Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision
NYSEG Norwich Former MGP Site
Norwich, Chenango County, New York
Site Number 709011

March 2008

New York State Department of Environmental Conservation
DAVID PATERSON, *Governor* ALEXANDER GRANNIS, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

NYSEG Norwich Former Manufactured Gas Plant Site
Norwich, Chenango County, New York
Site No. 709011

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the NYSEG Norwich Former Manufactured Gas Plant (MGP) site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the Department) for the NYSEG Norwich Former MGP site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the Department. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

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

Description of Selected Remedy

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the Norwich Former MGP site and the criteria identified for evaluation of alternatives, the Department has selected in-situ solidification/stabilization (ISS) of on-site source areas, removal of free-phase NAPL from selected off-site areas, in-situ chemical oxidation (ISCO) treatment of off-site source material, enhanced bioremediation, development of a site management plan, and institutional controls.

The components of the remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Any uncertainty identified during the RI/FS will be resolved, including a more precise delineation of the lateral and vertical extent of the proposed in-situ soil stabilization (ISS) technology.

2. In-situ solidification/stabilization (ISS) of on-site soils and off-site soils on portions of two properties immediately adjacent to the former MGP. To account for the volume expansion

associated with ISS, approximately 6 feet of shallow soils will be removed prior to the ISS process. Of this excavated material, any MGP waste, coal tar or contaminated soils meeting one or more of the following criteria: visible tar or oil; the presence of sheens or odors with total PAHs over 500 ppm; or total BTEX concentration above 10 ppm, will be disposed of at an off-site treatment or disposal facility. Excavated materials which are below the criteria will be stockpiled and evaluated for reuse on-site. This removal of shallow soils will also include potential underground structures and obstructions that could impede the ISS process.

3. A soil cover will be constructed over the site and the off-site ISS treatment area. This cover will be a minimum of one foot thick on-site and two feet thick off-site, and will consist of clean soil underlain by an indicator such as orange plastic snow fence to demarcate the cover soil from soil that exceeds the criteria for clean cover soils or solidified material. Clean soil will constitute soil that meets the Division of Environmental Remediation's criteria for backfill or local site background. Excavated soil that exceeds the criteria for clean cover soils, but is not required to be disposed off-site, may be stockpiled for re-use below the demarcation layer. The top six inches of soil will be of sufficient quality to support vegetation in areas intended to be vegetated. Non-vegetated areas (buildings, roadways, parking lots, etc.) will be covered by a paving system or concrete in lieu of the soil cover.

4. Collection of mobile NAPL at off-site areas south of Front Street. NAPL and highly contaminated groundwater will be collected from an estimated 12 collection wells, and transported to an off-site disposal facility. The primary objective of the extraction will be to remove free-phase NAPL and reduce the source material in advance of in-situ chemical oxidation (ISCO) treatment.

5. Following a period of NAPL removal acceptable to NYSDEC, the remaining off-site source material will be treated by in-situ chemical oxidation (ISCO). NAPL monitoring and, if necessary, collection, will continue during the ISCO treatment period to manage any NAPL that may be liberated by the ISCO process.

6. Biodegradation of dissolved phase contaminants may be enhanced following the chemical oxidation injections. Following a sufficient period of monitoring subsequent to ISCO treatment, the need for enhanced bioremediation of any residual off-site groundwater impacts will be evaluated.

7. Development of a site management plan to: (a) address residual 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; (b) evaluate the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified; (c) identify any use restrictions; and (d) provide for the operation and maintenance of the components of the remedy, both on-site and off-site.

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

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

New York State Department of Health Acceptance

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

Declaration

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

MAR 28 2008

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

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SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the New York State Electric and Gas (NYSEG) Norwich Former Manufactured Gas Plant (MGP) site. The presence of hazardous waste has created significant threats to human health and/or the environment that are addressed by this remedy. As more fully described in Sections 3 and 5 of this document, the production of manufactured gas and the generation of related by-products have resulted in the disposal of hazardous wastes, including MGP 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. This contamination has resulted in:

- a significant threat to human health associated with exposure to hazardous waste, contaminated site soils and contaminated groundwater.
- a significant environmental threat associated with the impacts of contaminants to groundwater.

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

- In-situ Solidification/Stabilization (ISS) of on-site source areas.
- Removal of free-phase NAPL from selected off-site areas.
- In-situ Chemical Oxidation (ISCO) treatment of off-site source material.
- Development of a site management plan to address residual contamination through groundwater monitoring, using enhanced bioremediation and use of institutional controls.
- Execution of an environmental easement and periodic certification of the institutional controls.

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

SECTION 2: SITE LOCATION AND DESCRIPTION

The NYSEG Norwich Former Manufactured Gas Plant (MGP) Site is located at 24 Birdsall Street, in the City of Norwich, Chenango County, New York (see Figures 1 and 2). The former facility is approximately one acre in area, and is bounded to the north by a plaza with retail shops, to the east by a NYSEG substation and private residences, to the south by the former Aero Products property (now owned by NYSEG), and to the west by the Lackawanna railroad tracks. The site is located in an urban setting with many private residences and retail businesses located nearby. The former plant is located on Birdsall Street, in the Chenango River valley, west of the Chenango River and Rt. 32, south of Rt. 23 and east of Rt 12.

The MGP site previously occupied approximately one acre of land located at 24 Birdsall Street. In the years following cessation of gas production, former MGP structures were razed and subsequently NYSEG used the site for equipment storage. Today, much of the property is paved with asphalt or covered with compacted gravel. A NYSEG electric substation exists on the eastern portion of the site.

The northern part of the former MGP has been developed as a shopping plaza with retail shops. NYSEG purchased the former Aero Products facility located to the south and used the building for storage for several years. During the summer of 2006, NYSEG demolished the former Aero Products building. The off-site area that extends to the south of the former Aero Products building is comprised of mostly residential housing (see Figure 2).

The groundwater table in the area ranges from four to 14 feet below the ground surface, and groundwater flows generally to the south. A silt and clay confining layer is present at depths ranging from approximately 8 to 25 feet. The City of Norwich Department of Public Works provides and maintains the municipal water system for area residents.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

Although the exact starting date of MGP operations at the Norwich MGP is unknown, Sanborn fire insurance maps suggest that the plant operations started sometime between 1863 and 1887. By 1887 the Norwich MGP plant began supplying manufactured gas to the City of Norwich under the name "Norwich Gas Light Company". Little is known about the generation and disposal practices of residues from the MGP, except that two tar storage vessels existed in the subsurface until they were removed in 1997. In addition, a potential purifier waste disposal area was identified in 1990 through an interview with a former employee of the MGP.

A MGP is a facility where gas for lighting and heating homes and businesses was produced. Manufactured gas was produced at this site using the coal gasification and carburetted water gas processes. In 1892, the name of the facility operator was changed to “Norwich Illuminating Company”, which was changed again in 1917 to “Norwich Gas and Electric Company”. Coal gas was produced on site until 1917, and then carburetted water gas was produced from 1917 to 1953. In 1939, NYSEG acquired the property.

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 cooled and purified prior to distribution. During the cooling, an oily liquid known as coal tar would condense from the hot gas and settle in the bottom of gas holders, pipes, and other structures. Typically, these structures were built below the ground surface, and would utilize groundwater as a bottom seal for cooling and pressure purposes. Hence, these structures have a significant potential to introduce byproducts from the coal gasification and carburetted water gas processes directly into the site groundwater and subsurface.

3.2: <u>Remedial History</u>

Several previous investigations and remedial actions were performed at the site preceding the Remedial Investigation (RI), and reports had been prepared by the various organizations involved.

In 1990, Engineering-Science Inc. assessed data from seven subsurface soil samples collected and analyzed by NUS Corporation, under contract to the USEPA. Based on this assessment, a Task II investigation was performed to address the potential presence of MGP residues in the subsurface and the potential for migration of MGP contaminants into groundwater. A July 1992 Task II Investigation Report determined that benzene, ethylbenzene, toluene and xylenes (BTEX) and polycyclic aromatic hydrocarbons (PAHs) were present in on-site subsurface soils, and that the most highly contaminated soils occurred at depths from 1 to 6 feet below grade beneath and downgradient of the former relief and distribution holders, the tar well, and former above ground oil tanks. BTEX and PAHS were also detected above NYSDEC Class GA standards or guidance values in groundwater samples.

A Task III investigation was performed to assess the potential presence of surface soil contamination in backyards adjoining the site, define the lateral extent of groundwater contamination, and to determine the location and size of the former tar well and relief holder. The July 1997 Task III Investigation Report indicated that no surface soils exceeded urban background levels (per ATSDR, Toxicological Profile for PAHs, 1990) for cyanide, BTEX compounds or PAHs. However, subsurface soil results confirmed the presence of MGP residue source beneath the former relief holder, and off-site downgradient groundwater concentrations exceeded groundwater standards for BTEX, PAHs and total cyanides.

In 1997, an Interim Remedial Measure (IRM) was performed to remove MGP residues from source areas at the site to achieve a site-wide soil clean-up goal of 0.1 parts per million(ppm) for benzene and 500 ppm for total PAHs. During the IRM, approximately 11,500 tons of soil were excavated and removed from the site, of which approximately 6,800 tons were considered source material. The IRM also included the removal of the former relief holder, tar well, related piping and surrounding soils. In addition, an air sparging and soil vapor extraction (AS/SVE) system was installed to address groundwater contamination.

The AS/SVE system operated from December 1999 until June 2003, when system evaluations indicated the system was no longer effective. Monitoring results determined that the system was able to remove approximately 586 pounds of BTEX and 761 pounds of total volatile organic compounds (VOCs) during the operational time period.

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 New York State Electric and Gas (NYSEG) entered into a multi-site Consent Order on March 30, 1994. The Consent Order (#D0-0002-9309) obligates the responsible party to implement a full remedial program for 33 former MGP sites across the State, including the Norwich site. After the remedy is selected, NYSEG will be required to implement the selected remedy under an Order on Consent.

SECTION 5: SITE CONTAMINATION

A remedial investigation/feasibility study (RI/FS) was 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 October 2004 and October 2006 by environmental consultants retained by NYSEG. The objective of the remedial investigation was to generate sufficient data to delineate the horizontal and vertical limits of hazardous materials on-site and off-site and determine the potential public health and environmental impacts as a consequence of those materials.

To determine the extent of contamination, the RI utilized knowledge of the gas manufacturing process, historic plans and information gained through previous preliminary investigations (including the IRM) to target probable areas of the site where MGP wastes could have been generated disposed or released. From that information, areas of the site were tested for the presence of MGP wastes.

The Remedial Investigation was completed in October 2006, and the Feasibility Study was completed in November 2007.

The following activities were conducted during the RI:

- Research of historical information;
- Installation of 65 direct push soil borings and 39 piezometers and a monitoring well for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions;
- Collection of numerous subsurface soil samples which were analyzed for organic compounds associated with former MGP site residues particularly BTEX and PAHs;
- Completion of the synthetic precipitation leaching procedure (SPLP) on site soils analyzing for volatile organic compounds (VOCs) and semivolatile organic compounds(SVOCs);
- One synoptic groundwater sampling round was performed at the vast majority of existing wells and the newly installed groundwater monitoring locations monitoring for VOCs, SVOCs and total cyanide;
- A survey of public and private water supply wells in the area around the site;
- Collection of indoor air, sub-slab soil vapor and ambient air at 14 off-site properties and chemical analysis;

5.1.1: <u>Standards, Criteria and Guidance (SCGs)</u>

To determine whether the soil and groundwater on-site and off-site contain contamination at levels of concern, data from the investigation were compared to the following SCGs:

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

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

- Concentrations of VOCs in air were evaluated using the air guidelines provided in the NYSDOH guidance document titled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," dated October 2006.

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

5.1.2: <u>Nature and Extent of Contamination</u>

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

As described in the RI report, many soil, groundwater samples were collected to characterize the nature and extent of contamination. The main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). Figure 3 illustrates the approximate extent of MGP-related source material and groundwater impacts.

Coal tar is a reddish brown oily liquid by-product which formed as a condensate as the gas cooled and which does not readily dissolve in water. Materials such as coal tar are commonly referred to as non-aqueous phase liquids, or NAPLs. The terms NAPL and coal tar are used interchangeably in this document. Although most coal tars are slightly more dense than water, the difference in density is slight. Consequently, this tar can either float or sink when in contact with water. Coal tar was found on-site and off-site during the remedial investigation.

Specific volatile organic compounds (VOCs) of concern are benzene, toluene, ethylbenzene, and xylenes. These are referred to as BTEX in this document. Semivolatile organic compounds of concern are the polycyclic aromatic hydrocarbons (PAHs). Total PAH concentrations are referred to in this document as the sum of individual PAH compounds.

Tars contain high levels of PAH compounds which exceed SCGs for BTEX by several orders of magnitude. In certain tar samples, enough benzene may be present to require the material to be managed as hazardous waste.

Chemical concentrations are reported parts per million (ppm) for soil and parts per billion (ppb) for groundwater. Air samples are reported in micrograms per cubic meter (ug/m3). The following are the media which were investigated and a summary of the findings of the investigation.

Waste Materials

The RI data indicate that coal tar is the major type of waste present at the site. Tars generated at the MGP were disposed, spilled or leaked from the relief holder and/or the tar well and associated piping and possibly other structures, at various locations throughout the site that no longer exist. Tar is visible as sheen on a water surface or as NAPL in soil or water.

Visual observations of sheens or NAPL in the subsurface were generally limited to the locations of former MGP structures, locations downgradient of the structures, and the gravel and sand water-bearing interval located immediately above the silty clay confining layer. Generally, the NAPL was observed at depths ranging from seven to 26 feet below the ground surface and was generally reddish-brown in color. Figure 3 depicts the extent where NAPL was observed within the subsurface. The greatest NAPL impacts (in a 5 to 10 feet thick soil zone) were encountered on the former MGP site and on the former Aero Products building property (now owned by NYSEG), just south of the MGP. Lesser NAPL impacts (less than 5 feet thick) were observed further to the south consistent with southerly migration of NAPL and groundwater flow from site. It is important to note that the impacts were observed above the silty clay layer, which by all indications is acting as a confining layer to vertical migration at the site and surrounding area.

Surface Soil

The surface soils on-site are generally not significantly impacted by the former MGP operation. Eleven composite surface soil samples were collected from on-site (five samples) and off-site (six samples) locations during the Task II and Task III investigations. On-site, the concentrations of total BTEX ranged from non-detect to approximately 0.010 ppm, while total PAHs ranged from 30 to 230 ppm. On-site surface soils had very low levels of total cyanide, with concentrations ranging from not detected to 0.016 ppm of total cyanide. The 1997 IRM removed approximately 3,300 tons of on-site surface soils from the site.

The five off-site surface soil samples indicated no BTEX compounds or PCBs. These samples were collected mainly in residential backyards downgradient of the site. PAHs were found with concentrations ranging from approximately 4.7 to 21 ppm.

Subsurface Soil

Analytical results for subsurface and saturated zone soil samples confirmed the general understanding of the nature and extent of impacts based on the visual observation of NAPL. The occurrence of soils exceeding the NYSDEC's recommended subsurface soil cleanup objective of 500 ppm for total SVOCs, as well as the distribution of NAPL, is consistent with the location of former subsurface structures associated with the MGP oerations and locations downgradient of the structures and of the site. The analytical results indicate that VOCs including benzene, toluene, ethylbenzene and xylenes (BTEX) and SVOCs (specifically PAHs) are the contaminants of concern.

The on-site subsurface soil contaminant concentrations for total VOCs range from 0.0021 ppm to 73 ppm, Total SVOCs range from 0.054 ppm to 3,400 ppm. This includes benzene levels as high as 5.51 ppm for the VOCs and naphthalene as high as 675 ppm for SVOCs in sub-surface soils. Evidence of coal tar NAPL, in the form of sheens and small NAPL globules, was observed in the subsurface soil across the majority of the Norwich former MGP site, as well as downgradient (south) of the site.

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

Groundwater

Groundwater at the site and at off-site residential properties has been impacted by NAPL and by dissolved-phase BTEX compounds and PAHs related to MGP residuals in the subsurface soil at the site. During the RI, groundwater was observed at depths ranging from four to 14 feet below the ground surface. The impacts are limited to the shallow groundwater found primarily above the silty clay confining layer. The silt and clay confining layer is present at depths ranging from approximately 8 to 25 feet across the study area. Observations from borings indicate that the thickness of the aquifer is generally 10-15 feet thick, but it is thinner in some areas where the silty layer is relatively shallow. Groundwater in the area flows generally to the south, with some convergence of groundwater from the east and west immediately around the site.

Total VOC concentrations in groundwater range from non-detect to 1,600 ppb which includes individual benzene concentrations as high as 272 ppb . Total SVOC concentrations in groundwater range from non-detect to 3,400 ppb which includes naphthalene concentrations as high as 2,810 ppb. Total cyanide groundwater concentrations were found as high as 400 ppb in the vicinity of the former MGP structures.

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

Surface Water

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

Sediments

No site-related sediment contamination of concern was identified during the RI/FS. Therefore, no remedial alternatives were evaluated for sediment.

Soil Gas/Sub-Slab Vapor/Air

A soil vapor intrusion investigation was performed in the residential/commercial neighborhood down gradient of the MGP site. The objective of the investigation was to determine whether actions are needed to address exposures to site-related contaminants, which may move from contaminated groundwater into the indoor air of a building through a process referred to as soil vapor intrusion.

As part of the investigation, air samples were collected from 14 properties, including 12 residences and two commercial establishments. At each location, indoor air samples were collected in the basement (except for two locations that did not have basements) and the lowest occupied floor. In addition, sub-slab vapor (air found in the pore space between soil particles) samples were collected from beneath each building (except for four locations that had a dirt floor).

The sample results indicate the presence of BTEX and other VOCs at low levels in sub-slab vapor and indoor air. These compounds are typically associated with MGP sites, but are also commonly found in products we store and use in our homes. The NYSDEC and NYSDOH reviewed the sample results for each home, in conjunction with all environmental sampling near each structure, and determined that actions to address exposures related to soil vapor intrusion are not needed at this time.

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.

A limited IRM was completed during 1997. The objective of this IRM was to remove MGP residues from source areas at the site to achieve a soil clean-up goal of 0.1 ppm for benzene and 500 ppm for total PAHs. During the IRM, approximately 11,500 tons of soil were excavated and removed from the site, of which approximately 6,800 tons were considered source material. The excavation included the former relief holder (654 tons) and the soils surrounding it (3,649 tons), the tar well (427 tons), related piping (3,412 tons), and shallow soils (3,305 tons).

During backfill of the IRM excavation, air sparging wells and a horizontal soil vapor extraction (SVE) system were installed. The air sparging/SVE system began operating in December 1999/January 2000 and ran until shutdown in June 2003. The air sparging/SVE system consisted of four legs: one closest to nearby residences in constant operation and three other legs that operated in shifts of eight hours during the last six months of the operation. Based on monitoring results, a total of 586 pounds of BTEX and 761 pounds of total volatile organic compounds were removed by the system during its operation.

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 7.0 of the Final Supplemental Remedial Investigation Report(October 2006). This document is available for review at the document repositories.

An exposure pathway describes the means by which an individual may be exposed to contaminants originating from a site. An exposure pathway has five elements: [1] a contaminant source, [2] contaminant release and transport mechanisms, [3] a point of exposure, [4] a route of exposure, and [5] a receptor population.

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

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

No completed exposure pathways have been identified at this site. The area is served by public water, public access to the site is limited, and the NYSDEC and NYSDOH have determined no actions are necessary to address exposures to site-related contaminants due to soil vapor intrusion. However, a potential exists for people to be exposed to site-related contaminants as follows:

- exposure to contaminated surface soil and sub-surface soil could occur by either direct contact with or ingestion of soil. The majority of the site is paved or covered with clean imported stone; therefore, exposure to contaminated soil is not likely. Workers who dig or enter excavations on-site or off-site could potentially be exposed to coal tar and contaminated soil through dermal contact and/or incidental ingestion.

5.4: Summary of Environmental Assessment

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.

The Norwich former MGP site is located in an urban setting including commercial properties which are associated with large paved parking lots. These commercial establishments intermingled with residential properties leave very limited opportunities for wildlife resources.

Subsurface soil contamination has negatively impacted the groundwater resource in the unconsolidated geologic units beneath the site. The impacted soil has been an ongoing leaching source of contamination resulting in the down gradient migration of contamination into the groundwater offsite.

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

- Site contamination has adversely impacted the groundwater resource in the overburden so as to render the aquifer unusable without treatment, in the area depicted on Figure 3.

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:

- remediate, to the extent practicable, areas containing source material;

- eliminate potential exposure to source material;

- control future migration of source material from on-site to off-site areas;
- eliminate potential human exposure to subsurface soil containing MGP-related contamination;
- eliminate potential human exposure to groundwater containing MGP-related contamination

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

- ambient groundwater quality standards.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, comply with other statutory requirements, and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the NYSEG Norwich Former MGP Site were identified, screened and evaluated in the FS report which is available at the document repositories established for this site.

A summary of the remedial alternatives that were considered for this site 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: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated source material in subsurface soils and groundwater through various remedial methods onsite and offsite.

On-Site Alternatives:

Alternative 1: No Further Action with Institutional Controls and Groundwater Monitoring

The No Further Action alternative recognizes remediation of the site conducted under the previously completed IRM. To evaluate the effectiveness of the remediation completed under the IRM, only continued monitoring and institutional controls are necessary. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

The no further action alternative would not impact current or expected future land uses at the Site. Soil and groundwater quality would not be affected other than through natural attenuation. The surface cover currently in place would limit potential human exposures to soils, and maintenance of the cover would occur. An institutional control, in the form of an environmental easement, would ensure continued protection of human health by restricting on-site land use and requiring compliance with a site management plan. Although groundwater standards would not be met, the easement would include a groundwater use restriction to ensure that exposure to on-site impacted groundwater would not occur.

This alternative includes continued groundwater monitoring. The estimated monitoring costs are based on analyses of groundwater samples collected at eight locations on an annual basis for a period of 30 years. This alternative would require six months to develop an environmental easement and prepare the site management plan.

Present Worth:	$418,685
Capital Cost:	$19,000
Annual Costs:	$26,000

Alternative 2 - Excavation of On-Site Source Material, Institutional Controls and Groundwater Monitoring

Alternative 2 would involve excavation of on-site MGP source material from the subsurface soils to the depth of the confining silt and clay layer. This excavation would include removal of the former MGP structures that remain underground, which were not removed during the IRM. MGP source material is defined as: 1) visible tar or oil; or 2) soil with total PAH concentrations of 500 ppm with the presence of sheens or odors. This alternative would also include an environmental easement, a site management plan and groundwater monitoring to address residual contamination that is not excavated.

The depth of excavation would vary with the confining layer, which ranges from 14 to 26 feet below the ground surface. Based on an average excavation depth of 22 feet over approximately 52,200 square feet, the volume of excavated soils is estimated to be 70,000 tons. Excavated soil that contains MGP source material would be transported off-site to a low temperature thermal desorption (LTTD) facility or other permitted disposal facility. Debris would be transported to a local permitted landfill for disposal. Clean soil, verified through sampling and analysis, from a DOT-approved source would be used as backfill material, along with unimpacted material that would be reused at deeper levels within the excavation. A soil cover consisting of a minimum of 12 inches of clean soil would be placed at the site. Due to the shallow groundwater and depth of the excavation, methods to support the excavation walls would be required and a de-watering system would be used to remove water from the excavation. The excavation water will require on-site pretreatment prior to direct discharge to the local sewage treatment plant or transport off-site for treatment and disposal.

Residual soil impacts beyond the footprint of the planned excavation area would be addressed by an environmental easement and site management plan that would regulate future excavation or other site utility or construction work. The easement and site management plan would require the property owner to periodically certify that the institutional and engineering controls (IC/ECs) necessary to protect public health and the environment are still in place and are effective. The certification would be prepared and submitted by a professional engineer or other environmental professional acceptable to the NYSDEC. The easement would also include a groundwater use restriction to ensure that on-site exposure to impacted groundwater does not occur in the future.

Alternative 2 would include groundwater monitoring for a minimum of three years, with options to continue, if required by the NYSDEC based on the data obtained. The cost estimate for this alternative assumes that annual monitoring at eight well locations would be conducted for a period of three years.

This alternative would require approximately one year to design and one year to construct, with a minimum of three years of groundwater monitoring and continued site management.

Present Worth:	$13,442,300
Capital Cost:	$13,388,400
Annual Costs:	$19,800

Alternative 3 - Perimeter NAPL Collection, Institutional Controls and Groundwater Monitoring

Alternative 3 would involve installation and operation of a collection trench to capture mobile coal tar NAPL at the downgradient perimeter of the on-site source area. Institutional controls to restrict land and groundwater uses, a site management plan, and groundwater monitoring are also included as components of this alternative.

Conceptually, the trench would be constructed as a gravel trench extending from just above the water table and to a depth of 25 feet below the ground surface. The trench would be constructed on the downgradient, or southern perimeter of the site and would continue along the east and west boundaries of the site, for an approximate total length of between 600 and 700 linear feet. Waste materials and excavation water generated during the collection trench installation would be managed in a similar manner as in Alternative 2. Monitoring/recovery wells would be installed within the trench to determine if mobile coal tar is accumulating. These wells would also be used to periodically remove accumulating coal tar. Specific details for the collection trench including the location, length, method of installation, materials of construction and NAPL removal method would be determined during the remedial design.

To prevent exposure to contaminants that would remain in the subsurface soil at the site, an environmental easement would be placed on the property, and a site management plan would be developed to control future land use, excavations and groundwater use. The easement and site management plan would require the property owner to periodically certify that the institutional and engineering controls (IC/ECs) necessary to protect public health and the environment are still in place and are effective. The certification would be prepared and submitted by a professional engineer or other environmental professional acceptable to the NYSDEC. Groundwater monitoring would be required in a manner similar to Alternative 1.

This alternative would require approximately one year to design and six months to construct with groundwater monitoring as part of the site management plan.

Present Worth:	$2,380,900
Capital Cost:	$1,553,500
Annual Costs:	$56,350

Alternative 4 -Containment and Capping, Institutional Controls and Groundwater Monitoring

Alternative 4 would involve construction of a perimeter subsurface barrier wall around, and a cap over, the on-site source area. Institutional controls to restrict land and groundwater uses, a site management plan, and groundwater monitoring are also included as components of this alternative.

A slurry wall, approximately 25 feet deep and 1,100 feet in length around the perimeter of the source area would be installed by excavating a narrow vertical trench to the low permeability confining layer. During excavation, the trench would be filled with slurry consisting of a mixture of bentonite, cement and water. Maintaining the trench full of slurry prevents caving or sloughing of the trench walls. After excavation, the slurry-filled trench is backfilled with a soil/bentonite/cement/water mixture to create a low permeability barrier. Other barrier types such as in-situ stabilization barrier, sheet piling, jet grout wall, may also be viable. The type, location and depth of the barrier would be finalized during remedial design. Waste materials and fluids generated during installation of the physical barrier would be managed in a similar manner as in Alternative 2.

An engineered cap would cover the containment area. The engineered cap would consist of a low-permeability layer, such as a geomembrane or clay, to prevent exposure to contaminants within the containment area, control potential odors and minimize the infiltration of precipitation. The cap would include drainage and protective layers of sufficient thickness to manage precipitation, protect the low-permeability layer, and provide a base for vegetation or asphalt pavement. The cap would be a minimum of 24 inches thick. Cap materials would satisfy Part 375-6 regulations for imported backfill material for residential use and for protection of groundwater. The top six inches of soil would be of sufficient quality to support vegetation in areas intended to be vegetated. Non-vegetated areas (buildings, roadways, parking lots, etc.) would be covered by a paving system or concrete. The engineered cap details including thickness and materials for each layer would be determined during the remedial design phase.

To prevent exposure to contaminants that would remain in the subsurface soil at the site, an environmental easement would be placed on the property, and a site management plan would be developed to control future land use, excavations and groundwater use. The easement and site management plan would require the property owner to periodically certify that the institutional and engineering controls (IC/ECs) necessary to protect public health and the environment are still in place and are effective. The certification would be prepared and submitted by a professional engineer or other environmental professional acceptable to the NYSDEC. Groundwater monitoring would be required in a manner similar to Alternative 1.

This alternative would require one year to design and one year to construct with groundwater monitoring as part of the site management plan.

Present Worth:	$2,311,100
Capital Cost:	$1,742,300
Annual Costs:	$37,000

Alternative 5 - In-Situ Solidification/Stabilization, Institutional Controls and Groundwater Monitoring

This alternative would involve the in-situ solidification/stabilization (ISS) of on-site source material, along with institutional controls to restrict land and groundwater uses, a site management plan, and groundwater monitoring.

ISS technology generally involves the mixing of contaminated soils with cement and bentonite (clay) to create a concrete-like material which greatly reduces the ability of groundwater to pass through them. This would greatly reduce the potential for contaminants in site soils from migrating off-site. A large diameter auger or other mechanical mixing methods would be used to mix the cement/bentonite grout into the soil without the need for excavation. The ISS process results in an increase in both the density (thickness and weight) and volume of the treated material. Treatment would proceed in columns, with the auger retracted after completing the mixing process and then repositioning the auger to overlap the previously treated column. This process is repeated several times until the entire area has been stabilized. Because the bulk density of the treated material is increased, excess material would be generated within the treated area and therefore would require removal. To make room for this excess material, the top six feet of soil (approximately 18,000 tons) would be removed from the ISS treatment area, stockpiled and tested. Non-impacted soil would be reused at the site or transported to a local landfill for disposal. Impacted soil would be transported off-site for LTTD treatment or other permitted disposal. During this soil removal process any underground structures and obstructions would also be removed and disposed off-site.

The area to be treated is estimated to be approximately 52,200 square feet to an approximate depth of 24 feet as shown on Figure 4. The exact dimensions of the source area would be refined during the remedial design.

To prevent exposure to contaminants that would remain in the subsurface soil at the site and to protect the ISS area, a soil cover would be placed over the site, an environmental easement would be placed on the property, and a site management plan would be developed to control future land use, excavations and groundwater use. The soil cover would be a minimum of 12 inches in thickness, and would be comprised of material that satisfies Part 375-6 requirements for imported backfill material for commercial use and for protection of groundwater. The top six inches of soil would be of sufficient quality to support vegetation in areas intended to be vegetated. Non-vegetated areas (buildings, roadways, parking lots, etc.) would be covered by a paving system or concrete. The easement and site management plan would require the property owner to periodically certify that the institutional and engineering controls (IC/ECs) necessary to protect public health and the environment are still in place and are effective. The certification would be prepared and submitted by a professional engineer or other environmental professional acceptable to the NYSDEC. Groundwater monitoring would be conducted over a projected period of three years. The need for further groundwater monitoring beyond the three year period would be determined by the NYSDEC based on an evaluation of the data obtained.

This alternative would require one year to design, one year to construct with continued site management including a minimum of three years of groundwater monitoring.

Present Worth:	$6,368,000
Capital Cost:	$6,177,500
Annual Costs:	$19,800

Alternative 6 - In-Situ Chemical Oxidation (ISCO), Institutional Controls and Groundwater Monitoring

This alternative would involve the treatment of on-site source material using in-situ (in place) chemical oxidation (ISCO), along with institutional controls to restrict land and groundwater uses, a site management plan, and groundwater monitoring.

ISCO technology involves injecting chemical oxidants into the subsurface soil to destroy MGP contaminants through oxidation. This is achieved through the installation of injectors, similar to small diameter wells, that are screened at depths to target the contaminated zones. The injectors are spaced at a distance that ensures overlap. The injector screens, which allow the oxidation chemical to be delivered, are set at a depth to ensure appropriate vertical coverage and efficient delivery of oxidant. The oxidants would be distributed through the subsurface by moving with the natural flow of groundwater, and would react with the MGP contaminants they come into contact with. The byproducts of this destruction process would be carbon dioxide and water.

The application of ISCO technology within an area source material (coal tar) must be carefully managed and must account for the amount of coal tar to be processed. The destruction of all coal tar or large quantities of source materials may not be practical to attempt using ISCO alone.

To prevent exposure to contaminants that would remain in the subsurface soil at the site, a soil cover would be placed over the site, an environmental easement would be placed on the property, and a site management plan would be developed to control future land use, excavations and groundwater use. The soil cover would be a minimum of 24 inches in thickness, and would be comprised of material that satisfies Part 375-6 requirements for imported backfill material for residential use and for protection of groundwater. The top six inches of soil would be of sufficient quality to support vegetation in areas intended to be vegetated. Non-vegetated areas (buildings, roadways, parking lots, etc.) would be covered by a paving system or concrete. The easement and site management plan would require the property owner to periodically certify that the institutional and engineering controls (IC/ECs) necessary to protect public health and the environment are still in place and are effective. The certification would be prepared and submitted by a professional engineer or other environmental professional acceptable to the NYSDEC.

Although a significant improvement in groundwater quality would be possible, the groundwater standards may not be achieved because of residual amounts of contaminants in the subsurface soils. Groundwater monitoring would be required with Alternative 6 and it is assumed it would continue for 20 years at eight well locations on an annual basis.

This alternative would require one year to design, two years to implement and continued site management including groundwater monitoring.

Present Worth:	$13,740,500
Capital Cost:	$13,367,000
Annual Costs:	$26,000

Off-Site Alternatives

Alternative 7 - No Remedial Action with Groundwater Monitoring

The no remedial action alternative recognizes remediation of the site conducted under the previously completed IRM. To evaluate the effectiveness of the remediation completed under the IRM, continued groundwater monitoring would be performed. Investigations have determined that groundwater is not currently being used. A site management plan would be developed for properties adjacent to the former MGP property where source material is present in subsurface soils. The site management plan would address excavations below the water table, where MGP contamination may be present above the confining layer.

The site management plan would include groundwater monitoring to determine whether the area of contamination is changing, and to confirm whether the groundwater use restrictions are necessary. The estimated groundwater monitoring costs are based on analyses of groundwater samples collected at 14 off-site locations on an annual basis for a period of 30 years.

Present Worth:	$618,400
Capital Cost:	$65,000
Annual Costs:	$36,000

Alternative 8 - In-Situ Chemical Oxidation (ISCO), and Monitored Natural Attenuation

This alternative would involve the treatment of off-site source material using in-situ (in place) chemical oxidation (ISCO) technology. Monitoring of natural attenuation in groundwater would be included as component of this remedial alternative.

ISCO technology involves injecting chemical oxidants into the subsurface soil to destroy MGP contaminants through oxidation. This would be achieved through the installation of small diameter wells that are screened at depths that target the contaminated zones. The injectors would be spaced at a sufficient distance to ensure adequate and efficient delivery of oxidant. The oxidants would be distributed throughout the subsurface by moving with the natural flow of groundwater, and would react with the MGP contaminants as they come into contact with them. The byproducts of this destruction process are carbon dioxide and water.

The application of ISCO technology within an area of source material (coal tar) must be carefully managed and must account for the amount of coal tar to be processed. The destruction of all coal tar or large quantities of source materials may not be practical using ISCO alone. The injector locations, injection intervals, oxidant chemical types and quantities, duration of treatment and other details would be determined during the remedial design phase.

A site management plan would be developed for monitoring the effectiveness of the ISCO process and for long-term groundwater monitoring. In areas of lower contamination, groundwater would be monitored for contaminant reductions due to natural attenuation. Although a significant improvement in groundwater quality would be expected, groundwater standards may not be achieved because of residual amounts of contaminants in the subsurface soils. Groundwater monitoring would be required for an estimated 20 years at 14 off-site well locations on an annual basis.

This alternative would require one year to design, six months to implement with groundwater monitoring as part of the site management plan.

Present Worth:	$3,836,400
Capital Cost:	$3,387,700
Annual Costs:	$36,000

Alternative 9 - Enhanced Bioremediation and Groundwater Monitoring

Alternative 9 would involve enhanced bioremediation of impacted groundwater using in-situ treatment, along with groundwater monitoring. The treatment would involve injection of an oxygen-supplying product using temporary borings. This process increases dissolved oxygen concentrations in groundwater and stimulates microbial activity to increase natural biodegradation of dissolved MGP residuals in groundwater. This alternative differs from Alternative 8 because it would target areas of lower concentrations at the perimeter of the groundwater plume, rather than the area of highly contaminated source material. It would involve injecting a much lower dose of oxygen to stimulate biological activity, rather than high-strength oxygen to chemically destroy contaminants. Bioremediation would have limited effectiveness in areas that contain source material, and therefore long-term impacts to groundwater quality would continue to occur. Therefore, this alternative to treat groundwater would be more efficient if combined with other measures to address the off-site source material, or periodic re-application of oxygenating material would be required. Details regarding accessible locations, spacing of injection borings, amount of oxidant injected per boring and the number of applications would be developed further during the remedial design phase.

A site management plan would be developed for properties adjacent to the former MGP property where source material is present in subsurface soils. The site management plan would address excavations below the water table, where MGP contamination may be present above the confining layer.

This alternative would require one year to design, with an estimated 20 years of bi-annual implementation and groundwater monitoring as part of the site management plan.

Present Worth:	$1,481,200
Capital Cost:	$352,700
Annual Costs:	$90,550

Alternative 10 - Periodic Extraction, and Monitored Natural Attenuation

Alternative 10 would involve installation of extraction wells in the off-site source material area, with periodic extraction and off-site disposal of groundwater and NAPL. Monitoring of natural attenuation of groundwater would be included as component of this remedial alternative.

A series of large diameter extraction wells would be installed in areas where source material is present. A vacuum truck or similar equipment would be used to pump out the extraction wells, removing a combination of highly concentrated groundwater and NAPL. The recovered fluids would be disposed at a permitted off-site facility. Conceptually, 18 extraction wells would be installed, and each month 6 of these wells would be pumped out on a rotating basis. An estimated 3,600 gallons of fluids would be removed on a monthly basis for a three year period. This would be followed by quarterly monitoring and extraction for seven additional years. The primary objective of the extraction program would be the removal of mobile NAPL and highly contaminated groundwater, which would enable natural attenuation to occur in areas of lower contamination.

A site management plan would be developed for properties adjacent to the former MGP property where source material is present in subsurface soils. The site management plan would address excavations below the water table, where MGP contamination may be present above the confining layer.

This alternative would require one year to design with an estimated ten years of implementation and 20 years of groundwater monitoring as part of the site management plan.

Present Worth:	$1,113,000
Capital Cost:	$321,500
Annual Costs:	$112,000

Alternative 11 - In-Situ Solidification/Stabilization(ISS), Periodic NAPL Extraction, In-Situ Chemical Oxidation (ISCO), Enhanced Bioremediation and Groundwater Monitoring

Alternative 11 would involve a phased approach to remediation that combines several components of the other off-site remedial alternatives. This alternative would include the in-situ stabilization (ISS) of source material beneath two properties north of Front Street, as shown on Figure 5. It would also include the installation of NAPL extraction points in source material areas south of Front Street, with periodic extraction and off-site disposal as described in Alternative 10. After a sufficient period of NAPL removal, in-situ chemical oxidation (ISCO) of remaining off-site residual material would be conducted. If indicated by groundwater monitoring, in-situ enhanced bioremediation of groundwater would then occur. Groundwater monitoring would also be a component of this alternative.

As described in on-site Alternative 5, ISS technology would involve the in-place mixing of contaminated soil with a cement/clay grout using mechanical mixing methods to solidify and immobilize the source material, thereby minimizing or eliminating the movement of contaminants in groundwater. As for Alternative 5, this alternative would require the removal of the top six feet of surface soil (approximately 4,500 tons) from the treatment area to account for the increase in density and volume of the ISS-treated soils. This soil, along with any underground structures and obstructions would be reused or disposed off-site. Based on a treatment depth of 24 feet below ground surface, an 18-foot vertical interval would be treated through the ISS process (approximately 9,000 cubic yards). This would occur on portions of the two properties located at 37 and 41 Front Street, which have been identified as containing source material. All excavation and ISS activities would employ odor/vapor suppressing methods to control MGP odors. The solidified areas would be restored by placement of a cover of clean soil at least 24 inches thick.

Off-site source areas south of Front Street would initially be addressed through the installation of NAPL extraction wells, with periodic extraction and off-site disposal of collected fluids. Conceptually, 12 extraction wells would be installed to the depth of the confining layer, approximately 25 feet below grade. A vacuum truck or similar equipment would be used to pump out the extraction wells, removing a combination of highly concentrated groundwater and NAPL. The recovered fluids would be disposed at a permitted off-site facility. An estimated 2,400 gallons of fluids would be removed from four locations on a monthly basis for a 3-year period. The specific number of extraction wells and their locations would be determined during the remedial design phase.

Following a sufficient period of NAPL removal, ISCO treatment of the remaining off-site source material would be conducted, as described in Alternative 6. An estimated 75 injectors would be installed in the area west and southwest of 40 Front Street targeted for ISCO treatment, as shown on Figure 5. The extent of the treatment area would be finalized during the remedial design phase.

Enhanced bioremediation of dissolved contaminants would be performed following the ISCO treatment, if indicated through groundwater monitoring. This treatment would involve injection of an oxygen-supplying product using temporary borings to increase dissolved oxygen concentrations in groundwater, stimulating microbial activity and the breakdown of dissolved contaminants. The treatment area may include areas of previously treated source materials, and/or untreated areas beyond the source area. Conceptually, two injections would be performed following a two-year monitoring period after ISCO treatment is complete, with 100 injection locations per event and 30 pounds of oxidant injected per injection location. Details regarding the location and spacing of injection borings, the quantity of oxidant injected per boring and the number of applications would be developed during the remedial design phase.

A site management plan would be developed for properties adjacent to the former MGP property where source material is present in subsurface soils. The site management plan would address excavations below the water table, where MGP contamination may be present above the confining layer.

This alternative would require one year to design, with an estimated four years to implement and 20 years of groundwater monitoring as part of the site management plan.

Present Worth:	$4,841,800
Capital Cost:	$4,641,700
Annual Costs:	$100,400

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-Effectivness. 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 1.

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

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP have been evaluated. The Responsiveness Summary (Appendix A) presents the public comments received and the manner in which the NYSDEC addressed the concerns raised. In general, the public comments received were supportive of the selected remedy. Several comments were received, however, pertaining to details of the remedy implementation and citizen participation concerns.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the NYSDEC has selected Alternative 5, In-Situ Solidification/Stabilization, Institutional Controls and Groundwater Monitoring, for the on-site remedy (see Figure 4) and Alternative 11, In-Situ Solidification/Stabilization, NAPL Extraction, In-Situ Chemical Oxidation, Enhanced Bioremediation and Groundwater Monitoring, as the off-site remedy for this site (see Figure 5). The elements of these remedies are described at the end of this section.

The selected remedies are based on the results of the RI and the evaluation of alternatives presented in the FS. The evaluation takes into consideration each comparative analysis criteria described in Section 7.2, in addition to the overall project consideration. Alternatives 5 and 11were selected because these alternatives will provide the highest level of protection to human health and the environment and will comply with New York State SCGs. Further, it will provide the best balance of the primary balancing criteria, as described in Section 7.2, by: 1) stabilizing on-site subsurface soil contamination, through ISS, that create the most significant threat to public health and the environment, 2) greatly reducing the source of contamination to groundwater on-site and off-site, and 3) addressing pockets of source materials off-site with a combination of remedial methods, creating conditions to minimize groundwater contamination to the extent practicable.

On-Site Remedy

Alternative 1 (no remedial action) would not adequately address the RAOs and would not be protective of human health and the environment. The containment alternatives, using a NAPL collection trench at the downgradient boundary (Alternative 3) or a physical barrier around the perimeter of the on-site source material (Alternative 4), are both cost-effective approaches that would adequately protect human health. However, Alternative 5 provides a higher level of protection of the environment and eliminates the need for the long-term maintenance required by Alternatives 3 and 4 for the on-site remedy.

Alternative 6 (ISCO treatment) would have similar costs as Alternative 2 but would have less certain long term effectiveness than excavation, due primarily to the extent of free-phase NAPL present in the source area. Although Alternative 2 (excavation of source material) would be highly effective in permanently removing the MGP-related impacts, excavation would involve significant implementation difficulties and short term impacts. Because a significant portion of the source area has already been excavated, the substantially higher cost of excavation would not yield a proportionally higher degree of protection for human health and the environment in comparison to Alternative 5. Although excavation (Alternative 2) and in-situ chemical oxidation (Alternative 6) would reduce a higher degree of contaminant volume through treatment, Alternative 5 will provide a similar degree of long-term effectiveness with less short-term impact and in a more cost-effective manner.

When considering all of the evaluation criteria, ISS (Alternative 5) is the preferred alternative to address the on-site source material. Solidification/stabilization of the source material will minimize the potential mobility of source material from the site, and will enable an off-site remedy to be effectively implemented. It will provide a high degree of long-term effectiveness in preventing further off-site migration by reducing the mobility of contamination through treatment.

Off-Site Remedy

Alternative 7 (no remedial action) would not adequately address the RAOs for off-site and protect human health and environment. However, the other alternatives that involve active remediation would provide higher degrees of health and environmental protection, and would achieve the goals of controlling further migration of source material and attaining groundwater standards to the extent feasible. Given the variable nature of land use and MGP-related impacts within the off-site area, a phased approach to remediation that combines several alternatives for remediation of the off-site impacts is preferred. Each off-site alternative would be effective for the specific remedial goal for which it was developed, but the individual alternatives would not efficiently address all aspects of the off-site contamination. Alternative 11 will combine all of the alternatives presented for off-site remediation and uses the multiple technologies to address the variable nature of the MGP related impacts within off-site areas. This approach will maximize the long term effectiveness and reduction in contaminant volume through treatment, while providing a remedy that will be implementable and cost-effective.

The first phase will include in-situ solidification/stabilization (ISS) of source material beneath portions of two properties north of Front Street. This will be followed by removal of free-phase NAPL at selected off-site areas (Alternative 10). The NAPL removal will include the installation of NAPL extraction points, and periodic monitoring of these points with subsequent removal of NAPL as required, with transport of the extracted liquids to an off-site treatment and disposal facility. The NAPL removal phase will improve effectiveness of the next phase which will be the in-situ chemical oxidation (ISCO) treatment. This phase will implement Alternative 8 (ISCO treatment of off-site source material, along with groundwater monitoring) for source material. After a sufficient period of monitoring the effectiveness of these technologies, as determined by NYSDEC, the need for enhanced bio-remediation (Alternative 9) will be evaluated. The enhanced bio-remediation will be used for treatment of any remaining off-site residual groundwater impacts.

The estimated present worth cost to implement the total combined remedy is $11,209,800. The cost to construct the remedy is estimated to be $10,819,200 and the estimated average annual operation, maintenance, and monitoring costs for 20 years is $120,200.

The elements of the selected remedy are as follows:

1. A remedial design program will be implemented to provide the details necessary for the construction, operation, maintenance, and monitoring of the remedial program. Any uncertainty identified during the RI/FS will be resolved, including a more precise delineation of the lateral and vertical extent of the proposed in-situ soil stabilization (ISS) technology.

2. In-situ solidification/stabilization (ISS) of on-site soils and off-site soils on portions of two properties immediately adjacent to the former MGP. To account for the volume expansion associated with ISS, approximately 6 feet of shallow soils will be removed prior to the ISS process. Of this excavated material, any MGP waste, coal tar or contaminated soils meeting one or more of the following criteria: visible tar or oil; the presence of sheens or odors with total PAHs over 500 ppm; or total BTEX concentration above 10 ppm, will be disposed of at an off-site treatment or disposal facility. Excavated materials which are below the criteria will be stockpiled and evaluated for reuse on-site. This removal of shallow soils will also include potential underground structures and obstructions that could impede the ISS process.

3. A soil cover will be constructed over the site and the off-site ISS treatment area. This cover will be a minimum of one foot thick on-site and two feet thick off-site, and will consist of clean soil underlain by an indicator such as orange plastic snow fence to demarcate the cover soil from soil that exceeds the criteria for clean cover soils or solidified material. Clean soil will constitute soil that meets the Division of Environmental Remediation's criteria for backfill or local site background. Excavated soil that exceeds the criteria for clean cover soils, but is not required to be disposed off-site, may be stockpiled for re-use below the demarcation layer. The top six inches of soil will be of sufficient quality to support vegetation in areas intended to be vegetated. Non-vegetated areas (buildings, roadways, parking lots, etc.) will be covered by a paving system or concrete in lieu of the soil cover.

4. Collection of mobile NAPL at off-site areas south of Front Street. NAPL and highly contaminated groundwater will be collected from an estimated 12 collection wells, and transported to an off-site disposal facility. The primary objective of the extraction will be

to remove free-phase NAPL and reduce the source material in advance of in-situ chemical oxidation (ISCO) treatment.

5. Following a period of NAPL removal acceptable to NYSDEC, the remaining off-site source material will be treated by in-situ chemical oxidation (ISCO). NAPL monitoring and, if necessary, collection, will continue during the ISCO treatment period to manage any NAPL that may be liberated by the ISCO process.

6. Biodegradation of dissolved phase contaminants may be enhanced following the chemical oxidation injections. Following a sufficient period of monitoring subsequent to ISCO treatment, the need for enhanced bioremediation of any residual off-site groundwater impacts will be evaluated.

7. Development of a site management plan to: (a) address residual 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; (b) evaluate the potential for vapor intrusion for any buildings developed on the site, including provision for mitigation of any impacts identified; (c) identify any use restrictions; and (d) provide for the operation and maintenance of the components of the remedy, both on-site and off-site.

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

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

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

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

- Repositories for documents pertaining to the site were established.

- A public contact list, which included nearby property owners, elected officials, local media and other interested parties, was established.

- A fact sheet announcing the Supplemental Remedial Investigation was mailed to the public contact list in October 2004.

- A fact sheet announcing the soil vapor investigation was mailed to the public contact list in March 2006.

- A public information meeting to discuss the soil vapor investigation was held on March 8, 2006.

- A fact sheet announcing the availability of the PRAP for public comment was issued to the public contact list on February 21, 2008.

- A public meeting was held on March 6, 2008 to present and receive comment on the PRAP.

- A responsiveness summary (Appendix A) was prepared to address the comments received during the public comment period for the PRAP.

Table 1
Remedial Alternative Costs

Remedial Alternative On-Site	Capital Cost ($)	Annual Cost ($)	Total Present Worth ($)
No Action	$0	$0	$0
Alternative 1- Institutional Controls(ICs) and Groundwater Monitoring(GM)	$19,000	$26,000	$418,700
Alternative 2-Excavation of MGP Source Materials, ICs, GM	$13,388,400	$19,800	$13,578,900
Alternative 3-Passive NAPL Collection Trench, ICs, GM	$1,553,500	$56,350	$2,380,900
Alternative 4-Containment, Cover, ICs, GM	$1,742,300	$37,000	$2,311,100
Alternative 5- In-situ Stabilization (ISS), ICs, GM	$6,177,500	$19,800	$6,368,000
Alternative 6- In-situ Chemical Oxidation (ISCO), ICs, GM	$13,367,000	$26,000	$13,740,500
Remedial Alternative Off-Site	**Capital Cost ($)**	**Annual Cost ($)**	**Total Present Worth ($)**
No Action	$0	$0	$0
Alternative 7- GM	$65,000	$36,000	$618,400
Alternative 8-ISCO, GM	$3,387,700	$36,000	$3,836,400
Alternative 9-Enhanced Bioremediation, GM	$352,700	$90,550	$1,481,200
Alternative 10-NAPL Extraction, GM	$321,500	$112,000	$1,113,000
Alternative 11-ISS, NAPL Extraction, ISCO, Enhanced Bioremediation, GM	$4,641,700	$100,400	$4,841,800
Recommended Remedy	**Capital Cost ($)**	**Annual Cost ($)**	**Total Present Worth ($)**
Alternatives 5 & 11 - ISS, NAPL Extraction, ISCO, Enhanced Bioremediation, GM	$10,819,200	$120,200	$11,209,800

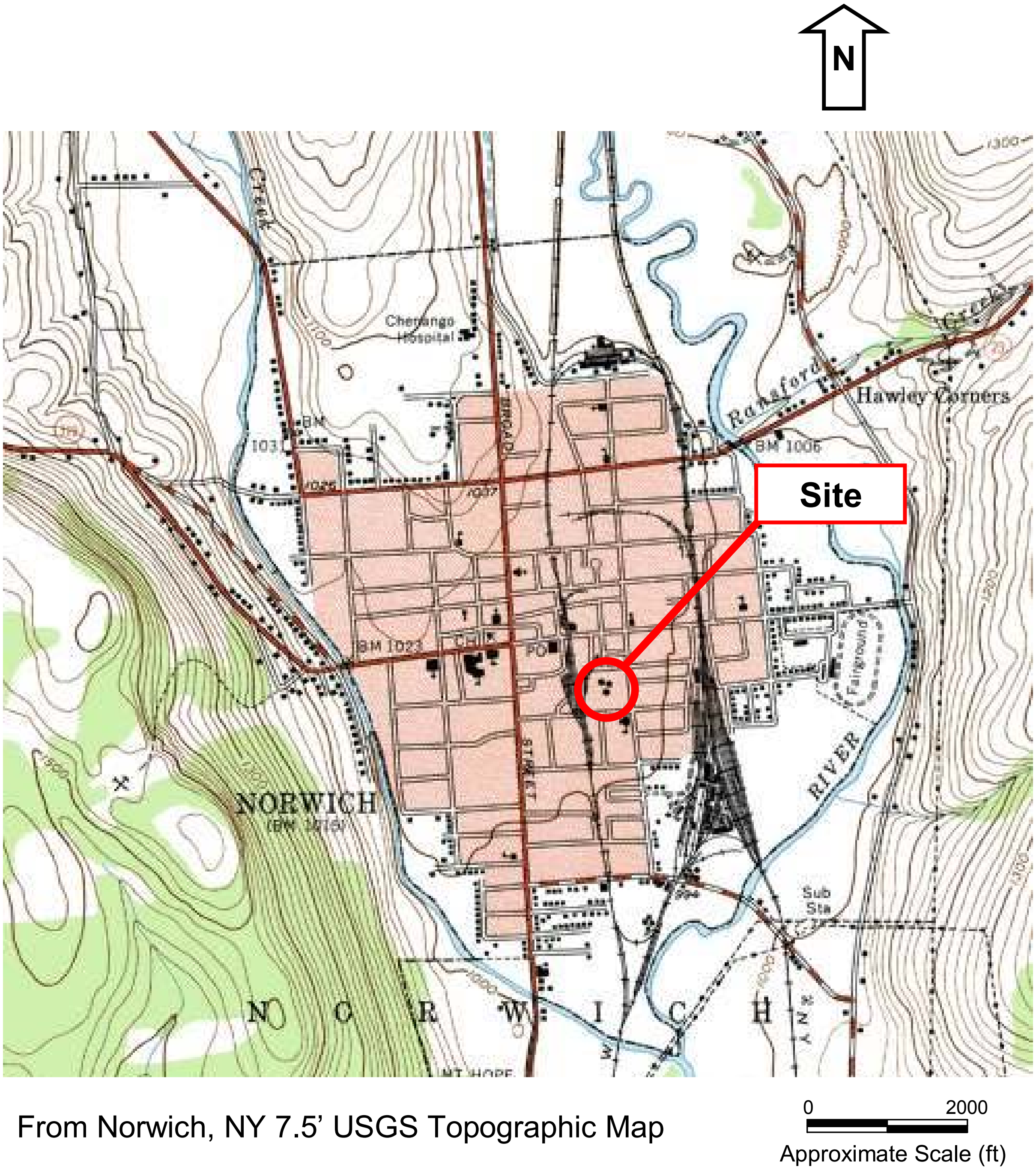


Figure 1- Site Location

LEGEND

- Location of Former Facility Structures
- Site Boundary
- Power Pole
- Tree or Shrub
- Man Hole
- Utility Pole
- Catch Basin
- Fire Hydrant

Note:
Field surveying completed by NYSEG on September 14 and 15, November 1, 2004, May 5, June 17 and December 19 and 20, 2005.

Base map drawn by NYSEG 12/30/2005

N

FIGURE 2		
General Site Map		
Norwich Former MGP Site 24 Birdsall Street, Norwich, New York		
Date: 4/23/2007	Ish Inc. / MTR	Figure 1-1

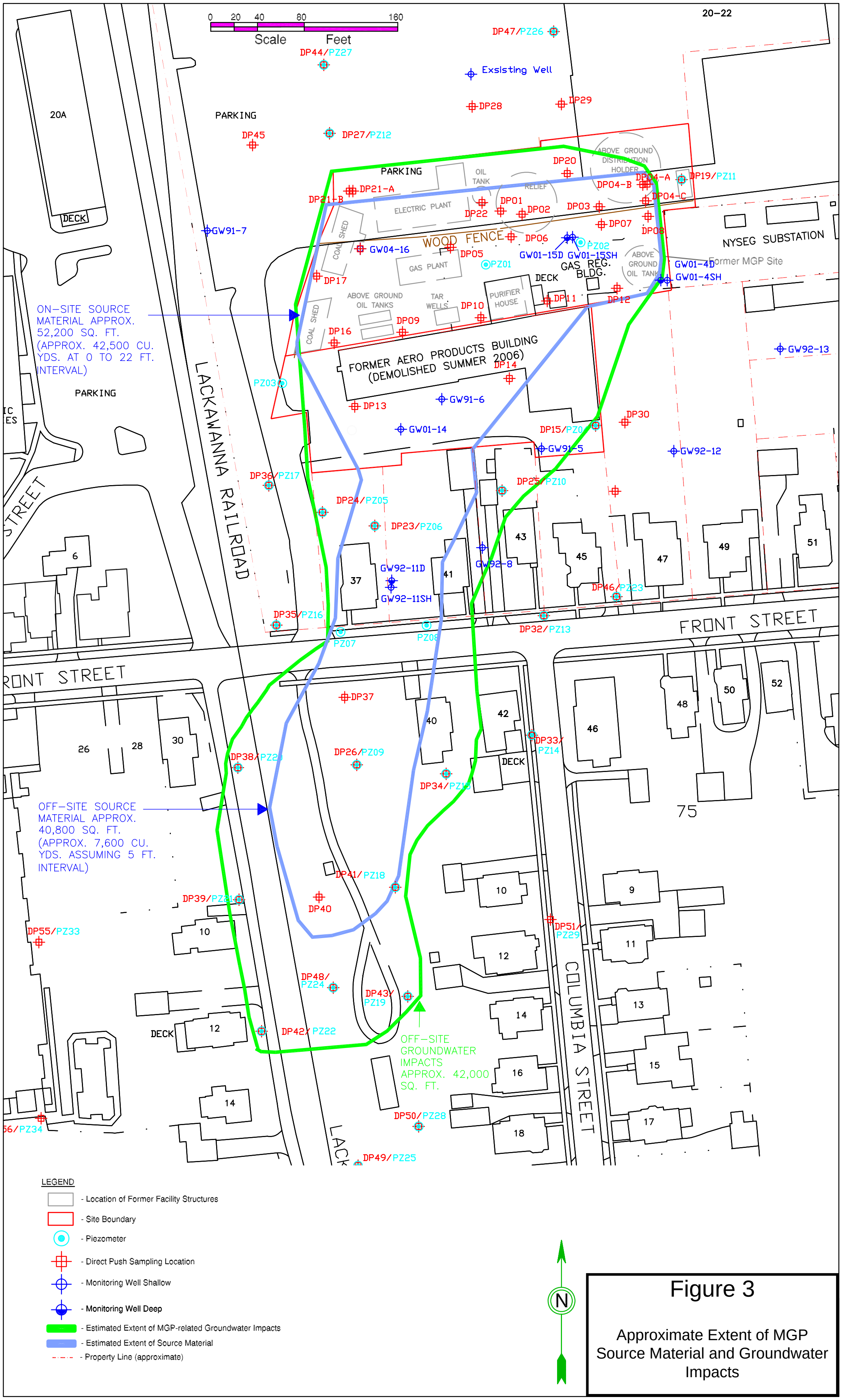


Figure 3

Approximate Extent of MGP Source Material and Groundwater Impacts

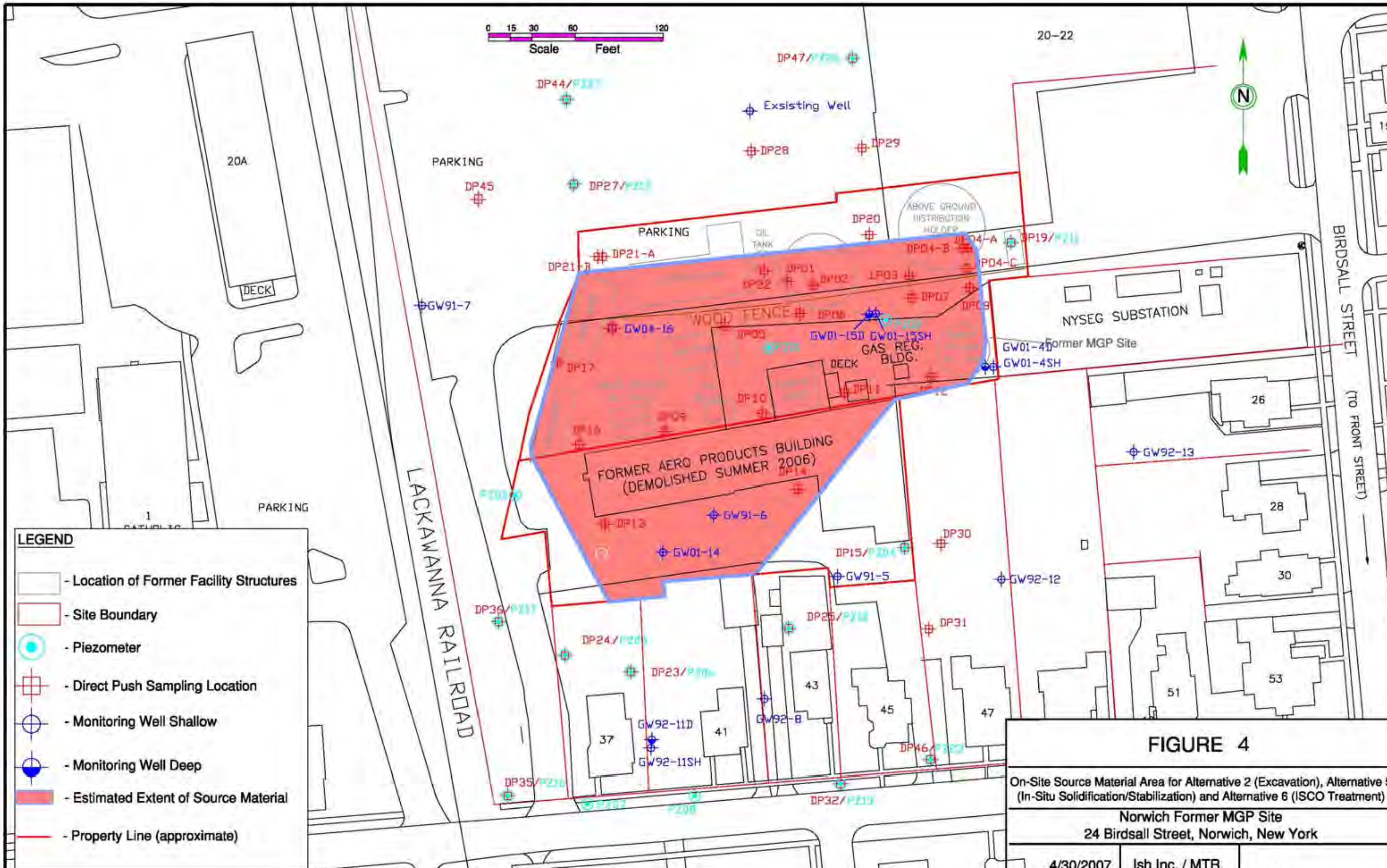
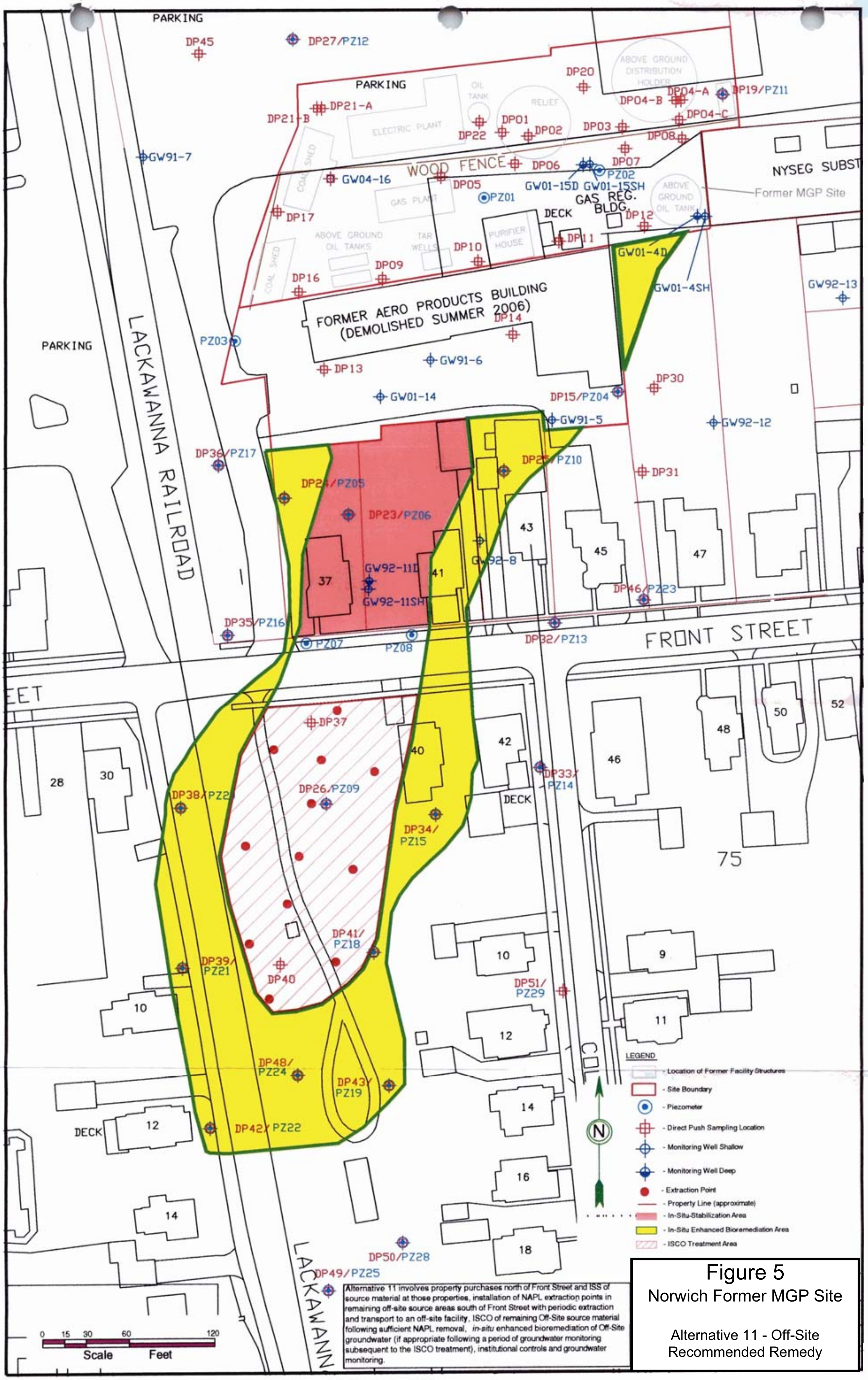


FIGURE 4

On-Site Source Material Area for Alternative 2 (Excavation), Alternative 5 (In-Situ Solidification/Stabilization) and Alternative 6 (ISCO Treatment)

Norwich Former MGP Site
24 Birdsall Street, Norwich, New York

4/30/2007 | Ish Inc. / MTR



Alternative 11 involves property purchases north of Front Street and ISS of source material at those properties, installation of NAPL extraction points in remaining off-site source areas south of Front Street with periodic extraction and transport to an off-site facility, ISCO of remaining Off-Site source material following sufficient NAPL removal, *in-situ* enhanced bioremediation of Off-Site groundwater (if appropriate following a period of groundwater monitoring subsequent to the ISCO treatment), institutional controls and groundwater monitoring.

Figure 5
Norwich Former MGP Site

Alternative 11 - Off-Site Recommended Remedy

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

NYSEG - Norwich Former MGP Site
Norwich, Chenango County New York
Site No. 7-09-011

The Proposed Remedial Action Plan (PRAP) for the NYSEG Norwich MGP site was prepared by the New York State Department of Environmental Conservation (the Department) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 22, 2008. The PRAP outlined the remedial measure proposed for the contaminated soil and groundwater at the Norwich MGP site.

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

A public meeting was held on March 6, 2008, 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 24, 2008.

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

The following comments were received during the March 6, 2008 public meeting:

Comment 1: Can the remedy be constructed without affecting the electric substation?

Response 1: Yes, the electric substation is not in the area of the former MGP, and will not interfere with, or be affected by, the remedy.

Comment 2: Does the PRAP require that two homes on Front Street (37 and 41 Front Street) be purchased by NYSEG and demolished? If so, why isn't the third house (43 Front Street) also targeted for demolition?

Response 2: The PRAP and ROD do not require the two homes referenced in the comment to be purchased by NYSEG or demolished.

Comment 3: The remedy needs to recognize the impacts to other landowners that are affected, and provide them with some compensation. The DEC and NYSEG should do more "mitigative outreach" to the community.

Response 3: The compensation of landowners is outside the scope of this ROD.

Comment 4: I live in the neighborhood, and I'm willing to accept a short term impact in exchange for a long term cleanup of the site.

Response 4: The Department acknowledges this comment and will work with NYSEG to minimize any short term impacts to the community.

Comment 5: What opportunities for public involvement will be provided for the rest of the process?

Response 5: The Department expects that a fact sheet will be mailed and an availability session will be held during the design phase and prior to construction.

Comment 6: Can the community hire an independent oversight consultant to monitor the DEC's and NYSEG's activities?

Response 6: The community may hire an independent oversight consultant; however, the community would be responsible for any associated costs.

Comment 7: When is construction expected to start?

Response 7: The Department estimates that the design phase of the project will be initiated in 2008 and continue through much of 2009, and that construction will begin in late 2009 and end in 2010.

Comment 8: Please describe the installation of extraction points planned for the downgradient area. What will the frequency of extractions be?

Response 8: Extraction points will be installed by a well driller in similar manner as the monitoring wells that were installed during the investigation phase. These wells will be slightly larger in diameter (4") than the investigation wells (1"), but like the existing wells, will be finished flush with the ground surface. The frequency of extraction will vary with the amount of NAPL that accumulates in each well. The current estimate is that each well will be measured for NAPL accumulation monthly and extracted quarterly.

Comment 9: Some data collected from 49 Front St. was rejected. Please explain this. Do the plume depictions in Figure 3 of the PRAP include this data?

Response 9: Results for a single compound, benzaldehyde, were rejected from the analyses of groundwater samples collected from several monitoring wells, including GW-92-12. These results were rejected because laboratory control (spiked) samples detected less than 10% of the known value for this compound. Benzaldehyde is not a contaminant of concern at this site, and it was not detected in soil or groundwater samples in the source area. The laboratory results for the remaining compounds were not affected by this problem, and the non-detectable results in monitoring well GW-92-12 were included in the plume map shown on Figure 3 of the ROD.

Comment 10: What is the margin of error in the blue and green lines on Figure 3 that show the extent of MGP impacts and dissolved groundwater contamination?

Response 10: Figure 3 is an approximation whose precision varies with the density of data in each area. The limits of the green line showing the approximate extent of groundwater quality standard exceedances were determined by linear interpolation of results on either side of the line. Monitoring locations outside of the green line are known to comply with water quality standards for MGP-related compounds.

Comment 11: Who will bear the cost of the remedy? Will electric rates increase as a result of the remedy?

Response 11: NYSEG is responsible for implementing the remedy. The effect on electric rates is outside the scope of this ROD.

Comment 12: NYSEG should build some tax-generating infrastructure on the remediated site.

Response 12: The specific future use of the site is outside the scope of this ROD.

Comment 13: Will this project be eligible for the Brownfield Cleanup Program tax credits?

Response 13: No.

Comment 14: The DEC should do more public outreach in the off-site area affected by the remedy.

Response 14: All properties affected by the groundwater plume were sent a fact sheet announcing the proposed remedy. The Department will continue to work with NYSEG to keep these property owners informed of the progress of the project and address any concerns they may have as implementation of the remedy goes forward. In addition, NYSEG will seek access from these property owners to implement the selected remedy.

Comment 15: I live at 51 Front Street and didn’t receive a Fact Sheet.

Response 15: This address has been added to the project contact list for future mailings.

Comment 16: My house at 45 Front Street has a well in the basement that is artesian certain times of the year. Should I use it for my garden and washing my car, or should I disconnect the pump? Can I get it sampled?

Response 16: An attempt was made to sample this well on March 17, 2007, when the soil vapor intrusion investigation was performed. However, the well was dry at that time. The property owner was advised to contact NYSEG when water returned to the well, but this notification has not been made. Based on sample results from other wells on this property, this well is not expected to be contaminated. However, NYSEG is prepared to sample it to confirm this expectation.

Comment 17: Will homeowners be indemnified by NYSEG for granting access to perform the remedy?

Response 17: NYSEG has informed the Department that their typical access agreement includes an indemnification provision.

Comment 18: What chemicals will be injected into off-site wells to oxidize the contaminants? These oxidants should be listed on the fact sheets that are sent to the community.

Response 18: Typical oxidants include permanganate or peroxide in liquid form. The specific oxidant and other injected chemicals will be determined during the remedial design phase of the project. The names of these chemicals will be provided to the community before they are applied.

Comment 19: Why is this being proposed now, instead of in 1997 when the IRM was performed?

Response 19: Additional data collected since 1997 has demonstrated that the IRM did not provide a comprehensive remedy for the site.

Comment 20: Has the plume moved since 2005?

Response 20: There is insufficient data to conclusively determine whether the plume has moved since 2005.

Comment 21: Are there other contaminants in the soil besides coal tar? What specific chemicals are in coal tar?

Response 21: The specific chemicals associated with coal tar are discussed in Section 5.1.2 of the ROD, and in greater detail in the RI and FS reports. These generally include benzene, toluene, ethyl benzene and xylene (BTEX), and polycyclic aromatic hydrocarbons (PAHs).

Comment 22: How far down in the ground will work be conducted?

Response 22: The solidification process will extend approximately 24 feet below ground surface. NAPL extraction and ISCO injection wells would be advanced to a similar depth off-site.

Comment 23: Will some contaminants always remain in the soil?

Response 23: Yes, some contamination will remain in the soil, both on-site and off-site. These will be addressed by the site management plan for the site.

Comment 24: Can coal tar be recycled?

Response 24: Because the coal tar to be removed is typically emulsified in water, it is not easily recycled. Similarly, any soil soaked with tar is not recyclable. If coal tar is recovered in recyclable form, this option will be pursued.

Comment 25: Is concrete used to stabilize bentonite?

Response 25: The stabilized mixture is a combination of soil, cement and bentonite. The cement provides physical stability to the soil, while the bentonite reduces the hydraulic conductivity (groundwater permeability) of the stabilized soil.

Comment 26: What is a specific time line/timetable for this project?

Response 26: See response to comment #7.

Comment 27: When can the property go back onto the tax rolls?

Response 27: The property is currently on the tax rolls as a NYSEG-owned parcel.

Comment 28: During work, can anyone knock on the trailer set up on site and get information?

Response 28: The Department will have an office trailer on the site, and a project sign with a phone number to call for information. The pre-construction fact sheet will also provide phone numbers to call for project information. The availability of the Department's on-site representative to respond to inquiries will depend on the nature of day-to-day activities. If the on-site representative is not available, a phone inquiry should be made.

Comment 29: Do you have any knowledge of the history of re-sale values of properties that have been remediated like this?

Response 29: The Department does not collect this type of information.

Hon. Joseph Maiurano, Mayor, City of Norwich submitted a letter dated March 6, 2008 which included the following comments. A copy of the letter is included in the Administrative Record.

Comment 30: I am concerned about the large scale and long duration of the cleanup activities. It appears that there will be an awful lot of digging, truck traffic, dust generation, noise, and general disruption of the immediate neighborhood and surrounding community for many years to come. The remediation plan should include some specific mitigation measures to benefit nearby neighbors and the larger community. Property owners within two hundred feet of excavation work should be compensated for the noise, dust, and general disruption to their daily lives that they will experience. In addition, some effort toward mitigating the negative effects of the project on the surrounding community should also be made.

Response 30: Financial compensation of nearby property owners for work in their neighborhood is outside the scope of the ROD. Construction-related impacts are typically mitigated by dust suppression techniques such as water misting and odor suppression techniques such as applying foam, limiting excavation size, and covering stockpiled soils. A community air monitoring plan will also be in effect to safeguard the downwind community from windblown dust and vapors. The contractor will also be required to comply with local noise ordinances.

Comment 31: I am concerned about the effects the heavy dump truck loads will have on our streets and sidewalks. I would propose that provisions be added to the remediation plan that would compensate the City for the wear and tear the project will have on the City's infrastructure.

Response 31: Provisions to protect and repair project-related damage to local roads and other infrastructure are typically included in project specifications. NYSEG will also consult with the City concerning haul routes to and from the site.

Attorney at Law- Sharon M. Pelosi, representing Dale and Paula Crosby owners of 37 Front Street, submitted a letter dated March 20, 2008 which included the following comments. A copy of the letter is included in the Administrative Record.

Comment 32: My clients request, at a minimum, neighborhood involvement in the remedial design phase of the cleanup; sufficient notice of cleanup activities; commitment to resurfacing any roadways damaged by wear and tear of heavy truck traffic; mitigation for damages to their house and any personal property caused by vibrations from the heavy machinery used during remediation; continued monitoring of their indoor air quality; and damages for the diminution in their property value caused by the contamination.

Response 32: See responses to comments #31, #30, #14, #5, #4 and #3.

APPENDIX B

Administrative Record

Administrative Record

NYSEG - Norwich Former MGP Site
Norwich, Chenango County New York
Site No. 7-09-011

1. Proposed Remedial Action Plan for the NYSEG - Norwich MGP site, dated February 2008, prepared by the Department.

2. The NYSDEC and New York State Electric and Gas (NYSEG) entered into a multi-site Consent Order on March 30, 1994. The Consent Order (#D0-0002-9309) obligates the responsible party to implement a full remedial program for 33 former MGP sites across the State, including the Norwich site. After the remedy is selected, NYSEG will be required to implement the selected remedy under an Order on Consent.

3. “Task I Engineering-Science Inc. assessment of data collected and analyzed by NUS Corporation, under contract to the U.S.EPA, for the Former Manufactured Gas Plant Site, Norwich, New York, in 1990"

4. “Task II Investigation Report for the Former Manufactured Gas Plant Site, Norwich, New York, Engineering-Science, Inc. In July 1992"

5. “Task III Investigation Report for the Former Manufactured Gas Plant Site, Norwich, New York, Engineering-Science, Inc. In June 1993 (final issued July 1997)"

6. “Final Report Phase III Interim Remedial Measures Work Plan for Norwich Former MGP Site, by Fluor Daniel GTI, Inc. in October 1997"

7. “Interim Remedial Measures Completion Report For System Enhancement Norwich Former MGP Site Norwich, New York, by IT Corporation, Inc. March 18, 2002"

8. “Semi-Annual Status Report - January 2003 to June 2003, Air Sparge/SVE System - Operation & Maintenance, Norwich Former MGP Site, by Shaw Environmental, Inc. in July 2003"

9. “Final Supplemental Remedial Investigation (SRI) Report Norwich Former MGP Site Norwich, New York by Ish Inc. October 2006"

10. “Final Feasibility Study Report, Norwich Former MGP Site Norwich, New York by Ish Inc. November 2007"

11. Letter dated March 6, 2008 from Hon. Joseph Maiurano, Mayor, City of Norwich.

12. Letter dated March 20, 2008 from Sharon M. Pelosi - Attorney at Law, representing Dale and Paula Crosby, owners of 37 Front Street, Norwich.