Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Niagara Mohawk Watertown Engine Street Former Manufactured Gas Plant Site Operable Units 1, 2 and 3 Watertown, Jefferson County, New York Site Number 6-23-011

March 2009

New York State Department of Environmental Conservation
David A. Patterson, *Governor* Alexander B. Grannis, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Niagara Mohawk Watertown Engine Street
Former Manufactured Gas Plant
Inactive Hazardous Waste Disposal Site
Operable Units 1, 2 and 3
Watertown, Jefferson County, New York
Site No. 6-23-011

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for Operable Units 1, 2 and 3 of the Niagara Mohawk Watertown Engine Street Former Manufactured Gas Plant (MGP) Site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for Operable Units 1, 2 and 3 of the Niagara Mohawk Watertown Engine Street Former MGP inactive hazardous waste disposal site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened releases of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential significant threat to public health and/or the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the Niagara Mohawk Watertown Engine Street Former MGP Site and the criteria identified for evaluation of alternatives, the Department has selected excavation and disposal of MGP contaminated soils; recovery and disposal of separate phase liquid from the bedrock; and removal and disposal of shoreline soils and sediments from identified areas. The components of the remedy are as follows:

A. Remedial Actions:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Any

uncertainty identified during the RI/FS will be resolved, including the need to remove MGP structures located outside the targeted excavation area.

2. Excavation of impacted soil meeting one or more of the following criteria as MGP source material: visible tar or oil; the presence of sheens or odors with total PAHs over 500 ppm, soils containing reactive cyanide at concentrations above 250 ppm, or soils containing reactive sulfide at concentrations above 500 ppm. It is estimated that this will result in excavation of contaminated soils to the top of the bedrock. Treatment and/or disposal of excavated materials meeting the above criteria will occur at an off-site facility. Demolition of Buildings 1, 2, and 3 on the Purcell property will be performed as necessary to enable the excavation of MGP-contaminated soils.

3. MGP structures outside the targeted excavation area will be subject to further assessment. The interior surfaces of the structures will be inspected for integrity and the exterior will be inspected to determine if the overburden alongside and potentially underneath the structure contains MGP contaminants. The bedrock and overburden interface will be inspected to determine if the former structures have released MGP contaminants or the presence of MGP contaminants. If the inspection reveals that the structure(s) may have released contaminants, MGP contamination is under the structure, MGP contamination is at the overburden and bedrock interface or the inspection is inconclusive, then the structure(s) itself will be removed, along with visible MGP contamination in surrounding soil and under the structure, if present.

4. In-situ stabilization of the area along the CSX railroad tracks and the railroad bridge which crosses the Black River, where excavation is not structurally feasible or impracticable.

5. Excavated materials which are below the remediation criteria will be stockpiled and evaluated for reuse as backfill. The excavation will be backfilled with stockpiled soils and clean imported soil, which is soil that meets the Division of Environmental Remediation's criteria for backfill or local site background.

6. Excavation of MGP contaminated sediments and riverbank soils from designated locations. The means of excavating sediments and riverbank soils will be evaluated in the design to address the flow conditions and fluctuations of the Black River. Contaminated sediment and soils will be removed and stored, if necessary, at the National Grid Property prior to disposal off-site.

7. Restoration of the stream bed and banks will be performed. All work on the stream bed and banks will meet the substantive requirements of 6NYCRR Part 608.

B. Engineering Controls

1. Except for the stream bank, a soil cover will be constructed over all vegetated areas to prevent exposure to contaminated soils. A minimum one-foot thick cover will consist of clean soil underlain by an indicator such as orange plastic snow fence to demarcate the cover soil from the subsurface soil. The top six inches of soil will be of sufficient quality to support vegetation. Clean soil will constitute soil that meets the Division of Environmental

Remediation's criteria for backfill or local site background. Non-vegetated areas (buildings, roadways, parking lots, etc.) will be covered by a paving system or concrete at least 6 inches thick.

2. Installation of approximately 10 bedrock NAPL recovery wells and periodic measurement and removal of accumulated NAPL. The locations and number of NAPL recovery wells, along with the method and frequency of NAPL removal, will be determined during the remedial design and remedial action phase. The bedrock surface and joints will be inspected and mapped during the soil excavation to determine the potential locations of NAPL recovery wells. Recovered NAPL will be transported off site for treatment or disposal. The operation of the NAPL recovery wells will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

C. Institutional Controls

1. Imposition of an institutional control in the form of an environmental easement on OU1 properties owned by National Grid that will require (a) limiting the use and development of the property to commercial use, which will also permit industrial use; (b) compliance with the approved site management plan; (c) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; and (d) the property owner to complete and submit to the Department a periodic certification of institutional and engineering controls.

2. Development of a site management plan which will include the following institutional and engineering controls: (a) management of the final cover system to restrict excavation below the soil cover's demarcation layer, pavement, or buildings. Excavated soil will be tested, properly handled to protect the health and safety of workers and the nearby community, and will be properly managed in a manner acceptable to the Department; (b) continued evaluation of the potential for vapor intrusion for any buildings developed on the project area, including provision for mitigation of any impacts identified; (c) monitoring of stream bank restoration, groundwater and sediment quality; (d) identification of any use restrictions on the site and adjacent properties; and (e) provisions for the continued proper operation and maintenance of the components of the remedy.

3. National Grid will provide a periodic certification of institutional and engineering controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal will: (a) contain certification that the institutional controls and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; (b) allow the Department access to the site; and (c) state that nothing has occurred that will impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

New York State Department of Health Acceptance

The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

MAR 2 6 2009

Date

Dale A. Desnoyers, Director
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TABLE OF CONTENTS

SECTION **PAGE**

1: SUMMARY OFTHE RECORD OF DECISION 1

2: SITE LOCATION AND DESCRIPTION 2

3: SITE HISTORY 3
- 3.1: Operational/Disposal History 3
- 3.2: Remedial History 3

4: ENFORCEMENT STATUS 4

5: SITE CONTAMINATION 4
- 5.1: Summary of the Remedial Investigation 4
- 5.2: Interim Remedial Measures 9
- 5.3: Summary of Human Exposure Pathways: 10
- 5.4: Summary of Environmental Assessment 11

6: SUMMARY OF THE REMEDIATION GOALS 12

7: SUMMARY OF THE EVALUATION OF ALTERNATIVES 12
- 7.1: Description of Remedial Alternatives 13
- 7.2 Evaluation of Remedial Alternatives 18

8: SUMMARY OF THE SELECTED REMEDY 19

Table
- Table 1: Remedial Alternative Costs 25

Figures
- Figure 1: Site Location Map 26
- Figure 2: Site Map 27
- Figure 3: Surface Water, Seep Sample and Sediment Sampling Locations 28
- Figure 4: Surface Soil results for PAHs 29
- Figure 5: Nature and Extent of Contamination Subsurface Soils . . 30
- Figure 6: Nature and Extent of Contamination Bedrock 31
- Figure 7: OU 1 Alternative 3 32
- Figure 8: OU 1 Alternative 4 33
- Figure 9: OU 1 Alternative 5 34
- Figure 10: Sediment Sample and Proposed Removal Locations 35

Appendices
- Appendix A: Responsiveness Summary A-1
- Appendix B: Administrative Record B-1

RECORD OF DECISION

Niagara Mohawk Watertown Engine Street Former Manufactured Gas Plant Site
Operable Units No. 1, 2 and 3
Watertown, Jefferson County, New York
Site No. 6-23-011
March 2009

SECTION 1: SUMMARY OFTHE RECORD OF DECISION

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for Operable Units 1, 2, and 3 of the Niagara Mohawk Watertown Engine Street Former Manufactured Gas Plant (MGP) Site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, operation of a manufactured gas plant at the site has resulted in the disposal of hazardous wastes, including polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), non-aqueous phase liquid (NAPL), and cyanide-contaminated purifier waste. These wastes have contaminated the soil and groundwater at the site; and soil, groundwater, sediments in off-site locations including the Black River, and have resulted in:

- a significant threat to public health associated with potential exposure to hazardous waste, contaminated soils and contaminated groundwater.

- a significant environmental threat associated with the current and potential impacts of contaminants to the subsurface soils, sediments and groundwater.

To eliminate or mitigate these threats, the Department has selected excavation and disposal of MGP contaminated soils; recovery and disposal of separate phase liquid from the bedrock; and removal and disposal of shoreline soils and sediments from identified areas.

The selected remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy must conform with officially 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.

SECTION 2: SITE LOCATION AND DESCRIPTION

The Niagara Mohawk Watertown Engine Street Former Manufactured Gas Plant (MGP) Site is located in the City of Watertown, Jefferson County (see Figures 1 and 2). The on-site portion, which is owned by Niagara Mohawk, is approximately 1.9 acres in size, and consists of a fenced lot which is used for storage of construction materials (e.g., crushed stone) and contains a gas regulator station. The site is bounded on the north by a westward extension of Newell Street; on the east by Engine Street; on the south by an apartment building, a single family home, and buildings and property associated with the Purcell Construction Company; and on the west by property owned by the Purcell Construction for storage of various building materials and equipment. The City of Watertown Department of Public Works (DPW) maintenance and storage building, and three Purcell Construction Company-owned buildings are located north of the site.

Active railroad tracks owned by CSX form the western boundary of the Purcell property. The property west of the railroad tracks is occupied by a Verizon Service Center and storage yard. The Black River is located north of the City of Watertown DPW building and the three Purcell buildings. Additional City of Watertown DPW buildings are located east of the site.

Geologic investigations have identified three stratigraphic units beneath and near the site. The first is the overburden, which contains fill and native soils (sand with much lesser amounts of gravel, silt, clay, and peat) which lies on top of the Chaumont Limestone. The thickness of the overburden unit generally ranges from 0 to 9 feet, and is thickest at 22 feet where the bedrock has depressions. Groundwater in the overburden lies 3 to 10 feet below the ground surface, and flows laterally toward the Black River or downward into the bedrock. The Chaumont Limestone is approximately 15 to 20 feet thick, and groundwater flow in this unit is toward the Black River along vertical joints that have a primary orientation that is approximately north-south, with secondary jointing that is oriented east-west. These joints are the most likely route for contaminated groundwater and mobile MGP tars to migrate in the bedrock. Directly under Chaumont Limestone is the Lowville Limestone unit, which is greater than 70 feet thick. The Lowville unit has features which allow horizontal flow of groundwater and mobile MGP tars.

Operable Unit (OU) No. 1, consists of the on-site and off-site overburden (soils overlying bedrock). Operable Unit No. 2 consists of the area of on-site and off-site groundwater that was investigated in the Remedial Investigation. Operable Unit No. 3 is the area of the Black River (partially shown in Figure 2) that was investigated which extends 900 feet downstream of the Vanduzee Street Bridge. An operable unit represents a portion of the site remedy that for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination. The remaining operable unit for this site is the area of groundwater and sediments beyond the boundaries of the current investigation. This area will be further investigated to determine if MGP contaminants have migrated in the bedrock or the sediments of the Black River to other areas that have not yet been investigated.

Throughout this document, “the site” refers to the MGP site itself. The larger area that has been impacted by migration of MGP contamination (including the MGP site itself) is referred to as the

"project area." The boundaries of the site and a portion of the project area are shown on Figure 2.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The Watertown Gas and Light Company constructed an MGP at the site in 1905, and the plant was operated by various companies until the 1950s. The predecessor companies were consolidated into the Niagara Mohawk Power Corporation in 1950. The layout of the former facility is shown on Figure 2. The plant used the Lowe carburetted water gas process to generate gas for heating and lighting homes and businesses. The carburetted water gas process involved the passage of steam through hot coal or coke. This formed a gaseous mixture called water gas, or blue gas, which was then passed through a superheater. Oil sprayed into the super heater would generate additional gas, enhancing the heat and light capacity of the gas mixture. The resulting gas was cooled and purified prior to distribution. Two principal waste materials were produced by the gas manufacturing process. MGP tar was an oily liquid by-product of the gas production which formed as a condensate as the gas cooled. This material settled in the bottom of gas holders, pipes, and other structures. Typically, these structures were built below the ground surface and would utilize groundwater as a bottom seal. As a result, byproducts from the water gas process were often released at the plant site. Purifier waste was a mixture of iron filings and wood chips which was used to remove cyanide and sulfur gases from the gas mixture prior to distribution. Both wastes have been found in the subsurface at the Watertown Engine Street Site.

While the MGP was operating, it is believed that some MGP tar generated from the gas manufacturing process was discharged to the Black River through a 15-inch diameter storm sewer pipe.

3.2: Remedial History

In 1996, the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

In December 1992 Niagara Mohawk entered into an Order on Consent with the Department that required an environmental investigation and, where necessary, remediation of 21 Former MGP sites owned or operated by Niagara Mohawk and its predecessor companies. Included among the 21 sites is the Watertown Engine Street Site. A chronology of the remedial history is as follows:

Preliminary Site Assessment	June 1995 - May 1996
Remedial Investigation	April 1997 - October 2007
Feasibility Study	September 2007 - January 2009

SECTION 4: 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 Department and the Niagara Mohawk Power Corporation entered into Consent Orders on December 7, 1992 and November 7, 2003. The Orders obligate Niagara Mohawk, and its successor, National Grid, to implement a full remedial program.

SECTION 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) has been conducted to evaluate the alternatives for addressing the significant threats to human health and the environment.

5.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between April 1997 and October 2007. The field activities and findings of the investigation are described in the RI report.

The site and areas around the site were the subject of a number of investigations starting in 1997 and ending in 2007. These investigations included drilling soil borings, installing monitoring wells, excavating test pits, probing sediment and river bank soils and sampling environmental media. The primary objectives of this work were to characterize the nature and delineate the extent of contamination on-site and off-site and provide information needed to prepare a Feasibility Study. To organize the development and evaluation of potential remedial alternatives, three operable units were established: OU1 - on-site and off-site overburden soils, OU2 - on-site and off-site bedrock, and OU3 - Black River. The operable units and the areal extent of investigations are shown on Figures 2, 3, 4 and 5.

The field activities and findings of the investigation are described in the Remedial Investigation Report (RI).

5.1.1: Standards, Criteria, and Guidance (SCGs)

To determine whether the soil, groundwater, and sediment contains contamination at levels of concern, data from the investigation were compared to the following SCGs:

- Groundwater, drinking water, and surface water SCGs are based on the Department's "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

- Soil SCGs are based on the Department's Cleanup Objectives "Technical and Administrative Guidance Memorandum [TAGM] 4046 and 6 NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives.

- Sediment SCGs are based on the Department's "Technical Guidance for Screening Contaminated Sediments."

- Concentrations of VOCs in air were compared to typical background levels of VOCs in indoor and outdoor air using the background levels provided in the NYSDOH guidance document titled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," dated October 2006. The background levels are not SCGs and are used only as a general tool to assist in data evaluation.

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and portions of the project area require remediation. These are summarized in Section 5.1.2. More complete information can be found in the RI report.

5.1.2: Nature and Extent of Contamination

This section describes the findings of the investigation for all environmental media that were investigated.

As described in the RI report, many soil, groundwater and sediment samples were collected to characterize the nature and extent of contamination. Figures 3, 4, 5, and 6 show the sampling locations which exceed their SCGs. The contaminants include volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and cyanides.

The manufactured gas was cooled and purified prior to distribution. Two principal waste materials were produced in this process: MGP tar and purifier waste. The tar produced from manufactured gas was a reddish brown oily liquid which formed as a condensate as the gas cooled. Purifier waste was a mixture of iron filings and wood chips which was used to remove cyanide and sulfur gases from the gas mix prior to distribution.

The liquid waste was largely derived from both coal and petroleum products used in the water gas process, it is commonly known as "MGP tar." It is important to note that this liquid does not necessarily have the sticky, viscous consistency of other materials commonly labeled as "tar." Materials such as MGP tar are commonly referred to as non-aqueous phase liquids, or NAPLs. The terms NAPL and MGP tar are used interchangeably in this document. Although most MGP tars are slightly more dense than water, the difference in density is slight. Consequently, this tar can either float or sink when in contact with water. NAPL was found during the remedial investigations in the soils and groundwater.

The VOCs of concern are benzene, toluene, ethylbenzene and xylene. These compounds are referred to as BTEX in this document, and are common components of coal and carburetted water gas tars. Of these compounds, benzene, which is a known human carcinogen, is the most significant.

SVOCs of concern are primarily a group of chemicals commonly referred to as polycyclic aromatic hydrocarbons (PAHs). The specific compounds of concern at this site, which are typically found at MGP sites are:

acenaphthene	*benzo(a)anthracene*	naphthalene
dibenzo(a,h)anthracene	*indeno(1,2,3-cd)pyrene*	benzo(g,h,i)perylenephenanthrene
acenaphthylene	*benzo(a)pyrene*	
fluoranthene	2-methylnaphthalene	*benzo(k)fluoranthene*
anthracene	*benzo(b)fluoranthene*	pyrene
fluorene		*chrysene*

Total PAH (TPAHs) concentrations referred to in this plan are the summation of the individual PAHs listed above. The italicized PAHs are probable human carcinogens.

The main inorganic contaminant of concern at this site is cyanide. Cyanide is commonly found at MGP sites where waste from gas purification is present. Cyanide has been found in site soils and site groundwater; however, the cyanide levels are generally below SCGs for both media. Where cyanide exceeds its SCGs, it is co-mingled with other site contaminants of concern.

Chemical concentrations are reported in parts per billion (ppb) for water and parts per million (ppm) for waste, soil, and sediment. Air samples are reported in micrograms per cubic meter ($\mu g/m^3$).

Waste Materials

The RI data indicates that MGP tar is the major type of waste present at the project area. MGP tars generated at the site were disposed, spilled or leaked at various locations throughout the project area from one or more gas holders, and possibly other structures that no longer exist. MGP contamination is visible as sheen on a water surface or as a NAPL in soil or water. Waste materials were found around the former MGP structures, locations downgradient of these structures, the top of the bedrock, and the Black River shoreline next to the discharge pipe. The NAPL also extends into the bedrock. The extent of NAPL contamination found in soils and bedrock is shown in Figures 5 and 6.

The source of the benzene, toluene, ethylbenzene and xylene (BTEX) and PAH contamination found in OU1 is the MGP tar that is found in and around the subsurface structures and is migrating through the subsurface. The NAPL was found to saturate the unconsolidated deposits and extends to the top of bedrock. Both of these conditions generally coincide with BTEX and PAH concentrations several orders of magnitude greater than the SCGs in adjacent soils, and typically result in significant impacts to the groundwater as well.

Areas where significant quantities of waste were disposed or where MGP tars have migrated are considered to be source areas, which represent a source of contamination to other media, such as groundwater or soil vapor. MGP source material is defined as: visible tar or oil, soils exhibiting sheens or odors that contain PAHs in excess of 500 ppm, soils containing reactive cyanide at concentrations above 250 ppm, or soils containing reactive sulfide at concentrations above 500

ppm. At the site, these source areas appear to be associated with several of the former plant structures, many of which remain on site below the ground surface.

PAHs account for a majority of the SVOCs present in soils throughout the project area. These compounds are widespread and occur in higher concentrations in locations adjacent to former MGP structures.

Waste identified during the RI/FS will be addressed in the remedy selection process.

Surface Soil

The surface soils at the project area are impacted by the former MGP operations. The primary contaminants of concern for the surface soil are PAHs. Nine surface soil sample results were above SCOs for individual PAH compounds. PAHs are common in fuel, asphalt, combustion and coal residues and are therefore common in developed areas.

Total PAHs (tPAH) detected in the thirteen surface soil samples ranged from below the method detection limit (MDL) to 3,860 ppm. Figure 4 shows the surface soil locations and results.

Surface soil contamination identified during the RI/FS will be addressed in the remedy selection process.

Subsurface Soil

Analytical results for subsurface and saturated zone soil samples confirmed the general pattern of contaminant distribution as impacts based on the visual observation of NAPL. Contaminants were found at the locations of former MGP subsurface structures and downgradient of these structures. The analytical results indicate that VOCs including benzene, toluene, ethylbenzene and xylenes (BTEX), SVOCs, (specifically PAHs) and cyanides are the contaminants of concern in the subsurface soils.

Total BTEX concentrations in soil samples collected from the subsurface at the project area ranged from below the MDL to 2,010 ppm. Total PAH concentrations ranged from below the MDL to 17,315 ppm. Cyanide concentrations ranged from below the MDL to 1,700 ppm. Figure 5 shows the portions of the project area which exceed the soil cleanup objectives for BTEX, PAHs or cyanide.

Subsurface soil contamination identified during the RI/FS will be addressed in the remedy selection process.

Groundwater

The groundwater at and near the site is monitored in the overburden and the bedrock. The overburden soils range from 2 to 22 feet below ground surface. The overburden groundwater is generally 3 to 10 feet below the ground surface and flows to the north toward the Black River. The bedrock groundwater movement is more complex and is expected to occur through the

horizontal and vertical joint or fractures. Bedrock groundwater samples at and near the site contain concentrations of contaminants which exceed groundwater standards in 16 of the 27 bedrock wells. As shown on Figure 6, the following monitoring wells contained NAPL during monitoring events: MW-3R, MW-4R, MW-6RD, MW-7R, MW-8R, MW-11R and MW-17R.

Contaminants detected in the overburden groundwater monitoring wells downgradient of the site also exceeded ambient groundwater quality standards. The most recent sampling in 2004 showed a decrease in BTEX, PAH and cyanide levels in the two downgradient monitoring wells. Figure 6 shows the overburden monitoring well locations where contaminants exceed groundwater standards.

Groundwater contamination identified during the RI/FS will be addressed in the remedy selection process.

Surface Water

Surface water samples were collected and analyzed in 1995. Only one location had detectable concentrations of BTEX or PAHs. As shown on Figure 3, this location (SW-5), was adjacent to the outfall pipe behind Building 3 of the Purcell property, and was reported as a seep sample. Groundwater seeps from a similar location were also sampled in 2007 and contained detectable concentrations of BTEX and PAHs. Due to the small volume of surface groundwater discharge in relation to the volume of river flow, water flowing from the seeps is not expected to cause an exceedance surface water standards. However, the seep sample results indicate the site is an ongoing source of contamination to the Black River.

Surface water contamination identified during the RI/FS will be addressed in the remedy selection process.

Sediments

Sediment probing and sampling was performed as part of investigations along the Black River. Due to flow conditions in the river, sediment deposits in the river are scarce, and ranged from only 0.2 to 1.6 feet thick in the areas investigated. The areas sampled and the respective PAH concentrations are shown on Figure 3.

The area near the plugged discharge pipe (behind Purcel building 3) had visual observations of hardened tar and PAH levels of 6,590 ppm. This area of MGP-contamination is in the portion of Black River sediments, that is exposed when flows are low. NAPL and/or sheen were observed in the soil deposits adjacent to the former discharge pipe and along the surface of the bedrock, indicating that this hardened tar deposit is the result of tar that had flowed from the pipe and/or along the bedrock surface. Downstream of the plugged discharge pipe sediment PAH concentrations ranged from 5.3 to 31,060 ppm.

Sediment contamination identified during the RI/FS will be addressed in the remedy selection process.

Soil Vapor/Sub-Slab Vapor/Air

A soil vapor intrusion (SVI) evaluation of the City DPW maintenance building and two of the Purcell buildings (Purcell No. 2 and No. 3) north of the site was conducted in March 2006. The SVI investigation included conducting a building reconnaissance and collecting six sub-slab soil vapor samples and one subsurface soil vapor sample to assess whether site-related VOCs are present in the soil vapor near or beneath these buildings.

Volatile organic compounds, including BTEX compounds, trimethylbenzenes, napthalene and freons were detected in soil vapor samples collected beneath and adjacent to the City DPW maintenance and storage building. The presence of the gasoline additive MTBE in two soil vapor samples suggests that elevated concentrations of VOCs beneath a portion of the City DPW maintenance and storage building are at least partially attributable to gasoline. Given the concentration of contaminants identified and the limited occupation of the DPW maintenance and storage building (approximately 1-2 hours per person per day); the likelihood of exposures is minimal. Therefore, additional soil vapor intrusion sampling is not required at this time.

Soil vapor sampling conducted beneath Purcell Buildings No. 2 and No. 3 indicated that volatile organic compounds, including BTEX compounds, acetone, napthalene and trichloroethene are present in soil vapor beneath the Purcell buildings. The Purcell buildings are deed restricted for storage use only; thus the likelihood of exposure is minimal. Therefore, additional soil vapor intrusion sampling is not required at this time.

Soil vapor contamination was identified during the RI/FS, however current exposures to soil vapor contaminants are not expected. The potential for future exposures to soil vapor contaminants will be addressed in the remedy selection process.

5.2: 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 completion of the RI/FS.

In 1998 Niagara Mohawk, National Grid's predecessor, implemented an IRM on a storm sewer pipe to address observations of MGP tar discharging from the pipe to the Black River. The 15 inch storm sewer pipe was plugged at both the outfall end and at the upgradient end.

Also in 1998, Niagara Mohawk assisted the City of Watertown with the installation of an oil/water separator and associated piping along the south side of their garage (former Sparicino building). Soils were excavated and characterized for subsequent disposal. Approximately 100 cubic yards of soil were removed and disposed of off-site.

In 2000 NAPL recovery began in monitoring wells where it was observed. To date the total amount of NAPL recovered from the monitoring wells is over 160 liters. Seven of the 31 monitoring wells installed at or around the site contain recoverable volumes of NAPL.

Adjacent to the site, an IRM was performed in 2003 to address MGP-related contamination found in soils excavated for the foundation of the City of Watertown's bus garage. The IRM removed approximately 450 cubic yards of MGP contaminated soil from an excavation that was slightly over 3 feet in depth. The excavated soils were disposed of properly off-site.

National Grid implemented a IRM in 2004 to address tar seeps exposed at the ground surface near the Purcell Buildings 2 and 3. These areas were covered with a pavement fabric and 2 inch top coat layer of asphalt pavement. Approximately 8,000 square feet of parking area was covered.

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 5 of the RI report. An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

The source of contamination is the location where contaminants were released to the environment (any waste disposal area or point of discharge). Contaminant release and transport mechanisms carry contaminants from the source to a point where people may be exposed. The exposure point is a location where actual or potential human contact with a contaminated medium may occur. The route of exposure is the manner in which a contaminant actually enters or contacts the body (e.g., ingestion, inhalation, or direct contact). The receptor population is the people who are, or may be, exposed to contaminants at a point of exposure.

An exposure pathway is complete when all five elements of an exposure pathway exist. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

Completed exposure pathways to site contaminants have not been documented. Potential exposure pathways to site contaminants are discussed below:

Direct contact, ingestion and inhalation of elevated PAHs in surface soil is a potential exposure pathway for site workers, trespassers, and site visitors. However, the potential for exposure to surface soil contaminants is unlikely since the majority of the project area is covered with impervious surfaces (such as asphalt and concrete) or are vegetated. Exposure to elevated PAHs in riverbank soils by site workers, trespassers, and site visitors could occur by direct contact, ingestion, or inhalation. However, since the majority of riverbank soil is not highly accessible due to difficult terrain, exposures are unlikely.

Direct contact, ingestion or inhalation of subsurface soil contaminated with BTEX, PAHs and cyanide are potential exposure pathways for site workers who may contact subsurface soil during future remedial or construction work. Site visitors, trespassers and nearby community residents could potentially be exposed to contaminants in subsurface soil through the inhalation of dusts generated during future site excavation/construction work.

The site and surrounding areas are served by public water; therefore, exposure to groundwater contaminants (BTEX and PAHs) via ingestion, direct contact or inhalation is unlikely. Direct contact, ingestion or inhalation of VOCs volatized from the groundwater are potential exposure pathways for site visitors and site workers who may contact groundwater during future remedial or construction work. Site visitors and trespassers could potentially be exposed to VOC vapors volatizing from the groundwater during future site construction activities. Exposure to groundwater contaminants by site workers, and trespassers could occur by direct contact or ingestion of groundwater from seeps. Since the seeps are not highly accessible due to difficult terrain, exposures are unlikely.

The potential for exposure to BTEX and PAHs in Black River sediments by recreational users of the Black River exists via direct contact or ingestion. However, given the minimal number of sediment depositional areas, exposures are unlikely.

Given the current use of the project area structures, current exposure to volatile organic compounds via soil vapor intrusion is considered unlikely. Volatile chemicals in subsurface soil or groundwater can be a source for soil vapor contamination and can potentially affect the indoor air quality of future structures through the process of vapor intrusion. Future building occupants could be exposed, via inhalation, to VOCs in indoor air through the process of soil vapor intrusion. Additionally, the potential for soil vapor intrusion exposures to building occupants exists should the use of the existing structures change such that they are routinely used and occupied.

5.4: Summary of Environmental Assessment

This section summarizes the assessment of existing and potential future environmental impacts presented by the site. Environmental impacts include existing and potential future exposure pathways to fish and wildlife receptors, as well as damage to natural resources such as aquifers and wetlands.

The Fish and Wildlife Impact Analysis, which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors. Exceedances of criteria and guidance values for the MGP contaminants indicates potential impacts to fish and wildlife resources.
The following environmental exposure pathways and ecological risks have been identified:

- MGP-contaminated soils along the riverbank may present a complete exposure pathway. The southern bank of the Black River from Engine Street downstream is characterized by steep banks comprised of fill materials. The lower portions of the banks are inundated

during periods of high flow. A 60-foot length of the riverbank contains hardened MGP tar that is exposed during low flow conditions.

- Groundwater seeps may present a complete exposure pathway for terrestrial fauna; however, the potential for exposure is relatively small due to the limited area where these seeps are present and the minimal amount of flow measured at these locations. Also, only a few constituents were detected in the groundwater seeps at concentrations above their associated standards/guidance values.

- Exposure of terrestrial and aquatic fauna to MGP contaminated sediments in the Black River was concluded to be a complete exposure pathway. However areas of sediment deposition in the river are scarce.

Site contamination has impacted the groundwater resource in the overburden and bedrock. Based on seep sampling, contaminants are migrating to the Black River.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The remediation goals for this site and surrounding areas are to eliminate or reduce to the extent practicable:

- exposures of persons at or around the site to MGP contaminants in soil, groundwater, and sediment;

- environmental exposures of flora or fauna to MGP contaminants in soil, groundwater, and sediment;

- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and

- the release of contaminants from soils and groundwater into the Black River through NAPL flow, groundwater movement and surface soil erosion.

Further, the remediation goals for the site include attaining to the extent practicable:

- ambient groundwater quality standards

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected 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. Potential remedial alternatives for the Niagara Mohawk Watertown Engine Street Former MGP Site were identified, screened and evaluated in the FS report which is available at the document repositories established for this site.

A summary of the remedial alternatives that were considered for this site is discussed below. The present worth 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.

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated soils, sediments, surface water, groundwater, and soil vapor at the site and surrounding areas.

Operable Unit 1: On-site and Off-site Overburden Soils

Alternative 1: No Further Action

The No Further Action alternative recognizes remediation of the site conducted under previously completed IRMs. To evaluate the effectiveness of the remediation completed under the IRM, only continued monitoring is necessary.

This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2: Institutional Controls

This alternative consists of establishing institutional controls to mitigate the potential for exposure of personnel to site contaminants. An institutional control, in the form of an environmental easement, would establish permissible future site use; procedures for intrusive activities at the site; requirements for evaluating soil vapor intrusion in new or reused structures; and prohibitions on groundwater use. These controls would be applied to National Grid-owned properties within the project area.

Institutional controls would be accompanied by a Site Management Plan (SMP) for all on-site and off-site areas that would identify requirements for conducting intrusive activities in the project area, handling and disposing of potentially contaminated materials that may be encountered during subsurface activities, long term monitoring, notifications and reporting. The SMP would require an evaluation of the potential for vapor intrusion for any buildings developed on the subject properties, or if the use of current buildings should change. This provision would include a provision for mitigation of any MGP related impacts, if identified.

Present Worth: . . . . . $ 180,000
Capital Cost: . . . . . $ 100,000
Annual Costs:
(Years 1-30): . . . . . $ 6,200

Alternative 3: Remove Targeted MGP-Contaminated Soils; Address Former MGP Structures; Institutional Controls

This remedial alternative would target those soils where occurrences of MGP source material are more frequent and contiguous, of larger extent, and in closer proximity to bedrock relative to the remaining portions of the project area. In addition, this remedial alternative addresses the contamination present at the former MGP structures which may represent potential sources of MGP contamination to soil and groundwater. Institutional controls, long-term monitoring and a site management plan would be established.

As shown on Figure 7 the proposed excavation area would include the area where MGP source material has been observed in a contiguous pattern, extending to bedrock. The estimated excavation volume is 21,500 cubic yards. Three buildings, labeled Purcell 1, 2 and 3 on Figure 7, would be demolished. These buildings are located on the Purcell property. This alternative would require obtaining access and coordinating activities with the Purcell property owner. If MGP source material are observed during remediation at the excavation limits identified on Figure 7, additional removal would be performed if determined feasible to do so. MGP source material is defined as: visible tar or oil, soils exhibiting sheens or odors that contain PAHs in excess of 500 ppm, soils containing reactive cyanide at concentrations above 250 ppm, or soils containing reactive sulfide at concentrations above 500 ppm.

Also, as part of this remedial alternative, former MGP structures located within the excavation limits would be removed. Other MGP structures located outside of the anticipated removal limits include a former purifier (located adjacent to the gas regulator station), a former separator, and former tar wells. These structures and surrounding areas would be subject to additional assessment as part of a pre-design investigation program. The assessment would include inspection of the exterior portions of the MGP structures in addition to the interior inspection of the structures. The goal of the inspection would be to determine if MGP source material is present. The inspection would include exposing a portion of the top of the bedrock to determine if MGP source material is present. The goal would be to remove or address the MGP contamination that is acting as a source and is migrating to the bedrock and Black River. Areas surrounding these structures where previous sampling has indicated potential areas of contiguous MGP source material that may represent sources of contamination to soil and groundwater would also be assessed. The area for additional investigation is shaded brown in Figure 7.

Certain areas of targeted soils area may not be feasible to excavate, and would be immobilized using ISS techniques. Such areas (if any) would be determined during the remedial design, and could include areas where excavation is unsafe and/or impracticable. These areas could include locations adjacent to the CSX railroad right-of-way and bridge, in the vicinity of existing subsurface utilities, and adjacent to building foundations and roadways.

Present Worth: $10,700,000
Capital Cost: $10,400,000
Annual Costs:
(Years 1-30): $12,000

Alternative 4: Remove MGP-Contaminated Soils; Address Former MGP Structures; Institutional Controls

This alternative would remove soils in the project area that contain MGP source material regardless of the location, extent or continuity, as well as the former MGP structures which may represent a potential source of MGP contaminants (e.g., grossly contaminated soil, NAPL and purifier wastes) that may contribute to exceedances of applicable groundwater quality standards. In addition, this remedial alternative would be expanded (relative to Alternative 3) to include the additional areas where total PAHs greater than 500 ppm are present in soil and not otherwise removed by the activities described above. Institutional controls, long-term monitoring and a site management plan would be established.

Figure 8 shows the estimated limits of soil removal under Alternative 4. The estimated excavation volume is 37,000 cubic yards. Three buildings, Purcell 1, 2 and 3, located on the Purcell property would be demolished. In addition this alternative would require obtaining access and coordinating activities with the Purcell, Verizon and City of Watertown property owners. If MGP source material is observed during remediation at the excavation limits identified on Figure 8, additional removal would be performed if determined safe and feasible to do so.

Similar to Alternative 3, certain MGP structures located outside the targeted excavation area would be subject to further assessment. The former MGP structures located within the excavation limits would be removed. Other MGP structures located outside of the anticipated removal limits include two former purifiers (located adjacent to the gas regulator station) and a former separator. These structures would be subject to additional assessment as part of a pre-design investigation program. The assessment would include inspection of the exterior portions of the MGP structures in addition to the interior inspection of the structures. The goal of the inspection would be to determine if MGP source material is present. The inspection would include exposing a portion of the top of the bedrock to determine if MGP source material is present. The goal would be to remove or address the MGP contamination that is acting as a source and is migrating to the bedrock and Black River.

Similar to Alternative 3, certain areas of targeted soils area may not be feasible to excavate, and would be immobilized using ISS techniques. Such areas (if any) would be determined during the remedial design, and could include areas where excavation is unsafe and/or impracticable. These areas could include locations adjacent to the CSX railroad right-of-way and bridge, in the vicinity of existing subsurface utilities, and adjacent to building foundations and roadways.

Present Worth: $16,300,000
Capital Cost: $16,000,000
Annual Costs:(Years 1-30): $12,000

Alternative 5 Removal of Soils to Achieve Unrestricted Use Soil Cleanup Objectives

This remedial alternative would excavate the soils and former MGP structures with concentrations of MGP contaminants that exceed the soil cleanup objectives for unrestricted use specified in 6 NYCRR Part 375.

Similar to Alternative 3 and 4, certain areas of targeted soils area may not be feasible to excavate, and would be immobilized using ISS techniques. Such areas (if any) would be determined during the remedial design, and could include areas where excavation is unsafe and/or impracticable. These areas could include locations adjacent to the CSX railroad right-of-way and bridge, in the vicinity of existing subsurface utilities, and adjacent to building foundations and roadways.

The active National Grid-owned gas regulator station would be excluded from the excavation area for the following reasons:

1. It is an active natural gas system and will remain as such for the foreseeable future,
2. Any remediation activities would present concerns regarding health and safety and disruption of gas service.
3. Soil in this area does not represent a large portion of the former MGP area.
4. The area is owned and controlled by National Grid and is secured with perimeter fencing.
5. Soil samples collected from the four sample locations immediately adjacent to the regulator station fence line do not contain MGP source material.

The portion of the site which contains the gas regulator station would require establishing institutional controls, long-term monitoring and a site management plan.

The estimated limits of soil removal under Alternative 5 are shown on Figure 9. The estimated excavation volume is 67,400 cubic yards.

Present Worth: . . . . . $ 25,600,000
Capital Cost: . . . . . $ 25,600,000
Annual Costs:
(Years 1-30): $0

<u>Operable Unit 2: On-site and Off-site Bedrock</u>

Alternative 1: No Further Action

The No Further Action alternative recognizes remediation of the site conducted under previously completed IRMs. To evaluate the effectiveness of the remediation completed under the IRM, only continued monitoring is necessary.

This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2: Institutional Controls

This alternative consists of establishing institutional controls to mitigate the potential for direct contact with contaminated groundwater. Institutional controls in the form of environmental easement would be established to prohibit future use of groundwater. Long-term monitoring and a site management plan would also be established.

Present Worth: $175,000
Capital Cost: $95,000
Annual Costs:
(Years 1-30): $6,200

Alternative 3: NAPL Recovery and Institutional Controls

This alternative consists of establishing a network of new and potentially existing NAPL recovery wells to facilitate NAPL collection, as well as implementation of institutional controls. The FS Report estimated 10 new, 6-inch diameter recovery wells would be installed under this alternative. This alternative also includes establishing institutional controls to mitigate the potential for direct contact with contaminated groundwater. Institutional controls in the form of an environmental easement would be established on the National Grid-owned properties to prohibit groundwater use. Long-term monitoring and a site management plan would also be established.

Present Worth: $790,000
Capital Cost: $460,000
Annual Costs:
(Years 1-30): $26,000

Operable Unit 3: Black River Sediments

Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the sediments to remain in an unremediated state. This alternative would leave the sediments in their present condition and would not provide any additional protection to human health or the environment.

Alternative 2: Sediment Removal

This alternative consists of physical removal of MGP-contaminated sediment and riverbank soils from eight depositional areas along the southern bank of the Black River. The locations of the eight sediment and soil deposits identified for removal (S3, S4, S5, S10, S11, S12, S13 and S14) are shown on Figure 10. These areas were selected based on their PAH concentrations; bank soil and sediment descriptions (e.g. visual observation of sheens, NAPL, or MGP tar); and a preliminary forensic evaluation of the PAH analytical results. Sediment and soil removal would be accomplished using mechanical or manual methods. In addition, this alternative would include annual inspection and sampling of these eight areas for an estimated five years to verify the effectiveness of Remedial

Alternatives implemented for OUs 1 and 2 in preventing recontamination of sediment and bank soils by MGP contaminants.

Present Worth: $661,000
Capital Cost: $610,000
Annual Costs:
(Years 1-5): $25,000

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York. 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 Public Health and the Environment. This criterion is an overall evaluation of each alternative's ability to protect public health and the environment.

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.

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

3. Short-term 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.

4. 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.

5. 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.

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.

7. Cost Effectivness. 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. The costs for each alternative are presented in Table 1.

This final criterion 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.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the Department addressed the concerns raised.

In general, the public comments received were supportive of the selected remedy. Several, comments were received, however, pertaining to the expensive cost, off-site investigations and future site use.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

For Operable Unit 1 the Department has selected Alternative 4, Remove MGP-Contaminated Soils; Address Former MGP Structures; Institutional Controls as the remedy for the on-site and off-site overburden soils.

For Operable Unit 2 the Department has selected Alternative 3, NAPL Recovery and Institutional Controls as the remedy for the on-site and off-site bedrock.

For Operable Unit 3 the Department has selected Alternative 2, Sediment Removal as the remedy for the Black River.

The elements of the selected remedy are described at the end of this section.

The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS.
These Alternatives were selected because, as described below, they satisfy the threshold criteria and provide the best balance of the primary balancing criteria described in Section 7.2. They will achieve the remediation goals for the site and surrounding areas by removing the MGP contaminated soils, NAPL in the bedrock, and sediment that create the most significant threat to public health and the environment. The proposed remedy will greatly reduce the NAPL that is the source of MGP contamination to groundwater and surface water, and it will create the conditions needed to restore groundwater quality to the extent practicable.
The evaluation of the alternatives for OU1, OU2 and OU3 are discussed below.

Operable Unit 1: On-site and Off-site Overburden Soils

Alternatives 1 (No Further Action)and 2 (Institutional Controls) for OU1 would not produce results that are physically different from the current conditions and would not address the MGP source material (NAPL) that has been identified in the soil. The presence of uncontrolled contamination that currently or potentially threatens human health and the environment would continue uncontrolled into the future. Furthermore, Alternatives 1 and 2 would not satisfy soil and groundwater SCGs in the project area. Contaminated soil would remain in the project area, with concentrations of hazardous substances exceeding SCG levels. Therefore, Alternatives 1 and 2 for OU1 are rejected as candidates for a potential remedy for OU1 because they would not meet the threshold criteria of protecting of human health and the environment and would not achieve SCGs for soils.

Alternatives 3, 4, and 5 for OU1 would provide varying degrees of human health and environmental protection. Alternative 5 would achieve the greatest protection of public health and the environment because it would achieve unrestricted use soil levels in the overburden soils. Alternative 3 would achieve some, but not all, of the soil cleanup objectives for individual contaminants. The removal of soils containing NAPL would be expected to improve groundwater quality. Alternative 4 would be more protective than Alternative 3 and less protective than Alternative 5 because it would remove the contaminated soils and NAPL that contribute most to the significant threat to public health and the environment. Because Alternatives 3, 4, and 5 satisfy the threshold criteria, the five balancing criteria were important in proposing a remedy for OU1.

Alternatives 3, 4 and 5 all have short-term impacts which can be controlled. The time needed to achieve the remediation goals would be longest for Alternative 3 and the shortest for Alternative 5 due to the increasing amount of contaminated soil removed. The greater the removal, the more quickly the groundwater quality would improve. Alternative 4 would be somewhere between Alternatives 3 and 5. The potential for short-term impacts would increase with the volume of soil removed, due to the increasing length of the construction period, the potential for odor releases, and the number of trucks needed to be driven over public streets to remove contaminated soil and import clean soil. Thus there is increasing potential for short term impacts with Alternatives 4 and 5 as compared to Alternative 3.

Achieving long-term effectiveness is best accomplished by excavation and removal of the contaminated overburden soils. Alternative 5 would achieve the greatest long-term effectiveness because it would remove contaminated soil above the SCGs. Alternative 4 would be the next most favorable because it would result in the removal all MGP source material above and below the overburden water table. Contamination would remain in the project area for Alternatives 3 and 4 above the SCGs, and exposure to remaining contamination would be addressed by a soil or pavement cover, property use restrictions, site management plan and long-term monitoring.

Alternatives 3, 4 and 5 would be implementable; however, some technical and administrative difficulties would exist, primarily dealing with access to non-National Grid owned properties and physical constraints such as the CSX railroad right-of-way, buildings, roadways, topography and the Black River. The implementability would become more difficult with increasing volumes of soil being addressed, therefore, Alternative 3 would be the most implementable soil removal alternative, followed by Alternative 4 and then Alternative 5. Alternative 5 would involve a very large portion of the project area and would pose severe space limitations, obstructions, water management, and other logistical issues associated with the increased amount soil removal. Based on the anticipated durations for

construction, Alternatives 4 and 5 would span two construction seasons with a period of no activity in the middle of the construction due to winter weather conditions typical to the Watertown area, making implementation more challenging for these alternatives. Alternatives 4 and 5 include soil excavation in the area immediately south of the City of Watertown DPW maintenance and storage building, and would require close coordination with the DPW to minimize disruption to operations at their facility. Alternatives 3, 4 and 5 would require demolition of the three Purcell Buildings. Alternative 4 would also require access to a small area on the Verizon and CSX properties, which would require coordination and access approvals. Alternative 5 would provide the greatest reduction of toxicity, mobility, and volume of contaminants through treatment, followed by Alternatives 4 and 3. Alternative 5 would remove 67,400 cy of contaminated soil, as compared to the next greatest removal alternative, Alternative 4, with an estimated removal volume of 37,000 cy. In addition, Alternative 5 would provide the greatest long term effectiveness and permanence because there would be no land use restrictions. Alternative 3 would remove a minimum of 21,500 cubic yards of MGP source material.

The costs of the alternatives vary significantly. Although Alternative 3 would be less expensive than the other excavation alternatives, Alternative 4 is very favorable because it is a permanent remedy that would address MGP source material and the source of contamination to groundwater and surface water to a greater extent and with greater expected long-term effectiveness. In addition there is more uncertainty in the excavation limits and associated cost estimated in the Feasibility Study for Alternative 3, which could significantly increase during remedial action as the pattern of contaminant distribution becomes more clear.

Operable Unit 2: On-site and Off-site Bedrock

Alternatives 1 (No Further Action) and 2 (Institutional Controls) for OU2 would not produce results that are physically different from current conditions and would not address NAPL in the bedrock. Alternative 2 would protect human health with institutional controls (ICs) to prevent exposure to contaminated groundwater. Institutional controls alone would have less long-term effectiveness and would have uncertain administrative implementability on off-site properties, as compared to ICs in combination with NAPL removal (Alternative 3). Alternative 3 would provide better environmental protection and long term effectiveness by removing NAPL and creating conditions for groundwater quality to improve through natural attenuation processes. Alternatives 1 and 2 would allow the presence of an uncontrolled contaminant source, in the form of NAPL, to persist in the environment. Although Alternative 3 has a higher cost and is slightly more difficult to implement than Alternative 2, it is preferred because it would provide a higher level of environmental protection.

Operable Unit 3: Black River

Alternative 1 (No Action) for OU3 would allow MGP contaminated sediments to remain in the Black River, and would not provide any increased environmental protection or achieve the SCGs for sediments. Although human health exposures to contaminated sediments and bank soils are unlikely due to the steep bank terrain and the surrounding industrial/commercial land use, the potential for ecological exposures exists for the areas of contaminated sediment. Alternative 2 for OU3 would protect the environment and would meet SCGs by removing MGP-contaminated sediment from the environment and disposing of them off-site. In conjunction with remedies for OU1 and OU2 that

prevent sediments from becoming recontaminated, Alternative 2 would provide a high degree of long-term effectiveness and permanence. Although Alternative 2 would be more costly and more difficult to implement, it is preferred because if would provide a higher level of environmental protection and permanence.

The estimated present worth cost to implement the remedy for all three operable units is $18,000,000. The cost to construct the remedy is estimated to be $17,200,000 and the estimated average annual costs for 5 years is $ 64,000 and for 5 to 30 years is $39,000. The estimated total costs for each operable unit are:

Operable Unit 1: On-site and Off-site Overburden Soils $16,300,000
Operable Unit 2: On-site and Off-site Bedrock $790,000
Operable Unit 3: Black River $661,000

The elements of the selected remedy are as follows:

A. Remedial Actions:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Any uncertainty identified during the RI/FS will be resolved, including the need to remove MGP structures located outside the targeted excavation area.

2. Excavation of impacted soil meeting one or more of the following criteria as MGP source material : visible tar or oil; the presence of sheens or odors with total PAHs over 500 ppm, soils containing reactive cyanide at concentrations above 250 ppm, or soils containing reactive sulfide at concentrations above 500 ppm. It is estimated that this will result in excavation of contaminated soils to the top of the bedrock. Treatment and/or disposal of excavated materials meeting the above criteria will occur at an off-site facility. Demolition of Buildings 1, 2, and 3 on the Purcell property will be performed as necessary to enable the excavation of MGP-contaminated soils.

3. MGP structures outside the targeted excavation area will be subject to further assessment. The interior surfaces of the structures will be inspected for integrity and the exterior will be inspected to determine if the overburden alongside and potentially underneath the structure contains MGP contaminants. The bedrock and overburden interface will be inspected to determine if the former structures have released MGP contaminants or the presence of MGP contaminants. If the inspection reveals that the structure(s) may have released contaminants, MGP contamination is under the structure, MGP contamination is at the overburden and bedrock interface or the inspection is inconclusive, then the structure(s) itself will be removed, along with visible MGP contamination in surrounding soil and under the structure, if present.

4. In-situ stabilization of the area along the CSX railroad tracks and the railroad bridge which crosses the Black River, where excavation is not structurally feasible or impracticable.

5. Excavated materials which are below the remediation criteria will be stockpiled and evaluated

for reuse as backfill. The excavation will be backfilled with stockpiled soils and clean imported soil, which is soil that meets the Division of Environmental Remediation's criteria for backfill or local site background.

6. Excavation of MGP contaminated sediments and riverbank soils from designated locations. The means of excavating sediments and riverbank soils will be evaluated in the design to address the flow conditions and fluctuations of the Black River. Contaminated sediment and soils will be removed and stored, if necessary, at the National Grid Property prior to disposal off-site.

7. Restoration of the stream bed and banks will be performed. All work on the stream bed and banks will meet the substantive requirements of 6NYCRR Part 608.

B. Engineering Controls

1. Except for the stream bank, a soil cover will be constructed over all vegetated areas to prevent exposure to contaminated soils. A minimum one-foot thick cover will consist of clean soil underlain by an indicator such as orange plastic snow fence to demarcate the cover soil from the subsurface soil. The top six inches of soil will be of sufficient quality to support vegetation. Clean soil will constitute soil that meets the Division of Environmental Remediation's criteria for backfill or local site background. Non-vegetated areas (buildings, roadways, parking lots, etc.) will be covered by a paving system or concrete at least 6 inches thick.

2. Installation of approximately 10 bedrock NAPL recovery wells and periodic measurement and removal of accumulated NAPL. The locations and number of NAPL recovery wells, along with the method and frequency of NAPL removal, will be determined during the remedial design and remedial action phase. The bedrock surface and joints will be inspected and mapped during the soil excavation to determine the potential locations of NAPL recovery wells. Recovered NAPL will be transported off site for treatment or disposal. The operation of the NAPL recovery wells will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

C. Institutional Controls

1. Imposition of an institutional control in the form of an environmental easement on OU1 properties owned by National Grid that will require (a) limiting the use and development of the property to commercial use, which will also permit industrial use; (b) compliance with the approved site management plan; (c) restricting the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by NYSDOH; and (d) the property owner to complete and submit to the Department a periodic certification of institutional and engineering controls.

2. Development of a site management plan which will include the following institutional and engineering controls: (a) management of the final cover system to restrict excavation below

the soil cover's demarcation layer, pavement, or buildings. Excavated soil will be tested, properly handled to protect the health and safety of workers and the nearby community, and will be properly managed in a manner acceptable to the Department; (b) continued evaluation of the potential for vapor intrusion for any buildings developed on the project area, including provision for mitigation of any impacts identified; (c) monitoring of stream bank restoration, groundwater and sediment quality; (d) identification of any use restrictions on the site and adjacent properties; and (e) provisions for the continued proper operation and maintenance of the components of the remedy.

3. National Grid will provide a periodic certification of institutional and engineering controls, prepared and submitted by a professional engineer or such other expert acceptable to the Department, until the Department notifies the property owner in writing that this certification is no longer needed. This submittal will: (a) contain certification that the institutional controls and engineering controls put in place are still in place and are either unchanged from the previous certification or are compliant with Department-approved modifications; (b) allow the Department access to the site; and (c) state that nothing has occurred that will impair the ability of the control to protect public health or the environment, or constitute a violation or failure to comply with the site management plan unless otherwise approved by the Department.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- Repositories for documents pertaining to the site were established.
- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.
- A fact sheet was sent to the mailing list in May 2008 announcing the completion of remedial investigations and a public meeting to discuss the results found in the report.
- Public Meeting was held on May 21, 2008 to present the results of the remedial invetigation.
- A fact sheet was sent to the public in early February 2009 announcing the availability of the PRAP, public comment period and solicit public comments on the proposed remedial alternative.
- A public meeting was held on March 3, 2009 to present and receive comment on the PRAP.
- A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.

Table 1
Remedial Alternative Costs

Remedial Alternative	Capital Cost ($)	Annual Costs ($)	Total Present Worth ($)
Operable Unit 1: On-site and Off-site Overburden Soils			
1. No Further Action	0	0	0
2. Institutional Controls	$100,000	$6,200	$180,000
3. Remove Certain NAPL-Containing Soils; Address Former MGP Structures; Institutional Controls	$10,400,000	$12,000	$10,700,000
4. Remove NAPL-Containing Soils; Address Former MGP Structures; Remove Soils with Total PAHs Above 500 ppm; Institutional Controls	$16,000,000	$12,000	$16,300,000
5. Removal of Soils to Achieve Unrestricted Use Soil Cleanup Objective	$25,600,000	0	$25,600,000
Operable Unit 2: On-site and Off-site Bedrock			
1. No Further Action	0	0	0
2. Institutional Controls	$95,000	$6,200	$175,000
3. NAPL Recovery and Institutional Controls	$460,000	$26,000	$790,000
Operable Unit 3: Black River			
1. No Further Action	0	0	0
2. Sediment Removal	$610,000	$25,000 (Years 1-5)	$661,000

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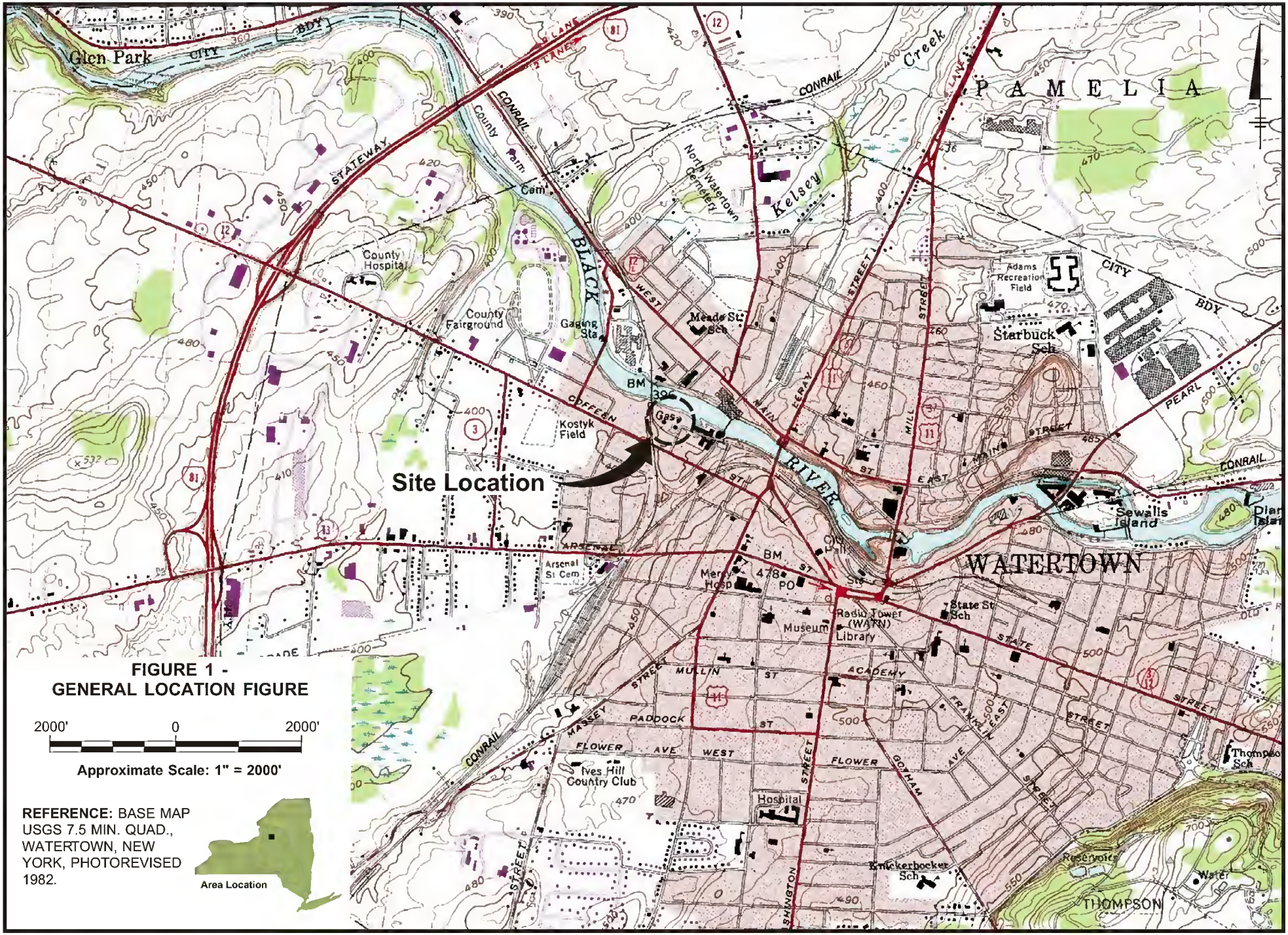

FIGURE 1 -
GENERAL LOCATION FIGURE

2000' 0 2000'

Approximate Scale: 1" = 2000'

REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., WATERTOWN, NEW YORK, PHOTOREVISED 1982.

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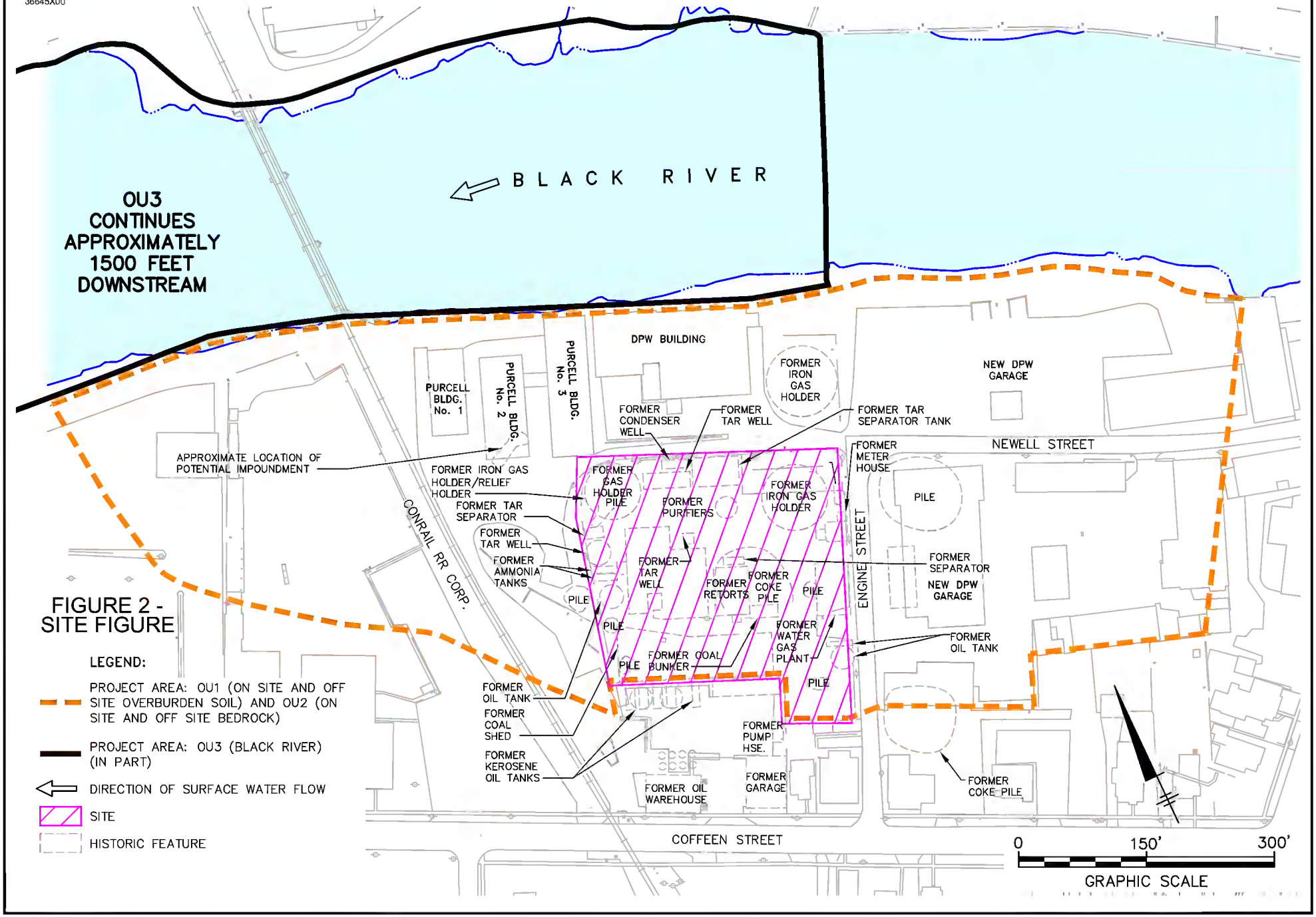
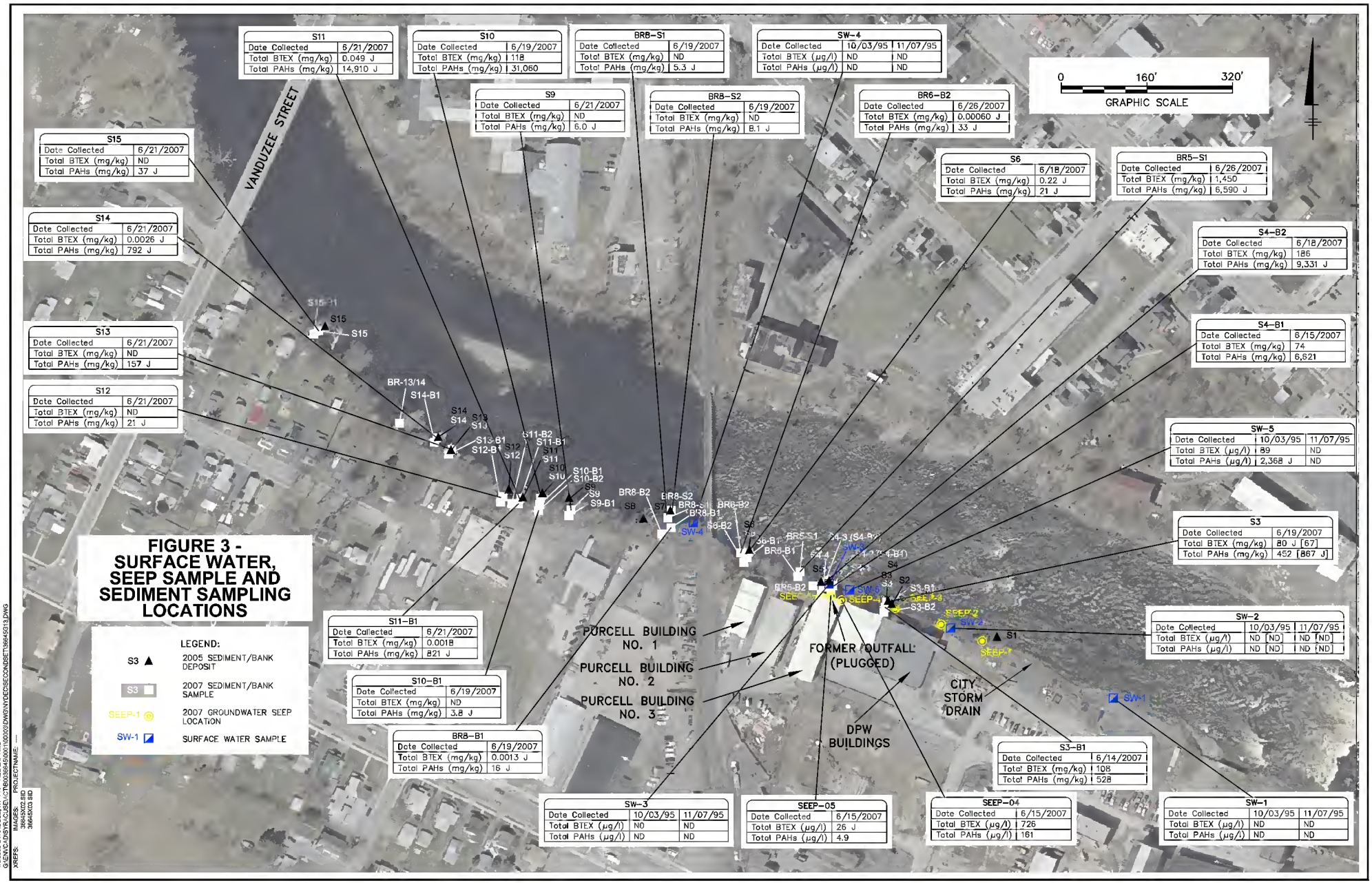


FIGURE 2 - SITE FIGURE

LEGEND:

- PROJECT AREA: OU1 (ON SITE AND OFF SITE OVERBURDEN SOIL) AND OU2 (ON SITE AND OFF SITE BEDROCK)
- PROJECT AREA: OU3 (BLACK RIVER) (IN PART)
- DIRECTION OF SURFACE WATER FLOW
- SITE
- HISTORIC FEATURE



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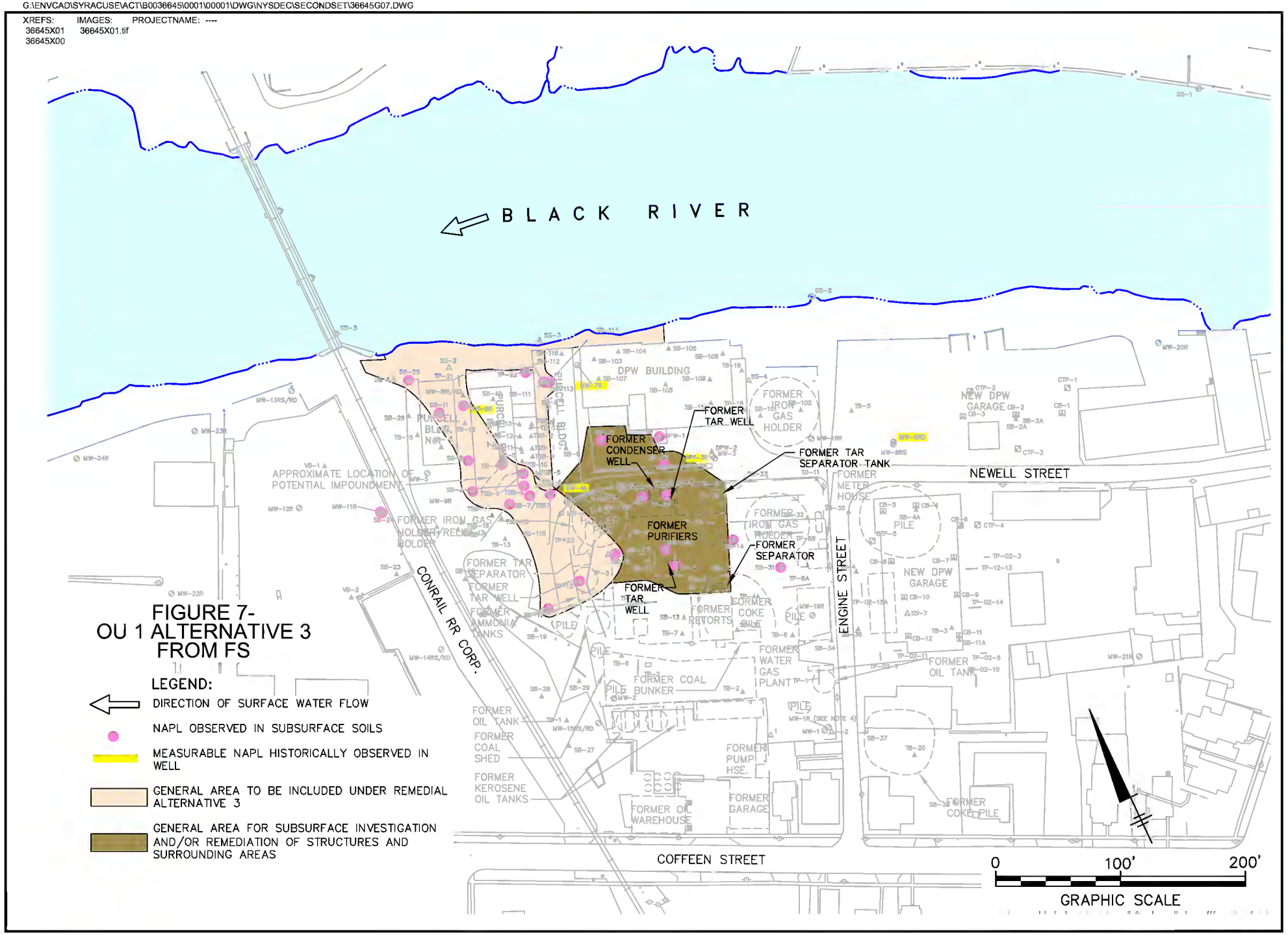

FIGURE 7-
OU 1 ALTERNATIVE 3
FROM FS

LEGEND:

- DIRECTION OF SURFACE WATER FLOW
- NAPL OBSERVED IN SUBSURFACE SOILS
- MEASURABLE NAPL HISTORICALLY OBSERVED IN WELL
- GENERAL AREA TO BE INCLUDED UNDER REMEDIAL ALTERNATIVE 3
- GENERAL AREA FOR SUBSURFACE INVESTIGATION AND/OR REMEDIATION OF STRUCTURES AND SURROUNDING AREAS

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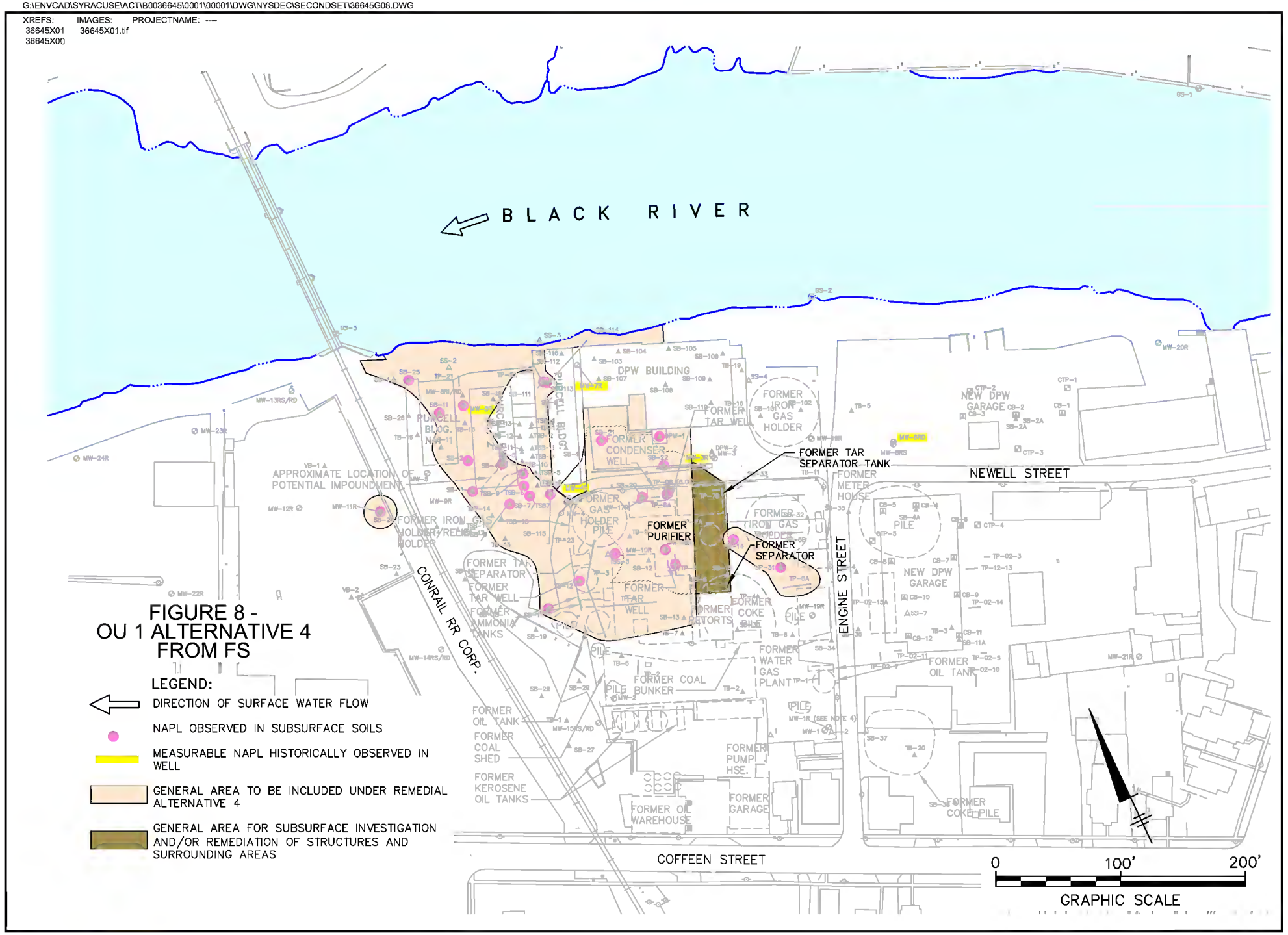

FIGURE 8 - OU 1 ALTERNATIVE 4 FROM FS

LEGEND:

- DIRECTION OF SURFACE WATER FLOW
- NAPL OBSERVED IN SUBSURFACE SOILS
- MEASURABLE NAPL HISTORICALLY OBSERVED IN WELL
- GENERAL AREA TO BE INCLUDED UNDER REMEDIAL ALTERNATIVE 4
- GENERAL AREA FOR SUBSURFACE INVESTIGATION AND/OR REMEDIATION OF STRUCTURES AND SURROUNDING AREAS

1/6/2009 SYRACUSE, NY-141 RCB LAF AMS
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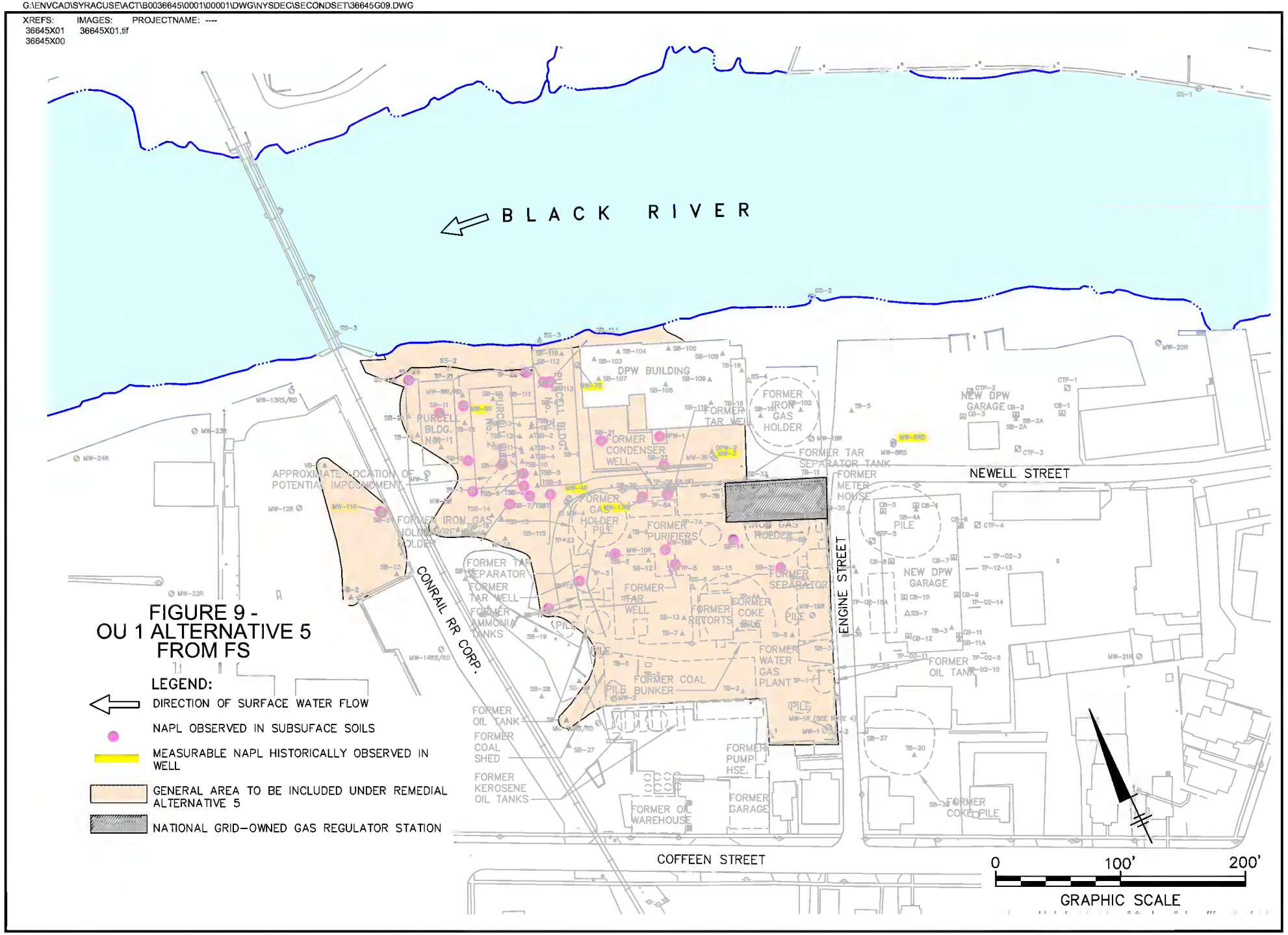

FIGURE 9 - OU 1 ALTERNATIVE 5 FROM FS

LEGEND:

- DIRECTION OF SURFACE WATER FLOW
- NAPL OBSERVED IN SUBSUFACE SOILS
- MEASURABLE NAPL HISTORICALLY OBSERVED IN WELL
- GENERAL AREA TO BE INCLUDED UNDER REMEDIAL ALTERNATIVE 5
- NATIONAL GRID–OWNED GAS REGULATOR STATION

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APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Niagara Mohawk Watertown Engine Street
Former Manufactured Gas Plant Site
Operable Units 1, 2 and 3
Watertown, Jefferson County, New York
Site No. 6-23-011

The Proposed Remedial Action Plan (PRAP) for the Niagara Mohawk Watertown Engine Street Former Manufactured Gas Plant (MGP) site, was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 11, 2009. The PRAP outlined the remedial measure proposed for the contaminated soil, bedrock and sediment at the Niagara Mohawk Watertown Engine Street Former MGP site.

The release of the PRAP was announced by sending a notice to the public contact list, informing the public of the opportunity to comment on the proposed remedy.

A public meeting was held on March 3, 2009, which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 13, 2009.

This responsiveness summary responds to all questions and comments raised during the public comment period. The following are the comments received, with the Department's responses:

The following comments were received during the March 3, 2009 public meeting:

COMMENT 1: The $18 million cost seems like an unreasonable amount to spend in this current economy. The property is currently unused, as it has been for 50 years, and the City has no viable use for the property. From a societal perspective, how can we justify spending this amount of money on a project which will not be totally cleaned up? The property will not see any higher use than it is now and future redevelopment may be hindered by the presence of the contamination that remains.

RESPONSE 1: The cost for this remedial project was considered during the evaluation of alternatives and was compared to the other alternatives to address the MGP contamination. The hazardous waste present at this site represents a significant threat to the environment as an ongoing source of contamination to groundwater, surface water and sediments, and a significant threat to public health due to the potential for exposure to waste. The Department and NYSDOH believe it is unacceptable to leave this Class 2 site in its current unremediated condition due to the threat it poses to the environment and the potential for human exposures.

Although the site will require institutional and engineering controls, including land use restrictions, the NYSDEC believes that the remedy will enable future redevelopment of the site to occur.

COMMENT 2: Spending the money for this project is worth every dime to protect the health of the residents of the community.

RESPONSE 2: The public comment in support of the project is noted.

COMMENT 3: When will construction of this project begin? How long will the project take?

RESPONSE 3: The construction portion of the project is expected to begin within two years and is expected to require approximately two years to perform.

COMMENT 4: What testing was completed beyond the site boundaries?

RESPONSE 4: Soil and groundwater sampling and analysis was performed at numerous locations beyond the southern, eastern and western boundaries of the site on the Purcell, Jefferson Concrete, Cappone/Verizon and City DPW properties. Sediment sampling was conducted north and west of the site in the Black River, over 1000 feet of the river bank. All of these sampling locations are shown in the February 2008 Remedial Investigation Report.

COMMENT 5: Was any testing conducted south of Coffeen Street?

RESPONSE 5: No, sampling did not extend south of Coffeen Street because MGP-related contamination was not observed in soil samples taken between the site and Coffeen Street.

COMMENT 6: Have other media been tested? I am concerned for bedrock as a migration pathway for soil vapor exposures to residents in the surrounding neighborhood.

RESPONSE 6: Yes other media were sampled, including soil vapor in the overburden in the vicinity of the site. The potential for soil vapor intrusion was evaluated on the north and northwestern portions of the project area where overburden and bedrock groundwater contain the highest concentration of site contaminants, structures are present, and the potential for vapor intrusion was considered the greatest. Given the current use of these structures, the potential for exposures via soil vapor intrusion is not likely. However, the remedy will include further evaluation should the use of the buildings change or new buildings are constructed in this area.

Relative to the bedrock groundwater contamination as a soil vapor pathway, MGP tar is heavier than water and has migrated downward in the vicinity of the site through the bedrock formation, contaminating the bedrock groundwater. While MGP tar in bedrock can be a potential source for soil vapor contamination, exposures to site contaminants in nearby residential properties through the

migration of soil vapor contamination in bedrock are not considered likely since the majority of the contamination is located on the north and northwestern portions of the project site and a significant source for soil vapor contamination is not present near the residential properties. Clean overburden groundwater is present on the southern and eastern portions of the site and typically acts as a barrier to contamination of vapors in the overburden soil above it. Therefore, the Department and New York State Department of Health (NYSDOH) have not identified soil vapor as a pathway of concern beyond the immediate project area. The remedy will address potential sources of soil vapor contamination by removing MGP source material in the overburden and NAPL in bedrock.

COMMENT 7: On the 500 block of Coffeen Street, in several homes there have been numerous incidents of severe cancers and Parkinson's disease. How do we know that the site is not the cause of these health effects?

RESPONSE 7: The NYSDOH is not aware of any unusual disease pattern around this site. Cancer is a group of more than 100 different diseases due to the abnormal growth of cells within the body. Cancer is more common than many people think. One in three persons will be diagnosed with cancer some time in their life and it will eventually affect three out of every four families. Since cancer is not a single disease, it generally does not have a single cause, such as contamination from a particular site.

It is true that some of the contaminants identified on the site are known or suspected cancer-causing agents (carcinogens). However, since the majority of the contamination is located in the soil and groundwater, and most of the project area is covered (pavement, buildings, grass, etc.), it is not likely that people can come into contact with the site contaminants. Therefore, health effects from site contamination would not be anticipated.

Information regarding the incidence of cancer detected in Watertown and in Jefferson County is available from the New York State Cancer Registry on the NYSDOH website at: http://www.health.state.ny.us/statistics/cancer/registry/. Additionally, people with individual concerns regarding cancer in the community are encouraged to contact the NYSDOH Cancer Surveillance Program at 518-474-2354.

COMMENT 8: When you excavate the soils, how many gallons of tar do you estimate you will dig out? How does this compare to the estimated volume that was collected and disposed of from the monitoring wells?

RESPONSE 8: The Department does not have an estimate of the tar that was disposed at the site, or the estimated volume that will be excavated by the remedy. The Department expects that it will far exceed the approximately 40 gallons that has been collected from the monitoring wells.

COMMENT 9: Although City residents drink water from the municipal supply, I am concerned that contamination in the bedrock groundwater could migrate and affect people who use groundwater for their drinking water supply.

RESPONSE 9: The site area is served by a municipal drinking water supply that is monitored regularly and meets NYS drinking water standards. We are not aware of any private water supply wells in the site area. The proposed remedy will include the collection of NAPL, which will enable groundwater quality to recover in the long term, along with a monitoring program for residual groundwater impacts.

COMMENT 10: Has anyone done a survey of private wells that may be used for drinking or irrigation?

RESPONSE 10: The project files were reviewed and documentation of a private well survey was not found. Public water is available and we are not currently aware of any groundwater usage. If documentation of an adequate private well survey cannot be found, it will be performed as part of the selected remedy.

COMMENT 11: How much coal tar would I have to be exposed to in order to have a health effect from this site? Is it long term, one lifetime, or multiple lifetimes?

RESPONSE 11: MGP tar is present on the site and project area in subsurface soil, riverbank soils (near the plugged pipe) and groundwater, where people do not typically come into contact with it. An Interim Remedial Measure (IRM) was performed in 2004 to cover tar seeps that were exposed at the ground surface near Purcell Building Nos. 2 and 3. It is not known if people were exposed to this tar prior to the IRM, however, given the location of the seeps, past public exposure is not considered likely.

The potential for health effects from exposure to coal tar or any other chemicals depends on many factors, including the level (how much) of exposure a person has, how long and how often they are exposed and an individual's sensitivity. If there is no exposure/contact with coal tar, then health effects cannot occur. It is not considered likely that the general public would have had repeated, long-term exposure to high levels of coal tar or other site contaminants since the majority of the site and surrounding area is covered with buildings and pavement and public water is supplied to the area. Therefore, health effects from coal tar contamination on the site are not considered likely.

COMMENT 12: Were surface water samples and seeps taken during low flow or high flow conditions?

RESPONSE 12: The surface water and seep samples were taken primarily during low flow conditions, however one group of samples were collected when the flow rate was high. The three sampling events occurred at flow rates of 958, 7,060 and 1,320 cubic feet per second.

COMMENT 13: I am concerned for exposure to recreational users of the river, particularly the rafting guides who may have frequent exposures.

RESPONSE 13: The remedy will address this exposure pathway. Site-related contaminants (primarily PAHs and BTEX compounds) are present in sediment and in bank soils in an area along the shoreline behind the Purcel Buildings that is exposed when river flows are low. The potential for recreational users of the river to come into contact with contamination in these areas exists, but is considered unlikely due to the limited number of sediment depositional areas and the terrain of the riverbank behind the Purcel Buildings. If concerned, recreational users of the river may wish to limit their contact in these areas until the remedy is completed.

COMMENT 14: Have background sediments or surface water samples been taken to evaluate whether sediments could be re-contaminated after the project is completed?

RESPONSE 14: Background sediment samples were not taken. The sediment areas selected for remediation were based on their PAH concentrations; bank soil and sediment descriptions (e.g. visual observation of sheens, NAPL, or MGP tar); and a preliminary forensic evaluation of the PAH analytical results. Background surface water samples were taken in 1995 during the investigation and compounds related to MGP contamination were not detected.

COMMENT 15: The B&R scrapyard is another source of contamination in the neighborhood, and should be investigated.

RESPONSE 15: Comment noted.

COMMENT 16: What is the point of identifying NAPL in the bedrock and removing it?

RESPONSE 16: Non-aqueous phase liquid (NAPL) found in bedrock represents a concentrated source of MGP contamination which is migrating within the bedrock and contaminating groundwater. Removing the NAPL in bedrock will create conditions for groundwater quality to improve. Otherwise the NAPL in the bedrock will remain as an uncontrolled contaminant source in the environment.

COMMENT 17: I am concerned about uptake of site contaminants by plants if groundwater is used for gardening or irrigation.

RESPONSE 17: Groundwater contamination appears to be limited to the site and project area. The Department is not aware of any users of groundwater for gardening or irrigation near the site. See response 10.

COMMENT 18: How much coal tar would I need to be exposed to during, for example, gardening, for it to be an issue?

RESPONSE 18: MGP tar is present on the site and within the project area in subsurface soil and

groundwater, where people cannot come into contact with it. There are no gardens on the site or project area and local residents are not expected to come into contact with coal tar. Contamination is limited to the site and project area, and residential properties near the site have not been impacted by coal tar.

The potential for health effects from exposure to coal tar or any other chemicals depends on many factors, including the level (how much) of exposure a person has, how long and how often they are exposed and an individual's sensitivity. If there is no exposure/contact with coal tar or any other chemical, then health effects cannot occur.

COMMENT 19: Were the results of upgradient or background samples used to confirm that the proposed remedy will not result in a site that is "cleaner" than the surrounding area?

RESPONSE 19: Background samples were not taken. The remedy will result in a site that is suitable for commercial, industrial and certain recreational uses, which is consistent with land use at the site and surrounding areas. Some levels of contamination will remain in site soil beneath the site cover, at levels above typical background concentrations, to be managed in compliance with a Department-approved site management plan.

COMMENT 20: Who will pay for the remediation?

RESPONSE 20: The remedial project will be funded by National Grid pursuant to an Order on Consent with the New York Start Department of Environmental Conservation.

COMMENT 21: I am concerned about the young children that live near the site in the Apartment Building.

RESPONSE 21: The majority of the contamination is located on the north and northwestern portions of the project site, not near the apartment building. Based on the site data and pattern of contaminant distribution, an investigation of the nearby apartment building property was not considered necessary. Procedures will be in place during remedial activities to ensure that site contaminants and dust are not leaving the site above action levels and that nearby properties are not impacted by site contaminants during remediation.

COMMENT 21: How were the soil vapor samples taken? Sub slab?

RESPONSE 22: The Soil Vapor Intrusion investigation included conducting a building reconnaissance and collecting six sub-slab soil vapor samples and one subsurface soil vapor sample to assess whether site-related VOCs are present in the soil vapor near or beneath these buildings. The procedures were reviewed and approved by the Department and NYSDOH as being consistent with the NYSDOH guidance for such investigations.

COMMENT 22: How was the coal tar disposed during the processing?

RESPONSE 23: The Department has no specific documentation concerning the method of tar disposal at this site. Tar from manufactured gas production was typically a reddish brown oily liquid that formed as a condensate when the gas cooled. This cooling occurred in gas storage holders, associated piping, tar pits, and possibly other structures that no longer exist aboveground. At this site tar and waste materials were found in soils near former MGP structures at the site, locations downgradient of these structures, at the top of the bedrock, and at the Black River shoreline next to the discharge pipe.

COMMENT 24: What about the downstream users of the water? Should the site be cleaned up for their sake?

RESPONSE 24: The areas where site-related contaminants are present in the Black River will be remediated.

Mr. Paul Foley submitted a letter dated March 10, 2009 which included the following comments:

COMMENT 25: The proposed cleanup will limit the future use of this prime waterfront area in the City of Watertown. The future development should not be limited to "commercial or industrial uses only" with environmental easements. The area along the Black River has a high potential for residential growth and recreational development.

RESPONSE 25: The selected remedy restricts site use to commercial, industrial and certain recreational uses. The restrictions are consistent with the existing and reasonably anticipated future land use, and local zoning.

COMMENT 26: Has enough investigation been performed downstream of the site? Has the gravel island downstream from the railroad bridge or the gravel bar downstream from Vanduzee Street along the north bank been adequately sampled?

RESPONSE 26: The limits of the project area investigations were identified in the Remedial Investigation Report dated February 2008. The two areas identified in this comment, the gravel island downstream from the railroad bridge and the gravel bar downstream from Vanduzee Street along the north bank, were investigated as part of sediment probing work in 2005. The probing found mostly medium to very coarse sand and gravel between rocks and cobbles, and did not reveal any sheens or odors which are characteristic of MGP contamination. No chemical testing was performed on samples collected from these two areas. The Department plans to have National Grid perform additional sediment investigations to determine if MGP contaminants have migrated in the Black River beyond the current project area and have been deposited in areas further downstream.

Catherine Geraci of ARCADIS submitted an email on behalf of National Grid dated March 13, 2009

which included the following comments:

COMMENT 27: Page 3, 4th paragraph includes the following text: "The remaining operable unit for this site is the area of groundwater and sediments beyond the boundaries of the current investigation. This area will be further investigated to determine if MGP contaminants have migrated in the bedrock or sediments of the Black River to other areas that have not yet been investigated." National Grid has completed a comprehensive Remedial Investigation (RI) addressing both on-site and off-site conditions and the requirement for additional investigation is not supported by the existing data.

RESPONSE 27: The site investigations have identified the major sources of MGP contamination at and adjacent to the National Grid property. The remedy will address the known areas of MGP contamination, however there are portions of the bedrock and Black River where the extent of contamination has not been fully delineated. Contaminants may have migrated further downstream in the Black River and been deposited in areas that have not been evaluated. The MGP contaminants may also have migrated in the bedrock beyond the limits of the project area. The Department plans additional investigations of this operable unit. See also Response 26.

COMMENT 28: National Grid does not agree with NYSDEC's proposed remedy for OU1 (on-site and off-site overburden soils - Alternative 4. National Grid recommended Alternative 3, which is a permanent remedy that is protective of human health and the environment, meets standards, criteria and guidance (SCGs), and costs approximately $6,000,000 less than NYSDEC's proposed remedy. Additionally, NYSDEC's proposed remedy has greater short-term impacts to the local community and surrounding properties, more technical and administrative difficulties for implementation, and still results in the same long-term requirements and property restrictions as Alternative 3.

RESPONSE 28: Although Alternative 3, as estimated, is less expensive than the other excavation alternatives, Alternative 4 is more favorable because it provides a greater reduction in contaminant volume that would address the source of contamination to groundwater and surface water to a greater extent and with greater expected long-term effectiveness. In addition there is considerable uncertainty in the excavation limits and associated cost estimated in the Feasibility Study for Alternative 3, which could significantly increase during remedial action as the pattern of contaminant distribution becomes more clear. National Grid is correct that the short-term impacts to the surrounding community may be greater in duration than for Alternative 3 as estimated, and this was acknowledged in the PRAP and at the public meeting. The technical and administrative difficulties for implementation are generally the same for Alternatives 3 and 4, because the only difference between them is the volume of excavation. National Grid is correct that the long-term requirements and property restrictions will be same as for Alternative 3.

COMMENT 29: The basis for identifying reactive cyanide and reactive sulfide as cleanup criteria for soils has not been provided, nor is the need for these criteria supported by the nature and extent of contamination. For example, page 7 of the Proposed Remedial Action Plan identifies that where cyanide is found in site soils and site groundwater the cyanide levels are generally below SCGs for both media; and where cyanide exceeds its SCGs, it is co-mingled with other site contaminants of concern.

RESPONSE 29: The Department's experience is that these criteria are indicative of purifier waste that is the source of contamination to other media, and has included them in other MGP PRAPs and RODs. Because previous investigations were not exhaustive, and the possibility exists that purifier waste may be present at locations not co-mingled with other MGP contaminants, the Department is retaining these criteria.

Eugene P. Hayes, with the City of Watertown, submitted a letter dated March 13, 2009 which included the following comments:

COMMENT 30: The City Strongly endorses the Operable Unit 3, Alternative 2 requiring the physical removal of MGP-contaminated sediment and riverbank soils from the targeted depositional areas along the southern bank of the Black River.

RESPONSE 31: The comment supporting Alternative 2 for Operable Unit 3 is noted.

COMMENT 32: The cost and adverse carbon footprint impact of the imposing removal, transport and subsequent reburial of such a tremendous amount of impacted onsite and offsite overburden as described in Operable Unit 1, Alternative 4 is questionable since the full scope of excavation will not even be realized until the work has actually begun. We would ask you to consider an alternative approach in which the stabilization of the site is uniquely designed around a joint use agreement between the City of Watertown and National Grid whereby the City will occupy the site and be responsible for the surface maintenance of an impermeable cap of the entire area.

We feel that it would be in the best interest of all of our agencies if an agreement could be negotiated that, while holding the City harmless from future cleanup activities associated the contamination from the former gas manufacturing plant, National Grid would be allowed to remove the targeted buildings, and conduct a less comprehensive/invasive overburden removal to consist of the removal of the previously capped drainage pipe and all associated tributary contributors. National Grid would then remove a sufficient depth of overburden to allow the capping of the site with an impervious cap consisting of a plastic liner, sub-base, base, binder and top asphaltic concrete course complete with a full surface water collection discharge system thereby eliminating the potential of any future leachate penetration into the former site. National Grid would also construct for the City a Salt Storage Facility in a location most suitable for this structure to be located east of the railroad tracts.

RESPONSE 32: The City's proposal to stabilize the site with an impermeable cap while conducting a less comprehensive removal would only partially address the migration of contaminants. The excavation and removal of MGP tar and source material will reduce further migration of contaminants into the bedrock that may not be addressed through capping. Excavation to the surface of the bedrock will also enable the fracture system beneath the site to be examined, and the NAPL recovery program to be optimally designed. The Department's hierarchy for source removal and control measures, as specified in 6NYCRR Part 375-1.8, favors removal and/or treatment remedies over containment remedies such as the City has proposed. Because source excavation is feasible at this site, the Department has selected Alternative 4, which will remove the full extent of source material and provide the greatest reduction in contaminant volume and mobility. See also Response 28.

COMMENT 33: If allowed to proceed with this modified plan then we would also suggest that the work associated with Operable Unit 2, Alternative 3, NAPL Recovery and Institutional Controls could be expanded to include additional well sites and the modification of the drilling and well completion to include fracturing and acidizing in order to increase both the productivity and efficiency of each well. We feel that the capturing and removal of the NAPL is a crucial component of the overall stabilization of the site and that this approach will be more cost effective and longer lasting.

RESPONSE 33: We agree that the capture and removal of NAPL is an important element of the overall remedial approach particularly with regard to protection of the River from recontamination. The specific number, location and drilling/recovery methods for the NAPL collection wells will be determined in the remedial design.

APPENDIX B

Administrative Record

Administrative Record

Niagara Mohawk Watertown Engine Street
Former Manufactured Gas Plant Site
Operable Units 1, 2 and 3
Watertown, Jefferson County, New York
Site No. 6-23-011

1. Proposed Remedial Action Plan for the Niagara Mohawk Watertown Engine Street Former Manufactured Gas Plant (MGP) site, Operable Units 1, 2 and 3, dated February 2009, prepared by the Department.

2. Order on Consent, Index No. D0001-9210, between the Department and Niagara Mohawk Power Corporation, executed on December 7, 1992.

3. "Preliminary Site Assessment/Interim Remedial Measures Study for the Watertown(Engine Street) Site", May 1996, prepared by Blasland, Bouck & Lee, Inc.

4. "Remedial Investigation Report Watertown (Engine Street) Former MGP Site", February 2008, prepared by ARCADIS BBL

5. "Feasibility Study Report", January 2009, prepared by ARCADIS

6. Remedial Investigation Fact Sheet dated May 2008

7. Proposed Remedial Action Plan Fact Sheet February 2009

8. Letter dated March 10, 2009 from Paul Foley, resident

9. Email dated March 13, 2009 from Catherine Geraci, ARCADIS on behalf of National Grid

10. Letter dated March 13, 2009 from Eugene P. Hayes, Superintendent of Public Works, City of Watertown