RECORD OF DECISION
NIMO Glens Falls - Mohican Street
Former MGP Site
Operable Unit No. 1
MGP Site and Canal

Glens Falls (C), Warren County, New York
Site No. 5-57-016

March 2003

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

DECLARATION STATEMENT - RECORD OF DECISION

NIMO Glens Falls - Mohican Street

Former Manufactured Gas Plant Site
Operable Unit No. 1 - MGP Site and Canal

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Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the NIMO Glens Falls- Mohican Street Former Manufactured Gas Plant (MGP) Site, Operable Unit No. 1 - MGP Site and Canal, which was chosen in accordance with the New York State Environmental Conservation Law. The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the referenced inactive hazardous waste disposal site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release 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 the environment.

Description of Selected Remedy

Based on the results of the Remedial Investigation/Feasibility Study for the NIMO Glens Falls - Mohican Street Former Manufactured Gas (MGP) Site, Operable Unit No. 1, and the criteria identified for the evaluation of alternatives, the NYSDEC has selected a remedial action for the site that includes excavation of NAPL source areas, a groundwater treatment/ barrier, and soil cover. The components of the remedy are as follows:

- The excavation and off site disposal/treatment of 2,500 to16,200 cubic yards of source areas, which include heavily contaminated site soils, non aqueous phase liquid (NAPL) and contaminated subsurface MGP structures that remain on site.

- A groundwater treatment /barrier wall will be constructed to contain dense non aqueous phase liquid (DNAPL) and passively treat contaminated groundwater and prevent their migration to off-site areas.

- Approximately 6,000 cubic yards of sediments contaminated with polyaromatic hydrocarbons (PAHs) will be removed from the Glens Falls Feeder Canal.

- A two foot clean soil cover will be placed on approximately 6 acres of the site to prevent future exposures to contaminated soil that will remain on site.

- Since the remedy will result in residual hazardous waste remaining at the site and employ engineering controls that will require operation and maintenance, a long term monitoring program and institutional controls will be developed and instituted.

- Annual certification would be required to confirm only appropriate use of the site and to ensure that engineering and institutional controls included in this remedy are in place and remain effective to control the identified potential exposures.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being 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 technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce the toxicity, mobility, or volume as a principal element.

MAR 31 2003

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

TABLE OF CONTENTS

SECTION **PAGE**

RECORD OF DECISION

NIMO Glens Falls (C) - Mohican Street
Former MGP Site
Operable Unit No. 1 - MGP Site and Canal
Glens Falls (C), Warren County, New York
Site No. 5-57-016
March 2003

SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for Operable Unit No.1 of the NIMO Glens Falls - Mohican Street Former Manufactured Gas Plant (MGP) site. Operable Unit 1 (OU1) of the site, consists of the site and the contaminated portion of the Glens Falls Feeder Canal. 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 the generation of related by products have resulted in the disposal of hazardous wastes, including coal gas tars, carburetted water gas tars, and purifier waste. These wastes contain benzene, toluene, ethylbenzene and xylene, as well as a number of polycyclic aromatic hydrocarbons and cyanide. These wastes have contaminated soils and groundwater at the site as well as sediments in the Glens Falls Feeder Canal. This contamination has resulted in:

- a significant threat to human health associated with current and potential exposure to contaminated site soils, contaminated former MGP structures, contaminated groundwater, canal surface water and contaminated canal sediments.

- a significant environmental threat associated with the impacts of contaminants to the groundwater resource, canal surface water and canal sediments.

To eliminate or mitigate these threats, the NYSDEC has selected the following remedy:

- The excavation and off site disposal/treatment of 2,500 to 16,200 cubic yards of source areas, which include heavily contaminated site soils, non aqueous phase liquid (NAPL) and contaminated subsurface MGP structures that remain on site.

- A groundwater treatment barrier wall will be constructed to contain and remove for off site disposal dense non aqueous phase liquid (DNAPL) and treat contaminated groundwater and prevent their migration to off-site areas.

- Approximately 6,000 cubic yards of sediments contaminated with polyaromatic hydrocarbons (PAHs) will be removed from the Glens Falls Feeder Canal.

- A two foot clean soil cover will be placed on approximately 6 acres of the site to prevent future exposures to contaminated soil that will remain on site.

- Since the remedy will result in residual hazardous waste remaining at the site and employ engineering controls that will require operation and maintenance, a long term monitoring program and institutional controls will be developed and instituted.

- Annual certification would be required to confirm only appropriate use of the site and to ensure that engineering and institutional controls included in this remedy are in place and remain effective to control the identified potential exposures.

This remedy, discussed in detail in Section 8, is intended to attain the remediation goals identified for this site in Section 6. The remedy is in conformity with officially promulgated standards and criteria that are directly applicable, or that are relevant and appropriate. This selection of a remedy also took into consideration guidance, as appropriate. Standards, criteria and guidance are hereafter called SCGs.

SECTION 2: SITE LOCATION AND DESCRIPTION

The NIMO Glens Falls - Mohican Street Former MGP Site is located at 14 Mohican Street in an urban residential/industrial section of the City of Glens Falls, Warren County, New York (see Figure 1). Operable Unit No. (OU) 1 of the site consists of the northern parcel, the southern parcel, and the City of Glens Falls property (see Figure 2). The site is generally bordered by Mohican Street to the north and west, the Glens Falls Feeder Canal to the east, and a Finch Pruyn Paper Company warehouse and Henry Street to the south. The Hudson River is adjacent to the Glens Falls Feeder Canal, directly south east of the site. The site is located immediately upstream of the Hudson River at the State Route 9 bridge.

The site consists of approximately 6 acres of land. Niagara Mohawk, A National Grid Company (NIMO) owns the southern and northern parcels of the site, which are utilized for equipment storage and a sizable service center complex. These parcels surround a smaller parcel which is owned by the city of Glens Falls. The site is flat with a slight slope to the east-southeast toward the adjacent Glens Falls Feeder Canal. The site is fenced and primarily covered with a gravel/asphalt surface, the Henry Street Electric Substation, a city of Glens Falls Sanitary Pump Station and three major NIMO service buildings. The largest of the service buildings is 80x260 feet and was built in 1931. The substation was added in 1959. The newest of the service buildings is the crew facility (41x163 feet), which was built in 1987.

OU 1, which is the subject of this Record of Decision (ROD), consists of the former MGP site and the Glens Fall Feeder Canal. An operable unit represents a portion of the site remedy that for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

The remaining operable unit for this site consists of the sediments impacted by this site in the Hudson River, designated as Operable Unit No. 2. The magnitude and extent of the site impact on the Hudson River is being investigated at this time.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

A manufactured gas plant (MGP) is a facility where gas for lighting and heating of homes and businesses was produced. Manufactured gas was produced at this site using the coal gas and the carburetted water gas processes. Coal gas was produced by heating coal in retorts or beehive ovens, carbonizing the coal in the absence of air. The carburetted 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 which had 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 1854, the Glens Falls Gas Light Company purchased a .243 acre parcel and constructed the original gas house at the site. The coal gas plant operated from 1854 to 1920, undergoing numerous expansions. In 1921, the plant was converted to the carburetted water gas process, which operated until 1929. After 1929, gas was provided to the area by pipeline from the Albany area. However, the plant at the site was operated for peak wintertime demand until December 29, 1950, when the plant operated for the last time. Beginning in approximately 1946, various plant structures were decommissioned. The last major structure removed appears to have been the eastern gas holder, which was demolished in 1959.

3.2: Remedial History

In May of 1987, the NYSDEC first listed the site as a Class 2a site in the Registry of Inactive Hazardous Waste Disposal Sites in New York (the Registry). Class 2a is a temporary classification assigned to a site that has inadequate and/or insufficient data for inclusion in any of the other classifications. In June 1992, Niagara Mohawk agreed to remediate the site as part of a multi-site consent order. Due to NIMO's voluntary entry into a consent order with the NYSDEC, listing of the site was deferred pending the continued progress of the remedial program.

Investigative activities at the site were initiated by Niagara Mohawk (NIMO) in the early 1980's. A summary of all activities performed before that date is presented in the following discussions.

In September 1988, the NYSDEC identified a petroleum seep from the storm water drain that passes under the on-site crew facility and discharges into the Glens Falls Feeder Canal. A spill response was initiated and absorbent booms were deployed to contain the material. This material was subsequently identified as coal tar and attributed to the former MGP plant. The spill case was closed and the incident was referred for further remedial investigation and action with the MGP site.

On January 16, 1991, NUS Corporation under contract to the United States Environmental Protection Agency (USEPA), conducted a site inspection of the site. A total of ten environmental samples were collected, consisting of three surface water, two sediment and five soil samples. Based on these limited results, the USEPA concluded that while contamination was identified at the site, it did not trigger further investigation or remediation by the USEPA. While the samples did not meet the USEPA criteria for action, NYSDEC did identify the site for action and NIMO agreed to pursue the investigation.

Additionally, in the early 1960's, NIMO uncovered gas holder foundations containing coal tar contaminated materials at the site while excavating for construction of the vehicle service building. Approximately 4,000 to 16,000 gallons of coal tar contaminated materials were removed and disposed of at the Bluebird Road Disposal Site located in the neighboring Town of South Glens Falls. In 1982, the Bluebird Road Disposal site was identified and subsequent investigations defined the extent of contamination at the disposal site. In 1991, the contaminated soils were removed and groundwater monitoring continues at this disposal 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 NYSDEC and the Niagara Mohawk Power Corporation (NMPC) entered into a multi-site Consent Order on December 7, 1992. The Order (#D0-0001-9210) obligates the responsible party to investigate and implement, when necessary, a full remedial program at 21 sites, including the site at Glens Falls.

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 August 1994 and December 2000. The field activities and findings of the investigation are described in the Supplemental Remedial Investigation (SRI) report. The RI was preceded by a Preliminary Site Assessment (PSA), which confirmed the need for further investigation and evaluation of the site.

The following activities were conducted during the RI:

- Research of historical information;
- Floor Drain and Storm Sewer Study, which included dye testing and videotaping the drain lines at the site;

- Completion of 29 additional soil borings, to observe subsurface geologic conditions and collect subsurface soil samples. Including the borings for the PSA and monitoring wells, approximately 83 borings have been completed at the site;

- Installation of 8 additional monitoring wells (bringing the site total to 13), to evaluate groundwater flow and collect groundwater samples;

- Installation of 4 piezometers to evaluate groundwater flow and collect groundwater samples;

- Completion of multiple rounds of sampling of the 17 monitoring wells and piezometers;

- Completion of multiple rounds of groundwater elevation readings, to evaluate groundwater flow and the accumulation of non aqueous phase liquid;

- Completion of slug testing on 6 monitoring wells and 4 piezometers, to evaluate groundwater velocities and soil transmissivity;

- Excavation of 4 additional test pits (bringing the site total to 9), to directly observe subsurface conditions, subsurface structures and collect soil samples;

- A survey of public and private water supply wells in the area around the site;

- Collection of approximately 25 sediment samples (bringing the site total to 32);

- Collection of approximately 140 soil samples (bringing the site total to approximately 170);

To determine whether the site soil, site groundwater, canal sediments and canal surface water contains contamination at levels of concern, data from the investigation were compared to the following SCGs:

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

- Soil SCGs are based on the NYSDEC "Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels".

- Sediment SCGs are based on the NYSDEC "Technical Guidance for Screening Contaminated Sediments."

- Background soil and sediment samples were taken from approximately 8 locations. These locations were upgradient and upstream of the site, and were unaffected by historic or current site operations. The soil samples were analyzed for volatile organic compounds (VOCs), pesticides, polychlorinated biphenyls (PCBs), semivolatile organic compounds (SVOCs), metals, cyanide and miscellaneous physical parameters. The sediment sample was analyzed for BTEX (benzene, toluene, ethylbenzene and xylene), PAHs, cyanide, and total organic carbon (TOC).

- The results of the analysis were compared to data from the RI (Table 1) to determine appropriate site remediation goals.

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 below. More complete information can be found in the SRI report.

5.1.1: Site Geology and Hydrogeology

The PSA and RI activities identified four unconsolidated units located beneath the site (in descending order); fill, fine/medium/coarse sand and silt, sandy silt/silty sand, and a silty clay. These units are consistent with the glacial fluvial deposits found in this region. Limestone bedrock underlies the unconsolidated units at the site, at depths ranging from approximately 8.5 to 29 feet below ground surface. Site features and boring locations are shown on Figures 2 and 3. Cross sections of the site geology are included as Figures 4 and 5.

The Glens Falls Feeder Canal is underlain (in descending order) by a fine to coarse sand and silt, and a clay unit. This sand/silt ranges in approximate thickness from 1 to 2.5 feet. The clay unit was observed to range from approximately 3 to 11 feet in thickness. Presumably, this clay is underlain by the limestone bedrock.

The canal tow path is underlain by fill, sand, clay and silty clay. Bedrock was encountered at depths that range from approximately 12 to 27 feet below ground surface.

Groundwater at the site is encountered at 2 to 14 feet below the ground surface. The groundwater flows across the site in a southeasternly direction. The groundwater discharges into the Glens Falls Feeder Canal at the eastern site boundary. This is consistent with regional groundwater, which flows into the Hudson River.

The water in the canal flows to the north, and eventually feeds into the Old Champlain Canal. This flow direction reverses in the winter, as the canal is drained to prevent ice damage. The water in the canal is drained by a drain pipe located just south of the site, which induces a southern flow in the canal when being opened. Thus, the water in the canal seeps into the Hudson River through the tow path and seasonally when the canal is emptied, discharging water and sediment directly into the Hudson River through the drain. The drain is just upstream of the site near an area of sediment contamination.

The Glens Falls Limestone serves as the bedrock aquifer in this area. The bedrock exhibits a low to very low groundwater yield. In the immediate vicinity of the site, public water is available and the Hudson River flows directly on the top of the limestone unit.

The site groundwater flow is consistent with the observed regional groundwater flow and site geologic conditions. Geophysical testing from several borings identified permeability values that ranged from $1.4x10^{-6}$ to $5.9x10^{-8}$ centimeters per second for the silty clay unit underlying the site.

This low permeability layer presents a confining layer to the vertical migration of groundwater and site contaminants. This layer was identified in all of the site borings with an approximate thickness of 1 to 15 feet, except for two borings (SB-11 and SB-12) in the extreme north northeast portion of the site. Both the site groundwater and contaminants flow horizontally through the more permeable geologic units at the site, particularly the coarser sand lenses, discharging through the banks of the Glens Falls Feeder Canal.

5.1.2: Nature of Contamination

As described in the SRI report, many soil, groundwater, surface water and sediment samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs).

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

SVOCs of concern are primarily polycyclic aromatic hydrocarbons (PAHs). The specific compounds of concern at this site, which are commonly found at MGP sites are:

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

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

Tars and purifier wastes are two major types of waste present at this site, and are typically found at former MGP sites. Coal tars and carburetted water gas tars are reddish brown to black, oily liquids which do not readily dissolve in water. Materials such as this are commonly referred to as a non aqueous phase liquid, or NAPL. 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. Tars were disposed, 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 tar contamination over large areas of the site, at various depths below the ground surface. The areas of NAPL were found to saturate the unconsolidated deposits and/or exist in scattered, discontinuous globules, particularly, in the more permeable sand units and lenses found at the site.

Tars contain high levels of PAH compounds, often greater than 100,000 parts per million. Tars also may exceed 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 a source of the BTEX and PAHs identified in various media at the site and discussed in section 5.1.3.

A petroleum based light non aqueous phase liquid (LNAPL) is another form of contamination known to exist at this site. LNAPLs, in the form of various petroleum products, were used as a feedstock in the carburetted water gas process at former MGPs and frequently leaked into the subsurface. LNAPL can also be associated with underground storage tanks that were used at the site to store petroleum and vehicle fuels. LNAPL also has high concentrations of BTEX and PAH compounds.

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 on site as fill. This waste contains high concentrations of sulfur and cyanide, and has 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.

Certain metals were found in excess of either TAGM guidance values or background concentrations. In general, the metals levels are consistent with background concentrations or coincided with areas of identified site impacts (BTEX/PAHs). Therefore, metals were not identified as a contaminant of concern for the site.

During the remedial investigation, three samples were tested for Toxicity Characteristic Leaching Protocol (TCLP). The TCLP test is used to identify materials which are hazardous waste, based on the comparison of the test results with TCLP criteria. The sample from soil boring SB-42 failed the TCLP maximum allowable concentration for benzene, with 5.6 ppm. All the other samples were within the maximum allowable concentrations.

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, i.e. coarse grain sand lenses, and is limited vertically by the finer grained units, i.e. silty clay. As NAPL migrates along these units, it collects in some features, such as depressions in the silty clay layer or against foundations, or eventually finds a discharge point into the Glens Falls Feeder Canal.

Similarly, the RI found site groundwater that comes into contact with the NAPL or more heavily contaminated soils, results in the contamination of the groundwater and aqueous phase migration of the contaminants.

The surface soils at the site are generally not contaminated by MGP wastes. Those soils that were present during the MGP plants operation history, are typically not the same as those that are presently on the surface of the site. At this site, the limited surface soils across the site are largely fill that was placed after MGP operations at the site ceased. The majority of the site surface is gravel and asphalt.

5.1.3: Extent of Contamination

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

Chemical concentrations are reported in parts per billion (ppb) for water, parts per million (ppm) for waste, soil, and sediment. For comparison purposes, where applicable, SCGs are provided for each medium.

Table 1 summarizes the degree of contamination for the contaminants of concern and compares 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 by-products, 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 plants was typically reused or sold, recovery of the tar was incomplete. Substantial amounts of tar leaked or was discharged from storage and processing facilities over the long life of the plant, contaminating subsurface soils on the site, as well as groundwater.

Another by product, purifier waste, was 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.

The source of much of the BTEX and PAH contamination found on site is the tar or NAPL which is found both in and around the various subsurface structures, or is migrating through the subsurface at the site. Analysis of the NAPL reveals that it contains BTEX and PAHs several orders of magnitude greater than the SCGs for these compounds. The NAPL was found to saturate the unconsolidated deposits and/or exist in scattered, discontinuous globules. Either of these conditions generally coincides with high BTEX and PAH concentrations in soils and typically results in significant contamination to the groundwater as well. Areas with a substantial volume of contaminants have been termed "source areas" and are defined as the locations at the site of former MGP structures and/or those areas of soil which contain significant volumes of coal tar waste or which are saturated with visually observed separate phase product (NAPL). Soils exhibiting odors, staining and/or sheens are not necessarily 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, some of which remain on site below the current ground surface. These "source areas", identified on Figure 7, are all located in the northern parcel of the site.

Surface Soil

The surface soils at the site are generally not contaminated by the former MGP operations. TPAHs detected in surface (0-2 inches) and shallow soil (0-2 feet) samples ranged from 0.002 to 15 ppm. The majority of the site surface is either fill that was placed after MGP operations ceased, or asphalt pavement and gravel. Although site constituents were found above analytical detection limits, they are orders of magnitude below those found in the "source areas", and are comparable to background soil samples.

Four background surface soil samples collected from areas around the site not contaminated by the MGP ranged from ND to 0.002 ppm for BTEX, and 0.65 to 1.8 ppm for TPAHs.

Subsurface Soil

During the RI, approximately 140 subsurface soil samples were collected and analyzed. These samples found certain areas of the site were heavily contaminated by MGP related constituents, while other areas were relatively uncontaminated. The most extensive and severe of these impacts are located in the Northern Parcel of the site. This parcel contains the former MGP plant footprint.

Analytical results for subsurface soil samples in the northern parcel were found to range for: individual PAH concentrations from non detect to 32,000 ppm of naphthalene, TPAHs from non detect to 123,730 ppm, as compared to total value of 500 ppm in TAGM 4046. Individual BTEX values ranged from non detect to 1,200 ppm of benzene, non detect to 2,000 ppm for toluene, non detect to 1,900 ppm of xylene, non detect to 430 ppm of ethylbenzene. Total BTEX ranged from non detect to 5,270 ppm, compared to a total VOC TAGM value of 10 ppm, and cyanide from non detect to 521 ppm.

For comparison, analytical results for the southern parcel for total PAHs reached a maximum value of 27,438 ppm, with the next highest value being 993 ppm. Similarly, the maximum total PAHs for the City of Glens Falls parcels was 2,430 ppm.

The impacts were visually observed to be heaviest in close proximity to several of the former plant structures, i.e. the below grade holder. The impacts were also observed to preferentially occur in the more permeable, coarser grained sand/silt layer.

Please refer to Figures 3, 4, and 5 for cross sections from the SRI Report that illustrate the subsurface conditions at the site, and subsurface BTEX and PAH contamination in relation to the former MGP structures. Please refer to Figure 7 for the areas identified as, "source areas."

Sediments

During the RI, approximately 20 sediment samples were collected from the Glens Falls Feeder Canal. These samples found the stretch of the canal immediately adjacent to the site to be significantly contaminated with contaminants consistent with those found on site, specifically BTEX, PAHs, and cyanide. These impacts were found to decline significantly with distance from the site.

Levels for site related contaminants observed in the canal adjacent to the site ranged from: non detect to 113 ppm of BTEX, 1 to 31,062 ppm of TPAHs, and non detect to 9 ppm of cyanide. NAPL was also visually observed in the canal bed and shallow sediments.

In contrast, levels detected north of the State Route 9 bridge, ranged from 4 to 108 ppm of TPAHs. The lowest levels were found in the sample furthest from the site, CS-6 which is located approximately 375 feet north of the bridge.

Pesticides and metals were also detected in the canal sediment samples. The pesticides and metals detections do not appear to be site related.

Groundwater

The RI identified significant groundwater contamination at the site. This groundwater contamination originates in the area of the former MGP structures, in the northern parcel, and extends beyond the south eastern property boundary.

Levels of groundwater contamination observed on the northern parcel during the RI investigation ranged from: non detect to 2,724 ppb of BTEX, non detect to 1,960,117 ppb of TPAHs, and non detect to 4,710 ppb of cyanide.

Levels of groundwater contamination observed on the City of Glens Falls parcel during the RI investigation ranged from: 7 to 271 ppb of BTEX, 35 to 1,188 ppb of TPAHs, and 600 to 1,570 ppb of cyanide. The BTEX compounds are the most mobile of the groundwater contaminants and all were present well above their individual groundwater quality standards. Concentrations of benzene, with a standard of 1 ppb, ranged from ND to 350 ppb; while toluene, ethylbenzene and xylene, all with a standard of 5 ppb, ranged respectively from ND to 350 ppb, 940 ppb and 1,600 ppb.

Levels of groundwater contamination observed during the RI investigation in monitoring wells in the canal towpath, downgradient of the site, were significantly lower. Levels observed in those wells ranged from non detect to 83 ppb of TPAHs. BTEX ranged from non detect to 12 ppb, and cyanide was not detected in these wells. This is likely due to dilution by the Glens Falls Feeder Canal and natural attenuation.

Surface Water

In June, 1993, 4 canal surface water and 4 storm drain outfall water samples were collected during the Preliminary Site Assessment (PSA), and analyzed for VOCs, SVOCs, metals and cyanide. These samples found only low levels of two chemicals (diethylphthalate and bis(2-ethylhexyl)phthalate) that are likely artifacts of sample collection and analysis. Thus, no additional samples were collected during the RI. However, sheens have been observed on the water surface in the canal, which is a contravention of surface water standards.

Air

Air samples were collected through adsorbent tubes during the test pit investigation at the site, to assess potential impacts to ambient air quality. Six environmental samples and a field blank were submitted for analysis of BTEX and PAH compounds. No PAHs were present in the air samples, while BTEX was detected in all of the samples, including the field blank. Individual concentrations ranged up to 40 $\mu g/m^3$ for toluene in the upwind sample.

Background Samples

Three background sediment samples were collected from the Glens Falls Feeder Canal to assess local sediment quality. These samples were collected upstream of the site and the drainage pipe that reverses flow in the canal in the site vicinity. These samples were collected to assess the condition of local sediment quality, due to anthropogenic or natural occurrences. These sediment samples found metals and pesticides levels that were generally comparable to those observed in the site vicinity. They also found the lowest levels of TPAHs in the background sample collected closest to the site, CS-1. Therefore, the Total PAH level of 9.28 ppm for this sample will be utilized as background for the site.

Six background soil samples were collected from across Mohican Street, on a parcel of property owned by NIMO. These samples were collected from the surface and subsurface soils to assess the condition of local soil quality, due to anthropogenic or natural occurrences.

These soil samples found metal levels that were generally comparable to those observed on the site.

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: Summarv 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 1.2 of the Final Feasibility Study 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 are documented. An exposure pathway is considered a potential pathway when one or more of the elements currently does not exist, but could in the future.

Potential Exposure Pathways

- Dermal contact and/or inhalation of vapors and airborne particulates from contaminants in soil by on-site workers and construction workers.

- Dermal contact with and/or inhalation of volatiles from NAPL in subsurface soil and shallow groundwater by construction workers involved in subsurface excavations.

- Dermal contact with contaminants in canal sediments by recreational users and canal workers.

- The potential for future exposures to contaminants in on-site groundwater is unlikely due to the on-site availability of a public water supply. However, potential exposures to contaminated groundwater could occur in the future if a drinking water well is installed on-site.

5.4: Summary of Environmental Impacts

This section summarizes the 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 NIMO operations facility, the chain link security fence that completely surrounds the site, the occupied site buildings and extensive paving on the site. However, fish and wildlife resources were associated with areas adjacent to the site, notably the Glens Falls Feeder Canal. The canal supports both fish and benthic communities, although the value of the resource is seasonally limited since the canal is drained every fall and remains dewatered during the winter to minimize ice damage. This dewatering and freezing of the canal sediments limits the benthic communities, aquatic plants, and fish communities present in the canal. While such dewatering and freezing of the sediment limits the community to species tolerant of such fluctuations, complete elimination does not occur. Additionally, the community would be expected to recover during the spring and summer growing season when the canal is flooded. This regrowth is expected to be aided by the reintroduction of species from populations in the Hudson River, which feeds the canal.

The canal also provides a valuable corridor of riparian habitat that wildlife may use to feed in and migrate through the area, as well as a direct link between the site and the Hudson River. Sediments in the canal contained levels of PAHs that may migrate into the Hudson River, via the canal's drain, when the canal is drained annually. Sediments in the Hudson River contained levels of PAHs that exceed the Department screening criteria effects range moderate, and will be evaluated further as operable unit 2. Several threatened or endangered species are also present within a 2.0 mile radius of the site, according to state and federal records.

The Fish and Wildlife Impact Analysis, which is included in the SRI 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 canal contained levels of PAHs that exceed the effects range moderate (ER-M) level in NYSDEC screening criteria, and exceed the background sample values.

- The potential for direct contact by terrestrial and aquatic fauna and flora with NAPL and contaminated subsurface soils.

- Site contamination has also contaminated the groundwater resource in the unconsolidated geologic units.

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 375-1.10. 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.

- Human and biota exposure to site related constituents in sediment above background in the Glens Falls Feeder Canal.

- The contravention of NYSDEC surface water quality criteria by site related constituents in the Glens Falls Feeder Canal.

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 does not attain Part 5 of the New York State Sanitary Code Drinking Water Standards and/or NYSDEC 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 Glens Falls Mohican Street Former MGP Site were identified, screened and evaluated in the FS report which is available at the document repositories.

A summary of the remedial alternatives that were considered for this site are 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: <u>Description of Remedial Alternatives</u>

The following potential remedies were considered to address the contaminated soils, sediments, surface water and groundwater at the site. Due to the nature and disposition of waste materials and NAPL, these media are not specifically identified for treatment, but will be remediated by activities directed at the soil, sediment or groundwater they are found in.

All of the alternatives considered, with the exception of the no action alternative, include several common elements which are not detailed in each alternative for the sake of brevity: (1) the removal of contaminated subsurface MGP structures that remain on the site, (2) the isolation and future remediation of soils underlying the Henry Street Electric Substation, and (3) the removal of contaminated sediments from the Glens Falls Feeder Canal.

The removal of contaminated sediments is included with all remedial alternatives due to the lack of any other appropriate option to effectively address existing exposures and impacts in the Glens Falls Feeder Canal. The removal of contaminated structures that remain from MGP plant operations is required due to the necessity of removing hazardous waste material that is typically found in such structures, and has been observed in and around these structures at the site. Soils beneath the Henry Street Substation would be isolated with an impermeable barrier wall, to be keyed into the top of the silty clay layer underlying the site. These soils would be excavated and disposed/treated when the substation is shut down for upgrading or decommissioning at an undetermined future date.

Alternative 1: No Action

Present Worth: *$129,600*
Capital Cost: *$0,000*
Annual OM&M:
(Years 1-30): *$10,500*

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, 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: Low Permeability Capping and Groundwater Containment Barrier

Present Worth: *$14,800,000*
Capital Cost: *$11,400,000*
Annual OM&M:
(Years 1-30): *$259,000*

Alternative 2 consists of the combination of a groundwater barrier around soil containing constituent concentrations exceeding TAGM cleanup objectives for the protection of groundwater, and the placing of a low-permeability cap over this enclosed area to minimize infiltration into this area.

The containment of the constituents in place at depth, would mitigate the existing human and environmental exposures to the site constituents. To prevent future human exposure to contaminated soil beneath the soil cover and contaminated on site groundwater, land and groundwater use restrictions would also be a component of this alternative. Operation, maintenance and monitoring would be required to maintain and evaluate the effectiveness of the remedy.

Off site groundwater and NAPL impacts would be expected to attenuate naturally due to the containment barrier and sediment removal from the feeder canal. This barrier wall would conceptually be a sheetpile cutoff wall keyed into the silty clay layer that underlies the site. In order to maintain effective containment, it would likely be necessary to extract groundwater from within the containment barrier to maintain an inward hydraulic gradient.

Additional details of this approach can be found in the FS, under media specific alternatives of GW-3 and S-2b.

Alternative 3: Excavation of NAPL Source Areas, Groundwater Treatment Barrier, and Soil Cover

Present Worth: *$16,200,000*
Capital Cost: *$13,750,000*
Annual OM&M:
(Years 1-30): *$188,700*

Alternative 3 consists of the combination of a groundwater treatment barrier, soil cover and the excavation and off site treatment/disposal of NAPL source areas. Under this alternative "source areas" are defined as the locations at the site of former MGP structures and/or those areas of soil which contain significant volumes of coal tar waste or which are saturated with visually observed separate phase product (NAPL). Soils exhibiting odors, staining and/or sheens will not be considered for removal as source areas. These areas would be excavated and transported off-site for treatment/disposal.

The NAPL source areas to be excavated under this alternative have been delineated based on available data and are shown on Figure 7. It is estimated that the in situ volume of source areas to be excavated and disposed/treated off site ranges from approximately 2,500 to 16,200 cubic yards (cy). Including this volume, it is estimated that up to 27,000 cy of material may be excavated to effect this alternative. This range of volumes is due to variability of waste material deposits observed on the site, which generally are found from 6 to 11 feet below ground surface, and the expected variability of subsurface conditions and abandoned MGP structure conditions often encountered at former MGP sites. Excavations would be dewatered, as necessary, to complete the removal.

The remaining site soils would be covered with at least two feet of clean soil underlain by a geotextile. A passive groundwater containment/treatment barrier, conceptually a sheet pile wall with groundwater treatment gates, would be installed on the hydraulic downgradient side of the site. Off site groundwater and NAPL contamination would be expected to cease due to the containment barrier as the treatment gates in the wall will only allow treated groundwater to pass through. This barrier wall would be keyed into the silty clay layer that underlies the site.

To prevent human exposure to soil beneath the soil cover and on site groundwater, land and groundwater use restrictions would also be a component of this alternative. Operation, maintenance and monitoring would be required to maintain and evaluate the effectiveness of the remedy.

Additional details of this alternative can be found in the FS, under media specific alternatives of S-4 (NAPL source area excavations), S-2a (soil capping) and GW-4 (funnel and gate).

Alternative 4: Excavation of Soils Exceeding TAGM Groundwater Protection Objectives, Soil Cover, and Monitored Natural Attenuation (MNA) of Groundwater.

Present Worth: *$26,340,000*
Capital Cost: *$24,803,000*
Annual OM&M:
(Years 1-30): *$250,000*

Alternative 4 consists of the excavation and off site disposal/treatment of soil exceeding the TAGM groundwater protection cleanup objectives, soil cover of the site and the monitored natural attenuation of the contaminated groundwater. Excavated soil not exceeding the cleanup objective, would be used as backfill for deeper excavations. The remaining site soils would be covered with at least two feet of clean soil, since some contamination above health based levels may remain at the site.

The areas to be excavated under this alternative, have been delineated based on available data and are shown on Figure 8. It is estimated that the in situ volume of soil/waste to be excavated and disposed/treated off-site ranges from approximately 20,000 to 30,000 cy. Further, it is estimated that up to 90,000 cy of material may have to be excavated to effect this alternative. Excavated soil not exceeding TAGM levels could be stockpiled for use as backfill for deeper excavations.

Groundwater quality, both on site and off site, would be expected to naturally improve with the removal of all of the soils acting as a source of contaminants to the groundwater at the site. Groundwater conditions would be monitored annually to confirm this attenuation occurs at an acceptable level and rate.

To prevent future human exposure to soil beneath the soil cover and on site groundwater until MNA has achieved groundwater standards, land and groundwater use restrictions would also be a component of this alternative. Inspection of the cover would occur to assure it remains in place.

Operation, maintenance and monitoring would be required to maintain and evaluate the effectiveness of the remedy.

Additional details of this alternative can be found in the FS, under media specific alternatives S-5 (removal of soil exceeding TAGM values for groundwater protection), S-2a (soil capping) and GW-2 (monitored natural attenuation).

Alternative 5: In Situ Stabilization of Soil Exceeding TAGM Groundwater Cleanup Objectives, Soil Cover and Monitored Natural Attenuation (MNA) of Groundwater

Present Worth: *$14,256,000*
Capital Cost: *$12,285,000*
Annual OM&M:
(Years 1-30): *$250,000*

Alternative 5 consists of the in place stabilization of soil and contaminants that exceeds the TAGM objective for groundwater, with these soils then being covered with at least two feet of clean soil. In place stabilization of these site soils and contaminants means they would be chemically bound in place to form a stable solid matrix. Large augers are typically used to inject the stabilizing reagents and mix them with the contaminated material. Excess volume generated by the bulking of the soils by the stabilizing reagents would be used to regrade the site.

The areas to be stabilized under this alternative, have been delineated based on available data and are shown on Figure 9. It is estimated that the in situ volume to be stabilized ranges from approximately 20,000 to 30,000 cubic yards (cy). Including this volume, it is estimated that up to 90,000 cy of material would be handled to effect this alternative. Also, all piping and structures present would need to be removed and properly disposed.

As the contaminants would be solidified in place, the groundwater would be expected to naturally improve. This improvement would be monitored to confirm this attenuation occurs at an acceptable level and rate, as would the continued effectiveness of the solidified mass at containing the contaminants of concern.

To prevent future human exposure to soil beneath the soil cover and on site groundwater, land and groundwater use restrictions would also be a component of this alternative. Operation, maintenance and monitoring would be required to maintain and evaluate the effectiveness of the remedy.

Additional details of this alternative can be found in the FS, under media specific alternatives S-6 (in situ treatment of soil), S-2a (soil capping) and GW-2 (monitored natural attenuation).

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 State. 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 NYSDEC 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 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.

This final criterion is considered a "modifying criterion" and is taken into account after evaluating those above. It is evaluated after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the NYSDEC will address the concerns raised. If the selected remedy

differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

Based upon the results of the RI/FS and the evaluation presented in Section 7, the NYSDEC is selecting Alternative 3: Excavation of NAPL Source Areas, Groundwater Treatment Barrier, and Soil Cover.

Alternative 3 is being selected because, as described below, it would satisfy the threshold criteria of being protective to human health and the environment; and complying with New York State standards, criteria and guidance to the extent practical. It is not cost effective and would result in an extended period of short term impacts, to treat/remove all materials at the site that are in exceedance of SCGs. Further, it provides the best balance of the primary balancing criteria described in Section 7.2. This alternative will best achieve the remediation goals for the site by removing the soil/waste materials defined as source areas, 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 groundwater quality to the extent practicable.

Alternative 1 has been rejected as a remedy since it would not satisfy the threshold criteria of being protective of public health and the environment; and complying with New York State standards, criteria and guidance.

Alternatives 2 and 5 would also comply with the threshold selection criteria but to a lesser degree or with a lower certainty. Alternative 2 would not be fully protective of public health or the environment as it would remove little contamination beyond that found within the contaminated structures from the site and rely on institutional and engineering controls to prevent contact with and migration of the contaminants that would remain on site. Alternative 5 would rely on the stabilization of the contaminants in place to prevent contact with and migration of the contaminants. As detailed below, at this time there is a degree of uncertainty to the long term effectiveness and implementability for a stabilization process for the wastes at this site.

Alternative 4 was not selected because even though it would remove a larger volume of contaminants from the site, it would not provide additional satisfaction of the remedial goals, yet it would be far more costly and less easily implemented. This alternative would remove more contaminants by excavating and disposing/treating site materials with lower concentrations of contaminants.

Because Alternatives 2, 3, 4, and 5 satisfy the threshold criteria, the five balancing criteria are particularly important in selecting a final remedy for the site.

Alternatives 2, 3, 4, and 5 all would have short-term impacts which would need to be controlled with a health and safety plan, and engineering controls as needed. The time needed to achieve the remediation goals and potential for adverse short term impacts at this site is largely a function of the time and activities required for remedial construction, and hence would be greatest for Alternative 4, due to the large volume of material to be excavated. The short term impacts would generally decrease, respectively, for Alternatives 5, 3, and 2 due to the decreasing volumes of contaminated material to be handled.

Achieving long-term effectiveness and permanence would be best accomplished by excavation and removal of the contaminated materials at the site (Alternatives 3 and 4). Alternative 3 will be more effective because it will result in the removal of the most heavily contaminated soils and waste materials (source areas), and will also include groundwater treatment and NAPL containment. These contaminated soils and waste materials (source areas) are acting as a source of further contamination to surface water, groundwater, and result in NAPL migration at the site. In comparison, while Alternative 4 would result in removal of almost all of the chemical contamination at the site, including source areas, thus obviating the need for groundwater and NAPL treatment/containment, it would be at a substantially greater cost and effort. Despite the greater effort represented by Alternative 4, the removal and offsite disposal/treatment of an additional 13,800 to 27,500 cy of contaminated soils, this alternative would still require property use restrictions and long-term site monitoring. Alternative 5 would handle a similar volume of site soils, although for the most part in-situ, but would also still require property use restrictions. In addition the long-term effectiveness and permanence of solidification is still unresolved due to the lack of data to assess long-term effectiveness of this treatment and site specific data on the treatability of the wastes present at the site.

Alternatives 2 and 3 would be relatively easy to implement in comparison to the other alternatives, as they both employ proven construction means that would be readily available. Although the removal of source areas in Alternative 3 may prove challenging, due to subsurface obstructions and the depth of excavations, these are manageable logistic concerns. Similarly, the larger scale of Alternative 4 would be expected to increase these logistic concerns.

Conversely, Alternative 5 may not be implementable at this site. In situ stabilization is considered an innovative technology for MGP wastes and, as such, a pilot test would be needed on the site specific contaminated materials, to ascertain the effectiveness, methodology and cost of the stabilization method that would best permanently solidify the site contaminants. The presence of subsurface utilities (both active and abandoned) and historic MGP structures also represent significant impediments to the physical execution of this alternative.

Further, Alternative 3 is favorable as it will substantially reduce the overall volume of heavily contaminated material on-site. Thus, substantially reducing the toxicity, mobility and volume of a majority of the total volume of contaminants at the site. Approximately 2,500 to 16,200 cubic yards of heavily contaminated material will be removed with Alternative 3. Although some contaminated soil and potential source material may remain on the site, the majority of the site contamination is located in the area of the former MGP plant footprint that will be removed under this alternative. Alternative 3 will also employ a passive groundwater treatment barrier to further reduce the volume, mobility, and toxicity of site contaminants in groundwater. This treatment barrier will also eliminate future off site groundwater contamination.

Alternative 4 would reduce the overall mass of site contaminants even more than Alternative 3 by removing a larger volume of site soils with lower levels of contamination. However, as noted previously, this alternative provides little benefit for this substantial increase in effort and cost. Alternative 2 would only provide a marginal decrease in the overall volume, toxicity and mobility of site contaminants, since only contaminants migrating off-site would be addressed beyond the limited removal included as the common elements to all of the alternatives considered. Alternative 5 would decrease toxicity by limiting the contaminants availability for uptake and should also decrease mobility, however it would actually increase the contaminated soil volume due to bulking of the site wastes.

The cost of the alternatives varies significantly. Capping and groundwater containment (Alternative 2) is less expensive than excavation (Alternatives 3 and 4) or in place treatment (Alternative 5). In situ treatment of site contaminants (Alternative 5) appears to be cost effective, but its implementability, long term effectiveness and cost due to the depth and large number of subsurface piping and structures are far less certain without a site treatability study than those of the preferred alternative. Alternative 3 is the most cost effective of the considered alternatives, as it will eliminate the primary sources of groundwater and NAPL contamination at the site for a substantially lower expenditure of resources and costs than Alternatives 4.

The estimated present worth cost to implement the remedy is $16,200,000. The capital cost to construct the remedy is estimated to be $13,750,000 and the estimated average annual operation, maintenance, and monitoring costs for 30 years is $ 188,700.

The elements of the selected remedy are as follows:

1. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Any uncertainties identified during the RI/FS will be resolved, which include the further delineation of NAPL impacts in the polygon identified for removal in figure 7, and the former MGP structure labeled C (former purifier house) in figure 7.

2. Source area materials will be removed and transported off-site for thermal treatment and/or other appropriate disposal. Source areas are defined as the locations at the site of former MGP structures and/or those areas of soil which contain significant volumes of coal tar waste or which are saturated with visually observed separate phase product (NAPL). Soils exhibiting odors, staining and/or sheens will not be considered for removal as source areas. The proposed limits of this source area excavation, including the removal of several subsurface MGP structures that remain on site, is represented in Figure 7. The precise limits, depths and volume of the excavations will be defined in the remedial design. The estimated in situ volume of source areas to be excavated from within the polygon and disposed/treated off site ranges from approximately 2,500 to 16,200 cubic yards (cy). This volume includes any excavation associated with structures B and C, however the upper limit could increase if additional source area soils are identified in the polygon area. To access source area materials, it is estimated that approximately 27,000 cy of material may have to be excavated for this remedy. Soils not defined as source areas, excavated as part of this remedial effort may be reused as deep backfill, per criteria to be defined in the remedial design. Additional imported backfill will be needed to restore the site to final grade.

3. The tar separator, relief holder, at grade holder, retort house foundation, gas compressor house foundation, and other minor subsurface structures will be removed, as represented in Figure 7. Any NAPL source area soils adjoining these structures will also be removed. Deep excavations required to remove source area soils associated with these structures, as defined in #2 above, will continue to depths below the water table. Shoring, dewatering, and

possibly sheet piling will be required to stabilize the deep excavations. The soils removed from below the water table will be dewatered and the water will be treated prior to discharge. The removal of all major piping associated with contaminated structures is also included. Piping encountered elsewhere during implementation of other aspects of the remedy may be cut, free drained, and capped, as determined appropriate by the final design.

4. As part of the remedial design, the former purifier house foundation will be reexamined. For the purposes of planning, it is assumed it contains significant contamination and will be removed. However, if during remedial design or construction it is found to not be a source area, it may be excluded from excavation and/or off site disposal/treatment.

5. A groundwater treatment barrier (i.e. sheet pile cutoff wall) will be constructed to contain and remove DNAPL for off site disposal, and thereby prevent its migration to off-site areas. Collection wells or sumps will be installed along the site side of the wall to allow for the removal of DNAPL for off-site treatment/disposal. Areas of perforations or "gates" will be included in the wall from the ground surface to slightly above the most shallow occurrence of DNAPL to allow for groundwater passage while containing the DNAPL. Groundwater flow through the wall will be through a funnel and gate configuration and will be treated for MGP constituents, only allowing treated groundwater to pass through the wall. See Figure 7 for the alignment of the wall.

6. Soils beneath the Henry Street Substation will be isolated with an impermeable barrier wall, to be keyed into the top of the silty clay layer underlying the site. These soils will be excavated and disposed/treated when the substation is shut down for upgrading or decommissioning at an undetermined future date.

7. Approximately 6,000 cubic yards of sediments contaminated with PAHs will be removed from the Glens Falls Feeder Canal. This removal will conceptually extend from sample point CS-1, then northward to a concrete lined portion of the canal. Approximately 2 feet of NAPL and PAH contaminated sand will be removed from the canal and the uncontaminated underlying silty clay will be left exposed as the canal bottom. The precise limits and specifics of the removal will be detailed in the remedial design and incorporate a planned concrete lining project by the New York State Canal Corporation that is estimated to begin 40 meters north of the Route 9 Bridge. The goal of the sediment remediation will be to remove all of the exposed PAH contaminated sediments above local background sediment values.

8. A soil cover will be constructed over approximately 6 acres of the site to prevent exposures to contaminated soil. The extent of this soil cover is shown in Figure 7. The two foot thick cover will consist of clean soil with a geotextile fabric or similar barrier installed above the contaminated soil as a demarcation layer. The top six inches of the soil cover will be of sufficient quality to support vegetation. Clean soil will constitute soil with no analytes in exceedance of NYSDEC TAGM 4046 levels. Alternately, areas planned for construction of buildings or other structures and areas planned for roadways or parking will be covered by pavement in a configuration that will maintain at least 6" of asphalt or concrete above the geotextile.

9. The remedy will be implemented incrementally. Conceptually, year 1 will include the installation of a pilot scale groundwater treatment barrier system and isolation of the soils beneath the Henry Street Substation. Subsurface utilities, i.e. the gas main and sanitary sewer, will be relocated in this year as well. In year 2, the design will be finalized with the benefit of data from the pilot scale system and a full scale groundwater treatment barrier system will be installed. In year three, the remedy will be completed with the removal and disposal/treatment of specified soils and sediments, as well as the completion of the site soil cover. The specific timing of the remedial components will be determined by the final remedial design.

10. Since the remedy will result in the hazardous waste remaining at the site, a long term monitoring program will be developed and then instituted upon the completion of remedial construction activities. Included in the long term program will be the monitoring and removal of DNAPL on a regular basis from wells or sumps installed behind the groundwater barrier and in-situ treatment wall. Groundwater treatment for site related contaminants, including LNAPL, will also be performed at the gates of the wall. In addition, a groundwater monitoring well network will be established to monitor the effectiveness of the remedy. A monitoring program will also be established for sediments and surface water in the Glens Falls Feeder Canal.

11. The long term monitoring program will contain contingencies to be implemented immediately, should the site remedy fail to achieve the remedial action objectives for the site in a timely fashion or NAPL releases are observed in the Glens Falls Feeder Canal.

12. The long term monitoring program will require inspection of the soil cover to be conducted on a regular basis as a component of the operation and maintenance for the site. Inspection and maintenance of the groundwater treatment barrier (i.e. carbon changeout) will be conducted on a regular basis.

13. A soils management plan will be developed to address residual hazardous waste contaminated soils that may be excavated from the site during future redevelopment. The plan will require soil characterization and where applicable, disposal/reuse in accordance with NYSDEC regulations.

14. Institutional controls will be implemented to limit future site development and prevent future exposures to site contaminants. These will include: (a) a prohibition of land development for residential use without prior written approval of the NYSDEC, provided that site conditions are protective of the new use or made protective for such new use by additional remediation. Without such approval, only appropriate commercial, industrial, or recreational use will be allowed; (b) worker notification if utility or other excavation work below the demarcation barrier is planned; (c) notification to the NYSDEC prior to any action which could jeopardize the integrity of the remedy; (d) development and approval of a soil management plan for any soil or waste removed from below the demarcation barrier, and (e) prohibition of the development of water supply wells on the site property. Annual certification would be required to confirm only appropriate use of the site and to ensure that engineering and institutional controls included in this remedy are in place and remain effective to control the identified potential exposures.

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

TABLE 1 A
Nature and Extent of Subsurface Soil Contamination
NIMO Glens Falls - Mohican Street MGP Site
August 1994 - December 2000

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Benzene	ND - 1200	0.06	21/140
	Toluene	ND - 2000	1.5	17/140
	Ethylbenzene	ND - 430	5.5	18/140
	Xylene	ND - 1900	1.2	22/140
	BTEX	ND - 5270	10	19/140
Semivolatile Organic Compounds	Total cPAHs	ND - 22630	10	44/140
	Total PAHs	ND - 123730	500	22/140
Inorganic	Cyanide	ND - 521	NA	NA

TABLE 1 B
Nature and Extent of Surface Soil Contamination
NIMO Glens Falls - Mohican Street MGP Site
August 1994 - December 2000

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Benzene	ND - 0.017	0.06	0
	Toluene	ND - 0.007	1.5	0
	Ethylbenzene	ND - 0.002	5.5	0
	Xylene	ND - 0.004	1.2	0
	BTEX	ND - 0.03	10	0
Semivolatile Organic Compounds	Total cPAHs	ND - 7.762	10	0
	Total PAHs	ND - 15.448	500	0
Inorganic	Cyanide	ND - 2.7	NA	NA

TABLE 1 C
Nature and Extent of Groundwater Contamination
NIMO Glens Falls - Mohican Street MGP Site
August 1994 - December 2000

GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds (VOCs)	Benzene	ND - 350	1	19/50
	Toluene	ND - 340	5	18/50
	Ethylbenzene	ND - 940	5	10/50
	Xylene	ND - 1600	5	13/50
	BTEX	ND - 27[illegible]4	NA	NA
Semivolatile Organic Compounds	Total cPAHs	ND - 317	NA	NA
	Total PAHs	ND - 1,960,117	NA	NA
Inorganic	Cyanide	ND - 4710	NA	NA

TABLE 1 D
Nature and Extent of Canal Sediment Contamination
NIMO Glens Falls - Mohican Street MGP Site
August 1994 - December 2000

CANAL SEDIMENTS	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]		Frequency of Exceeding SCG
			ERL/ERM[c]	BACK GROUND[1]	
Volatile Organic Compounds (VOCs)	Benzene	ND - 16	NA	ND	7/22
	Toluene	ND - 15	NA	ND	9/22
	Ethylbenzene	ND - 220	NA	ND	11/22
	Xylene	ND - 60	NA	ND	13/22
	BTEX	ND - 113	NA	ND	13/22
Semivolatile Organic Compounds	Total cPAHs	ND - 5632	NA	3.98	19/22
	Total PAHs	ND - 31062	4/35	9.28	17/22
Inorganic	Cyanide	ND - 9.5	NC	3	0/22

[1] Sediment background is represented in this table by sediment sample CS-1

For Table 1A-D

[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;

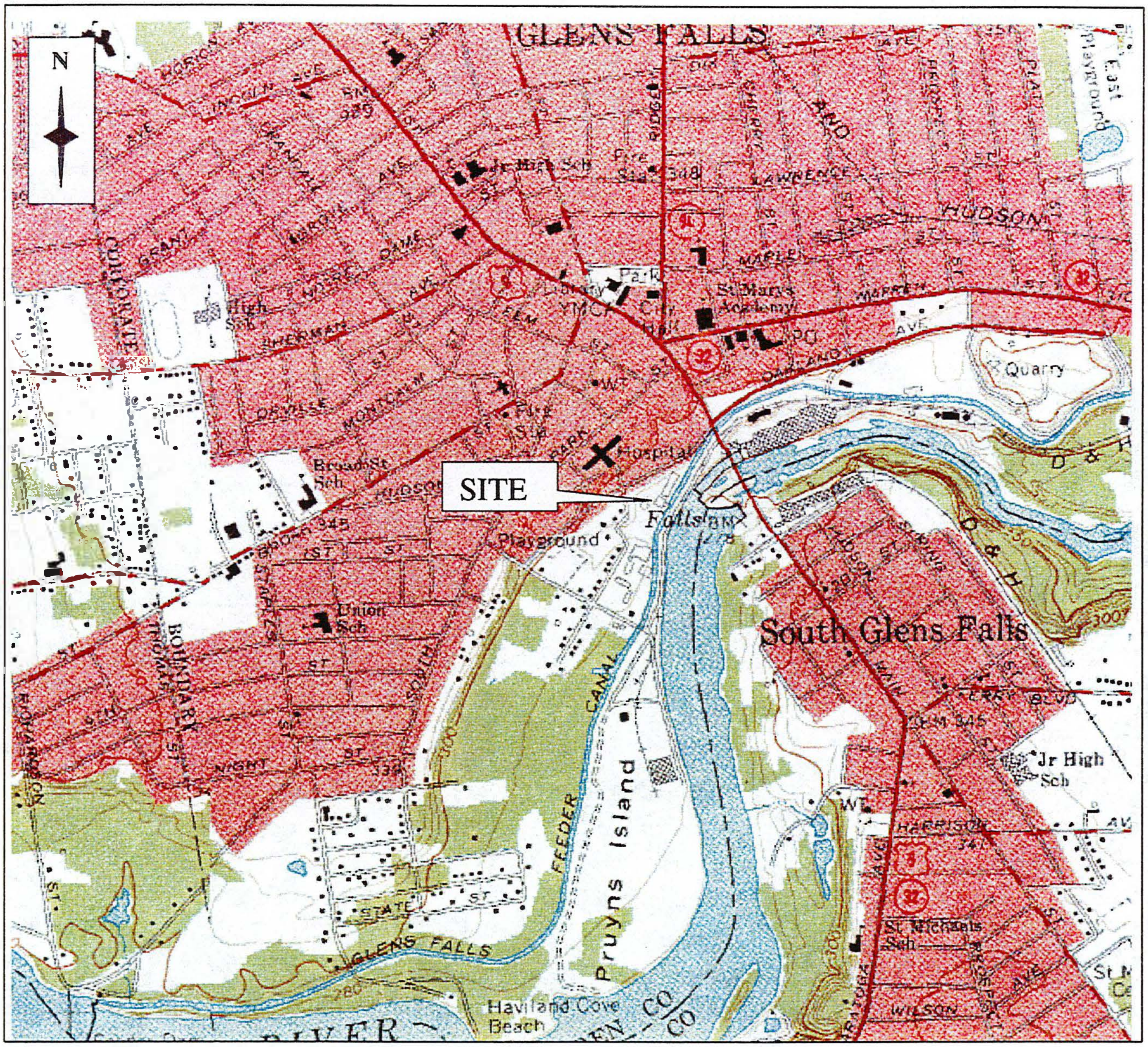
[c] ERL = Effects Range-Low and ERM = Effects Range-Moderate. A sediment is considered to be contaminated if either of these criteria is exceeded. If both criteria are exceeded, the sediment is moderately contaminated. If only the ERL is exceeded, the impact is considered to be low.

ND - Not Detected
NA - None Available

BTEX indicates the summation of benzene, toluene, ethylbenzene and xylene
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
NIMO Glens Falls - Mohican Street MGP Site

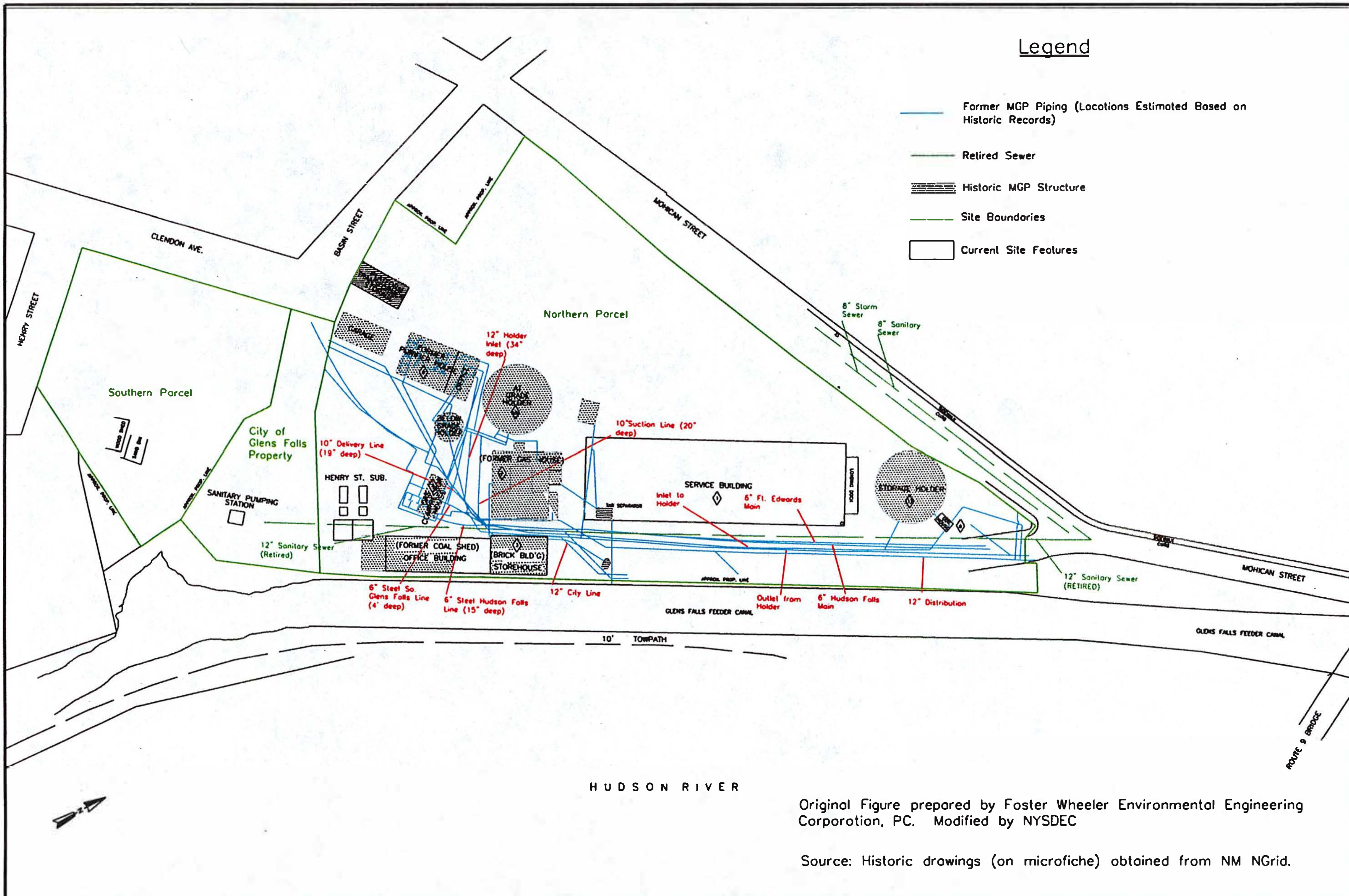
Remedial Alternative	Capital Cost	Annual OM&M	Total Present Worth
No Action	$ 0	$ 10,500	$ 129,600
Low Permeability Capping and Groundwater Containment Barrier	$ 11,400,000	$ 259,000	$ 14,800,000
Excavation of NAPL Source Areas, Groundwater Treatment Barrier, and Soil Cover	$ 13,750,000	$ 188,000	$ 16,200,000
Excavation of Soils Exceeding TAGM Groundwater Protection Objectives, Soil Cover, and Monitored Natural Attenuation	$ 24,803,000	$ 250,000	$ 26,340,000
In Situ Stabilization of Soil Exceeding TAGM Groundwater Cleanup Objectives, Soil Cover and Monitored Natural Attenuation	$ 12,285,000	$ 250,000	$ 14,256,000



NIMO GLENS FALLS MOHICAN ST. SITE
GLENS FALLS, WARREN COUNTY, NEW YORK

SITE LOCATION

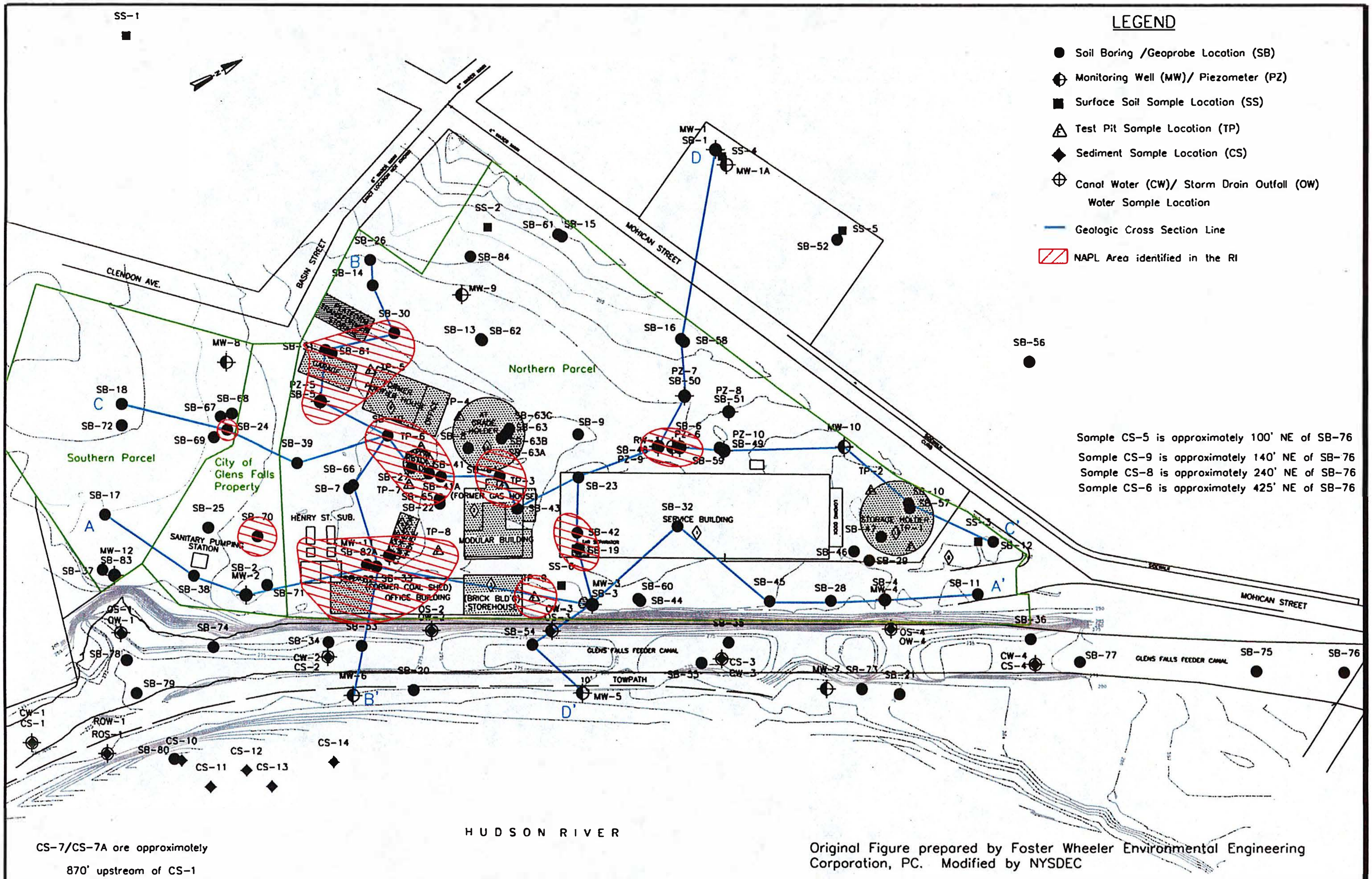
FIGURE 1



NIMO GLENS FALLS MOHICAN ST. SITE
GLENS FALLS, WARREN COUNTY, NEW YORK

PRESENT SITE CONDITIONS

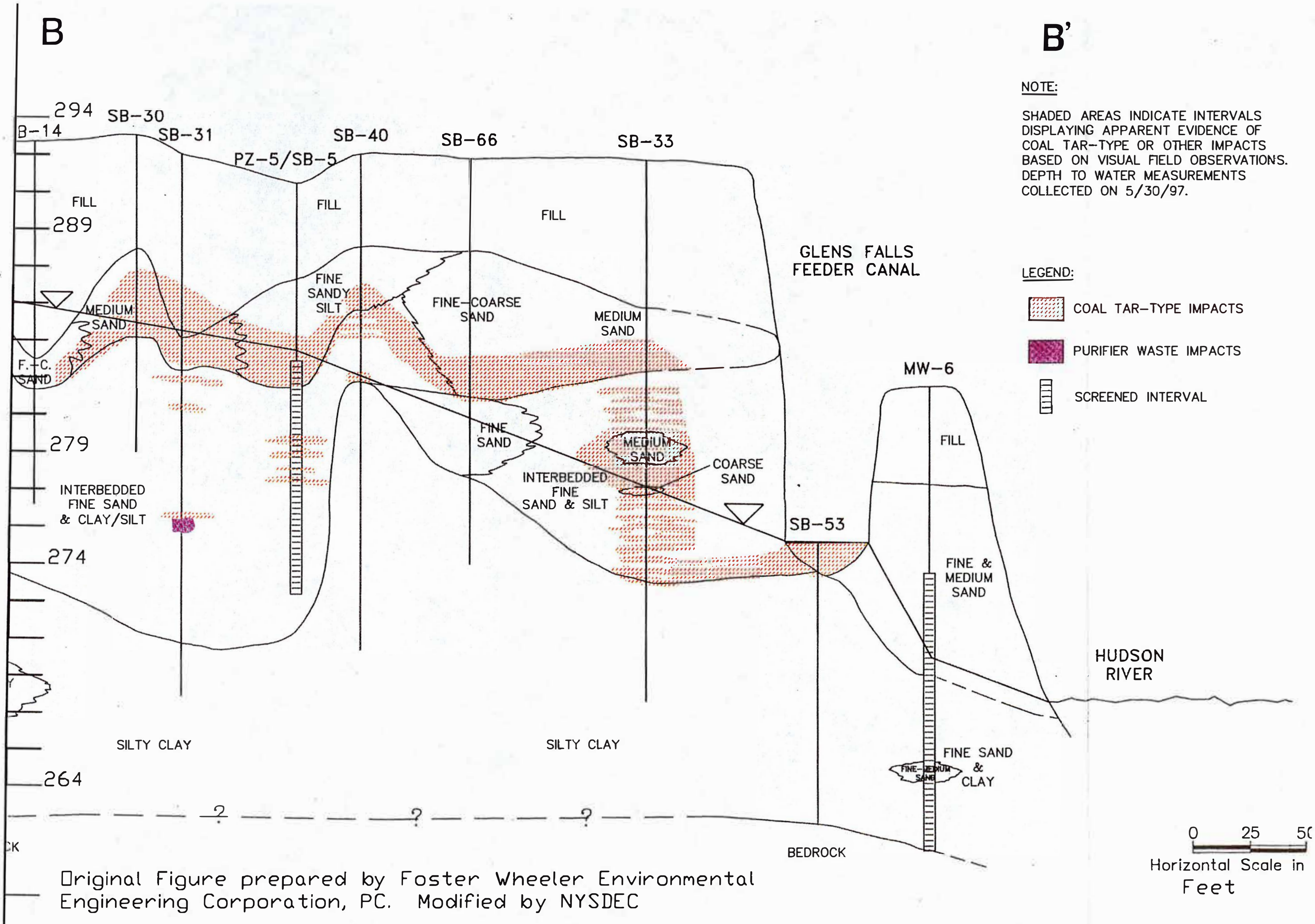
FIGURE 2



NIMO GLENS FALLS MOHICAN ST. SITE
GLENS FALLS, WARREN COUNTY, NEW YORK

RI BORING AND CROSS SECTION LOCATIONS

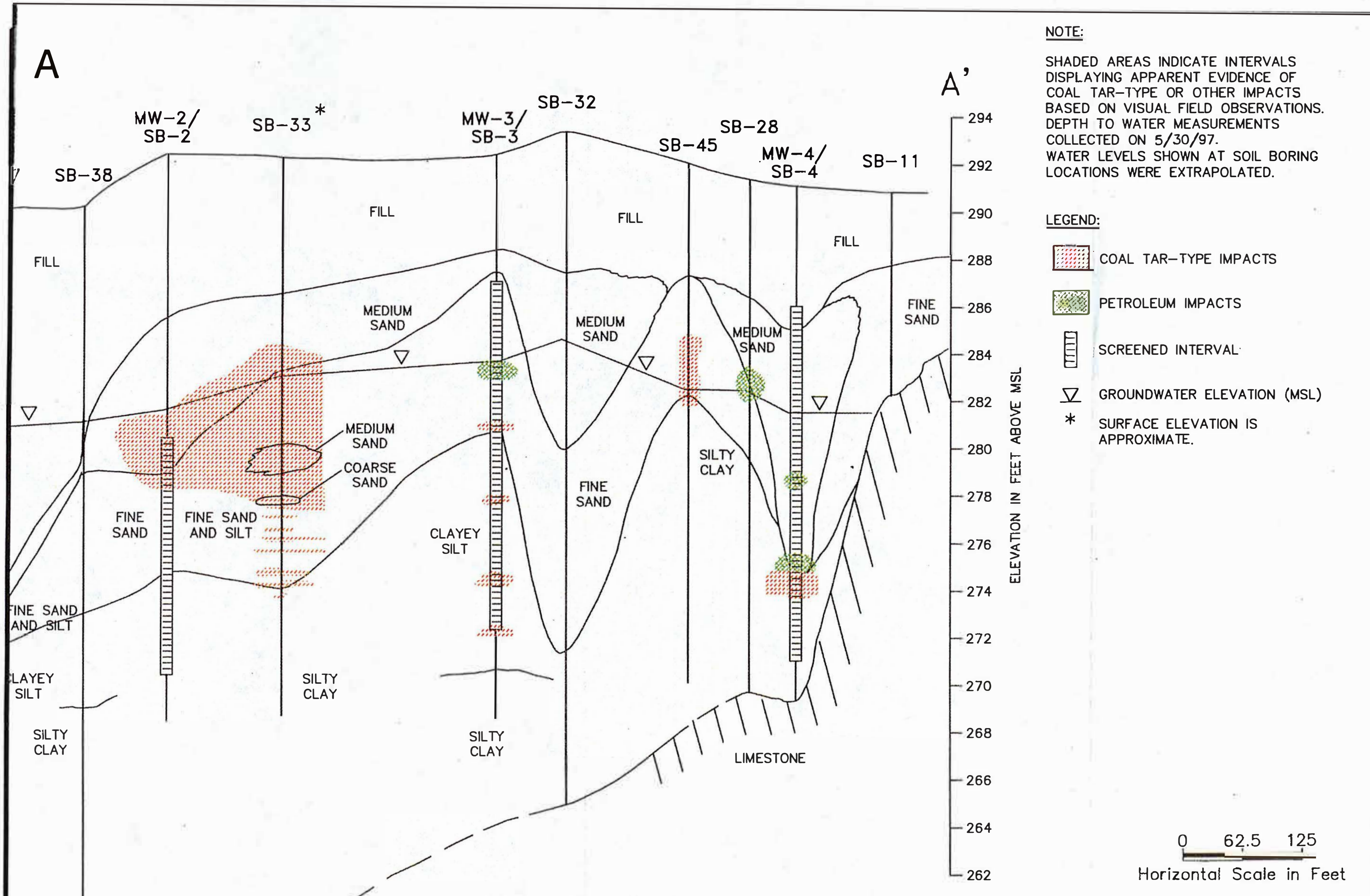
FIGURE 3



NIMO GLENS FALLS MOHICAN ST. SITE
GLENS FALLS, WARREN COUNTY, NEW YORK

CROSS SECTION B

FIGURE 4

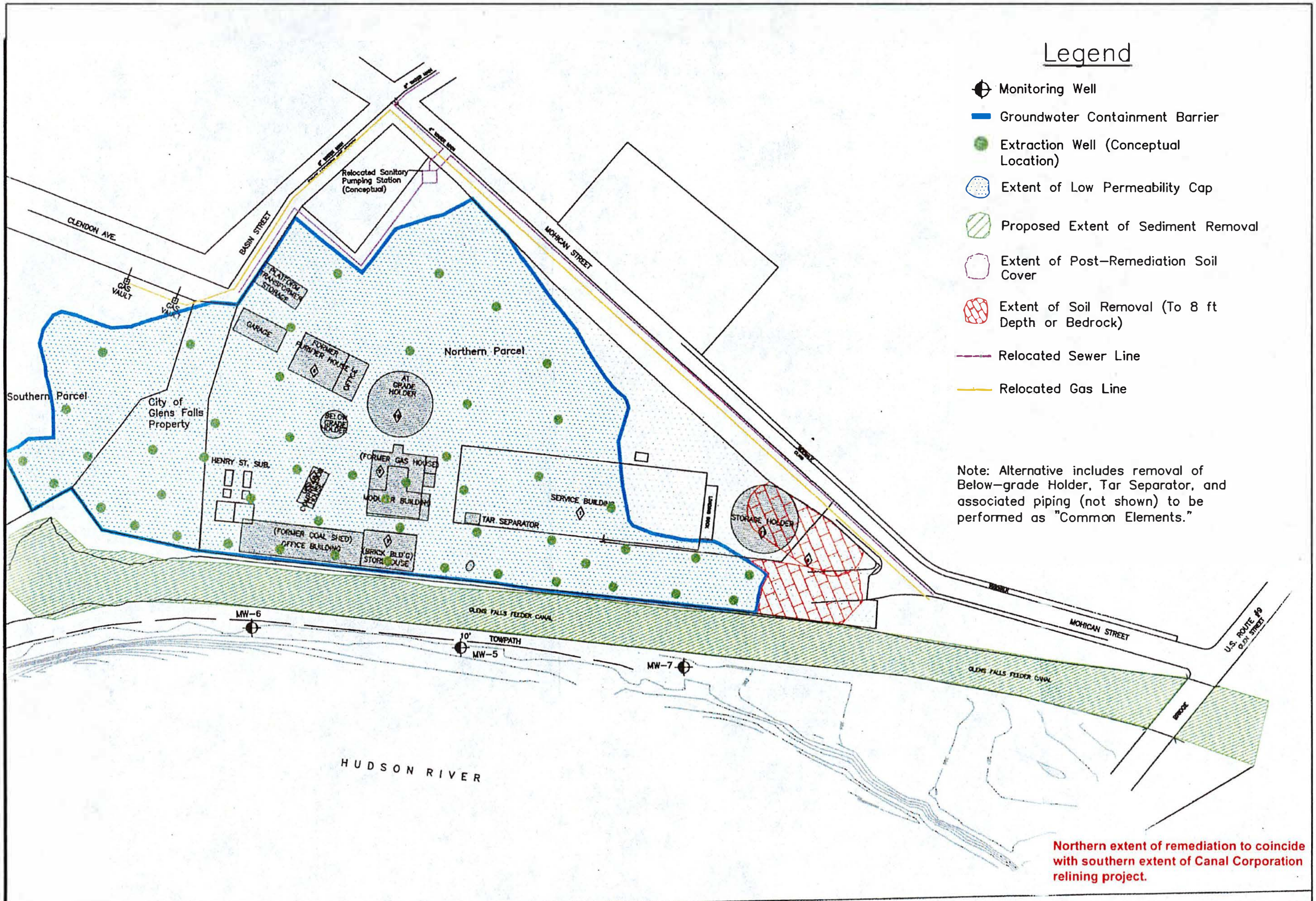


Original Figure prepared by Foster Wheeler Environmental Engineering Corporation, PC. Modified by NYSDEC

NIMO GLENS FALLS MOHICAN ST. SITE
GLENS FALLS, WARREN COUNTY, NEW YORK

CROSS SECTION A

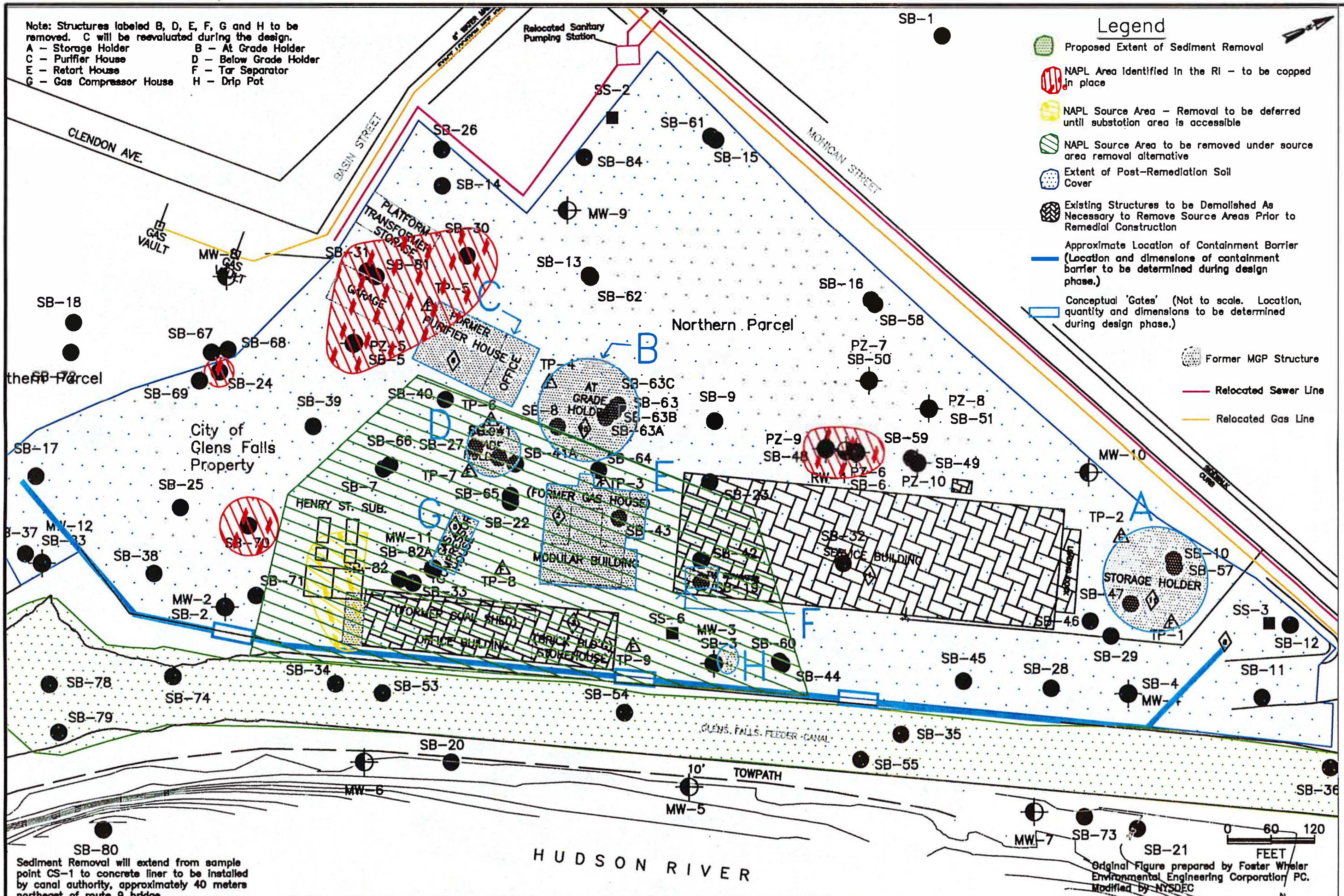
FIGURE 5



NIMO GLENS FALLS MOHICAN ST. SITE
GLENS FALLS, WARREN COUNTY, NEW YORK

ALTERNATE 2 - LOW PERMEABILITY CAP AND CONTAINMENT WALL

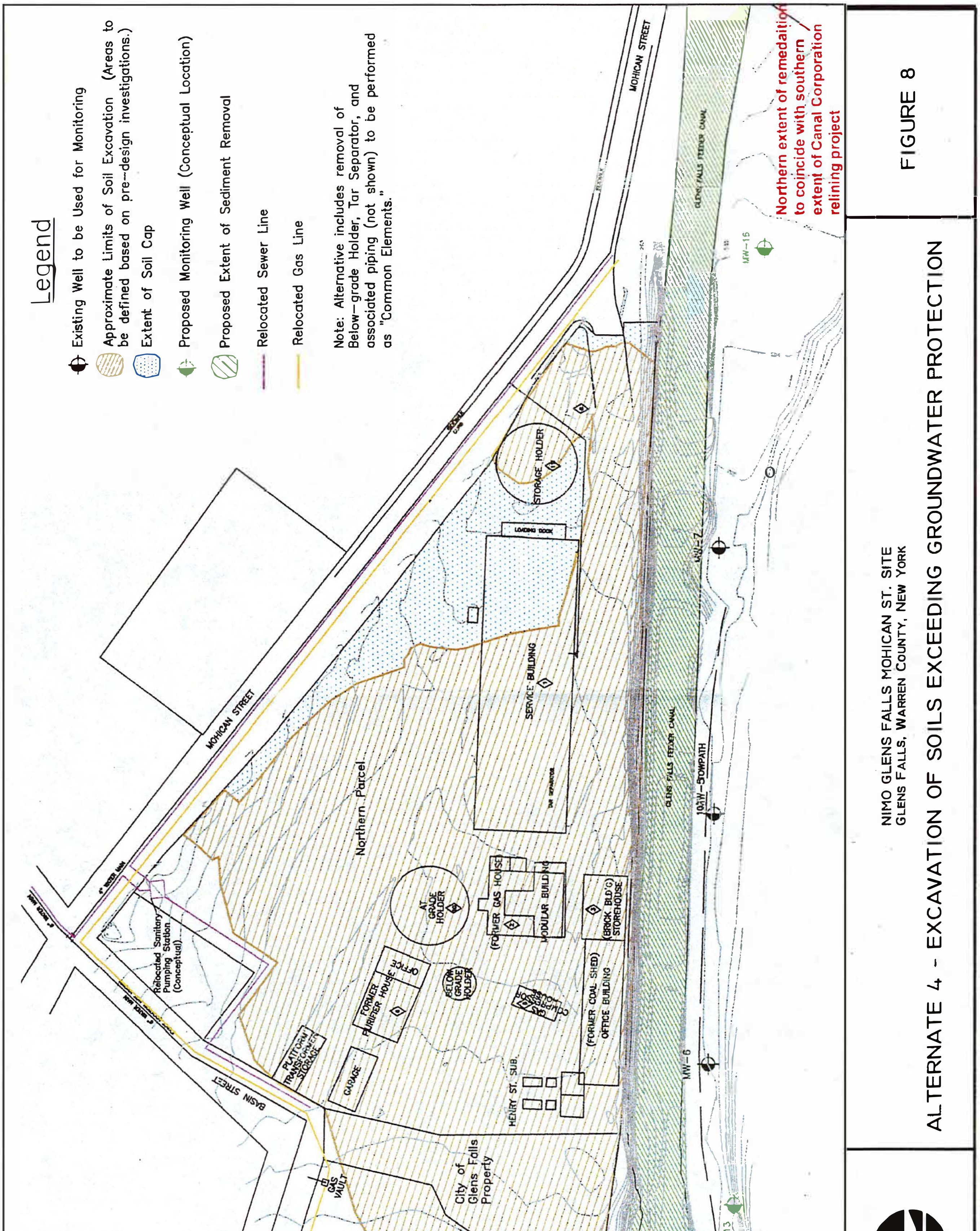
FIGURE 6



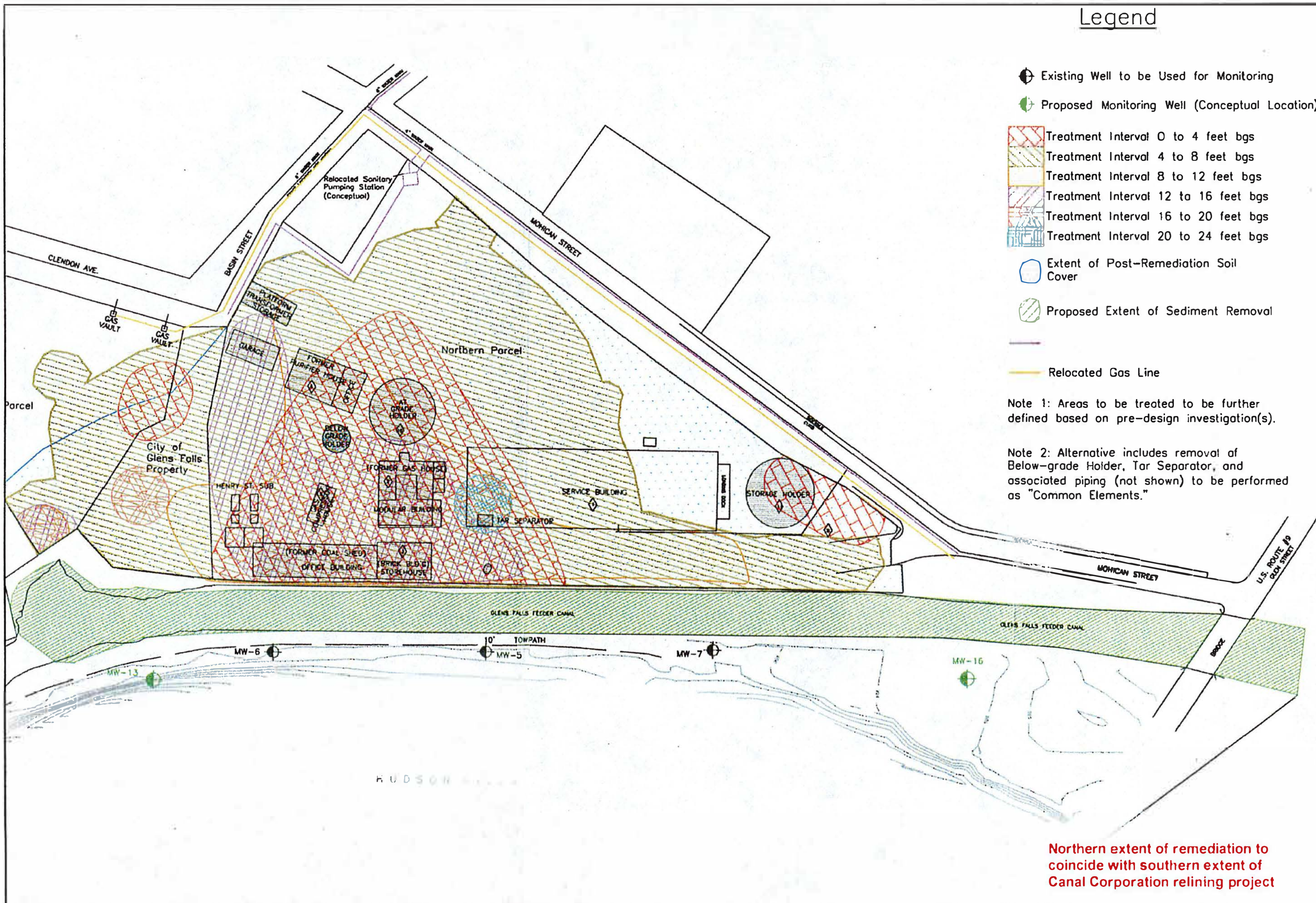
NIMO GLENS FALLS MOHICAN ST. SITE
GLENS FALLS, WARREN COUNTY, NEW YORK

ALTERNATE 3 - SOURCE AREA REMOVAL

FIGURE 7



Legend
Existing Well to be Used for Monitoring
Approximate Limits of Soil Excavation (Areas to be defined based on pre-design investigations.)
Extent of Soil Cap
Proposed Monitoring Well (Conceptual Location)
Proposed Extent of Sediment Removal
Relocated Sewer Line
Relocated Gas Line
Note: Alternative includes removal of Below-grade Holder, Tar Separator, and associated piping (not shown) to be performed as "Common Elements."
Northern extent of remedaition to coincide with southern extent of Canal Corporation relining project
MOHICAN STREET
BASIN STREET
CLENDON AVE.
Northern Parcel
Southern Parcel
City of Glens Falls Property
Relocated Sanitary Pumping Station (Conceptual)
STORAGE HOLDER
LOADING DOCK
SERVICE BUILDING
TAR SEPARATOR
AT GRADE HOLDER
(FORMER GAS HOUSE)
MODULAR BUILDING
(BRICK BLD'G) STOREHOUSE
(FORMER COAL SHED) OFFICE BUILDING
GAS COMPRESSOR HOUSE
BELOW GRADE HOLDER
FORMER PURIFIER HOUSE
OFFICE
PLATFORM TRANSFORMER STORAGE
GARAGE
HENRY ST. SUB.
GAS VAULT
GAS VAULT
GLENS FALLS FEEDER CANAL
TOWPATH
MW-7
MW-6
MW-13
MW-15
NIMO GLENS FALLS MOHICAN ST. SITE
GLENS FALLS, WARREN COUNTY, NEW YORK
ALTERNATE 4 - EXCAVATION OF SOILS EXCEEDING GROUNDWATER PROTECTION
FIGURE 8



NIMO GLENS FALLS MOHICAN ST. SITE
GLENS FALLS, WARREN COUNTY, NEW YORK

ALTERNATE 5 - IN SITU STABILIZATION

FIGURE 9

APPENDIX A

RESPONSIVENESS SUMMARY

NIMO Glens Falls - Mohican Street Former MGP Site, Operable Unit No. 01 City of Glens Falls, Warren County, New York Site No. 5-57-016

The Proposed Remedial Action Plan (PRAP) for the NIMO Glens Falls - Mohican Street Former MGP Site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH), and was issued to the document repositories on January 31, 2003. The PRAP outlined the remedial measure proposed for the contaminated site soils, surface water, groundwater, and sediments associated with the site.

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

A public meeting was held on **February 19, 2003**, which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 5, 2003.

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

Comment 1: What kind of contamination was found in the Feeder Canal?

Response 1: The contamination found in the Canal sediments adjacent to the site was consistent with the coal tar found on the site, and is present as a dense non aqueous phase liquid (DNAPL), consisting predominantly of the volatile compounds benzene, toluene, ethylbenzene and xylene (BTEX) and the sem-volatile compounds known as polycyclic aromatic hydrocarbons (PAHs). The PAHs are largely insoluble in water and appear as a DNAPL in the sediments of the canal and also result in intermittent sheens on the surface of the canal. As BTEX is lighter than water and more soluble, it appears as sheens in the canal. Both were also identified in the sediment analytical results at elevated levels, where the above described visible indicators are not present. While sheens may be present on the water surface, analytical results of the water in the canal did not detect levels of these contaminants above surface water standards. This is due to the effect of dilution when collecting the volume of water necessary for the analysis, however the presence of such sheens is still a contravention of surface water standards.

Comment 2: Is the contamination in the canal a possible threat to drinking water intakes, wells and other downstream users?

Response 2: No drinking water intakes were identified in the Feeder Canal, nor were water supply wells identified in close proximity to the area of the canal impacted by the site. As discussed in Response 1, the dilution effect on the large volume of water in the canal would be expected to preclude levels of contaminants above drinking water standards. This is supported by analytical results of the feeder canal water. The sheens generated are a potential point of exposure for canal users in the immediate proximity of the site. The sheens typically are also broken up by wave action or otherwise diluted before they travel very far down stream, where the channelized nature of the canal in this area minimizes casual contact aside from boaters.

Comment 3: Has anyone looked at private wells in the neighborhood? There is at least one private well on a residential property on Clendon Avenue that is used for watering lawns and gardens.

Response 3: The investigation of the site found the contaminated groundwater was limited to the southeastern portion of the site, near the Henry St. Electric Substation, where it discharges to the feeder canal. Based upon the groundwater investigation of the RI, any well in the Clendon Avenue area would be up-gradient of the site and the related contamination. Upgradient is the equivalent to being upstream in a surface water body. The closest monitoring well to Clendon Avenue is MW-8. Groundwater samples from this well were non detect for both the BTEX and PAH compounds. Low levels of cyanide, 37 to 39 ppb, were detected in this well; however, these values are well below drinking water standards.

Comment 4: Will wells be tested for the presence of these chemicals at those residences within a reasonable distance of the site?

Response 4: Due to their presence in many everyday products, such as gasoline, fuel oil and products containing mineral spirits, possible property conditions unrelated to the site could result in the presence of BTEX or PAH compounds. Therefore, sampling of private wells is evaluated on a case by case basis and would be considered only if an impact from the site was anticipated, based upon existing groundwater contamination. During the remedial investigation the extent of groundwater contamination was fully defined. As stated in Response 3, the groundwater contamination appears to be restricted to the site and the canal tow path, so the need for sampling of wells in the up-gradient area is not considered necessary.

Comment 5: There used to be homes on Mohican Street; could the occupants of those homes have been exposed to contaminants from well water?

Response 5: Without specific data from these properties such as the presence of wells or other possible exposure points, it is not possible to determine whether any exposure may have occurred.

Comment 6: Will residents and former residents who live or have lived in the immediate proximity of the site be offered free testing for detectable levels of those chemicals found to be present at the site?

Response 6: The investigation of the site has not identified any completed exposure pathway, i.e. contact or ingestion, with any site related contaminants. Such testing and monitoring would not provide meaningful results due to the complex cause and effect relationship of exposures to chemicals. Additionally, as discussed in Response 4, the site contaminants are commonly found chemicals and there would be no way to conclusively identify the source of the contamination or differentiate any potential impacts from other sources.

Comment 7: Is it possible to do blood testing for those individuals?

Response 7: The investigation of the site has not identified any completed exposure pathway, i.e. contact or ingestion, with any site related contaminants and therefore medical testing to evaluate such exposures is not being considered.

Comment 8: Will every effort be made to establish a transportation routing for vehicles carrying the removed matter that does not impact the city playground area at Murray and Mohican Streets?

Response 8: Yes, every reasonable effort will be made to protect the public from materials transported to and from the site. This would include minimizing traffic on the secondary roads to the west of the site, where the city playground is located. Haul routes for off-site disposal are typically identified during the design phase of the project and the public will be afforded an opportunity to review the design documents. Also see Response 9.

Comment 9: What steps will be taken to protect the public from airborne matter during removal?

Response 9: The removal will be completed in conformance with a site specific Health and Safety Plan, and the New York State Department of Health's Community Air Monitoring Plan. Site activities will be continuously monitored and engineering controls, such as vapor suppressing foam, will be employed to control any potential emissions. If any activities generate odors or emissions not in compliance with these plans they will be immediately corrected or ceased. The public will be afforded an opportunity to review the design documents which will identify the steps to address this issue.

Comment 10: What is the proposed effect on the larger Niagara Mohawk service building?

Response 10: When this question was raised at the public meeting, based upon the presentation in the Niagara Mohawk (NM) FS and discussions with NM, it was the DEC's understanding that this building would be demolished to facilitate the removal of the impacted structures and soils near and beneath a portion of it. However, in NM's letter commenting on the PRAP, NM indicated that a decision on demolition of all or a portion of the building would be made during the design of the remedy. Also see Response 29.

Comment 11: What is the time frame for this demolition, will it be in the first year?

Response 11: This will be determined in the remedial design. At this time, we anticipate that this demolition, if needed, would occur in the first or second year of remedy implementation.

Comment 12: We represent the Feeder Canal Alliance. We utilize the canal and tow path for canoeing, biking and other activities. How would the remedy impact our activities?

Response 12: The level of disruption will be dependent on the final design, which has not be completed. At this time, we anticipate that access along the tow path will only be restricted in the immediate vicinity of the site during the sediment excavation work in the feeder canal. This work will likely occur during a single winter when the canal is dewatered. As noted in Response 9, the public will be given an opportunity to review the design.

Comment 13: How can we get that information out to our members?

Response 13: The Department will provide that information to the Feeder Canal Alliance when it becomes available, see Response 12. The Department could also provide a fact sheet for the Feeder Canal Alliance's dissemination or progress updates upon request.

Comment 14: Considering the issues raised by the Niagara Mohawk statement (see Comments 20 to 27 below), are Niagara Mohawk and the New York State Department of Environmental Conservation in agreement on the remedy?

Response 14: We believe the remedy proposed in the PRAP and selected by this Record of Decision (ROD) is essentially what was presented in the Niagara Mohawk FS and accepted by the Department. However, as noted in NM's comments, there are details that we are continuing to refine due to data interpretation, data extrapolation and semantics.

Comment 15: Is one of the evaluated alternatives more expensive than the others?

Response 15: Yes. The costs of all of the alternatives were identified in Table 2 of the PRAP (and ROD). These costs vary from $ 129,000 to $ 26,340,000. The proposed remedy was selected based on a comparative analysis of the following criteria: protection of human health and the environment; compliance with standards, criteria and guidance; short term effectiveness; long term effectiveness and permanence; reduction of toxicity, mobility, or volume; implementability; cost effectiveness; and community acceptance. Cost is only one of eight factors evaluated in proposing a remedy.

Comment 16: Has there been any communication from the city regarding the possible future uses of the site?

Response 16: As of the public meeting, the Department has received several informal inquiries; however, the City of Glens Falls has not yet advanced any formal plans or positions regarding potential uses of the site. Also see Responses 86 and 87 for the City's comment on the PRAP, which addresses this issue.

Comment 17: About 15 years ago, the DEC cleaned up the Luzerne Road Site. Then they came back to remove more soils. Then they came back because the containment cell was leaking. So, I do not have a lot of faith in the remedy you are proposing for this site.

Response 17: The remedy proposed for this site will address the identified contamination. For any site, however, the possibility of a changed condition exists. The operation, maintenance and monitoring (OM&M) plan requirements for a site are intended to confirm the remedy will perform satisfactorily and will include provisions to implement modifications or adjustments as needed. However, these sites can be complex, such as Luzerne Road, and it may at times, be necessary to review a remedy.

Comment 18: What was done at the Excelsior Spring site in Saratoga Springs? That site has the same type of contamination and also has water coming down the hill into the site like Mohican Street.

Response 18: The Saratoga Springs site remedy consisted of a watertight sheet pile system around the entire site, groundwater collection within the sheet pile, source area removal and an impermeable cap. At Mohican Street the remedy is comparable, except it will employ a barrier wall with an in-situ treatment system on the down gradient side of the site due to less complex groundwater conditions.

Comment 19: Will materials removed from the feeder canal be managed as soil or dredge spoils, and will technical DEC guidance apply other than the solid waste facility's O&M criteria (permits)?

Response 19: The Department anticipates that the material from the feeder canal will be managed as soil, since the canal is a man made structure that is dewatered every year allowing these materials to be removed by standard excavation equipment in a dry excavation. The ability of a specific treatment or disposal facility to accept these materials will be determined by that facility's permit criteria.

At the public meeting, Mr. Steven Stucker representing Niagara Mohawk/A National Grid Company, read the following comments into the public record.

Comment 20: The Record of Decision should also reiterate that MGP structures containing significant volumes of soil saturated with NAPL within the polygon are the focus of the removal, as noted on Figure 7. As previously discussed with the Department, the feasibility and need to remove these structures should be evaluated during the predesign phase.

Response 20: The need for and feasibility of this work was clearly documented and established by the RI/FS. In agreement with these reports, the Department has concluded and defined in the Record of Decision their removal, as well as the disposal/treatment of the contaminants within and adjacent to these structures.

Comment 21: The FS indicates that any uncertainties identified during the RI/FS would be resolved through the predesign investigations, which will include the further delineation of NAPL impacts within the polygon identified for removal in Figure 7, the former MGP structure labeled C (former purifier house), and the former MGP structure labeled B (at grade holder) in Figure 7. The Department needs to ensure that the ROD incorporates this concept.

Response 21: The Department accepted this language in the FS, as Niagara Mohawk maintains there is some uncertainty associated with the extent of contamination in the two identified structures. Based on the presence of substantial contamination outside of three of the four walls of the former structure C, experience at numerous other sites where purifier structures contain significant tar and the results of test pit 5, the Department is confident that contamination within this structure would warrant removal. However, the Department also acknowledges that there are no borings within this structure and the resulting uncertainty is best resolved in the remedial design. Again based on experience at other MGP sites, the results of test pit 4, and the results of soil borings SB-8, SB-63A, SB-63B and SB-63C, the Department maintains that structure B is clearly a source area and will require the removal of this structure, as well as the disposal/treatment of the contaminants within and adjacent to this structure. Hence the language that was utilized in the Record of Decision. The FS, the PRAP and now the ROD, were developed with the understanding that excavation within the referenced polygon may identify subsurface conditions that will cause the excavation and disposal/treatment volumes to be either increased or decreased, within the limits of the polygon.

Comment 22: The pre-design effort should evaluate the need and feasibility of excavating soil below the water table.

Response 22: The need and feasibility for this work was clearly evaluated and documented in the NM RI/FS. Specifically, the need and ability to dewater was evaluated in the FS for soil alternatives S-3 and S-4, which were identified as technically feasible. Based on the RI and FS, the Department has concluded that removal is necessary and feasible below the water table and will be implemented based upon the removal criteria identified by the FS, PRAP and ROD. The only question to be answered by the pre-design work is the extent of the removal needed to meet the criteria, as discussed in Response 21.

Comment 23: As indicated in our Final FS transmittal letter to DEC, dated December 3, 2002, if pre-design investigations indicate that the area within the Purifier House or At-grade Holder structure footprints represent impacted former MGP structures containing NAPL, then in-situ remedial alternatives (e.g. passive NAPL collection, stabilization, Chem-Ox, etc.) will be evaluated along with soil removal alternatives.

Response 23: NM's FS report evaluated the effectiveness of in situ remedial alternatives and concluded that their use would be precluded by one or all of the following; the utilities, structures, debris, fill and fine grained materials present at the site. Therefore, only one in situ process was retained by the FS for evaluation as a detailed alternative, stabilization/solidification in conjunction with the removal of the site structures and utilities. The utilization of the requested remedial treatment options for the identified structures in the Record of Decision would be inconsistent with the evaluation and recommendations of the NM FS and is therefore not included in the ROD.

Comment 24: In situ remedial alternatives would be less intrusive, yet would provide comparable protection of human health and the environment at this industrial property.

Response 24: As discussed in Response 23, these in situ technologies were evaluated and dismissed by the NM FS. Since these technologies were not accepted, their use in this instance and the claim of comparable protection of public heath and the environment is not a conclusion that is supported by any scientific analysis. The removal of on site source areas is a component of the NM FS remedy, has been a component of virtually every remedy or IRM performed at New York State MGP sites, and is consistent with DEC practice of removing source areas where feasible at any site.

Comment 25: Pg. 20, Item 7. NM does not agree with the goal stated in the last sentence of Item 7. We suggest that the sentence be terminated after, "...exposed PAH contaminated sediments." The feeder canal remedial alternative in the FS consists of removal of contaminated sediment to a depth of two feet and replacement with comparable material. This would eliminate material that could potentially impact the surface water and sediment ecosystem. The Record of Decision should clarify that removal will be based solely on a two foot depth.

Response 25: The PRAP and ROD specifically call for the removal of all sediments above background. This would be consistent with Department guidance to NM during the FS process and is consistent with the FS which called for the removal of sediment from the canal to "an estimated design depth of two feet". The removal specified by the ROD would generally be two feet or less, except for areas where the contaminated coarse grained sediments overlying the canal's clay liner are thicker (SB-34, SB-53 and SB-54). The modification to the site remedy proposed in the comment would require leaving in place highly contaminated sediment in limited areas (SB-34) on a third-party land owner's property. Such containment of contaminated sediments may not be administratively feasible and was rejected by the NM FS due to institutional controls that may be incompatible with the recreational and water level/flood control use of the canal. See also Response 26.

Comment 26: Regarding the lateral extent of sediment removal, NM will better identify sources of PAHs to the Feeder Canal (e.g. storm sewers, etc..) during pre design activities, and refine the background sediment value for PAHs. The DEC proposed background number appears to be unrealistically low given the long term industrial history of the area surrounding the site.

Response 26: Niagara Mohawk's Supplemental RI Report defined the limits of the impacted sediments based on the background station sample CS-1, which was 9 ppm for total PAHs. This is the background value and limits of impacted sediments that was utilized in the Record of Decision. This location was accepted as background for the canal sediments by the Department as it is: immediately up-gradient of the site and the drain valve for the canal; out of the three sediment samples collected up-gradient of the site this location contained the lowest levels of PAHs; and the low levels of cyanide observed in the sample are not considered a valid detection due to matrix interferences observed throughout the canal sediment samples.

Comment 27: NM would like flexibility to evaluate performance of the barrier wall/funnel and gate following its installation. In other words, we would like an opportunity to prove that this part of the remediation is effective in providing protection to the adjacent Feeder Canal and to refine the volume of soil removal from the site. To proceed with additional soil removals immediately after barrier wall/funnel and gate installation does not make sense, as the purpose of the wall and treatment system is to stop migration.

Response 27: The purpose of the barrier wall/funnel and gate system is to prevent further migration of contaminants into the Glens Falls Feeder Canal. However, the removal of on site source areas, in addition to reducing future migration into the feeder canal from the site, is also considered necessary to minimize the potential for NAPL impacts on the treatment system and for consistency with the DEC preference for the reduction of toxicity, mobility, and volume of waste remaining at a site. Therefore, the ROD will not provide for the refining of the volume of soil removal from the site based on the barrier wall/funnel and gate system's performance.

Comment 28: The soil removal should be limited to the NAPL impacted structures. Piping encountered during remedial activities should be cut, free drained and capped. This approach is consistent with the focus of the remediation on mobile NAPL source areas.

Response 28: Niagara Mohawk's FS also identified soil in the vicinity of the NAPL impacted structures which represents mobile NAPL source areas. The presence of highly contaminated materials and NAPL adjacent to such structures is common at MGP sites due to leakage and spillage. These conditions were observed at this site, i.e. SB-64 and SB-65. Therefore, the ROD will require the removal of all impacted structures and surrounding soils, as well as major piping associated with these structures. The ROD does not require the removal of all piping and allows for peripheral piping to be cut, free drained and capped. The ROD clarifies that the extent of any removal of the piping can be determined in the design.

Mr. Stucker of NM also provided the following written comments in a follow up letter dated March 5, 2003. This letter included the reiteration of comments 20, 21, 22, 25, 26 and 27 from the oral comments identified above:

Comment 29: A general comment on Figure 7 relative to the "Service Building". NM would prefer to evaluate the need to keep the Service Building during the pre design activities. NM believes that the Tar Sump can be addressed without removal of the building.

Response 29: While the NM FS called for the demolition of the service building, which is the basis for this statement in the PRAP, the Department is open to reconsideration of the need, provided the agreed upon source area materials can be removed from the site. The crew facility will need to be demolished to install the barrier\treatment wall and remove source areas, as identified by the NM FS. The ROD has been modified accordingly.

Comment 30: One of our major overall concerns is that it appears that the PRAP's description of areas requiring remediation does not match with the NYSDEC approved Feasibility Study for the site. For example, "Source Areas" are defined in the NYSDEC approved FS include locations at the site where significant volumes of soil have been found to be heavily saturated with product (NAPL), grossly impacted soils, or as containing free flowing product or coal tar.

Response 30: The PRAP definition for source areas on page 19 in the itemization of the elements of the remedy, was verbatim from the NM FS. The discussion of source areas on page 9 of the PRAP elaborated on the definition for clarity, for example the NM FS use of "heavily saturated" in the definition of source areas was considered repetitive as saturated by definition precludes a material from being heavily or lightly saturated. NM comments on the PRAP, see Comments 31 and 32, suggested revisions to this definition, such as noting the need to, "clarify what is defined by "grossly impacted" or strike it from the document. The Department agrees that terms such as "grossly impacted" or "grossly contaminated" need definition if retained.

The definition of source areas was a significant topic of discussion between the Department and NM during development of the NM FS. NAPL mobility and resulting exposures is a significant issue at this site; it was the focus of the NM FS and remains the focus of the remedy. Migration of NAPL from the former MGP structures and contaminated soil in the subsurface has resulted in the significant soil, groundwater and sediment contamination which this remedy will address.

Therefore, the definition and removal of the source areas responsible for this mobile NAPL is fundamental to an effective remedy. The delineation of the polygon area for source area removal was the result of these discussions, along with the definition of NAPL impacted material presented in the NM FS.

The definition of source area in the NM FS represented the initial attempt at defining this critical element of the remedy. While not absolute, it was adequate to allow alternatives to be developed, the NM FS to be accepted and a PRAP to be prepared for public review and comment. The remedy and source area definition proposed in this ROD is consistent with the approved NM FS, as evidenced by the identical area specified for removal.

Under the DER-MGP program, the basis for the definition of source area is to require the removal of NAPL/coal tar contaminated MGP structures and other areas of soil which contain mobile coal tar or NAPL

After consideration of the basis of the definition, the definitions utilized in the NM FS and PRAP, and the subsequent comments on the PRAP definition, the ROD will read:

> Source areas are defined as the locations at the site of former MGP structures and/or those areas of soil which contain significant volumes of coal tar waste or which are saturated with visually observed separate phase product (NAPL). Soils exhibiting odors, staining and/or sheens will not be considered for removal as source areas.

Comment 31: Page 9, 1st paragraph, 5th sentence; [Regarding the definition of, "Source Areas] suggest striking "areas of significant waste disposal have been termed...." Suggest striking "identified", "there are", and "visually" from this sentence, so that the sentence reads: "Source Areas are defined as locations at the site where former MGP structures containing significant volumes of soil saturated with NAPL" After initial use of source areas in this sentence, suggest referencing as 'Source Areas' thereafter (i.e. no quotes).

Response 31: As discussed in Response 30, the definition of source areas from the NM FS has been revised as a result of input including comments from NM. The designation of source areas at MGP sites will likely remain an evolving one, to allow for the consideration of site specific conditions.

Comment 32: The Record of Decision should clarify that the "Source Areas" subject to potential soil removal are limited to the polygon area on Figure 7 of the PRAP which contains structures D, E, F, G and H per the FS. A schematic representation of the preferred site wide alternative was presented in Figure 6-1 of the Final FS Report. This alternative encompasses locations where NAPL has not been identified in soil borings advanced at the site. Therefore, as agreed upon between NM and NYSDEC at our October 10, 2002, meeting the polygon conceptual extent of removal has been acknowledged by all parties as representing a worst-case NAPL source area removal scenario. Accordingly, the lateral extent of the predesign investigation will be limited to the boundary of the polygon footprint depicted on Figure 7, as agreed to between NYSDEC and NM on October 10, 2002.

Response 32: The polygon represents the worst case lateral extent for removal and disposal/treatment of subsurface soils with NAPL contamination, in conjunction with the removal of the former MGP structures that are also contaminated with NAPL. The extent of this polygon was agreed to by the Department and NM, as it represents a delineation for removal of those NAPL contaminated soils at the site that are acting as a source of additional contamination to soils, groundwater, surface water and sediments at the site; those areas that are defined as source areas in Response 30. With the removal of these source areas, a significant mass of the mobile contaminants at the site will be eliminated. The extent of the removal of subsurface soils within this polygon will be refined in the remedial design, to limit the need for the off site disposal/treatment of the soils to those that are consistent to the source area definition. As the polygon was meant to delineate those NAPL contaminated soils at the site whose removal was feasible, i.e. due to depth or economies of scale, it was not drawn to include or exclude the two impacted structures upgradient of the polygon contaminated soils. The basis for the ROD actions for these structures is discussed in Response 21.

Comment 33: Page 19, Item 2, the PRAP should also clarify what is defined by "grossly impacted" or strike it from the document.

Response 33: As noted in the previous Response 30, the definition of source areas as provided in the NM FS has been revised due to input, such as this comment provided by NM which requests a different definition than that in the FS submitted by NM. The use of "grossly contaminated" has been replaced where utilized to define the source areas.

Comment 34: Page 19, Item 2, clarify that NAPL-impacted source areas inside the polygon are targets for evaluation of soil removal, not NAPL and source areas. The existing language in the PRAP is too vague.

Response 34: Section 8, Item 2 of the ROD has been revised as follows: source area materials will be removed and transported off-site for thermal treatment and/or other appropriate disposal.

Comment 35: Page 19, 2nd column, Item #1, 2nd sentence: Should be revised to read, "Any uncertainties identified during the RI/FS would be resolved *through pre-design investigations*, which *will* include the further delineation of NAPL impacts within the polygon identified for removal in Figure 7, the former MGP structure labeled C (former purifier house), *and the former MGP structure labeled B* (at-grade holder) in Figure 7.

Response 35: See Response 21.

Comment 36: The areas and volumes identified for removal based on the predesign investigation may ultimately be less than those presented in Table 1 of the letter to NYSDEC dated 11/8/02 [by NM]. Page 19, Item 2, should be revised to reflect this issue.

Response 36: The ROD utilizes the range of 2,500 to 16,000 cubic yards for the selected alternative to reflect this issue. This volume may be either increased or decreased, within the limits of the polygon identified for remedial action in the selected alternative, based upon the predesign and remedial action efforts.

Comment 37: Figure 7 should clearly indicate what structures are associated with each letter.

Response 37: Figure 7 has been revised to address this item.

Comment 38: Page 20, Item 3. The feasibility of excavating soil below the water table was not evaluated during the FS. The predesign effort will evaluate the need and feasibility of excavating below the water table. This element of the proposed remedy assumes deep excavation of source area soils below the water table. Excavation to these depths may not be feasible.

Response 38: See Response 22.

Comment 39: Page 20, 1st column, Item #4, 1st sentence: As indicated in our Final FS transmittal letter to DEC, dated 12/3/02, if predesign investigations indicate that the area within the Purifier House or At-grade Holder structure footprints represent impacted former MGP structures containing NAPL, then in-situ remedial alternatives (e.g. passive NAPL collection, stabilization, Chem-Ox, etc.) will be evaluated along with soil removal alternatives. To clarify, Niagara Mohawk intends to remove mobile NAPL from the interior of these structures, if present. If mobile NAPL is found under these structures, it is our intent to utilize passive NAPL collection or other in situ remedies to address NAPL found under the foundations.

Response 39: See Response 23.

Comment 40: In situ remedial alternatives would be less intrusive, yet would provide comparable protection of human health and the environment at this industrial property. We believe that this is an acceptable technical solution for a number of reasons: 1) these structures are some distance from the feeder canal, and the funnel and gate system proposed to be installed will prevent future migration of NAPL and unacceptable concentrations of dissolved constituents to the Feeder Canal, and 2) the foundations of the purifier house and at grade holder may be extensive and difficult to remove.

Response 40: The purpose of the barrier wall/funnel and gate system is to prevent further migration of contaminants into the Glens Falls Feeder Canal. The removal of the source area is discussed in Responses 24 and 27. Regarding the ability to remove former MGP structures, the demolition of old structures is a common construction practice. In fact, the partial demolition of the purifier house foundation and at grade holder foundation was probably required to install the former parking shed at this facility, as well as the numerous other facilities that Niagara Mohawk has constructed at the facility. The NM FS identified the need for specialized equipment to demolish former structures, but did not identify this as a technical impracticality.

Comment 41: Page 20, 1st column, Item #3, 1st sentence: If necessary [removal of the former MGP structures], removal should not proceed beyond one foot below the bottom of the structure.

Response 41: The full extent of the removal will be determined in the design and modified as necessary during remedial construction. However, it is the Department's expectation that the removal will continue until source area materials around and below the former MGP structures are removed. Based on data from Niagara Mohawk's SRI Report, these impacts extend well beyond one foot below the bottom of some of the former structures. For example, coal tar was observed continuously to 8 feet below the bottom of the at grade holder in SB 8B. A sample from 4 feet below the bottom of this structure yielded more than 2,000 ppm of TPAHs. As noted in Response 22, the NM FS found such excavation to be technically feasible and the feasibility of excavations below the water table is well documented in MGP remediations and Superfund remediations under taken by the Department.

Comment 42: Page 13, Section 7.1, third paragraph, DEC should revise the discussion on the sediment options to indicate that no other "appropriate" options were identified as opposed to "competitive" options, so that the sentence now reads, "The removal of impacted sediments is included with all remedial alternatives due to the lack of any other appropriate option to effectively address existing exposures and impacts in the Glens Falls Feeder Canal."

Response 42: Section 7.1 of the ROD has been modified to reflect this comment.

Comment 43: Page 11, 1st column under background samples. NM will better identify sources of PAHs to the Feeder Canal during pre-design activities, and develop a more accurate background sediment value for PAHs, as necessary. This value will be utilized to better refine the limits for sediment removal, as appropriate.

Response 43: See Responses 25 and 26.

Comment 44: Item 9, page 21 of the Proposed Remedial Action Plan (PRAP) should reflect a phased approach for remedial construction which is predicated on approval of the Remedial Design by NYSDEC. This conceptual schedule for the proposed phases of the remedial action was included in the NYSDEC approved FS.

Response 44: A phased approach was included in the selected remedy, as element 9. The approach in the ROD was modified from that in the FS, to account for activities during design and to provide a time for the completion of remedial design. This schedule may be modified further by the final design.

Comment 45: The Record of Decision should clearly indicate that excavated soil not containing NAPL would be eligible for use as backfill.

Response 45: Soil with low levels of contamination may be reused as backfill at the site, below the soil cover in areas excavated for source removal. The criteria for determining what soils will be appropriate for backfill will be determined in the remedial design. Section 8, item 2 of the selected alternative in the ROD has been modified to reflect this.

Comment 46: Page 15, 1st column, 1st full paragraph, 1st sentence: should be revised to reflect that imported backfill may be necessary to grade the site prior to the placement of final cover.

Response 46: The modification to Section 8, item 2 also reflects this.

Comment 47: The area of applicability for any post-remedial subsurface use restrictions (as potentially identified in a HASP or Soil Management Plan (SMP)) should be clearly defined. This would also help to clarify potential issues raised by on-site workers for subsurface activities elsewhere on this active site.

Response 47: This will be addressed by the soil management plan to be developed as part of the OM&M requirements for the site.

Comment 48: The requirements on pg. 21, Item 14 regarding the prior notification to DEC for intrusive work is not feasible. The SMP and HASP should be written to address these concerns.

Response 48: The SMP and HASP will be written to better define the requirements for notification to the Department for intrusive work. For example, due to the existence of critical utility infrastructure on the site, the potential for emergency utility work to occur that would preclude advance notice is certainly possibly. Whereas, the installation of a new building or extensive regrading would require Department notification.

Comment 49: The preferred site wide alternative presented in the May 2002 draft FS report was considered to be a cost effective remedy for the site based on the comparative evaluation performed during the FS, despite the fact that this remedy was not the least costly alternative considered. The selected site remedy that was presented in the NYSDEC approved FS is more costly than the alternative presented in the draft FS report. If predesign investigations identify significantly greater soil volumes requiring off site treatment/disposal than presented in the final FS, then the selected alternative may no longer be considered as satisfying the CERCLA evaluation criteria, particularly with cost. In such case, NM would petition that the selected site remedy, as presented in the NYSDEC approved FS, be reevaluated by NYSDEC.

Response 49: The Department will consider new information generated by the pre-design investigation, however, cost effectiveness is only one of eight criteria evaluated in selecting the site remedy, as discussed in Response 15. Regarding the cost effectiveness of the selected alternative, the NM FS dated December 2002 prepared by NM's engineering consultant generated the cost estimates, which identified the selected remedy in the ROD as cost effective. Costs and proposals in the draft documents are not relevant as they were not accepted or approved by the Department. Additionally, the costs in the approved FS are only estimates and (as noted on page 4-3 of the NM FS) the level of uncertainty for the cost estimates in this FS is minus 30% to plus 50%, which is typical for this type of preliminary estimate.

Comment 50: It should be noted that the area is a commercial/industrial area, and that any deed restriction or institutional control will be consistent with this usage.

Response 50: As noted on page 3 of the PRAP, the site is located in an urban residential/industrial section of Glens Falls. Further, there is a home adjacent to the site on the corner of Mohican and Basin Streets. However, the current use of the site for commercial and industrial use is acknowledged.

Comment 51: Section 1, the DEC should clarify in the ROD that the contamination at these locations dates back into the mid 1800s. The public should be reminded that neither Niagara Mohawk Power Corporation (NMPC), nor National Grid had any involvement with the operation of the former manufactured gas plant, other than possible successor status, in causing the contamination.

Response 51: The historical profile dated December 1992, identifies that Niagara Mohawk Power Corporation (NMPC) acquired the property in 1950. It also indicates the plant last operated on December 29, 1950, therefore it appears that NMPC actually did operate this plant, albeit briefly. No change has been made to the ROD.

Comment 52: In Section 2, the DEC should explain more fully the current use and status of the site. The description in Section 5.4 (active NM operations, chain link fence, extensive paving, etc.) provides a better picture of the site status. The DEC should explain the property history and status up-front so that the public understands that no imminent risk to human health and the environment exists.

Response 52: The site description in Section 2 has been revised. However, the site does indeed pose a current threat to human health and the environment.

Comment 53: Page 1, 1st column, 1st bullet, replace the word "threat" with "potential risk" so that the sentence now reads, "a significant potential risk to human health associated with current and potential exposure to contaminated site soils, contaminated groundwater, canal surface water and contaminated canal sediments."

Response 53: The site poses a current threat to human health and the environment.

Comment 54: Page 1, 2nd column, 3rd bullet, replace the word "threat" with "potential risk" so that the sentence now reads, "a significant potential risk associated with the impacts of contaminants to the groundwater resource, canal surface water, and canal sediments."

Response 54: See Response 53.

Comment 55: Page 1, 2nd column, 3rd bullet, statement should be revised to reflect that groundwater would not only be contained, but also treated in situ so that the sentence now reads, "A groundwater treatment barrier would be constructed to contain dense non aqueous phase liquid (DNAPL), treat contaminated groundwater and prevent their migration to off site areas."

Response 55: The noted statement has been made to read: A groundwater treatment barrier will be constructed to contain and remove for off site disposal dense non aqueous phase liquid (DNAPL) and treat contaminated groundwater and prevent their migration to off-site areas.

Comment 56: Page 3, 2nd paragraph, 1st sentence, Revise to reflect that the site is 6 acres in area, so that the sentence now reads, "The site consists of approximately 6 acres of land."

Response 56: The site acreage noted in the PRAP was based on information in the NM Supplemental Remedial Investigation Report. This information will be revised as requested in the ROD.

Comment 57: Page 5, 2nd column, 2nd bullet, suggest that the word "aquatic" be stricken (redundant), so that the sentence now reads "Collection of approximately 25 sediment samples (bringing the site total to 32)."

Response 57: The change has been made to the ROD.

Comment 58: Page 7, 2nd column, 2nd full paragraph, should be revised to reflect that the fingerprint analysis of a sample collected at the site indicated that the LNAPL encountered at the site appears to be a diesel fuel and that a recovery well installed in the area no longer recovers LNAPL.

Response 58: The fingerprint analysis identified the referenced LNAPL (observed in PZ-9) as diesel fuel or number 2 fuel oil. The LNAPL in PZ-9, which is no longer recoverable from nearby recovery well RW-1, is considered to likely be diesel fuel from a former underground storage tank in this area. However, it is also important to note that LNAPL has been observed at other areas of the site, i.e. PZ-5, and that diesel type petroleum was a common feed stock for carburetted water gas plants. Thus, for brevity and in the context of the paragraph's general MGP waste discussion, the existing language will be retained.

Comment 59: Page 9, 1st paragraph, suggest revising "NAPL" to "DNAPL."

Response 59: NAPL was utilized in the text, as LNAPL and DNAPL have both been observed near former plant structures, i.e. PZ-5 and MW-3. Therefore, the existing language use of NAPL has been retained in the ROD.

Comment 60: Page 9, 2nd column, last full paragraph, This paragraph should be revised to note that the cross sections depict BTEX and PAH impacts, not Source Areas so that the sentence now reads, "Please refer to Figures 3, 4, and 5 for cross sections that illustrates subsurface conditions at the site, and the identified subsurface BTEX and PAH impacts in relation to the former MGP structures."

Response 60: The sentence has been revised. The sentence now reads, "Please refer to Figures 3, 4, and 5 for cross sections from the SRI Report that illustrate the subsurface conditions at the site, and subsurface BTEX and PAH contamination in relation to the former MGP structures. Please refer to Figure 7 for the areas identified as, "source areas."

Comment 61: Page 12, 1st column, last paragraph: suggest revising this paragraph to note that dewatering of the canal also reduces the period of exposure to mobile aquatic organisms.

Response 61: The Department did not make this revision as additional revisions would be needed to the document to conversely note that the exposures are simultaneously increased for all organisms in the Hudson River. When the canal is dewatered, the drain valve from the canal to the Hudson River is open. This drain allows contaminated canal water and sediments to discharge into the Hudson River.

Comment 62: Page 12, 2nd column, 4th paragraph, the paragraph doesn't make clear how fish and aquatic flora and fauna will come into contact with subsurface soils and NAPL.

Response 62: Subsurface soils at the site are an environmental risk to flora and fauna in the canal as contaminated subsurface soils are present in the bank of the canal, and may enter the canal by erosion from the bank or through the subsurface storm drain lines that discharge into the canal. NAPL exposure has been documented by seeps observed in the bank of the canal, discharging from the subsurface storm drains and pooled on the bottom of the canal. The ROD language was not revised as the clarification is included here.

Comment 63: Page 15, Alternative 3 should indicate that the barrier wall would be keyed in to a clay layer, **where present**.

Response 63: The clay layer was observed at the site, except for borings SB-11 and SB-12. As the barrier wall will not be installed at the location of these borings in the extreme northern corner of the site, the barrier wall will be keyed in to the clay layer. It is the Department's position that if the clay layer is found to be absent where the barrier wall is to be installed during construction or the design, modification of the design or remedy may be required as the containment ability of a clay layer beneath the site and the barrier wall is a fundamental element of the selected remedy.

Comment 64: Page 13, section 7.1, paragraph two should clarify that common elements focused on removal of NAPL-impacted structures, not "contaminated" so that Item (1) reads, "the removal of NAPL-impacted subsurface MGP structures that remain on the site." Same comment in paragraph three.

Response 64: The ROD has been revised to utilized "contaminated" in place of "impacted" as noted, since contamination provides a better description.

Comment 65: Page 15 and 18, the PRAP should clarify that passive ground water treatment is proposed, not active pump and treat.

Response 65: The noted pages have been modified, with the inclusion that active collection of NAPL may be needed to prevent fouling of the passive groundwater treatment system. The Department expects this decision to be made during the design, and reevaluated during site operation and maintenance.

Comment 66: Page 18, 1st column, 1st full paragraph, 2nd sentence: this sentence should be revised to state that Alternative 4 would result in "more mass of contaminants" removed from the site so that the sentence reads, "This alternative would remove more mass of contaminants by excavating and disposing/treating site materials with lower concentrations of contaminants."

Response 66: The ROD has been revised to read, " Alternative 4 would reduce the overall mass of site contaminants even more than Alternative 3 by removing a larger volume of site soils with lower levels of contamination."

Comment 67: Page 20, 2nd column, Item #8, last sentence: should be revised to reflect that areas associated with roadways or parking would be covered by pavement that would maintain at least 6" of low permeable (not impermeable) cover above the geotextile, so that the sentence now reads, "Alternately, areas planned for construction of buildings or other structures and areas planned for roadways or parking would be covered by pavement in a configuration that would maintain at least 6" of low-permeable cover above the geotextile."

Response 67: The sentence has been revised to read, "Alternately, areas planned for construction of buildings or other structures and areas planned for roadways or parking will be covered by pavement in a configuration that will maintain at least 6" of asphalt or concrete above the geotextile."

Comment 68: Page 21, 1st column, Item #10, 1st sentence should be revised to state, "[s]ince the remedy would result in hazardous *constituents* remaining at the site, a long term monitoring program would be developed and then instituted upon the completion of remedial construction activities."

Response 68: Hazardous wastes will remain on the site, as materials contaminated by MGP wastes that failed toxicity characteristic leaching protocol (TCLP) sampling, and thus are hazardous by definition, will remain on the site after the selected remedial action is performed. Therefore, the existing language is retained in the ROD. Also see Response 71.

Comment 69: Page 21, 2nd column, Item #11, 1st sentence, Revise "objects" to "objectives"

Response 69: This change has been made to the ROD.

Comment 70: Cross hatching in Figure 7 for areas of potential removal must be revised to be consistent with the legend.

Response 70: The hatching has been revised to be consistent with that in the legend.

Comment 71: Page 21, Items 10 and 13; Delete the term "hazardous." There is no data available to indicate that soils exhibit hazardous waste characteristics based on the TCLP.

Response 71: Per Niagara Mohawk's SRI Report, page 4-17, "Seventy-one of the soil boring samples also analyzed for....., while five samples were tested for TCLP and RCRA parameters. Analytical data for the subsurface soil samples [underline added] were tabulated, and are presented as Appendix E, Tables E-8 through E-15." Table E-15, Sample SB-42, 6-8' failed TCLP criteria for benzene, thus characteristically qualifying this subsurface soil sample as a hazardous waste.

Comment 72: Page 22, Item 15, the DEC should attempt to better define the basis for, "not feasible".

Response 72: The criteria for this evaluation will be defined in the site operation and maintenance plan.

Comment 73: Note that Section 1 and Section 6 fail to mention the National Contingency Plan (NCP), even though NYSDEC regulations (Part 375) specifically refer to the NCP.

Response 73: The Department considers the references to Part 375 sufficient, as is noted by NM, this regulation references the NCP. Additionally, the Declaration Statement of the ROD, which is not a part of the PRAP, references the NCP.

Comment 74: The PRAP should specify that soil complying with Technical and Guidance Memorandum (TAGM) 4046 will be used as the upper two feet of soil cover.

Response 74: The PRAP and ROD both include this requirement in section 8, item 8.

The following comments were received in a letter dated March 5, 2003 from Mr. John Dergosits of the New York State Canal Corporation:

Comment 75: References to the "Canal Authority" should be changed to reflect the, "New York State (NYS) Canal Corporation". Also please eliminate "Barge" from references to the "Old Champlain Barge Canal."

Response 75: The requested revisions have been made to the ROD.

Comment 76: Has Niagara Mohawk conducted a survey of their property? We are specifically interested in our joint boundary and where it is in relationship to the remedial work.

Response 76: Surveys were completed as part of the site remedial investigation, to document sampling locations. It is unclear if the surveys were of a level or quality to define the referenced property boundary.

Comment 77: What mechanism will be used to conduct any long-term monitoring of the project area? Please be advised that the implementation of both construction activities and long-term monitoring will require a work and/or use and occupancy permit from the NYS Canal Corporation.

Response 77: The long-term monitoring requirements will be defined in the site OM&M plan. It is the Department's expectation that this monitoring will be conducted by Niagara Mohawk. The need for the specified permits is noted by the Department.

Comment 78: Continual coordination during design and construction between the Canal Corporation, Niagara Mohawk, and its consultants will eliminate the potential for conflicts to our [Canal Corporation's] operations. Please keep in mind that water flowing through this feeder during the navigational season must be maintained to allow us to pass vessels within the Champlain Canal. This feeder is the primary source of water to the high point of the Champlain Canal System.

Response 78: Coordination is essential to minimize disruptions to all facilities in the area of the site. It is expected that any work affecting the canal operations would be conducted outside of the navigation season, when the canal is dewatered.

Comment 79: The laid up stone wall on the south/west side of the feeder canal is a significant cultural resource, historic resource, and a distinguishing feature of the Canal System. We believe that the concrete wall north/east of the feeder canal may have a concrete cover over the original laid up stone wall. Coordination with the State Historic Presevation Office must be initiated to protect this valuable resource.

Response 79: Remedial efforts in the canal will have to be coordinated with the NYS Canal Corporation and the State Historic Preservation Office. NM will have to undertake all necessary coordination as part of the design and construction of the remedy.

Comment 80: The excavation of two feet of sediments from within the feeder canal causes us concern due to the stability of the laid up stone walls. We have serious concerns regarding the potential for sloughing of the earthen slopes and the stones walls during and after sediment removal.

Response 80: The remedial design will have to address this issue.

Comment 81: We recommend that if two feet of sediment is removed, a concrete liner be placed to lock in the toe of the vertical canal walls and provide an impermeable cap separating the feeder canal water from the underlying stratum. This barrier will also provide a physical barrier to prevent the removal of possibly contaminated sediments should future dredging be required.

Response 81: This recommendation is noted, however, the Department is unable to concur with this proposal at this time since the ROD selected remedy would not require any cap to isolate the remaining sediments or facilitate dredging of the canal in the future. The remedial design will resolve this technical issue, in coordination with various other technical aspects of the proposed remedy, i.e. the final depth of the sediment removal and equipment access into the canal.

Comment 82: A recent trip to the site uncovered snow being pushed from the Niagara Mohawk site into the Canal. Due to the presence of contaminants on site, this practice must be stopped immediately.

Response 82: It should be noted that the contamination at the site is largely subsurface, thus there is a minimal risk of snow on the site acquiring site contaminants. However, the Department has advised Niagara Mohawk of the NYS Canal Corporations concern.

Comment 83: The purpose of a sheet pile cutoff wall with groundwater treatment gate is confusing. Will this "gate" be a continual source of contaminated water to the Canal? There is some discussion about treatment of groundwater but we are not sure of the details.

Response 83: The gates will treat the water as it passes through them, so only treated groundwater will pass through the barrier wall and discharge to the canal. Section 7.d and Section 8, item 5 of the ROD have been revised to clarify that point.

Comment 84: Page 12, right column, the feeder canal does not drain directly into the Hudson River.

Response 84: The ROD has been revised to clarify that feeder canal water is discharged into the Hudson River when the drain valve for the canal is opened.

Comment 85: Page 20, left column, "ranged from 16,200 to 27,000 cubic yards"

Response 85: The ROD has been revised to clarify that the in situ volume of source areas to be excavated and disposed/treated off site ranges from approximately 2,500 to 16,200 cubic yards (cy). Including this volume, it is estimated that up to 27,000 cy of material may be excavated to effect this alternative.

The following comment was received in a letter dated February 27, 2003, from Mayor Robert A. Regan of the City of Glens Falls:

Comment 86: I am writing this letter on behalf of the City of Glens Falls and in accordance with the Notice of Availability of the above referenced PRAP. I understand that a Remedial Investigation (RI) of the site was completed, a subsequent Feasibility Study (FS) performed and remedy proposed. The City supports a full and comprehensive clean up of the site. We rely on the technical expertise of NYSDEC [New York State Department of Environmental Conservation] to assure this type of clean up effort is undertaken and completed.

Response 86: The Department appreciates the City of Glens Falls continued support of the project.

Comment 87: In terms of comments regarding the site, our interest is focused on reuse of the site after the remediation of the site is completed. Given the proximity of the site to the City's central business district, the City prefers that the highest and best use be pursued. To accommodate the realization of this pursuit, a remedial plan will have to allow for building construction and potential human habitation of the site. Accordingly, preferred uses include permanent residential dwellings (e.g. apartments, condominiums, etc.); offices for professional and service based industries; light industrial involving light assembly and/or manufacturing. Accommodation of these uses, or a mix of these uses, will require subsurface excavation for buildings, infrastructure and other support facilities. Therefore, remedial actions would require proper design and need to be flexible in consideration of the various physical requirements associated with the uses cited above.

Therefore, I am formally requesting that the selected remedy include the capacity to accept new buildings and associated infrastructure for residences, offices, industry, or a mix of these uses.

I look forward to reviewing the "responsiveness summary" to learn how this comment will be addressed in the final remediation plan. Thank you for consideration of my comments.

Response 87: Due to the nature and extent of contamination at the site, as well as the property's current use, the Feasibility Study concluded that a cleanup of the parcel to unrestricted use was not practical nor cost effective and thus an unrestricted use alternative was not carried into the final evaluation of alternatives. While the unrestricted use alternative was not evaluated by the PRAP, the evaluation of Alternative 4 in Section 8, which would not require as much soil removal as an unrestricted use alternative, does evaluate the impact of increasing soil volumes on the viability of a remedy. In large part this determination was supported by the current land use and zoning (heavy industrial) of the site. The majority of the site is owned by Niagara Mohawk and occupied for commercial purposes. The only other property owner is the City of Glens Falls, which owns a small parcel on which a sewage pump station is located. Additionally, due to NM's willingness to maintain the current commercial/industrial use of the site and the similar restriction of the use of the City's parcel due to the pump station, an unrestricted use alternative was not included in the PRAP. Therefore, the selected remedy will leave levels of contaminants contained in place, with deed restrictions to preclude incompatible future activities at the site, such as residential use.

In evaluating the contamination which will remain after implementation of the selected remedy, it is possible to develop portions of the site for restricted residential with some additional remediation or with certain restrictions on the development plan. Absent a specific redevelopment proposal to evaluate, and considering NM's current ownership of the property and stated intention to limit development to the current use, a decision regarding redevelopment cannot be made with the information available at this time. However, Section 8, item 14 has been modified to indicate that with Department approval the restriction against residential use can be reconsidered, provided that site conditions are protective of the new use or made protective for such new use by additional remediation.

APPENDIX B

Administrative Record

Proposed Remedial Action Plan, NIMO Glens Falls - Mohican Street Former MGP Site, Operable Unit No. 1, MGP Site and Canal, Glens Falls (C), Warren County, New York, Site No. 5-57-016, January 2003, New York State Department of Environmental Conservation

Final Feasibility Study Report, Glens Falls (Mohican St.) Site, December 2002, Foster Wheeler Environmental Engineering Corporation PC

Supplemental Remedial Investigation Report, Glens Falls (Mohican St.) Site, December 2001, Foster Wheeler Environmental Engineering Corporation PC

Preliminary Historical Profile, Glens Falls (Mohican St.) MGP Site, December 1992, Niagara Mohawk Power Corporation

Letter from G. Litwin of the New York State Department of Health, to D. Desnoyers, NYSDEC, dated March 28, 2003.

A letter from S. Stucker of Niagara Mohawk (A National Grid Company) to J. Helmeset, NYSDEC, dated March 5, 2003.

A letter from J. Dergosits of New York State Canal Corporation to J. Helmeset, NYSDEC, dated March 5, 2003.

A letter from Mayor Robert A Regan for the City of Glens Falls to J. Helmeset, NYSDEC, dated February 27, 2003.