Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

O&R Port Jervis Former MGP Site
Port Jervis (C), Orange County, New York
Site Number 3-36-049

December 2007

New York State Department of Environmental Conservation
ELIOT SPITZER, *Governor* ALEXANDER B. GRANNIS, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

O&R Port Jervis Former MGP Site
Port Jervis (C), Orange County, New York
Site No. 3-36-049

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Orange and Rockland (O&R) Port Jervis Former Manufactured Gas Plant (MGP) 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 the O&R Port Jervis Former MGP site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the Department. Comments received during the public comment period are addressed in the Responsiveness Summary, which is Appendix A of the ROD. 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 O&R Port Jervis Former MGP site and the criteria identified for evaluation of alternatives, the Department has selected to excavate and remove highly contaminated source areas and former MGP subsurface structures, construct a series of wells to collect dense non-aqueous phase liquid (DNAPL), install a system of wells to treat contaminated groundwater, enhance the existing on-site cover system to prevent future exposures, and implement a site management plan to ensure all engineering and institutional controls are in place and effective.

The components of the remedy are as follows:

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

2. Former MGP structures and their contents will be demolished, excavated and removed for off-site disposal. Source area soils will also be excavated. It is estimated this will result in the disposal of approximately 4,600 cubic yards of material.

3. Surface soil in the off-site 28 Pike Street area will be removed to a depth of at least 2 feet below ground surface and restored with clean soil, as defined by the Department.

4. Areas of the basement of 28 Pike Street where there is soil exposed at the surface will be covered with a concrete slab or other cover system. The infrastructure for a sub-slab depressurization system will be installed at that time. Future monitoring will determine if that system will operate as a passive or active system.

5. NAPL collection wells will be installed to remove NAPL from the subsurface. The conceptual placement of these wells is shown on Figure 5.

6. Groundwater treatment wells will be installed downgradient of the site and placed to intercept the dissolved phase groundwater plume heading toward the Delaware River. The groundwater will be treated by enhanced aerobic biodegradation of the contaminants. The conceptual placement of these wells is shown on Figure 5.

7. A cover system (*e.g.*, pavement) will be installed at the site to prevent exposure to contaminated surface and subsurface soils.

8. Imposition of an institutional control in the form of an environmental easement 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.

9. 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 site, including provision for mitigation of any impacts identified; (c) monitoring of groundwater and Delaware River sediments; (d) identification of any use restrictions on the site; (e) provisions for the continued proper operation and maintenance of the components of the remedy.

10. The property owner 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 would 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.

11. The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

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.

12/27/07
Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

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SECTION 1: SUMMARY OF THE 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 the O&R Port Jervis Former Manufactured Gas Plant (MGP) Site. The presence of hazardous waste has created significant threats to human health and the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, the production of manufactured gas and related byproducts has resulted in the disposal of hazardous wastes, including coal tars. These wastes contain benzene, toluene, ethylbenzene, and xylene, as well as a number of polycyclic aromatic hydrocarbons and cyanide. These wastes have contaminated the soil and groundwater at the site, the off-site groundwater, and have resulted in:

- a significant threat to human health associated with potential exposure to contaminated site soils and contaminated groundwater.

- a significant environmental threat associated with the current and potential impacts of contaminants to the groundwater resource.

To eliminate or mitigate these threats, the Department has selected to excavate and remove highly contaminated source areas and former MGP subsurface structures, construct a series of wells to collect dense non-aqueous phase liquid (DNAPL), install a system of wells to treat contaminated groundwater, enhance the existing on-site cover system to prevent future exposures, and implement a site management plan to ensure all engineering and institutional controls are in place and effective.

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 O&R Port Jervis Former MGP Site is located at 16 Pike Street in a residential/commercial section of the City of Port Jervis, Orange County, New York (see Figures 1 & 2). The site itself is zoned for commercial and industrial purposes. The site is located immediately north of the State Route 209 bridge across the Delaware River. State Route 209 overlaps Pike Street on the eastern boundary of the site. The site is generally bordered by Brown Street to the north, Water Street to the west, King Street to the east, and Pike Street to the south. The Delaware River is approximately 160 feet to the southwest of the site, beyond Water Street. This stretch of the Delaware River is a Class A waterbody. The Neversink River is located approximately 1 mile southeast of the site and flows generally southwest. It empties into the Delaware River approximately 1.25 miles (as measured along the Delaware River) downstream of the Route 209 bridge. This stretch of the Neversink River is a Class B waterbody.

The site consists of approximately 1.2 acres of land owned by O&R, which is utilized for equipment storage, utility service, and customer service. The site is completely fenced and primarily covered with a gravel/asphalt surface and the multiple-use service building. A vacant apartment building, now owned by O&R, is located to the southwest of the Operations Center.

Historically, a tail race from the Delaware and Hudson Canal passed through the site and discharged to the Delaware River. The tail race was abandoned and backfilled by 1905 and currently contains a 60-inch storm sewer line. This line also runs beneath Flo-Jean Restaurant before discharging through a backflow control structure into the Delaware River.

Site investigations have identified four unconsolidated soil units located beneath the site (in descending order): fill, fine-grained alluvium, coarse-grained alluvium, and glacial outwash. These units are consistent with the glacial fluvial deposits found in this region. A gray shale bedrock underlies the unconsolidated units at the site at depths ranging from approximately 148 to 180 feet below ground surface.

Groundwater was observed approximately 16 to 20 feet below grade. Groundwater flows to the southeast, which is consistent with the regional groundwater flow. Groundwater is also affected by the seasonal flood events that occur on the Delaware and Neversink Rivers. No private wells were identified in the vicinity of the site. The City of Port Jervis utilizes a reservoir system for the municipal water supply.

There are several other contaminated and/or potentially contaminated sites in the area. Most notable among those sites is the Roundhouse property, a former rail yard. This site is located approximately 1,200 feet to the north-northeast of the Pike Street site, just south of West Main Street. The primary contaminants of concern at the Roundhouse Site are petroleum products, which may have similar constituents to the MGP waste. This site has been evaluated previously and will be addressed separately. It does not appear to be having a significant impact on the MGP site.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

A manufactured gas plant (MGP) is a facility where gas for lighting and heating homes and businesses was produced. Manufactured gas was produced at this site using the coal carbonization and carbureted water gas processes. The carbureted water gas process involved the passage of steam through burning coal. This formed a gaseous mixture (water gas or blue gas), which was then passed through a super heater with an oil spray. The oil spray would generate additional gas, enhancing the heat and light capacity of the overall gas mixture. In each process, the gas produced was condensed and purified prior to distribution.

In the mid-1800's, the Port Jervis Gas and Light Company operated a manufactured gas plant at the site. The plant utilized a variety of production processes over the subsequent decades of operation. The plant used coal and naphtha as feed stock. The naphtha, which is a flammable liquid derived by distilling crude oil, was delivered by an underground pipeline to the western side of the plant from the railroad yard. Various infrastructure was built or relocated on-site during the plant's life, including naphtha tanks, lime purifier beds, sawdust purifier beds, tar wells, and at least four separate gas holders. Refer to Figure 2 for a composite of the various plant structures that existed at the site.

The plant ceased regular operations in 1938, at which time natural gas was introduced to the area. It is unknown at what date the plant ceased all operations; however, by 1959 only the largest gas holder and governor house remained at the site because the rest of the plant had been demolished to make way for construction of the current service center.

3.2: Remedial History

In June 1996, a large underground storage tank (UST) and 229 tons of petroleum-impacted soil were removed from the tank area and disposed of at an off-site facility. The location of the tank is noted as Diesel Tank UST N, on Figure 2. In April 1998, a 1,000-gallon UST and approximately 110 cubic yards of petroleum-impacted soil were removed from that tank area. The location of the tank is noted as Gasoline UST M on Figure 2.

In 1998, O&R completed a site assessment for the former MGP. The results of this screening are presented in the September 1998, "Draft Preliminary Site Assessment Report - Port Jervis." This report confirmed the plant's location and identified the need for additional investigation and remediation of the site.

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 Orange & Rockland Utilities, Inc. (O&R) entered into an Order on Consent Index No. D3-0002-9412 on January 2, 1996. The order obligates the responsible party to

investigate multiple former MGP sites in its service area. This order was superseded by Order on Consent Index No. D3-0001-99-01 dated March 11, 1999, revising Order on Consent Index No. D3-0001-98-03 (September 29, 1998), clarifying O&R's obligation to investigate, and as necessary, remediate the O&R Port Jervis Former MGP Site.

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 September 2000 and October 2005. The field activities and findings of the investigation are described in the RI report entitled "Remedial Investigation Report, Phase II" and dated October 25, 2005.

Activities completed as part of the RI included research of historical information and evaluation of surface soil, subsurface soil, groundwater, soil vapor, indoor air, and ambient air. Several on-site surface soil samples were collected for laboratory analysis as were samples from off-site areas for comparison. Many soil borings were advanced to observe subsurface geologic conditions and collect subsurface soil samples. Several monitoring wells were installed to evaluate groundwater quality. Groundwater elevation readings were recorded on several occasions and multiple rounds of groundwater sampling were conducted. Also as part of RI activities, sediment samples were collected from the Delaware River to assess any impact the site may have had. An investigation of the storm sewer system was conducted, including the collection and analysis of several samples to determine to what extent the results of the river sediment may have been influenced by other sources (e.g., urban runoff). An investigation was also performed to assess soil vapor intrusion at on-site and nearby buildings. During the investigation samples of soil vapor were collected from across the site and from adjoining properties, including properties on the northwest side of Brown Street, a property on the southwest side of Water Street and properties on the southeast side of Pike Street. Indoor air, sub-slab soil vapor, and outdoor (ambient) air samples were collected from the on-site O&R operations building, the building at 28 Pike Street, and the buildings at 9 Pike Street.

5.1.1: Standards, Criteria, and Guidance (SCGs)

To determine whether the soil, groundwater, sediments, surface water, and soil vapor contain 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; Determination of Soil Cleanup Objectives and Cleanup Levels." 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 February 2005. The background levels are not SCGs and are used only as a general tool to assist in data evaluation.

- Background soil samples were collected from three off-site locations. The samples were analyzed for volatile organic compounds (VOCs), pesticides, polychlorinated biphenyls (PCBs), semi-volatile organic compounds (SVOCs), metals, cyanide, and miscellaneous physical parameters. The results of the background sample analysis were compared to relevant RI data to determine appropriate site remediation goals.

- Background sediment samples were taken from five locations. These locations were upstream of the site, and were unaffected by historic or current site operations. The samples were analyzed for PAHs and Total Organic Carbon (TOC). The results of the background sample analysis were compared to relevant RI data to determine appropriate site remediation goals.

- A background grit sample from the storm sewer system upgradient of the site. The sample was analyzed for VOCs, SVOCs, metals, cyanide and TOC.

Based on the RI results, in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site 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, sediment, and air samples were collected to characterize the nature and extent of contamination. As seen in Figures 3A through 4 and summarized in Table 1, the main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs), and to a lesser extent cyanide and metals. For comparison purposes, where applicable, SCGs are provided for each medium.

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 ($\mu g/m^3$).

The VOCs of concern are benzene, toluene, ethylbenzene, and xylene. These compounds, commonly referred to as BTEX, are a common component of coal and carbureted water gas tars. SVOCs of concern primarily include a number of polycyclic aromatic hydrocarbons (PAHs) which are commonly found at MGP sites. These include:

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

PAH concentrations referred to in this plan are the summation of the individual PAHs listed above (i.e., total PAHs or tPAHs). The italicized PAHs are probable human carcinogens. The summation of the italicized PAHs is referred to in this document as cPAHs.

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. Low levels of cyanide have been found in site soils and groundwater; however, these detections are below SCGs for both media.

Tars and purifier wastes are two major types of waste present that are typically found at former MGP sites. Coal tars and carbureted water gas tars are reddish brown to black, oily liquids that do not readily dissolve in water. Materials such as these are commonly referred to as non-aqueous phase liquids, or NAPLs. NAPL was observed at the site and in a downgradient area.

Although most tars are slightly more dense than water (DNAPL), the difference in density is slight. Consequently, they typically sink when in contact with water but may also be found as a neutrally buoyant or floating product. Both light non-aqueous phase liquid (LNAPL) and DNAPL are known to exist at this site.

The LNAPL observed may also be partially derived from the various petroleum products that were used as a feedstock in the carbureted water gas process and associated with underground storage tanks that were used at the site to store petroleum and vehicle fuels.

NAPLs were disposed of, spilled, or leaked from tanks, gas holders, and other structures at several locations throughout the site and have moved away from these locations through the subsurface. This migration results in NAPL contamination at various depths below the ground surface. The areas of NAPL contamination were found to saturate the unconsolidated deposits in seams and/or exist in scattered, discontinuous globules, particularly, in the more permeable sand and gravel lenses found at the site.

Tars contain high levels of PAH compounds, often greater than 100,000 parts per million. Tars also may exceed groundwater SCGs for BTEX by several orders of magnitude. In certain tar samples, enough benzene may be present to require that the material be managed as a hazardous waste. The tar is the primary source of the BTEX and PAHs identified in various media at the site and discussed in section 5.1.3.

Purifier waste covers a variety of materials used to remove sulfur and other undesirable compounds from the manufactured gas before distribution to the public. Materials used for this purpose at the site include lime and wood chips impregnated with iron oxide. Purifier materials which were no longer capable of removing the impurities were often disposed of on-site as fill. This waste contains high concentrations of sulfur and cyanide, and may have a characteristic blue color from the ferric/ferrocyanides when present at high levels. Cyanide and sulfur from this waste can impact site soils, groundwater and sediment. Sulfur and cyanide may also be present in the tars from MGP processes. No significant deposits of purifier waste were observed at or near the site.

Certain metals were found in excess of TAGM guidance values, which for many metals are defined as the background concentration for that metal. In general, areas where metals exceeded TAGM values or background concentrations coincided with areas of identified site impacts (BTEX/PAHs).

Figures 3A through 4 and Table 1 summarize the degree of contamination for the contaminants of concern in soil, groundwater, and sediments and compare the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Waste Materials

The production of manufactured gas created many byproducts, some of which remain on the site. A dense, oily liquid known as tar would condense out of the gas at various stages during its production, purification and distribution. Although much of the tar produced by MGPs was typically reused or sold, recovery of the tar was incomplete. Substantial amounts of tar leaked or were discharged from storage and processing facilities over the long life of the plant, contaminating subsurface soils on the site, as well as groundwater.

The RI found that the NAPL contamination appears to have originated in the area of the former MGP plant structures and migrated through the subsurface of the site. This migration is along the more permeable units, particularly the coarse-grained alluvium unit. The migration appears to be limited vertically by the NAPL density and preference for lateral migration in the coarse-grained alluvium unit. As the NAPL material migrates along this unit, it collects in some areas, penetrates into the underlying unit to varying depths, or dissipates to blebs and sheens, which may eventually find a discharge point into the Delaware River.

Another byproduct, purifier waste, is the exhausted lime and/or iron oxide treated wood chips that were used to remove cyanide and sulfur from the gas. Purifier waste was often discarded on

the site of a gas plant or used as a fill material. No significant deposits of purifier waste were observed at or near the site

The source of much of the BTEX and PAH contamination found on-site is the tar or NAPL found in and around the various subsurface structures that remain on the site or migrating through the subsurface. Analysis of the NAPL reveals that it contains BTEX and PAH concentrations several orders of magnitude greater than the groundwater SCGs for these compounds. The NAPL was found in the unconsolidated deposits in seams and/or exists in scattered, discontinuous globules. Either of these conditions generally coincides with high BTEX and PAH concentrations observed in soils and correlates to significant impacts observed in the groundwater. Areas of significant waste disposal represent "source areas" and are defined as those identified locations on the site where there are former MGP structures containing waste and/or where significant volumes of soil have been found visually to be saturated with NAPL. Soils exhibiting odors, staining and/or sheens are not included in the definition of "source areas." At the site, these source areas appear to be directly associated with several of the former plant structures, notably Gas Holder A, Tar Separator O, Gas Holder D and Gas Holder C, shown on Figure 2.

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

Surface Soil (0-2 inches)

The surface soils at the site are generally not impacted. At this site, the surface materials across the site are largely fill or pavement that were placed after MGP operations had ceased. Those soils that were present at the surface during the MGP plant's operation are typically not the same as those that are presently exposed on the surface of the site in limited areas. The majority of the site surface is gravel or asphalt.

Three surface soil samples were collected from 0-2 inches below grade from off-site areas to assess local surface soil conditions. These background values were used to help determine the impact to surface soils by the former MGP. The results of the background surface soil sampling are summarized in Table 1A.

tPAHs detected in surface (0-2 inches) soil samples taken from potentially impacted areas ranged from 8.41 to 446.2 ppm, as compared to the SCG of 500 defined by TAGM 4046. Several individual PAHs were detected at levels above their respective SCGs, including benzo(a)pyrene, which was detected at levels ranging from 0.58 to 27 ppm compared to the SCG value of 0.061 ppm as defined by TAGM 4046. Although site constituents were found in surface soils above SCGs, they are orders of magnitude below those found in the "source areas." Arsenic was also detected at estimated concentrations ranging from 4.8 to 8.8 ppm, slightly above its site-specific SCG of 7.5 ppm. The results of the surface soil sampling are summarized in Table 1B.

A small off-site area of surface soil contamination identified during the RI/FS will be addressed in the remedy selection process.

Subsurface Soil

During the RI, approximately 67 subsurface soil samples were collected and analyzed. These samples found that certain areas of the site were heavily impacted by MGP related constituents, while other areas were not impacted. The most extensive and severe of these subsurface soil impacts are located in the vicinity of Gas Holder A and monitoring well cluster MW-1.

Analytical results for subsurface soil samples for individual PAH concentrations were found to range from non-detect to 9,000 ppm of naphthalene, as compared to the SCG value of 13.0 ppm as defined by TAGM 4046; and tPAHs from non-detect to 19,060 ppm, as compared to the SCG value of 500 ppm in TAGM 4046. For comparison, analytical results for subsurface soils on off-site parcels reached a maximum value of 130 ppm for tPAHs.

Individual BTEX values ranged from non-detect to 1,200 ppm of benzene; non-detect to 1,700 ppm for toluene; non-detect to 1,400 ppm of ethylbenzene; and non-detect to 1,900 ppm of xylene. For comparison, TAGM 4046 values for benzene, toluene, ethylbenzene, and xylene are 0.06 ppm, 1.5 ppm, 5.5 ppm, and 1.2 ppm, respectively. Total BTEX ranged from non-detect to 6,200 ppm, compared to a total VOC TAGM SCG value of 10 ppm. Cyanide was detected at low levels ranging from non-detect to 1.7 ppm.

Subsurface soil contamination identified in these areas will be addressed in the remedy selection process. The results of the subsurface soil sampling conducted are summarized in Table 1C and shown on Figures 3A through 3C.

Groundwater

The RI identified significant groundwater contamination at the site. This groundwater contamination originates in the area of the former MGP structures, and extends beyond the southeastern property boundary to the Delaware River. Groundwater that comes into contact with the NAPL or more heavily impacted site soil results in the contamination of the groundwater and aqueous phase migration of the contaminants.

Several contaminants were detected in on-site groundwater including benzene, toluene, ethylbenzene and xylene. Concentrations of benzene, with a standard of 1 ppb, ranged from ND to 331 ppb. Concentrations of toluene, ethylbenzene and xylene, all with a standard of 5 ppb, were present at levels ranging from ND to 52 ppb, 1220 ppb and 760 ppb, respectively. Several PAHs were detected in on-site groundwater above standards, including naphthalene and acenaphthene. Naphthalene, with a standard of 10 ppb, was present at levels ranging from non-detect to 6300 ppb. Acenaphthene, with a standard of 20 ppb, was present at levels ranging from non-detect to 370 ppb.

Levels of groundwater contamination were also observed off-site above groundwater standards. Measured concentrations of benzene, toluene, ethylbenzene and xylene ranged from ND to 150 ppb, 22 ppb, 1100 ppb and 760 ppb, respectively. Off-site levels of naphthalene and acenaphthene ranged from non-detect to 3600 ppb and 160 ppb, respectively.

Contamination was observed in monitoring wells on the banks of the Delaware River; however, in general, it was at much lower concentrations. Levels observed in those wells ranged from non-detect to 58 ppb of acenaphthene and non-detect to 22 ppb, 26 ppb, and 24 ppb of benzene, ethylbenzene and xylene, respectively. This is likely due to dilution of the groundwater by the river.

Groundwater contamination identified during the RI/FS will be addressed in the remedy selection process. The results of the groundwater sampling conducted are summarized in Table 1D and shown on Figure 3A.

Surface Water

No water samples were collected from the Delaware River due to the high dilution from the river volume. Trace sheens were occasionally observed during the probing of the shallow sediments in the Delaware River, which is a contravention of surface water standards. The sheens were intermittent and not reproducible at any of the 258 specific probing locations. Heavy sheens were also observed emanating from the storm sewer outfall during rainfall events. It is possible that urban runoff may have contributed to the presence of the sheens. This is discussed further below, in the section concerning Sediments.

No site-related surface water contamination of concern was identified during the RI/FS. Therefore, no remedial alternatives need to be evaluated for surface water.

Sediments

During the RI, 42 sediment samples were collected from the Delaware River during three separate field investigations. These samples found the stretch of the Delaware River near the site to be mildly impacted with contaminants consistent with those found on-site, specifically PAHs. The levels of contaminants detected in the sediments were found to be comparable to those observed from other urban sources and may be indicative of impacts to the river from other sources such as urban runoff; however, based on the results obtained, the possibility of impact to the Delaware River sediments by the site could not be ruled out.

Total PAH concentrations were calculated for each sample for the purpose of comparing analytical results for samples taken from areas potentially impacted by the site to results obtained from upgradient areas. Levels of tPAHs detected in Delaware River sediments ranged from non-detect to 70.82 ppm. The second highest level of tPAHs observed was 42 ppm. The samples with the largest values were collected in the area below the storm sewer outfall which crosses the site. Levels detected downstream of the outfall, including to the south of the State Route 209 bridge where the groundwater plume discharges to the river, ranged from ND to19 ppm of tPAHs.

The levels observed in the outfall sediments are comparable to those observed in grit from the storm sewer system upgradient of the site. Two storm water samples and a grit sample were collected from the storm sewer that crosses the site, upgadient of the site to assess the contribution of urban runoff to contaminant levels detected in the sediments of the Delaware

River. This storm sewer lies within the former canal tail race and is above the water table. As such, it is not likely to create a preferential migration pathway of contaminated groundwater. The storm water samples were analyzed for VOCs, SVOCs, metals and cyanide. One water sample was collected upgradient of the site, from a manhole east of King Street, and the second sample was collected at the storm water outfall. The SVOC sample results found only low levels of bis(2-ethylhexyl)phthalate, which is likely an artifact of sample collection and/or laboratory analysis. VOCs and cyanide were not detected in either sample. A grit sample was also collected from the upgradient location. No grit was available in the line for sampling at the storm water outfall. The upgradient grit sample was analyzed for VOCs, SVOCs, metals and cyanide. This sampling found 0.063 ppm of toluene, 45.9 ppm of tPAHs and 1.1 ppm of cyanide.

These results support other site data (e.g., test pits and the video log of the storm sewer) that indicate the storm sewer has not been impacted adversely by the site and that the urban runoff in the storm sewer contains constituents comparable to those observed in the Delaware River.

Five background sediment samples were collected from the Delaware River to assess sediment quality. These samples were collected upstream of the site. These samples were collected to assess the condition of local sediment quality due to anthropogenic or natural occurrences. tPAH values detected in these samples ranged from non-detect to 0.7 ppm. Five sediment samples were also collected in the vicinity of a second storm water outfall located out of the river channel downstream from the site. These samples were collected to assess the local sediment quality (i.e., typical contaminant concentrations) due to storm water outfalls from the City of Port Jervis. tPAH values detected in these samples ranged from 0.4 to 5 ppm.

The results of the sediment sampling conducted are summarized in Table 1E. A summary of the results of the sediment sampling and related work performed can be seen in Figure 4. No site-related sediment contamination of concern was conclusively identified during the RI/FS.

Soil Vapor/Sub-Slab Vapor/Air

Air samples were collected several times during the site investigation for analysis for VOCs. Sampling included indoor air, soil vapor, sub-slab soil vapor, and ambient air.

Eleven indoor air samples were collected from several buildings on and surrounding the site at several times during the RI. The buildings sampled include the O&R Operations Center located on-site, a building located at 28 Pike Street, which is located to the northeast of the O&R Operations Center and contains a restaurant and apartments, a residence located southeast of the site on the southeast side of Pike Street at 9 Pike Street, and a private school that is also located on the property at 9 Pike Street. Sub-slab samples were also collected from each of these buildings, except for the school due to the property owner's refusal to allow a sub-slab sample. To compensate, a soil vapor sample was instead collected from just outside the school's footprint. An additional 28 soil vapor samples and 11 ambient air samples were collected from various locations surrounding the site. A supplemental field program was conducted between June 25-27, 2006. Two soil vapor samples were collected from under the building at 28 Pike

Street and two indoor air samples were collected from within the building. The samples were analyzed for VOCs.

The PRAP required that further soil vapor sampling be conducted at 28 Pike Street during the heating season. This sampling was conducted in March 2007. The results showed levels of VOCs in the indoor air slightly above levels found typically at residential properties, however the source of the elevated compounds in indoor air was not completely clear. Actions will be taken that will be likely to mitigate the potential for soil vapor intrusion at 28 Pike Street, namely a concrete slab or other cover system will be placed over the portions of the basement where there is soil exposed at the surface. The infrastructure for a soil vapor intrusion mitigation system will be installed at that time. Further monitoring will determine if the mitigation system will be operated as an active system, which would include the installation of a fan to maintain a constant
negative pressure beneath the slab.

The results of the main phase of the investigation did not identify any significant site-related impacts to soil vapor or indoor air at other locations. Some of the soil vapor sampling did identify significant levels of toluene. However, re-sampling of soil vapor in those areas did not confirm the toluene detections. During the supplemental field sampling program conducted on Pike Street, tetrachloroethene (PCE) was detected in the soil vapor at levels that indicate some action may be required. This compound is not believed to be associated with the MGP site. The source of the PCE is not readily apparent and will be subject to separate investigation by the Department.

No site-related indoor air contamination-of-concern was identified during the RI/FS. Further monitoring may be required at 28 Pike Street to evaluate the effectiveness of the remedial measures discussed above.

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

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 6 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 do not exist, but could in the future.

Potential Exposure Pathways

Under the current land use at the site, construction workers could be exposed to site contamination in soil and groundwater. During excavation work, construction workers could come in direct contact with contaminated soil and groundwater, potentially resulting in dermal exposures or exposure through the inhalation of soil particles or vapors released from groundwater.

Depending on future land use conditions at the site, future occupants and construction workers could be exposed to contamination present in soil and groundwater. Future occupants and construction workers could come in direct contact with contaminated soil and groundwater if excavation work were to be conducted on the site. Inhalation of soil particles or vapors released from soil or groundwater may also occur as a result of excavation, if appropriate controls are not utilized. Ingestion of contaminated groundwater could also occur if drinking water wells were installed on the site.

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.

Results of the site investigation revealed that the site itself provides limited value for fish and wildlife resources due to the site's use as an active O&R operations facility, the chain link security fence that completely surrounds the site, the occupied site buildings and extensive paving of the site.

However, significant fish and wildlife resources were associated with areas adjacent to the site, notably the Delaware River and its banks. The Delaware River is located approximately 160 feet southwest of the site and has a Class A designation, meaning it is a source of water supply for drinking, culinary, or food processing purposes, primary and secondary contact recreation, and fishing, and that the waters shall be suitable for fish propagation and survival.

The river corridor supports both fish and benthic communities. This area also provides valuable riparian habitat that wildlife may use to feed, propagate, and migrate through the area. Several threatened or endangered species have been recorded within a 2.0 mile radius of the site, although none are within the area of investigation of the RI.

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.

The following environmental exposure pathways and ecological risks have been identified:

- Sediments in the Delaware River contained levels of PAHs that exceed the lowest effect level (LEL) in Department screening criteria, and exceed the background sample values. Although these impacts may not be related to the site, the site does pose the potential for creating future adverse impacts.

Site contamination has also impacted the groundwater resource in the unconsolidated geologic units, which also discharges to the Delaware River, although with no discernible impact.

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 are to eliminate or reduce to the extent practicable:

- human, flora and fauna contact with surface and subsurface soils exceeding standards, criteria and guidance.

- migration of LNAPL and DNAPL in groundwater and subsurface soil.

- off-site migration of groundwater that does not attain New York State Groundwater Quality Standards.

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

- the prevention of human, flora, and fauna contact with groundwater containing site-related constituents that do not attain Part 5 of the New York State Sanitary Code Drinking Water Standards and/or Department 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 O&R Port Jervis 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 and groundwater associated with the site. Observed waste materials and NAPL will be remediated by activities directed at the structures, soil, and groundwater they are found in.

All of the alternatives considered, with the exception of the no action alternative, include several common elements. For example, removal of contaminated MGP structures, to varying degrees, is common to all six remedial alternatives considered. The site contains several known or suspected structures that are impacted, which include the subsurface foundations for Gas Holders A and B, on-grade foundations for Gas Holders C and D, on-grade purifier foundations and subsurface tar structures. Foundations may also be present for several former aboveground storage tanks. All known underground storage tanks have been removed from the site.

At a minimum, the anticipated extent of this removal is anticipated to be approximately 3 feet for Gas Holders C and D, 12 feet for Holder A and 5 to 12 feet for the contents of Tar Separator O. The anticipated extent of these common element excavations are based on the accessibility of the former MGP structures and the depth to the bottom of the MGP structures. The remains of Gas Holders C and D extend to approximately 3 feet below grade, Gas Holder A to approximately12 feet below grade and Tar Separator O to approximately 8 feet below grade. Excavation of a portion of Gas Holder D may not be possible due to the existence of a natural gas regulator station on its western side. Excavation of Tar Separator O will likely be limited to approximately 5 to 12 feet for any alternative due to its proximity to the existing on-site building and concerns with the structural integrity of that building. Varying levels and depths of contamination were found across the site and therefore differing levels of excavation are considered in each remedial alternative, with differing levels of effort required for each alternative. The common element excavations are anticipated to result in the removal of approximately 1,800 cubic yards of impacted soil and debris. The extent of the final excavation will depend on several factors that may limit the feasibility of continuing the excavation. These obstructions/limitations include underground utilities, roadways, occupied buildings, and the depth of the waste. To prepare the site for construction the vacant apartment building owned by O&R will be demolished.

Odor, vapor, and dust control measures will be required for the remedial excavations due to the proximity of residential and commercial buildings. Excavation and handling of NAPL impacted

soils will be performed under temporary fabric structures to the extent practicable. The structure will be equipped with an air handling and treatment system. The on-site operations center employees will be temporarily relocated during this work as well.
Additionally, during the RI a small area of soil behind the restaurant building on Pike Street at sample location SS 1 was found to contain PAHs at a concentration of 446 ppm. Although this concentration is less than the TAGM cleanup objective of 500 ppm and may not be site-related, the soil will be removed, at a minimum, to a depth of approximately two feet. It is anticipated that the total volume of soil removed will be approximately 1 cubic yard.

All of the remedial alternatives would include NAPL recovery to reduce the volume of NAPL in the subsurface, which is the potential source of hydrocarbon impacts to groundwater. For all of the alternatives, however, unrecoverable contamination would remain and continue to impact groundwater quality for the long-term. The location and placement of the NAPL recovery wells will be determined during the design and remedial action.

To address the residual groundwater contamination, all of the alternatives include a series of downgradient aeration wells. These wells will intercept the dissolved phase groundwater plume before it discharges to the Delaware River and enhance the aerobic biodegradation of the remaining contaminants. The wells will provide additional oxygen and nutrients to the aquifer through submersed diffusers in the wells. A design investigation will determine the optimal spacing and specifications of the system.

Based on information gathered during the RI, it is likely several collection wells and treatment wells will need to be installed on the property at 9 Pike Street, which is located on the southeast side of Pike Street, to the south of the site. Access to the property will be required to install the wells and periodically for several years to operate and monitor the wells and perform maintenance as required.

Institutional controls including an environmental easement will also be needed and they will be developed and implemented by a Site Management Plan, which also provides the details of the operation, maintenance and monitoring of the various remedial systems.

Alternative 1: No Action

Present Worth: *$460,000*
Capital Cost: *$100,000*
Annual Costs:
(Years 1-30): *$20,000*

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, including the installation of additional groundwater monitoring wells, allowing the site to remain in an unremediated state. 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: MGP Structure Excavations

Present Worth: *$3,600,000*
Capital Cost: *$2,500,000*
Annual Costs:
(Years 1-4): *$92,000*
(Years 4-30): *$49,000*

Alternative 2 would remove the following former MGP structures; Gas Holder A, Gas Holder C, Gas Holder D, and Tar Separator O. Initially, surface features such as Gas Holder C and Gas Holder D would be removed. Excavation of the remaining subsurface structures would then proceed as noted in the common elements discussion. Significant excavation dewatering would not be anticipated because the groundwater table is typically at 15 to 18 feet below grade. It is estimated that approximately 1,800 cubic yards of impacted soil and debris would be excavated and transported off-site for proper disposal. An equivalent amount of clean soil would be imported as backfill. Based on the NAPL mass removed by this alternative, it is estimated that NAPL removal from the recovery wells would be performed for a minimum of 4 years and the aeration system would operate for a minimum of 30 years, however, actual operation of each system would continue until the Department determines it is no longer necessary. The FS costs are based on those time projections in addition to the cost of the proposed excavations. Additional details of this approach can be found in the FS under Alternative 1.

Alternative 3: Expanded MGP Structures Excavation

Present Worth: *$5,400,000*
Capital Cost: *$4,800,000*
Annual Costs:
(Years 1-1.5): *$92,000*
(Years 1.5-20): *$49,000*
(Years 20-30): *$20,000*

Alternative 3 would remove the same former MGP structures as in Alternative 2 plus an adjoining area of heavily contaminated soil that extends into the Former Tank Area and under Purifier T. The vacant apartment building owned by O&R will also be demolished. Excavation of the structures and soils would require pre-engineered shoring (e.g., trench boxes). Moderate dewatering would be expected because the excavation would proceed to approximately 20 feet below the ground surface. Expanding this excavation beyond 20 feet in depth or to other portions of the site would likely not be feasible due to the limited site area available for staging, equipment limitations and other constraints. The depth of excavation of the eastern portion of Gas Holder A would likely be limited to a depth of approximately 12 feet due to its proximity to the on-site building and concerns with the structural integrity of that building.

It is estimated that approximately 4,600 cubic yards of impacted soil and debris would be excavated and transported to an off-site facility for proper disposal. An equivalent volume of clean soil would be imported as backfill. Based on the NAPL mass removed by this alternative, it is estimated that NAPL removal from the recovery wells would be performed for a minimum

of 2 years and the aeration system would operate for a minimum of 20 years, however, actual operation of each system would continue until the Department determines it is no longer necessary. This remedial alternative would also include monitoring of the quality of Delaware River sediments at the outfall. The FS costs are based on the above time projections in addition to the cost of the proposed excavations. Additional details of this approach can be found in the FS under Alternative 2.

Alternative 4: MGP Structures and NAPL/Sheen Impacted Soils Excavation

Present Worth: *$18,000,000*
Capital Cost: *$17,000,000*
Annual Costs:
(Years 1-1.5): *$80,000*
(Years 1.5-10): *$42,000*
(Years 10-30): *$20,000*

Alternative 4 would remove the same former MGP structures and soil as in Alternative 3 plus an adjoining area of soil that extends further into the Former Tank Area, and under Purifier T, as well as under Purifier V, Tar Extractor R, and the vacant O&R apartment building.

Initially, surface features would be removed, including the gas holder foundations and the vacant apartment building. A combination of excavation sidewall support systems would then need to be installed (i.e., sheet piles and pile and lagging). The excavations would then proceed, with the depths anticipated to extend to 30 feet below grade in the former tank area, 40 feet below grade in the vacant apartment building area, and 50 feet below grade at Gas Holder A. The approximate depths of these excavations are based on the approximate extent of accessible on-site soils that were found to be saturated by NAPL or to exhibit a sheen.

In addition to providing sidewall support for such deep excavations, the system would need to ensure the integrity of the existing buildings, gas lines and storm water line at the site. Because the water table is typically 15 to 18 feet below grade, substantial dewatering would be required. It is estimated that approximately 29,500 cubic yards of impacted soil and debris would be excavated and transported off-site for proper disposal under this alternative. An equivalent volume of clean soil would be imported as backfill.

Based on the NAPL mass removed by this alternative, it is estimated that NAPL removal from the recovery wells would be performed for a minimum 2 years and the aeration system would operate for a minimum of 10 years, however, actual operation of each system would continue until the Department determines it is no longer necessary. The FS costs are based on those time projections in addition to the cost of the proposed excavations. Additional details of this approach can be found in the FS under Alternative 3.

Alternative 5: MGP Structures and Shallow NAPL/Sheen Impacted Soils Excavation with Stabilization of Deep Soils

Present Worth: *$11,000,000*
Capital Cost: *$10,000,000*

Annual Costs:
(Years 1-1.5): $80,000
(Years 1.5-10): $42,000
(Years 10-30): $20,000

Alternative 5 would require the same removal as presented in Alternative 4 above the groundwater table; however, rather than excavate below the water table, the contaminated subsurface soils would be solidified in place. This alternative is aimed at excavating or stabilizing those on-site soils that are saturated with NAPL or exhibit a sheen. Initially, surface features would be removed including the gas holder foundations and the vacant apartment building. A combination of excavation sidewall support systems would then be installed because, the shallow excavations would need to remain open while the deeper soils were stabilized.

Soils between 15 and 30 feet below grade would be stabilized; however, some excavation would be required in this interval to remove large stones or debris that would hinder the solidification equipment. The stabilization equipment utilizes large-diameter augers to mix the soils with pozzolanic agents that are injected through the stem of the augers. This process produces overlapping columns of soil that would solidify into a monolithic mass. The permeability of this mass would bind the contaminants in place and limit groundwater entering into the mass. Due to the height of the stabilization equipment and limited exposed surface of impacted material, the stabilization effort would be completed without the fabric structure.

It is estimated that approximately 13,000 cubic yards of impacted soil and debris would be excavated and transported off-site for proper disposal under this alternative. In addition, approximately 12,500 cubic yards of impacted soil would be solidified in place. Based on the NAPL mass removed by this alternative, it is estimated that NAPL removal from the recovery wells would be performed for a minimum of 1.5 years and the aeration system would operate for a minimum of 10 years, however, actual operation of each system would continue until the Department determines it is no longer necessary. The FS costs are based on those time projections in addition to the cost of the proposed excavations and solidification. Additional details of this approach can be found in the FS under Alternative 4.

Alternative 6: Excavation of MGP Structures and Containment of NAPL/Sheen Impacted Soils

Present Worth: $10,000,000
Capital Cost: $9,000,000
Annual Costs:
(Years 1-1.5): $110,000
(Years 1.5-10): $72,000
(Years 10-30): $60,000

Alternative 6 would include the same removal as presented in Alternative 2, the common element excavation of MGP structures, plus the construction of a cell to contain the remaining

areas targeted in Alternatives 3, 4 and 5. This would contain, to the extent practical, soils at the site that are impacted by NAPL, staining and sheen.

The containment cell would be constructed by installing vertical barrier walls, with a grout curtain underneath, to create a bottom seal. Approximately 540 linear feet of vertical wall would be installed to an average depth of 50 feet below grade. The grout curtain would comprise approximately 40,000 square feet. These activities would produce approximately 3,500 cubic yards of impacted spoils that would be transported off-site for proper disposal. A low permeability cap would also be installed at the site to minimize groundwater infiltration into the containment cell. Additionally, a groundwater pumping system would be installed to maintain a negative groundwater head within the cell.

Based on the contaminant mass removed or contained by this alternative, it is estimated that NAPL removal from the recovery wells would be performed for a minimum of 1.5 years and the aeration system would operate for a minimum 10 years, however, actual operation of each system would continue until the Department determines it is no longer necessary. The FS costs are based on those time projections in addition to the cost of the proposed excavations and construction of the containment cell. Additional details of this approach can be found in the FS under Alternative 5.

Alternative 7: Excavation of MGP Structures and Soils Impacted Above Screening Criteria

Present Worth: *$37,000,000*
Capital Cost: *$36,000,000*
Annual Costs:
(Years 1-1.5): *$80,000*
(Years 1.5-10): *$42,000*
(Years 10-30): *$20,000*

Alternative 7 would require the excavation and proper off-site disposal of all soil that has contaminant levels above soil screening criteria in areas that are accessible. To achieve this, approximately 69,900 cubic yards of soil and debris would be removed. Excavations would be completed to approximately 50 feet below grade. Despite the extensive excavations that would be implemented under this alternative, NAPL would likely remain in the subsurface in areas inaccessible to excavation, such as areas under buildings or under subsurface utilities, including the large storm sewer that runs through the site. NAPL collection wells would likely have to be installed to collect NAPL from these areas. Groundwater treatment wells would also be installed. Based on the contaminant mass removed by this alternative, it is estimated that NAPL removal would be performed for a minimum of 1.5 years and the aeration system would operate for a minimum 10 years, however, actual operation of each system would continue until the Department determines it is no longer necessary. Additional details of this approach can be found in the FS under Alternative 6.

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 Human 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-Effectiveness. Capital costs and annual operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in Table 2.

8. Land Use - If the Department determines there is reasonable certainty associated with the use of the site and its surroundings, and when cleanup to pre-disposal conditions is determined not feasible, land use may be considered in evaluating the remedy.

This next 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.

9. 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 will address or has addressed the concerns raised. Comments were received pertaining to the level of community involvement during the investigation, recent flooding of the Delaware River, which certain residents were concerned may have affected/changed the subsurface distribution of MGP-related contaminants, and elements of the proposed remedy concerning the property at 28 Pike Street. In response to comments received at the public meeting in February and during the 30-day comment period, the comment period was extended an additional 30 days and a public availability session was held in August 2007. Also, a fact sheet responding to some of the questions raised during the comment period was sent to the site contact list in June 2007.

One element of the PRAP required further testing at 28 Pike Street, which was performed in March 2007. It has since been determined that certain actions must be taken to eliminate any potential exposures at that property. These requirements are explained in more detail in item 4 of the elements of the selected remedy included in Section 8.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the Department has selected Alternative 3, Expanded MGP Structures Excavation, as the remedy for this site. The elements of this remedy are described at the end of this section. The components of the selected remedy are shown on Figure 5.

The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS. Alternative 3 has been selected because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It will achieve the remediation goals for the site by removing the most heavily impacted soil/waste source materials, which represent the most significant threat to public health and the environment. This removal will greatly reduce the source of contamination to groundwater and will create the conditions needed to restore off-site groundwater quality to the extent practicable.

Alternatives 2, 4, 5, 6 and 7 would also comply with the threshold selection criteria, but Alternative 2 would remove less contaminant mass than the proposed alternative and Alternative 3 will not be significantly more difficult to implement or result in significantly higher short-term

impacts. Because Alternatives 3, 4, 5, 6, and 7 satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

Alternative 4 (excavation of all NAPL/sheen-impacted soils) would create significant short-term impacts, without removing a significantly larger amount of contaminant mass or increasing the level of protectiveness of the remedy. It would require about eleven months for on-site construction to be completed, as compared to about six months for Alternative 3, would create significant noise and traffic concerns and create potentially negative impacts to air quality due to construction vehicles and odors released from contaminated soils during excavation. It would also require extensive excavations that would require significant shoring and dewatering. Even with proper shoring the potential exists for surrounding buildings to be damaged, because these excavations would require substantial dewatering, which could create soil subsidence and subsequent damage to structures. Furthermore, the large quantities of water removed from the excavations would require either storage and treatment (which would be a problem given the small site area) or removal for off-site disposal which would create additional impacts to traffic and noise.

Alternative 5 (excavation of shallow NAPL/sheen-impacted soils and *in situ* stabilization [ISS] of deep soils) would present many of the same difficulties associated with Alternative 4, and the *in situ* stabilization portion of the remedy would require large equipment for mixing and storage, which would be a problem and potentially infeasible, given the limited available space. Also, the ISS equipment is so large it would likely not be possible to perform the work under a tent structure, which would make it much more difficult to control odors and, therefore, would likely result in significant odor impacts to the surrounding area. Furthermore, large boulders or other subsurface features would have to be excavated from the area to be stabilized in order for the ISS to be implemented successfully, which would present the same structural issues/concerns discussed under Alternative 4. The difficulties associated with implementing this remedy could result in an incomplete or ineffective remedy, therefore making it potentially a less effective remedy than Alternative 3 in the long-term.

Alternative 6 (excavation of MGP structures and containment of NAPL/sheen-impacted soils) would present the same difficulties as Alternative 4 and would require more extensive monitoring of the containment system, which could be costly. Furthermore, construction of a grout curtain is difficult when a layer of rocks/boulders is encountered in the subsurface. During the RI there was a layer of cobbles approximately 10-15 feet thick encountered at approximately 18 feet below grade. This could create significant difficulties in implementing this alternative and raises concerns with this alternative's ability to function effectively in the long term. This alternative is potentially less effective than Alternative 3.

Alternative 7 (excavation of soils above applicable criteria) would create the same issues as Alternative 4, but to a much greater extent, and despite removing a larger mass of contamination, contaminated soils and NAPL would remain in the subsurface in areas inaccessible to excavation, such as areas under buildings and subsurface utilities. Alternative 7 would also require Pike Street to be closed for a significant length of time in order to complete the excavation to the required depth. This would have severe impacts to traffic as it would prevent

traffic from moving between New York and Pennsylvania across the Delaware River via U.S. Route 209.

The estimated present worth cost to implement the remedy is $5,400,000. The cost to construct the remedy is estimated to be $4,825,000 and the estimated average annual cost for 20 years is $52,000.

The elements of the selected remedy are as follows:

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

2. Former MGP structures and their contents will be demolished, excavated and removed for off-site disposal. Source area soils will also be excavated. It is estimated this will result in the disposal of approximately 4,600 cubic yards of material.

3. Surface soil in the off-site 28 Pike Street area will be removed to a depth of at least 2 feet below ground surface and restored with clean soil, as defined by the Department.

4. Areas of the basement of 28 Pike Street where there is soil exposed at the surface will be covered with a concrete slab or other cover system. The infrastructure for a sub-slab depressurization system will be installed at that time. Future monitoring will determine if that system will operate as a passive or active system.

5. NAPL collection wells will be installed to remove NAPL from the subsurface. The conceptual placement of these wells is shown on Figure 5.

6. Groundwater treatment wells will be installed downgradient of the site and placed to intercept the dissolved phase groundwater plume heading toward the Delaware River. The groundwater will be treated by enhanced aerobic biodegradation of the contaminants. The conceptual placement of these wells is shown on Figure 5.

7. A cover system (*e.g.*, pavement) will be installed at the site to prevent exposure to contaminated surface and subsurface soils.

8. Imposition of an institutional control in the form of an environmental easement 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.

9. 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 site, including provision for mitigation of any impacts identified; (c) monitoring of groundwater and Delaware River sediments; (d) identification of any use restrictions on the site; (e) provisions for the continued proper operation and maintenance of the components of the remedy.

10. The property owner 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 would 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.

11. The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

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 public meeting was held on February 21, 2007 to present and receive comment on the PRAP.
- The comment period on the PRAP was extended to April 1, 2007.
- A project update fact sheet was mailed to the site contact list on June 25, 2007 to respond to some of the comments and questions received on the PRAP.
- A public availability session was held on August 8, 2007 to further respond to comments received 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 A
Background Levels of Contaminants in Surface Soil
O&R Port Jervis Former MGP Site
November 2000

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]
Inorganics	Arsenic	3.4 - 7.4
	Barium	37.4 - 85.7
	Cadmium	ND - 0.84
	Chromium	7.3 - 9.5
	Cobalt	5.1 - 7.7
	Copper	8.1 - 488
	Cyanide	ND
	Lead	36.9 - 201
	Mercury	ND
	Nickel	8.8 - 21.7
	Potassium	519 - 827
	Selenium	ND - 0.87
	Silver	ND
	Zinc	42.6 - 207

TABLE 1 B
Nature and Extent of Surface Soil Contamination
O&R Port Jervis Former MGP Site
November 2000

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)	Frequency of Exceeding SCG
Polycyclic Aromatic Hydrocarbons (PAHs)	Benzo(a)anthracene	0.56 - 38	0.224	7/7
	Benzo(a)pyrene	0.58 - 27	0.061	7/7
	Total PAHs	8.41 - 446.2	500	0/7
Inorganics	Arsenic	4.8 - 8.8	7.5	3/7
	Lead	70.3 - 2020	400	1/7
	Mercury	ND - 0.8	0.1	1/7
	Nickel	8.9 - 23.1	21.7	1/7
	Potassium	555 - 846	827	1/7
	Zinc	70.8 - 807	207	4/7

TABLE 1 C
Nature and Extent of Subsurface Soil Contamination
O&R Port Jervis Former MGP Site
April 1998 - September 2004

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Benzene	ND - 1,200	0.06	2/75
	Toluene	ND - 1,700	1.5	3/75
	Ethylbenzene	ND - 1,400	5.5	10/75
	Xylene	ND - 1,900	1.2	12/75
	BTEX	ND - 6,200	10	10/75
Polycyclic Aromatic Hydrocarbons (PAHs)	Naphthalene	ND - 9,000	13.0	14/75
	Total PAHs	ND - 19,060	500	8/75
Inorganics	Arsenic	0.71 - 21.4	7.5	7/61
	Cobalt	ND - 103	30	1/61
	Lead	2.7 - 573	400	1/61
	Mercury	ND - 0.81	0.1	3/61
	Nickel	8.7 - 22.8	21.7	1/61
	Potassium	ND - 926	827	1/61
	Selenium	ND - 3	2	3/61
	Silver	ND - 2.9	2.2	3/61

TABLE 1 D
Nature and Extent of Groundwater Contamination
O&R Port Jervis Former MGP Site
May 1998 - November 2004

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Benzene	ND - 331	1	33/75
	Toluene	ND - 52	5	15/75
	Ethylbenzene	ND - 1,220	5	29/75
	Xylene	ND - 760	5	34/75
Polycyclic Aromatic Hydrocarbons (PAHs)	Acenaphthene	ND - 370	20	31/75
	Anthracene	ND - 94	0.002	1/75
	Benzo(a)anthracene	ND - 7.9	0.002	8/75
	Benzo(a)pyrene	ND - 1	ND	1/75
	Benzo(b)fluoranthene	ND - 4.2	0.002	7/75
	Benzo(k)fluoranthene	ND - 1.6	0.002	4/75
	Chrysene	ND - 7.9	0.002	8/75
	Fluoranthene	ND - 83	0.002	1/75
	Fluorene	ND - 140	50	6/75
	Indeno(1,2,3-cd)pyrene	ND - 7	0.002	5/75
	Naphthalene	ND - 6,300	10	29/75
	Phenanthrene	ND - 380	50	10/75
	Pyrene	ND - 110	0.002	1/75
Inorganics	Arsenic	ND - 33	25	2/23
	Iron	ND - 27,100	300	17/23
	Manganese	ND - 33,300	300	19/23
	Sodium	12,600 - 112,000	20,000	22/25

TABLE 1 E
Nature and Extent of Delaware River Sediment Contamination
O&R Port Jervis Former MGP Site
May 1998 - October 2004

RIVER SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppm)[a]	Background[1] (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Polycyclic Aromatic Hydrocarbons (PAHs)	Total PAHs	ND - 70.82	ND - 0.670	4.00	16/43
Total Organic Carbon (TOC)	TOC	723 - 61,900	1,530 - 9,350	LEL[d] - 10,000 SEL[d] -100,000	10/38 0/38
Inorganics	Cadmium	ND - 1.1	NA	LEL[d] - 0.6 SEL[d] - 9.0	1/6 0/6
	Copper	16.4 - 60.1	NA	LEL[d] - 16.0 SEL[d] - 110.0	6/6 0/6
	Lead	32.4 - 437	NA	LEL[d] - 31.0 SEL[d] - 110.0	6/6 2/6
	Mercury	ND - 0.22	NA	LEL[d] - 0.15 SEL[d] - 1.3	1/6 0/6
	Nickel	9.4 - 17.6	NA	LEL[d] - 16.0 SEL[d] - 50.0	2/6 0/6
	Zinc	63 - 185	NA	LEL[d] - 120.0 SEL[d] - 270.0	2/6 0/6

[1] Sediment background is represented in this table by sediment samples BSD1, BSD2, BSD3, BSD4 & BSD5, taken from the Delaware River.

For Table 1A-E

[a] ppb = parts per billion, which is equivalent to micrograms per liter, µg/l, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
$\mu g/m^3$ = micrograms per cubic meter

[b] SCG = standards, criteria, and guidance values;

[d] LEL = Lowest Effects Level and SEL = Severe Effects Level. A sediment is considered to be contaminated if either of these criteria is exceeded. If both criteria are exceeded, the sediment is severely impacted. If only the LEL is exceeded, the impact is considered to be moderate.

SB - Site Background
ND - Not Detected
NA - None Available

BTEX indicates the summation of benzene, toluene, ethylbenzene, and xylene
Total SVOCs indicates the total of all SVOCs identified
Total PAH indicates the total of all PAH compounds identified
Total cPAH indicates the total of the seven PAH compounds that are considered carcinogenic

TABLE 2
Remedial Alternative Costs
O&R Port Jervis Former MGP Site

Remedial Alternative	Capital Cost	Average Annual Costs	Total Present Worth
Alternative 1 No Action	$ 100,000	$ 20,000	$ 460,000
Alternative 2 Excavation of MGP Structures, Installation of NAPL Recovery Wells, Installation of Aeration Wells	$ 2,500,000	$ 55,000	$ 3,600,000
Alternative 3 Excavation of MGP Structures, Excavation of Soils Near Purifier T and Former Tank Area, Installation of NAPL Recovery Wells, Installation of Aeration Wells	$ 4,800,000	$ 41,000	$ 5,400,000
Alternative 4 Excavation of MGP Structures, Excavation of NAPL/Sheen Impacted Soils, Installation of NAPL Recovery Wells, Installation of Aeration Wells	$ 17,000,000	$ 29,000	$ 18,000,000
Alternative 5 Excavation of MGP Structures, Excavation of Shallow NAPL/Sheen Impacted Soils, *In-Situ* Stabilization of Deep Soils, Installation of NAPL Recovery Wells, Installation of Aeration Wells	$ 10,000,000	$ 29,000	$ 11,000,000
Alternative 6 Excavation of MGP Structures, Installation of NAPL Recovery Wells, Installation of Aeration Wells, Containment of NAPL/Sheen Impacted Soils	$ 9,000,000	$ 66,000	$ 10,000,000
Alternative 7 Excavation of MGP Structures, Excavation of All Soils Impacted Above Screening Criteria, Installation of NAPL Recovery Wells (if necessary), Installation of Aeration Wells	$ 36,000,000	$ 29,000	$ 37,000,000

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

O&R Port Jervis Former MGP
Port Jervis (C), Orange County, New York
Site No. 3-36-049

The Proposed Remedial Action Plan (PRAP) for the O&R Port Jervis 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 January 31, 2007. The PRAP outlined the remedial measures proposed for the contaminated soil and groundwater at the O&R Port Jervis Former MGP site, as well as measures requiring further monitoring of Delaware River sediments and of the possibility for soil vapor intrusion at one off-site building.

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 February 21, 2007, 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 was to have ended on March 2, 2007; however, due to the number of comments, the Department extended the comment period 30 days. This extension ended April 1, 2007. An Availability Session was also held on August 8, 2007.

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:

COMMENT 1: Several comments were received stating that there had not been sufficient notification of the community that the site was contaminated or that work was ongoing. Many of those comments stated that as a result, another meeting should be held in order for the community to receive a response to their comments prior to the ROD being issued. Other questions were concerned with what is typically done to notify the community.

RESPONSE 1: As mentioned above, in response to these comments, the comment period on the PRAP was extended 30 days and, subsequently, an Availability Session was held

The public notice is typically performed as milestones are reached and takes the form of a fact sheet mailed to the site contact list, which includes local, county, state and federal officials, media, environmental advocacy groups, and the local community. More public notice that a contaminated site exists in the community and that investigations were being performed at the site should have been provided in this case. The Department will ensure more extensive citizen participation activities in the future.

It should be noted that other outreach activities were undertaken previously. The previous mayor of the City and the Commissioner of the City Department of Public Works were notified by O&R of the site and activities associated with it in May 2006. The City was again informed when the subject of the former MGP site came up during a meeting regarding two other remediation sites in the City held on September 13, 2006. At that time the Department was developing the PRAP and explained to the City officials present that the Department would meet with the City to discuss the site once the PRAP was finalized. The City was also notified via the Fact Sheet sent to the rest of the site contact list and briefed on the site during a meeting between the Department, DOH, O&R and City officials on February 5th, 2007.

COMMENT 2: There were several comments and questions regarding the flooding of the Delaware River, which has occurred three times in approximately the last three years. Those comments were concerned with how the flooding may have affected the migration of the contaminant plume and whether the flooded properties were likely to have been affected by site-related contaminants. In particular, these concerns were raised by owners and residents of those properties located on the block to the northeast of the site, bounded by Pike Street, King Street, Brown Street & Railroad Avenue. Several of those commenting requested the Department perform testing to confirm whether there is MGP-related contamination on their properties.

RESPONSE 2: As discussed at length in the June 2007 Project Update, it is very unlikely that the flooding has significantly affected the migration of site-related contaminants. The contaminants have been in the ground for between 60 years and 150 years, or more. In that time, Port Jervis has experienced several flooding events. The contaminant plume was delineated during the investigation and the plume was found to exist at varying depths and to be migrating to the south. Much of the plume is situated between 15 and 35 feet below the ground's surface, particularly those portions of the plume that have migrated off-site. Given the geology of the area and the nature of MGP wastes, that is the expected path of migration. This shows that the plume has not been significantly affected by historic flooding, and, therefore, it is not likely to have been greatly affected by recent flooding. Furthermore, portions of the investigation were performed prior to recent flooding events and some tasks were performed after the flooding. The soil borings completed and samples analyzed after the flooding did not indicate a change from pre-flood conditions.

The block bounded by Pike Street, King Street, Brown Street and Railroad Avenue, where many of those concerned with flooding live or own property, is upgradient of the MGP site, which means site-related contamination is moving away from those properties. There were several soil borings placed between the site and that block which were clean, showing MGP wastes have not migrated towards these properties.

There are likely several factors that help to minimize the effects of flooding on the migration of the NAPL. First of all, the coal tar (NAPL) is more dense than water. Which means that as the groundwater level rises, the NAPL will not necessarily rise with it. The NAPL is also clearly less mobile than the groundwater. This is evidenced by the fact that in over 100 years, the NAPL has only traveled several hundred feet, whereas the groundwater moves many times more quickly.

Flooding events occur as a result of the raised level of the river. Under normal conditions the river acts as a discharge point for groundwater. During a flood, the level of the river rises above the groundwater table, which, based on the duration of the event, may cause a local buildup of the groundwater, which then may move outward. However, it does not move outward in a rushing torrent. It moves slowly and is more like the filling of a reservoir and then, following the flooding, the draining of the reservoir. This would not result in forces that would cause the NAPL to move significantly. In the immediate source areas (located on O&R property), where there is NAPL above the groundwater table, it is possible for some of that to have been shifted during the flooding as the rising groundwater dislodged or displaced some of that NAPL. However, again, based on the investigation performed, it does not appear this caused the NAPL to move significantly. Also, flooding events last a few days, while the contamination has been present in the subsurface for several decades. Over the course of those decades the contamination has only moved a few hundred feet. Therefore, the NAPL would not be expected to move significantly over the term of a flooding event. Furthermore, anywhere the NAPL traveled it would have left at least a trail of residual contamination. The investigation has delineated the extent of that plume, which is depicted in the figures of the RI Report, PRAP and ROD, and it does not extend to the properties in question.

The other mechanism potentially at work during the flood would be the erosional transport of contaminated soil particles. While it is possible this occurred during the flooding events, there is very little contamination exposed at the surface, so it is not likely. The site area is paved and the contamination exists several feet below the ground's surface for most of its extent, therefore, there is little possibility for this to occur. The only area of surface soil contamination found was a small area, which would not result in movement of appreciable amounts of contaminated soil.

COMMENT 3: We own the property at 9 Pike Street where a number of the wells needed for remediation are proposed to be located. How will the installation and operation of these wells affect our property and our business?

RESPONSE 3: It is important to note that the locations for the wells shown in the ROD are conceptual, and the actual locations can be changed. During remedial design, O&R and the Department will work with property owners to identify final locations which will minimize the impact on the use of the property, while still being effective. Also, installation of those wells will be scheduled with the owners. Once the wells are installed, they are rather inconspicuous. The wells are below ground and any plumbing for the wells will also be below ground. A small access port will be exposed at the ground's surface, but will be made flush with the ground. The remedy was selected giving consideration to minimizing the impact to the community, while still achieving the goal of remediating the site in a manner that is protective of human health and the environment.

COMMENT 4: My property is located directly across King Street from the site. Will my property be condemned? If it will be condemned I want the State or O&R to buy my property. How can I sell my property now?
RESPONSE 4: The Department will not condemn any properties. This property is upgradient of the contaminant plume and there is no evidence it is affected by this site.

COMMENT 5: The monitoring wells that were installed on the Delaware River shore (below the retaining wall) were damaged during the flood. We've tried to contact O&R to let them know, but have not received any response.

RESPONSE 5: The damaged wells were decommissioned and any broken pieces removed the week of July 23, 2007.

COMMENT 6: Will the proposed excavation affect the storm sewer line that runs through O&R's property?

RESPONSE 6: The excavation is proposed to end before the storm sewer line. The exact distance required between the storm sewer and the end of the excavation to prevent damage to the storm sewer will be determined during the remedial design.

COMMENT 7: This remedy seems to only address subsurface contamination. What will be done about contamination on the surface?

RESPONSE 7: The site is currently paved and following any excavations at the site the area disturbed will be re-paved or covered in some other appropriate manner. There was a small area of surface soil contamination found adjacent to O&R property which will be excavated to a minimum depth of two feet and restored with an equivalent amount of clean soil. A Site Management Plan will be developed that will address the requirement for routine post-remedial inspection and repair of those paved areas. Maintenance of that soil cover will also be required as part of the site management.

COMMENT 8: Several comments were received which noted that O&R stores transformers at the site and has for some time and questioned if those transformers contained PCB-containing oil. Several also questioned whether samples were analyzed for PCBs during the investigation. Allegations were also made by an adjacent property owner that in the past he had witnessed dumping of transformer oil and other unspecified liquid wastes in the area of the O&R property behind 28 Pike Street along King Street. Due to these allegations it was requested that further investigatory work be performed to the rear of the 28 Pike Street property and beneath an addition on the building at 28 Pike Street. Other comments questioned the adequacy of the RI, both in response to these allegations and in general.

RESPONSE 8: It is known that transformers are and have been stored at the site. Given the history of the site usage as an O&R service center since the closing of the MGP, it is very likely that some of the transformers stored were PCB-containing transformers. During the early stages of the site investigation samples were collected for PCB analysis. PCBs were not detected above standards in any sample. As a result, PCBs were removed from the contaminants of concern for this site and further sampling did not include PCBs.

While the remedial investigation included tests in or adjacent to the areas of alleged dumping of PCB oil and other wastes along King Street, additional samples will be collected during the remedial design from this area and analyzed for the full suite of potential contaminants,

including PCBs. Any further actions, such as remediation and/or further sampling, would be determined by those results. If PCB contamination is found, appropriate remedial action would be undertaken in regards to the PCBs. At that time, further testing will also be performed in the area between O&R's building and 28 Pike Street to supplement information obtained in that area.

Based on the information gathered during the RI, experience in the field and general knowledge of the underlying sciences related to environmental remediation, the nature and extent of the contamination have been determined. The level of detail obtained was sufficient to propose a remedy for the site as a whole.

COMMENT 9: I own Gino's Restaurant. As a kid, I used to play in the yard and thought that the rich black soil at the property was a good thing. Later on, I learned the soil was contaminated. O&R has stated they are not in the business of buying properties; however, they bought at least one other property.

RESPONSE 9: Comment noted.

COMMENT 10: Why were there no samples collected on the northeastern side of King Street?

RESPONSE 10: The results of the investigation indicate that MGP contamination does not exist in that area. There were several borings completed and samples collected on the southwestern side of King Street (on O&R property) that did not show signs of contamination. Also, all the data collected showed the plume moving to the south, along with groundwater flow. Those factors combined to give the Department confidence that the edge of the contaminant plume had been adequately delineated.

COMMENT 11: How will air quality be impacted during construction, in particular during the proposed excavation, and what will be done to protect nearby residents and other properties? Will I need to wear a respirator?

RESPONSE 11: Given the characteristics of the site and surrounding community, the excavation will likely be performed under a structure which will include a ventilation and filtration system to prevent the migration of dust and vapors/odors. Also, a Community Air Monitoring Plan (CAMP) will be prepared and followed during all intrusive activities. The CAMP will require monitoring of air quality at the site perimeter to ensure site contaminants and dust are not leaving the site above action levels. The CAMP will require action be taken if dust or contaminants are detected downwind of the site at levels above the upwind side of the site.

COMMENT 12: You said it is possible for the contaminants to volatilize, so what has the human exposure been over the past 100 years?

RESPONSE 12: It is not possible to provide an accurate estimation of the level of exposure to site-related contaminants due to volatilization over the past 100 years.

COMMENT 13: Were the results of the Supplemental Investigation considered in the development of the PRAP?

RESPONSE 13: Yes, they were considered. The results of the investigation were available prior to the formal report being submitted.

COMMENT 14: During the Supplemental Investigation at 28 Pike Street, tetrachloroethene was detected in the soil vapor and indoor air. When and how will the investigation into the source of that contamination be conducted? Is it possible the contamination originated from O&R's property?

RESPONSE 14: The Department has been informed that there used to be a dry cleaner called Done Right Cleaners on the corner of King Street and Pike Street, immediately across King Street from Gino's Restaurant, which reportedly operated in the late 1970s. Tetrachloroethene (PCE), which was detected in the soil vapor and indoor air at 28 Pike Street and the O&R Operations Building, is commonly used as a dry cleaning solvent. As this source would not be related to MGP wastes, it will be addressed separately from this investigation and remediation. Given the nature of the contamination found, the dry cleaner is considered a potential source. The Department plans to conduct a further and separate investigation at that location in regards to the possibility of contamination existing as a result of the former usage of that property as a dry cleaner. While it is possible that PCE may have been used at the site, it was not detected in soil or groundwater, suggesting that the source area of contamination is not in the area investigated during the MGP investigation.

COMMENT 15: Some comments received asked whether the former canal raceway and the storm sewer that cross the site were conveying MGP-related NAPL. There were also reports of orange-colored discharges from the raceway and oily discharges from the storm sewer. Other comments asked what contaminants were found at the outfall of the storm sewer pipe and at what level they were detected.

RESPONSE 15: There were several soil borings and test pits installed in the former canal raceway, and based on those results, it did not appear the raceway was providing a conduit for the NAPL. A survey was conducted of the storm sewer and there was no evidence to indicate that NAPL was entering the pipe.

Samples of sediments at the outfall of the storm sewer were collected and analyzed to determine if there was an impact from the MGP site. The analytical results of sediments near the sewer outfall showed levels of PAHs, though did not identify the material at the outfall as MGP waste. PAHs are constituents of petroleum products and paving materials, and as such, the contamination is likely related to other sources. PAHs are typically found in urban runoff. Furthermore, a sample of sediment material taken from the storm sewer upgradient of the site showed levels of contaminants that were similar to the levels at the outfall.

The orange-colored discharge is most likely a result of iron in the groundwater. The occurrences of oily substances being discharged into the River via the storm sewer line is documented and was discussed in the PRAP, ROD and other site-related documents. However, based on analytical results, it does not appear these are MGP-related. This is not an uncommon occurrence in urban areas.

COMMENT 16: How was the cost of the remedy determined?

RESPONSE 16: The estimate was developed by O&R's engineer and the basis for the cost is presented in the PRAP and ROD.

COMMENT 17: Why was O&R's engineer allowed to develop the cost? Why didn't the Department develop the cost?

RESPONSE 17: Costs are developed by the remedial party as a matter of practice. Consistent with that practice, O&R was responsible for developing the remedial program at the site, including cost estimates. The details of the breakdown of the cost for the remedy is included in the FS which was reviewed and accepted by the Department.

COMMENT 18: What will be done regarding sample jars that were broken during the Supplementary Investigation at 28 Pike Street? Will the Department require additional testing at the affected sample point? Also the report states the laboratory instruments were out of calibration.

RESPONSE 18: Three jars were broken, however, only one groundwater sample was lost as a result. To compensate for this, two other groundwater samples were collected from locations near the lost sample. This was a reasonable adjustment and the data obtained was equally effective at delineating any potential groundwater contamination. O&R will also collect another groundwater sample from this location.

The analytes affected by calibration or instrument sensitivity issues were not site-related contaminants of concern and therefore the effects on data quality are not significant. The data obtained by the laboratory is acceptable.

COMMENT 19: There needs to be DEC oversight during the investigation and remediation.

RESPONSE 19: There was appropriate Department oversight during the investigation and there will continue to be oversight of remediation activities and any further investigative activities.

COMMENT 20: The PRAP mentions that institutional controls may be implemented at 28 Pike Street. What form would those controls take?

RESPONSE 20: A concrete slab or equivalent will be placed over at least the portion of the basement which has a dirt floor. At that time, the infrastructure for a sub-slab depressurization system will be installed in case future indoor air and soil vapor results show a need for such a system. The institutional control to accompany the engineering control would be the Site Management Plan, which would be implemented by the remedial party and would require a periodic certification that the slab is intact and continues to be effective at eliminating potential exposure to soils beneath the building.

COMMENT 21: During the presentation you stated there were no current human exposures to site-related contaminants. How did you come to that conclusion? There are exposures at 28 Pike Street to surface and subsurface soils contaminated with PAHs and metals from the old gas plant.

RESPONSE 21: While the investigation conducted at this site did identify several potential pathways of exposure, there are currently no completed pathways of exposure to site-related contaminants. The remedy proposed for this site will further reduce the potential for exposure to site contaminants.

Direct exposure to subsurface soils at 28 Pike Street is highly unlikely. If future intrusive activities were undertaken at 28 Pike Street, exposures would be controlled through proper protocols. Furthermore, the levels of contaminants detected in subsurface soils at 28 Pike Street are low.

There are elements of the remedy that will further reduce the potential for exposures, including a measure that requires excavation of a minimum of two feet of contaminated surface soil in the area to the rear of the building, which will then be replaced with an equivalent amount of clean soil. A concrete slab or equivalent will be placed over at least the portion of the basement which has a dirt floor. At that time, the infrastructure for a sub-slab depressurization system will be installed in case future indoor air and soil vapor results show a need for such a system.

COMMENT 22: Following the flooding there was muck in the basements of for two weeks. Was that material contaminated? If contaminants are present in basements of residences that were flooded, how long will those contaminants remain?

RESPONSE 22: The results of the Remedial Investigation did not show contaminated soil between the site and the flooded properties on the northeast side of King Street, which suggests that there was no contribution of site-related contaminants to this material. The possibility of other contaminants being present in basements is unknown. There is no information on which to base a response to how long the contaminants would remain. See also the Response to Comment 2.

COMMENT 23: Why did the Department not provide comments on the Feasibility Study (FS) and is that typical?

RESPONSE 23: The FS was developed by O&R with input from the Department. As a result, it was in a form that was considered acceptable when submitted to the Department.

COMMENT 24: Why was Mr. Codichini not informed that the FS was submitted in March 2006?

RESPONSE 24: O&R has provided the Department documentation showing a copy of the FS was sent to Mr. Codichini on April 11, 2006. The opportunity for public comment comes with the issuance of the PRAP, which occurred in January 2007. The availability of the PRAP and the commencement of the public comment period was announced via a fact sheet which was sent to the site contact list, which was developed in accordance with typical Department procedures and includes Mr. Codichini.

COMMENT 25: What is the schedule for the remaining stages of the remedial process?

RESPONSE 25: The remedial design would be initiated following issuance of the ROD, and typically lasts approximately one year. The remedial action would then follow. Some elements of the remedy, such as placing a concrete slab in the basement of 28 Pike Street, will be implemented as soon as possible.

COMMENT 26: Will responses to the comments, questions and concerns raised at the public meeting be made available prior to the ROD being issued?

RESPONSE 26: To address some of the major comments, questions and concerns, the Department issued a Project Update on June 25, 2007, and a public Availability Session was held August 8, 2007.

COMMENT 27: We are surrounded by toxic sites. It is not just this one, but the junkyard at the end of King Street, the Roundhouse property and several others.

RESPONSE 27: Comment noted.

COMMENT 28: What SCGs were the soil data compared to?

RESPONSE 28: The soil data was compared to the Technical and Administrative Guidance Memorandum (TAGM) #4046: Determination of Soil Cleanup Objectives and Cleanup Levels, which are guidance values for on-site and off-site areas.

COMMENT 29: What SCGs were the groundwater data compared to?

RESPONSE 29: The groundwater data was compared to 6 NYCRR Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations (Part 703) and the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1: Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations.

The following comment was received via telephone on February 12th, 2007.

COMMENT 30: I am with Matamoras Water Authority. We have public water supply wells near the Delaware River (on the Pennsylvania side of the River) that use groundwater and would like to know if our aquifers have been affected by this site.

RESPONSE 30: There were several multilevel wells installed on the riverbank in order to more closely delineate the groundwater plume vertically in that area. It was found that the groundwater plume appears to end near the river, extending to a maximum depth of approximately 20 feet below grade in that area. The contaminants detected in that area were at much lower levels than other areas of the site. Due to the low levels of contaminants at the river's edge, the distance between these wells and the Pennsylvania side of the river and the extremely large volume of water flowing in the River and the subsurface of the riverbed (which would dilute the levels of contaminants further) there is no reason to believe the site could potentially affect the supply wells. Of further note, public supply wells require regular testing of water quality, so if contaminants were present they would have been detected previously.

Chris Johnston submitted a letter (dated January 29, 2007), which included comments addressed by responses 1, 2, 8, 10, and 11.

State Senator John Bonacic submitted a letter (dated February 12, 2007), attached to which was an email letter from Richard Codichini to Senator Bonacic, which included the following comments:

COMMENT 31: I fear I may have to close my business after 83 years of Gino's being in my family.

RESPONSE 31: Given the relatively low levels of contaminants detected at the property, and since the potential for exposure to soil vapor will be eliminated at Gino's Restaurant, the Department and NYSDOH do not believe there is a reason why Gino's would have to close due to the MGP site.

COMMENT 32: The DEC has told me that some of the contaminants on my property and in my building may have originated from my property.

RESPONSE 32: This is true. BTEX and PAHs are ubiquitous in urban areas and are found in a vast array of products, many of which are used regularly at the property in question. The building formerly had a coal furnace, as identified by Mr. Codichini, which could also be a source of some of the contaminants found at the property, including contamination in an area of the basement where there were coal fragments found, which may have been associated with the building's coal furnace.

COMMENT 33: Further testing is "recommended as needed" So if someone comes down with terminal cancer they will run more tests?

RESPONSE 33: The element of the PRAP referred to above states, "Another round of sampling would be conducted at 28 Pike Street during the heating season to evaluate the potential for soil vapor intrusion. Also, the soil quality in the basement area at 28 Pike Street would be subject to

further assessment and remediation (e.g., excavation, concrete cover) including engineering controls and/or institutional controls, as appropriate," which would require sampling and remediation if the sampling showed a need for such.
The sampling referenced has since been completed. Based on the data it was determined that the potential for exposure to contaminants in the surface soil in the basement of 28 Pike Street should be eliminated. It is likely this will take the form of a concrete slab placed in areas of the basement where there is exposed soil.

Marlene A. Jones submitted a letter (dated February 22, 2007) which included comments addressed by responses 1, 2, 8, 10, 21, 22, 38 and 41.

William H. Jones submitted a letter (dated February 22, 2007) which included comments addressed by responses 1, 2, 8, 10, 15, and 22.

Chester J. Wallace submitted a letter (dated February 23, 2007) which included comments addressed by responses 1 and 8.

Lynne Wallace, the owner of Flo-Jean Restaurant submitted a letter (dated February 23, 2007) which included comments addressed by responses 1, 2, 8, 11, 15, 21 and the following additional comments:

COMMENT 34: If the plan is implemented, several issues need to be addressed regarding the closing of Pike Street and the bridge causing loss of business.

RESPONSE 34: The proposed remedy is not expected to require the closing of Pike Street or the bridge, nor cause a severe hindrance to traffic in the area. Therefore, it should not create a hindrance to business. The remedy was selected with those issues in mind, although some short term disruption may be required. These disruptions would not be likely to close all lanes of traffic. See the Response to Comment 3.

COMMENT 35: There is a subsurface sump pump in the area of the restaurant that sits over the groundwater plume which delivers wastewater to the City sewer. This should be tested to ensure no MGP contaminants are passing through the system.

RESPONSE 35: No contaminants were detected in the groundwater samples collected in that area from the groundwater table at approximately 27 feet below the ground's surface. Low levels of contaminants were only detected in groundwater from the same area at a depth of approximately 52 feet below the ground's surface. The sump referenced is only approximately 1.5 to 2 feet deep. It is unlikely that any water discharged from that sump would be affected by the MGP site.

Richard Codichini, the owner of Gino's Tavern & Restaurant submitted a letter (dated February 23, 2007) which included comments addressed by responses 1, 8, 9, 18, 21, 40, 41 and the following comments:

COMMENT 36: My property and business are located on part of the old gas plant and are in the same location as a former coal house. Other MGP-related buildings or structures, including Tar Well S, were located within two feet of my building and may have been partially on my property.

RESPONSE 36: Mr. Codichini, the owner of the property at 28 Pike Street, has stated that his building was constructed in 1880. Historic maps for the City and site area (including Sanborn maps which date from 1888 to 1945) show a building at 28 Pike Street that appears to be the same building that exists today. According to these maps, the coal house existed contemporaneously with the building at 28 Pike Street, and the coal house is depicted to the southwest of the building at 28 Pike Street. Therefore, the best approximation of the location of the coal house would not place it on Mr. Codichini's property. The approximate location of the coal house has been corrected on figures included in the ROD.

For similar reasons, it is unlikely that Tar Well S was located on the property or under the current building at 28 Pike Street. The building at 28 Pike predates the first time Tar Well S was depicted on historic maps and the tar well is shown to the southwest of it, therefore, the most appropriate estimation of the location of Tar Well S would not place it under the building at 28 Pike. The compositing of these historic maps does not give the level of precision required to make a determination of a structure's location within a few feet; however, the location of Tar Well S on the composite map included in the RI appears to be a reasonable depiction.

There were MGP-related buildings that appear to have been located in close proximity to the building at 28 Pike Street. The exact distance would be difficult to determine from these maps.

The Site as defined by the Order on Consent is based on the areas where gas production activities are known to have occurred and the property owned by O&R. Available information does not indicate the Codichini property was ever part of gas production activities, as such 28 Pike Street is considered off-site. It is noted that remediation is required for both on-site and off-site areas.

It is further noted that the MGP operations initially occupied only a portion of the block and, as it expanded, more land was acquired. For instance, previous land use on the block included several residences on the Brown Street side of O&R's property. It is considered unlikely that the MGP would have sold off land (i.e., Mr. Codichini's property), while at the same time expanding into other portions of the block.

COMMENT 37: During the question and answer period it was stated that a dry cleaner was formerly located on the northwest corner of Pike and King Streets. I own that property and want to confirm there were never any dry cleaning operations at that location. When the former owner died, the police found an unopened, unused, gallon container of dry cleaning fluid under his bed.

RESPONSE 37: Comment noted. The Department still considers this property a potential source of the PCE. See also the Response to Comment 14.

COMMENT 38: The site documents state that contaminant levels are safe, as they are in the higher percentiles acceptable to DOH, however there is a long list of people connected to 28 Pike Street who have had severe illnesses.

RESPONSE 38: The New York State Department of Health (NYSDOH) is unaware of any unusual disease pattern around this site. Should anyone care to discuss/report the occurrence of illness in the community they are encouraged to contact Mr. James Bower with the NYSDOH Bureau of Environmental and Occupational Epidemiology at 1-800-458-1158, extension 2-7950.

Victoria Johnston submitted a letter (dated February 24, 2007) which included comments addressed by responses 1, 2, 8 and 10.

Annette Codichini submitted a letter (dated February 25, 2007) which included comments addressed by responses 8.

Seth Johnston submitted a letter (dated February 27, 2007) which included comments addressed by responses 2, 8, 10 and 41.

John Meder, Martin Meder & Katharina Meder submitted a letter (dated March 1, 2007), which included comments addressed by response 1.

Kimberlea Shaw Rea, Esq. submitted a letter on behalf of her clients Mr. and Mrs. Richard Codichini and Ercole, Inc., d/b/a Gino's Tavern and Restaurant (dated March 2, 2007) which included comments addressed by responses 1, 2, 8, 14, 15, 18, 20, 21, 22, 24, 28, 36, 38, 46, 52 and the following additional comments:

COMMENT 39: The Department is exerting considerable efforts to blame off-site PAH contamination, including contamination found on Mr. Codichini's property, on automobile run-off.

RESPONSE 39: The Department never asserted that PAH contamination on Mr. Codichini's property was likely due to automobile run-off. The Department has asserted that PAH contamination in sediments in the Delaware River may be attributable, at least in part, to urban runoff.

COMMENT 40: The indoor air sampling results show levels of benzene, toluene and heptane, in air samples in the basement and the first floor that are extremely disturbing to us.

RESPONSE 40: The chlorinated VOCs (e.g., PCE) found in the indoor air are not attributable to the MGP. Other contaminants detected in the indoor air may have been in part due to products noted in the building at 28 Pike Street that could be contributing to the levels detected. There were a number of cleaning agents found in Mr. Codichini's building, including several labeled as being metal cleaners (*i.e.*, degreasers) and a number that are derived from petroleum. See also the Responses to Comments 14 and 21.

COMMENT 41: How can the O&R property undergo a cleanup entailing so much source removal next door and not subject my client's property to the same degree of vigor?

RESPONSE 41: The bulk of the source removal activities on the O&R property are not adjacent to 28 Pike and also include the properties to the south of the site. This is where the source areas of contamination are located. The relatively low levels of contamination detected previously at 28 Pike Street do not constitute a "source area."
The building at 28 Pike Street takes up nearly the entire tax parcel, so there is very little possibility of direct excavation of contaminated soils. The area where this is possible, to the rear of his building, will be excavated by the remedy. Further excavation would require demolition of the building. The Department does not typically require evictions and demolition of buildings in order to address relatively low levels of contamination. Such an action would not be warranted in this case.

COMMENT 42: When was the vacant apartment building acquired by O&R? Why was acquisition necessary?

RESPONSE 42: The Department did not require O&R to acquire the building. The RI Report states the property was purchased in 1999.

COMMENT 43: What was tar well S used for?

RESPONSE 43: The term "tar well" refers to any subsurface tank or vessel used to accumulate or store tar. It was common for the tar to be collected at points in the process.

COMMENT 44: When was Tar Well S's use discontinued? What happened to the tar stored in the well?

RESPONSE 44: Historic maps of the site that show adequate detail are available for the following years: 1888, 1894, 1900, 1905, 1912, 1921, 1931 and 1931-1945. Tar Well S was shown on maps from 1912 and 1921. Based on this, it would place the known usage of Tar Well S from some time in 1912 through some time in 1921; however, it is possible the period of use was longer or shorter. Sanborns do not always consistently report all structures. Borings placed in and around it (HA-1, GRSB-3) did not encounter high levels of contamination. See also the Response to Comment 43.

COMMENT 45: Why does Table 1B of the PRAP (p.8) not contain any analysis for 28 Pike Street for Benzo(a)pyrene or Benzo(a)anthracene? Should they be included since there were exceedances? Why does Table 1C (subsurface soil exceedances) of the PRAP and Table 1D (groundwater exceedances) not contain any data from the Supplemental Investigation at Gino's?

RESPONSE 45: Table 1 is a summary of the exceedances found in the various site media to illustrate the general level of contaminants at and emanating from the site and how widespread those contaminants are. As such, these results may not be included in the Table, however, a complete listing of all analytical results is available in the RI and SI Reports.

Lynne Wallace, the owner of Flo-Jean Restaurant submitted a letter (dated March 21, 2007) which included the following comments:

COMMENT 46: Soil and air testing should be performed at the Flo-Jean Restaurant to ease our concerns for the health and safety of employees and customers.

RESPONSE 46: Samples were collected at this property and the results of soil, groundwater and soil vapor samples collected on the Flo-Jean property do not indicate that there is a potential for exposure to site-related contamination on said property.

The soil sampling did not show any impacts from the MGP, with the possible exception of one sample which had very low levels of PAHs that was collected from a depth of 23 to 25 feet below the surface.

Groundwater samples collected at a depth of approximately 52 feet below the ground's surface indicate a low level of contamination at one sample point (See the Response to Comment 35). Samples of shallow groundwater (about 27 feet deep) collected on and near the Flo-Jean property do not indicate the presence of any site-related contamination. Further, soil vapor samples collected on the property did not show any signs of MGP-related compounds. Due to the absence of site-related contamination in shallow groundwater and the soil layer above said layer of groundwater on Flo-Jean property, soil vapor intrusion does not represent a concern for the Flo-Jean restaurant building.

COMMENT 47: There was apparently no Citizen Participation Plan (CPP) developed or implemented for this site, which is required for a voluntary cleanup. The voluntary cleanup is being performed by O&R to address barriers that hinder their redevelopment and use of the property.

RESPONSE 47: See the Response to Comment 1.

Chris Johnston submitted a letter (which was received on March 30, 2007), which included comments addressed by response 2, 8 and 10.

Kimberlea Shaw Rea, Esq., representing Mr. and Mrs. Richard Codichini and Ercole, Inc., d/b/a Gino's Tavern and Restaurant, submitted a second letter (dated April 2, 2007) which included comments addressed by responses 1, 8, 10, 21, 32, 36, 38, 41, 51, 52 and the following additional comments:

COMMENT 48: The RETEC report notes that historic facility maps in the possession of O&R exist. Unfortunately, these old facility maps were never made available. These facility maps would illuminate several issues, notably the presence of the former Gas Plant coal house on Mr. Codichini's property. The SI Report also contains a map dated September 12,2006, that shows the location of the former coal house on the entire western third of Mr. Codichini's property.

RESPONSE 48: The maps referenced and other historic documents were conveyed to the Department on April 2, 2007 and subsequently made available to the commenter, Attorney Rea.

The maps did not include new information. A map from 1853 did not show any buildings on the block. Another map showing the canal raceway, (therefore from some time prior to 1905) appears to depict Mr. Codichini's property as separate from the MGP (there is a line separating the area of Mr. Codichini's property and the MGP site). However, it is not completely clear that the line means it is a separate property, although that was the typical practice for maps of that type.
A more formal submittal, titled "Historical Property Boundary Review: 28 Pike Street Property", was made by O&R in August 2007 which included copies of the Sanborn maps and other historical maps, the current tax map for the area and a copy of the deed for 28 Pike Street. Based on that information, it does not appear the coal house or other MGP-related structures were located on the property at 28 Pike Street. See also the Response to Comment 36.

COMMENT 49: The responsibility for investigation and remediation of MGP-related contamination at 28 Pike Street should be placed on O&R.

RESPONSE 49: O&R has been, and will continue to be, responsible for remedial costs at Mr. Codichini's property that the Department determines to be necessary due to contaminants attributable to the MGP site.

COMMENT 50: O&R should be required to meet TAGMs in the cleanup of 28 Pike Street. And in fact, since his property contains residential dwellings (as opposed to O&R's industrial facility), far more restrictive standards must apply.

RESPONSE 50: If a cleanup were determined to be necessary at 28 Pike, the SCGs to be applied would ensure protection of public health given the use of the property. Recently, new regulations governing remedial programs were promulgated by the Department, which include soil cleanup objectives (SCOs). It is possible that the SCOs, rather than TAGM 4046, would be used to assess remedial requirements.

Richard Codichini, the owner of Gino's Tavern & Restaurant submitted a letter (dated April 2, 2007) which included comments addressed by responses 2, 8, 21, 22, 32, 36, 38, 41, 44, 48, and the following additional comments:

COMMENT 51: I have done research into the past usage of my property. Using the Sanborn maps, and other source references, and the construction features on my property, there is no question that my property was once the site of the Gas Plant coal storage house.

The cellar of the building was the coal house. There were formerly coal chutes on the Pike Street side of my cellar (now covered), behind the present electrical panels, that open directly into the cellar. This corresponds to the location of the coal chips and PAH and metals contamination that were found during the Supplemental Investigation. By contrast, I have found the coal chute through which Gino's coal was delivered, on the other (eastern) side of the building, on the King Street side.

RESPONSE 51: See the Responses to Comments 36 and 48. Available information does not show that the property was used for MGP operations. The assertion that the basement was used for coal storage for the MGP has not been substantiated.

COMMENT 52: Attached is the second listing of persons in the immediate neighborhood who have been diagnosed with cancer and/or neurological disorders. This list supplements the list I sent to you in my first comment letter, dated February 23, 2006.

RESPONSE 52: See the Response to Comment 38.

APPENDIX B

Administrative Record

Administrative Record

O&R Port Jervis Former MGP
City of Port Jervis, Orange County, New York
Site No. 3-36-049

1. Proposed Remedial Action Plan for the O&R Port Jervis Former MGP site, dated January 2007, prepared by the Department.

2. Order on Consent, Index No. D3-0002-9412, between the Department and Orange and Rockland Utilities, Inc., executed on January 8, 1996.

3. Order on Consent, Index No. D3-0001-98-03, between the Department and Orange and Rockland Utilities, Inc., executed on September 29, 1998.

4. Order on Consent, Index No. D3-0001-99-01, between the Department and Orange and Rockland Utilities, Inc., executed on March 11, 1999, modified August 31, 2005.

5. "Remedial Investigation Report: Phase II", August 2005, prepared by The RETEC Group, Inc.

6. "Feasibility Study", March 2006, prepared by RETEC Engineering P.C./The RETEC Group, Inc.

7. "Soil Vapor Intrusion Evaluation - O&R Operations Facility Building", June 2007, prepared by The RETEC Group Inc. - Merged with ENSR in 2007.

8. "Historical Property Boundary Review: 28 Pike Street Property", August 2007, prepared by The RETEC Group, Inc. - Merged with ENSR in 2007.

9. "Supplemental Investigation Report", August 2007, prepared by The RETEC Group, Inc.

10. "Soil Vapor Intrusion Evaluation - 28 Pike Street", August 2007, prepared by The RETEC Group Inc. - Merged with ENSR in 2007.

11. Letter dated January 29, 2007 from Chris Johnston.

12. Letter dated February 12, 2007 from John Bonacic, State Senator, attached to which was an letter dated February 5, 2007 from Richard Codichini to Senator Bonacic.

13. Phone Conversation with Matamoras Municipal Authority, February 12, 2007.

14. Letter dated February 22, 2007 from Marlene Jones.

15. Letter dated February 22, 2007 from William Jones.

16. Letter dated February 23, 2007 from Chester Wallace.

17. Letter dated February 23, 2007 from Lynne Wallace, owner of Flo-Jean Restaurant, 2 Pike Street, Port Jervis, NY.

18. Letter dated February 23, 2007 from Richard Codichini, owner of Gino's Tavern & Restaurant, 28 Pike Street, Port Jervis, NY.

19. Letter dated February 24, 2007 from Victoria Johnston.

20. Letter dated February 25, 2007 from Annette Codichini.

21. Letter dated February 27, 2007 from Seth Johnston.

22. Letter dated March 1, 2007 from John Meder, Martin Meder & Katharina Meder.

23. Letter dated March 2, 2007 from Kimberlea Shaw Rea, Esq., attorney for Mr. and Mrs. Richard Codichini and Ercole, Inc., d/b/a Gino's Tavern and Restaurant.

24. Letter dated March 21, 2007 from Lynne Wallace, owner of Flo-Jean Restaurant, 2 Pike Street, Port Jervis, NY.

25. Letter received March 30, 2007 from Chris Johnston.

26. Letter dated April 2, 2007 from Kimberlea Shaw Rea, Esq., attorney for Mr. and Mrs. Richard Codichini and Ercole, Inc., d/b/a Gino's Tavern and Restaurant.

27. Letter dated April 2, 2007 from Richard Codichini, owner of Gino's Tavern & Restaurant, 28 Pike Street, Port Jervis, NY.

The following letters were dated after the end of the comment period and therefore were not included in the Responsiveness Summary, but have been included in the Administrative Record for completeness.

28. Letter dated June 20, 2007 from Orange and Rockland Utilities, Inc. to the New York State Department of Environmental Conservation and the New York State Department of Health.

29. Letter dated June 29, 2007 from Kimberlea Shaw Rea, Esq., attorney for Mr. and Mrs. Richard Codichini and Ercole, Inc., d/b/a Gino's Tavern and Restaurant.

30. Letter dated July 2, 2007 from the New York State Department of Health to Mr. Richard Codichini.

31. Letter dated July 3, 2007 from the New York State Department of Environmental Conservation to Kimberlea Shaw Rea, Esq., attorney for Mr. and Mrs. Richard Codichini and Ercole, Inc., d/b/a Gino's Tavern and Restaurant.

32. Letter dated July 3, 2007 from the New York State Department of Environmental Conservation to Orange and Rockland Utilities, Inc.

33. Letter dated August 8, 2007 from Conrad Geoscience Corp., consultant for Mr. and Mrs. Richard Codichini and Ercole, Inc., d/b/a Gino's Tavern and Restaurant.

34. Letter dated August 16, 2007 from ENSR Corporation (dba The RETEC Group Inc.) to the New York State Department of Environmental Conservation.

35. Letter dated August 31, 2007 from Kimberlea Shaw Rea, Esq., attorney for Mr. and Mrs. Richard Codichini and Ercole, Inc., d/b/a Gino's Tavern and Restaurant to the New York State Department of Environmental Conservation.

36. Letter dated September 6, 2007 from the New York State Department of Environmental Conservation to Kimberlea Shaw Rea, Esq., attorney for Mr. and Mrs. Richard Codichini and Ercole, Inc., d/b/a Gino's Tavern and Restaurant.

37. Letter dated September 7, 2007 from Kimberlea Shaw Rea, Esq., attorney for Mr. and Mrs. Richard Codichini and Ercole, Inc., d/b/a Gino's Tavern and Restaurant to the New York State Department of Environmental Conservation.

38. Letter dated September 12, 2007 from the New York State Department of Environmental Conservation to Kimberlea Shaw Rea, Esq., attorney for Mr. and Mrs. Richard Codichini and Ercole, Inc., d/b/a Gino's Tavern and Restaurant.

39. Letter dated September 20, 2007 from Conrad Geoscience Corp., consultant for Mr. and Mrs. Richard Codichini and Ercole, Inc., d/b/a Gino's Tavern and Restaurant.

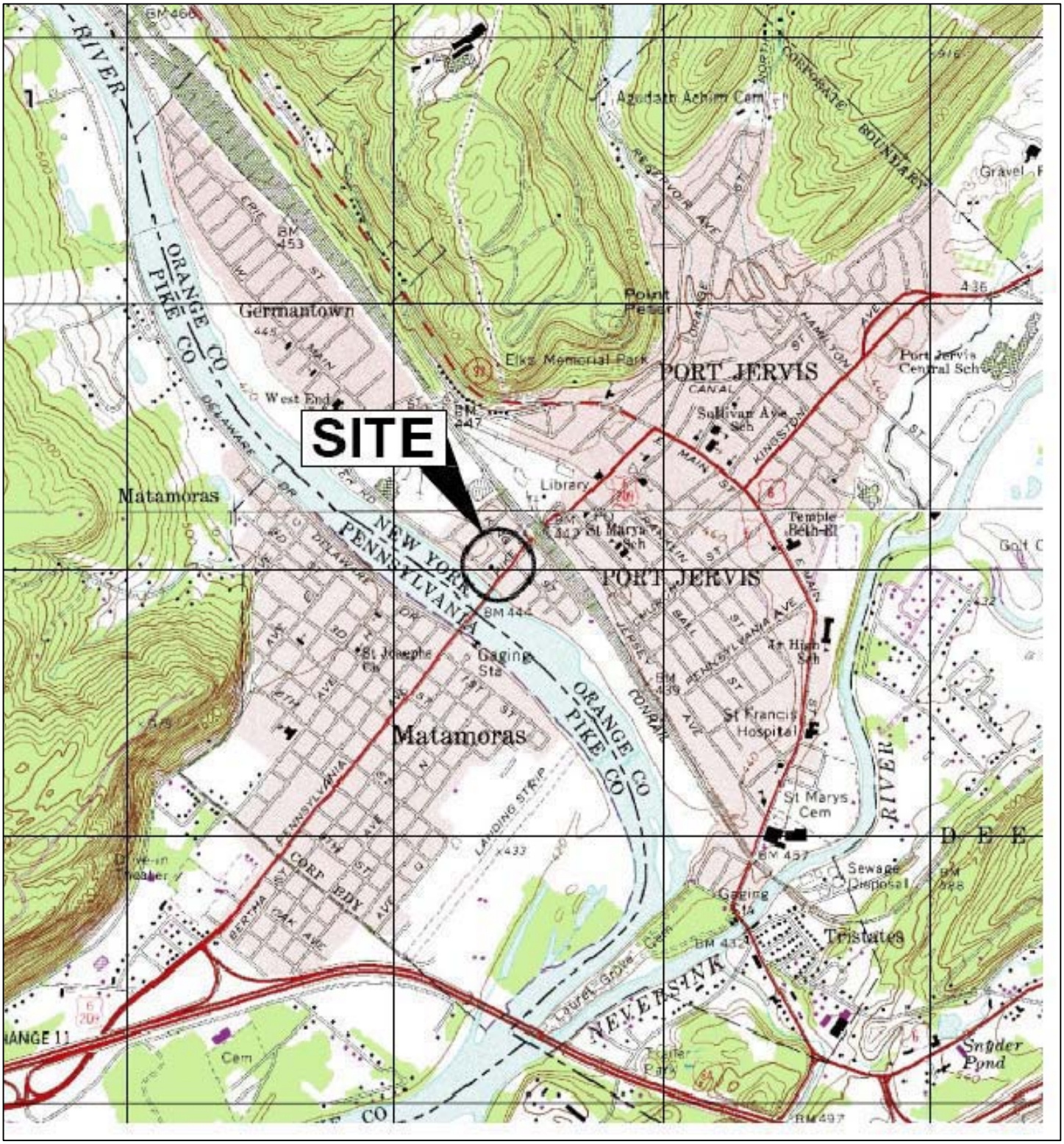

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FIGURE 1
Site Location Map

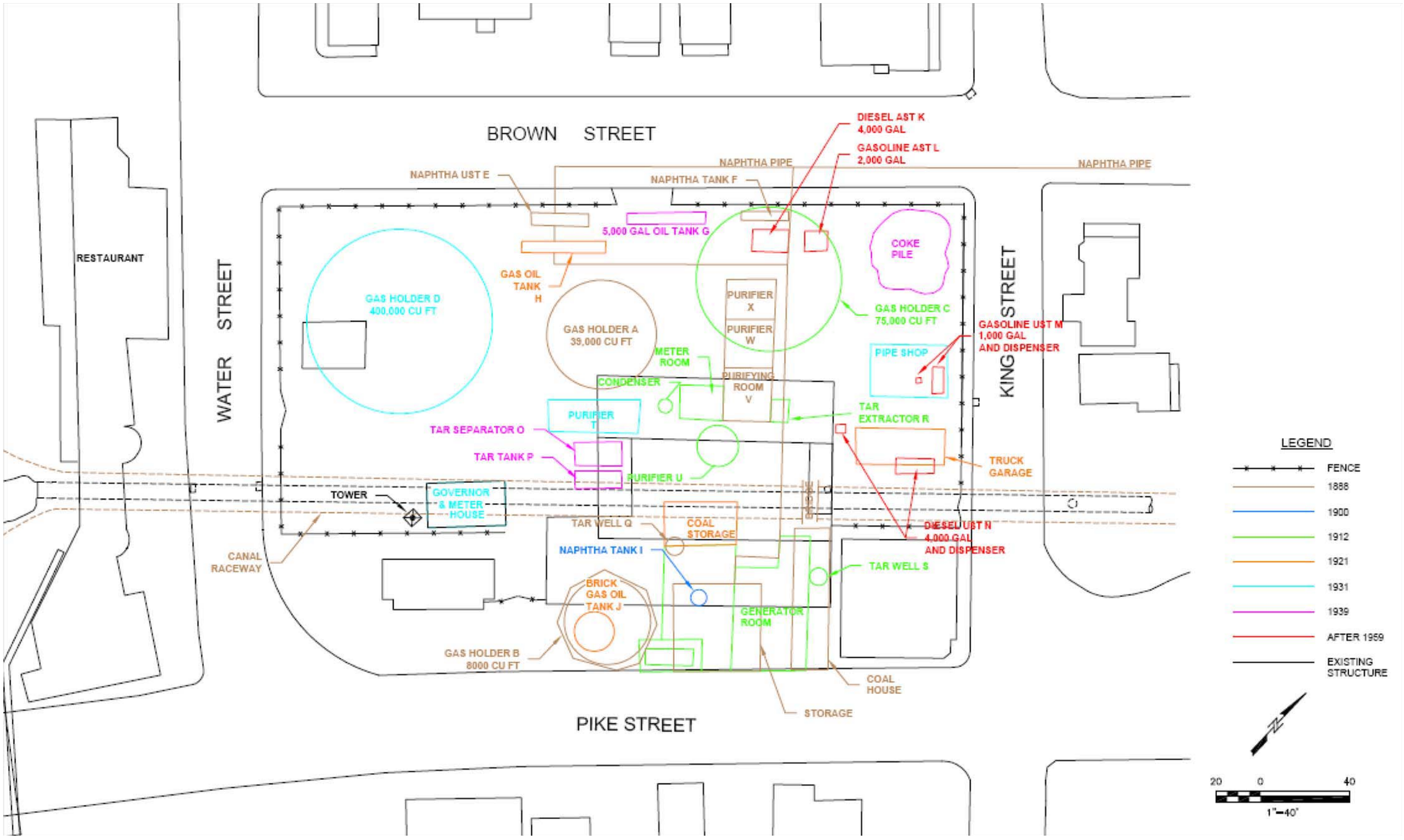


FIGURE 2

Historic MGP Structures

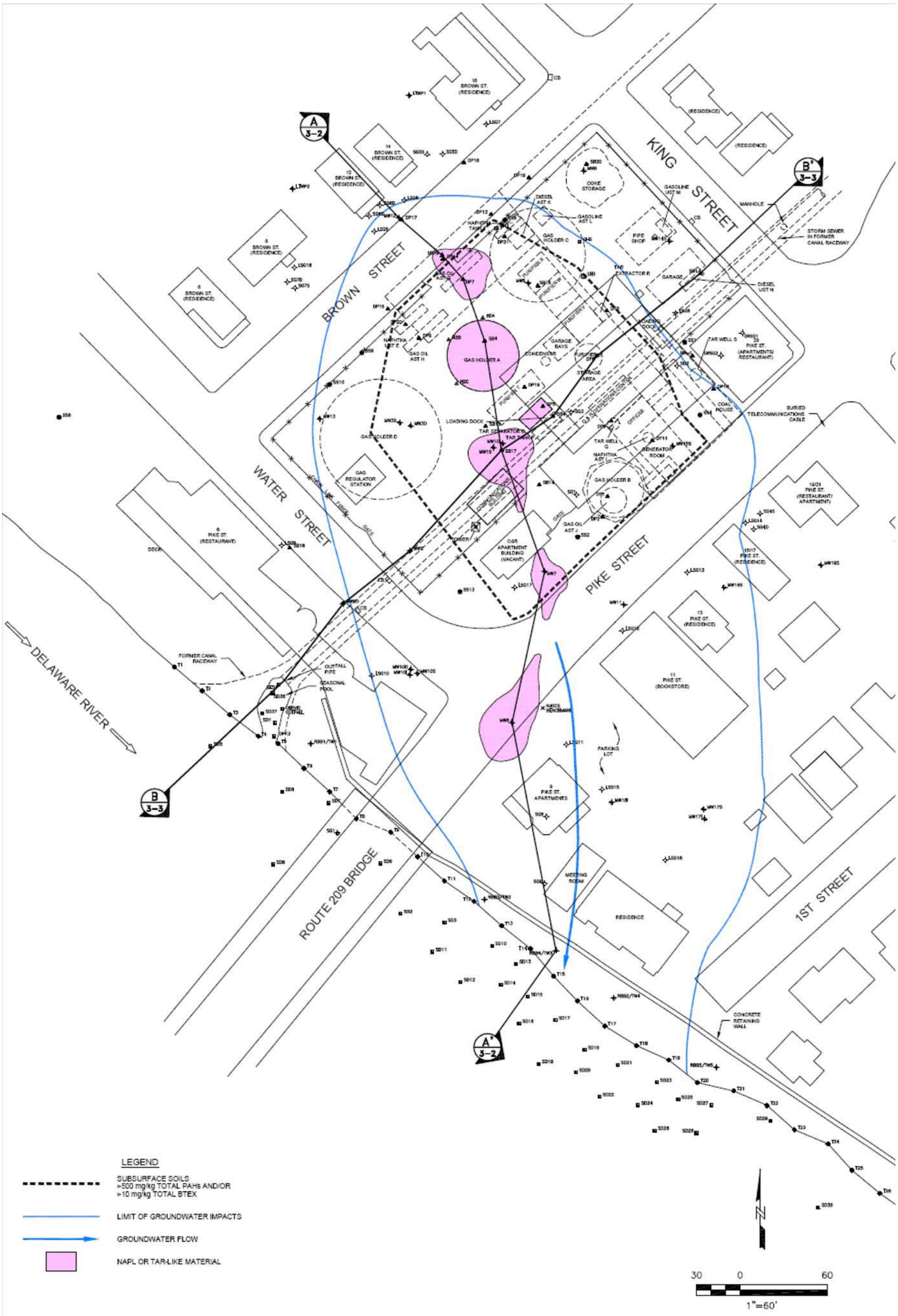


FIGURE 3A

Extent of Contamination

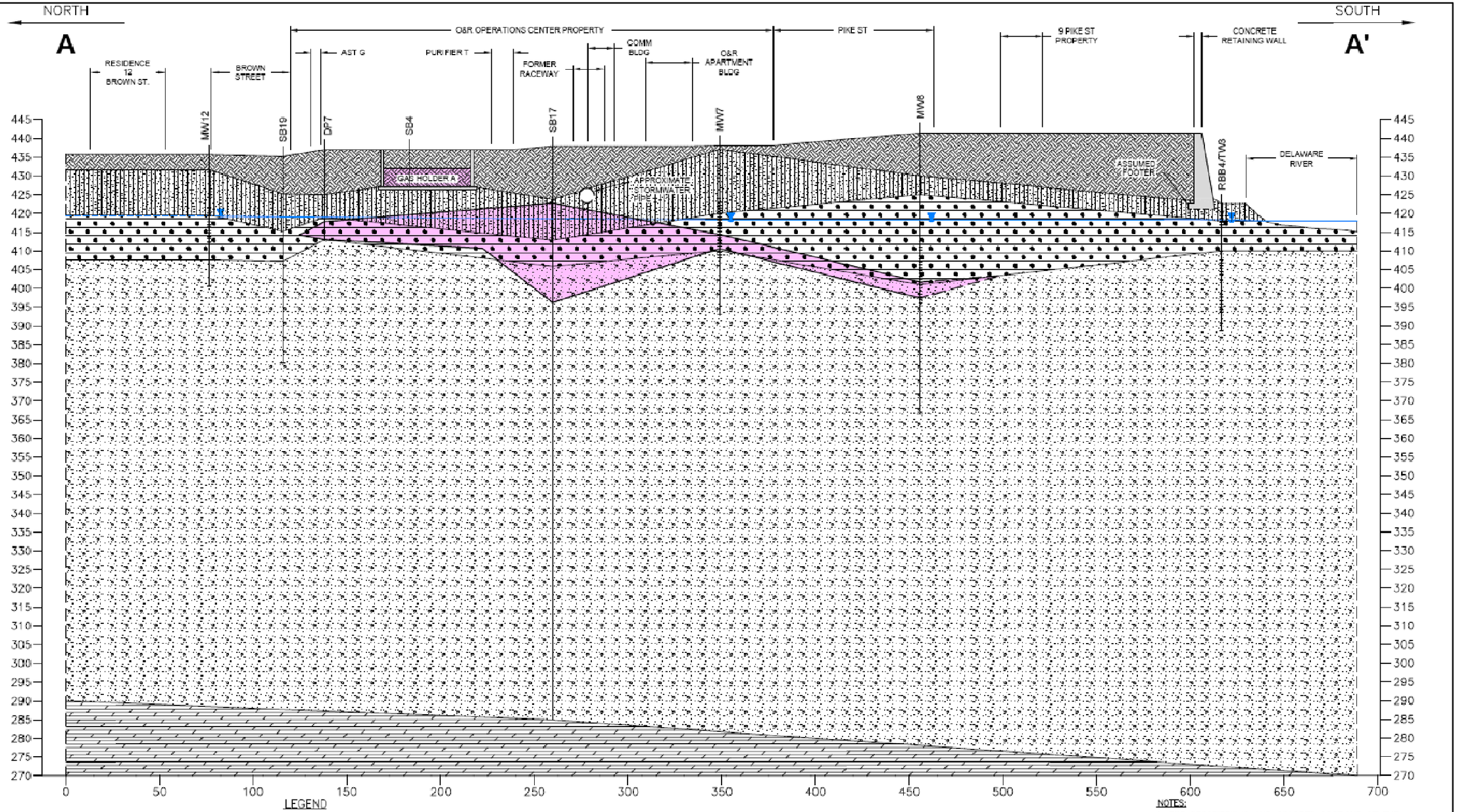
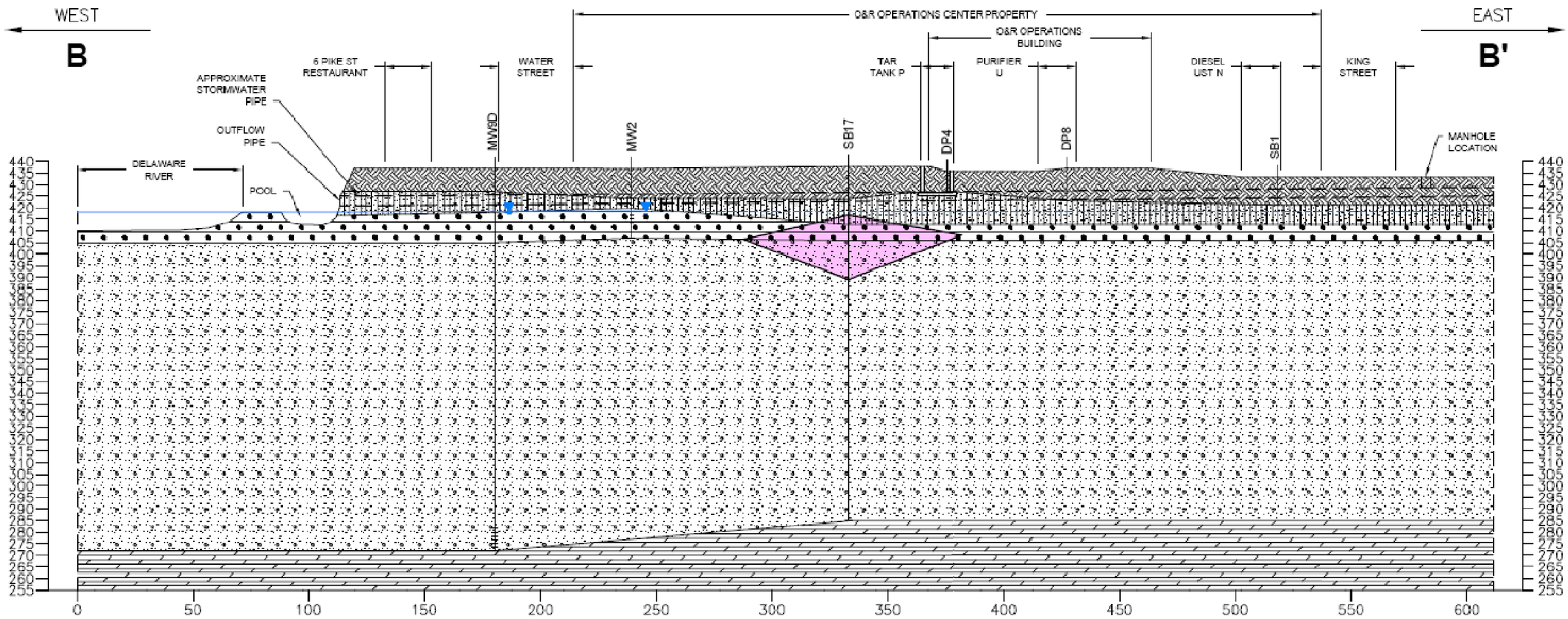


FIGURE 3B

Cross-Section A-A'



HORIZONTAL SCALE
1" = 50'

LEGEND

- FILL
- SHALE BEDROCK
- SM—COARSE GRAINED ALLUVIUM
- SW—GLACIAL OUTWASH
- SM—FINE GRAINED ALLUVIUM
- SOIL SATURATED WITH TAR-LIKE MATERIAL OR NAPL
- PIEZOMETRIC SURFACE (NOVEMBER 5, 2004)
- WELL SCREENED SECTION
- SOIL BORING

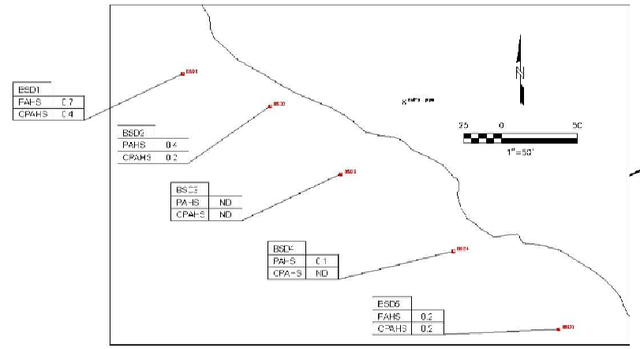
NOTES:

1. THE DESCRIPTIONS AND COLORED PORTIONS OF THE FIGURE ARE GENERAL IN NATURE AND ARE BASED ON A LIMITED NUMBER OF SAMPLES. REFER TO THE BORELOGS AND THE RESULTS OF THE CHEMICAL ANALYSES FOR SPECIFIC INFORMATION REGARDING THE SUBSURFACE GEOLOGIC UNITS AND THE DISTRIBUTION OF HYDROCARBONS.

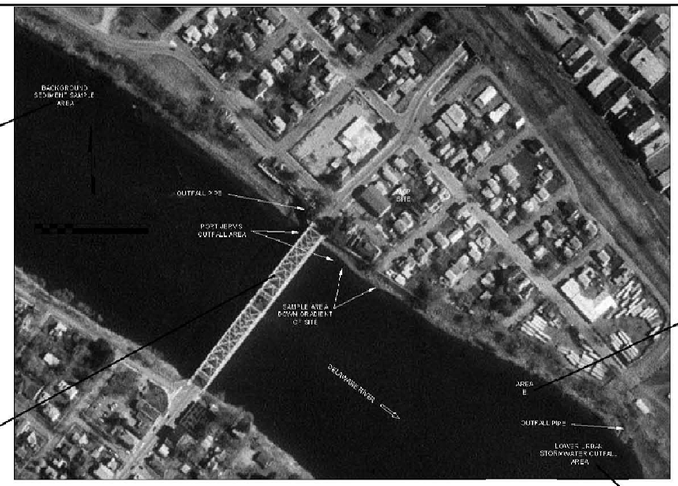
2. THE CROSS SECTION IS SHOWN AS DIRECT DISTANCE THROUGH THE WELLS (MW) AND BORINGS (SB).

FIGURE 3C

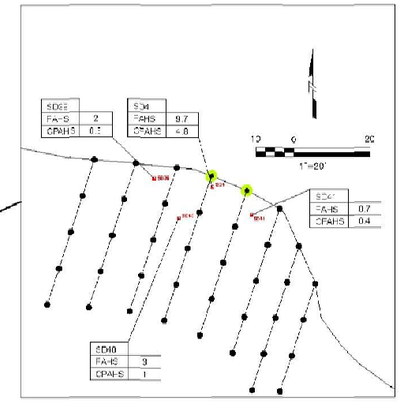
Cross-Section B-B'



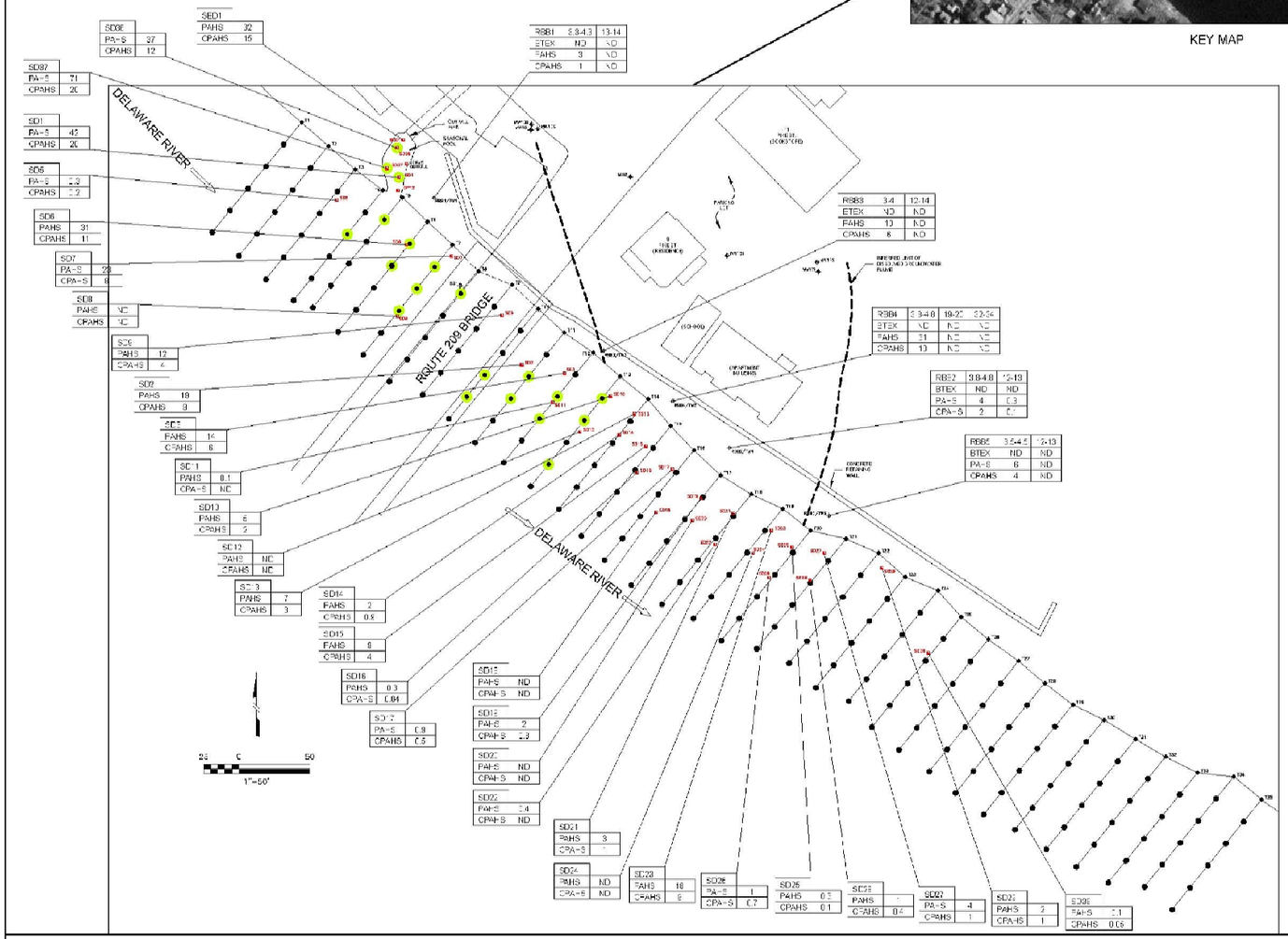
BACKGROUND SEDIMENT SAMPLE AREA

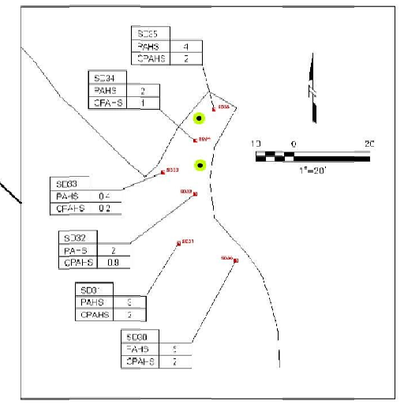


KEY MAP



AREA B





LOWER URBAN STORMWATER OUTFALL AREA

LEGEND

- MW13 — MONITORING WELL
- RBB2/TW4 — TEMPORARY WELL
- T16 — SEDIMENT TRANSECT LOCATION
- SD2 — SEDIMENT SAMPLE
- SD1 — STAFF GAUGE LOCATION
- PROBING LOCATION
- PROBING LOCATION WHERE TRACE HYDROCARBON LIKE SHEEN OBSERVED
- FENCE
- EXISTING STRUCTURES
- INTERPRETED LIMIT OF IMPACTED GROUNDWATER PLUME
- RIVER FLOW DIRECTION

FIGURE 4

Sediment Sampling Overview

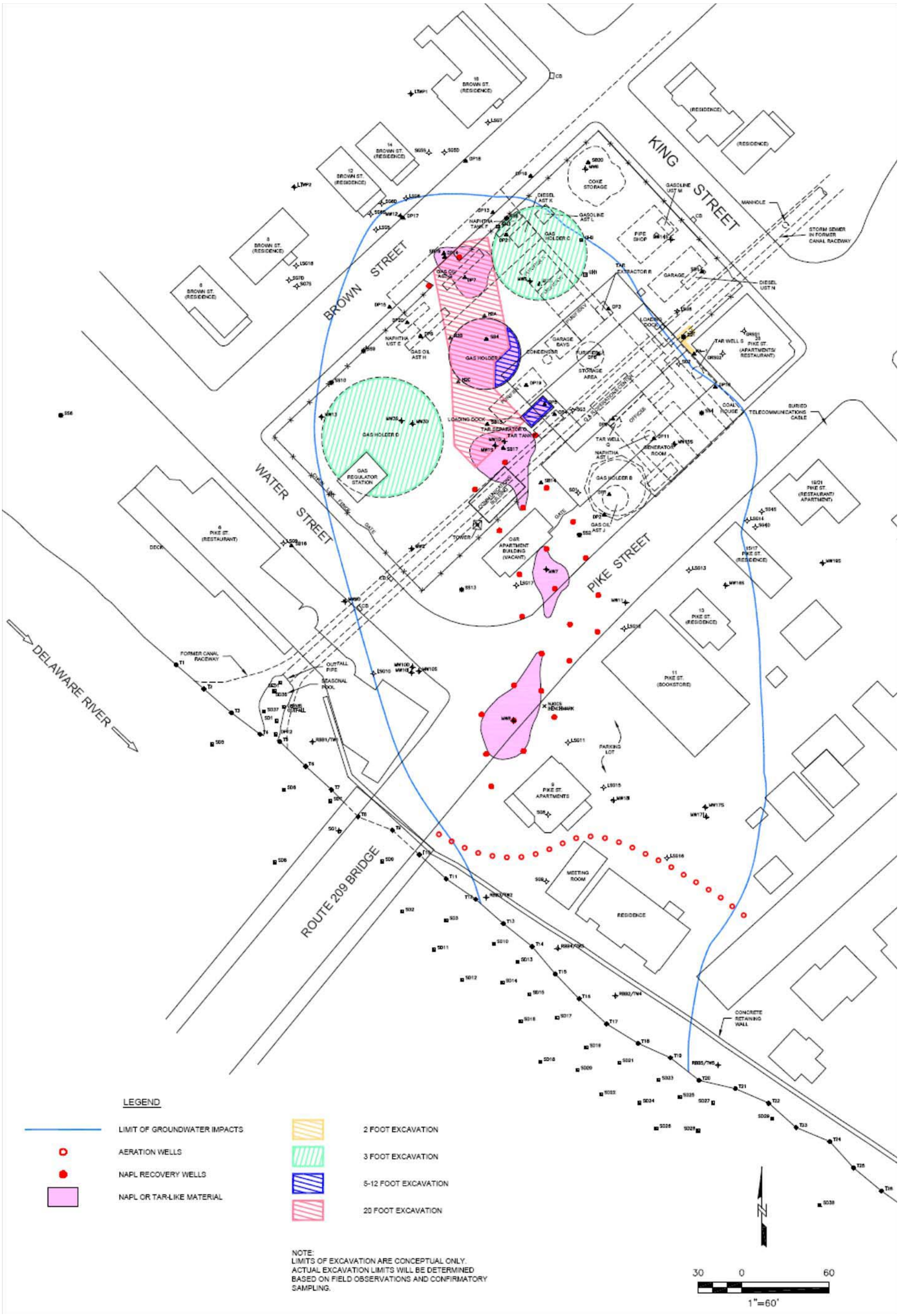


FIGURE 5

Proposed Remedy