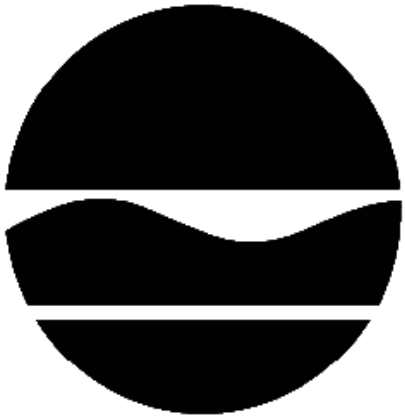
PROPOSED REMEDIAL ACTION PLAN

K - Skillman St. Station
State Superfund Project
Brooklyn, Kings County
Site No. 224068
February 2015



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 repositories 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 repositories:

Brooklyn Community Board 3
Attn: Henry Butler
1360 Fulton Street
Brooklyn, NY 11216
Phone: (718) 622-6601

Brooklyn Public Library
Williamsburg Branch
240 Division at Marcy Street
Brooklyn, NY 11211
Phone: (718) 302-3485

A public comment period has been set from:

A public meeting is scheduled for the following date:

Public meeting location:

At the meeting, the findings of the remedial investigation (RI) 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 __ to:

Scott Deyette
NYS Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
scott.deyette@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: SITE DESCRIPTION AND HISTORY

Location: The Skillman Street Holder Station is located in an urban area, at 7 Skillman Street, Brooklyn, New York, Kings County.

Site Features: The 7 Skillman Street parcel is completely covered by a two-story building. This building is used as a banquet/catering hall.

Current Zoning/Use: The property is currently in active use as a banquet hall, and is zoned for light industrial/commercial use. The surrounding parcels are currently used for a combination of commercial and residential purposes. The nearest residential building is approximately 150 feet to the southwest.

Past Use of the Site: Two manufactured gas storage holders were constructed at the site between 1887 and 1904. These holders were operated solely as gas distribution holders, and no gas production facilities were present. At some point prior to 1935, gas storage operations ceased and the holders were demolished. The site remained under the ownership of the Brooklyn Union Gas Company until sometime prior to 1947. Upon being sold the property was used for automobile parking and storage. By 1950, the site was used as an automobile repair facility which remained until at least 1993. In 2003, the existing building was developed into a catering hall, which is presently in operation.

Site Geology and Hydrogeology: The site is underlain by fill material, alluvial sands, glacial outwash and bedrock at depth. Groundwater is typically found at approximately 7 to 16 feet below ground surface (bgs), and flows generally to the west-northwest.

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 Grid

The Department and KeySpan (a predecessor to National Grid) entered into an Order on Consent A2-0552-0606 in February, 2007. The Order obligates the responsible parties to implement a full remedial program for MGP-related contamination at the site. As a successor to KeySpan, National Grid remains bound by the terms of this consent order.

Non-MGP contamination was also found in groundwater and soil vapor samples, for which National Grid is not responsible. The site owner was notified of this contamination and was advised to take certain actions to address potential soil vapor intrusion. There is currently insufficient data to conclusively determine whether this site is the source of the chlorinated organic compounds identified, but the additional investigations conducted pursuant to the MGP site remedy are expected to further define the source.

On-site and off-site contamination unrelated to the former MGP activities identified during the environmental investigations will be addressed separately by the NYSDEC. The responsible party, in accordance with the Order on Consent, is not responsible for non-MGP related contamination.

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
- indoor 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	NAPHTHALENE
BENZENE	Isopropylbenzene
TOLUENE	STYRENE
ETHYLBENZENE	cis-1,2-Dichloroethene
XYLENE (MIXED)	CYANIDES(SOLUBLE CYANIDE SALTS)
BENZO(B)FLUORANTHENE	TRICHLOROETHENE (TCE)
BENZ(A)ANTHRACENE	TETRACHLOROETHYLENE (PCE)
BENZO(A)PYRENE	VINYL CHLORIDE
Chrysene	1,2-DICHLOROETHANE
indeno(1,2,3-cd)pyrene	trans-1,2-Dichloroethene

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

- groundwater
- soil
- soil vapor intrusion

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 OU 01.

Based upon investigations conducted to date, the primary contaminants of concern are the volatile organic compounds (VOCs) benzene, toluene, ethylbenzene and xylene (together known as BTEX), and styrene; polycyclic aromatic hydrocarbons (PAHs); and metals.

Soil- The subsurface soil exceedances for on-site VOCs (BTEX) were slightly above unrestricted soil cleanup objectives (USCOs), though no samples exceed the commercial SCOs. However sampling of soil beneath the site was limited due to the inability to access much of the property with a drill rig, and a source area of higher contaminant concentrations may be present beneath the buildings. Adjacent to the site, in a sample collected beneath Skillman Street at a depth of approximately 27 feet where evidence of coal tar was observed, the concentration of toluene was 160 ppm, ethylbenzene was 220 ppm, and xylenes were 840 ppm in subsurface soil. Styrene was also detected at this location at a concentration of 400 ppm.

There were no detections of chlorinated solvents or total cyanide in soil above unrestricted SCOs either on or off-site.

The PAH exceedances above unrestricted SCOs consisted of benzo(b)fluoranthene, benz(a)anthracene, benzo(a)pyrene, chrysene, indeno(1,2,3-cd)pyrene, and naphthalene. Adjacent to the site the concentration of naphthalene was 1000 ppm (at 27 feet below ground surface).

The only inorganics to exceed unrestricted SCOs were lead and mercury, although neither exceeded the commercial SCOs in soil.

Groundwater - Samples collected from monitoring wells located both on-site (temporary sampling points) and off-site exceeded groundwater quality standards (GWQS) for benzene, toluene, ethylbenzene, xylenes (BTEX) compounds, naphthalene, chlorinated VOCs, cyanide, and metals. On-site, benzene ranged from 13 to 5,600 ppb (GWQS of 1 ppb), toluene at 20,000 ppb (GWQS of 5 ppb), ethylbenzene at 12,000 ppb (GWQS of 5 ppb), xylenes at 9,400 ppb (GWQS of 5 ppb), isopropyl benzene at 420 ppb (GWQS of 5 ppb), styrene at 82 ppb (GWQS of 5 ppb), cis-1,2-dichloroethene at 9.2 ppb (GWQS of 5 ppb), naphthalene at 5,600 ppb (GWQS of 10 ppb), total cyanide at 240 ppb (GWQS of 200 ppb), chromium at 380 ppb (GWQS of 50 ppb), and lead at 280 ppb (GWQS of 25 ppb). Elevated BTEX and napthalene also indicate the possible presence of MGP-related contaminants in the subsurface beneath the building.

Off-site, detections of benzene range from 100 ppb to 410 ppb; toluene from 79 ppb to 1,100 ppb; ethylbenzene from 32 ppb to 930 ppb; xylenes from 100 ppb to 3,900 ppb; tetrachloroethene (PCE) from 5.6 to 9,400 ppb; trichloroethene (TCE) from 140 to 1,900 ppb; vinyl chloride from 200 to 380 ppb; cis-1,2-dichloroethene from 600 ppb to 8,000 ppb; isopropyl benzene from 64 ppb to 420 ppb; styrene from 82 ppb to 1,800 ppb; and naphthalene from 62 ppb to 5,600 ppb.

There were also eight inorganic compounds that exceeded the groundwater standards in both on-site and off-site wells. These compounds were copper, iron, magnesium, manganese, nickel, selenium, sodium, and thallium, all of which are not associated with the former MGP operations.

Soil Vapor - Soil vapor samples collected from the site contained elevated levels of both MGP-related and non-MGP-related compounds. The MGP-related detections included benzene at 35 ug/m3; toluene at 96 ug/m3; ethylbenzene at 12 ug/m3; xylenes at 40 ug/m3; 1,2,4-trimethylbenzene at 12 ug/m3; and nonane at 8.4 ug/m3. The non-MGP constituents included PCE at 12,000 ug/m3, TCE at 1,200 ug/m3, and cis-1,2-dichloroethene at 1,500 ug/m3.

Indoor Air - The contaminants present in soil vapor at elevated levels were detected at much lower concentrations in indoor air. The highest concentration of the BTEX compounds was toluene at 6.3 ug/m3. PCE was detected at a concentration of 0.66 ug/m3; TCE at 0.21 ug/m3; and ethanol at 450 ug/m3. The ethanol concentrations in indoor air were approximately an order of magnitude larger than the soil vapor concentrations, indicating the source to be within the building. No indoor air guidance values were exceeded for any compound. The owners of the affected property have been notified where mitigation or monitoring of impacts to indoor air is required.

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.*

Direct contact with contaminants in the soil is unlikely because the site is covered with buildings and pavement. Contaminated groundwater at the site is not used for drinking or other purposes and the site is served by a public water supply that obtains water from a different source not affected by this contamination. Volatile organic compounds in the groundwater may move in to the soil vapor (air spaces within the soil), which in turn 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. Mitigation has been recommended to address the potential for people to inhale contaminants in indoor air of the onsite building due to soil vapor intrusion. Environmental sampling indicates that soil vapor intrusion is a concern for off-site buildings which are occupied.

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.
- 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.

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 Site Management with Institutional Controls remedy.

The estimated present worth cost to implement the remedy is $468,000. The cost to construct the remedy is estimated to be $97,500 and the estimated average annual cost is $370,000.

The elements of the proposed remedy are as follows:

1) Cover System: A site cover currently exists (building) and will be maintained to allow for commercial use of the site. Any site redevelopment will maintain a site cover, which may consist either of the structures such as buildings, pavement and sidewalks comprising the site development, or a soil cover in areas where the upper one foot of exposed soil will exceed the applicable soil cleanup objectives (SCOs). Where a soil cover is required it will be a minimum of one foot of soil, meeting the SCOs for cover material as set forth in 6 NYCRR Part 375-6.7(d) for commercial use. The soil cover will be placed over a demarcation layer, with the upper six inches of the soil of sufficiant quality to maintain a vegetation layer. Any fill material brought to the site will meet the requirements for the identified site use as set forth in 6 NYCRR Part 375-6.7(d).

2) Imposition of an institutional control in the form of an environmental easement for the controlled property that:

- requires 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);
- allows the use and development of the controlled property for commercial and industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restricts the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the NYSDOH or the NYC Department of health; and
- requires compliance with the Department approved Site Management Plan.

3) 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/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in Paragraph 2 above.

Engineering Controls: The soil cover discussed in Paragraph 1 above.

The SMP will include, but may not be limited to:

-an Excavation Plan which details the provisions for management of limited excavations in areas of remaining contamination;

-a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable, as well as off-site contamination, will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department's determination of the need for a remedy, a remedial work plan will be developed for the final remedy for MGP contamination at the site and off-site areas, including removal and/or treatment of any source areas to the extent feasible. This removal or treatment will be sufficient in scope to address the site as a source of both on-site and off-site groundwater contamination. The presumptive remedy for MGP contamination will be excavation of both former MGP structures and MGP-related source material, unless an alternative, equivalent remedy is developed based on new information. If a remedy is determined to be necessary to address sources of non-MGP contamination present at the site, this will be evaluated separately for further action. Citizen Participation Plan (CPP) will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment;

-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 notification.

In addition the SMP will include:

-descriptions of the provisions of the environmental easement including any land use and groundwater use restrictions;

-the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

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

-a schedule of monitoring and frequency of submittals to the Department; and

-monitoring for vapor intrusion for any buildings developed on the site, as may be required by the Institutional and Engineering Control Plan discussed above.

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 three 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.

Waste/Source Areas

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

Wastes are defined in 6 NYCRR Part 375-1.2(aw) and include solid, industrial and/or hazardous wastes. Source Areas are defined in 6 NYCRR Part 375(au). Source areas are areas of concern at a site were substantial quantities of contaminants are found which can migrate and release significant levels of contaminants to another environmental medium. Wastes and source areas were identified at the site within and adjacent to the former MGP structures, which were two gas holders.

The production of manufactured gas created waste products which are resistant to natural decay and often results in potential effects on public health and the environment. The primary waste was an oily liquid known as coal tar, which formed as a condensate during storage prior to distribution. The coal tar contains certain hazardous substances of concern in the volatile organic compound (VOC) and semi-volatile organic compound (SVOC) chemical classes. Specific VOCs of concern are benzene, toluene, ethylbenzene and xylenes (BTEX). Specific SVOCs of concern are the polycyclic aromatic hydrocarbons (PAHs): chrysene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene and indeno(1,2,3-cd)pyrene, as well as napthalene.

Total PAH concentrations are referred to in this plan are the sum of the individual PAHs listed above.

Evidence of waste and potential source areas were found at and adjacent to the site, in both soil and limited groundwater samples, and are potentially present within and adjacent to the former MGP gas holder structures. However, these areas could not be fully investigated due to the presence of an occupied building over the entire site. The waste/source areas identified will be addressed in the remedy selection process.

Groundwater

Groundwater samples were collected to assess groundwater conditions on and off-site. Sampling results indicate that benzene, toluene, ethylbenzene and xylene (BTEX), isopropylbenzene, and styrene (VOCs); naphthalene (PAHs); and lead, chromium and total cyanide (inorganics) exceed standards or guidance values at the site and off-site.

Several chlorinated solvents, including 1,2-dichloroethane, cis-1,2-dichloroethene, trans-1,2-dichloroethene, tetrachloroethene, trichloroethene and vinyl chloride, were found in one on-site monitoring well and four off-site monitoring wells. These compounds are not associated with the former MGP operations.

There were also eight inorganic compounds that exceeded the groundwater standards in both on-site and off-site wells. These compounds were copper, iron, magnesium, manganese, nickel, selenium, sodium and thallium, and are not associated with the former MGP operations.

Table #1 - Groundwater

Detected Constituents	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)	Frequency Exceeding SCG
VOCs			
Benzene	ND – 4300	1	5 of 11
Toluene	ND – 20000	5	5 of 11
Ethylbenzene	ND – 12000	5	5 of 11
Xylene (total isomers)	ND – 12800	5	5 of 11
Isopropyl benzene	ND – 420	5	2 of 11
Styrene	ND – 1800	5	4 of 11
Cis-1,2-dichloroethene	ND – 8000	5	4 of 11
Trans-1,2-dichloroethene	ND – 39	5	1 of 11
Vinyl chloride	ND -- 380	2	3 of 11
Tetrachloroethene	ND – 9400	5	4 of 11
Trichloroethene	ND -- 1900	5	2 of 11
SVOCs			
Napthalene	ND -- 5600	10	5 of 11
Inorganics			
Cyanide (total)	ND – 330	200	2 of 11
Chromium	ND – 380	50	2 of 11
Lead	ND -- 280	25	3 of 11

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).

Based on the findings of the RI, the presence of manufactured gas plant wastes 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: benzene, toluene, ethylbenzene and xylene.

Soil

Subsurface soil samples were collected and analyzed for volatile, semi-volatile, cyanide and metals during the remedial investigation to determine the nature and extent of impacts to soil as a result of the former MGP operations. These samples were collected from 2 to 40 feet below ground surface.

Individual BTEX compounds exceeded the unrestricted SCOs at one on-site (within holder structure) and one off-site location (adjacent to holder). Only one compound (total xylene) exceeded the commercial use SCOs. Individual PAH compounds only slightly exceeded the unrestricted SCOs, with benzo(a)pyrene and naphthalene as the only compounds found to exceed the commercial SCOs.

Inorganic compounds lead and mercury were found to exceed unrestricted SCOs in only three locations.

Table #2 – Subsurface Soil

Detected Constituents	Concentration Range Detected (ppm)[a]	Unrestricted SCG[b] (ppm)	Frequency Exceeding Unrestricted SCG	Commercial Use SCG[c] (ppm)	Frequency Exceeding Restricted SCG
VOCs					
Benzene	ND – 0.61	0.06	1 of 26	44	0 of 26
Toluene	ND – 160	0.7	2 of 26	500	0 of 26
Ethylbenzene	ND – 220	1	2 of 26	390	0 of 26
Xylene (total)	ND -- 840	0.26	2 of 26	500	1 of 26
SVOCs					
Benzo(a)pyrene	ND – 1.4	1	1 of 26	1	1 of 26
Benzo(a)anthracene	ND – 1.5	1	1 of 26	5.6	0 of 26
Benzo(b)fluoranthene	ND – 1.3	1	2 of 26	5.6	0 of 26
Chrysene	ND – 1.5	1	1 of 26	56	0 of 26
Indeno(1,2,3-cd)pyrene	ND – 1.2	0.5	1 of 26	5.6	0 of 26
Napthalene	ND -- 1000	12	2 of 26	500	1 of 26
Inorganics					
Lead	ND – 330	63	3 of 26	1000	0 of 26
Mercury	ND – 0.38	0.18	2 of 26	2.8	0 of 26

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.

Based on the findings of the Remedial Investigation, the presence of MGP-related contaminants have 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 (polycyclic aromatic hydrocarbons), and BTEX (benzene, toluene, ethylbenzene and xylene).

Soil Vapor

The evaluation of the potential for soil vapor intrusion resulting from the presence of site related soil or groundwater contamination was evaluated by the sampling of soil vapor, sub-slab soil vapor under structures, and indoor air inside structures. At this site due to the presence of buildings in the impacted area a full suite of samples were collected to evaluate whether actions are needed to address potential exposures related to soil vapor intrusion.

Soil vapor samples were collected from the sub-slab of the structure located on the 7 Skillman Street property. Indoor air and outdoor air samples were also collected at this time. The results indicate BTEX (benzene, toluene, ethylbenzene and xylene), 1,2,4-trimethylbenzene, indane, nonane, n-decane, n-undecane, n-dodecane, naphthalene, ethanol, tetrachloroethene (PCE), trichloroethylene (TCE), 1,1,1-TCA, carbon tetrachloride, and cis-1,2-dichloroethene were detected in on-site sub-slab vapor.

Indoor air samples had minor detections of BTEX constituents, TCE and PCE. There were no compounds detected above guidance values in the indoor air.

Ethanol was also noted in the indoor air in the structure tested. The pre-sampling survey indicated the storage of ethanol-containing commercial products in the building. Further, ethanol was detected in the indoor air samples at concentrations higher than either sub-slab soil vapor sampled. Therefore, the ethanol found in the indoor air is not considered to be site specific contaminant of concern and is not considered to be present due to soil vapor intrusion.

Based on the concentration detected, and in comparison with the NYSDOH Soil Vapor Intrusion Guidance, the primary soil vapor contaminants are tetrachloroethene (PCE) and trichloroethene (TCE). These chlorinated solvents are not associated with the former MGP operations, and may be related to subsequent site uses. The guidance recommends that mitigation be undertaken to minimize the potential for human exposure associated with the migration of PCE and TCE into the indoor air. The site owner was notified of this contamination was advised to take certain actions to address potential soil vapor intrusion.

Based on the findings of the Remedial Investigation, the presence of groundwater contaminated with both PCE and TCE has resulted in the contamination of soil vapor.

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.

Alternative 2: Site Management

The Site Management Alternative requires only institutional controls for the site. This alternative includes institutional controls, in the form of an environmental easement and an interim site management plan, necessary to protect public health and the environment from any contamination identified at the site.

This Alternative will include the following components:

- Placement of an institutional control in the form of an environmental easement to restrict the use of the on-site property to commercial or industrial uses and restrict the use of groundwater.
- Development of a Site Management Plan to include institutional controls to address residual soil, soil vapor and groundwater contamination; and engineering controls to address the existing site cover (building). This plan will include a provision for further investigation and remediation should large scale redevelopment occur, if the existing structure is demolished, or if the subsurface is otherwise accessible. The presumptive remedy for MGP contamination will be excavation of both former MGP structures and MGP-related source material, unless an alternative, equivalent remedy is developed based on new information.

The cost to implement Alternative 2 has been estimated as follows:

Present Worth: *$435,500*
Capital Cost: *$97,500*
Annual Costs: ..... *$338,000* [(a)]

[(a)] – These costs include annual groundwater monitoring.

Exhibit C

Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
No Action	0	0	0
Site Management [(a)]	97,500	338,000	435,500

(a) – These costs include annual groundwater monitoring.

Exhibit D

SUMMARY OF THE PROPOSED REMEDY

The Department is proposing Alternative 2, Site Management as the remedy for this site. Alternative 2 would achieve the remediation goals for the site by protecting human health and the environment from exposure to impacted media. The elements of this remedy are described in Section 7. The proposed remedy is depicted in Figure 4.

Basis for Selection

The proposed remedy is based on the results of the investigation completed to date and the existing structures on-site which hinder the ability to implement a full investigation and remedy. The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375.

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 (No Action) does not include active remedial actions and thus will not provide any additional protection to human health and the environment compared to what currently exists. Additionally, this alternative will not comply with SCGs; since source material will remain in place and continue to pose a threat to both human health and the environment. Therefore, Alternative 1 is eliminated from further evaluation.

Alternative 2 (Site Management) will provide protection of human health and the environment through an institutional control and SMP provisions for limited excavation protocols, further investigation and remediation when the site becomes accessible, evaluation and mitigation of non-MGP soil vapor intrusion by the site owner and the groundwater use restriction.

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.

Although Alternative 2 does not immediately address SCGs, the provisions in the SMP would require further investigation and remedial work should the building be demolished which would satisfy this criteria.

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.

For Alternative 2, site management will be effective, but it will not be desirable in the long term. This would be considered only a short-term proposal with the implementation of the SMP, with more remedial work required once the site becomes accessible.

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.

Alternative 2 would control potential exposures with institutional controls only and will not reduce the toxicity, mobility or volume of contaminants remaining. This alternative will include a groundwater use restriction and a provision for the investigation and mitigation of exposures from soil vapor intrusion.

5. Short-term Impacts and Effectiveness. 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 would not have any short-term impacts, but may take a long amount of time to achieve the remediation goals.

6. Implementability. 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.

Alternative 2 is readily implementable as it is primarily an administrative task initially. Future actions will be able to be implemented without significant short term impacts once the building has been removed.

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 2 is cost effective.

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.

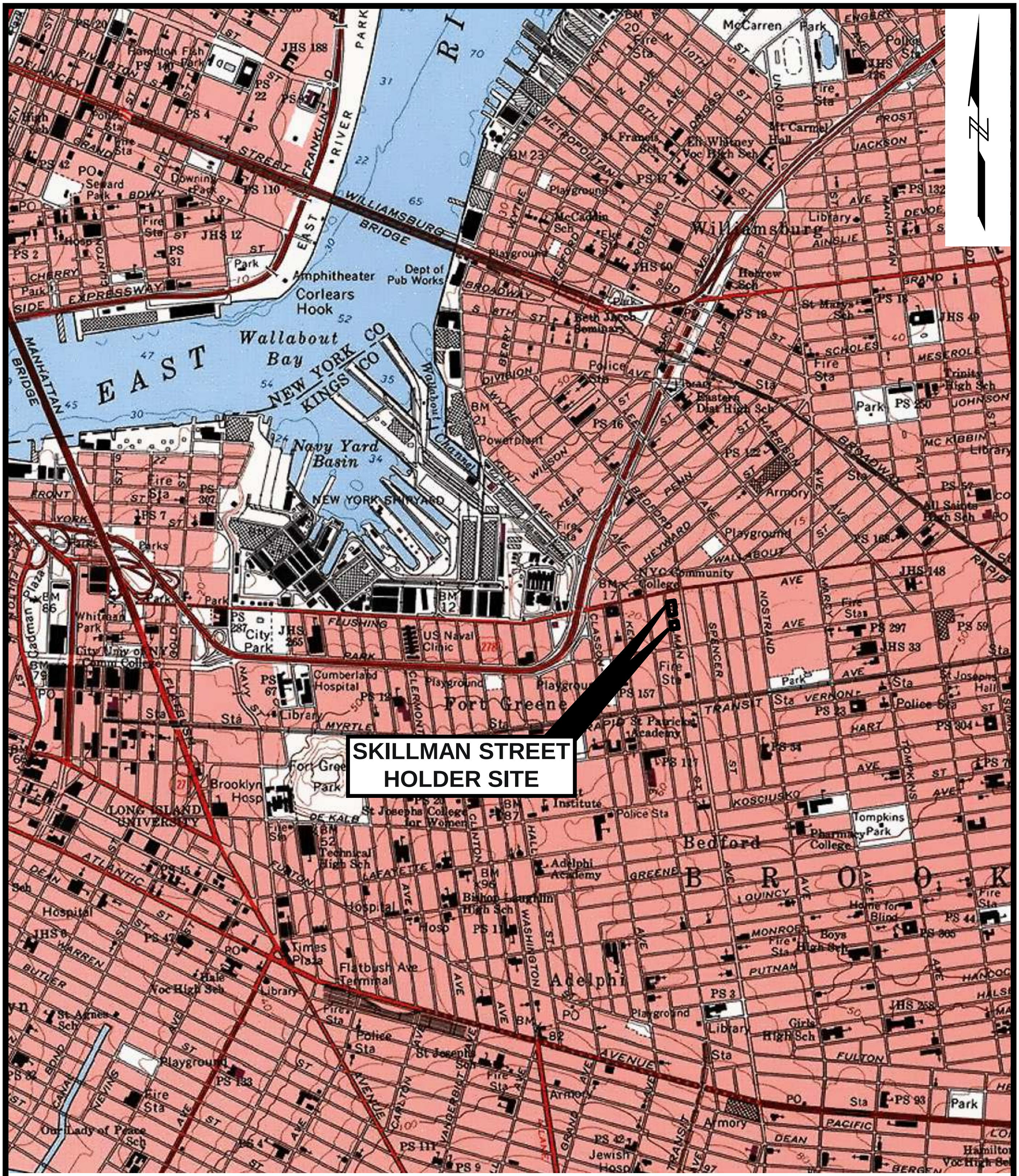
Since the anticipated use of the site is commercial, Alternative 2 is not the most desirable because at least some contaminated soil would remain on the property. However, the residual contamination with Alternative 2 would be controllable with implementation of a Site Management Plan.

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



SOURCE: Map created with TOPO! ® ©2001 National Geographic (www.nationalgeographic.com/topo)

0 2000 4000
SCALE, FEET

SITE CHARACTERIZATION REPORT
SKILLMAN STREET HOLDER STATION
BROOKLYN, NEW YORK

nationalgrid

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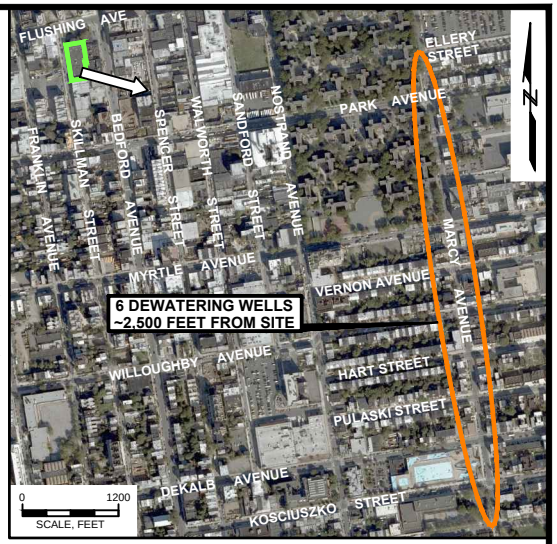
SITE LOCATION MAP

Project 093080-1-1102 | December 2013 | Figure 1

Sample Name:		SSMW-07
Well Screen Depth (feet):	NYS AWQS	(7-17)
Sample Date:		9/9/2011
BTEX (ug/L)		
Total BTEX	NE	ND
Other VOCs (ug/L)		
Total VOCs	NE	2.12
PAHs (ug/L)		
Total PAHs	NE	ND
Other SVOCs (ug/L)		
Total SVOCs	NE	0.62

Sample Name:		SSMW-06
Well Screen Depth (feet):	NYS AWQS	(25-30)
Sample Date:		5/31/2011
BTEX (µg/L)		
Benzene	1	**410**
Toluene	5	**600**
Ethylbenzene	5	**720**
Total Xylene	5	**1700**
Total BTEX	NE	**3430**
Other VOCs (µg/L)		
cis-1,2-Dichloroethene	5	**600**
Styrene	5	**92**
Vinyl chloride	2	**290**
Total VOCs	NE	**4412**
PAHs (µg/L)		
Naphthalene	10*	**1200**
Total PAHs	NE	**1214**
Other SVOCs (µg/L)		
2-Methylphenol (o-Cresol)	1	**21 J**
Total SVOCs	NE	**1235**
Total Metals (µg/L)		
Manganese	300	**3460**
Sodium	20000	**109000**

Sample Name:		SSGW-06
Well Screen Depth (feet):	NYS AWQS	(11-16)
Sample Date:		8/25/2010
BTEX (µg/L)		
Toluene	5	**1100**
Ethylbenzene	5	**930**
Total Xylene	5	**3900**
Total BTEX	NE	**5930**
Other VOCs (µg/L)		
Styrene	5	**1800**
Total VOCs	NE	**7730**
PAHs (µg/L)		
Naphthalene	10*	**3300**
Total PAHs	NE	**3400**
Other SVOCs (µg/L)		
Total SVOCs	NE	**3400**
Total Metals (µg/L)		
Iron	300	**6840**
Manganese	300	**5830**
Sodium	20000	**99900**



LOCATION OF DEWATERING WELLS

Sample Name:		SSMW-03
Well Screen Depth (feet):	NYS AWQS	(12-22)
Sample Date:		5/31/2011
BTEX (µg/L)		
Total BTEX	NE	**4.36**
Other VOCs (µg/L)		
Total VOCs	NE	**9.06**
PAHs (µg/L)		
Total PAHs	NE	**5.6**
Other SVOCs (µg/L)		
Total SVOCs	NE	**6.22**
Total Metals (µg/L)		
Iron	300	**3720**
Manganese	300	**965**
Sodium	20000	**197000**

Sample Name:		SSMW-08
Well Screen Depth (feet):	NYS AWQS	(7-17)
Sample Date:		9/9/2011
BTEX (ug/L)		
Total BTEX	NE	ND
Other VOCs (ug/L)		
Total VOCs	NE	17.4
PAHs (ug/L)		
Total PAHs	NE	ND
Other SVOCs (ug/L)		
Phenol	1	**1.4**
Total SVOCs	NE	1.4

Sample Name:		SSGW-05
Well Screen Depth (feet):	NYS AWQS	(8-18)
Sample Date:		8/9/2010
BTEX (µg/L)		
Total BTEX	NE	ND
Other VOCs (µg/L)		
Total VOCs	NE	ND
PAHs (µg/L)		
Total PAHs	NE	ND
Other SVOCs (µg/L)		
Total SVOCs	NE	**1**
Total Metals (µg/L)		
Iron	300	**10100**
Manganese	300	**2780**
Sodium	20000	**59800**

Sample Name:		SSMW-02
Well Screen Depth (feet):	NYS AWQS	(11-21)
Sample Date:		5/31/2011
BTEX (µg/L)		
Benzene	1	**100 J**
Toluene	5	**260**
Ethylbenzene	5	**250**
Total Xylene	5	**800**
Total BTEX	NE	**1410**
Other VOCs (µg/L)		
Acetone	50*	**850**
cis-1,2-Dichloroethene	5	**8000**
trans-1,2-Dichloroethene	5	**39 J**
Styrene	5	**360**
Tetrachloroethene (PCE)	5	**9400**
Trichloroethene (TCE)	5	**1900**
Vinyl chloride	2	**380**
Total VOCs	NE	**22339**
PAHs (µg/L)		
Naphthalene	10*	**490**
Total PAHs	NE	**500**
Other SVOCs (µg/L)		
Total SVOCs	NE	**500**
Total Metals (µg/L)		
Iron	300	**26400**
Manganese	300	**7070**
Sodium	20000	**114000**

LEGEND:

SITE BOUNDARY(APPROXIMATE)

SAMPLE LOCATIONS:

SSMW-02	MONITORING WELL
SSGW-05	TEMPORARY GROUNDWATER SAMPLING POINT
7.5	GROUNDWATER CONTOUR (FEET NAVD)
8.04	GROUNDWATER ELEVATION (FEET NAVD)
	INFERRED GROUNDWATER FLOW DIRECTION
NAVD	NORTH AMERICAN VERTICAL DATUM

NYS AWQS - New York State Ambient Water Quality Standards and Guidance Values for GA groundwater

NE	not established
ND	not detected
J	estimated value
U	indicates not detected to the reporting limit for organic analysis and the method detection limit for inorganic analysis
*	indicates the value is a guidance value and not a standard
BOLD	indicates detected concentration
BOLD	indicates that the detected concentration is above the NYS AWQS objective it was compared to
µg/L	micrograms per liter or parts per billion (ppb)
BTEX	benzene, toluene, ethlybenzene, and xylene
PAHs	polycyclic aromatic hydrocarbons
VOCs	volatile organic compounds
SVOCs	semi-volatile organic compounds

SOURCES:

1. BING AERIAL IMAGERY © 2011 MICROSOFT CORPORATION (www.bing.com/maps) ACCESSED ON 06/24/11.
2. SURVEY OF SAMPLE LOCATIONS CONDUCTED BY GEI CONSULTANTS, INC. ON 5/31/11 AND 6/23/11. SURVEY BY NEW YORK STATE LICENSED LAND SURVEYOR NUMBER 050146. HORIZONTAL DATUM: NEW YORK STATE PLANE COORDINATE SYSTEM (NY EAST ZONE), VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM (NAVD)88.

0 120' 240'

SCALE: 1" = 120'

Site Characterization Report
Skillman Street Holder Station
Brooklyn, New York

nationalgrid

GEI Consultants

Project 093080

GROUNDWATER CONTOURS (SEPTEMBER 9, 2011) AND GROUNDWATER ANALYTICAL SUMMARY (µg/L)

December 2014 Fig. 2a

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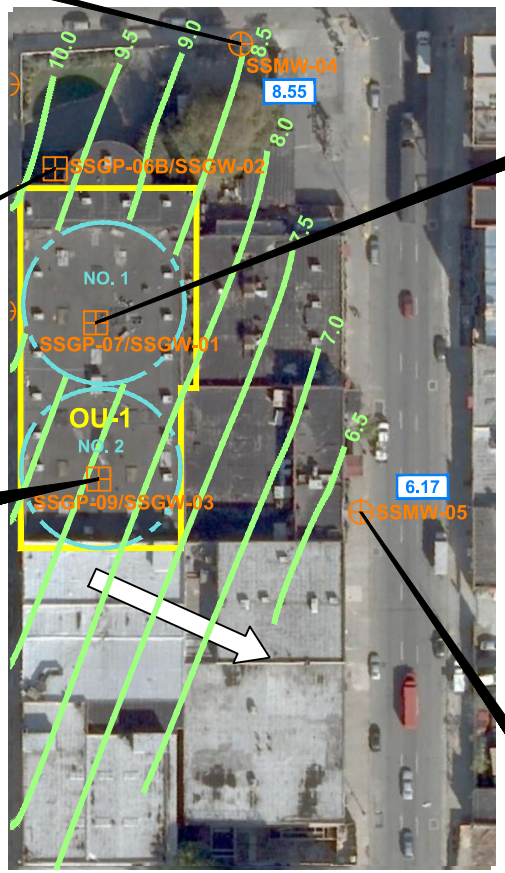
Sample Name: / Well Screen Depth (feet): / Sample Date:	NYS AWQS	SSMW-04 (10-20) 6/1/2011
BTEX (µg/L)		
Total BTEX	NE	ND
Other VOCs (µg/L)		
Tetrachloroethene (PCE)	5	**12**
Total VOCs	NE	**14.22**
PAHs (µg/L)		
Total PAHs	NE	ND
Other SVOCs (µg/L)		
Total SVOCs	NE	**0.85**
Total Metals (µg/L)		
Antimony	3	**5.1 J**
Iron	300	**15100**
Magnesium	35000*	**188000**
Manganese	300	**1590**
Selenium	10	**20.3 J**
Sodium	20000	**87500**
Thallium	0.5*	**4 J**

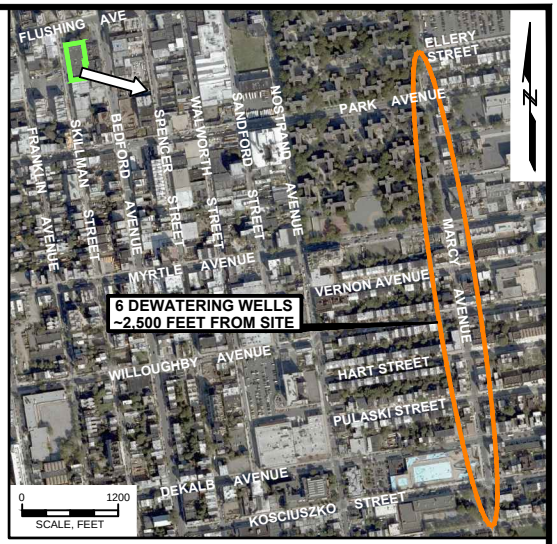
Sample Name: / Well Screen Depth (feet): / Sample Date:	NYS AWQS	SSGW-02 (13-23) 6/28/2013
BTEX (µg/L)		
Benzene	1	**240**
Toluene	5	**79**
Ethylbenzene	5	**32**
o-Xylene	5	**150**
m/p-Xylene	5	**100**
Total BTEX	NE	**601**
Other VOCs (µg/L)		
cis-1,2-Dichloroethene	5	**1900**
Isopropyl benzene	5	**64**
Tetrachloroethene (PCE)	5	**230**
Trichloroethene (TCE)	5	**140**
Vinyl chloride	2	**200**
Total VOCs	NE	**3135**
PAHs (µg/L)		
Naphthalene	10*	**62**
Total PAHs	NE	**62**
Other SVOCs (µg/L)		
Total SVOCs	NE	**62**
Total Metals (µg/L)		
Chromium	50	**68**
Iron	300	**50000**
Lead	25	**75**
Manganese	300	**2700**
Sodium	20000	**83000**
Total Cyanide (µg/L)		
Total Cyanide	200	**330 J**

Sample Name: / Well Screen Depth (feet): / Sample Date:	NYS AWQS	SSGW-03 (15-25) 6/26/2013
BTEX (µg/L)		
Benzene	1	**13**
Total BTEX	NE	**13**
Other VOCs (µg/L)		
cis-1,2-Dichloroethene	5	**9.2**
Total VOCs	NE	**22.2**
PAHs (µg/L)		
Total PAHs	NE	**ND**
Other SVOCs (µg/L)		
Total SVOCs	NE	**ND**
Total Metals (µg/L)		
Chromium	50	**380**
Copper	200	**390**
Iron	300	**410000**
Lead	25	**170**
Magnesium	35000*	**150000**
Manganese	300	**30000**
Nickel	100	**280**
Sodium	20000	**140000**



Sample Name: / Well Screen Depth (feet): / Sample Date:	NYS AWQS	SSGW-01 (11.5-21.5) 6/27/2013	Duplicate of: SSGW-01 (11.5-21.5) 6/27/2013
BTEX (µg/L)			
Benzene	1	**4300**	**5600**
Toluene	5	**16000**	**20000**
Ethylbenzene	5	**9500**	**12000**
o-Xylene	5	**4000**	**4900**
m/p-Xylene	5	**7700**	**9400**
Total BTEX	NE	**41500**	**51900**
Other VOCs (µg/L)			
Isopropyl benzene	5	**350**	**420**
Styrene	5	**70 J**	**82**
Total VOCs	NE	**41920**	**52402**
PAHs (µg/L)			
Naphthalene	10*	**5600 J**	**3300 J**
Total PAHs	NE	**5600**	**3500**
Other SVOCs (µg/L)			
Total SVOCs	NE	**5600**	**3500**
Total Metals (µg/L)			
Iron	300	**20000**	**26000**
Lead	25	**83 J**	**280 J**
Manganese	300	**690 J**	**1300 J**
Sodium	20000	**100000**	**110000**
Total Cyanide (µg/L)			
Total Cyanide	200	**240 J**	**200 J**

Sample Name: / Well Screen Depth (feet): / Sample Date:	NYS AWQS	SSMW-05 (11-21) 6/1/2011	Duplicate of SSMW-05 (11-21) 6/1/2011
BTEX (µg/L)			
Total BTEX	NE	ND	ND
Other VOCs (µg/L)			
1,2-Dichloroethane	0.6	**4.3 J**	**4.1 J**
Tetrachloroethene	5	**5.6**	5 U
Total VOCs	NE	**9.9**	**4.1**
PAHs (µg/L)			
Total PAHs	NE	ND	ND
Other SVOCs (µg/L)			
Total SVOCs	NE	**1.11**	**1.06**
Total Metals (µg/L)			
Manganese	300	**7440**	**7540**
Sodium	20000	**293000**	**276000**



LOCATION OF DEWATERING WELLS

LEGEND:

SITE BOUNDARY(APPROXIMATE)

HISTORICAL GAS HOLDER

SAMPLE LOCATIONS:

SSMW-02 — MONITORING WELL

SSGW-05 — TEMPORARY GROUNDWATER SAMPLING POINT

7.5 — GROUNDWATER CONTOUR (FEET NAVD)

8.04 — GROUNDWATER ELEVATION (FEET NAVD)

INFERRED GROUNDWATER FLOW DIRECTION

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VOCs	volatile organic compounds
SVOCs	semi-volatile organic compounds

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0 120' 240'

SCALE: 1" = 120'

Site Characterization Report
Skillman Street Holder Station
Brooklyn, New York

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Project 093080

GROUNDWATER CONTOURS (SEPTEMBER 9, 2011) AND GROUNDWATER ANALYTICAL SUMMARY (µg/L)

December 2014 Fig. 2b

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Sample Name: / Sample Depth (feet): / Sample Date:	UNRESTRICTED USE SCO	RESTRICTED USE SCO - COMMERCIAL	SSGP-17 (10-12) 8/22/2011
BTEX (mg/kg)			
Total BTEX	NE	NE	ND
Other VOCs (mg/kg)			
Total VOCs	NE	NE	ND
PAHs (mg/kg)			
Total PAHs	NE	NE	**0.181**
Other SVOCs (mg/kg)			
Total SVOCs	NE	NE	**0.181**

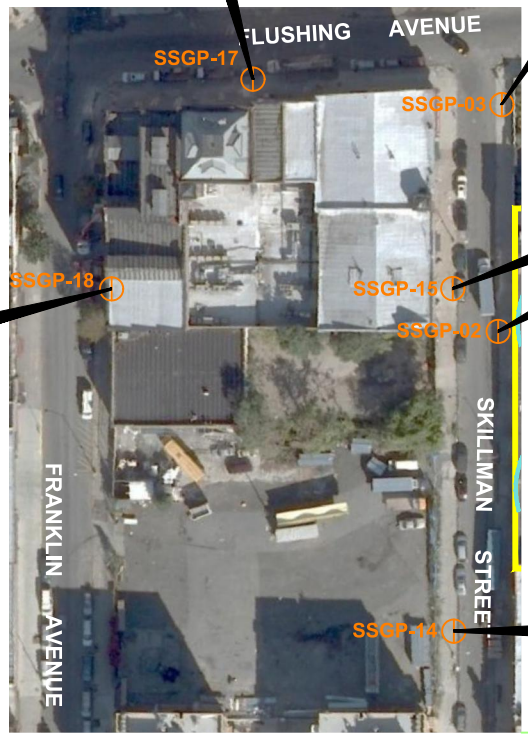
Sample Name: / Sample Depth (feet): / Sample Date:	UNRESTRICTED USE SCO	RESTRICTED USE SCO - COMMERCIAL	SSGP-03A (0.5-3.5) 8/12/2010	SSGP-03A (15-17) 8/12/2010
BTEX (mg/kg)				
Total BTEX	NE	NE	ND	ND
Other VOCs (mg/kg)				
Total VOCs	NE	NE	ND	ND
PAHs (mg/kg)				
Total PAHs	NE	NE	**1.004**	ND
Other SVOCs (mg/kg)				
Total SVOCs	NE	NE	**1.004**	ND

Sample Name: / Sample Depth (feet): / Sample Date:	UNRESTRICTED USE SCO	RESTRICTED USE SCO - COMMERCIAL	SSGP-15 (2-5) 8/19/2010	SSGP-15 (13.5-15) 8/19/2010
BTEX (mg/kg)				
Total BTEX	NE	NE	ND	**0.01517**
Other VOCs (mg/kg)				
Total VOCs	NE	NE	ND	**0.02617**
PAHs (mg/kg)				
Total PAHs	NE	NE	ND	**1.786**
Other SVOCs (mg/kg)				
Total SVOCs	NE	NE	ND	**1.786**

Sample Name: / Sample Depth (feet): / Sample Date:	UNRESTRICTED USE SCO	RESTRICTED USE SCO - COMMERCIAL	SSGP-18 (10-12) 8/23/2011
BTEX (mg/kg)			
Total BTEX	NE	NE	ND
Other VOCs (mg/kg)			
Total VOCs	NE	NE	ND
PAHs (mg/kg)			
Total PAHs	NE	NE	**0.744**
Other SVOCs (mg/kg)			
Total SVOCs	NE	NE	**0.744**

Sample Name: / Sample Depth (feet): / Sample Date:	UNRESTRICTED USE SCO	RESTRICTED USE SCO - COMMERCIAL	SSGP-02 (0.5-5) 8/9/2010	SSGP-02 (26.7-28.3) 8/9/2010
BTEX (mg/kg)				
Toluene	0.7	500	0.0057 U	**160**
Ethylbenzene	1	390	0.0057 U	**220**
Total Xylene	0.26	500	0.0057 U	**840**
Total BTEX	NE	NE	**0.001**	**1220**
Other VOCs (mg/kg)				
Acetone	0.05	500	**0.091 J**	58 UJ
Total VOCs	NE	NE	**0.092**	**1620**
PAHs (mg/kg)				
Naphthalene	12	500	**0.21 J**	**1000**
Total PAHs	NE	NE	**2.067**	**1218.7**
Other SVOCs (mg/kg)				
Total SVOCs	NE	NE	**2.113**	**1218.7**

Sample Name: / Sample Depth (feet): / Sample Date:	UNRESTRICTED USE SCO	RESTRICTED USE SCO - COMMERCIAL	SSGP-14 (3-5) 8/9/2010	SSGP-14 (12.75-13) 8/9/2010
BTEX (mg/kg)				
Total BTEX	NE	NE	ND	ND
Other VOCs (mg/kg)				
Total VOCs	NE	NE	ND	ND
PAHs (mg/kg)				
Total PAHs	NE	NE	ND	**1.182**
Other SVOCs (mg/kg)				
Total SVOCs	NE	NE	ND	**1.182**



SAMPLE LOCATIONS:

SSGP-06 GEOPROBE® BORING

6 NYCRR -New York State Register and Official Compilation of Codes, Rules and Regulations of the State of New York

6 NYCRR 375 SCO UNRESTRICTED USE - regulatory comparison against NYCRR, Chapter IV, Part 375-6 Unrestricted Use Soil Cleanup Objectives

6 NYCRR 375 SCO RESTRICTED USE RESTRICTED-RESIDENTIAL - regulatory comparison against NYCRR, Chapter IV, Part 375-6 Restricted Use Restricted-Residential Soil Cleanup Objectives

mg/kg	milligrams/kilogram or parts per million (ppm)
ft bgs	feet below ground surface
BTEX	benzene, toluene, ethlybenzene, and xylene
PAHs	polycyclic aromatic hydrocarbons
VOCs	volatile organic compounds
SVOCs	semi-volatile organic compounds
NE	not established
ND	not detected; total concentration is listed as ND because no compounds were detected in the group
U	indicates not detected at or above the reporting limit shown
J	estimated value
BOLD	indicates a detected concentration
BOLD	indicates that the detected result value exceeds established 6 NYCRR SCO UNRESTRICTED USE
BOLD	indicates that the detected result value exceeds established 6 NYCRR SCO RESTRICTED USE COMMERCIAL

SOURCES:

1. BING AERIAL IMAGERY © 2011 MICROSOFT CORPORATION (www.bing.com/maps) ACCESSED ON 06/24/11.
2. SURVEY OF SAMPLE LOCATIONS CONDUCTED BY GEI CONSULTANTS, INC. ON 5/31/11 AND 6/23/11. SURVEY BY NEW YORK STATE LICENSED LAND SURVEYOR NUMBER 050146. HORIZONTAL DATUM: NEW YORK STATE PLANE COORDINATE SYSTEM (NY EAST ZONE), VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM (NAVD)88.

0 120' 240'

SCALE: 1" = 120'

Site Characterization Report
Skillman Street Holder Station
Brooklyn, New York

nationalgrid

GEI Consultants

SUBSURFACE SOIL SUMMARY (mg/kg)

Project 093080 | December 2014 | Fig. 3a

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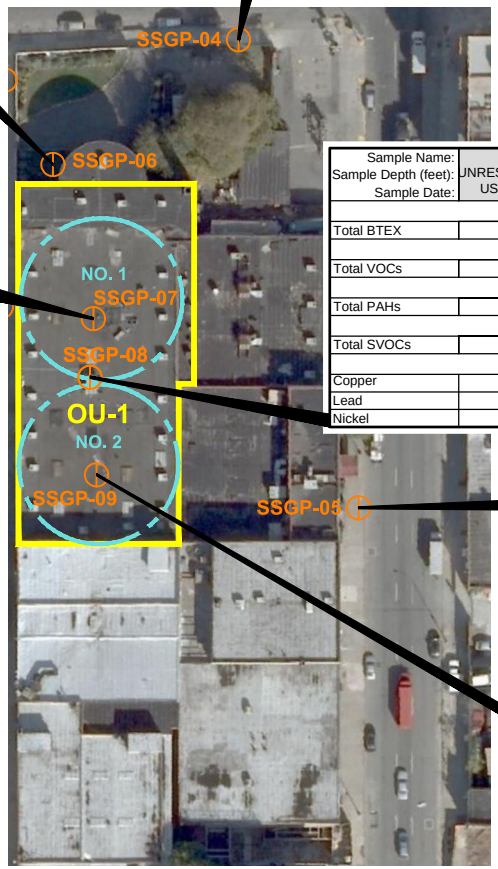
Sample Name: / Sample Depth (feet): / Sample Date:	UNRESTRICTED USE SCO	RESTRICTED USE SCO - COMMERCIAL	SSGP-06 (3-3.5) 6/27/2013	SSGP-06 (15-17) 6/27/2013	SSGP-06 (31-32) 6/27/2013
BTEX (mg/kg)					
Total BTEX	NE	NE	ND	ND	ND
Other VOCs (mg/kg)					
Total VOCs	NE	NE	**0.0313**	**0.0586**	ND
PAHs (mg/kg)					
Benzo(b)fluoranthene	1	5.6	**1.1**	0.039 U	0.036 U
Total PAHs	NE	500	**10.587**	ND	ND
Other SVOCs (mg/kg)					
Total SVOCs	NE	NE	**10.587**	ND	ND
Metals (mg/kg)					
Copper	50	270	**63**	**22**	**25**
Lead	63	1000	**160 J**	**4.6 J**	**7.1 J**
Mercury	0.18	2.8	**0.38**	0.02 U	0.018 U
Nickel	30	310	**31**	8.7 U	**11**
Zinc	109	10000	**280**	**23**	**31**

Sample Name: / Sample Depth (feet): / Sample Date:	UNRESTRICTED USE SCO	RESTRICTED USE SCO - COMMERCIAL	SSGP-04 (0.5-5) 8/20/2010	SSGP-04 (9.5-10.5) 8/20/2010
BTEX (mg/kg)				
Total BTEX	NE	NE	ND	ND
Other VOCs (mg/kg)				
Total VOCs	NE	NE	ND	ND
PAHs (mg/kg)				
Total PAHs	NE	NE	ND	**0.665**
Other SVOCs (mg/kg)				
Total SVOCs	NE	NE	**0.021**	**0.665**

Sample Name: / Sample Depth (feet): / Sample Date:	UNRESTRICTED USE SCO	RESTRICTED USE SCO - COMMERCIAL	SSGP-08 (3.5-4.5) 6/25/2013	SSGP-08 (10-10.5) 6/25/2013
BTEX (mg/kg)				
Total BTEX	NE	NE	ND	ND
Other VOCs (mg/kg)				
Total VOCs	NE	NE	ND	ND
PAHs (mg/kg)				
Total PAHs	NE	500	**0.338**	ND
Other SVOCs (mg/kg)				
Total SVOCs	NE	NE	**0.338**	**ND**
Metals (mg/kg)				
Copper	50	270	**63**	**25**
Lead	63	1000	**330 J**	**73 J**
Nickel	30	310	**170**	**36**

Sample Name: / Sample Depth (feet): / Sample Date:	UNRESTRICTED USE SCO	RESTRICTED USE SCO - COMMERCIAL	SSGP-07 (3-4) 6/26/2013	Duplicate of: SSGP-07 (3-4) 6/26/2013	SSGP-07 (10-15) 6/26/2013	SSGP-07 (20-22) 6/26/2013
BTEX (mg/kg)						
Benzene	0.06	44	**0.0013 J**	**0.0011 J**	0.0013 UJ	**0.61 J**
Toluene	0.7	500	0.0024 UJ	0.0011 UJ	0.0013 UJ	**12 J**
Ethylbenzene	1	390	0.0024 UJ	0.0011 UJ	0.0013 UJ	**29 J**
o-Xylene	0.26	500	0.0024 UJ	0.0011 UJ	0.0013 UJ	**11 J**
m/p Xylene	0.26	500	0.0024 UJ	0.0011 UJ	0.0013 UJ	**25 J**
Total BTEX	NE	NE	**0.0013**	**0.0011**	0.0013 UJ	**77.61**
Other VOCs (mg/kg)						
Total VOCs	NE	NE	**0.0358**	**0.0291**	ND	**80.85**
PAHs (mg/kg)						
Benzo(b)fluoranthene	1	5.6	**0.85**	**1.3**	0.043 U	0.22 U
Benzo(a)anthracene	1	5.6	**1.1**	**1.5**	**0.055**	0.22 U
Benzo(a)pyrene	1	1	**0.86**	**1.4**	0.043 U	0.22 U
Chrysene	1	56	**0.96**	**1.5**	0.43 U	2.2 U
Indeno(1,2,3-cd)pyrene	0.5	5.6	**0.61 J**	**1.2 J**	0.043 U	0.22 U
Naphthalene	12	500	0.37 U	0.37 U	0.43 U	**38 J**
Total PAHs	NE	500	**10.638**	**16.58**	0.055	**46.1**
Other SVOCs (mg/kg)						
Total SVOCs	NE	NE	**10.638**	**16.58**	**0.055**	**46.1**
Metals (mg/kg)						
Lead	63	1000	**270 J**	**330 J**	**56 J**	**160 J**
Mercury	0.18	2.8	**0.31**	**0.28**	**0.033**	**0.07**
Nickel	30	310	**21**	**20**	**69**	**41**
Zinc	109	10000	**230**	**170**	**49**	**80**



Sample Name: / Sample Depth (feet): / Sample Date:	UNRESTRICTED USE SCO	RESTRICTED USE SCO - COMMERCIAL	SSGP-05 (0.5-5) 8/16/2010	SSGP-05 (15) 8/16/2010
BTEX (mg/kg)				
Total BTEX	NE	NE	ND	ND
Other VOCs (mg/kg)				
Total VOCs	NE	NE	ND	ND
PAHs (mg/kg)				
Total PAHs	NE	NE	ND	ND
Other SVOCs (mg/kg)				
Total SVOCs	NE	NE	**0.12**	**0.061**

Sample Name: / Sample Depth (feet): / Sample Date:	UNRESTRICTED USE SCO	RESTRICTED USE SCO - COMMERCIAL	SSGP-09 (3.0-3.4) 6/25/2013	SSGP-09 (16.4-17.4) 6/25/2013	SSGP-09B (26-26.5) 6/26/2013
BTEX (mg/kg)					
Total BTEX	NE	NE	ND	ND	ND
Other VOCs (mg/kg)					
Total VOCs	NE	NE	ND	ND	ND
PAHs (mg/kg)					
Total PAHs	NE	500	ND	ND	ND
Other SVOCs (mg/kg)					
Total SVOCs	NE	NE	ND	ND	ND

LEGEND:

SITE BOUNDARY(APPROXIMATE)

HISTORICAL GAS HOLDER

SAMPLE LOCATIONS:

SSGP-06 GEOPROBE® BORING

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Site Characterization Report
Skillman Street Holder Station
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GEI Consultants

SUBSURFACE SOIL SUMMARY (mg/kg)

Project 093080 | December 2014 | Fig. 3b

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Figure 4:
Alternative 2
Limits

Site Boundary and
Limits of Easement