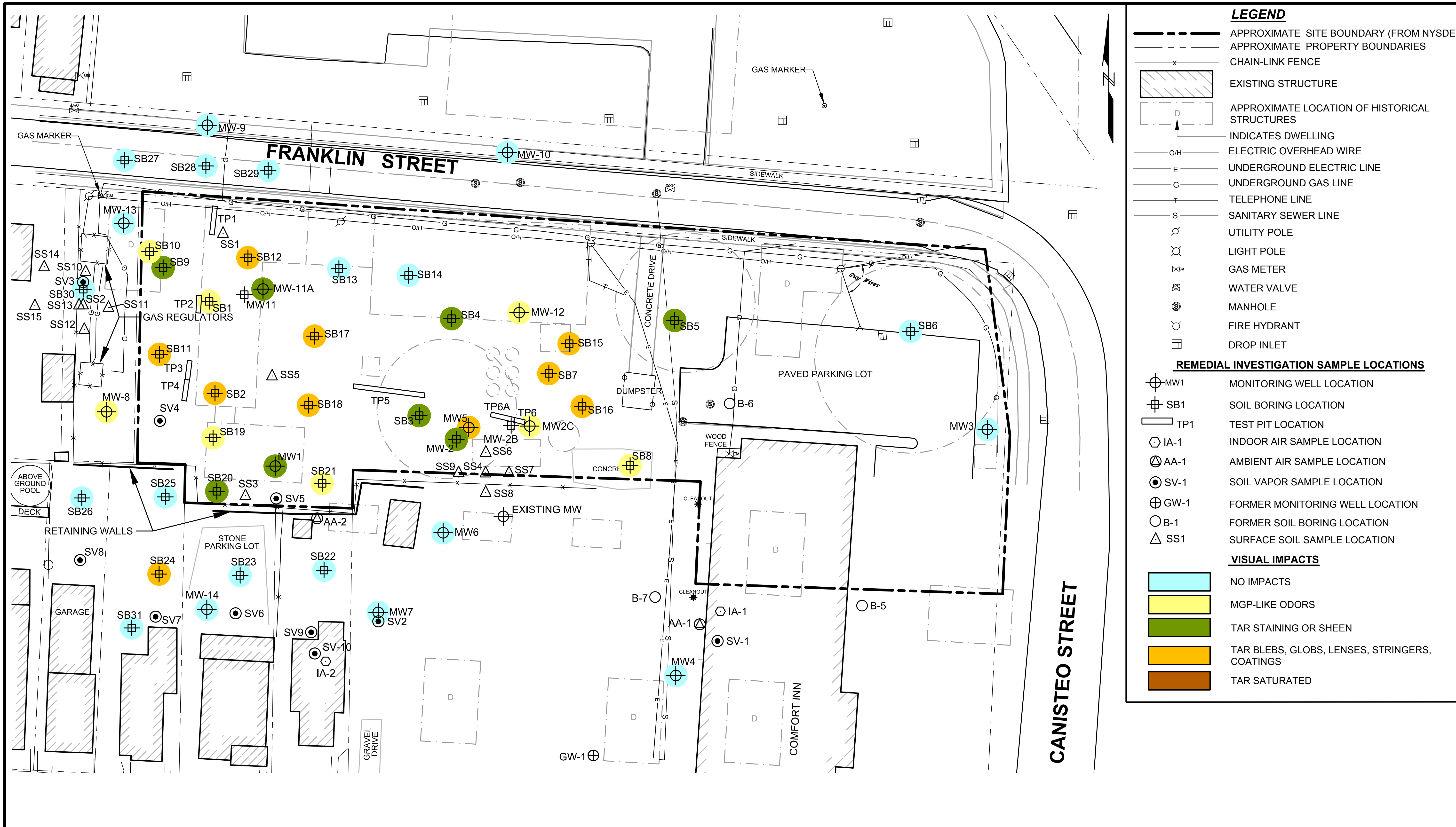
Project 102260-1008

VISUAL IMPACTS
0 TO 15 FEET DEPTH

June 2014

Figure 4

I:\Project\National Fuel Gas Dist Co\HORNELL\RIR\2014-06\Hornell - RI Figures.dwg



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REMEDIAL INVESTIGATION REPORT
HORNELL FORMER MGP SITE
HORNELL, NEW YORK

NATIONAL FUEL GAS DISTRIBUTION COMPANY

GEI Consultants

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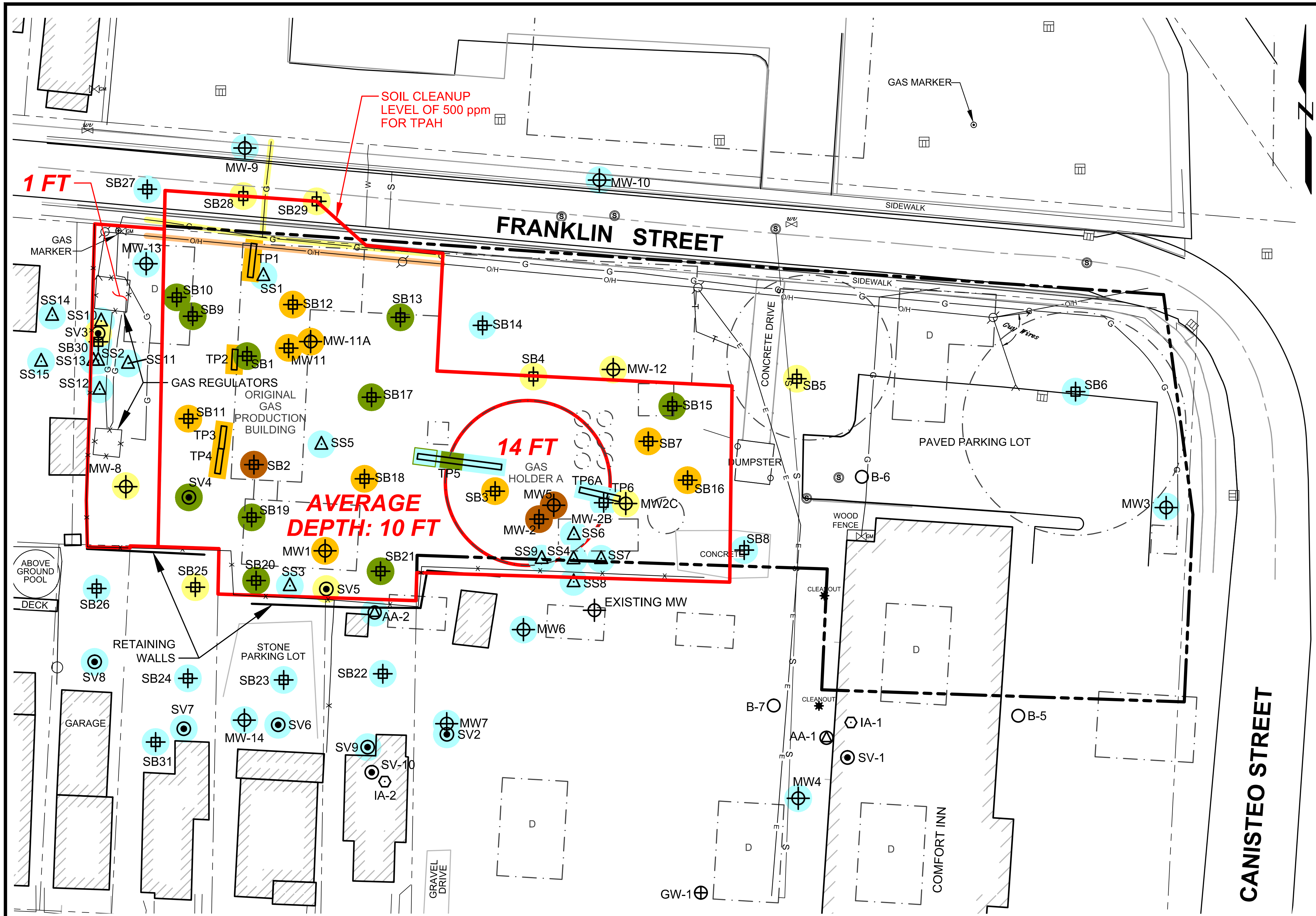
VISUAL IMPACTS BELOW 15 FEET

June 2014

Figure 5

I:\Project\National Fuel Gas Dist Co\HORNELL\RIR\2014-06\Hornell - RI Figures.dwg



LEGEND

- APPROXIMATE SITE BOUNDARY (FROM NYSDEC)
- APPROXIMATE PROPERTY BOUNDARIES
- CHAIN-LINK FENCE
- EXISTING STRUCTURE
- APPROXIMATE LOCATION OF HISTORICAL STRUCTURES
- INDICATES DWELLING
- O/H ELECTRIC OVERHEAD WIRE TO BE RELOCATED
- E UNDERGROUND ELECTRIC LINE TO BE RELOCATED
- G UNDERGROUND GAS LINE TO BE RELOCATED
- T TELEPHONE LINE
- S SANITARY SEWER LINE
- UTILITY POLE
- LIGHT POLE
- GAS METER
- WATER VALVE
- MANHOLE
- FIRE HYDRANT
- DROP INLET

REMEDIAL INVESTIGATION SAMPLE LOCATIONS

MW1	MONITORING WELL LOCATION
SB1	SOIL BORING LOCATION
TP1	TEST PIT LOCATION
IA-1	INDOOR AIR SAMPLE LOCATION
AA-1	AMBIENT AIR SAMPLE LOCATION
SV-1	SOIL VAPOR SAMPLE LOCATION
GW-1	FORMER MONITORING WELL LOCATION
B-1	FORMER SOIL BORING LOCATION
SS1	SURFACE SOIL SAMPLE LOCATION

VISUAL IMPACTS

- NO IMPACTS
- MGP-LIKE ODORS
- TAR STAINING OR SHEEN
- TAR BLEBS, GLOBS, LENSES, STRINGERS, COATINGS
- TAR SATURATED

ALTERNATIVE 4:

- Relocate gas and electric lines
- Excavate soil/debris exceeding 500 ppm TPAH in Franklin Street and gas regulator parcel. Pre-excavation of soils for ISS areas on Former MGP Parcel, .
- 1-ft soil on MPG Parcel and Gas Regulator Parcel
- Groundwater Monitoring & IC/ECs
- ISS of soils >15 ft with tar or NAPL on MGP Parcel.

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0 40' 80'

SCALE: 1" = 40'

Feasibility Study Report
Hornell Former MGP Site
Hornell, New York

National Fuel Gas Distribution Company

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ALTERNATIVE 4 - PRE-ISS SOIL REMOVAL

Project 1412830 | December 2017 | Fig. 6

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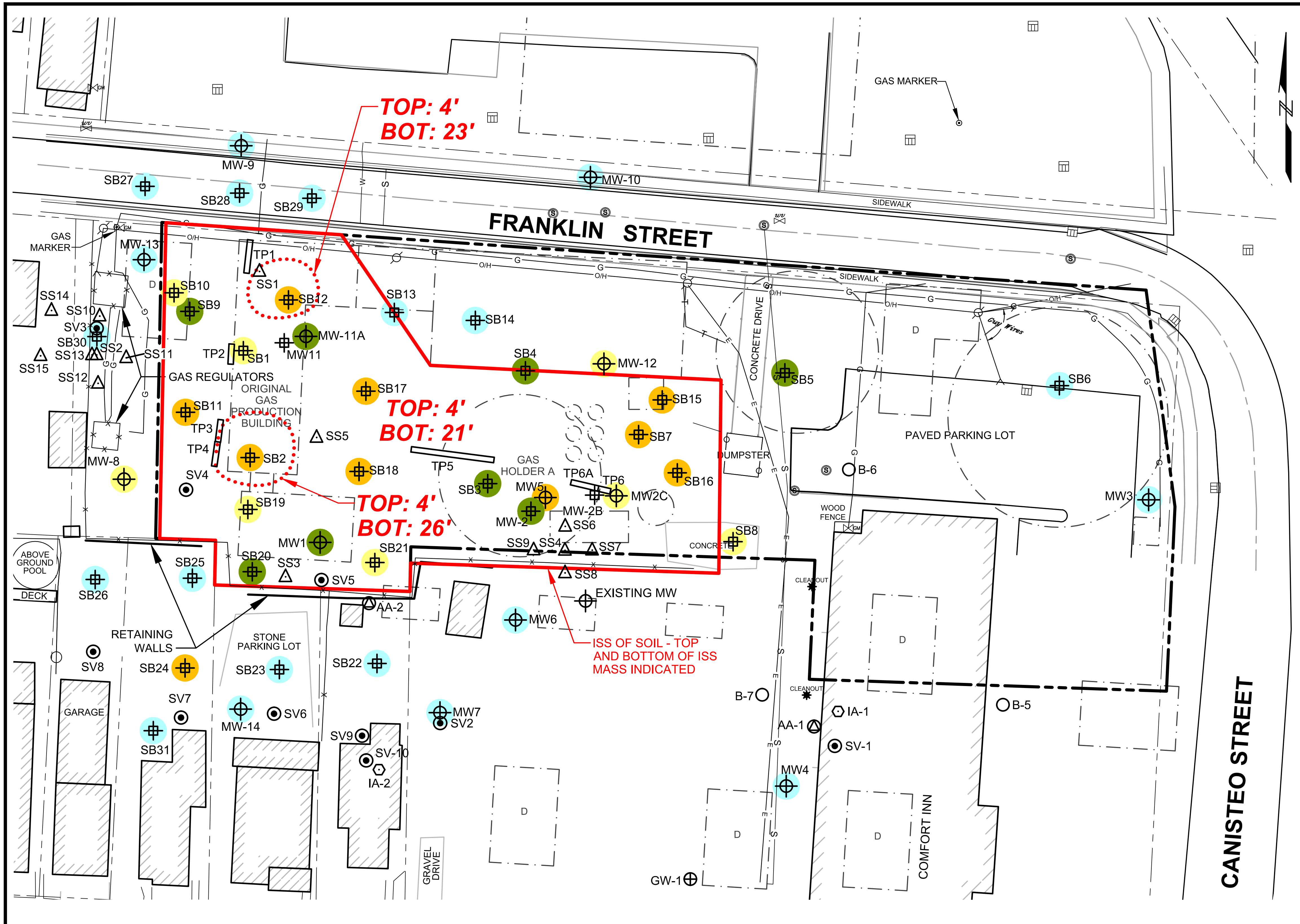

LEGEND

- APPROXIMATE SITE BOUNDARY (FROM NYSDEC)
- APPROXIMATE PROPERTY BOUNDARIES
- CHAIN-LINK FENCE
- EXISTING STRUCTURE
- APPROXIMATE LOCATION OF HISTORICAL STRUCTURES
- INDICATES DWELLING
- O/H ELECTRIC OVERHEAD WIRE
- E UNDERGROUND ELECTRIC LINE
- G UNDERGROUND GAS LINE
- T TELEPHONE LINE
- S SANITARY SEWER LINE
- UTILITY POLE
- LIGHT POLE
- GAS METER
- WATER VALVE
- MANHOLE
- FIRE HYDRANT
- DROP INLET

TOP: 4' TOP DEPTH (BGS) OF CURED ISS
BOT: 23' BOTTOM DEPTH OF ISS

REMEDIAL INVESTIGATION SAMPLE LOCATIONS

- MW1 MONITORING WELL LOCATION
- SB1 SOIL BORING LOCATION
- TP1 TEST PIT LOCATION
- IA-1 INDOOR AIR SAMPLE LOCATION
- AA-1 AMBIENT AIR SAMPLE LOCATION
- SV-1 SOIL VAPOR SAMPLE LOCATION
- GW-1 FORMER MONITORING WELL LOCATION
- B-1 FORMER SOIL BORING LOCATION
- SS1 SURFACE SOIL SAMPLE LOCATION

VISUAL IMPACTS

- NO IMPACTS
- MGP-LIKE ODORS
- TAR STAINING OR SHEEN
- TAR BLEBS, GLOBS, LENSES, STRINGERS, COATINGS
- TAR SATURATED

ALTERNATIVE 4:

- Relocate gas and electric lines
- Excavate soil/debris exceeding 500 ppm TPAH in Franklin Street and gas regulator parcel. Pre-excavation of soils for ISS areas on Former MGP Parcel.
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4. Sanborn Fire Insurance Maps from 1888 to 1961.

Feasibility Study Report Hornell Former MGP Site Hornell, New York	GEI Consultants	ALTERNATIVE 4 - DEPTHS OF TOP AND BOTTOM OF ISS
National Fuel Gas Distribution Company	Project 1412830	December 2017 Fig. 7

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Exhibit A

Nature and Extent of Contamination

This section describes the findings of the Remedial Investigation for all environmental media that were evaluated. As described in Section 6.1, samples were collected from various environmental media to characterize the nature and extent of contamination.

For each medium for which contamination was identified, a table summarizes the findings of the investigation. The tables present the range of contamination found at the site in the media and compares the data with the applicable SCGs for the site. The contaminants are arranged into four categories; volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganics (metals and cyanide). For comparison purposes, the SCGs are provided for each medium that allows for unrestricted use. For soil, if applicable, the Restricted Use SCGs identified in Section 4 and Section 6.1.1 are also presented.

Source Areas

As described in the RI report, source materials were identified at the site and are impacting groundwater, and soil.

Source areas are defined in 6 NYCRR Part 375-1.2(au). Source areas are areas of concern at a site where substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium. Source areas were identified at the site include the central area of the site, associated with the foundations of the former MGP structures, which are still present in the subsurface.

The source material found at the site is coal tar: a heavy, oily liquid that was formed as a byproduct of the gas manufacturing process. Coal tar does not readily dissolve in water. Materials such as this are commonly referred to as non-aqueous phase liquids, or NAPLs. The terms NAPL and coal tar are used interchangeably in this document. Although most coal tars are slightly denser than water, the difference in density is slight. Consequently, they can either float or sink when in contact with water.

Although coal tar does not readily dissolve in water, certain classes of chemical compounds found in the tar will dissolve to some extent. These dissolved constituents are considered groundwater contaminants, and can migrate through the subsurface, following ordinary patterns of groundwater flow.

Visible coal tar was found in the subsurface soils in the source area. The most heavily impacted interval at the site was from 4 to 20 feet below ground surface (bgs). Some of the tar has moved downward to depths of approximately 30 feet, and laterally a short distance off-site into a residential parcel to the south, in a roughly one foot thick layer at a depth of approximately 30 feet bgs.

The source areas identified will be addressed in the remedy selection process.

Groundwater

Some components of the tar have dissolved into the groundwater beneath the site, contaminating the groundwater with volatile organic compounds (VOCs) and polycyclic aromatic compounds (PAHs). Groundwater samples form monitoring wells at the site confirm that VOC and PAH contamination is present, as shown in Table 1.

Table 1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Benzene	ND – 4,100	1	14/33
Toluene	ND – 1,900	5	8/33
Ethylbenzene	ND – 270	5	11/33
Total Xylenes	ND – 510	5	11/33
Total BTEX	ND – 5,981	NA	NA
Isopropyl benzene	ND – 17	5	5/28
Styrene	ND – 130	5	8/33
SVOCs (PAHs)			
Acenaphthene	ND – 90	20	9/33
Fluorene	ND – 57	50	1/33
Naphthalene	ND – 1,200	10	11/33
Phenanthrene	ND – 54	50	1/33
Benz[*a*]anthracene	ND – 2.7	0.002	5/33
Benzo[*a*]pyrene	ND – 1.7	ND	4/33
Benzo[*b*]fluoranthene	ND – 1.5	0.002	4/33
Benzo[*k*]fluoranthene	ND – 0.82	0.002	1/33
Chrysene	ND – 2.2	0.002	5/33
Indeno[1,2,3-*cd*]pyrene	ND – 0.53	0.002	1/33
Total PAHs	ND – 1,625.21	NA	NA
Inorganics			
Lead	ND – 28	25	1/33
Free Cyanide	ND – 15	NA	NA
Total Cyanide	ND – 3,300	200	3/33

a - ppb: parts per billion, which is equivalent to micrograms per liter, ug/L, in water.
b- SCG: Standard Criteria or Guidance - Ambient Water Quality Standards and Guidance Values (TOGs 1.1.1), 6 NYCRR Part 703, Surface water and Groundwater Quality Standards, and Part 5 of the New York State Sanitary Code (10 NYCRR Part 5).
ND- Not Detected
NA – Not applicable
Total BTEX- sum of Benzene, toluene, ethylbenzene, and total xylenes

The primary groundwater contaminants are VOCs and PAHs associated with coal tar source material in the subsurface. The major contributors to VOC and PAH contamination in groundwater are benzene and naphthalene, respectively. As noted on Figure 2, the groundwater contamination is most severe in the immediate vicinity of tar contaminated soils in the central portion of the site. Relatively little migration of contaminated groundwater has taken place.

Based on the findings of the RI, the presence of coal tar has resulted in the contamination of groundwater. The site contaminants that are considered to be the primary contaminants of concern which will drive the remediation of groundwater to be addressed by the remedy selection process are: BTEX, PAHs, and total cyanide.

Soil

Surface and subsurface soil samples were collected at the site and off-site during the RI. Surface soil samples were collected from a depth of 0-2 inches to assess direct human exposure. Subsurface soil samples were collected from depths up to 30 feet bgs to assess the extent of coal tar migration in the subsurface. Figure 3 shows the surface soil analytical results, and Figures 4 and 5 show the areal extent of coal tar contamination, above and below 15 feet bgs, respectively. The results confirm that the coal tar source areas have contaminated the soils, resulting in Commercial SCG exceedances for both individual and total PAHs.

Table 2a – Non-Residential Surface Soil (0-2'') (all samples except for the two residential samples west of the gas regulator)

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
SVOCs (PAHs)					
Benz[*a*]anthracene	0.72 – 97	1	12/14	5.6	4/14
Benzo[*b*]fluoranthene	1 – 93	1	13/14	5.6	6/14
Benzo[*k*]fluoranthene	0.58 – 1.3	0.8	1/14	56	0/14
Benzo[*a*]pyrene	0.81 – 73	1	12/14	1	12/14
Chrysene	0.9 – 72	1	12/14	56	1/14
Dibenz[*a*,*h*]anthracene	0.11 – 12	0.33	11/14	0.56	9/14
Fluoranthene	1.1 – 180	100	1/14	500	0/14
Indeno[1,2,3-*cd*]pyrene	0.52 – 36	0.5	14/14	5.6	4/14
Phenanthrene	0.49 – 170	100	1/14	500	0/14
Pyrene	1.4 – 150	100	1/14	500	0/14
Total PAH	8.4 – 1,033	NA	NA	500	1/14
Inorganics					
Arsenic	6.1 – 120	13	9/14	16	9/14
Lead	26 – 470	63	11/14	1,000	0/14
Mercury	0.039 – 1.9	0.18	10/14	2.8	0/14

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use, unless otherwise noted.
Total PAH – sum of all PAH compounds
NA-Not Applicable

Table 2b – Residential Surface Soil (0-2'') (residential parcel to the west of the gas regulator)

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Residential SCG[c] (ppm)	Frequency Exceeding Residential SCG
SVOCs (PAHs)					
Indeno[1,2,3-*cd*]pyrene	0.41 – 0.54	0.5	1/2	0.5	1/2
Inorganics					
Arsenic	13 – 21	13	1/2	16	1/2
Lead	400 – 7,200	63	2/2	400	1/2
Mercury	0.56 – 0.85	0.18	2/2	0.81	1/2

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Residential Use, unless otherwise noted.

Table 3a – Non-Residential Subsurface Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial SCG[c] (ppm)	Frequency Exceeding Commercial SCG
VOCs					
Benzene	0.00085 – 180	0.06	15/89	44	5/89
Toluene	0.00025 – 410	0.7	14/89	500	0/89
Ethylbenzene	0.0018 – 29	1	19/89	390	0/89

Total Xylenes	0.0008 – 440	0.26	24/89	500	0/89
Acetone	0.0055 – 0.35	0.05	3/40	500	0/40
SVOCs (PAHs)					
Acenaphthene	0.01 – 350	20	11/89	500	0/89
Acenaphthylene	0.0088 – 420	100	7/89	500	0/89
Anthracene	0.0083 – 2,100	100	9/89	500	1/89
Benz[*a*]anthracene	0.022 – 1,400	1	39/89	5.6	25/89
Benzo[*b*]fluoranthene	0.015 – 1,200	1	38/89	5.6	25/89
Benzo[*k*]fluoranthene	0.06 – 510	0.8	25/89	56	5/89
Benzo[*ghi*]perylene	0.0085 – 400	100	2/89	500	0/89
Benzo[*a*]pyrene	0.015 – 1,100	1	38/89	1	38/89
Chrysene	0.017 – 1,200	1	38/89	56	10/89
Dibenz[*a*,*h*]anthracene	0.013 – 540	0.33	27/89	0.56	23/89
Fluoranthene	0.0082 – 3,500	100	14/89	500	2/89
Fluorene	0.01 – 1,800	30	14/89	500	1/89
Indeno[1,2,3-*cd*]pyrene	0.0093 – 530	0.5	36/89	5.6	20/89
Naphthalene	0.01 – 13,000	12	27/89	500	8/89
Phenanthrene	0.013 – 5,600	100	14/89	500	5/89
Pyrene	0.0097 – 2,500	100	13/89	500	1/89
Total PAH	ND – 39,400	NA	NA	500	16/89
Inorganics					
Arsenic	1.9 – 27	13	4/62	16	1/62
Lead	4 – 176	63	4/62	1,000	0/62
Mercury	0.0053 – 1.1	0.18	7/62	2.8	0/62
Free Cyanide	0.82 – 3.2	NA	NA	NA	NA
Total Cyanide	0.11 – 173	27	6/89	27	6/89

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Commercial Use, unless otherwise noted.

Table 3b – Residential Subsurface Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Residential SCG[c] (ppm)	Frequency Exceeding Residential SCG
VOCs					
SVOCs (PAHs)					
Fluorene	0.015 – 44	30	1/15	100	0/15
Naphthalene	0.022 – 130	12	3/15	100	1/15
Phenanthrene	0.019 – 130	100	1/15	100	1/15
Benz[*a*]anthracene	0.044 – 36	1	3/15	1	3/15
Benzo[*a*]pyrene	0.061 – 27	1	3/15	1	3/15
Benzo[*b*]fluoranthene	0.067 – 32	1	3/15	1	3/15
Benzo[*k*]fluoranthene	13 – 13	0.8	1/15	1	1/15
Chrysene	0.045 – 25	1	3/15	1	3/15
Dibenz[*a*,*h*]anthracene	2.4 – 3.4	0.33	3/15	0.33	3/15
Indeno[1,2,3-*cd*]pyrene	0.04 – 9.4	0.5	3/15	0.5	3/15
Inorganics					
Arsenic	4.8 – 15	13	1/8	16	0/8

a - ppm: parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
b - SCG: Part 375-6.8(a), Unrestricted Soil Cleanup Objectives.
c - SCG: Part 375-6.8(b), Restricted Use Soil Cleanup Objectives for the Protection of Public Health for Residential Use, unless otherwise noted.

The primary soil contaminants are polycyclic aromatic hydrocarbons (PAHs) associated with coal tar from the operation of the former MGP. The highest total PAHs concentration was 39,400 ppm in a sample of tar-impacted soil from test pit TP4 which is located in the former purifier area. BTEX compounds are also present in soil. The highest concentration of BTEX was 1,059 ppm near the former retorts and purifiers in SB1.

Overall, although PAH levels in surface soils exceed applicable SCOs, most of the most heavily contaminated soils are found in the subsurface at depths greater than 4 ft bgs, where direct exposure is not expected.

Surface soil samples were collected from 15 locations. Individual PAHs were detected at concentrations greater than the commercial SCO in 11 of the 13 surface soil samples on commercial parcels. One surface soil sample, SS2, on the gas regulator parcel west of the site, contained a total PAHs concentration of 1,033 ppm. This result, about 2 orders of magnitude greater than surrounding results, was not found to be representative of the surface soils in the area. SS-13, right next to SS-2, shows a total PAH value of 23.98 ppm, which is comparable to the rest of the surface soil sample results throughout the site. On-site total PAH surface soil values ranged from 11 ppm to 41 ppm. For the two surface soil samples on the residential parcel west of the gas regulator, one PAH, indeno[1,2,3-cd]pyrene, was detected at 0.54 ppm in one sample, SS-14, slightly exceeding the residential SCO of 0.5 ppm.

Cyanide was not detected at levels above the unrestricted SCO for surface soil. In subsurface soils, cyanide was detected above commercial SCO levels in 6 of 89 samples. In general, cyanide was detected at relatively low concentrations, in close proximity to other MGP contaminants. Its absence in surface soils, and its colocation with other contaminants in subsurface soils, mean that it is not a major factor in evaluation of soil contamination.

Arsenic was detected at concentrations greater than the commercial use SCO in 10 of the 15 surface soil samples, and in 1 of the 45 subsurface soil samples from 0 to 15 feet bgs.

Lead was measured above the Residential SCO in one surface soil sample, SS15, on the residential property west of the site. This isolated lead measurement exceeded all other results. The implication is that the presence of lead is due to man-made material present in the shallow soils at the location, such as lead paint chips or other building materials. This isolated incidence of lead, therefore, is not considered a site-related contaminant of concern.

PAHs were measured at concentrations greater than the residential use SCOs in 3 of the 15 residential subsurface soil samples. Two of the samples (one duplicate) were taken in the 11-12 ft bgs interval where coal tar odors were observed. One of the samples was taken at another residential location in the 29-30 ft bgs interval where tar coated soil was observed.

Based on the findings of the Remedial Investigation, the presence of coal tar has resulted in the contamination of soil. The site contaminants identified in soil which are considered to be the primary contaminants of concern, to be addressed by the remedy selection process are PAHs and BTEX compounds.

Soil Vapor, Sub-slab Vapor, Crawl Space Air, Indoor Air, and Outdoor Air

Soil vapor samples were collected from on-site and off-site locations to evaluate the nature and extent of site-related contamination in this medium. Total BTEX concentrations were found in on-site soil vapor samples at concentrations up to 1,665 $\mu g/m^3$ at SV5, located near the southern property line of the site and consistent with the finding of soil and groundwater impacts at this location. Naphthalene was found in off-site soil vapor samples at concentrations up to 110 $\mu g/m^3$; however, resampling at this location yield a result of 10 $\mu g/m^3$ of naphthalene. The next highest concentration of naphthalene found in soil vapor was 30 $\mu g/m^3$ in SV9.

Sub-slab vapor, crawl space air, indoor air, and outdoor air samples were collected at two off-site locations to determine whether actions are needed to address exposures related to soil vapor intrusion. Two outdoor air samples were collected and indicated total BTEX concentrations up 8.88 $\mu g/m^3$. Two indoor air samples were collected and the results were comparable with total BTEX concentrations of 4.77 $\mu g/m^3$ and 9.21 $\mu g/m^3$. Sub-slab vapor and crawl space air samples (two total) yielded concentrations of total BTEX at 47 $\mu g/m^3$ and 1.3 $\mu g/m^3$. Overall, based on the sampling results, no actions were indicated as being needed in any of the buildings tested and no additional sampling of off-site buildings is needed.

Based on the findings of the Remedial Investigation, the presence of tar blebs, coal tar, and other MGP wastes, as well as elevated soil vapor concentrations, on the site warrant soil vapor intrusion evaluations for buildings developed on the site.

Exhibit B

Description of Remedial Alternatives

The following alternatives were considered based on the remedial action objectives (see Section 6.5) to address the contaminated media identified at the site as described in Exhibit A.

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative leaves the site in its present condition and does not provide any additional protection to public health and the environment. There are no monitoring costs in the No Action Alternative because there are no Institutional Controls / Engineering Controls (IC/ECs).

Alternative 2: Surface and Subsurface Soil Removal up to 15 feet, Soil Cover, MNA, and IC/ECs

This alternative would include the excavation of impacts in soils exceeding Commercial SCOs (500 ppm total PAHs) to a depth of 15 feet for the site and part of Franklin Street, and establishment and maintenance of a site cover meeting the requirements for commercial use for the gas regulator parcel. The excavations will be backfilled with soils meeting the appropriate SCOs in each area. Surface soil removal for all on-site areas is addressed by the subsurface soil removal, and a site cover will be placed over on-site soils meeting the requirements for Commercial Use. Monitored natural attenuation (MNA) will be implemented to document the effects of the source removal on levels of contaminants in groundwater. This alternative also includes the implementation of institutional and engineering controls (IC/ECs), including the development and implementation of a Site Management Plan (SMP), and site and groundwater use restrictions pursuant to an environmental easement to prevent human contact with media containing contaminants of concern (COCs) above relevant SCOs.

Present Worth:..*$4.33 million*
Capital Cost:..*$4.02 million*
Annual Costs:..*$19.9 thousand*

Alternative 3: Surface and Subsurface Soil Removal to 15 feet, Soil Cover, ISCO of Impacts Below 15 feet, MNA, and IC/ECs

This alternative would include all the components described in Alternative 2, plus the implementation of in-situ chemical oxidation (ISCO) to directly treat the unexcavated grossly impacted soils below 15 feet bgs.

Present Worth:..*$5.65 million*
Capital Cost:..*$5.45 million*
Annual Costs:..*$13.3 thousand*

Alternative 4: ISS of Subsurface Soil with Pre-Excavation

This alternative would use in-situ solidification (ISS) to immobilize subsurface coal tar contamination. The ISS process involves mixing of the soil with Portland cement and other bonding agents. When the resulting mixture solidifies, the contaminants contained in the soil are tightly held in a solid, impermeable mass. The ISS process also greatly diminishes soil permeability, effectively isolating the contaminants from contact with groundwater and thus greatly diminishing groundwater contamination.

In order for the ISS mixing to be effective, large subsurface obstructions such as pipes, tanks, and building foundations must be removed prior to implementing the ISS process. Pre-excavation would proceed to a depth of approximately 10 feet. ISS would then be implemented to depths ranging from 21 to 26 feet. The site would then be backfilled to its current grade, using imported soils which meet appropriate SCOs for the site. Where the soil cover is required over the ISS treatment area, it will consist of a minimum of four feet of soil meeting the appropriate SCOs for the site.

Other components of Alternative 2 would remain, including the placement of a site cover on the site and gas regulator parcel, excavation beneath Franklin Street, and the imposition of institutional and engineering controls to protect the integrity of the remedy.

Present Worth: .... *$4.21 million*
Capital Cost: .... *$4.00 million*
Annual Costs: .... *$13.3 thousand*

Alternative 5: Excavation of Impacted Soils <15 feet Exceeding SCOs, Deep Source Removal

This alternative would build on the soil removal described in Alternative 3, extending the excavation to depths from 21 to 26 feet bgs to remove contaminated soils. All other components of the remedy would remain as in Alternative 3. Similar to Alternatives 2-4, Alternative 5 remedies the on-site area to Commercial use SCOs, therefore, IC/ECs are required.

Present Worth: .... *$7.05 million*
Capital Cost: .... *$6.93 million*
Annual Costs: .... *$7.69 thousand*

Alternative 6: Restoration to Pre-Disposal or Unrestricted Conditions

This alternative achieves all of the SCGs discussed in Section 6.1.1 and Exhibit A and soil meets the unrestricted soil clean objectives (SCOs) listed in Part 375-6.8 (a). This alternative is an extension of Alternative 5 by removing all of the soils on the site and adjoining parcels that exceed the SCOs for Unrestricted use. Approximately 21,600 cubic yards (CY) of soil would be removed, compared to 17,900 CY for Alternative 5, and 6,300 CY for Alternative 4. Alternative 6 would build upon Alternative 5 by including: additional areas of excavation, on-site and off-site, and the removal and replacement of the natural gas regulator station. Because Alternative 6 involves the greatest amount of excavation, both in area and depth, it poses the greatest challenge to excavation support and dewatering. Because of the completeness of the removal, monitored natural attenuation (MNA) for groundwater would not be applicable to this alternative. However, groundwater monitoring would be periodically performed for a short period of time (assumed up to 5 years for cost estimations) to verify the effectiveness of the remedy. Once all remedial action objectives have been achieved, there will be no institutional or engineering controls, no Site Management, no restrictions, and no periodic review. This remedy will have a minimal annual cost for the post-remedial groundwater monitoring, plus the capital cost.

Present Worth: .... *$8.08 million*
Capital Cost: .... *$7.96 million*
Annual Costs: .... *$7.69 thousand*

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($ millions)	Annual Costs ($ thousands)	Total Present Worth ($ millions)
No Action	0	0	0
Surface and Subsurface Soil Removal up to 15 feet, Soil Cover, MNA, and IC/ECs	4.02	19.9	4.33
Surface and Subsurface Soil Removal to 15 feet, Soil Cover, ISCO of Impacts Below 15 feet, MNA, and IC/ECs	5.45	13.3	5.65
ISS of Subsurface Soil with Pre-Excavation	4.00	13.3	4.21
Excavation of Impacted Soils <15 feet Exceeding SCOs, Deep Source Removal	6.93	7.69	7.05
Restoration to Pre-Disposal or Unrestricted Conditions	7.96	7.69	8.08

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 4, ISS of Subsurface Soil with Pre-Excavation as the remedy for this site. Alternative 4 would achieve the remediation goals for the site by the use of soil removal and in-situ solidification (ISS) to address subsurface impacts. In addition, a cover system meeting commercial SCOs will be placed over the Site. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figures 6 and 7.

Basis for Selection

The proposed remedy is based on the results of the RI and the evaluation of alternatives. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed "threshold criteria" and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

Alternative 1 does not provide any additional protection, and is thus eliminated from further consideration. Alternatives 2-6 satisfy this criterion to varying degrees for environmental protection, using different techniques. Alternatives 2-6 are all protective of public health either through restoration to pre-disposal conditions or through the implementation of protective engineering and institutional controls.

The proposed remedy (Alternative 4) would satisfy this criterion by removing near-surface contamination and solidifying the remaining impacted soils in place. This results in a low permeability monolith that reduces or eliminates mobility of contamination and reduces or eliminates the source of groundwater contamination. Groundwater contamination is the most significant threat to the environment. The placement of a clean soil cover over the solidified soil in the subsurface would also decrease the potential for accidental human exposure from uncontrolled future excavation activities.

Alternative 6 would also be protective, because it involves the complete removal of contaminants of concern to Unrestricted Use SCOs at all locations at all depths. Alternative 5 targets the same mass of soil as Alternative 4, but calls for excavation rather than solidifying the soils in place. Therefore, Alternative 5 is protective of the environment. Alternatives 3 and 2, with excavation down to 15 feet, also comply with this criterion but to a lesser degree or with lower certainty, because they address impacts below 15 feet bgs to a lesser degree compared to Alternatives 4, 5, and 6.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

Alternative 4 complies with SCGs to the extent practicable. It addresses source areas of contamination and complies with the restricted use soil cleanup objectives at the surface through construction of a cover system. It also creates the conditions necessary to restore groundwater quality to the extent practicable. Alternatives 5 and 6 also comply with SCGs. Alternatives 2 and 3 also comply with this criterion but to a lesser degree or with lower certainty.

Because Alternatives 2-6 satisfy the threshold criteria, the remaining criteria are particularly important in selecting a final remedy for the site.

The next six "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

The Long-term effectiveness of the alternatives differ principally in how effective they address groundwater impacts. Alternative 4 is recommended since it will remove a large portion of the contaminant mass and treat most of the remaining contaminated soils in a manner which limits the contaminants' ability to leach those contaminants into groundwater.

Alternative 6 would be even more effective and permanent, because it would involve the complete removal of impacted source materials using a much larger excavation. With the contaminant source removed, groundwater would be expected to return to pre-release conditions within a few years. Alternative 5 would rank as the next most effective and permanent option due to the somewhat less extensive removal of contaminated soils.

Alternative 3 seeks to address soil contamination beyond the limits of excavation by treating it with oxidizing chemicals. This technique can be highly effective in treating soils where contaminants are more or less evenly distributed through the soil mass. However, it is essential that the oxidizing chemicals come into close contact with the contaminants in order for this chemical reaction to take place. In cases where the contaminants are in the form of oily liquids which do not readily mix with water, it often proves difficult or impossible to achieve this intimate mixing. Consequently, the long-term effectiveness of the ISCO component of Alternative 3 is questionable.

Alternative 2 would rank somewhat lower in terms of long-term effectiveness, since it would leave significant volumes of contaminated soil below the proposed 15-foot excavation depth. Contact with remaining soil contamination would be addressed with engineering and institutional controls in this Alternative as well as Alternatives 3, 4, 5, and, possibly for an interim duration, 6.

4. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Three of the alternatives rely heavily on excavation and removal of contaminated soils. Such techniques are effective in eliminating mobility and toxicity, and reducing the volume of contamination within the excavation limits. Alternative 6 would result in complete removal of all contaminants, therefore it would have complete reduction of toxicity, mobility, and volume of contamination. Alternative 5 would result in the next greatest reduction by soil removal. Alternative 2 would offer a lower level of reduction, with a more restricted soil removal.

Alternatives 3 and 4 offer two different approaches to dealing with contaminants left behind by the excavation of shallow contamination and source structures. Under Alternative 3, contaminants beyond the excavation limits would be treated with oxidizing chemicals injected into the ground. Any coal tar contamination which is successfully treated by the injection program would be permanently destroyed, meeting the requirements for mobility, toxicity and volume reduction. However, as noted above, there are concerns with how complete the destruction of coal tar contamination would be.

Alternative 4, in which remaining contamination is solidified into an impermeable mass, offers a high degree of toxicity and mobility reduction. However, it actually increases the volume of the treated soil slightly. This increase in volume is negligible in this case, since the pre-removal of subsurface structures will create enough room for the soil expansion to take place. No increase in volume will be noticeable at the surface, since the solidified mass will be covered with clean soils from an off-site source.

5. <u>Short-term Impacts and Effectiveness.</u> The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

Alternative 2 will have the least short-term impact as it requires the smallest amount of volume of soil to be removed from the site, and no additional work below 15 feet bgs. Alternative 3 ranks next because ISCO injection would require only the advancement of borings into the restored site to remediate deep soils. Like alternative 2, most of the short-term impacts will result from the removal of the upper 15 feet of soils. The methods available to control these impacts are reliable and effective. Such methods include an odor and dust control plan to prevent vapors, dust, and odors from escaping into the surrounding neighborhood. A community air monitoring plan (CAMP) will also be in place to conduct real-time monitoring for VOCs and particulates (i.e., dust) at the perimeter of the site during the clean-up. The CAMP is intended to provide a measure of protection for the surrounding community, with specific action levels requiring increased monitoring, corrective actions to abate emissions, and/or work shutdown.

Alternatives 4 and 5 will have similar degrees of impact. For alternative 4, the ISS mixing equipment will require more heavy construction equipment and support facilities.

For alternative 5, deep excavation of source areas would require more robust deep shoring equipment to support the deeper excavation. Alternative 6 will involve the greatest excavation quantities and depths, resulting in the greatest negative short-term impacts, with a high-level of disruption due to the removal and replacement of the existing natural gas regulator station and roadway. The driving of sheet piling to conduct deeper soil excavation can be a significant source of noise and ground vibration, which is an important consideration on a site which is bounded by single family residences and a hotel. Alternative 4 will avoid the disruptions caused by deeper excavation in Alternative 5 and 6. Alternative 6 will also require the largest truck traffic volume.

The odor and dust control plan and CAMP will also be in place for Alternatives 4, 5, and 6 to control short-term impacts.

6. <u>Implementability.</u> The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

All of the remedial alternatives evaluated here can be implemented. All of the Alternatives require the use of widely available construction equipment, and have been implemented at other MGP sites in New York and elsewhere. There are no site, land-use, or equipment limitations that would prevent them from being conducted.

Nonetheless, Alternative 2 would be most implementable, because all work would be conducted at or above the water table, minimizing the need for water management. Alternative 3 would rank as next most implementable, because ISCO injection is relatively easy to conduct below the water table. Implementation of Alternative 4 would be somewhat more challenging, because of the use of deep mixing equipment, but this equipment has been used elsewhere on similar sites and is readily available.

Deep excavation below the water table requires that the excavation be supported, most likely using temporary sheet piling. Alternative 5 will rank next due to the need for deep shoring methods to allow for excavation of source material from 15 to 50 feet bgs. Alternative 6 ranks last and will have the greatest disruption to the site. The gas regulator equipment would need to be decommissioned and replaced to allow for full removal of soils containing MGP impacts.

7. Cost-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision.

Alternative 4, at an estimated $4.21 million, is the most cost-effective option, and also addresses the source areas at all depths and reduces future groundwater impacts. Estimated costs for Alternative 2 are nearly the same; however, Alternative 2 would allow long-term groundwater impacts to remain at the site. Alternative 3 is the next costliest option at approximately $5.65 million, followed by Alternative 5 at approximately $7.05 million and Alternative 6 at approximately $8.08 million.

8. Land Use. When cleanup to pre-disposal conditions is determined to be infeasible, the Department may consider the current, intended, and reasonable anticipated future land use of the site and its surroundings in the selection of the soil remedy.

The property is zoned for commercial use. Alternative 6 would allow for unrestricted land use. Alternatives 3 and 5 will allow for a land use of Commercial. Both would remediate the upper 15 feet by excavation to the same depth to meet Commercial land use SCOs. An SMP and environmental easement would be required on-site for management of impacted soils below 15 feet and to prevent groundwater use. Alternative 4 would be similar to Alternatives 3 and 5 and allow full Commercial use of the site. The presence of the ISS mass below 4 feet can increase the cost for site redevelopment for soil handling or disposal. An SMP and environmental easement will be required on-site, as well as restriction on groundwater use. Alternative 2 will be supportive of any future commercial land uses, but with additional concern regarding soil and groundwater below 15 feet due to the COCs remaining at the site below that depth. An environmental easement and groundwater restriction will be required on-site, indefinitely. For Alternatives 2 through 5, an off-site SMP will require off-site property owners to implement any necessary site management on the off-site properties.

The final criterion, Community Acceptance, is considered a “modifying criterion” and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

9. Community Acceptance. Concerns of the community regarding the investigation, the evaluation of alternatives, and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the Department will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

Alternative 4 is being proposed because, as described above, it satisfies the threshold criteria and provides the best balance of the balancing criterion.