



**Division of Environmental Remediation**

---

# **Record of Decision**

**Madison Ave Former Manufacture Gas Plant  
(MGP) Site**

**City of Elmira, Chemung County, New York  
Site Number 8-08-018**

---

**March 2008**

## **DECLARATION STATEMENT - RECORD OF DECISION**

---

### **Madison Avenue Former MGP Site City of Elmira, Chemung County, New York Site No. 8-08-018**

#### **Statement of Purpose and Basis**

The Record of Decision (ROD) presents the selected remedy for the Madison Avenue Former MGP site, a Class 2 inactive hazardous waste disposal site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

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

#### **Assessment of the Site**

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

#### **Description of Selected Remedy**

Based on the results of the Remedial Investigation and Feasibility Study (RI/FS) for the Madison Avenue Former MGP site and the criteria identified for evaluation of alternatives, the Department has selected shallow soil removal, in-place treatment of deeper soil using solidification/stabilization process, passive MGP tar recovery and oxygen enhancement of groundwater. The components of the remedy are as follows:

1. Excavation and removal of about 4,500 cubic yards of MGP tar impacted soil to approximately 8 feet bgs, from the areas shown in Figure 9;
2. Excavation and removal of the contents of the oil and tar separator, their foundations, and contaminated soils surrounding them to an approximate depth of 18 feet bgs. Heavily impacted source materials around the structures will be removed to the extent practicable;

3. Excavation and removal of the concrete pipe located along the southern property boundary to the extent practicable;
4. Installation of a visible demarcation barrier at the bottom of the deep excavation areas to mark the extent of soil removal prior to backfilling the excavation;
5. In-situ solidification/stabilization (ISS) of heavily tar-impacted soil to depths ranging from approximately 13 to 28 feet bgs. The actual depth and lateral extent of treatment will be determined after the completion of the pre-design investigation;
6. Passive coal tar recovery through installation of extraction wells at locations pre-determined to contain potentially mobile coal tar. The specific number of recovery wells and locations will be determined during the design phase of this project. Tar which spontaneously enters the wells through subsurface migration will be removed and transported off site for proper treatment and disposal;
7. Introduction of oxygen into the subsurface along the southwestern property boundary, in the area identified on Figure 9, to enhance aerobic biodegradation of contaminants of concern in groundwater. The specific method for the delivering of oxygen to the subsurface will be determined during the design phase of this project. The injected oxygen will help to mitigate migration of constituents of concern beyond the site boundary;
8. Following the excavation and stabilization, remedial areas will be demarcated, backfilled and covered with at least 1 foot of clean materials from a Department approved off-site location;
9. Since the remedy results in contamination above unrestricted levels remaining at the site, an institutional control in the form of an environmental easement will be required for the site; and
10. A site management plan (SMP) will be developed and implemented. The SMP will identify the institutional controls and engineering controls (IC/ECs) required for the proposed remedy and detail their implementation. The SMP for the proposed remedy will include:
  - (a) An IC/EC control plan to establish the controls and procedures necessary to; (i) manage remaining contaminated soils that may be excavated from the site during future activities, including procedures for soil characterization, handling, health and safety of workers and the community as well as, disposal/reuse in accordance with applicable Department regulations and procedures; (ii) evaluate the potential for vapor intrusion for any buildings developed on the site, including mitigation of any impacts identified; (iii) maintain use restrictions regarding site development or groundwater use identified in the environmental easement; and (iv) require the property owner to provide an institutional control/engineering control (IC/EC) certification on a periodic basis.
  - (b) A monitoring plan to monitor the effectiveness of the oxygen injection in groundwater and to monitor the effectiveness of the proposed remedy and the trend of contaminant concentrations in the groundwater.

- (c) An operation and maintenance plan to provide the detailed procedures necessary to operate and maintain the remedy, including the oxygen injection and coal tar recovery systems. The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

**New York State Department of Health Acceptance**

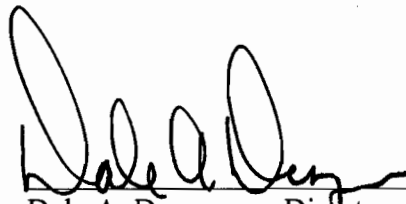
The New York State Department of Health (NYSDOH) concurs that the remedy selected for this site is protective of human health.

**Declaration**

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

MAR 27 2008

Date



Dale A. Desnoyers, Director  
Division of Environmental Remediation

## TABLE OF CONTENTS

| SECTION  |   | PAGE |
|--|---|------|
| 1: SUMMARY OF THE RECORD OF DECISION .....         |   | 1    |
| 2: SITE LOCATION AND DESCRIPTION .....             |   | 1    |
| 3: SITE HISTORY .....                              |   | 2    |
| 3.1: Operational/Disposal History .....            |   | 2    |
| 3.2: Remedial History .....                        |   | 2    |
| 4: ENFORCEMENT STATUS .....                        |   | 2    |
| 5: SITE CONTAMINATION .....                        |   | 3    |
| 5.1: Summary of the Remedial Investigation .....   |   | 3    |
| 5.2: Interim Remedial Measures .....               |   | 7    |
| 5.3: Summary of Human Exposure Pathways: .....     |   | 7    |
| 5.4: Summary of Environmental Assessment .....     |   | 8    |
| 6: SUMMARY OF THE REMEDIATION GOALS .....          |   | 9    |
| 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES ..... |   | 9    |
| 7.1: Description of Remedial Alternatives .....    |   | 10   |
| 7.2: Evaluation of Remedial Alternatives .....     |   | 14   |
| 8: SUMMARY OF THE SELECTED REMEDY .....            |   | 15   |
| Tables   | <ul style="list-style-type: none"> <li>- Table 1: Nature and Extent of Contamination .....</li> <li>- Table 2: Remedial Alternative Costs .....</li> </ul>  | 22   |
| Figures  | <ul style="list-style-type: none"> <li>- Figure 1: Site Location Map .....</li> <li>- Figure 2: Site Map .....</li> <li>- Figure 3: Geologic Cross Section .....</li> <li>- Figure 4: Approximate Location of Coal Tar Impacted Soil ..</li> <li>- Figure 5: Estimated Extent of COCs Exceeding Class GA Groundwater Standards .....</li> <li>- Figure 6: IRM Removal Areas .....</li> <li>- Figure 7: Alternative 2 .....</li> <li>- Figure 8: Alternative 3 .....</li> <li>- Figure 9: Alternative 4 .....</li> <li>- Figure 10: Alternative 5 .....</li> </ul> |      |
| Appendices   | <ul style="list-style-type: none"> <li>- Appendix A: Responsiveness Summary .....</li> <li>- Appendix B: Administrative Record .....</li> </ul>   | 23   |

# **RECORD OF DECISION**

**Madison Avenue Former MGP Site  
City of Elmira Chemung County, New York  
Site No. 8-08-018  
March 2008**

---

## **SECTION 1: SUMMARY OF THE RECORD OF DECISION**

The New York State Department of Environmental Conservation (the Department), in consultation with the New York State Department of Health (NYSDOH), has selected this remedy for the Madison Avenue 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 proposed remedy. As more fully described in Sections 3 and 5 of this document, the operation of a manufactured gas plant at the former MGP site have resulted in the disposal of hazardous wastes, including coal tar containing benzene, toluene, ethylbenzene, xylene and polycyclic aromatic hydrocarbons (PAHs). Purifier waste was also identified at the site and was removed during a previous interim remedial measure. These wastes have contaminated the subsurface soil and groundwater at the site, and have resulted in:

- a significant threat to human health associated with potential exposure to contaminated soil and groundwater.
- a significant environmental threat associated with the impacts of contaminants to groundwater.

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

The selected remedy will include a combination of removal and in-situ treatment of contaminated soils that are heavily impacted with MGP coal tar. The remedy will also include passive recovery of mobile coal tar and treatment of impacted groundwater through introduction of oxygen into the subsurface. An environmental easement and site management plan will also be required.

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 Madison Avenue Former MGP site is located in the City of Elmira, Chemung County, and is approximately 6 acres in size (see Figures 1 & 2). The former MGP site is bounded by East Fifth

Street to the north and north east, East Clinton Street to the south and Madison Avenue to the west.

The New York State Electric and Gas Corporation (NYSEG) currently owns the property and maintains an electric substation in the northeastern portion of the site. The site is approximately 1,500 feet west of Newtown Creek and 3,000 feet north of the Chemung River.

There are five main geologic units beneath the site including (from the ground surface downward) fill, alluvial silt and clay, sand and gravel, lacustrine silt and clay, and a sandy/silty glacial till (see Figure 3). The water table is approximately seven to eight feet below the ground surface, and groundwater flows in a south to southeasterly direction.

The sand and gravel unit beneath the site is part of the Newtown Creek aquifer, which is an important local water resource; however, no drinking water wells are located in the vicinity of the site, and site contaminants (as described in Section 5.1.2 below) have not migrated extensively through the aquifer.

### **SECTION 3: SITE HISTORY**

#### **3.1: Operational/Disposal History**

A gas manufacturing facility was located on the site from the late 1860s until 1947. The manufacturing process involved heating coal and petroleum products to produce a combustible gas. The gas was cooled, purified and then piped to homes and businesses in the surrounding area where it was used for heating and cooking in much the same way that natural gas is used today.

The former MGP facility consisted of, at different stages of operation, the gas house, coal house, liquid purifiers, purifier boxes, retorts, governor house, tar separators, oil tanks and generator house. Over the years, by-products, such as coal tar generated from the MGP operations, have leaked or been released from the former holders and other structures resulting in the contamination of soil and groundwater.

#### **3.2: Remedial History**

In 1986, the Department listed the site as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

NYSEG has conducted several remedial activities including four interim remedial measures, which are discussed in Section 5.2 below.

### **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. New

York State Electric and Gas, the current owner and former operator of the site, is the only PRP identified for the site.

The Department and NYSEG entered into a multi-site Consent Order on March 30, 1994. The consent order (index number DO-0002-9309) obligates NYSEG to implement a full remedial program at 33 former MGP sites across the State, including the Madison Avenue Site. After the remedy is selected, NYSEG will be required to implement the selected remedy pursuant to the Consent Order.

## **SECTION 5: SITE CONTAMINATION**

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

### **5.1: Summary of the Remedial Investigation**

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The RI was conducted between August 2003 and April 2006. The field activities and findings of the investigation are described in the RI report.

Three field programs consisting of soil, groundwater and soil vapor sampling were performed at the site to determine the nature and extent of impacts to these media of concern.

#### **5.1.1: Standards, Criteria, and Guidance (SCGs)**

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

- Groundwater, drinking water, and surface water SCGs are based on the Department's "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.
- Soil SCGs are based on the Department's Cleanup Objectives ("Technical and Administrative Guidance Memorandum [TAGM] 4046; Determination of Soil Cleanup Objectives and Cleanup Levels and 6 NYCRR Subpart 375-6 - Remedial Program Soil Cleanup Objectives")
- Concentrations of sub slab Soil Vapor VOCs were evaluated in accordance with 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: Nature and Extent of Contamination

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

As described in the RI report, many soil, groundwater and sub slab soil vapor samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, the main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs). For comparison purposes, where applicable, SCGs are provided for each medium.

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

Figures 4 & 5 and Table 1 summarize the degree of contamination for the contaminants of concern in soil and groundwater and compare the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

The principal waste product produced at the former MGP site was coal tar, which is an oily, dark colored liquid with a strong, objectionable odor. Unlike most materials labeled as "tar", this is not a viscous material. Rather, it has a physical consistency similar to motor oil, which enables it to move through the subsurface. Coal tar is referred to as a dense non-aqueous phase liquid or DNAPL since it is heavier than water and will not readily dissolve in water. When released into the subsurface, it will sink through the groundwater until it reaches some impermeable material which it cannot penetrate. It can, under certain conditions, move laterally away from the point where it was initially released.

The tar contains high levels of volatile and semi-volatile organic compounds (VOCs and SVOCs). The principal coal tar VOCs are benzene, toluene, ethylbenzene, and xylenes. These compounds, collectively known as BTEX, are slightly soluble in water. Groundwater which comes into contact with tar or tar-contaminated soils will become contaminated with BTEX compounds. This contaminated groundwater can then move through the subsurface, along with the ordinary groundwater flow.

The principal coal tar SVOCs are a group of compounds known as polycyclic aromatic hydrocarbons, commonly abbreviated as PAHs. PAH compounds are generally less soluble than BTEX, and are consequently less likely to dissolve in groundwater. This makes PAH compounds less mobile in the subsurface, so the highest levels of PAHs are normally found in proximity to the tar from which they are derived. The specific semivolatile organic compounds of concern in soil and groundwater are the following polycyclic aromatic hydrocarbons (PAHs):

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

In this document, PAH concentrations are referred to as either total PAHs (TPAHs) or carcinogenic PAHs (cPAHs). The TPAH concentration is the sum of the concentrations of each (italicized and non-italicized) PAH listed above. The cPAH concentration is the sum of the concentrations of each italicized PAH listed above.

All of the BTEX and PAH contaminants which dissolve in groundwater are subject to degradation by natural processes. Common soil bacteria are capable of using these chemical compounds as a food source, converting them to carbon dioxide and water. This degradation process takes place more rapidly when abundant oxygen is present in the groundwater, and can in many cases be expedited by the introduction of additional oxygen.

### **Surface Soil**

Surface soil is defined as the soil located from zero to two inches in depth below the ground surface. While several VOCs and SVOCs were detected in the surface soil samples, none of the VOCs were detected above the NYSDEC's TAGM recommended cleanup objectives values. The SVOCs detected were generally comparable to the levels detected in the surrounding area background samples. Potential exposure to constituents in surface soil has also been reduced through a combination of the Interim Remedial Measures (IRM) conducted in the past and the existence of buildings and asphalt cover in the western portion of the site and gravel and clean fill cover in the eastern portion of the site.

On-site surface soils show TPAH concentrations ranging from 0.02 ppm to 72 ppm. BTEX concentrations range from non-detect to 0.01 ppm.

Surface soil contamination identified during the RI/FS was addressed during IRMs to remove soil associated with purifier waste and polychlorinated biphenyl (PCB) contamination described in Section 5.2. Additionally, institutional controls will ensure that the surface cover placed down during the IRMs is maintained and remains protective in the future.

### **Subsurface Soil**

The remedial investigation revealed that high levels of coal tar contamination are generally found in subsurface soils in the immediate vicinity of former MGP structures that handled tar (see Figure 2). Two areas of coal tar impacted soil were identified. The first was in the vicinity of the two former MGP gas holders near the southern property line. The second was to the north and east of a former distribution holder. Other areas where coal tar was noted include the vicinity of the former oil and tar separators located about 100 feet north of the two former holders. A concrete pipe located in the southeastern portion of the site was encountered during the remedial investigation. A black sludge with a strong coal tar-like odor was observed inside the pipe. It should be noted that the two former holders and the foundations were removed during a 2004 IRM.

Coal tar beneath the area of the former MGP structures appears to have migrated into the subsurface to a depth of about 40 feet below ground surface (bgs) and has penetrated glacial till in some locations. Coal tar impacted soil in the eastern portion of the site has not penetrated as

deeply, and is generally present from approximately 8 to 14 feet bgs. Coal tar impacted soil is primarily constrained to within the site boundary with the exception of a small area south of the former gas holders 1 and 2, where the tar appears to have migrated south beneath the adjacent property at a depth of about 20 to 25 feet bgs.

Chemical analyses of the subsurface soils show elevated PAH and BTEX concentrations in areas where visible tar contamination was noted. TPAH concentrations in subsurface soils range from non detect to a maximum of 2,458 ppm. BTEX concentrations range from non-detect to 102 ppm.

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

### **Groundwater**

Groundwater contamination was detected in the areas near the grossly impacted soil and former MGP structures as shown on Figure 5. Some southward migration of contaminated groundwater will be expected, based on the mapped direction of groundwater flow in the area. However, this migration has been limited and has not carried site-related groundwater far beyond the tar-contaminated areas under current site conditions.

Total BTEX concentrations in groundwater range from 0.6 to a maximum of 13,400 ppb. TPAH concentrations range from 1.2 to 11,096 ppb. The lateral extent of dissolved-phase BTEX and PAH contamination appears to be limited to roughly 100 feet beyond the southern site boundary. The vertical extent of the contaminated groundwater appears to be limited to within 50 feet of the ground surface. The deep groundwater zone (deeper than 50 feet bgs) does not appear to be impacted by site related contaminants.

Four chlorinated VOCs (1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene and chloroethane) were detected above Class GA Groundwater Standards in groundwater at two shallow wells MW-3S and MW-4S located in the western portion of the site during the April 2004 sampling event. The presence of these chlorinated VOCs, ranging from 7.3 to 139 micrograms per liter, is not significant in comparison to the MGP-related BTEX concentrations. Even so, the proposed remedy will address this area by a combination of soil removal and injection of oxygen into the subsurface.

No significant amount of liquid coal tar has been observed in any of the monitoring wells.

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

### **Soil Vapor/Sub-Slab Vapor/Air**

The investigation performed to determine the potential for soil vapor intrusion of VOCs in buildings on and near the site indicates that actions are not currently needed to address potential exposures related to soil vapor intrusion. The warehouse/storage building in the western portion

of the site (and the center of the former MGP operation area) including the Trayer buildings along the southern edge of the site were evaluated. Additionally, institutional controls will ensure that the potential for exposures related to soil vapor intrusion will be evaluated for any new construction on-site.

## **5.2: Interim Remedial Measures**

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS. Four IRMs have been performed at this site as the investigation of site contamination proceeded (see Figure 6).

NYSEG performed an IRM from late 2003 to early 2004 to excavate the foundations of former gas holders 1 and 2, located in the southwestern portion of the site. The contents of the holder foundations were heavily contaminated with coal tar wastes and the IRM removed the contents, the foundations and contaminated soil in the immediately surrounding areas to depths of between 14 to 16 bgs. This material was transported off site for proper treatment and disposal.

In 2004, NYSEG also excavated and disposed of the top 3 feet of soil associated with the purifier waste disposal area along the southern boundary of the site.

In 1996, polychlorinated biphenyl (PCB) impacted soil was removed in the eastern portion of the site. The PCB contamination was related to former storage of transformers on the site and was not related to the historic use of the site as a gas plant.

The former gas house building was demolished and disposed of in 2003. For each of the completed IRMs, clean backfill and surface cover was used to replace any contaminated material that was removed.

## **5.3: Summary of Human Exposure Pathways:**

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 6.2 of the February 2007 Supplemental RI report, which can be found at the document repository. 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.

At this site the potential exposure pathways are:

- Dermal contact with contaminated soil, NAPL, or contaminated groundwater;
- Incidental ingestion of contaminated soils or groundwater; and
- Inhalation of contaminated soil vapors or dust.

The potential for exposure to contamination in surface soil has been reduced through a combination of the IRMs conducted in the past and the presence of buildings and asphalt cover in the western portion of the site and gravel and clean fill cover in the eastern portion of the site. Where site-related contamination was detected in surface soil it was generally comparable to background soil samples collected from off-site locations. The potential for exposure to NAPL-contaminated soil is unlikely since NAPL is only present in the subsurface, which is not easily accessible. However, redevelopment, subsurface utility work or building maintenance work in the future could bring workers into contact with contaminated material or bring contaminated soils to the surface. Exposure to contaminated groundwater is unlikely since the area is served by public water. However, the potential for exposure to contaminated groundwater in the future exists if a well were installed or construction was to occur below the shallow groundwater table.

The potential for exposures related to soil vapor intrusion was evaluated for buildings on and near the site. It was determined that actions are not needed to address this exposure pathway. However, the soil vapor intrusion pathway should be evaluated for any new buildings constructed on-site.

#### **5.4: Summary of Environmental Assessment**

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

The Fish and Wildlife Impact Analysis, which is included in the RI report, presents a detailed discussion of the existing and potential impacts from the site to fish and wildlife receptors.

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

- Analytical results from groundwater samples indicate that shallow groundwater (within the first 50 feet bgs) beneath the site is impacted by contaminants resulting from the operation of the former MGP. Although this groundwater impact has resulted in significant damage to the groundwater resource at the site, the contamination has not moved far beyond the site boundary. The groundwater is not currently used as a source of

potable water, and there are no identified exposure routes for the contaminated groundwater. Although the extent of off-site groundwater contamination is relatively limited under current conditions, changes in local groundwater usage (such as an installation of a high capacity public supply or production well near the site) could change flow conditions in the future and lead to greater off-site migration.

## **SECTION 6: SUMMARY OF THE REMEDIATION GOALS**

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

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

- potential human exposure to subsurface soil containing contaminants of concern (COCs);
- potential human exposure to MGP tar;
- further off-site migration of MGP tar;
- future COC impacts to groundwater;
- potential human exposure to groundwater containing COCs;
- further off-site migration of groundwater containing COCs;
- maintaining the existing surface cover materials to provide continued protection against potential human exposure to soil containing COCs; and
- future exposures resulting from soil vapor intrusion.

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 Madison Avenue Former MGP Site were identified, screened and evaluated in the FS report which is available at the document repositories established for this site.

A summary of the remedial alternatives that were considered for this site is discussed below. The present worth represents the amount of money invested in the current year that will 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 will 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 subsurface soils and groundwater at the site.

##### **Alternative 1: No Action with Institutional Controls**

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative will leave the site in its present condition and will not provide any additional protection to human health or the environment. Although this alternative will not require active remediation, it will include institutional controls to limit the use of groundwater containing COCs above the Department Class GA Groundwater Standards. These controls may be in the form of government, proprietary, enforcement or permit controls and/or informational devices. A periodic site review will be performed to assess any changes in the risk to human health and the environment posed by the site.

Capital costs associated with this alternative are the costs necessary to implement institutional controls to limit disturbance of cover materials, control subsurface activities, and restrict groundwater use within the project area. There will also be costs for continued annual monitoring and operation.

The cost to implement Alternative 1, based on an annual operation and maintenance (O&M), for a period of 30 years has been estimated as follows:

|                                       |           |
|---------------------------------------|-----------|
| <i>Present Worth:</i> .....           | \$300,000 |
| <i>Capital Cost:</i> .....            | \$140,000 |
| <i>Annual Costs (OM&amp;M):</i> ..... | \$13,000  |

##### **Alternative 2: Targeted Removal of Source Areas and Passive Recovery of MGP tar.**

This Alternative will remove the most grossly impacted material from the subsurface (see Figure 7). The components of Alternative 2 will include the following:

- excavation and off-site disposal of approximately 4,800 cubic yards of targeted sources areas of MGP coal tar impacted subsurface soil to a depth of about 20 feet bgs;
- excavation and off-site disposal of the underground oil and tar separator;
- removal of the concrete pipe located along the southeastern boundary; and

- passive MGP coal tar collection using recovery wells. The wells will not be pumped; however, any tar which collects in the wells will be removed periodically for proper off site treatment and disposal.

This alternative will require an environmental easement which will restrict use of site to commercial and industrial use, restrict the use of groundwater, require implementation of a site management plan (to include monitoring of the site) and call for periodic reviews of effectiveness of the remediation. This remedy will take approximately 12 months to design and 8 to 12 months to complete.

The cost to implement Alternative 3 has been estimated as follows:

|                                       |             |
|---------------------------------------|-------------|
| <i>Present Worth:</i> .....           | \$4,450,000 |
| <i>Capital Cost:</i> .....            | \$3,550,000 |
| <i>Annual Costs (OM&amp;M):</i> ..... | \$73,000    |

**Alternative 3: Removal of MGP Impacted Soil Containing PAHs Greater Than 500 mg/kg and BTEX Greater Than 10 mg/kg (to a depth of approximately 20 feet below grade) and Monitored Groundwater Natural Attenuation.**

This alternative builds on Alternative 2, calling for removal of more soil, as shown in Figure 8. Any soils containing visible MGP tar, or TPAH values above 500 mg/kg, or BTEX concentrations above 10 mg/kg will be removed down to a defined depth of about 20 feet bgs.

The components of Alternative 3 will include the following:

- excavation and off-site disposal of soil containing coal tar, total PAHs and total BTEX concentrations greater than the TAGM 4046 criteria of 500 mg/kg and 10 mg/kg respectively to a depth of about 20 feet bgs. An estimated 36,000 cubic yards of contaminated material will be removed under this alternative;
- excavation and off-site disposal of the underground oil and tar separator;
- excavation and off-site disposal of concrete pipe located along the southeastern property boundary; and
- monitored groundwater natural attenuation.

This alternative will require an environmental easement which will restrict use of site to commercial and industrial use, restrict the use of groundwater, require implementation of a site management plan (to include monitoring of the site) and call for periodic reviews of effectiveness of the remediation. This remedy will take approximately 12 months to design and about 18 to 24 months to complete.



The cost to implement Alternative 3 has been estimated as follows:

|                                       |              |
|---------------------------------------|--------------|
| <i>Present Worth:</i> .....           | \$15,383,000 |
| <i>Capital Cost:</i> .....            | \$14,685,000 |
| <i>Annual Costs (OM&amp;M):</i> ..... | \$56,000     |

**Alternative 4: Excavation of Heavily Impacted Soil, In-situ Solidification/Stabilization (ISS) of Deeper Soils, Passive MGP Tar Recovery, and Oxygen Enhancement of Groundwater.**

This Alternative will include a combination of removal and in-place treatment of impacted soils, together with collection and removal of mobile MGP tar and treatment of contaminated groundwater, as shown in Figure 9.

Shallow soils (from surface up to 8 ft bgs) will be removed and transported off site for proper treatment and disposal. Deeper soils will be stabilized using in-situ stabilization (ISS). The ISS process involves mixing the soil with pozzolanic agents (typically portland cement) to create a solid monolith with greatly reduced permeability. Overlapping vertical columns of solidified soil will be created using large diameter augers, jet grouting, or other methods. Contaminants will not be destroyed, but they will be immobilized in place, and contact with groundwater will be greatly reduced. Any subsurface structures will interfere with the mixing process and will need to be removed prior to beginning the stabilization process.

The components of Alternative 4 will include the following:

- excavation and removal of about 4,500 cubic yards of shallow, heavily tar-impacted soil down to the water table, at a depth of approximately 8 feet bgs. Excavated material determined not impacted by MGP waste may be reused for deeper backfill;
- excavation and removal of the oil and tar separator area located at about 100 feet north of the two former holders in the western portion of the site to a depth of about 18 feet bgs;
- excavation and removal of the concrete pipe located along the southeastern property boundary;
- ISS of approximately 22,400 cubic yards of heavily coal tar impacted soil to depths ranging from approximately 13 to 28 feet bgs. The actual treatment depth will be determined based on existing boring logs and subsequent pre-design investigation results;
- passive recovery of MGP coal tar;
- addition of oxygen to the groundwater along the southwestern property line to accelerate the natural degradation of dissolved contamination; and
- Development and implementation of a Site Management Plan which will include engineering and institutional controls designed to ensure that the implemented remedies remain protective of public health and the environment into the future.

This alternative will require an environmental easement which will restrict use of site to commercial and industrial use, restrict the use of groundwater, require implementation of a site management plan (to include monitoring of the site) and call for periodic reviews of effectiveness of the remediation. This remedy will take approximately 12 to 18 months to design and one to two years to complete.

The cost to implement Alternative 4 has been estimated as follows:

|                                       |              |
|---------------------------------------|--------------|
| <i>Present Worth:</i> .....           | \$10,440,000 |
| <i>Capital Cost:</i> .....            | \$9,320,000  |
| <i>Annual Costs (OM&amp;M):</i> ..... | \$90,000     |

**Alternative 5: Removal of Soil Exceeding TAGM 4046 Recommended Soil Cleanup Objectives (RSCOs) and Monitored Natural Attenuation of Groundwater.**

This alternative will call for the maximum degree of soil removal as a means to restore the site to pre-release conditions to the maximum extent practicable. Soil containing individual constituents greater than their respective TAGM 4046 RSCOs (see Figure 10) will be excavated and transported off site for proper treatment and disposal. Because of the depth to which tar contamination has penetrated, the required excavation will be quite deep, and the volume of soil removed will be very large. The components of Alternative 5 will include the following:

- excavation of about 240,000 cubic yards of soil containing constituents of concern to a depth of approximately 40 feet bgs;
- excavation and removal of the oil and tar separator area to a depth of about 18 feet bgs;
- excavation and removal of the concrete pipe located along the southeastern property boundary; and
- groundwater monitoring to ascertain the effectiveness of natural attenuation in reducing MGP constituents dissolved in the groundwater.

This remedy will take approximately 12 to 18 months to design and about three to five years to complete.

The cost to implement Alternative 5 has been estimated as follows:

|                                       |              |
|---------------------------------------|--------------|
| <i>Present Worth:</i> .....           | \$80,783,000 |
| <i>Capital Cost:</i> .....            | \$80,163,000 |
| <i>Annual Costs (OM&amp;M):</i> ..... | \$50,000     |

**7.2 Evaluation of Remedial Alternatives**

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York A

detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

The first two evaluation criteria are termed “threshold criteria” and must be satisfied in order for an alternative to be considered for selection.

1. Protection of Human Health and the Environment. This criterion is an overall evaluation of each alternative’s ability to protect public health and the environment.

2. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether a remedy will meet environmental laws, regulations, and other standards and criteria. In addition, this criterion includes the consideration of guidance which the Department has determined to be applicable on a case-specific basis.

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

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and/or implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared against the other alternatives.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of the remedial alternatives after implementation. If wastes or treated residuals remain on-site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the engineering and/or institutional controls intended to limit the risk, and 3) the reliability of these controls.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

6. Implementability. The technical and administrative feasibility of implementing each alternative are evaluated. Technical feasibility includes the difficulties associated with the construction of the remedy and the ability to monitor its effectiveness. For administrative feasibility, the availability of the necessary personnel and materials is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, institutional controls, and so forth.

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

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 public comments received and the manner in which the Department addressed the concerns raised.

In general, the public comments received were supportive of the selected remedy. However, the public were mostly concerned about the impacts (noise, truck traffic, odor, dust etc) the construction of the remedy may have on the community.

## **SECTION 8: SUMMARY OF THE SELECTED REMEDY**

Based on the Administrative Record (Appendix B) and the discussion presented below, the Department has selected Alternative 4, excavation of shallow contaminated soils, in-situ Solidification/Stabilization (ISS) of deeper contaminated soils, mobile coal tar recovery through the use of passive extraction wells, oxygen enhancement of groundwater and the implementation of a site management plan as the remedy for this site. The number and exact locations of the recovery wells will be determined during the design phase of this project. The elements of this remedy are described at the end of this section.

The selected remedy is based on the results of the RI and the evaluation of alternatives presented in the FS. The selected remedy, when fully implemented, will mitigate all threats to public health and the environment presented by the contaminated materials present at the site. The selected remedy will achieve the remedial action objectives (RAOs) and comply with applicable environmental laws, regulations and other standards and criteria.

Alternative 1 does not include active remedial actions and thus will not provide additional protection to human health and the environment over what currently exists. This alternative will not comply with SCGs, since source materials and other MGP-related structures will remain in place and continue to pose a threat to both human health and the environment. This alternative was therefore eliminated from further evaluation.

Alternatives 2, 3, 4 and 5 will all provide some level of protection to public health and the environment and were retained for consideration. Balancing criteria are used to evaluate the alternatives in relation to one another.

Alternative 2, which calls for removal of targeted sources of coal tar, passive coal tar recovery and the removal of the concrete pipe will limit potential for site construction workers to come into direct contact with impacted source material. However, this alternative will not comply with SCGs and Department groundwater standards, as significant amounts of source material will not be addressed, which will continue to act as a source of contamination to soil and groundwater. This alternative will not fully prevent further migration of site contamination to off-site locations.

Alternative 3 calls for more removal of contaminated material than Alternative 2. While this alternative will provide a higher level of protection of human health and the environment, source material will remain in place beyond the excavation limits at depth, and will continue to act as a source of contamination to soil and groundwater. In addition, this alternative will rely heavily on natural attenuation mechanisms to bring groundwater into compliance with the SCGs. Such

compliance will require significant length of time to achieve the desired results. Alternative 3 will be less desirable when compared to the proposed alternative.

Alternative 5, which includes near-total removal of contaminated materials to their full depth of approximately 40 feet bgs, will provide a slightly greater degree of protection to human health and the environment than Alternative 4. Only low levels of contaminated materials will remain following completion of this alternative, primarily in areas deep beneath existing buildings and infrastructure. However, this alternative will create several adverse short-term impacts during its implementation. The 40 foot excavation called for in this Alternative will require extensive dewatering in order to maintain safe working conditions. A massive groundwater treatment and disposal effort will be required. A significant increase in truck traffic will also result, because of the large volumes of soil to be transported off-site. The estimated 240,000 cubic yards of soil will require roughly 12,000 tandem truck trips through the community. While this alternative will result in a reduction of volume of contaminated source materials, it will create greater short-term adverse impacts on nearby residents and commercial establishments during construction (i.e. heavy traffic, noise, possible odors), while providing only minimal additional protection of human health and the environment over the proposed remedy. The incremental cost of over \$70 million and the significantly increased community disruption associated with this alternative over the proposed alternative are not justified by the marginal increase in protection to human health and the environment.

Alternative 4 is being proposed because, as described below, it satisfies the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It will achieve the remediation goals for the site as it will either remove or treat in place most of the sources of site contamination. Alternative 4 will prevent off-site migration of the remaining source material through the installation of coal tar recovery wells and active treatment of dissolved phase contamination. Alternative 4 will be readily implementable and will permanently reduce the toxicity, mobility and volume of impacted material at the site.

Although all alternatives with the exception of Alternative 1 will achieve RAOs established for the site and meet SCGs through different means, they will not (with the exception of Alternative 5) provide comparable level of reductions in toxicity, mobility and volume of contaminated materials compared to the proposed Alternative 4.

The estimated present worth cost to implement the remedy is \$10,440,000. The cost to construct the remedy is estimated to be \$9,320,000 and the estimated average annual costs for O&M over a period of 30 years is \$90,000.

The elements of the proposed 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. In addition, pre-design investigation will be required to further define the extent and/or volume of heavily impacted soil that will require excavation and ISS treatment. The target areas for the pre-design investigation will include but will not be limited to areas around and within the former distribution holder and areas immediately north of the

holder. A few additional borings will also be required within the former locations of holders 1 and 2 to determine the nature of materials left behind after the previous IRM. A treatability study will also be required to determine the mix requirements and other parameters associated with the ISS;

2. Excavation and removal of about 4,500 cubic yards of MGP tar impacted soil to approximately 8 feet bgs, from the areas shown in Figure 9. Visually clean excavated material determined to meet reuse criteria (based on analytical data) may be reused for deeper backfill;
3. Excavation and removal of the contents of the oil and tar separator, their foundations, and contaminated soils surrounding them to an approximate depth of 18 feet bgs. Heavily impacted source materials around the structures will be removed to the extent practicable;
4. Excavation and removal of the concrete pipe located along the southern property boundary to the extent practicable;
5. Installation of a visible demarcation barrier at the bottom of the deep excavation areas to mark the extent of soil removal prior to backfilling the excavation;
6. In-situ solidification/stabilization (ISS) of heavily tar-impacted soil to depths ranging from approximately 13 to 28 feet bgs. The actual depth and lateral extent of treatment will be determined after the completion of the pre-design investigation;
7. Passive coal tar recovery through installation of extraction wells at locations pre-determined to contain potentially mobile coal tar. The specific number of recovery wells and locations will be determined during the design phase of this project. Tar which spontaneously enters the wells through subsurface migration will be removed and transported off site for proper treatment and disposal;
8. Introduction of oxygen into the subsurface along the southwestern property boundary, in the area identified on Figure 9, to enhance aerobic biodegradation of contaminants of concern in groundwater. The specific method for the delivering of oxygen to the subsurface will be determined during the design phase of this project. The injected oxygen will help to mitigate migration of constituents of concern beyond the site boundary;
9. Following the excavation and stabilization, remedial areas will be demarcated, backfilled and covered with at least 1 foot of clean materials from a Department approved off-site location;
10. Since the remedy results in contamination above unrestricted levels remaining at the site, an institutional control in the form of an environmental easement will be required for the site. The environmental easement will:
  - (a) restrict the use of the site to commercial and industrial use;
  - (b) restrict the use of groundwater at the site;

- (c) require the management of the site in accordance with the provisions of the site management plan, to be approved by the Department; and
- (d) require the property owner complete and submit to the Department a periodic certification.

11. A site management plan (SMP) will be developed and implemented. The SMP will identify the institutional controls and engineering controls (IC/ECs) required for the proposed remedy and detail their implementation. The SMP for the proposed remedy will include:
- (a) An IC/EC control plan to establish the controls and procedures necessary to; (i) manage remaining contaminated soils that may be excavated from the site during future activities, including procedures for soil characterization, handling, health and safety of workers and the community as well as, disposal/reuse in accordance with applicable Department regulations and procedures; (ii) evaluate the potential for vapor intrusion for any buildings developed on the site, including mitigation of any impacts identified; (iii) maintain use restrictions regarding site development or groundwater use identified in the environmental easement; and (iv) require the property owner to provide an institutional control/engineering control (IC/EC) certification on a periodic basis.
  - (b) A monitoring plan to monitor the effectiveness of the oxygen injection in groundwater and to monitor the effectiveness of the proposed remedy and the trend of contaminant concentrations in the groundwater.
  - (c) An operation and maintenance plan to provide the detailed procedures necessary to operate and maintain the remedy, including the oxygen injection and coal tar recovery systems. The operation of the components of the remedy will continue until the remedial objectives have been achieved, or until the Department determines that continued operation is technically impracticable or not feasible.

## **SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION**

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following 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.
- Fact sheets were sent to the public explaining status of site remedial activities.
- A public meeting was held on May 7, 2003 to allow the public opportunity to ask questions about site investigation and a proposed interim remedial measure to remove former gas holder foundations.

- A public meeting was held on March 5, 2008 to present and receive comments on the Proposed Remedial Action Plan (PRAP). brief the public on a proposed remedial action plan to address the site contamination.



**TABLE 1**  
**Nature and Extent of Contamination**

| <b>Subsurface Soil Analyte</b>  | <b>Contaminants of Concern</b> | <b>Concentration Range Detected (ppm)<sup>a</sup></b> | <b>SCG<sup>b</sup> (ppm)<sup>a</sup></b> | <b>Frequency of Exceeding SCG</b> |
|---|--------------------------------|---|--|-----------------------------------|
| <b>Volatile Organic Compounds (VOCs)</b><br><br><br><br><br><br><br><br><br><br><b>Semi Volatile Organic Compounds (SVOCs)</b><br><br>cPAHs | Benzene                        | 0.0003 - 3.9  | 0.06                                     | 13/61                             |
|   | Toluene                        | 0.0008- 18  | 1.5                                      | 3/61                              |
|   | Ethylbenzene                   | 0.0002 - 44   | 5.5                                      | 7/61                              |
|   | Xylenes (Total)                | 0.0009- 43  | 1.2                                      | 13/61                             |
|   | Total BTEX                     | 0.0008 - 101.9  | 10                                       | 10/61                             |
|   | Benzo(a)anthracene             | 0.011- 76   | 0.224                                    | 36/78                             |
|   | Benzo(a)pyrene                 | 0.011 - 100   | 0.061                                    | 47/78                             |
|   | Benzo(b)fluoranthene           | 0.0077 - 50   | 1.1                                      | 28/78                             |
|   | Benzo(k)fluoranthene           | 0.098 - 66  | 1.1                                      | 29/78                             |
|   | Chrysene                       | 0.012 - 96  | 0.4                                      | 32/78                             |
|   | Dibenzo(a,h)anthracene         | 0.016 - 13  | 0.014                                    | 37/78                             |
|   | indeno(1,2,3-cd)pyrene         | 0.012 - 54  | 3.2                                      | 21/78                             |

| <b>Groundwater</b>   | <b>Contaminants of Concern</b> | <b>Concentration Range Detected (ppb)<sup>a</sup></b> | <b>SCG<sup>b</sup> (ppb)<sup>a</sup></b> | <b>Frequency of Exceeding SCG</b> |
|--|--------------------------------|---|--|-----------------------------------|
| <b>Volatile Organic Compounds (VOCs)</b><br><br><br><br><br><br><br><br><br><br><b>Semivolatile Organic Compounds (SVOCs)</b><br><br>cPAHs | Benzene                        | 0.5- 5,400  | 1  | 5/36                              |
|  | Toluene                        | 1.2 - 4,800   | 5  | 5/36                              |
|  | Ethylbenzene                   | 1.3 - 2,200   | 5  | 5/36                              |
|  | Xylenes (Total)                | 6 - 2,100   | 5  | 6/36                              |
|  | Total BTEX                     | 0.6-13,400  | N/A                                      | N/A                               |
|  | Benzo(a)anthracene             | 17 - 17   | 0.002                                    | 0/36                              |
|  | Benzo(a)pyrene                 | 14 - 14   | 0.002                                    | 1/36                              |
|  | Benzo(b)fluoranthene           | ND - ND   | ND                                       | 0/36                              |

| Groundwater | Contaminants of Concern | Concentration Range Detected (ppb) <sup>a</sup> | SCG <sup>b</sup> (ppb) <sup>a</sup> | Frequency of Exceeding SCG |
|-------------|-------------------------|---|-------------------------------------|----------------------------|
|             | Benzo(k)fluoranthene    | 10 - 10   | 0.002                               | 1/36                       |
|             | Indeno(1,2,3-cd)pyrene  | ND - ND   | 0.002                               | 0/36                       |
|             | Chrysene                | 13-13   | 0.002                               | 1/36                       |
|             | TPAHs                   | 1.2 - 11,096                                    | N/A                                 | N/A                        |

<sup>a</sup> ppb = parts per billion, which is equivalent to micrograms per liter, mcg/L, in water;

ND = Non Detect;

N/A = Not Applicable

ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;

mcg/m<sup>3</sup> = micrograms per cubic meter

<sup>b</sup> SCG = standards, criteria, and guidance values as presented in Department's TAGM 4046.

Table 2  
Remedial Alternative Costs

| Remedial Alternative  | Capital Cost (\$) | Annual (O&M) Costs (\$) | Total Present Worth (\$) |
|---|-------------------|-------------------------|--------------------------|
| <b>Alternative 1:</b> No Action.  | \$140,000         | \$13,000                | \$300,000                |
| <b>Alternative 2:</b> Targeted Removal of Source Areas and Passive Recovery of MGP tar.   | \$3,550,000       | \$73,000                | \$4,450,000              |
| <b>Alternative 3:</b> Removal of MGP Impacted Soil Containing PAHs Greater Than 500 mg/kg and BTEX Greater Than 10 mg/kg (to a depth of approximately 20 feet below grade) and Monitored Groundwater Natural Attenuation. | \$14,685,000      | \$56,000                | \$15,383,000             |
| <b>Alternative 4:</b> Excavation of Heavily Impacted Soil, In-situ Solidification/Stabilization (ISS) of Deeper Soils, Passive MGP Tar Recovery, and Oxygen Enhancement of Groundwater.                                   | \$9,320,000       | \$90,000                | \$10,440,000             |
| <b>Alternative 5:</b> Removal of Soil Exceeding TAGM 4046 Recommended Soil Cleanup Objectives (RSCOs) and Monitored Natural Attenuation of Groundwater.   | \$80,163,000      | \$50,000                | \$80,783,000             |

# **APPENDIX A**

## **Responsiveness Summary**

# **RESPONSIVENESS SUMMARY**

## **Madison Avenue Former MGP Site City of Elmira, Chemung County, New York Site No. 8-08-018**

The Proposed Remedial Action Plan (PRAP) for the Madison Avenue Former 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 15, 2008. The PRAP outlined the remedial measure proposed for the contaminated soil and groundwater at the Madison Avenue Former MGP site.

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

A public meeting was held on March 5, 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 20, 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:

**COMMENT 1:** What exactly brought your attention to the site? How did you know that there was contamination?

**RESPONSE 1:** This particular site was on a list of former gas manufacturing plants, which NYSEG identified for a multi-site cleanup agreement with the Department in the mid 1990s. Most MGPs were replaced by connections to natural gas pipelines. In most cities the company which offers gas service today has the business records from the previous MGP. NYSEG was one of the first utility companies in New York to sign such an agreement and has made significant progress in investigating and cleaning up MGP sites. Environmental contamination is commonly associated with MGPs based on our experience and a preliminary site characterization performed at the site confirmed that the site is contaminated by constituents of concern.

**COMMENT 2:** After Hurricane Agnes back in the 1970s, much of that area had been flooded. What affect, if any, would the flooding have had to the site?

**RESPONSE 2:** There was likely none at all. The bulk of the site contamination is below the ground surface and flood events generally do not have noticeable effects on subsurface groundwater flow or contamination. Given that it occurred over 30 years ago, the investigation which identified the current nature and extent of the site contamination took into account any potential impacts from the hurricane or other natural events.

**COMMENT 3:** Who is paying for the clean-up cost?

**RESPONSE 3:** NYSEG is responsible for the cost of investigating and cleaning up the site. They also pay the costs which the Department incurs in overseeing their work.

**COMMENT 4:** There are some vapors and we may smell some as you said – will we be able to smell the vapor when you start to excavate the soil?

**RESPONSE 4:** All intrusive work will be conducted in accordance with a Community Air Monitoring Plan (CAMP). The CAMP requires monitoring for dust and volatile compounds, and sets action levels to protect the health of people in the surrounding community. If action levels are exceeded, work at the site will be suspended and will not resume until appropriate odor control measures are taken. Typically, vapor emissions are controlled with foam sprays, while potential dust disturbances are controlled by wetting down the dust-generating area with water spraying trucks.

Please note that MGP odor is very distinctive and can be smelled by humans at levels far below the levels that would produce harmful health effects. Control of these odors is a high priority during remediation work; however, we cannot guarantee that you won't smell some odor. A Department representative will require appropriate actions if odors are strong or persistent. There will be a reporting mechanism in place as cleanup work proceeds, so that residents can report such odors if they detect them.

**COMMENT 5:** As a neighbor, I am directly behind the site and would like to know how long the process is going to take?

**RESPONSE 5:** It is estimated that it will take approximately three years to complete from the time the Record of Decision is issued. Not all of this time will involve construction activity. We estimate about one year for the design and another two years for the construction.

**COMMENT 6:** More questions will likely surface when you start getting into it from the neighborhood. Will you be willing to come back and meet with the residents?

**RESPONSE 6:** Yes. The Department maintains an active citizen participation program. The program includes the distribution of fact sheets and additional public meeting prior to the start of construction. Typically, one of the major issues is routing of truck traffic to and from the site. We coordinate trucking routes with the local Department of Public Works and New York State Department of Transportation. We will work with NYSEG to minimize traffic and noise impacts to the community as much as possible and will involve the community on these issues.

**COMMENT 7:** What will your work hours be?

**RESPONSE 7:** Work usually starts around 7:00 in the morning and stops early in the afternoon so that the trucks can get to their destinations in time.

**COMMENT 8:** Do you truck it and dispose of the soil locally?

**RESPONSE 8:** The excavated materials are typically taken to a permitted thermal treatment facility for

treatment and disposal or to a permitted waste landfill. The actual treatment location will be determined by NYSEG through a bidding process. Some less contaminated material such as brick and concrete debris may be sent to local landfills.

**COMMENT 9:** The people most affected are not here. Is there any way that we can get this information to the local community groups?

**RESPONSE 9:** We do our best to make sure that the community is informed of the site activities. If there are any suggestions on enhancements to communication vehicles, please let us know.

**COMMENT 10:** Is the institutional control or environmental easement mentioned in the PRAP applicable to adjacent properties?

**RESPONSE 10:** No. The institutional control to limit future use of the site is only applicable to the site.

## **APPENDIX B**

### **Administrative Record**



# **Administrative Record**

## **Madison Avenue Former MGP Site Site No. 8-08-018**

1. Proposed Remedial Action Plan for the Madison Avenue Former MGP site, dated March 2008, prepared by the Department.
2. Order on Consent, Index No. DO-0002-9309, between the Department and New York State Electric and Gas Corporation executed on March 30, 1994.
3. Supplemental Remedial Investigation Report, Madison Avenue Former MGP Site, Elmira, New York, Dated February 2007, prepared by ARCADIS, BBL.
4. Feasibility Study Report, Madison Avenue Former MGP Site, Elmira, New York, Dated January 2008, prepared by ARCADIS, BBL.
5. Fact Sheet, Proposed Remedial Action Plan, Madison Avenue Former MGP Site, Elmira, New York, Dated February 2008, prepared by the Department.







## SITE MAP





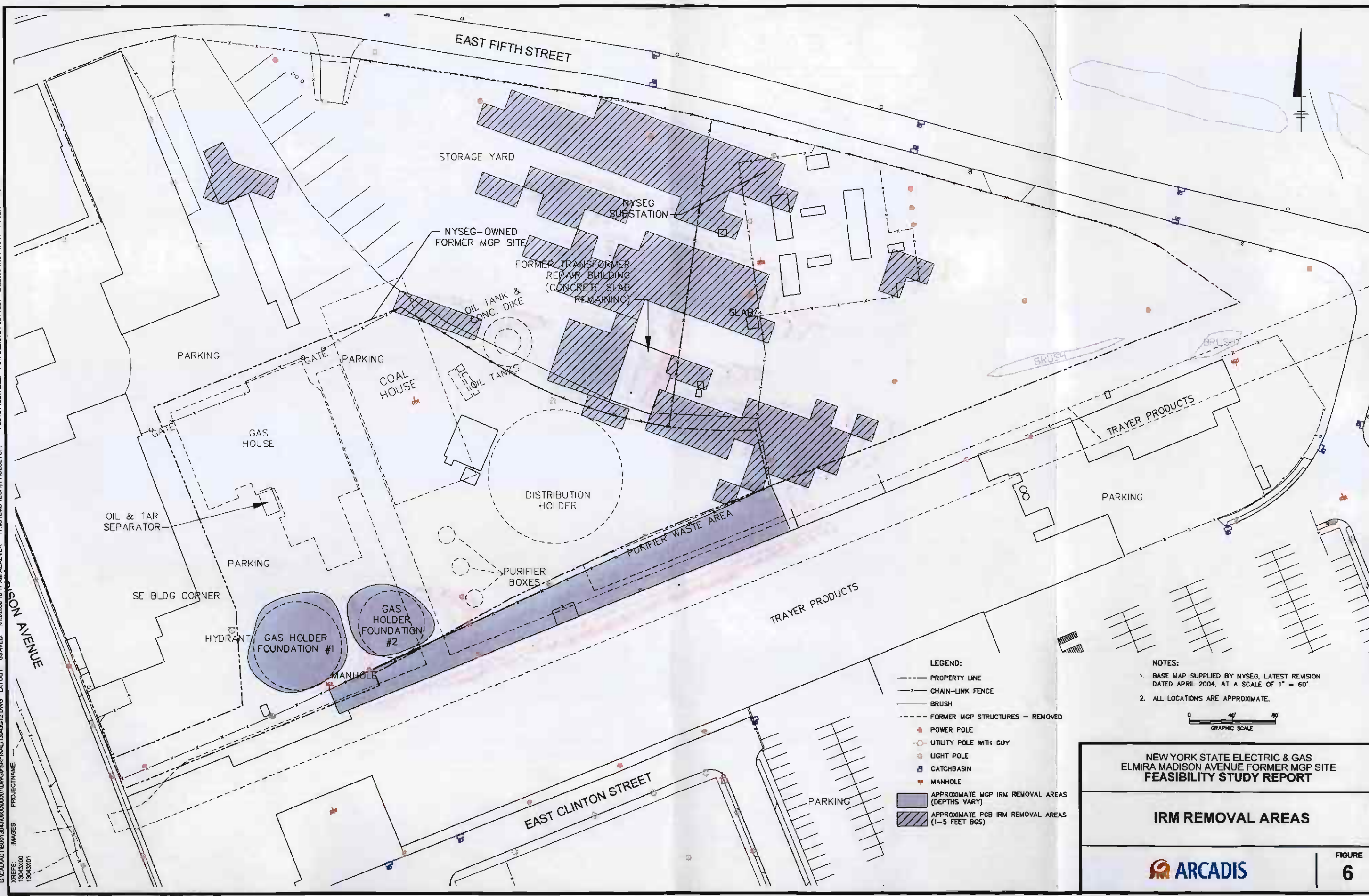








CITY: SYRACUSE DIVISION: BKGAD DB LIP LD AM PO TM TR LYRON: OFF-REF  
G:\CAD\ACT\BKGAD\BKGAD00000000\DWG\BKGAD00000000\DWG\BKGAD00000000.DWG LAYOUT 68AVED: 1/15/2008 10:17 AM ACADVER: 17.08 (LMS TECH) PAGESETUP: PLT: FULL CTB PLOTTEO: 28/2008 4:02 PM BY: POSENAUER, LISA



NEW YORK STATE ELECTRIC & GAS  
ELMIRA MADISON AVENUE FORMER MGP SITE  
FEASIBILITY STUDY REPORT

IRM REMOVAL AREAS

















