Department of Environmental Conservation

Division of Environmental Remediation

Environmental Restoration
Record of Decision
Former Ladd's Gas Station
City of Schenectady, Schenectady County
Site Number B-00049-4

March 2002

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* Erin M. Crotty, *Commissioner*

DECLARATION STATEMENT
ENVIRONMENTAL RESTORATION RECORD OF DECISION

"Former Ladd's Gas Station" Environmental Restoration Site
City of Schenectady, Schenectady County, New York
Site No. B-00049-4

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Former Ladd's Gas Station environmental restoration site which was chosen in accordance with the New York State Environmental Conservation Law.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Former Ladd's Gas Station environmental restoration site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. 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 release of petroleum products from this site, if not addressed by implementing the remedy selected in this ROD, presents a current or potential threat to public health and the environment.

Description of Selected Remedy

Based on the results of the Site Investigation/Remedial Alternatives Report (SI/RAR) for the Former Ladd's Gas Station site and the criteria identified for evaluation of alternatives, the NYSDEC has selected Alternative 6 as the remedy for this site. The components of the remedy are as follows:

- A pilot test program to determine the site specific radius of influence (ROI) of the High Vacuum (HiVac) technology, the suitability of existing monitoring wells, and to quantify the number of new extraction wells to be installed.

- A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the SI/RAR would be resolved.

- Remediation of the residual BTEX (gasoline) hot spot areas in the soil and groundwater to meet NYS groundwater standards will be accomplished by HiVac Extraction. The off-gas from the exhaust stack will be treated using either granular activated carbon (GAC) or a catalytic oxidizer to prevent nuisance odors in the community. HiVac Extraction efforts will continue until the remedial goals for the groundwater are reached

- Since a diminished plume of low level BTEX contamination will remain off site, a long term monitoring program will be instituted as a component of the operation and maintenance

program to determine the effectiveness of the remedy. Existing data suggests that the dissolved plume is in a state of dynamic equilibrium and that it has reached a stable configuration. It is anticipated that monitoring will require between two and four years of quarterly sampling of select wells along the centerline of the dissolved BTEX plume. The long term monitoring program will be terminated once the remedial goals for the site are reached. This monitoring would include a contingency plan that would require the BTEX plume to be treated more aggressively, if the selected remedy is not effective.

- Institutional controls in the form of deed restrictions will be placed on the Ladd's property to prevent the use of on-site groundwater, control future excavation of soil, and limit the property to only be used as a "Parking Lot/Park".

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective.

3/19/2002
Date

Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

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Environmental Restoration
RECORD OF DECISION

Former Ladd's Gas Station Site
City of Schenectady, Schenectady County
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March 2002

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 to address the threat to human health and/or the environment created by the presence of hazardous substances at the Former Ladd's Gas Station (Ladd's), brownfields site.

The 1996 Clean Water/ Clean Air Bond Act provides funding to municipalities for the investigation and cleanup of brownfields. Under the Environmental Restoration (Brownfield) Program, the State may provide a grant to the City of Schenectady to reimburse up to 75 percent of the eligible costs for site remediation activities. Once remediated the property can then be reused.

The Former Ladd's Gas Station is located downtown at the entrance to the Stockade section of the City of Schenectady, NY between Union Street, Erie Boulevard, and South College Street. Downtown Schenectady is a historical commercial-residential urban neighborhood. As more fully described in Sections 3 and 4 of this document, the gasoline service station operated from the early 1920s until 1987. The operation of the Former Ladd's Gas Station on this site has contaminated the groundwater with primarily benzene, toluene, ethylbenzene, and xylene (BTEX). A plume of this contamination currently extends approximately 500 feet to the west of the site to the surrounding area. This BTEX plume has resulted in the following threats to the public health and/or the environment.

- A potential threat to human health associated with the possibility for petroleum vapors to migrate into the basements of buildings.

- A potential threat to human health associated with the direct contact with contaminated groundwater and saturated sub-surface soils by construction workers.

- A potential threat to human health associated with BTEX contamination in the groundwater. Even though the area is served by municipal water and is unlikely to be developed as a water supply, the contamination significantly exceeds drinking water and groundwater standards.

- An environmental threat associated with the contaminated groundwater. The site is located in the General Aquifer Recharge Area (Zone II) of the Schenectady-Niskayuna Aquifer. This is a US Environmental Protection Agency designated sole source aquifer.

In order to eliminate or mitigate the threats to the public health and/or the environment that the hazardous substances disposed at the Ladd's brownfield site have caused, the following remedy is selected to allow for approved commercial/recreational use of the site:

- The contaminated groundwater will be remediated by using a HiVac extraction system in conjunction with institutional controls and a contingency plan, if necessary. The HiVac extraction system will be truck or trailer mounted to provide easy mobility and access to extraction points.

- Institutional controls in the form of deed restrictions will be placed to prevent the use of on-site groundwater and limit the property to only be used as a "Parking Lot/Park". In order to change the use of the site in the future a waiver will be required from the NYSDEC and NYSDOH. If development or excavation occurs on site any subsurface soils that are excavated will have to be disposed off site at an approved and permitted landfill in accordance with NYSDEC regulations. A plan will be submitted and approval must be given by NYSDEC before any work proceeds.

The selected remedy, discussed in detail in Section 8 of this document, is intended to attain the remediation goals selected for this site in Section 6 of this Record of Decision (ROD) in conformity with applicable standards, criteria, and guidance (SCGs).

SECTION 2: SITE LOCATION AND DESCRIPTION

The Ladd's site acts as a gateway to the "Stockade Section" of the City of Schenectady from Erie Boulevard. Erie Boulevard is a major thoroughfare in the City originating at General Electric, intersecting Union Street (Rt. 5) and terminating at the Mohawk River. The site is located between Union Street, Erie Boulevard, and South College Street in the City of Schenectady, Schenectady County, New York *(see Figure 1)*. The site is located in a commercial-residential urban neighborhood approximately 2,000 feet to the southeast of the Mohawk River. The area is almost completely covered by asphalt, concrete, or buildings. The site is at an elevation of approximately 230 feet above mean sea level. Topography in the area slopes very gently to the west towards the Mohawk River, which has an elevation of approximately 210 feet. Surface drainage flows into the local storm sewer system, which discharges to the Mohawk River. In the past several gas stations operated in the vicinity of the site. A Texaco service station was located across Erie Boulevard to the east. A Gulf Oil service station (currently the Burger King restaurant) was located at the corner of Erie Boulevard and Liberty Street from 1956 to 1969. Several buildings at the southwestern corner of Union Street and South College Street are vacant. The remaining buildings along the south side of Union Street are residential apartments.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The Ladd family owned and operated a gasoline service station at the site from the early 1920s until 1987. In 1997, the property was foreclosed upon and deeded to the City of Schenectady.

3.2: Environmental Restoration History

Several remedial actions have been undertaken under the "NYS Oil Spill Program" at the site since the initial discovery of petroleum contamination. Remedial actions taken to date are summarized below:

- **1986** - An underground storage tank (UST) which had failed a tightness test was excavated and removed from the site.

- **1986** - A subsurface investigation was initiated and completed in 1988. Subsequent investigations revealed the presence of Light Non-Aqueous Phase Liquids (LNAPL) on the water table and dissolved-phase petroleum constituents in groundwater on and downgradient (west) of the site.

- **May 1987** - 13 underground storage tanks (USTs) and approximately 5,300 cubic yards of gasoline contaminated soil were removed from the site.

- **July 1987** - A soil venting system beneath the service station building was installed and operated until the Spring of 1993.

- **Fall 1989** - A groundwater recovery/treatment system downgradient of the site was installed and operated, with modifications, until March 1996.

The groundwater recovery/treatment system that was installed in the fall of 1989 and operated until March 1996 eliminated most of the free product LNAPL in the groundwater and stabilized the plume. This operation was successful by keeping the plume from further migrating downgradient from the site and eliminating the VOC vapors that were present in the surrounding residential basements. Even though this treatment system stabilized the plume and eliminated basement vapors, the potential health and environmental risks are still a concern due to the elevated concentration of BTEX contamination that remains in the groundwater.

SECTION 4: CURRENT STATUS

To determine the nature and extent of any contamination by hazardous substances of this environmental restoration site, the City of Schenectady has recently completed a Site Investigation/Remedial Action Report (SI/RAR).

4.1: Summary of the Site Investigation

The purpose of the SI was to define the nature and extent of any contamination resulting from previous activities at the site.

The SI was conducted in two phases. The first phase was in July 1998 and the second phase in October 1999. A report entitled "Brownfields Site Investigation/Remedial Alternatives Study" has been prepared which describes the field activities and findings of the SI in detail.

The SI included the following activities:

- Soil borings and the collection and analysis of soil samples.
- Organic vapor screening of soil sample headspace.
- Installation of groundwater monitoring wells.
- Collection and analysis of groundwater samples.
- Measurements of groundwater elevations to estimate groundwater flow directions and hydraulic gradients.
- Basement ambient air samples from selected off-site buildings located above the groundwater plume.
- Surface soil sampling on site.

To determine which media (soil, groundwater, etc.) are contaminated at levels of concern, the SI analytical data was compared to environmental Standards, Criteria, and Guidance values (SCGs). Groundwater, drinking water and surface water SCGs identified for the Ladd's site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part 5 of the New York State Sanitary Code. For soils, NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 provides soil cleanup guidelines for the protection of groundwater, background conditions and evaluating exposure scenarios. In addition, for soils, background concentration levels can be considered for certain categories of contaminants. Guidance values for evaluating contamination in surface water sediments are provided by the NYSDEC Technical Guidance for Screening Contaminated Sediments. For the basement ambient air samples, NYSDOH data for background indoor/outdoor air levels of Volatile Organic Compounds (VOCs) in homes provided the guidelines for evaluating health-based exposure scenarios.

Ambient air quality sampling, conducted in February 2001, showed that VOCs are not presently migrating into the surrounding residential basements. However, due to the high concentrations of BTEX contamination in the groundwater and soils below the water table that remains on site the potential for migration still exists.

Based on the Site Investigation results in comparison to the SCGs and potential public health and environmental exposure routes, certain media and areas of the site require remediation. These are summarized below. More complete information can be found in the SI Report.

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

4.1.1: Site Geology and Hydrogeology

Geology

The site is located within the Mohawk River Flood Plain deposits. Overburden soils beneath the site are characterized by alluvial silty sands, with occasional clay lenses. The thickness of the overburden in the vicinity of the site is unknown, however information from borings completed during previous investigations suggest that the overburden is at least 30 feet thick. Bedrock beneath the site is the Ordivician Schenectady Formation, which consists of graywackes, siltstones, shales, and sandstones.

To the east of the site, the north-south trending former Erie Canal is beneath what is now Erie Boulevard. The canal was backfilled with various materials and debris in the late 1800s to early 1900s. The depth of the backfill is estimated to be 10 to 15 feet below grade. The clay banks of the old canal are believed to still exist in the subsurface. Several areas of building demolition debris have also been found to the west of the site.

Hydrogeology

Groundwater was encountered at approximately 9 to 10 feet below ground surface at the site. Based on groundwater elevations measured during the SI, the groundwater flow direction is to the west towards the Mohawk River under a relatively flat gradient of approximately 0.0008. Previous investigations have estimated hydraulic conductivity values ranging from 2.5 to 5 feet/day.

4.1.2: Nature of Contamination

As described in the SI report, many soil and groundwater samples were collected at the site to characterize the nature and extent of contamination.

The significant contaminants of concern are VOCs and Semi-Volatile Organic Compounds (SVOCs). Benzene, toluene, ethylbenzene, and xylenes, from gasoline, are the predominant VOCs. Pentachlorophenol and naphthalene are the predominant SVOCs. Naphthalene is commonly found in petroleum products, however, pentachlorophenol is not related to the operation of the service station. Pentachlorophenol is a wood preservative often used for treating railroad ties, telephone poles, and large wood beams used for shoring embankments. Soil boring 88-1 encountered wood debris. This information suggest that the source of the pentachlorophenol contamination found in the groundwater at this location is most likely from the wood debris and not the BTEX. This single detection of pentachlorophenol is not considered to be site related and will not be addressed further in this document. SI data shows that the higher concentrations of VOCs are located offsite to the west, and downgradient.

4.1.3: Extent of Contamination

Table 1 summarizes the extent of contamination for the contaminants of concern in groundwater and compares the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation.

Groundwater

Groundwater at the Ladd's site is primarily impacted by BTEX compounds from gasoline *(see Figure 2)*. Total BTEX concentrations in all groundwater samples taken from on-site and off-site monitoring wells ranged from 42 parts per billion (ppb) to 38,100 ppb.

The maximum total BTEX concentration detected in on-site groundwater was 5,380 ppb located in monitoring well UNK-1. This monitoring well is located at the downgradient border of the site in the northwest corner. Light non-aqueous phase liquid (LNAPL) was not found in any of the on-site monitoring wells.

The most contaminated part of the BTEX plume is located off site. The highest total BTEX concentrations in off-site groundwater were detected in monitoring wells 88-5 (38,100 ppb), 88-7 (26,800 ppb), AH-1 (23,800 ppb), and MW-13 (17,300 ppb), all of which are located to the west, and downgradient of, the Ladd's site.

Soil

Surface soils at the site showed some low level concentrations of carcinogenic SVOCs which included benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and chrysene. Even though the concentrations of benzo(a)anthracene and benzo(a)pyrene are above TAGM levels they are within the typical background levels found in urban areas. These concentrations correspond to typical levels of byproducts of combustion found in urban areas due to a variety of sources. Therefore, it has been determined that the carcinogenic SVOCs in the surface soil at Ladds are not related to the petroleum contamination and are not chemicals of concern addressed in this record of decision.

Unsaturated soil (soils above the watertable) at the Ladd's site showed some low level concentrations of BTEX contamination. The highest concentration was sample SB-09 which was 42ppb. However, these concentrations did not exceed NYS TAGM HWR-94-4046 guidance values for cleanup. Contaminated soil at the site was removed in May 1987, when the remaining underground fuel tanks were removed. No other source areas of soil contamination were discovered during the site investigation. However, the soil under the concrete pad that the gasoline service station was built on remains on site. There is the potential that soil under this concrete pad is contaminated with elevated levels of BTEX contamination. During excavation of the underground fuel tanks the contaminated soil was removed under and around the tanks to the water table. Contamination may still exist at approximately 16 feet below the ground surface at the water table interface.

Saturated soils (soils below the watertable) at the Ladd's site showed relatively high level concentrations of BTEX contamination. There were three on-site soil samples taken from the saturated soil. The total BTEX concentrations for these samples ranged from 108,600 ppb to

925,200 ppb. The highest concentration (925,200 ppb) was taken from soil boring SB-15. These concentrations indicated that residual free-phase petroleum contamination likely exists in the saturated soils at these locations even though LNAPL was not directly observed in these samples. However, off-site soil boring SB-2 did contain LNAPL in the saturated soil sample. Based on Figure 2, only seven percent of the total plume area (defined as the 1,000 ppb iso-concentration contour) is located on the Ladd's site.

Air

Basement and ambient air sample data taken in August 1998 indicate toluene and total xylenes were detected in the ambient air and in all of the basement air samples taken from 250 Union Street. Toluene was detected in the basement samples at concentrations ranging from 0.012 to 0.021 ppb. The concentration of toluene in the ambient sample was 0.0097 ppb. As reported by the New York State Department of Health (NYSDOH), the concentrations of toluene detected in the basement samples are approximately equal to the median background concentrations measured in homes in New York State.

Total xylenes were detected in the basement samples at concentrations ranging from 0.008 to 0.011 ppb, which are less than the concentration of total xylenes in the ambient sample of 0.012 ppb. The concentration of total xylenes detected in the basement samples are less than the 95th percentile and only slightly higher than the median background concentrations for m and p-xylenes, which represent the lowest median xylene isomer background concentrations measured in the NYSDOH study.

In February 2001 air sampling at 250 and 252 Union Street did not detect any VOCs in thge basements of these buildings.

4.2: 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 SI/RAR.

During the removal of an underground storage tank in 1986 BTEX contaminated soil were discovered on site. In 1987 the remaining underground tanks and contaminated soil was removed and disposed. The above ground portion of the gasoline station structure was subsequently removed as an IRM in 1998 to facilitate the site investigation work conducted under the Brownfields project.

4.3: 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 health risks can be found in Section 3 of the RAR report.

An exposure pathway is the manner by which an individual may come in contact with a contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) the environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past,

present, or future events.

Pathways which are known to or may exist at the site include:

- Ingestion - the ingestion of groundwater
- Direct Contact - dermal contact with groundwater or subsurface soil (current and future construction workers)
- Inhalation - the inhalation of vapors from groundwater and subsurface soil due to the potential for vapors from these media to migrate into surrounding basements of homeowners (current and future construction workers, future site workers, and homeowners)

4.4: Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures and ecological risks which may be presented by the site. The following pathways for environmental exposure or ecological risks have been identified:

The contaminated groundwater is the only potential pathway for environmental exposure at this site and, therefore does not pose a threat to fish and wildlife.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past owners and operators, waste generators, and haulers. The Attorney General has executed a settlement with the only known responsible party (the Ladds) and their insurance company for a portion of the costs incurred by the State prior to the Brownfield activities. Therefore, we do not expect any additional enforcement actions to be initiated to recover State Brownfield costs.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS AND THE PROPOSED USE OF THE SITE

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to meet all Standards, Criteria, and Guidance (SCGs) and be protective of human health and the environment. At a minimum, the remedy selected must eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous substances disposed at the site through the proper application of scientific and engineering principles.

The proposed future use for the Ladd's site is commercial/recreational. The goals selected for this site are:

- Provide for attainment of SCGs for groundwater quality in the area where the BTEX contamination exists, to the extent practicable.

- Mitigate, to the extent practicable, the potential for further off-site migration (plume migration) of contaminatedgroundwater that does not attain NYSDEC Class GA Ambient Water Quality Criteria due to elevated levels of VOCs (BTEX).

- Mitigate, to the extent practicable, the potential exposure to VOC vapors in the basements of the surrounding buildings.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost effective and comply with other statutory requirements. Potential remedial alternatives for the Ladd's site were identified, screened and evaluated in a Remedial Alternatives Report. This evaluation is presented in the report entitled "Brownfield Site Investigation/Remedial Alternatives Report", January 2000.

A summary of the detailed analysis follows. As presented below, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy or procure contracts for design and construction.

7.1: Description of Remedial Alternatives

The remedial alternatives are intended to address the contaminated groundwater at the site.

Alternative 1: No Further Action

Present Worth:	*$ 0*
Capital Cost:	*$ 0*
Annual O&M:	*$ 0*
Duration	> 100 years

This alternative recognizes remedial work conducted under a previously completed Spill Removal. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2: Vertical Well Groundwater Extraction and Institutional Controls

Present Worth:	*$ 980,000*
Capital Cost:	*$ 161,000*
Annual O&M:	*$ 54,000*
Time to Implement	6 months
Duration	> 30 years

This alternative includes institutional controls, long term groundwater monitoring, and the installation and operation of a one to two-well vertical well groundwater extraction system utilizing ex-situ groundwater granular activated carbon (GAC) treatment. Pretreatment would be required

to prevent iron fouling to remediate the BTEX contamination in the off-site groundwater. This alternative would involve the installation of pumps, filters, piping, and electrical controls. To implement this alternative the existing groundwater monitoring wells would have to be rehabilitated and it would be necessary to install an additional groundwater extraction well.

Alternative 3: Vertical Well Groundwater and Soil Vapor Extraction and Institutional Controls

Present Worth:	*$ 1,240,000*
Capital Cost:	*$ 266,000*
Annual O&M:	*$ 93,000*
Time to Implement	6 months
Duration	5 - 10 years

This alternative includes institutional controls, long term groundwater monitoring, and the installation and operation of a groundwater extraction system concurrent with a 20-well soil vapor extraction (SVE) system to remediate the BTEX contamination in the off-site groundwater. Two properly placed wells would be installed to produce the desired drawdown to operate the SVE system. Both systems would utilize ex-situ treatment of groundwater and vapors with GAC. To implement this remedy a vapor extraction well, blowers, knock-out tanks, and a silencer would have to be installed. In addition to this equipment and before the remedy could be implemented a vapor recovery pilot test would have to be implemented.

Alternative 4: ORC Injection and Institutional Controls

Present Worth:	*$ 2,135,390*
Capital Cost:	*$ 398,000*
Annual O&M:	*$ 225,000*
Time to Implement	3 months
Duration	5 - 20 years

This alternative includes institutional controls, long term groundwater monitoring, and the injection of Oxygen Release Compound (ORC) to introduce oxygen to the contaminated groundwater, thereby enhancing the natural attenuation of the groundwater plume. ORC-introduction methods considered as part of this alternative would include direct injection of ORC in boreholes and the use of ORC "socks" in wells. This Alternative would require the installation of 150 geoprobe boreholes for the direct injection of the ORC chemical into the plume. The ORC would be injected semi-annually for period of 10 years. The ORC socks would include the installation of seven additional wells. An intensive monitoring program with several new wells would have to be installed and implemented for both of these methods.

Alternative 5: NoVOCs wells and Institutional Controls

Present Worth:	*$ 1,170,000*
Capital Cost:	*$ 288,000*
Annual O&M:	*$ 57,000*
Time to Implement	1 year
Duration	15 - 30 years

Alternative 5 consists of institutional controls, long term groundwater monitoring, and one NoVOCs well. NoVOCs is an in-well vapor stripping technology that volatilizes dissolved phase contaminants by extraction wells installed in contaminated groundwater. Groundwater would enter the bottom of a NoVOCs well through a screen. Air is then injected at the base of borehole, causing the contaminated groundwater to rise within the well. The air also volatilizes the dissolved phase VOCs as they travel up the well. The contaminants are then carried to the surface as vapor, where they are treated by using granular activated carbon. To implement this remedy, piping, blowers, knock-out tanks, silencer, electrical controls and a treatment building would have to be installed. Before this system could be implemented a pilot test and installation of an additional monitoring well would be necessary to assess the radius of influence and effectiveness of the system.

Alternative 6: HiVac Extraction of BTEX Contaminated Groundwater and Institutional Controls

Present Worth:	*$ 340,000*
Capital Cost:	*$ 290,000*
Annual O&M:	*$ 10,000*
Time to Implement	3 months
Duration	5 years

Alternative 6 includes institutional controls, long term groundwater monitoring, and High Vacuum (HiVac) Extraction. HiVac Extraction, also known as Multiphase Extraction (MPX) or Bioslurping, will be used to pull residual gasoline contamination off the subsurface soils on and adjacent to the site. This will significantly reduce and ultimately destroy the source of the off-site dissolved BTEX plume. Also included is a contingency plan that would consider other alternative technologies, if necessary, as described in Section 8 of this document.

HiVac Extraction is an emerging in-situ remedial technology for the simultaneous extraction of vapor phase, dissolved phase and separate phase contaminants from the unsaturated zone, capillary fringe, saturated zone soils and groundwater. It is in essence the application of vacuum to specially designed extraction wells, sufficient to pull out residual gasoline, petroleum vapors and contaminated groundwater. The technology is capable of removing sufficient free phase and residual petroleum contamination to render the subsurface environment suitable for natural microbial biodegradation. Once that stage is reached, biodegradation would complete the destruction of the residual hydrocarbons.

HiVac Extraction would be conducted utilizing a mobile unit to supply the requisite vacuum to the extraction wells. At this site a standard vacuum truck would be used as the mobile unit. This would eliminate the need for the trenching and lateral piping associated with a stationary system and minimize disruption to the residential community. The mobile HiVac unit would be moved around the area and would connect to several wells at a time using above ground hoses. The system would be operated on a given set of wells until petroleum concentrations measured in the system exhaust diminish. The system would then move to another set of wells. It is expected that the process would have to be repeated several times for each set of wells. The off-gas from the exhaust stack would be treated using either granular activated carbon or a catalytic oxidizer to prevent nuisance odors.

To implement this remedy, a pilot test would be necessary to determine the number of extraction points for the system. While specifics pertaining to system operation will be determined from the pilot test, it is estimated that the wells would have to be vacuumed four at a time for a duration of 30 to 90 days until photoionization detection readings stabilize and decrease.

7.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of environmental restoration project sites in New York State (6 NYCCR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is included in the Remedial Alternatives 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. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance. The most significant SCG used for evaluating the sampling data for the Ladd's site was the "Water Quality Regulations for Surface Waters and Groundwaters".

The groundwater at the site has been significantly impacted by the BTEX volatile organic compounds. The concentrations for the four individual BTEX compounds in the groundwater range from 9.5 to 16,700 ppb, much higher than the drinking water standard value of 1 ppb for benzene and 5 ppb for toluene, ethylbenzene, and xylenes.

Alternative 1 does not comply with the SCGs. Without any remedial plan, SCGs would not be achieved for many decades. Alternatives 2, 3, 4, 5, and 6 would all comply with the chemical-specific SCGs for the contaminated groundwater. The most significant groundwater contamination is located off site. The remedial goal for off-site contaminated groundwater should be achieved within about a 30 year period. Alternatives 2, 3, 4, 5, and 6 would meet groundwater requirements, however they would possibly require the treatment of the exhausted air stream from the SVE using a GAC system.

2. 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.

Alternative 1 would not be protective of human health or the environment. Institutional controls should prevent direct contact with the site contaminants. However, the potential for human exposure to VOC vapors in basements would remain. Alternatives 2, 3, 4, 5, and 6 would all be protective of human health and the environment by remediating the BTEX plume and reducing the human health and environmental risk associated with the potential direct contact to the contaminated groundwater and VOC vapors.

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.

All of the alternatives would result in little worker and/or community exposure during the remedial action. Alternative 1, 2, and 5 would not be effective in achieving clean up levels in the short term. Alternatives 3, 4, and 6 would result in the required cleanup levels being reached in a shorter term for the contaminated groundwater.

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 controls intended to limit the risk, and 3) the reliability of these controls.

Alternative 1 would leave contaminants unremediated. The cleanup goals could take many years to meet the long term objectives. Alternatives 2, 3, 4, 5, and 6 would all meet the long-term cleanup goals for off-site groundwater within about a 30 year period.

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

Alternative 1 would rely on natural attenuation to breakdown and destroy the BTEX VOCs in the groundwater. Alternatives 2, 3, 4, 5, and 6 would significantly reduce the toxicity, mobility, and volume by effectively remediating the groundwater source areas where the greatest concentrations of BTEX exist. Alternative 3 may be effective in removing BTEX source areas, however, the technology to be employed for forcing air into the ground could potentially force BTEX vapors into the basements of buildings within the plume's footprint.

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

Alternative 1 would be the easiest to implement as no construction work is required. Alternatives 2, 3, 4, 5, and 6 would easily be implemented as experienced contractors are readily available to construct each technology. However, all of these alternatives would require temporary access to private properties. Alternative 3 would require a site-specific field test of the SVE component of the remedy. This remedy would require the use of existing wells and several new wells and piping. This remedy would be intrusive to the site and may effect everyday activities of the residences.

Alternative 4 would require numerous well points (roughly 1000) to inject the oxygen release compound. Although this remedy would be effective in addressing the contaminated groundwater, it would be difficult to capture the contamination that is under building foundations. Alternative 5 would require additional monitoring wells and piping and would be intrusive to the site and effect everyday activities of the residences. Alternative 6 would be easily implemented using a mobile Vac-truck or trailer mounted unit and temporary non-intrusive vacuum lines. A Hi-vacuum system would be used to remove the BTEX from the groundwater and surrounding soil.

7. Cost. Capital and operation and maintenance costs are estimated for each alternative and compared on a present worth basis. Although cost is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the remaining criteria, cost effectiveness can be used as the basis for the final decision. The costs for each alternative are presented in Table 2. The most expensive alternative was Alternative 4 ($2,135,390) the least expensive, excluding Alternative 1, was Alternative 6 ($340,000). Alternatives 3 & 5 costs are the same at roughly $1,200,000. Alternative 2 cost is $980,000.

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 SI/RAR reports and the Proposed Remedial Action Plan have been evaluated. A "Responsiveness Summary" included as Appendix A presents the public comments received and the manner in which the Department will address the concerns raised.

No significant public comments were received during the public comment period. In general the public comments received were supportive of the selected remedy.

SECTION 8: SUMMARY OF THE SELECTED REMEDY

Based on the results of the SI/RAR, and the evaluation presented in Section 7, the NYSDEC is selecting Alternative 6 as the remedy for this site which consists of: High Vacuum Extraction (HiVac) applied to BTEX contaminated soil and groundwater on and adjacent to the site. This will minimize the source of the dissolved BTEX plume and cause it to collapse. The selected remedy is coupled with a contingency plan if necessary, and institutional controls.

This selection is based on the evaluation in Section 7 of the six alternatives developed for the site. Each of the alternatives, excluding the "No Action" alternative, is protective of human health and the environment.

Alternative 1 is not protective of human health and the environment because the contaminated groundwater plume will remain under the residences to the west of the site. In order to accelerate the remediation of the off-site plume, the other alternatives were developed. The selected remedy employs targeted HiVac Extraction to remediate residual source areas off site of the Ladd's property.

The HiVac system in Alternative 6 is selected over Alternatives 2 through 5 because it will be much less disruptive to the adjacent mixed residential neighborhood. The selected remedy will be approximately one third the cost of Alternative 2, the next least expensive option. Savings will be achieved through the utilization of a standard vac truck instead of a permanently installed system and by utilizing above ground hose instead of trenched pipe runs. The NYSDEC projects that the remedial effectiveness of Alternative 6 will meet or exceed that of Alternatives 2 through 5 without the significant construction requirements and associated expense.

Alternative 6 is selected because:

- It will be effective in both the long and short term by aggressively eliminating or significantly reducing the residual sources of BTEX contamination, including LNAPL, and the dissolved groundwater plume.

- It will be the most cost effective alternative that meets the remediation goals for the site in an acceptable time frame.

- It will reduce the toxicity, mobility, and volume of contamination at the site.

The estimated present worth cost to implement the remedy is $190,000 to $340,000 depending on the required duration of remedial efforts. The cost to construct the remedy is estimated to be between $140,000 to $290,000 and the estimated average annual operations and maintenance cost is $10,000.

NYSDEC anticipates the duration of the active phase of the remedy (HiVac Extraction) will be 30 to 90 days.

The elements of the selected remedy are as follows:

1. A pilot test program to determine the site specific radius of influence (ROI) of the HiVac technology, the suitability of existing monitoring wells, and to quantify the number of new extraction wells to be installed *(see Figures 3 & 4)*.

2. A remedial design program to verify the components of the conceptual design and provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program. Any uncertainties identified during the SI/RAR would be resolved.

3. Remediation of the residual BTEX hot spot areas in the off-site groundwater plume to meet NYS groundwater standards would be accomplished by HiVac Extraction. The off-gas from the exhaust stack would be treated using either granular activated carbon (GAC) or a catalytic oxidizer. HiVac Extraction efforts would continue until the remedial goals for the off-site groundwater are reached.

4. Since a plume of low level BTEX contamination will remain off site, a long term monitoring program will be instituted as a component of the operation and maintenance program to

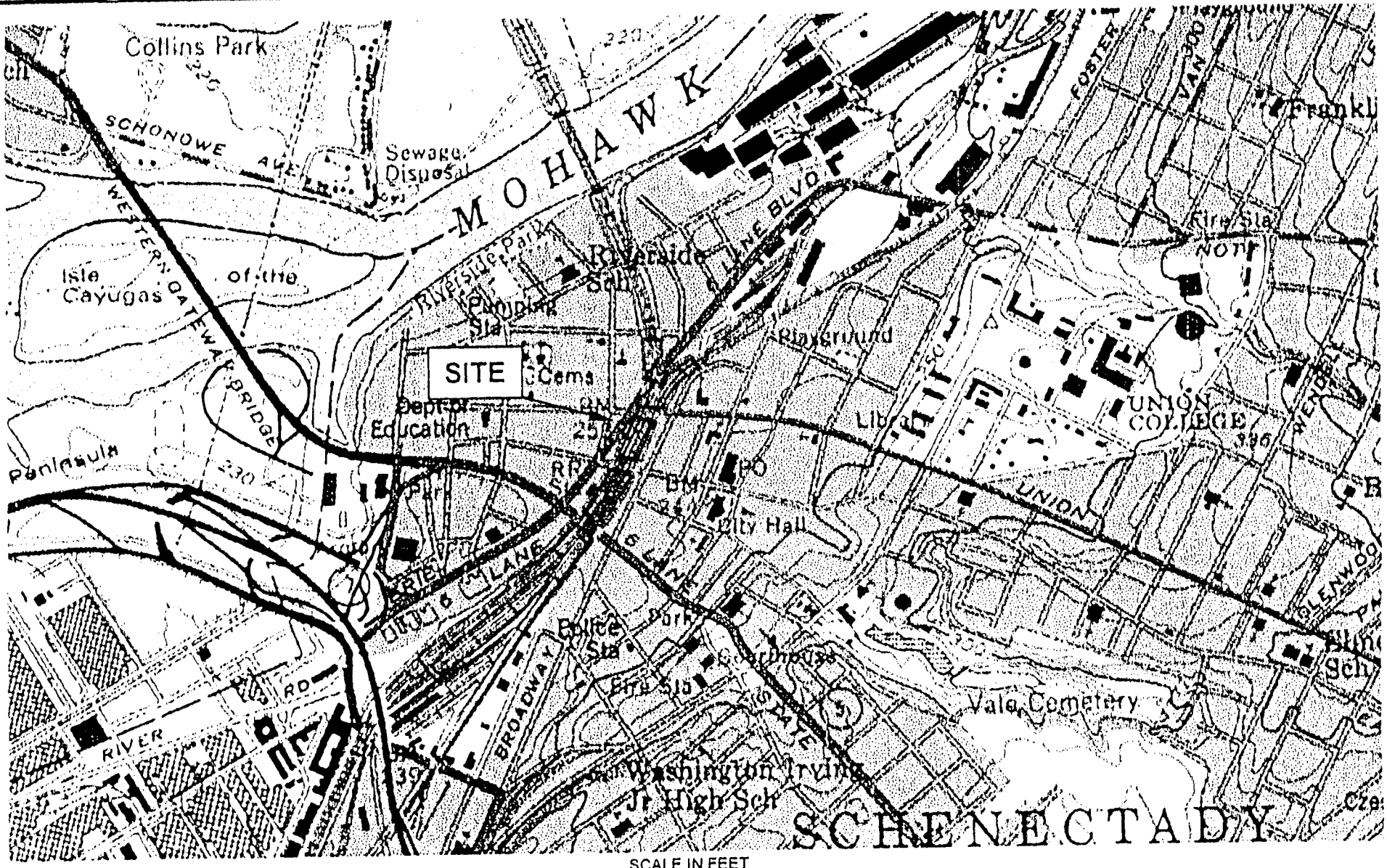
determine the effectiveness of the remedy. Existing data suggests that the dissolved plume is in a state of dynamic equilibrium and that it has reached a stable configuration. It is anticipated that monitoring will require between two and four years of quarterly sampling of select wells along the centerline of the dissolved BTEX plume. The long term monitoring program will be terminated once the remedial goals for the site are reached. This monitoring will include a contingency plan that would require the BTEX plume to be treated more aggressively. If data from the O&M plan concludes that the HiVac system did not meet its goal of reducing the concentration of BTEX in the off-site groundwater plume, other technologies such as but not limited to SVE, air sparging, or low flow pure oxygen biosparging will be considered.

5. Institutional controls in the form of deed restrictions will be placed on the Former Ladd's Gas Station property to prevent the use of on-site groundwater, control future excavation of soil, and limit the property to only be used as a "Parking Lot/Park". In order to change the use of the site in the future a waiver will be required from the NYSDEC and NYSDOH. If development or excavation occurs on site, any subsurface soils that are excavated will have to be disposed off site at an approved and permitted landfill in accordance with NYSDEC regulations. A plan will be required to be submitted and approved by NYSDEC before any work proceeds. The owner of the site will certify annually to the NYSDEC that these institutional controls are in place and enforced as required by the remedy.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the Former Ladds Gas Station environmental restoration process, a number of Citizen Participation activities were undertaken in an effort 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:

- A repository for documents pertaining to the site was established.
- A site mailing list was established which included nearby property owners, local political officials, local media and other interested parties.
- A Factsheet was mailed to the nearby property owners announcing the availability of the PRAP and the public meeting
- A public meeting was held on November 14, 2001 at the Schenectady County Public Library
- A public comment period for the PRAP was established, beginning on September 28, 2001 and ending on November 21, 2001.
- A Responsiveness Summary was prepared and included as part of this document, to address the comments received during the public comment period for the PRAP.

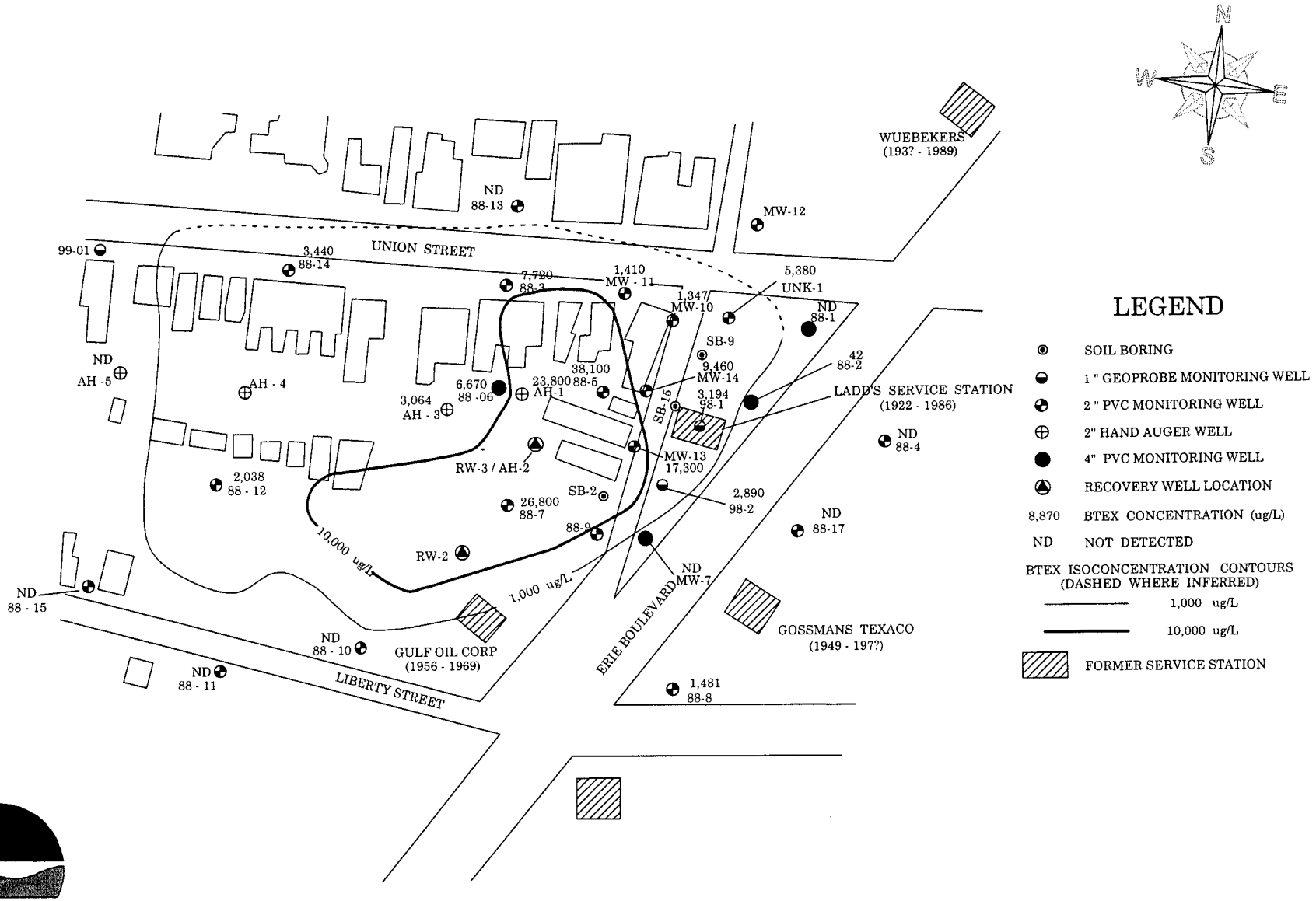


SOURCE: U.S.G.S 7.5 MIN. SCHENECTADY QUAD, 1980

FORMER LADD'S GAS STATION
SCHENECTADY, NEW YORK

LOCATION MAP

FIGURE 1

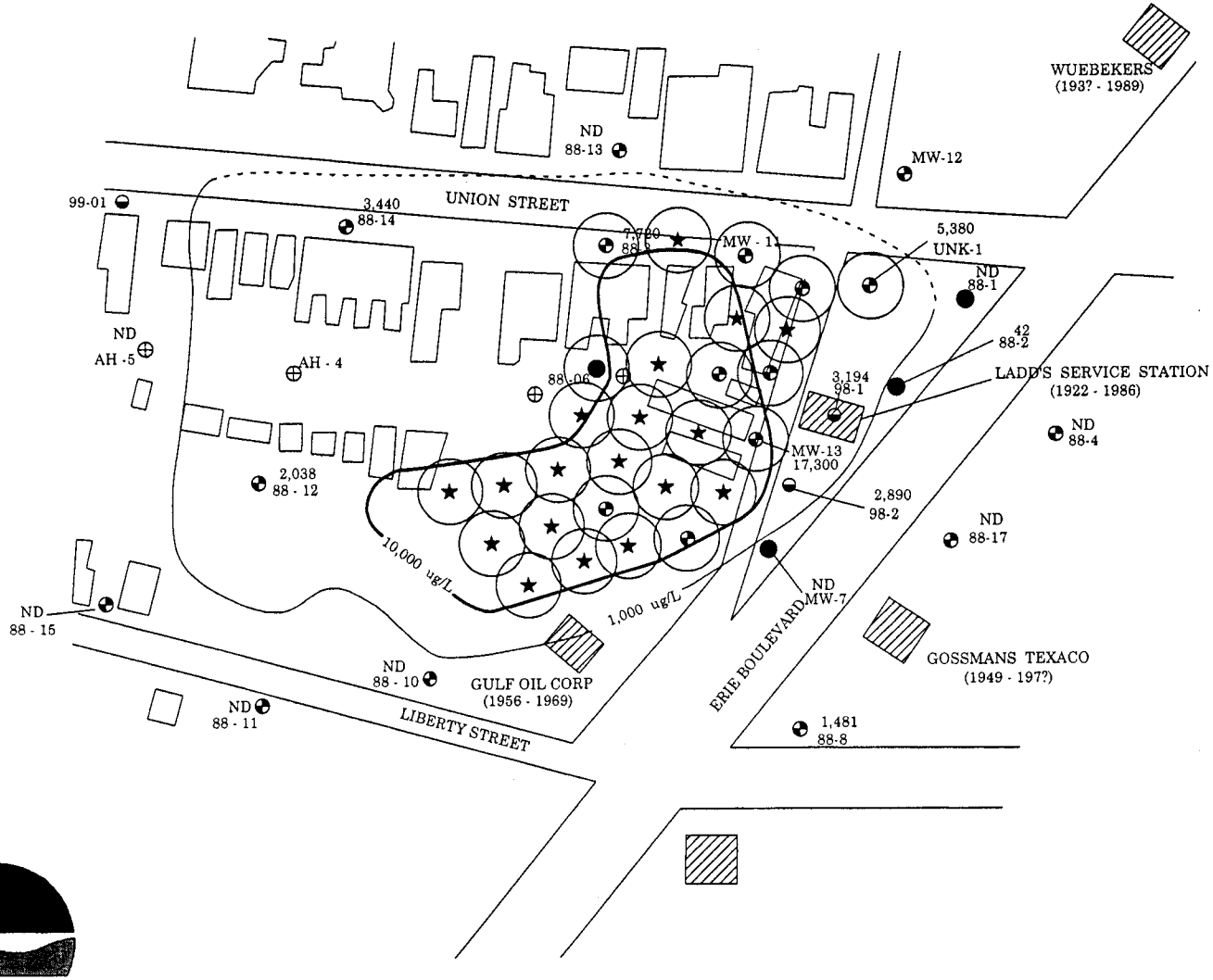


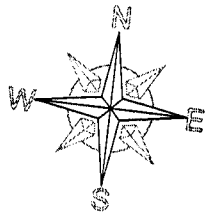
NYSDEC

Figure 2.

K. HALE

DRAWN BY: SITE REMEDIATION SECTION DATE: 15 JUNE 2001	FORMER LADD'S GASOLINE S/S SCHENECTADY, NEW YORK SITE / CONTAMINANT PLUME MAP	APPROXIMATE SCALE IN FEET 0 25 50 75 150





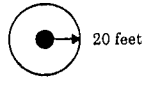
LEGEND

- ★ 18 NEW HIVAC EXTRACTION WELLS
- ◒ 1 " GEOPROBE MONITORING WELL
- ◕ 2 " PVC MONITORING WELL
- ⊕ 2" HAND AUGER WELL
- ● 4" PVC MONITORING WELL
- ◮ RECOVERY WELL LOCATION
- 8,870 BTEX CONCENTRATION (ug/L)
- ND NOT DETECTED

BTEX ISOCONCENTRATION CONTOURS
(DASHED WHERE INFERRED)

- ——— 1,000 ug/L
- ——— 10,000 ug/L
- ▨ FORMER SERVICE STATION

RADIUS OF INFLUENCE (ROI)



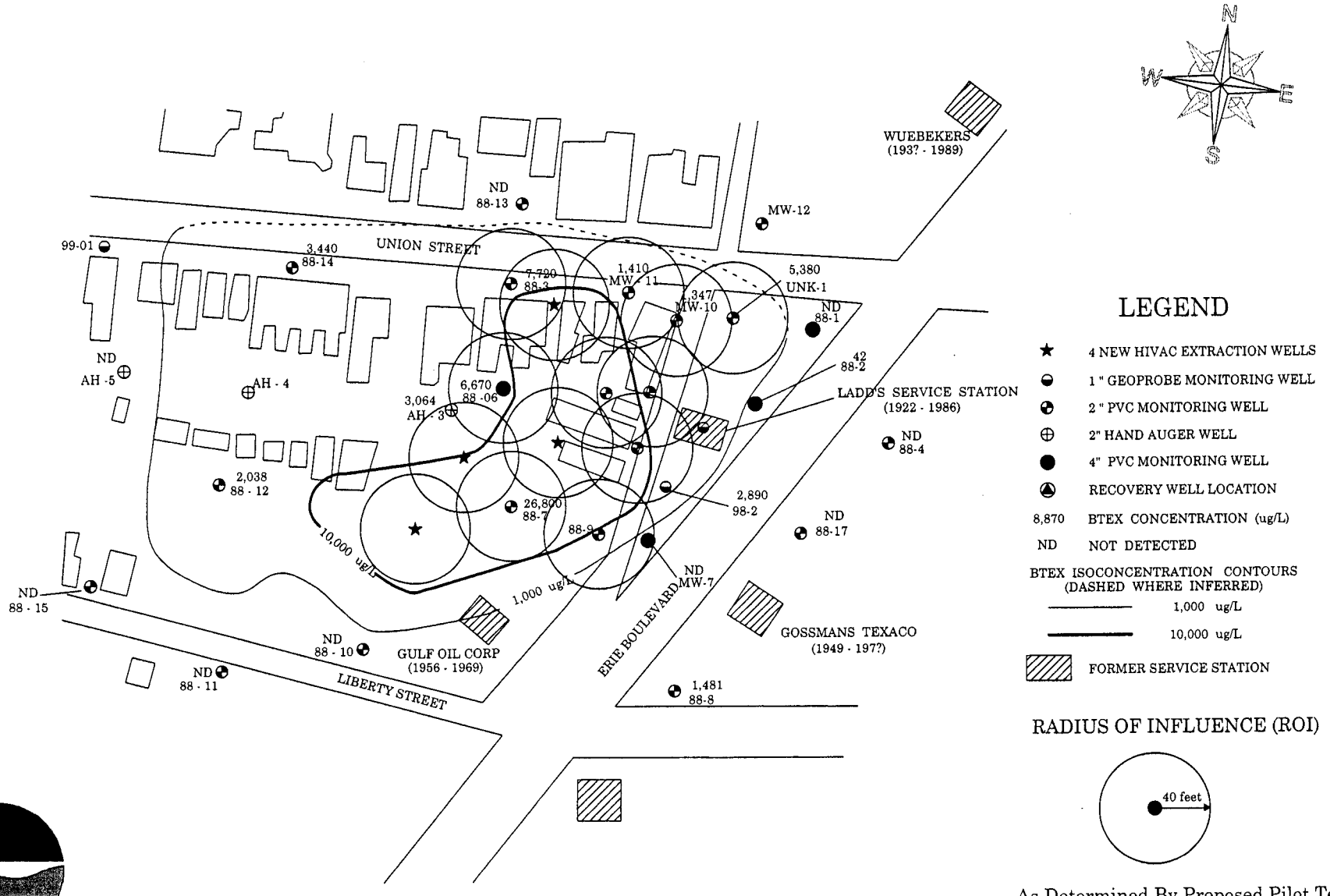
As Determined By Proposed Pilot Test

NYSDEC

Figure 3.

K. HALE

DRAWN BY: SITE REMEDIATION SECTION DATE: 15 JUNE 2001	FORMER LADD'S GASOLINE S/S SCHENECTADY, NEW YORK HiVac Well Placement Assuming 20' ROI	APPROXIMATE SCALE IN FEET 0 25 50 75 150



LEGEND

- ★ 4 NEW HIVAC EXTRACTION WELLS
- 1 " GEOPROBE MONITORING WELL
- 2 " PVC MONITORING WELL
- 2" HAND AUGER WELL
- 4" PVC MONITORING WELL
- RECOVERY WELL LOCATION
- 8,870 BTEX CONCENTRATION (ug/L)
- ND NOT DETECTED
- BTEX ISOCONCENTRATION CONTOURS (DASHED WHERE INFERRED)
  - 1,000 ug/L
  - 10,000 ug/L
- FORMER SERVICE STATION

RADIUS OF INFLUENCE (ROI)

As Determined By Proposed Pilot Test

NYSDEC

Figure 4.

K. HALE

DRAWN BY: SITE REMEDIATION SECTION DATE: 15 JUNE 2001	FORMER LADD'S GASOLINE S/S SCHENECTADY, NEW YORK HiVac Well Placement Assuming 40' ROI	APPROXIMATE SCALE IN FEET 0 25 50 75 150

Table 1
Nature and Extent of Contamination

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	FREQUENCY of Exceeding SCGs or Background	SCG/ Bkgd. (ppb)
Groundwater	Volatile Organic Compounds (VOCs)	benzene	42 to 8,000	18 of 27	1
		toluene	9.5 to 13,800	16 of 27	5
		ethylbenzene	35 to 4,300	18 of 27	5
		xylenes	330 to 16,700	18 of 27	5
	Semivolatile Organic Compounds (SVOCs)	naphthalene	ND - 52	1 of 6	NA
Surface Soil (on-site)	Semivolatile Organic Compounds (SVOCs)	benzo(a)anthracene	480	1 of 4	224
		benzo(a)pyrene	420	1 of 4	61
Sub-surface Soil (on-site) saturated	Volatile Organic Compounds (VOCs)	benzene	8,000 to 53,500	5 of 5	60
		toluene	570 to 894,000	3 of 5	1500
		ethylbenzene	20,900 to 232,100	4 of 5	5500
		xylenes	69,900 to 914,600	5 of 5	1200
Sub-surface Soil (on-site) unsaturated	Volatile Organic Compounds (VOCs)	benzene	ND	0 of 3	60
		toluene	ND to 28	2 of 3	1500
		ethylbenzene	ND to 5.1	1 of 3	5500
		xylenes	ND to 14	1 of 3	1200

The sampling results were determined between July 1998 and July 2001

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth
Alternative 1 - No Further Action	$0	$0	$0
Alternative 2 - Vertical Well Groundwater Extraction and Institutional Controls	$161,000	$54,000	$980,000
Alternative 3 - Vertical Well Groundwater and Soil Vapor Extraction and Institutional Controls	$266,000	$93,000	$1,240,000
Alternative 4 - ORC Injection and Institutional Controls	$398,000	$225,000	$2,135,390
Alternative 5 - No VOCs wells and Institutional Controls	$288,000	$57,000	$1,170,000
Alternative 6 - HiVac Extraction of BTEX Contaminated Groundwater and Institutional Controls	$290,000	$10,000	$340,000

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Former Ladd's Gas Station

Environmental Restoration Proposed Remedial Action Plan

City of Schenectady, Schenectady County

Site No. B-00049-4

The Proposed Remedial Action Plan PRAP was prepared by the New York State Department of Environmental Conservation (NYSDEC) and delivered to the Schenectady County Library (document repository) on September 26, 2001. This plan outlined the preferred remedial measure for the Former Ladd's Gas Station site. The preferred remedy includes development, implementation, and evaluation of a HiVac Extraction System for the entire groundwater plume, (the majority of the plume is located offsite), groundwater monitoring and application of institutional controls to the Ladd's property prohibiting groundwater use and limiting site use to parking lot/park.

The release of the PRAP was announced via notice to the public using a mailing list provided by the applicant, informing the public of the PRAP's availability.

A public meeting was held on November 14, 2001 at the Schenectady County Public Library. NYSDEC and NYSDOH staff presented the results of the site investigation (SI) and Remedial Alternatives Report (RAR) and discussed the proposed remediation plan and public health considerations. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the project. These comments have been incorporated into the Administrative Record for this site.

The public comment period for the PRAP ended on November 21, 2001. Written comments were submitted by the City of Schenectady and the Schenectady Heritage Foundation.

This Responsiveness Summary responds to all questions and comments raised at the public meeting and to written comments.

The following are the comments received at the public meeting, with the NYSDEC's and the City of Schenectady responses:

Comment 1 - What type of public notice did the Department utilize to publicize the public meeting. Was there any newspaper notification?

Response 1 - A notice in the form of a fact sheet was sent to local residents, local media and city and county elected representatives. The list was prepared by the applicant. An advertisement was not placed in a local newspaper.

Comment 2 - What is the status of the Gillette Properties brownfield project?

Response 2 - DEC staff are preparing a PRAP for the Former Gillette Properties Brownfields Site (Gillette Properties). (Note: The PRAP for the Gillette Properties was issued on February 4, 2002. A public meeting is scheduled for March 6, 2002 and the comment period will end on March 20, 2002.

Comment 3 - What is the relationship of the Ladd's and Gillette Properties Brownfield projects?

Response 3 - The Gillette Properties consist of two residential/commercial properties located to the West of the former Ladd's Gas Station along Union Street. Petroleum contamination originating from the Ladd's Gas Station is located in the groundwater beneath the Gillette Properties. Site investigation at the Gillette Properties indicates exterior surface soil lead contamination.

Petroleum contamination beneath the Gillette Properties will be addressed in the Ladd's project and will not be a consideration in the Gillette Properties project (other then possibly the requirement for institutional controls). The scope and schedule of the Ladd's project should not impact the Gillette Properties schedule or future use of those properties. There is potential for remediation activities related to the Ladd's project to be conducted on the Gillette Properties site.

Comment 4 - What are the health risks and impacts on drinking water associated with this contamination?

Response 4 - There should not be any impact on drinking water from this contamination since facilities in this area are served by the City of Schenectady municipal water supply. Although the Ladd's site is located in Zone II of the Schenectady/Niskayuna Aquifer, contamination will not reach the area of the aquifer where the supply wells are located. Also, the contamination will not reach the Mohawk River and cannot impact any surface water supplies downstream. However, if someone wanted to use groundwater from this site for drinking water, it would require proper treatment. Additional risks include the potential for petroleum vapors to migrate into basements and the potential for direct contact with contaminated soil and groundwater during excavation/construction activities.

Comment 5 - Given the response to Comment 4, what is the rationale for requiring groundwater remediation?

Response 5 - The Department also has the environmental objective of meeting groundwater standards. Sampling indicates significant exceedance of groundwater standards.

Comment 6 - How will the remedial portion of the brownfield be funded?

Response 6 - The Department intends to implement the remedy using state funds as a followup phase to previous actions taken under the Oil Spill Program to address the contamination from the site.

Comment 7 - What type of impacts will the proposed remedy have on community activities?

Response 7 - There will be some noise associated with operation of the HiVac extraction system. The remediation plan will require intermittent site access, first to install additional wells as required and then to access various well clusters. The recovery unit will be rotated in different locations.

The plan calls for an initial operational period of 30 to 90 days. Depending on how well the system performs, the operation may be extended to an indefinite period of time, or it may be determined that the system opertation is inadequate requiring evaluation of other alternatives.

Comment 8 - What is a plume?

Response 8 - A plume is an area of subsurface contamination in the soil and on water. For this project, plume refers to the area of groundwater contamination that originates from the former Ladd's Gas Station.

Comment 9 - What is the depth to groundwater?

Response 9 - Groundwater levels fluctuate during the seasons. Depth to groundwater averaged nine to ten feet.

Comment 10 - When was basement air sampling last conducted? (for this project)

Response 10 - Sampling for the Ladd's project was conducted over a 24 hour period at 250 Union Street, 248 Union Street and 242 Union Street on August 13 - 14, 1998. Sampling was also conducted in February 2001 for the Former Gillette Properties Brownfields Site which is located adjacent to the Ladd's site. Sampling did not detect any VOCs in the basement at this time.

Comment 11 - Is the plume migrating?

Response 11 - The plume is believed to be stable except for the potential for migration westward on the southern side of Union Street. MW-99-1 was installed to monitor plume movement in this area. The figures in the ROD have been updated to include the identification of this well.

Comment 12 - Do any other gasoline stations contribute to the contamination?

Response 12 - The site investigation indicates that the majority of contamination is associated with operations of the former Ladd's Gas Station.

Comment 13 - Would you smell gasoline in the building basements on Union Street?

Response 13 - Subsequent sampling conducted for the Gillette Properties project did not indicate any volatile organic compounds in the basements at 250 and 252 Union Street. A remedial objective is to reduce the potential for migration of petroleum fumes into basements.

Comment 14 - Is there contamination beneath the area of excavation on the Ladd's property?

Response 14 - Site borings indicate there is significant soil contamination beneath the area of excavation with the highest concentrations found in soil boring 15 (SB-15) on the western side of the property near the concrete pad of the former Ladd's service station. Groundwater sampling shows that the most contaminated portion of the plume has migrated off site. This area of on-site contamination will be included in the pilot study to determine if remediation would be effective in removing the hot spot area around (SB-15).

Comment 15 - Why was the Ladd's site subject to investigation?

Response 15 - Contamination was discovered on September 2, 1986 during the removal of the underground storage tanks to replace them with new ones. The Department's Petroleum Bulk Storage Regulations, which became effective on December 27, 1985, required specific facility operational requirements. Compliance with these requirements was frequently accomplished by the installation of new, improved tanks.

Comment 16 - Will the HiVac remedial plan affect groundwater quality?

Response 16 - The HiVac system will improve groundwater by removing volatile compounds from the soil close to the groundwater table as well as a smaller portion from the groundwater itself. This system will also remove the most highly contaminated groundwater which is typically found at the top of the water table.

Comment 17- Where do we go from here?

Response 17 - Following completion of the comment period, DEC in conjunction with DOH will prepare a Record of Decision (ROD). The goal is to execute a ROD by March 1, 2002. We expect that the earliest the remedial plan will be implemented will be next summer.

Comment 18 - We are in favor of the project. The present condition compromises property value because of the stigma associated with the contamination. This is an opportunity to address this concern.

Response 18 - Agreed, our Division Director has indicated that this is a high priority project that needs to be completed.

Milton Mitchell, Commissioner of Department of Public Works, City of Schenectady submitted written comments in a letter dated November 15, 2001. Commissioner Mitchell has requested a meeting to discuss the City's comments.

Comment #CS1: Staff indicated that the City would be required to submit an application for a remediation grant. Since DEC indicated that all of the potentially contaminated groundwater was off the Ladd's Gas Station site, the City of Schenectady does not intend to invest any additional City of Schenectady taxpayer's money in this effort. The Bond Act required the City to pay for the Remedition and then to receive reimbursement. The City will not enter into such an agreement.

Response #CS1: Response #6 addresses the funding of future remedial activities. Note that the State indicated that the majority of the plume was located offsite. A portion of the plume remains on the Ladd's property.

Comment #CS2: We are not convinced that the remediation alternative being recommended will accomplish the goals in a timely fashion and therefore, the question (operation?) and maintenance costs may be considerably higher than estimated.

Response #CS2: The remediation plan includes a proposed operational period that includes implementation and evaluation. We recognize that operation of the proposed remedy may have to be extended. Also, if post-remediation monitoring indicates the remedy was not effective, an alternative remedy may have to be identified.

Comment #CS3: We would be pleased to meet with you...to satisfactorily resolve this issue.

Response #CS3: A meeting with City officials will be scheduled, if necessary, following issuance of the Record of Decision (ROD) for this project.

Barbara Blanchard, Chair and Gloria Kishton, Vice-Chair of the Schenectady Heritage Foundation submitted written comments in a letter dated September 20, 2001.

Comment #SHP1: The Schenectady Heritage Foundation supported the proposed remediation of groundwater. They identified the historic and diverse nature of the Stockade Section of Schenectady. The stigma on the area, both in perception and property values, resulting on this area from the large Ladd's plume; the relationship to development of the Gillette Properties; and the threat to human health and the environment were stated as reasons to support the remedy.

Response #SHP1: We appreciate the support. As stated elsewhere, this is a priority project for the Department.

APPENDIX B

Administrative Record

Administrative Record
Former Ladd's Gas Station
Site No B-00049-4

1. Record of Decision, Former Ladd's Gas Station, March 2002
2. Factsheet - Former Ladd's Gas Station - September 2001
3. Proposed Remedial Action Plan, Former Ladd's Gas Station - September 2001
4. Surface Soil Sampling Results - Former Ladd's Gas Station - July 18, 2001
5. Factsheet - Former Ladd's Gas Station - September 2000
6. Final Site Investigation/Remedial Alternatives Report - Former Ladd's Gas Station - January 2000
7. Final Site Investigation/Remedial Alternatives Report Work Plan - Former Ladd's Gas Station - July 1998