PROPOSED REMEDIAL ACTION PLAN
LUZERNE ROAD SITE
Operable Units No. 2 & 3
Queensbury (T), Warren County, New York
Site No. 5-57-010

December 2004

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

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SECTION 1: <u>SUMMARY AND PURPOSE OF THE PROPOSED PLAN</u>

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), is proposing a remedy for the Luzerne Road Site, Operable Units 2 and 3, which consists of the polychlorinated biphenyl (PCB) containment cell and historic disposal area and the impacted on-site and off-site groundwater. 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 salvaging of capacitors has resulted in the disposal of hazardous wastes, including PCBs. These wastes have contaminated the soil and groundwater at the site, and have resulted in:

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

In order to restore the Luzerne Road inactive hazardous waste disposal site to predisposal conditions to the extent feasible and authorized by law, but at a minimum to eliminate or mitigate all significant threats, the NYSDEC proposes the following remedy:

- A remedial design program of the selected remedy in the Record of Decision (ROD).
- Removal of the PCB containment cell and excavation of the on-site contaminated surface soil to 1 part per million (ppm) in the top 2 feet, and to 10 ppm in the subsurface soils. A demarcation layer would be installed over soils that are residually contaminated above 1 ppm.
- On-site treatment of the excavated materials by thermal desorption. After the treatment of the soils, the site would be restored by placement of the treated soil, placement of topsoil, and seeding of excavated and/or filled areas.
- A site management plan would be developed to address residual contaminated soils that may be excavated from the site during future redevelopment.
- The property owner would complete and submit to the NYSDEC an annual certification that the institutional controls and engineering controls are still in place.
- Imposition of an institutional control in form of an environmental easement that would: (a) require compliance with the approved site management plan, (b) limit the use and development of the property to commercial, industrial or recreational uses; (c) restrict use of groundwater as a

source of potable or process water, without necessary water quality treatment as determined by the New York State Department of Health; and, (d) require the property owner to complete and submit to the NYSDEC an annual certification.

- Long term monitoring of the groundwater to evaluate the effectiveness of the source removal and treatment actions of the PCB contaminated soils.

The proposed 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.

This Proposed Remedial Action Plan (PRAP) identifies the preferred remedy, summarizes the other alternatives considered, and discusses the reasons for this preference. The NYSDEC will select a final remedy for the site only after careful consideration of all comments received during the public comment period.

The NYSDEC has issued this PRAP as a component of the Citizen Participation Plan developed pursuant to the New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375. This document is a summary of the information that can be found in greater detail in the August 2002 "Remedial Investigation (RI) Report", the May 2004 "Feasibility Study" (FS), and other relevant documents. The public is encouraged to review the project documents, which are available at the following repositories:

Crandall Public Library
251 Glen Street
Glens Falls, NY 12801-3539
Hours: Monday, Tuesday, Wednesday and Thursday: 9 AM to 9 PM; Friday: 9 AM to 6 PM; Saturday: 9 AM to 5 PM; Sunday: 1 PM to 5 PM
(518) 792-6508

Glens Falls City Hall, 2nd floor
Department of Economic Development
42 Ridge Street
Glens Falls, NY 12801
Hours: Monday through Friday, 8:30 AM to 4:30 PM Appointment requested; call (518) 761-3864

NYSDEC Region 5 Warrensburg Sub-Office
232 Hudson Street, P.O. Box 220
Warrensburg, NY 12885
Hours: M-F 8:30 AM - 4 PM
Appointment requested; contact
Michael DiPietro (518) 623-1236

The NYSDEC seeks input from the community on all PRAPs. A public comment period has been set from December 23, 2004 to January 28, 2005 to provide an opportunity for public participation in the remedy selection process. A public meeting is scheduled for January 4, 2005 at the West Glens Falls Fire Station #1 beginning at 7 PM. An availability session for individual questions will be held that afternoon from 3 PM to 5 PM.

At the meeting, the results of the Remedial Investigation/Feasibility Study (RI/FS) will be presented along with a summary of the proposed remedy. After the presentation, a question-and-answer period will be held, during which verbal or written comments may be submitted on the PRAP. Written comments may also be sent to Mr. David Tromp at the above address through January 28, 2005.

The NYSDEC may modify the preferred alternative or select another of the alternatives presented in this PRAP, based on new information or public comments. Therefore, the public is encouraged to review and comment on all of the alternatives identified here.

Comments will be summarized and addressed in the responsiveness summary section of the Record of Decision (ROD). The ROD is the NYSDEC's final selection of the remedy for this site.

SECTION 2: SITE LOCATION AND DESCRIPTION

The site is located in the Town of Queensbury, Warren County. It is approximately nine acres in total, and is located on Luzerne Road. Luzerne Road is one street north of Main Street (Corinth Road), which is the location of Exit 18 of the Northway (I-87). The surrounding area is mainly flat land located in a combination of residential and light industrial/commercial properties. Immediately to the east of the site, there is property that could be developed as commercial/light industrial. Figure 1 is the site location map.

The only topographic change is the property to the west, which is the Old Glens Falls Landfill Site (5-57-003), another Class 2 Inactive Hazardous Waste Disposal Site. The area to the north has a depression, which could have been a borrow pit for daily cover for the landfill. Figure 2 outlines the two sites. The Glens Falls Landfill has a selected remedy, in the 2003 Record of Decision for that site, for an impermeable landfill cap on the landfill.

An operable unit represents a portion of the site remedy that for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release or exposure pathway resulting from the site contamination.

Operable Unit 1 (OU1) for this site was the initial response action taken by the NYSDEC to prevent exposure to PCBs in 1979, by creating the PCB containment cell to hold the PCB contaminated materials and soils until a viable technology could be attained.

Operable Unit (OU) No. 2, which is the subject of this PRAP, consists of the PCB containment cell, and the surface soils on the rest of the 51 Luzerne Road property, and the back lot of the 53 Luzerne Road property.

OU3, which is also the subject of this PRAP, is the PCB groundwater plume that is monitored by the NYSDEC. Currently, monitoring wells are located through the plume to check the concentrations and movement of the contamination. In addition, a well survey was performed in order to note if there were any private wells using the shallow groundwater aquifer.

Due to site size and variations in both vegetation and topography, the Luzerne Road site study area was divided into six areas for investigation. These areas include the PCB landfill cell, which was considered one area. The "southern area" is the area south of the landfill and is bounded by the cell on its north side, Luzerne Road on its south side, and dirt access roads on its east and west sides. The "western area" is bounded on the east by the landfill cell and the dirt access road leading to the cell; the concrete block building at its southern side; a wooded area on its western side; and the Glens Falls Landfill on its northern side. The "northern area" consists of a 100-foot wide strip paralleling the northern side of the landfill cell. The "eastern area" consists of a 150-foot wide strip paralleling the eastern side of the landfill cell. North of the landfill cell is a wetland area. Figure 3 shows the site areas.

The site consists of the 51 Luzerne Road (Tax Map No. 309.10-1-91) and the back portion of 53 Luzerne Road (Tax Map Lot No. 309.10-1-90). The 51 Luzerne Road property consists of the PCB cell and the "southern area." The back portion of 53 Luzerne Road is the "western area" of the study area, and is owned by a private party. The 51 Luzerne Road land is owned by the State of New York, who took title of the land after the creation of the PCB cell (mentioned further below in the Remedial History).

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

During the 1950's through the 1970's (exact dates are not known), off-spec capacitors were transported to the back lot of 53 Luzerne Road. The capacitors were cut apart and the metals were salvaged. The oils within these capacitors spilled onto the grounds of 53 Luzerne Road. The oils were impregnated with PCBs.

3.2: Remedial History

In 1987, the NYSDEC 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.

Before that classification, in 1979, the State, acting to reduce exposure pathways from the 53 Luzerne Road site, created a containment cell on the adjoining parcel at 51 Luzerne Road. All wastes from 53 Luzerne Road, and other local properties where capacitors were salvaged, as well as some 13,000 cubic yards of contaminated soils, were emplaced in the clay lined and capped cell. An unknown volume of contaminated soil was left on the 53 Luzerne Road site. That soil was covered with a highly organic layer to reduce the volatilization of the PCBs, and covered with top soil and grass seed. No effort was made to remediate site contaminated groundwater at that time. The State took title of the land after the creation of the PCB cell.

From 1979 to 1985, water that collected at the bottom of the containment cell was pumped out and transported off-site for treatment. In 1985, the leachate removal concluded with the addition of an engineered cover over the cell. However, liquid remained in the cell and was monitored over the next ten years. In 1995, the liquid level in the cell was observed to drop. Therefore, the remaining liquid in the cell was pumped out and treated off-site. There is a negligible amount of liquid still present. The containment cell continues to be monitored.

The USEPA issued a TSCA approval for the construction of the cell and an emergency declaration was issued by the Commissioner of the New York State Department of Health. The purpose of this action was to limit human exposure from the contaminated PCB soils of the residential properties, as well as the 53 Luzerne Road property. The cell was considered a temporary measure (to stop PCB volatilization and prevent direct contact) and not a permanent disposal site.

Three previous site investigations provide environmental media condition data relevant to this site:

In 1987, a Phase II study was conducted for the Glens Falls Landfill (immediately to the west of the site). That study found PCBs in groundwater downgradient of the landfill (in the southeast direction).

In 1991, a study conducted by the owners of 53/55 Luzerne Road found PCB concentrations in the soils up to 62,300 ppm at the 53 Luzerne Road property. Approximately 25 cubic yards of soil were excavated from the 53 Luzerne Road property.

In 1996 to 1997, NYSDEC conducted a supplemental soil and groundwater investigation around the Glens Fall Landfill, and concluded that the soils on 53 Luzerne Road contained elevated PCB concentrations.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

The PRPs for the site, documented to date, include: Alfred and Roslyn Alkes, property owners from 1951 to 1976; Fred H. Alexy, Leo R. Monahan and Robert E. Geh, property owners from 1976 to 1994; FLR Associates, Ltd., current owner; Marshall Pond, possible transporter; AMG Industries, Inc., possible former operator; City of Glens Falls, possible former transporter; and General Electric Company, possible generator.

No agreement could be reached with any PRP to perform the RI/FS. After the remedy is selected, PRPs will be contacted to assume responsibility for the remedial program. If an agreement cannot be reached with the PRPs, the NYSDEC will evaluate the site for further action under the State Superfund. The PRPs are subject to legal actions by the state for recovery of all response costs the state has incurred.

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 July 1999 and March 2001. Additional groundwater sampling was performed in 2002 and 2004.

The field activities and findings of the investigation are described in the RI report.

The following activities were conducted during the RI:

- Research of historical information;
- Collecting and analyzing surface soils samples for PCBs;
- Collecting subsurface soil samples from grade to the depth of the water table, and analyzing the samples for PCBs via analytical screening methods and laboratory certified methods;
- Collecting and analyzing sediment samples from an on-site ditch and a wetland area north of the site;
- Installing 14 shallow, 5 intermediate, and 3 deep monitoring wells for analysis of soils and groundwater as well as physical properties of soil and hydrogeologic conditions;
- Sampling of the 19 new and 5 existing monitoring wells, as well as a groundwater monitoring point adjacent to the containment cell;
- Collecting and analyzing surface soil samples at a dozen private residences ;
- Collecting and analyzing subsurface soil samples using a direct push technique at a dozen private residences;
- A survey of public and private water supply wells in the area around the site;
- Collecting and analyzing soil samples from the PCB containment cell;
- Collection of the PCB containment cell soil samples and soil samples from the back portion of 53 Luzerne Road for grain size analysis, moisture content, and bulk density geotechnical analysis.

To determine whether the soil and groundwater, 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 NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code.

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

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

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

5.1.1: <u>Site Geology and Hydrogeology</u>

Medium to fine sands underlie the site from grade to a depth of approximately 85 to 95 feet below ground surface (BGS). The sand is underlain by a clay layer of unknown thickness; depth to clay varies across the site as the clay layer dips southeast. Bedrock was not encountered during the drilling of the groundwater monitoring wells.

The water table is located at 15 feet below the ground surface. Horizontal site hydraulic gradient is approximately 1.24 feet per hundred feet in the shallow zone. An upward vertical gradient exists across the site. Vertical gradients between the intermediate and shallow wells varied from 0.01 feet per foot (ft/ft) to 0.1 ft/ft across the site. Vertical gradients between the intermediate and deep wells varied between 0.065 ft/ft to 0.22 ft/ft across the site, increasing in the downgradient direction.

Site hydraulic conductivity values had geometric mean values of 6.2×10^{-2} centimeters per second (cm/sec) in the shallow saturated zone; 1.43×10^{-2} cm/sec in the intermediate zone; and 1.3×10^{-3} cm/sec in the deep saturated zone. The groundwater flows at approximately 1 foot per day, towards the southeast. The Hudson River is located one mile southeast from the site.

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

As described in the RI report, many soil, groundwater and sediment samples were collected to characterize the nature and extent of contamination. As summarized in Table 1, outside the containment cell the only category of contaminants that exceed their SCGs for are polychlorinated biphenyls (PCBs). Within the containment cell, benzene, chlorobenzene, xylene, 1,2-dichloroethane and 2-butanone exceed SCGs.

Therefore, the only contaminants of concern for the entire site are PCBs, and the volatile organic compounds (VOCs) within the containment cell. This is from the dismantling of the capacitors and allowing the oils to spill onto the ground. PCBs usually bind onto organic particles. PCBs are primarily hydrophobic, and do not easily dissolve in water.

5.1.3: <u>Extent of Contamination</u>

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

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

Table 1 summarizes the degree of contamination for the contaminants of concern in the waste material, surface soil, subsurface soil, and groundwater and compares the data with the SCGs for the site. The following are the media which were investigated and a summary of the finding of the investigation.

Waste Materials

The PCB containment cell is located immediately east of the original disposal area, behind 53

Luzerne Road. There are two layers of clay beneath the waste materials, which are mainly capacitor parts and contaminated soils.

The most contaminated soils are located in the containment cell. Two soil samples were collected within the cell, with analytical results of 2,723 ppm and 12,150 ppm for PCBs. Concentrations of 50 ppm and greater are considered to be hazardous waste in New York State.

In addition to PCBs, five VOCs were detected with concentrations exceeding the TAGM 4046 cleanup criteria in the soils within the cell. There was only one detection of benzene, and the concentration was estimated at 5 ppm (the soil guidance value is 0.224 ppm). Also for the VOCs, chlorobenzene concentrations ranged up to 120 ppm (the guidance value of 1.7 ppm), and xylene ranged up to 20 ppm (the guidance value is 1.2 ppm). The 1,2-dichloroethane concentrations ranged up to 12 ppm (the guidance value is 0.3 ppm). The 2-butanone concentrations ranged up to 34 ppm (the guidance value is 0.3 ppm).

Surface Soil (0" - 2")

A total of 33 surface soil samples were collected and analyzed. The samples are from the top two inches of the soil. Due to the placement of the soil layer over the back portion of 53 Luzerne Road (the original disposal area) in 1979, there are no detections of PCBs in the surface soils.

Immediately south of the PCB cell, where there has been no previous remedial activity, there are several samples with high PCB concentrations. The greatest total PCB concentration detected in site surface soil was 2,984 ppm, found in the southern area.

Figure 4 shows the extent of surficial soil PCB contamination.

Subsurface Soils (2" and greater)

Subsurface soil PCB presence is limited to the western and southern areas. PCBs were detected to a depth of 12 feet in the middle of the southern area, and to a depth of 16 feet in the western flank of the southern area. However, most of the PCBs in the southern area are located within the top 4 feet of the soil.

PCBs were also detected to a depth of 24 feet in the western area, which is the original disposal area. The greatest subsurface soil total PCB concentration detected was 17,200 ppm, found in the 0 to 4-foot depth interval located within the west side of the site.

Figure 5 shows the extent of subsurface soil PCB contamination.

Groundwater

Groundwater PCB concentrations generally ranged from below the detection limit to 5.98 ppb directly downgradient of the Glens Falls Landfill. Groundwater PCB concentrations downgradient of the PCB containment cell generally ranged from below detection to 2.42 ppb. PCBs were detected at a concentration of 151 ppb in one piezometer immediately adjacent to the cell. However, PCBs were detected in another well 100 feet downgradient of this well at concentrations ranging from 1.2 ppb to 2.42 ppb. Most of the detections of PCBs were in the shallow groundwater monitoring wells, which ranged from 20 to 35 feet deep. A few detections were found in the intermediate groundwater monitoring wells, which ranged from 60 to 65 feet deep. No detections were found in the deep groundwater monitoring wells, which were between 80 and 90 feet deep.

In addition, groundwater samples collected downgradient of the site by direct push technology in March 2001 contained PCB concentrations ranging up to 5.4 ppb southeast of the landfill cell, although concentrations then decreased considerably downgradient from that point. Samples off-site contain PCB concentrations which are just above the groundwater standard of 0.09 ppb, but are below the drinking water standard of 0.5 ppb. The residential properties downgradient of the cell are served by a public water supply.

Figures 6 and 6A show the extent of PCB contamination in the on-site and off-site groundwater.

Sediment

Sediment samples from 12 locations were collected in drainage ditches around the site. However, due to the sandy soils throughout the site, water is usually not seen in these ditches and these samples were considered "soil" samples. These samples did not contain detectable PCB concentrations.

Residential Soils

Several events of residential surface and subsurface soil sampling were conducted. Collectively, they indicated PCBs were present at concentrations requiring immediate action. NYSDEC executed an Interim Remedial Measure (IRM) in which PCB-containing soil was removed. The IRM was conducted between September 18, 2000 and November 22, 2000. The residential soil sampling data collected and analyzed during the Remedial Investigation (before the excavations) are no longer representative of site conditions, and thus are not presented in this report. The Interim Remedial Measures performed at these properties are described below in Section 5.2, Interim Remedial Measures.

5.2: <u>Interim Remedial Measures</u>

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.

Several residential properties within 1 mile of the Luzerne Road Site received capacitors from the site during the time of the salvaging operation. These properties were investigated in 1979, and visibly contaminated soil was removed from some of the properties. During the Remedial Investigation of the Site, these residential properties were investigated with the current analytical methods. Some of the properties contained residual soil contamination. NYSDEC executed an Interim Remedial Measure (IRM) in which PCB-containing soil was removed between September 18, 2000 and November 22, 2000. In June 2003, NYSDEC prepared a separate report addressing the IRM entitled *Post Remediation Report, Interim Remedial Measure, PCB Contaminated Soil Excavation Removal and Disposal Contract, Luzerne Road Site, Site NO. 5-57-010, Town of Queensbury, Warren County, New York.*

In addition, another property with PCB contamination was located in 2002. Sampling of this property in 2002 and 2003 resulted in the excavation of PCB contaminated soil in the Fall 2003. This report is also under separate cover.

No additional remediation or monitoring would be necessary for these properties, as the PCB contaminated soils have been remediated to 1 ppm or less. Therefore, there is no longer the human health exposure to PCBs, and no environmental easements are needed on these properties.

5.3: <u>Summary of Human Exposure Pathways</u>:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section 7 of the RI report.

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

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

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

There are potential exposure pathways at the site. These are:

- dermal contact with or incidental ingestion of contaminated surface soil at the site;
- dermal contact with or incidental ingestion of contaminated subsurface soil at the site
- ingestion of contaminated groundwater.

Dermal contact with or incidental ingestion of contaminated surface and subsurface soil is possible since site access is not completely controlled and there are no restrictions in place that would prevent access or future development that could bring subsurface contaminants to the surface. Groundwater in the area is not currently used for drinking but groundwater could be used in the future since there are no restrictions in place to prevent its use. Although the ingestion of contaminated groundwater is a potential exposure pathway, the ingestion of contaminated groundwater is not expected because the surrounding area is serviced by municipal water.

5.4: Summary of Environmental Impacts

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

The Fish and Wildlife Impact Analysis, which is included in Chapter 8 of 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:

- In the southern area, which is a small forested area, the existing PCB surface soil contamination could pose potential impacts for songbirds and small mammals that forage regularly in that area.

Site contamination has also impacted the groundwater resource in the shallow aquifer.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

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

- Exposures of persons at or around the site to PCBs in the surface and subsurface soils.
- Environmental exposures of flora or fauna to PCBs in the surface and subsurface soils.
- The release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards; and
- Reduce further off-site migration of contaminated groundwater to the extent practical.

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

- ambient groundwater quality standards based on NYSDEC "Ambient Water Quality Standards and Guidance Values" and Part 5 of the New York State Sanitary Code; and
- soil cleanup goals based on the NYSDEC "Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels", which are 1 ppm of total PCBs at the surface (down to 2 feet below grade) and 10 ppm of total PCBs in the subsurface (2 feet and below).

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 Luzerne Road Site were identified, screened and evaluated in the FS report which is available at the document repositories identified in Section 1.

A summary of the remedial alternatives that were considered for this site are discussed below. The present worth represents the amount of money invested in the current year that would be sufficient to cover all present and future costs associated with the alternative. This enables the costs of remedial alternatives to be compared on a common basis. As a convention, a time frame of 30 years is used to evaluate present worth costs for alternatives with an indefinite duration. This does not imply that operation, maintenance, or monitoring would cease after 30 years if remediation goals are not achieved.

7.1: Description of Remedial Alternatives

The following potential remedies were considered to address the contaminated surface soils, subsurface soils, and groundwater at the site.

Soil Alternatives

The soil remedial alternatives directly address the contaminated soils at the site, which are the primary source of contamination.

Soil Alternative 1: No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. This alternative would be acceptable only if it is demonstrated that the contamination at the site is below the remedial action objectives of 1 ppm PCBs in the surface soils and 10 ppm PCBs in the subsurface soils, or that natural processes would reduce the contamination to acceptable levels. This alternative does not include institutional controls. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Present Worth: *$0*

Capital Cost: *$0*
Annual OM&M: *$0*
Time to Implement: . . . . *N / A*

Soil Alternative 2: Source Area Capping and Excavation And Off-Site Disposal of the PCB Cell

This alternative consists of consolidating and capping the contaminated surface and subsurface soil material at the site. Since the PCB cell was constructed as an interim remedial measure, this alternative also involves excavation and off-site disposal of contaminated material stored in the cell. This containment alternative reduces direct contact exposure, migration of fugitive dust, and minimizes vertical transport of contaminants into the groundwater. Removal of the PCB cell would also eliminate the potential for leachate to vertically migrate into the groundwater. Excavation of contaminated material would be performed using conventional means and methods. The cap system would meet the requirements of RCRA Subtitle C and 6 NYCRR Part 373 for hazardous waste sites. Institutional controls would be implemented in combination with the cap installation to maintain the integrity of the capping system. Some details of this alternative are shown in Figure 7. Institutional controls would also be implemented to prevent the use of the on-site groundwater without treatment. Environmental easements would be implemented to prevent the disturbance of the cap system.

Present Worth: *$14,552,000*
Capital Cost: *$13,954,000*
Annual OM&M: *$7,203*
Time to Implement . . . . *1 - 1½ years*

Soil Alternative 3: Excavation and Off-Site Disposal of Contaminated Soils

This alternative consists of excavation and off-site disposal of contaminated soils that exceed the remedial action objective for PCBs of 1 ppm in the surface soils and 10 ppm in the subsurface soils. As more fully described in the FS document, a total of approximately 112,000 cubic yards of contaminated soils would be excavated from the southern, western, and PCB cell areas. Excavation of contaminated material would be performed using conventional means and methods. Along the northern edge of the western area bordering the Glens Falls Landfill, sheet piling would be needed to adequately support the 24-foot excavation in that area. Dewatering may be necessary once depths of 19 feet or more are encountered based on groundwater data in the western area of the site. A demarcation layer would be installed between imported soils and residually contaminated soils. In accordance with New York State Hazardous Waste and TSCA regulations, materials containing PCBs at or above 50 ppm would be disposed of at an RCRA-permitted facility. Contaminated material with concentrations less than 50 ppm is considered non-hazardous waste, and would be disposed of in a non-hazardous, permitted industrial/solid waste facility. Off-site clean fill would be used to backfill the excavated areas. Institutional controls would be implemented to prevent the use of the on-site groundwater without treatment. Environmental easements would be implemented so that all excavations into any soils with PCB concentrations greater than 1 ppm would adhere to the site management plan.

Present Worth: *$28,479,000*
Capital Cost: *$28,479,000*
Annual OM&M: *$0*
Time to Implement . . . . *1 - 1½ years*

Soil Alternative 4: Excavation and On-Site Thermal Treatment of Contaminated Soils

This alternative consists of excavating and thermally treating contaminated soils that exceed the remedial action objective for PCBs of 1 ppm in the surface soils and 10 ppm in the subsurface soils. As more fully described in the FS document, a total of approximately 112,000 cubic yards of contaminated soils would be excavated from the southern, western, and PCB cell areas. Excavation of contaminated material would be performed using conventional means and methods. Along the northern edge of the western area bordering the Glens Falls Landfill, sheet piling would be needed to adequately support the 24-foot excavation in that area. Dewatering may be necessary once depths of 19 feet or more are encountered based on groundwater data in the western area of the site. A demarcation layer would be installed over soils that are residually contaminated above 1 ppm. A thermal desorption system would be used to treat the contaminated material. Figures 8 and 11 present a conceptual process for this alternative. This treatment process generally involves the application of heat to contaminated material to volatilize the contaminants (i.e., physical separation process), and then collecting and treating the gas stream. An air pollution control system (APCS) would also be included as part of the treatment system to ensure that air emissions meet stringent air emission requirements determined by the NYSDEC. The treatment technology would also adhere to a Community Air Monitoring Plan to monitor the site during remedial work. Treated soil and clean material from the PCB cell cap would be used for backfilling the excavated areas. Institutional controls would be implemented to prevent the use of the on-site groundwater without treatment. Environmental easements would be implemented so that all excavations into any soils with PCB concentrations greater than 1 ppm would adhere to the site management plan.

Thermal desorption is a proven technology suitable to treat volatile and semi-volatile organics, pesticides, and PCBs.

Present Worth: *$22,041,000*
Capital Cost: *$22,041,000*
Annual OM&M: *$0*
Time to Implement . . . . *1-2 years*

Soil Alternative 5: Excavation and On-Site Soil Washing of Contaminated Soils

This alternative consists of excavating and washing contaminated soils that exceed the remedial action objective for PCBs. Similar to Alternatives 3 and 4 and as more fully described in the FS document, a total of approximately 112,000 cubic yards of contaminated soils would be excavated from the southern, western, and PCB cell areas. Excavation of contaminated material would be performed using conventional means and methods. Along the northern edge of the western area bordering the Glens Falls Landfill, sheet piling would be needed to adequately support the 24-foot excavation in that area. Dewatering may be necessary once depths of 19 feet or more are encountered based on groundwater data in the western area of the site. A demarcation layer would be installed over soils that are residually contaminated above 1 ppm.

After excavation, this alternative would involve on-site washing of contaminated surface and subsurface soils. Because the quantity and type of surfactant (a surface-active substance, such as a detergent or soap, that lowers the surface tension of a solvent or water) used to wash contaminated soils and process parameters are site specific, bench scale tests would be required prior to implementation of this alternative. Excavation of contaminated material would be performed using conventional means and methods. Figure 9 presents a conceptual process for this alternative and Figure 10 presents a general process for soil washing that is expected to be utilized at this site. After excavation of contaminated soils, the soils would be hauled and placed in storage piles near the treatment unit.

This treatment process would be performed as a batch process, operating 8 hours per day 5 days per week. The soil would travel to a mixing tank where water and surfactant would be added and the mixture would be agitated to encourage contaminant transfer from the soil matrix to the liquid phase. After sufficient agitation has occurred, wash water would then be separated from the mixture, treated, and disposed of appropriately. The contaminated fines would be set aside from the remaining treated soil in piles;

both soil piles would be analytically tested for PCBs.

The soil washing process would result in clean soil, wash water, dissolved contaminants, and/or precipitated solids, and a finer fraction containing adsorbed organics and precipitated soils. The contaminants would be concentrated into a relatively small volume of material, which would be disposed off-site. Treated soil and the previously removed larger size fraction of the soil would be analyzed to confirm that contaminants have been removed to below SCGs and this material would be used to backfill excavated areas. No additional backfill would be needed to bring the site to original grades. Treated soil and clean material from the PCB cell cap liner would be used for backfilling the excavated areas.

Controls would need to be implemented during the excavation and physical separation of the soil and sediment prior to actually performing the soil washing process to prevent the airborne release of contaminants. These controls would most likely include water to control dust.

Institutional controls would be implemented to prevent the use of the on-site groundwater without treatment. Environmental easements would be implemented so that all excavations into any soils with PCB concentrations greater than 1 ppm would adhere to the site management plan.

Present Worth: *$17,969,000*
Capital Cost: *$17,969,000*
Annual OM&M: *$0*
Time to Implement . . . . *1-2 years*

Groundwater Alternatives

In addition to addressing the contaminated soils on-site, the contaminated groundwater is addressed in this PRAP. The groundwater remedial alternatives are:

Groundwater Alternative 1 - No Action

This alternative would be acceptable only if it is demonstrated that the contamination at the site is below the remedial action objectives, or that natural processes would reduce the contamination to acceptable levels. This alternative does not include institutional controls.

Present Worth: *$0*
Capital Cost: *$0*
Annual OM&M: *$0*
Time to Implement . . . . *N / A*

Groundwater Alternative 2 - Long-Term Monitoring

Since the PCB concentrations in groundwater are relatively low, (with the exception of PCB-E1, MW-101-4, MW-101-5), this alternative consists of long-term monitoring of the on-site groundwater. This alternative would not actively reduce contaminant concentration, however, because groundwater in the vicinity of the site is not used as a drinking water source, this alternative is effective in preventing exposure to groundwater contaminants. Institutional controls, such as environmental easements, would also be implemented to minimize future potential exposure to the groundwater without treatment.

Present Worth: *$214,000*
Capital Cost: *$23,000*
Annual OM&M: *$11,372*
Time to Implement . . . . *0 - 6 months*

Groundwater Alternative 3 - Limited Groundwater Extraction and Treatment, and Long-Term Monitoring

With the exception of PCB-E1 (the monitoring point immediately adjacent to the PCB cell), and MW-101-4 and 101-5 (located just southeast from the tow of Glens Falls landfill), on-site PCB groundwater concentrations ranged between 0.1 and 1.0 ppb. This alternative consists of limited groundwater extraction and treatment from the area south of the PCB cell, in combination with long-term monitoring of on site groundwater. A carbon treatment system would be used to treat contaminated groundwater in a limited area where the highest PCB concentration is suspected (near PCB-E1). This alternative would be effective in preventing exposure to groundwater contaminants, in addition to actively providing contaminant reduction through limited treatment of the groundwater hot spot area. Institutional controls would be implemented to prevent the use of the on-site groundwater without treatment.

Present Worth: *$817,000*
Capital Cost: *$347,000*
Annual OM&M: *$52,442*
Time to Implement . . . . *1 year*

7.2 Evaluation of Remedial Alternatives

The criteria to which potential remedial alternatives are compared are defined in 6 NYCRR Part 375, which governs the remediation of inactive hazardous waste disposal sites in New York State. A detailed discussion of the evaluation criteria and comparative analysis is included in the FS report.

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

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

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

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

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

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

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

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

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

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

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the PRAP are evaluated. A responsiveness summary will be prepared that describes public comments received and the manner in which the NYSDEC will address the concerns raised. If the selected remedy differs significantly from the proposed remedy, notices to the public will be issued describing the differences and reasons for the changes.

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

The NYSDEC is proposing Soil Alternative 4 and Groundwater Alternative 2 as the remedy for this site. The elements of this remedy are described at the end of this section.

The proposed remedy is based on the results of the RI and the evaluation of alternatives presented in the FS. Soil Alternative 4 is 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 would achieve the remediation goals for the site by permanently treating the soils that create the significant threat to public health and the environment, it would greatly reduce the source of contamination to groundwater, and it would create the conditions needed to restore groundwater quality to the extent practicable. Soil Alternatives 2, 3, and 5 would also comply with the threshold selection criteria but to a lesser degree or with equal or lower certainty.

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

Soil Alternatives 2 (capping), 3 (excavation and removal), 4 (treatment through thermal desorption) and 5 (treatment through soil washing) all have short-term impacts which can easily be controlled. The time needed to achieve the remediation goals would be the longest for Soil Alternatives 4 and 5.

Achieving long-term effectiveness is best accomplished by excavation of the contaminated soils, followed by removal or treatment of the contaminated overburden soils (Soil Alternatives 3, 4 and 5). Soil Alternative 2 would not achieve long-term effectiveness, compared to Soil Alternatives 3, 4 and 5, because hazardous waste would remain on-site. Soil Alternative 3 would require a large amount of backfill from elsewhere to replace the soils hauled off-site. Soil Alternatives 4 and 5 are favorable because the alternatives would require little to no backfill material, as the on-site soils would be treated and placed back on-site.

Soil Alternative 2 would greatly reduce the mobility of contaminants but this reduction is dependent upon the long-term maintenance of the capping system. Also, the hazardous waste would still be present in the subsurface soils. Soil Alternative 3 would limit the mobility of contaminants, as the waste would be contained within an off-site permitted facility. Soil Alternatives 4 and 5 would reduce the volume and mobility of the contaminants by chemical/physical treatment of the majority of the site soils. Any concentrated contamination from the processes would be disposed at an off-site permitted facility. Thermal desorption (Soil Alternative 4) would remove the contaminants from the soil and then destroy the contaminants, whereas soil washing (Soil Alternative 5) would transfer the contaminants from the soil to the washwater and the fine soil particles. The washwater would require treatment, and the contaminated fines would be disposed off-site at an approved facility. Therefore, Soil Alternative 4 would reduce the volume of contaminated material more than Soil Alternative 5 because thermal desorption would destroy the contaminants.

Soil Alternative 4 is favorable because it is readily implementable. Soil Alternatives 2, 3 and 5 are also implementable. For Soil Alternative 5, a pilot study would be required to determine the most suitable surfactant (or combination of surfactants) to use to remove the contaminants present at the site.

The cost of the alternatives varies significantly. Although capping (Soil Alternative 2) is less expensive than excavation (Soil Alternative 3) or treatment (Soil Alternatives 4 and 5), it is not a permanent remedy. Soil Alternative 4 is very favorable because it is a permanent remedy that would eliminate the continuing source of groundwater contamination from this site. Off-site disposal (Soil Alternative 3) is the most costly remedy. The costs of Soil Alternatives 4 and 5 are similar to each other in that the actual excavation and disposal of the material are not the largest costs associated with these remedies. Due to the high concentrations and large volume of material to be treated, thermal desorption of the contaminated soils is preferable to soil washing. The cost for soil washing (Soil Alternative 5) would become more expensive if additional passes for the contaminated soil through the soil washing unit are needed in order to achieve the cleanup levels. More passes through the unit would increase the length of the project and increase the time and energy costs.

Based on the remedial alternative evaluation completed in Sections 5 and 6 of the FS, the recommended remedy for the Luzerne Road Site consists of excavation and on-site thermal treatment of contaminated soils including the PCB cell (Soil Alternative 4), along with long-term monitoring of the on-site groundwater (Groundwater Alternative 2).

Thermal treatment of contaminated surface and subsurface soils and the PCB cell represents an active remedial approach to treat target contaminants to meet proposed site cleanup criteria, which is a preferred technology. This alternative also provides for permanent protection of human health and the environment.

Excavation and off-site disposal provides the same level of protection of human health and the environment as the thermal treatment alternative, but is a more costly alternative and is a less desirable alternative because the waste volume would not be reduced through treatment. Source area capping and removal and off-site disposal of the PCB cell would not be a permanent remedy. Potential future exposures would be possible should institutional controls be compromised. This alternative would also limit the use of approximately a three-acre area of the site, where the cap would be installed. Due to the high concentrations and large volume of material to be treated, thermal desorption of the contaminated soils is preferable to soil washing. Washing this amount of material would produce large volumes of washwater, which would require treatment.

Removing and treating PCB contaminated subsurface soil (below the depth of 2 feet) to 1 ppm (instead of 10 ppm) is not recommended due to the increased cost, estimated to be approximately 10 percent more in capital costs, than the proposed alternative. The soil cleanup levels developed in NYSDEC TAGM 4046, for the protection of groundwater and/or drinking water standards, is 10 ppm of Total PCBs for the subsurface soils. The soils that contain PCB concentrations greater than 1 ppm but less than 10 ppm at the Luzerne Road Site are expected to be at a significant depth (16 to 24 feet). Environmental easements at the site would prevent the use of the on-site groundwater without treatment and all excavation into PCB contaminated soils above 1 ppm would need to adhere to the site management plan. Therefore, the proposed alternative would provide a similar level of protection for a lower cost.

Combined with on-site thermal treatment of contaminated soils, long-term monitoring and institutional controls is the recommended alternative to address groundwater contamination at the site. This alternative would be protective of human health and the environment. Treating the contaminated soils from the site would remove two of the three suspected sources of groundwater contamination identified during the RI (E & E, 2002). The third source of contamination will be addressed by the Glens Falls Landfill Record of Decision, which is to place an impermeable cap on the landfill. Since no groundwater receptors have been identified at the site, this alternative would minimize any future exposure to on-site contaminated groundwater with the use of institutional controls for the property. Although extraction and treatment of groundwater may provide a higher level of protection of human health and the environment, this alternative is not warranted since the sources of suspected on-site contamination (i.e., site soil and the PCB cell) would be removed under Soil Alternative 4.

The total present worth of the recommended soil and groundwater remedies for the site is $22,248,000. This total is comprised of a capital cost of $22,041,000 for excavation and on-site thermal treatment of contaminated soil from the site; and a present worth cost of $214,000 for the annual costs of long-term monitoring of the groundwater and institutional controls.

The elements of the proposed remedy are as follows:

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

2. Removal of the PCB containment cell and excavation of the on-site contaminated surface soil to 1 part per million (ppm) in the top 2 feet, and to 10 ppm in the subsurface soils. A demarcation layer would be installed over soils that are residually contaminated above 1 ppm. There would be at least 2 feet of soil that is 1 ppm or less over this demarcation layer.

3. On-site treatment of the excavated materials by thermal desorption. After the treatment of the soils, the site would be restored by placement of the treated soil, placement of topsoil, and seeding of excavated and/or filled areas.

4. A site management plan would be developed to address residual contaminated soils that may be excavated from the site during future redevelopment. The plan would require soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations. Monitoring of the site groundwater would be needed.

5. The property owner would complete and submit to the NYSDEC an annual certification until the NYSDEC notifies the property owner in writing that this certification is no longer needed. This submittal would contain certification that the institutional controls and engineering controls put in place, pursuant to the Record of Decision, are still in place, have not been altered, and are still effective.

6. Imposition of an institutional control in form of an environmental easement that would: (a) require compliance with the approved site management plan, (b) limit the use and development of the property to commercial, industrial or recreational uses; (c) restrict use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the New York State Department of Health; and, (d) require the property owner to complete and submit to the NYSDEC an annual certification.

7. Long term monitoring of the groundwater to evaluate the effectiveness of the source removal and treatment actions of the PCB contaminated soils. This monitoring would also consist of a periodic review of the groundwater. Other alternatives would be evaluated if groundwater cleanup goals are not met.

TABLE 1

Nature and Extent of Contamination

Range of sampling dates: July 1999-April 2002

WASTE (Within the Cell)	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
PCB/Pesticides	Total PCBs	2,723 to 12,150	10	2 of 2
	(1242 and 1254)			
Volatile Organic Compounds (VOCs)	Benzene	ND[c] to 5 (estimated)	0.06	1 of 8
	Chlorobenzene	ND to 120	1.7	4 of 8
	Xylene	ND to 20	1.2	3 of 8
	1,2-dichloroethane	ND to 12	0.3	2 of 8
	2-butanone	ND to 34	0.3	7 of 8

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
PCB/Pesticides	Total PCBs	ND[c] to 2,984	1	24 of 33
	(1242 and 1254)			

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
PCB/Pesticides	Total PCBs	ND[c] to 22110	10	95 of 919
	(1242 and 1254)			

[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m^3 = micrograms per cubic meter

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

[c] ND = No Detection

TABLE 1
Nature and Extent of Contamination
Range of sampling dates: July 1999-April 2002

SHALLOW GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
PCB/Pesticides	Total PCBs	ND[c] to 5.98	0.09	13 of 16
	(1242, 1248, 1254)			
Inorganics (Metals)	Iron	63.3 to 45,300	300	11 of 12
	Lead	ND to 102	25	1 of 12
	Magnesium	572 to 91,000	35,000	2 of 12
	Manganese	10 to 5,220	300	11 of 12
	Selenium	ND to 25.2	10	2 of 12
	Sodium	17,800 to 74,400	20,000	10 of 12
	Thallium	ND to 21.4	0.5	5 of 12
	Zinc	12.3 to 23,500	2,000	1 of 12

INTERMEDIATE GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
PCB/Pesticides	Total PCBs	ND[c] to 1.7	0.09	3 of 5
	(1242 and 1254)			
Inorganics (Metals)	Iron	ND[c] to 752	300	1 of 4

DEEP GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
PCB/Pesticides	Total PCBs	ND[c]	0.09	0 of 3
	(1242 and 1254)			
Inorganics (Metals)	Iron	155 to 4,800	300	3 of 4
	Manganese	40 to 317	300	1 of 4
	Sodium	4,920 to 24,400	20,000	1 of 4

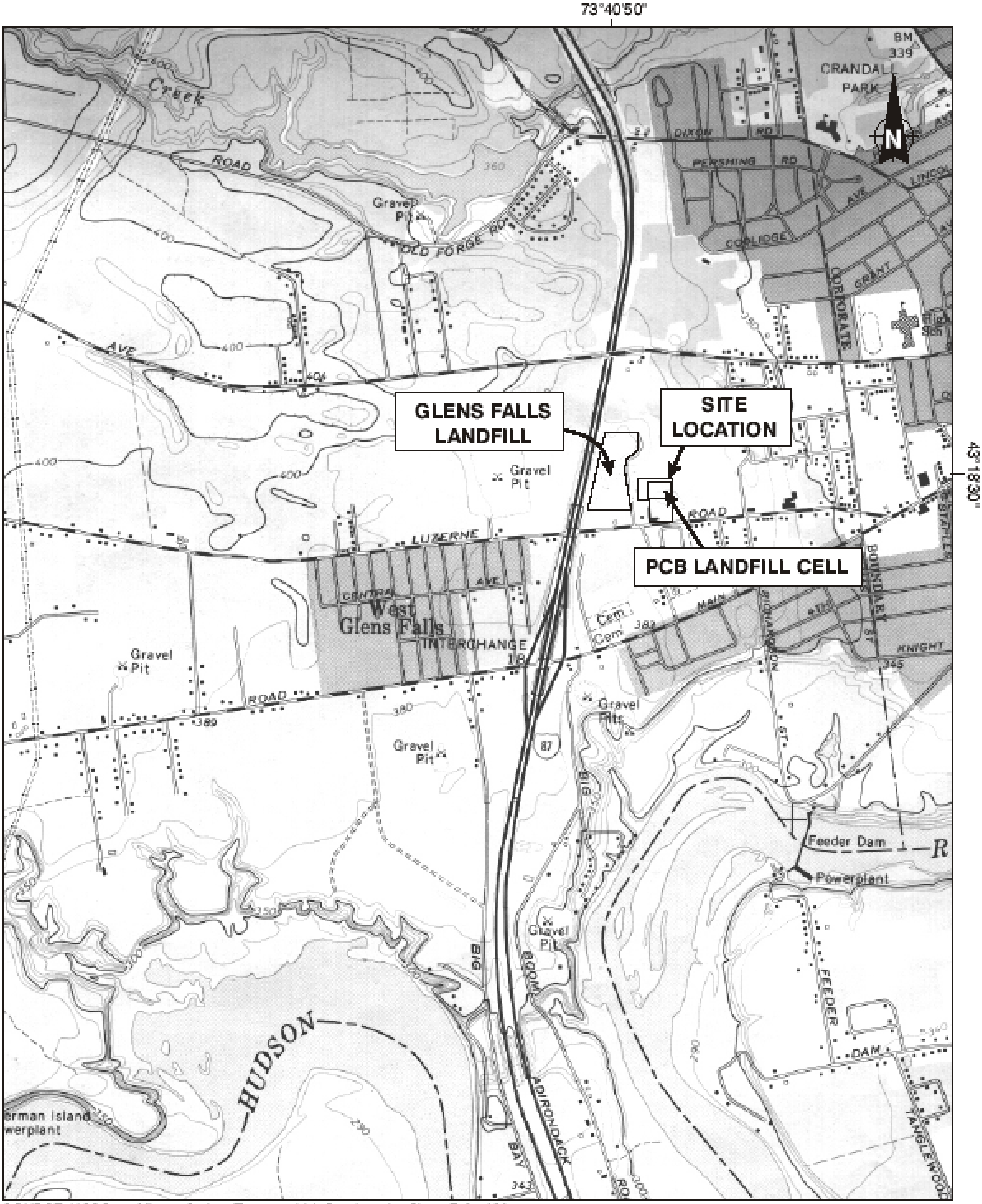
[a] ppb = parts per billion, which is equivalent to micrograms per liter, ug/L, in water;
ppm = parts per million, which is equivalent to milligrams per kilogram, mg/kg, in soil;
ug/m^3 = micrograms per cubic meter

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

[c] ND = No Detection

Table 2
Remedial Alternative Costs

SOIL REMEDIAL ALTERNATIVES			
Remedial Action	**Capital Cost**	**Annual O&M**	**Total Present Worth**
1. No Action	$0	$0	$0
2. Removal of Cell/Source Area Cap	$13,954,000	$7,203	$14,552,000
3. Excavation and Off-Site Disposal	$28,479,000	$0	$28,479,000
4. Excavation & Thermal Desorption	$22,041,000	$0	$22,041,000
5. Excavation & Soil Washing	$17,969,000	$0	$17,969,000
GROUNDWATER REMEDIAL ALTERNATIVES			
Remedial Action	**Capital Cost**	**Annual O&M**	**Total Present Worth**
1. No Action	$0	$0	$0
2. Long-term Monitoring	$23,000	$11,372	$214,000
3. Extraction & Treatment	$347,000	$52,442	$817,000



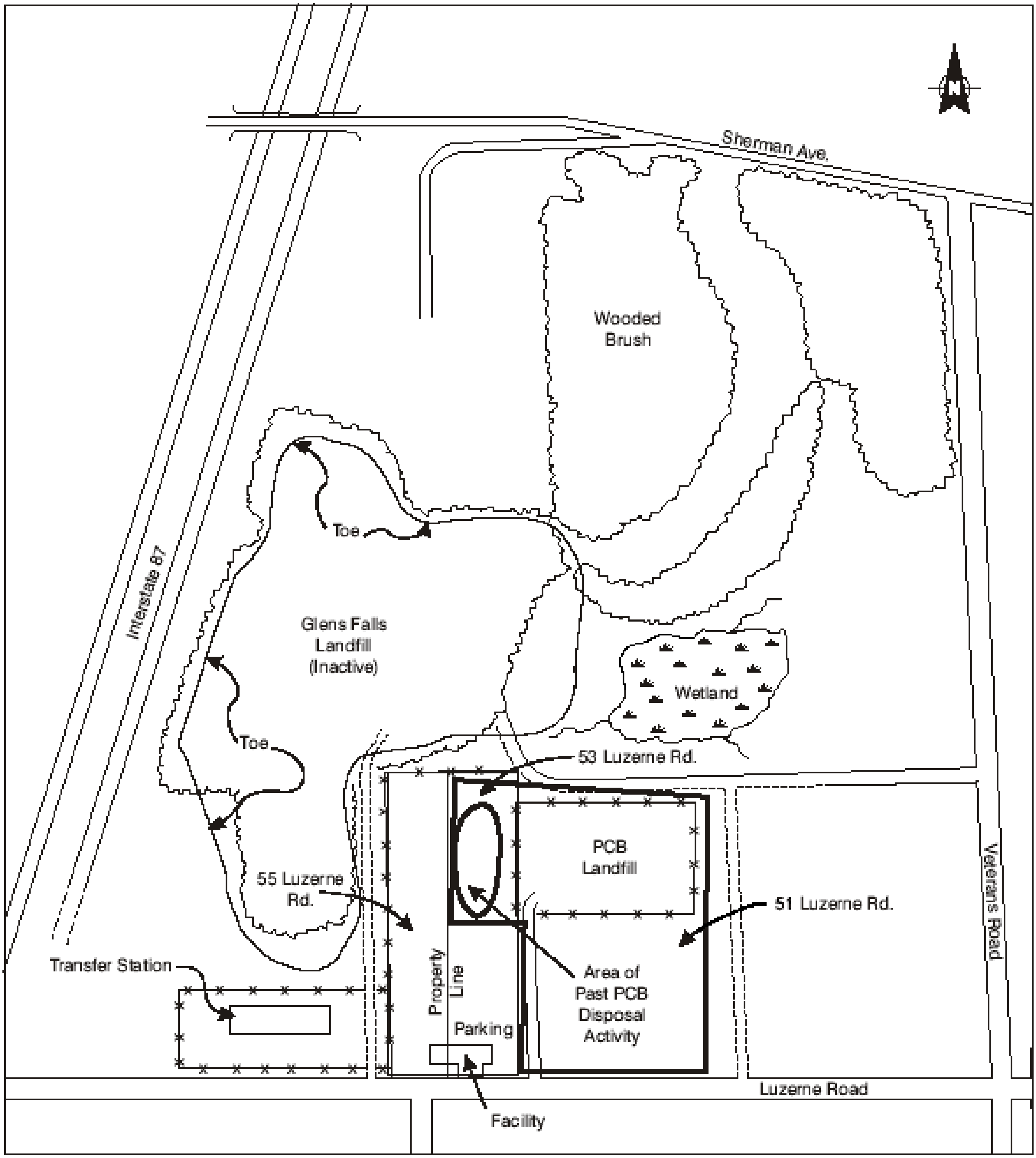
SOURCE: USGS 7.5 Minute Series (Topographic) Quadrangle: Glens Falls, NY, 1966.
Note: Limits of Glens Falls Landfill are approximated based on Site Topography.
Limits of area labeled as Site Location delineate the extent of the on-site study area.

SCALE 1:24,000

0 ½ 1 Mile

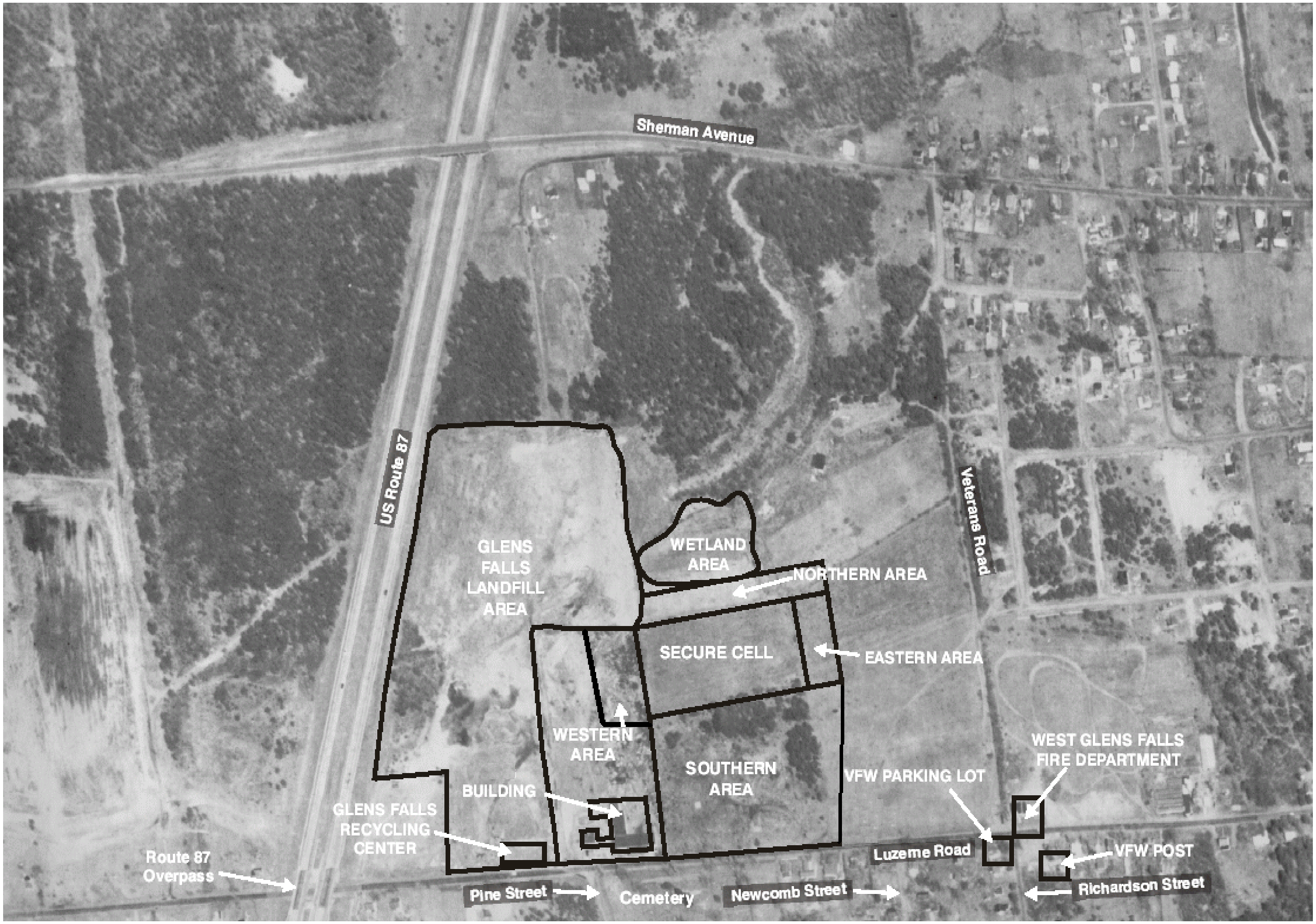
0 .5 1 Kilometer

Figure 1 - Site Location Map, Luzerne Road Site, Queensbury, New York



SOURCE: RCRA Environmental 1986

Figure 2 - Site Map, Luzerne Road Site, Queensbury, New York



KEY:

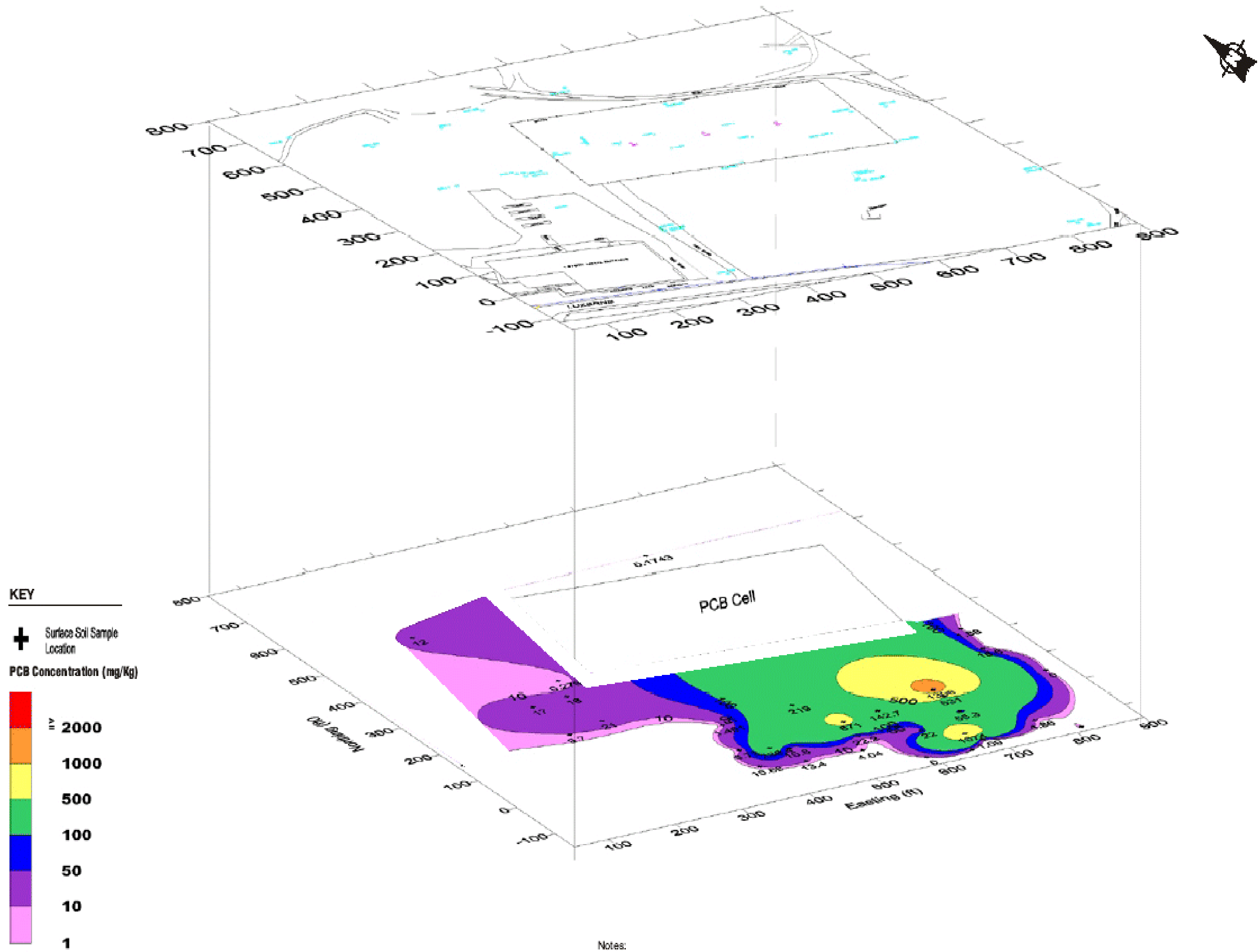
Approximate Location of Site Feature Border

BASE MAP SOURCE: Warren County Real Property Department, 1966 Aerial Photo.
SURVEY DATA SOURCE: Ecology and Environment, Inc. 1999.

Figure 3 - SITE FEATURES MAP
LUZERNE ROAD LANDFILL SITE,
QUEENSBURY, NEW YORK

SCALE

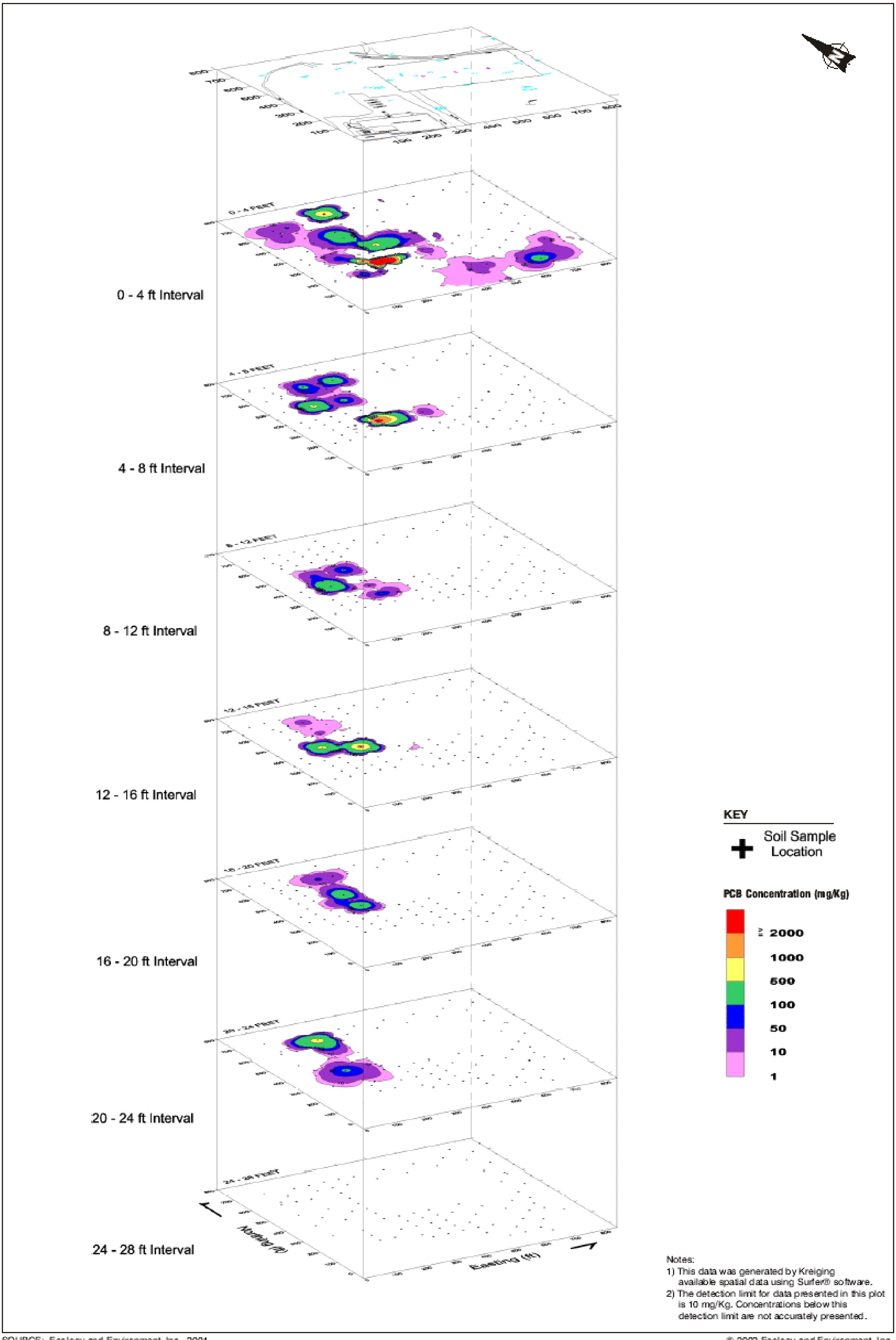
0 — 0.25 — 0.5 Miles



Notes:
1) This data was generated by Kreiging available spatial data using Surfer® software.
2) The detection limit for data presented in this plot is 1 mg/Kg. Concentrations below this detection limit are not accurately presented.

SOURCE: Ecology and Environment, Inc., 2001

Figure 4 Total PCB Concentration Distribution in On-site Surface Soils Luzerne Road Landfill Site Queensbury, New York

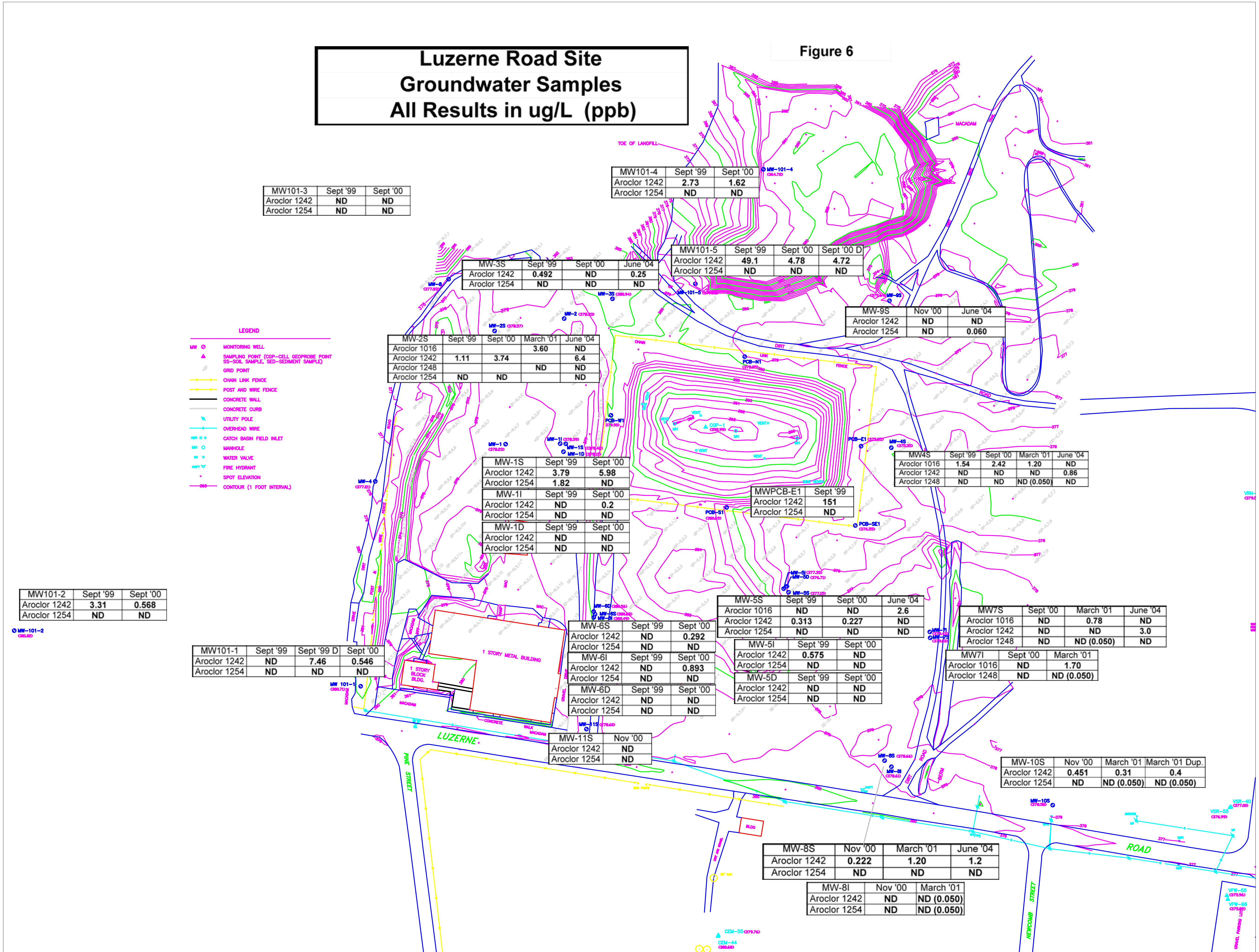


SOURCE: Ecology and Environment, Inc., 2001

Figure 5 **Total PCB Concentration Distribution in On-site Subsurface Soils Luzerne Road Landfill Site Queensbury, New York**

Figure 6

Luzerne Road Site
Groundwater Samples
All Results in ug/L (ppb)



MW101-3	Sept '99	Sept '00
Aroclor 1242	ND	ND
Aroclor 1254	ND	ND

MW101-4	Sept '99	Sept '00
Aroclor 1242	2.73	1.62
Aroclor 1254	ND	ND

MW101-5	Sept '99	Sept '00	Sept '00 D
Aroclor 1242	49.1	4.78	4.72
Aroclor 1254	ND	ND	ND

MW-3S	Sept '99	Sept '00	June '04
Aroclor 1242	0.492	ND	0.25
Aroclor 1254	ND	ND	ND

MW-9S	Nov '00	June '04
Aroclor 1242	ND	ND
Aroclor 1254	ND	0.060

MW-2S	Sept '99	Sept '00	March '01	June '04
Aroclor 1016			3.60	ND
Aroclor 1242	1.11	3.74		6.4
Aroclor 1248			ND	ND
Aroclor 1254	ND	ND		ND

MW-1S	Sept '99	Sept '00
Aroclor 1242	3.79	5.98
Aroclor 1254	1.82	ND

MW-1I	Sept '99	Sept '00
Aroclor 1242	ND	0.2
Aroclor 1254	ND	ND

MW-1D	Sept '99	Sept '00
Aroclor 1242	ND	ND
Aroclor 1254	ND	ND

MW4S	Sept '99	Sept '00	March '01	June '04
Aroclor 1016	1.54	2.42	1.20	ND
Aroclor 1242	ND	ND	ND	0.86
Aroclor 1248	ND	ND	ND (0.050)	ND

MWPCB-E1	Sept '99
Aroclor 1242	151
Aroclor 1254	ND

MW101-2	Sept '99	Sept '00
Aroclor 1242	3.31	0.568
Aroclor 1254	ND	ND

MW-5S	Sept '99	Sept '00	June '04
Aroclor 1016	ND	ND	2.6
Aroclor 1242	0.313	0.227	ND
Aroclor 1254	ND	ND	ND

MW7S	Sept '00	March '01	June '04
Aroclor 1016	ND	0.78	ND
Aroclor 1242	ND	ND	3.0
Aroclor 1248	ND	ND (0.050)	ND

MW101-1	Sept '99	Sept '99 D	Sept '00
Aroclor 1242	ND	7.46	0.546
Aroclor 1254	ND	ND	ND

MW-6S	Sept '99	Sept '00
Aroclor 1242	ND	0.292
Aroclor 1254	ND	ND

MW-6I	Sept '99	Sept '00
Aroclor 1242	ND	0.893
Aroclor 1254	ND	ND

MW-6D	Sept '99	Sept '00
Aroclor 1242	ND	ND
Aroclor 1254	ND	ND

MW-5I	Sept '99	Sept '00
Aroclor 1242	0.575	ND
Aroclor 1254	ND	ND

MW-5D	Sept '99	Sept '00
Aroclor 1242	ND	ND
Aroclor 1254	ND	ND

MW7I	Sept '00	March '01
Aroclor 1016	ND	1.70
Aroclor 1248	ND	ND (0.050)

MW-11S	Nov '00
Aroclor 1242	ND
Aroclor 1254	ND

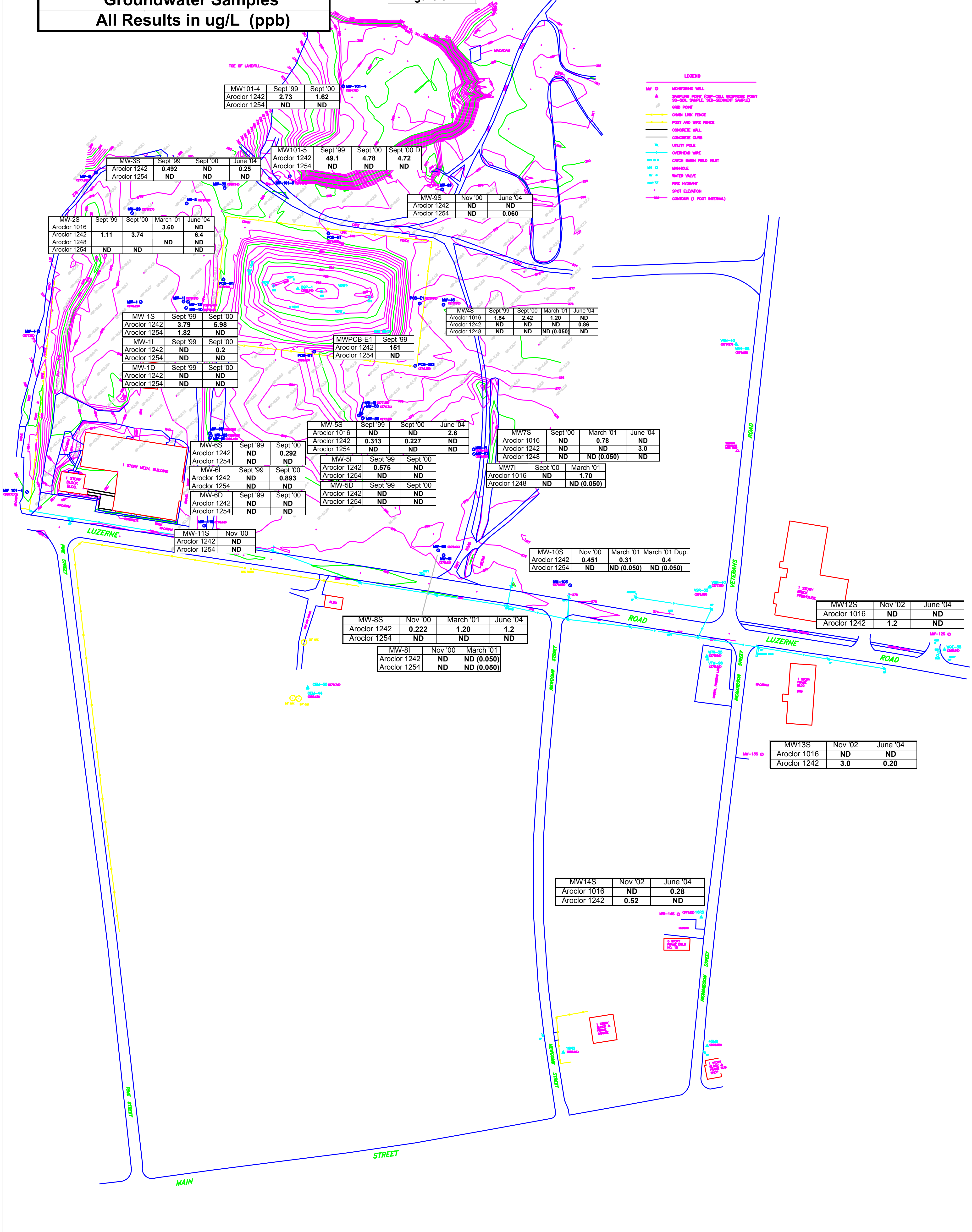
MW-10S	Nov '00	March '01	March '01 Dup.
Aroclor 1242	0.451	0.31	0.4
Aroclor 1254	ND	ND (0.050)	ND (0.050)

MW-8S	Nov '00	March '01	June '04
Aroclor 1242	0.222	1.20	1.2
Aroclor 1254	ND	ND	ND

MW-8I	Nov '00	March '01
Aroclor 1242	ND	ND (0.050)
Aroclor 1254	ND	ND (0.050)

Luzerne Road Site
Groundwater Samples
All Results in ug/L (ppb)

Figure 6A



MW101-4	Sept '99	Sept '00
Aroclor 1242	**2.73**	**1.62**
Aroclor 1254	**ND**	**ND**

MW101-5	Sept '99	Sept '00	Sept '00 D
Aroclor 1242	**49.1**	**4.78**	**4.72**
Aroclor 1254	**ND**	**ND**	**ND**

MW-3S	Sept '99	Sept '00	June '04
Aroclor 1242	**0.492**	**ND**	**0.25**
Aroclor 1254	**ND**	**ND**	**ND**

MW-9S	Nov '00	June '04
Aroclor 1242	**ND**	**ND**
Aroclor 1254	**ND**	**0.060**

MW-2S	Sept '99	Sept '00	March '01	June '04
Aroclor 1016			**3.60**	**ND**
Aroclor 1242	**1.11**	**3.74**		**6.4**
Aroclor 1248			**ND**	**ND**
Aroclor 1254	**ND**	**ND**		**ND**

MW4S	Sept '99	Sept '00	March '01	June '04
Aroclor 1016	**1.54**	**2.42**	**1.20**	**ND**
Aroclor 1242	**ND**	**ND**	**ND**	**0.86**
Aroclor 1248	**ND**	**ND**	**ND (0.050)**	**ND**

MW-1S	Sept '99	Sept '00
Aroclor 1242	**3.79**	**5.98**
Aroclor 1254	**1.82**	**ND**

MWPCB-E1	Sept '99
Aroclor 1242	**151**
Aroclor 1254	**ND**

MW-1I	Sept '99	Sept '00
Aroclor 1242	**ND**	**0.2**
Aroclor 1254	**ND**	**ND**

MW-1D	Sept '99	Sept '00
Aroclor 1242	**ND**	**ND**
Aroclor 1254	**ND**	**ND**

MW-5S	Sept '99	Sept '00	June '04
Aroclor 1016	**ND**	**ND**	**2.6**
Aroclor 1242	**0.313**	**0.227**	**ND**
Aroclor 1254	**ND**	**ND**	**ND**

MW7S	Sept '00	March '01	June '04
Aroclor 1016	**ND**	**0.78**	**ND**
Aroclor 1242	**ND**	**ND**	**3.0**
Aroclor 1248	**ND**	**ND (0.050)**	**ND**

MW-6S	Sept '99	Sept '00
Aroclor 1242	**ND**	**0.292**
Aroclor 1254	**ND**	**ND**

MW-5I	Sept '99	Sept '00
Aroclor 1242	**0.575**	**ND**
Aroclor 1254	**ND**	**ND**

MW7I	Sept '00	March '01
Aroclor 1016	**ND**	**1.70**
Aroclor 1248	**ND**	**ND (0.050)**

MW-6I	Sept '99	Sept '00
Aroclor 1242	**ND**	**0.893**
Aroclor 1254	**ND**	**ND**

MW-5D	Sept '99	Sept '00
Aroclor 1242	**ND**	**ND**
Aroclor 1254	**ND**	**ND**

MW-6D	Sept '99	Sept '00
Aroclor 1242	**ND**	**ND**
Aroclor 1254	**ND**	**ND**

MW-11S	Nov '00
Aroclor 1242	**ND**
Aroclor 1254	**ND**

MW-10S	Nov '00	March '01	March '01 Dup.
Aroclor 1242	**0.451**	**0.31**	**0.4**
Aroclor 1254	**ND**	**ND (0.050)**	**ND (0.050)**

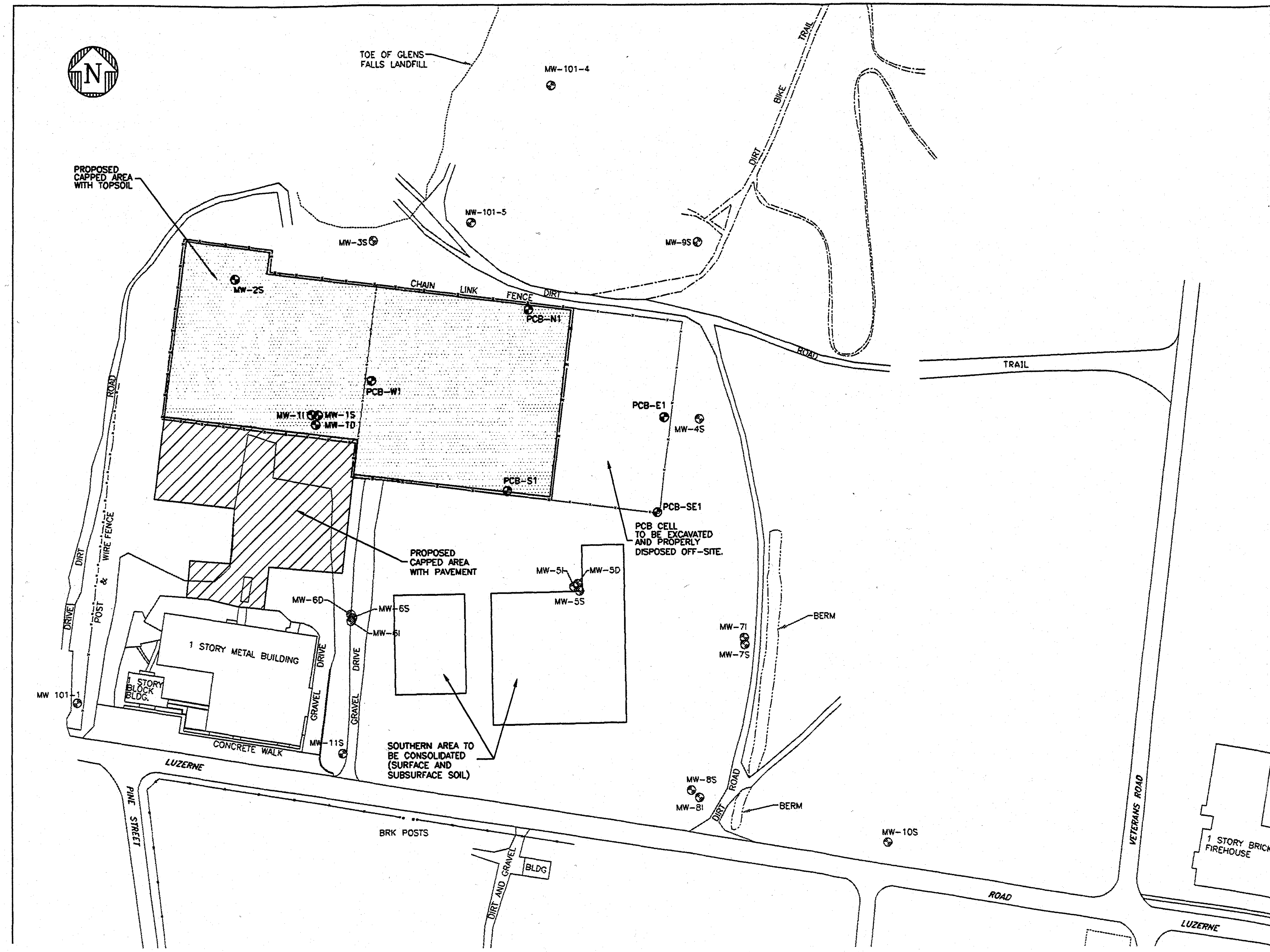
MW12S	Nov '02	June '04
Aroclor 1016	**ND**	**ND**
Aroclor 1242	**1.2**	**ND**

MW-8S	Nov '00	March '01	June '04
Aroclor 1242	**0.222**	**1.20**	**1.2**
Aroclor 1254	**ND**	**ND**	**ND**

MW-8I	Nov '00	March '01
Aroclor 1242	**ND**	**ND (0.050)**
Aroclor 1254	**ND**	**ND (0.050)**

MW13S	Nov '02	June '04
Aroclor 1016	**ND**	**ND**
Aroclor 1242	**3.0**	**0.20**

MW14S	Nov '02	June '04
Aroclor 1016	**ND**	**0.28**
Aroclor 1242	**0.52**	**ND**



NOTES:

1. BACKGROUND DATA FOR THIS FIGURE, TAKEN FROM YEC INC. LUZERNE ROAD SURVEY DATED AUGUST 13, 1999, SEPTEMBER 27, 1999, NOVEMBER 6, 2000, AND MARCH 28, 2001.
2. HORIZONTAL DATUM: ASSUMED
3. VERTICAL DATUM: FROM PREVIOUS SURVEY INFORMATION SUPPLIED BY ECOLOGY AND ENVIRONMENT, INC.
4. PCB CELL TO BE EXCAVATED PRIOR TO SOIL CONSOLIDATION.
5. SURFACE AND SUBSURFACE SOIL FROM SOUTHERN AREA AND PARKING LOT TO BE CONSOLIDATED AND PLACED INTO FOOTPRINT OF FORMER PCB CELL.

LEGEND

- EXISTING CHAIN LINK FENCE
- EXISTING POST AND WIRE FENCE
- EXISTING CONCRETE WALL
- EXISTING CONCRETE CURB
- PROPOSED CAPPED AREA (WITH TOPSOIL SURFACE)
- PROPOSED CAPPED AREA (WITH PAVEMENT SURFACE)
- PROPOSED CHAIN LINK FENCE
- PCB-W1 PROPOSED MONITORING WELL TO BE DECOMMISSIONED
- MW-71 EXISTING MONITORING WELL

SCALE IN FEET

0 150 300 450

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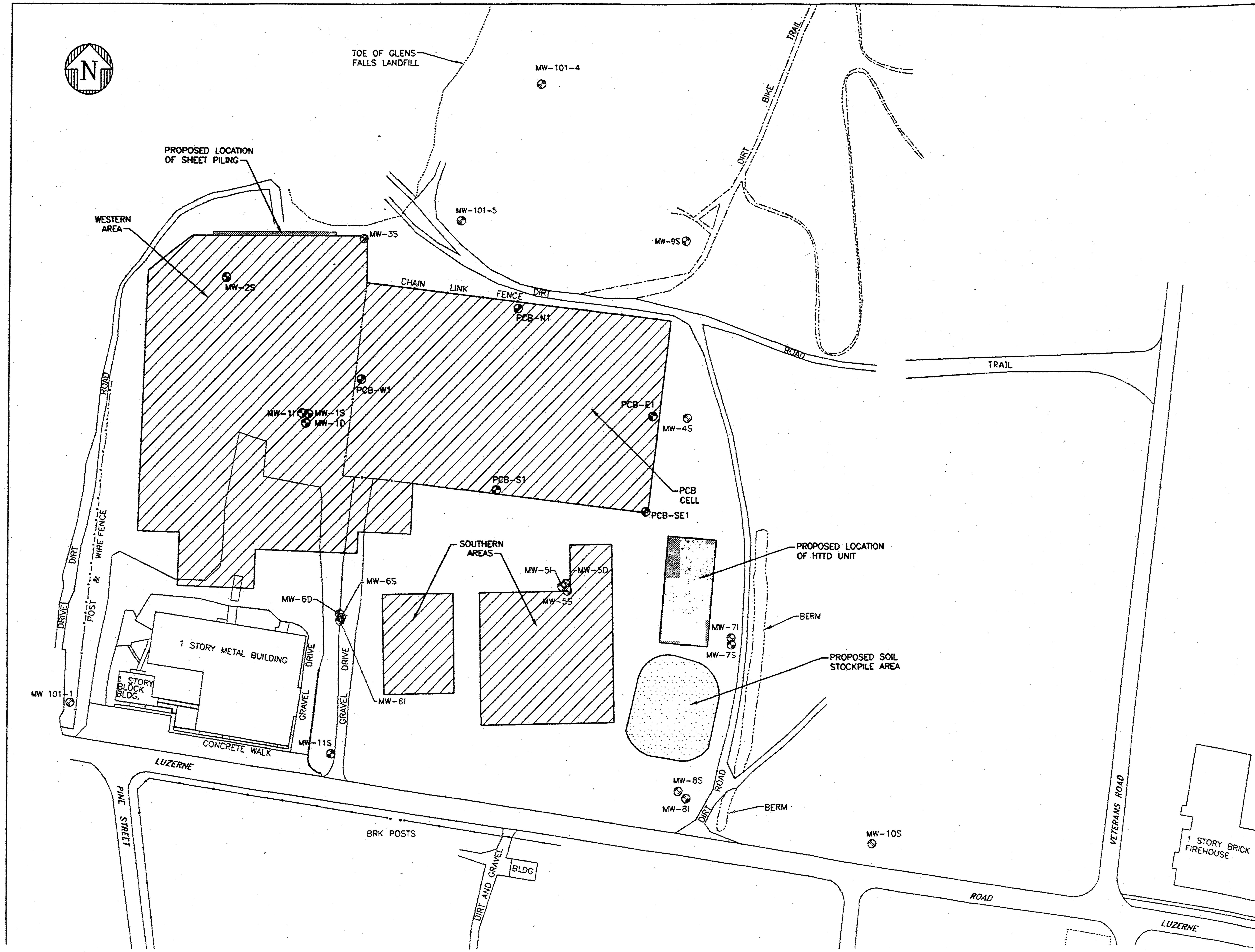
FIGURE 7 ALTERNATIVE 2 – SOURCE AREA CAPPING & EXCAVATION & OFF-SITE DISPOSAL OF PCB CELL
LUZERNE ROAD SITE
QUEENSBURY, NEW YORK



NOTES:

1. BACKGROUND DATA FOR THIS FIGURE, TAKEN FROM YEC INC. LUZERNE ROAD SURVEY DATED AUGUST 13, 1999, SEPTEMBER 27, 1999, NOVEMBER 6, 2000, AND MARCH 28, 2001.
2. HORIZONTAL DATUM: ASSUMED
3. VERTICAL DATUM: FROM PREVIOUS SURVEY INFORMATION SUPPLIED BY ECOLOGY AND ENVIRONMENT, INC.
4. SURFACE SOIL TO BE EXCAVATED IN THE SOUTHERN AREA FROM 0 TO 1 FOOT.
5. LIMITS OF EXCAVATION ARE SHOWN AT GRADE (i.e. INCLUDING REQUIRED CUTBACK). FOR SUBSURFACE SOILS, DEPTH OF EXCAVATION IS ASSUMED TO BE MAXIMUM 4 FEET BGS IN SOUTHERN AREA AND 24 FEET BGS IN WESTERN AREA.
6. DEPTH OF EXCAVATION IS ASSUMED TO BE MAXIMUM AT 15 FEET BGS IN PCB CELL AREA.

LEGEND

- EXISTING CHAIN LINK FENCE
- EXISTING POST AND WIRE FENCE
- EXISTING CONCRETE WALL
- EXISTING CONCRETE CURB
- PROPOSED AREAS TO BE EXCAVATED AND TREATED ON-SITE
- PROPOSED SOIL STOCKPILE AREA
- PCB-W1 — PROPOSED MONITORING WELL TO BE DECOMMISSIONED
- MW-71 — EXISTING MONITORING WELL

SCALE IN FEET

0 150 300 450

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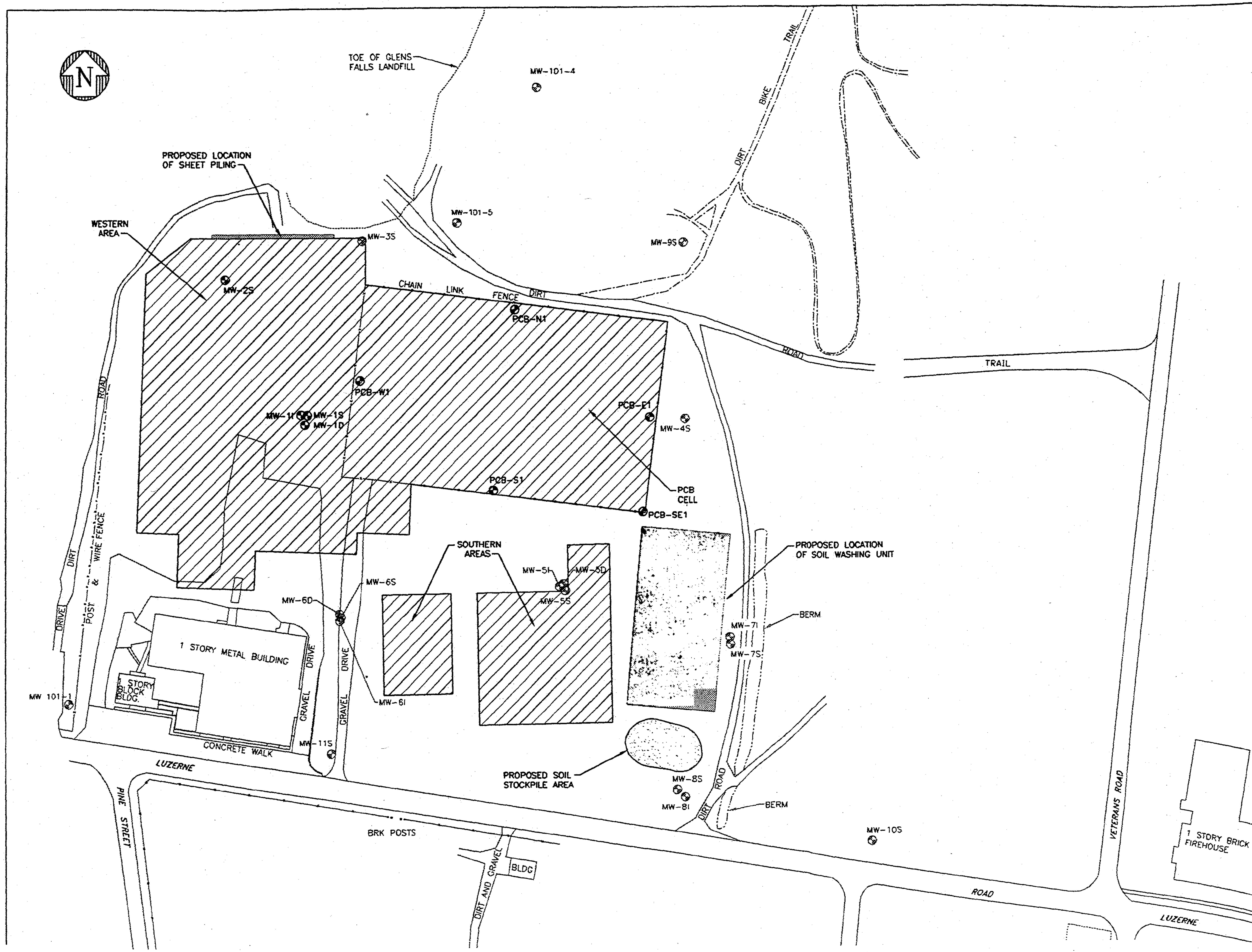
FIGURE 8 ALTERNATIVE 4 – EXCAVATION & ON-SITE THERMAL TREATMENT OF CONTAMINATED SOILS LUZERNE ROAD SITE QUEENSBURY, NEW YORK



NOTES:

1. BACKGROUND DATA FOR THIS FIGURE, TAKEN FROM YEC INC. LUZERNE ROAD SURVEY DATED AUGUST 13, 1999, SEPTEMBER 27, 1999, NOVEMBER 6, 2000, AND MARCH 28, 2001.
2. HORIZONTAL DATUM: ASSUMED
3. VERTICAL DATUM: FROM PREVIOUS SURVEY INFORMATION SUPPLIED BY ECOLOGY AND ENVIRONMENT, INC.
4. SURFACE SOIL TO BE EXCAVATED IN THE SOUTHERN AREA FROM 0 TO 1 FOOT.
5. LIMITS OF EXCAVATION ARE SHOWN AT GRADE (i.e. INCLUDING REQUIRED CUTBACK). FOR SUBSURFACE SOILS, DEPTH OF EXCAVATION IS ASSUMED TO BE MAXIMUM 4 FEET BGS IN SOUTHERN AREA AND 24 FEET BGS IN WESTERN AREA.
6. DEPTH OF EXCAVATION IS ASSUMED TO BE MAXIMUM AT 15 FEET BGS IN PCB CELL AREA.

LEGEND

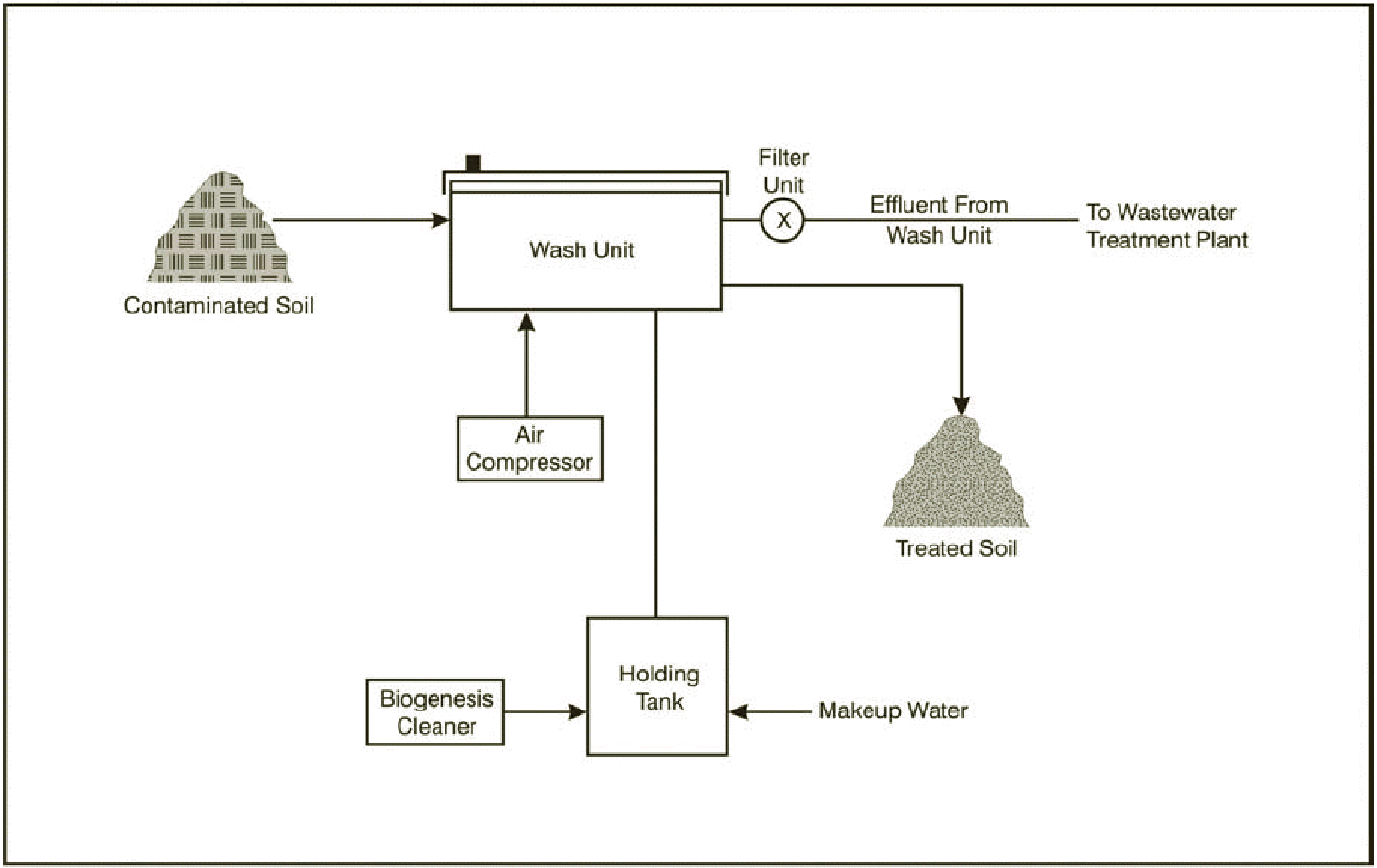
- EXISTING CHAIN LINK FENCE
- EXISTING POST AND WIRE FENCE
- EXISTING CONCRETE WALL
- EXISTING CONCRETE CURB
- PROPOSED AREAS TO BE EXCAVATED AND TREATED ON-SITE
- PROPOSED SOIL STOCKPILE AREA
- PCB-W1 PROPOSED MONITORING WELL TO BE DECOMMISSIONED
- MW-71 EXISTING MONITORING WELL

SCALE IN FEET

0 150 300 450

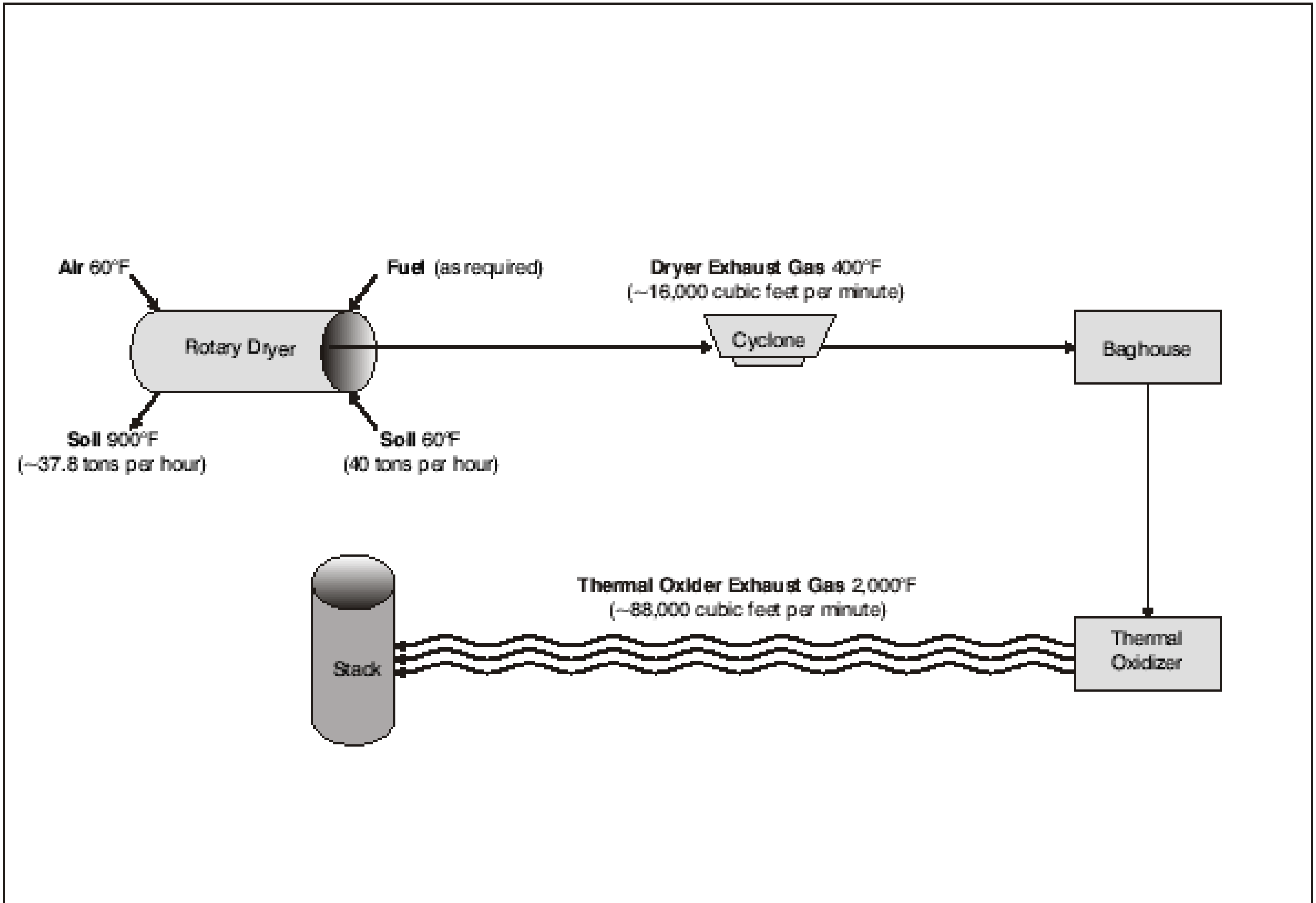
ecology and environment

FIGURE 9 ALTERNATIVE 5 – EXCAVATION & ON-SITE SOIL WASHING OF CONTAMINATED SOILS LUZERNE ROAD SITE QUEENSBURY, NEW YORK



SOURCE: EPA/540/R-93/510, Biogenesis™ Soil Washing Technology, Innovative Technology Evaluation Report, September 1993

Figure 10 Conceptual Soil Washing Process, Luzerne Road Site



SOURCE: Ecology and Environment, Inc. 2002

Figure 11 **High-temperature Thermal Mass and Energy Balance**
Luzerne Road Site