Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Harmon Railroad Yard Site
Operable Unit II
Croton-on-Hudson, Westchester County
Site Number 3-60-010

March 1998

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* JOHN P. CAHILL, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Harmon Railroad Yard
Operable Unit II
Inactive Hazardous Waste Site
Croton-on-Hudson, Westchester County, New York
Site No. 3-60-010

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Harmon Railroad Yard Operable Unit II (OU-II) inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Harmon Railroad Yard OU-II Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

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

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Harmon Railroad Yard OU-II site and the criteria identified for evaluation of alternatives the NYSDEC has selected Alternative 5, Vacuum Enhanced Non-aqueous Phase Liquid (NAPL) Removal . The components of the remedy are as follows:

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

2. Vacuum-enhanced removal of OU-II NAPL found within four NAPL areas located adjacent to the former wastewater lagoon (Operable Unit 1);

3. Offsite disposal of all liquid-phase OU-II NAPL at a TSCA and RCRA-permitted incinerator;

4. Long-term groundwater and NAPL monitoring; and

5. Access and use restrictions.

New York State Department of Health Acceptance

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

Declaration

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

3/27/98
Date

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

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

RECORD OF DECISION

Harmon Railroad Yard, Operable Unit II
Inactive Hazardous Waste Site
Croton-on-Hudson, Westchester County, New York
Site No. 3-60-010
March 1998

SECTION 1 SITE LOCATION AND DESCRIPTION

The Harmon Railroad Yard, in Croton-on-Hudson, Westchester County, is an approximately 100 acre maintenance and repair yard owned by Penn Central Corporation of Cincinnati, Ohio and/or its subsidiaries, and presently leased by the Metropolitan Transportation Authority. The facility has been operated by Metro-North Commuter Railroad (MN) since 1983. The Yard was previously operated by Consolidated Rail Corporation (Conrail). The Yard is located on the northwestern edge of the Croton Point Peninsula (Figure 1). The Yard is bounded by the Croton Point Landfill on the south and the Hudson River to the northwest. Historical sand hills of up to 60 feet in height have been leveled by sand mining to make way for the railroad operation. The former equalization lagoon and old wastewater treatment plant, referred to as Operable Unit I, was the subject of a Remedial Investigation/ Feasibility Study (RI/FS) and Remedial Action (RA) which was completed in May 1996. Operable Unit II, which is the subject of this PRAP, consists of floating product and groundwater along the perimeter of the former lagoon, soils surrounding the discharge pipe from the former wastewater treatment plant which empties into Croton Bay and sediments in Croton Bay impacted by discharges from this pipe (Figure 2).

An Operable Unit represents a portion of the site remedy which 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.

SECTION 2 SITE HISTORY

2.1 Operational/Disposal History

In 1980, polychlorinated biphenyls (PCBs) were discovered in the effluent discharge from the Old Wastewater Treatment Plant. The source of the PCBs was identified as the maintenance areas where empty transformers were serviced by Conrail, a predecessor railroad operator. The rinseate from this activity contained residual PCBs and was conveyed to the equalization lagoon (Figure 3). Since the treatment process was not capable of removing PCBs, residual PCBs were found in the Old Plant, its appurtenances, the lagoon and the pond. Once the source of the problem was discovered, the rinsing operation at the maintenance area was discontinued and the affected areas of the shop, the conveyance pipelines and the wet well were cleaned by Paul M. Mallon Company under the supervision of NYSDEC. Portions of the Old Plant and equalization lagoon and the pond were not remediated. At that time, Conrail contracted with O.H. Materials Co., (OHM) of Findlay, Ohio to furnish, install and operate the Treatment Plant to ensure that subsequent discharges from the wastewater treatment area did not contain PCBs.

In 1985, Metro-North constructed the New Treatment Plant at the Site. The New Treatment Plant processes influent wastewater streams from the wet well which are received from the maintenance areas of the yard. The current influent wastewater streams do not contain PCBs. Effluent from the New Treatment Plant discharges to Croton Bay pursuant to a new New York State Pollution Discharge Elimination System (SPDES) permit. The Old Plant and its associated appurtenances were dismantled and decommissioned as part of the OU-I remedial action.

NYSDEC first placed the Harmon Railroad Yard on the state registry of Inactive Hazardous Waste Disposal Sites in 1985. At that time, the Harmon Railroad Yard was classified as a 2a, a temporary classification assigned to sites with inadequate and/or insufficient data for inclusion in any other classification. In December of 1988, at the request of Metro-North, NYSDEC split the Harmon Railroad Yard into two separate sites. The Old Plant and lagoon were designated as one site and reclassified as a Class 2. Hart Environmental Management Corporation, on behalf of Metro-North, initiated a RI/FS project at the Old Plant and lagoon at that time. The remainder of the Harmon Railroad Yard is being investigated as a petroleum only site since no hazardous waste is present.

After the RI/FS project was completed, a ROD was issued by the NYSDEC in September 1992. The ROD separated the Old Plant and lagoon area into two operable units designated OU-I and OU-II. A remedial design was completed for OU-I and the remedial action was completed in May 1996 (see Section 3.2 of this PRAP). This RI/FS addresses OU-II.

The groundwater component of OU-II is that portion of the saturated zone which may have been impacted by discharges from the former wastewater lagoon and treatment plant, including possible impacts to surface water. The Non-Aqueous Phase Liquid (NAPL) component of OU-II includes the hydrocarbon layer which floats on the water table surface which is attributable to the former wastewater lagoon. The soil component of OU-II represents soil adjacent to the former discharge line which conveyed wastewater to the outfall point at Croton Bay which may have been affected by any NAPL layer or any seepage of chemicals from this line. The sediment component of OU-II is any sediment in Croton Bay or the Hudson River which may have been adversely impacted by discharges and/or releases from the Site. The surface water component of OU-II is any surface water which may have been adversely impacted by discharges and/or releases from the Site.

2.2 Remedial History

Two response actions have been conducted in this area of the Site. They are:

- NAPL removal in the vicinity of the lagoon as an Interim Remedial Measure (IRM) for OU-I; and

- implementation of the selected OU-I remedial action for the former lagoon (ie., removal of the Old Plant and closure of the lagoon).

The NAPL IRM operated from January 1991 through May 1992 and recovered approximately 473 gallons of floating product in the vicinity of the former wastewater lagoon from three NAPL recovery wells. Remediation of the wastewater lagoon included installation of sheet pilings around the perimeter of the lagoon, removal and offsite incineration of lagoon sludge, offsite disposal of PCB-contaminated soils, excavation and staging of low-level PCB-contaminated soils (under 10 ppm), placement of a low-permeability liner over the remediated lagoon, placement of low-level PCB-contaminated soil and uncontaminated soil on the liner and placement of a low-permeability cover over this soil. The Old Wastewater Treatment Plant remedial action included decontamination, demolition and disposal of the Plant.

SECTION 3 CURRENT STATUS

In response to a determination that the presence of hazardous waste at the Site presents a significant threat to human health and/or the environment, Metro-North's engineering consultant has recently completed a Remedial Investigation/Feasibility Study (RI/FS).

3.1 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 November 1994 and May 1996. A draft RI report was issued in October 1996 and a final RI report was issued in January 1997.

The RI included the following activities:

- NAPL delineation around the former lagoon with the installation of approximately 93 temporary or permanent NAPL delineation wells;
- NAPL analysis for PCBs;
- NAPL baildown testing;
- soil investigation along the former discharge line with the installation of 62 Geoprobe borings;
- analysis of discharge line samples for the Target Compound List (TCL) parameters and total organic carbon (TOC);
- sediment and surface water investigation in Croton Bay at the outfall from the former Wastewater Treatment Plant;
- analysis of sediment and surface water samples for the TCL, Target Analyte List (TAL) and TOC parameters;

- investigation of groundwater in the vicinity of the former wastewater lagoon;
- analysis of groundwater samples for TCL and TAL parameters; and
- groundwater elevation and flow data.

Refer to Figures 4, 5 and 6 for the sampling locations of the various above described media.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Harmon Railroad Yard Operable Unit II site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. NYSDEC TAGM 4046, Determination of Soil Cleanup Objectives and Cleanup Levels, was used as SCGs for soil and the Division of Fish and Wildlife Technical Guidance for Screening Contaminated Sediments was used for surface water sediments.

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

3.1.1 <u>Nature and Extent of Contamination</u>

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

3.1.1.1 NAPL Contamination

As part of the NAPL delineation task of the OU-II RI, NAPL monitoring has been conducted at wells in the vicinity of the lagoon since November 1994. Monitoring data has been collected both at previously existing monitoring wells and at temporary and permanent monitoring wells installed for the OU-II RI.

The NAPL monitoring data is represented on a NAPL thickness map (Figure 7). NAPL generally occurs in four areas in the vicinity of the former wastewater lagoon (Figure 4) as follows:

- L1 - to the northwest of the lagoon in the vicinity of wells TB-1 and WB-9;
- L2 - to the north of the lagoon in the vicinity of well WB-4;
- L3 - to the northeast of the lagoon in the vicinity of well WB-2;
- L4 - to the southeast of the lagoon in the vicinity of wells TB-6 and WB-5.

NAPL in the OU-II study area is a viscous, severely biodegraded, diesel fuel which floats on the water table surface. The depth from ground surface to the top of the NAPL layer in these areas ranges from 5.5 feet below grade in NAPL area L4 to 19 feet below grade in NAPL area L1.

NAPL area L1 has an areal coverage of 0.27 acres, a maximum NAPL thickness of 2.5 feet and an estimated NAPL volume of 26,700 gallons. The maximum PCB concentration detected in L1 is 7.2 ppm. NAPL area L2 has an areal coverage of 0.03 acres, a maximum NAPL thickness of 1.35 feet and an estimated NAPL volume of 2,500 gallons. The maximum PCB concentration detected in L2 is 19 ppm. NAPL area L3 has an areal coverage of 0.05 acres, a maximum NAPL thickness of 1.3 feet and an estimated NAPL volume of 4,900 gallons. The maximum PCB concentration detected in L3 is 3.6 ppm. NAPL area L4 has an areal coverage of 0.61 acres, a maximum NAPL thickness of 3.7 feet and an estimated NAPL volume of 118,500 gallons. The maximum PCB concentration detected in L4 is 119 ppm. The average PCB concentration found throughout the four NAPL areas was 8.8 ppm. Figure 8 shows PCB concentrations found in NAPL samples collected from the vicinity of the former wastewater lagoon.

Baildown tests were conducted in all four NAPL areas to determine the feasibility of NAPL recovery. Results indicated that NAPL recovery ranged from moderate to good in all four areas and demonstrated that NAPL recovery is feasible in all four NAPL areas which were identified as part of OU-II.

3.1.1.2 Soil Contamination Along the Former Discharge Line

The soil along the former discharge line that connected the old treatment plant to the outfall at Croton Bay was investigated to determine whether contaminated wastewater was discharged to surrounding soil.

Figure 5 shows the location of the 62 soil borings constructed along the discharge line. Samples were collected at depths ranging from 1.0 to 11.5 feet and were analyzed for TCL parameters and TOC.

There were no PCBs in soil from around the former discharge line at concentrations which exceeded the OU-I remedial goal for subsurface soils of 10 ppm. The maximum PCB concentration was 0.068 ppm.

The suite of organic compounds in soils along the former discharge line were similar to those found in soils during a separate investigation for petroleum constituents in Harmon Yard. This separate Harmon Yard petroleum constituent investigation was conducted by Harmon Yard under the jurisdiction of the former NYSDEC Division of Spills Management, now the Bureau of Spill Prevention and Response in the Division of Environmental Remediation. Many of these compounds can be associated with fuel oil. TOC concentrations from these samples ranged from 2073 ppm to 282,481 ppm, consistent with TOC levels detected during the Harmon Yard investigation.

Based on the above, the soil along the former discharge line can be eliminated as an area of concern from the OU-II RI/FS and addressed along with the remainder of the Harmon Yard under the jurisdiction of the NYSDEC's Bureau of Spill Prevention and Response covered by the Stipulation of Discontinuance Agreement #383-89.

3.1.1.3 Sediment and Surface Water in Croton Bay

Sediment and surface water samples were collected at the outfall of the former discharge line that connected the old treatment plant to Croton Bay to determine whether contaminated wastewater was discharged to the Croton Bay.

3.1.1.3.1 Sediments

Figure 6 shows the locations of the six sediment samples and one surface water sample collected in Croton Bay. Sediment samples were collected at a depth of 0 to 2 feet. All samples were analyzed for TCL, TAL and TOC parameters.

To place the OU-2 sediment data in perspective, the results were compared to data from two separate sources. One source is data from the Croton Point Sanitary Landfill Remedial Investigation (1992) where 52 samples from 23 locations were collected. A second source is Iona Island Marsh, upriver of the Landfill, where background data was available. Table 1 provides a summary of this data with concentrations presented as an average for all samples collected within the specific area of concern.

Volatile Organic Compounds (VOCs) were detected in the OU-II sediment samples at levels consistent with samples collected during the Croton Point Sanitary Landfill Remedial Investigation and at the Iona Island Marsh.

Several SVOCs were detected in OU-II samples, most of which were reported at higher concentrations than observed either in the Croton Point or Iona Marsh samples. Most of the SVOCs are fuel oil related. The three compounds which were not fuel oil related were also present in sediments from Croton Point and Iona Marsh. The fuel oils were addressed as part of the spills investigation for the Harmon Railroad Yard. A cutoff trench and wall were installed to mitigate the migration of NAPL toward Croton Bay.

PCB's were detected in all of the sediment samples with concentrations as high as 0.9 ppm. This level is slightly above concentrations typically found in this area of the Hudson River.

Several pesticide compounds were found in the OU-II sediment samples which were not reported in samples from Croton Point or Iona Marsh. Levels exceed the NYSDEC human health and/ or bioaccumulation sediment criteria and are slightly above background concentrations for this area.

Inorganic constituents were present in all OU-II sediment samples, most of which are at levels similar or lower than those reported in samples from Croton Point or Iona Marsh. Antimony was the only constituent found at Croton Bay which was not reported in samples from Croton Point or Iona Marsh. In the cases where Croton Bay sediment samples exhibited higher inorganic concentrations, they were of the same order of magnitude with the exception of mercury. The highest level of mercury reported from Croton Bay (360 ppb) was from a sediment stockpile which was removed during the Croton River Bridge reconstruction project.

In summary, contaminant concentrations in Croton Bay sediments are comparable to or slightly higher than typical concentrations for this area with the exception of fuel oil related SVOCs. The fuel oils are being addressed as part of the Spills investigation for the Harmon Railroad Yard.

3.1.1.3.2 Surface Water

One VOC was detected in surface water (4-Methyl-2-pentanone) at a level of 18 ppb. No SVOCs, pesticides or PCBs were detected in this surface water sample. Several inorganic constituents were detected in both the filtered and unfiltered surface water samples.

3.1.1.4 Groundwater in the Vicinity of the Former Lagoon

A groundwater investigation was carried out to determine if groundwater in the vicinity of the former wastewater lagoon has been adversely impacted by contaminants present in the lagoon.

Figure 4 shows the location of the 10 groundwater monitoring wells (eight shallow and two deep wells) along the perimeter of the former wastewater lagoon. These wells were analyzed for TCL and TAL parameters. Table 2 presents a summary of contaminants detected in the groundwater.

VOCs were detected at trace concentrations, below groundwater standards, with the exception of chlorobenzene which was found in two samples at levels up to 62 ppb.

SVOCs were detected in all monitoring well samples, most however were at levels below groundwater standards and associated with fuel oils. The highest SVOC detected was 2-methylnaphthalene at a concentration of 410 ppb.

No pesticides or PCBs were detected in any of the wells sampled.

Several inorganic constituents were detected above groundwater standards, most notably arsenic, chromium, copper and lead.

Groundwater elevation data collected during the course of the OU-II RI shows groundwater levels to have remained fairly consistent over this period. The groundwater flow map (Figure 9) indicates the principal direction of flow to be to the northwest. During earlier periods when the lagoon was in operation, groundwater flow was likely radial from the center of the lagoon.

3.2 Interim Remedial Measures

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

An IRM was conducted prior to remediation of the wastewater lagoon in an attempt to recover floating product outside the perimeter of the lagoon. The NAPL IRM operated from January 1991 through May 1992 and recovered approximately 473 gallons of floating product from three NAPL recovery wells. This

IRM was discontinued due to various problems with the system and to facilitate work on the OU-I remedy. No IRMs were carried out during the OU-II RI/FS.

3.3 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 4 of the RI Report.

An exposure pathway is how an individual may come into 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.

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

- ingestion of fish in Croton Bay which may bioaccumulate chemicals of concern; and
- direct contact with NAPL during subsurface work.

These potential human exposure pathways will be addressed through the remedial actions presented in this ROD.

3.4 Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures which may be presented by the site. The Fish and Wildlife Impact Assessment included in the RI presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources. Completed pathways which are known to or may exist at the site include:

- ingestion of sediments with contaminants of concern in Croton Bay by aquatic life; and
- ingestion of fish by terrestrial life in Croton Bay which may bioaccumulate chemicals of concern;

These potential environmental exposure pathways will be addressed through the remedial actions presented in this ROD.

SECTION 4 ENFORCEMENT STATUS

The NYSDEC and the Metro-North Railroad Company entered into a Stipulation of Discontinuance on August 5, 1994. In regard to Metro-North's Article 78 action against NYSDEC, Metro-North agreed to dismiss, with prejudice, it's Article 78 action brought against NYSDEC's enforcement action for the Harmon Railroad Yard and other Metro-North facilities. Under this agreement, Metro-North Railroad

Company is obligated to implement a remedial program for the Harmon Railroad Yard and other sites and is also eligible for reimbursement by the State of up to 75 percent of the eligible remediation costs .

SECTION 5 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. 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 should eliminate or mitigate all significant threats to the public health and to the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- Prevent further offsite migration of OU-II NAPL;
- Remove OU-II NAPL to the extent practicable; and
- Continue to prevent direct contact with subsurface OU-II NAPL in the vicinity of the former lagoon.

SECTION 6 SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy should be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the Harmon Railroad Yard site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled "Remedial Investigation/ Feasibility Study Report, Harmon Railroad Yard Wastewater Treatment Area, Operable Unit II" dated January 1998.

A summary of the detailed analysis follows. As used in the following text, the time to implement reflects only the time required to implement the remedy, and does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties for implementation of the remedy.

6.1 Description of Alternatives

The potential remedies are intended to achieve the established remedial goals for the contaminated media identified under Operable Unit II including PCB-contaminated diesel fuel which floats on the water table in the vicinity of the former wastewater lagoon.

Alternative 1 **No Action**

Present Worth:	$ 104,263
Capital Cost:	$ 2,944
Annual O&M:	$ 101,319
Time to Implement	30 years

The no action alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the site to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

If the No Action Alternative were implemented, the existing access and use restrictions would still be maintained. This alternative also assumes that long-term monitoring of NAPL and groundwater would be implemented and sediment deposition in the Croton Bay sediment area would continue to occur naturally. However, no action would be taken to remove or contain the OU-II NAPL under this alternative.

Alternative 2 **OU-II NAPL Removal Using NAPL-Only Recovery Technologies**

Present Worth:	$ 1,281,155
Capital Cost:	$ 805,498
Total Present Worth O&M:	$ 475,656
Time to Implement	3 years

In addition to OU-II NAPL Removal Using NAPL-Only Recovery Technologies, Alternative 2 includes the common actions including long-term groundwater and NAPL monitoring in the vicinity of the former wastewater lagoon and access and use restrictions consistent with those required by the OU-I Record of Decision. In addition, natural sediment deposition would continue to occur in Croton Bay.

NAPL-only recovery technologies use either canister collection systems or NAPL-only pumps equipped with NAPL/water interface sensors. Canisters, which float or are situated on the NAPL/water interface within a NAPL recovery well, collect the NAPL. The recovered NAPL, which is stored in the sump within the unit, is transferred from the canister to an aboveground storage vessel. The collected NAPL is temporarily stored above ground and is subsequently disposed of at an appropriate off-site facility.

In contrast, NAPL-only recovery pumps, equipped with interface sensors, pump NAPL directly from the recovery well into an aboveground storage vessel. This system uses NAPL interface sensors to situate the pump on the NAPL interface. The pump then removes NAPL until the interface sensor indicates that water has been reached. At this point, all the recoverable NAPL has been evacuated from the well. The pump would then resume pumping when a sufficient amount of NAPL has accumulated in the well.

NAPL-only recovery systems can be installed in recovery wells or in recovery wells located within recovery trenches. For Alternative 2, NAPL Area L1, located to the northwest of the former wastewater lagoon, between the lagoon and the Hudson River, will pump from recovery wells located within a trench.

The rationale for this method is to limit the potential for migration of NAPL to the Hudson River. NAPL Areas L2, L3 and L4 would be remediated using recovery wells only.

NAPL-only recovery relies on the natural flow of NAPL into the recovery well and does not disturb the continuity of the floating NAPL layer. The average NAPL-only recovery rate would be approximately 2 gpd per well and NAPL-only recovery would remove 5% to 20% of the OU-II NAPL that is present in the formation.

Waste materials generated during construction of this remedy as well as recovered NAPL generated following implementation are expected to be handled as follows:

- Three-quarters of the overlying soil excavated for the recovery trench and all of the soil excavated from the well vaults would contain acceptable concentrations of PCB's (less than or equal to 1.0 ppm PCB's for surface soils and less than or equal to 10.0 ppm PCB's for subsurface soil) and would be used for backfill of the recovery trench;

- one-quarter of the overlying soil excavated for the recovery trench would be classified as a RCRA and TSCA waste and disposed of at a RCRA and TSCA-permitted chemical waste landfill;

- all of the contaminated soils from the lower portion of the trench and excavated during well construction would be classified as a RCRA and TSCA waste and disposed of at a RCRA and TSCA-permitted chemical waste landfill; and

- all of the OU-II NAPL recovered as a liquid phase would be classified as a TSCA and RCRA waste and would be disposed of at a TSCA and RCRA-permitted incinerator.

Alternative 3 Excavation and Offsite Disposal of OU-II NAPL

Present Worth:	$ 9,396,462
Capital Cost:	$ 9,304,946
Total Present Worth O&M:	$ 91,516
Time to Implement	1 year

In addition to Excavation and Offsite Disposal of OU-II NAPL, Alternative 3 includes several common actions including long-term groundwater and NAPL monitoring in the vicinity of the former wastewater lagoon and access and use restrictions consistent with those required by the OU-I Record of Decision. In addition, natural sediment deposition would continue to occur in Croton Bay.

This technology would entail excavation and off-site disposal of OU-II NAPL and associated overlying unsaturated soil. The depth to groundwater in the four OU-II NAPL Areas ranges from 9 to 20 feet below grade. Therefore, under this technology, soil and NAPL to depths ranging from 9 to 20 feet would be excavated, transferred into trucks and transported to an off-site facility for disposal. The excavated soil may be stockpiled and solidified to remove free liquids prior to transportation. Sheeting may be required to enable excavation in areas adjacent to structures.

For Alternative 3, the area of the excavation would be approximately one acre (encompassing NAPL areas L1, L2, L3 and L4) and the depth of the excavation would be up to 20 feet. Approximately 14,000 cubic yards of overlying soils are expected to be excavated while 9,000 cubic yards of product-saturated soils would require excavation.

Waste materials generated during construction of Alternative 3 are expected to be handled as follows:

- Three-quarters of the overlying soil would contain acceptable concentrations of PCB's (less than or equal to 1.0 ppm PCB's for surface soils and less than or equal to 10.0 ppm PCB's for subsurface soil) and would be used for backfill of the excavation;

- one-quarter of the overlying soil would be classified as a RCRA and TSCA waste and disposed of at a RCRA and TSCA-permitted chemical waste landfill; and

- all of the contaminated soils from the lower portion of the excavation would be classified as a RCRA and TSCA waste and disposed of at a RCRA and TSCA-permitted chemical waste landfill.

Alternative 4 OU-II NAPL Removal Using NAPL Recovery With Groundwater Depression

Present Worth:	$ 5,236,309
Capital Cost:	$ 4,087,640
Total Present Worth O&M:	$ 1,148,669
Time to Implement	3.5 years

In addition to OU-II NAPL Removal Using NAPL Recovery With Groundwater Depression, Alternative 4 includes several common actions including long-term groundwater and NAPL monitoring in the vicinity of the former wastewater lagoon and access and use restrictions consistent with those required by the OU-I Record of Decision. In addition, natural sediment deposition would continue to occur in Croton Bay.

NAPL recovery with groundwater depression involves simultaneous but separate removal of groundwater and NAPL using two separate pumps. Groundwater is removed from the recovery well to depress the water table and promote NAPL movement into the recovery well. The accumulated NAPL is then separately pumped from the recovery well into a storage vessel. The extracted groundwater is transferred to a treatment unit and ultimately discharged to surface water. The NAPL remains in the storage vessel until it is transported off-site for disposal.

NAPL recovery systems with groundwater depression can be installed in recovery wells or in recovery wells located within recovery trenches. For Alternative 4, recovery trenches with recovery wells would be constructed for NAPL Areas L1 and L4 while recovery wells only would be utilized for NAPL Areas L2 and L3. Recovery trenches are proposed for the two larger NAPL areas, where 95% of the recoverable oil is found, to better facilitate product movement to the recovery wells.

Alternative 4 would require that the estimated 47 gallons per minute of groundwater generated from the 16 groundwater depression wells be treated at a central treatment plant. The proposed treatment train would include the following basic components:

- Metals removal using pH adjustment, flocculation, settling and filtration;
- metals removal sludge thickening and dewatering;
- cyanide destruction; and
- organics removal using carbon adsorption.

Waste materials generated during construction of this remedy as well as recovered NAPL generated following implementation are expected to be handled as described in Alternative 2. Alternative 4 would also generate waste from the water treatment plant in the form of metals removal sludge and spent liquid phase carbon. While the spent carbon could be regenerated, the metals removal sludge would be classified as a RCRA hazardous waste and a TSCA liquid waste, requiring incineration.

NAPL removal with groundwater depression is expected to remove up to 30% of the NAPL present in subsurface soil at a rate of approximately 2.5 gpd/well of OU-II NAPL from the four OU-II NAPL areas.

Alternative 5 OU-II NAPL Removal Using Vacuum-Enhanced NAPL Recovery

Present Worth:	$ 1,881,032
Capital Cost:	$ 1,381,782
Total Present Worth O&M:	$ 499,250
Time to Implement	3 years

In addition to OU-II NAPL Removal Using Vacuum-Enhanced NAPL Recovery, Alternative 5 includes several common actions including long-term groundwater and NAPL monitoring in the vicinity of the former wastewater lagoon and access and use restrictions consistent with those required by the OU-I Record of Decision. In addition, natural sediment deposition would continue to occur in Croton Bay.

Vacuum enhanced NAPL recovery is an innovative NAPL remediation technology that combines physical NAPL recovery, in-situ biodegradation of primarily petroleum-related organic compounds and vapor extraction of volatile compounds. This technology is also referred to as bioslurping.

In vacuum enhanced NAPL recovery applications, air, which is supplied to the formation through air inlet wells, is drawn through the subsurface soil using a series of vacuum recovery wells. This induced air flow:

- transports NAPL through subsurface soil to the recovery wells where the organic compounds and, in particular, the petroleum-related organic compounds that comprise OU-II NAPL, are removed through the vacuum lines in the recovery wells;

- promotes the biodegradation of the NAPL that is adsorbed onto soil particles in the unsaturated zone above the NAPL layer (i.e., residual saturation); and

- promotes the volatilization of volatile organic compounds that may be constituents in the OU-II NAPL.

A typical vacuum enhanced NAPL recovery system consists of one or more vacuum enhanced NAPL recovery wells screened across the water table and the unsaturated soil zone immediately above the water table (i.e., the capillary fringe), a vacuum pump, a vacuum line that extends from the vacuum pump through the recovery well to the NAPL layer, liquid/vapor separation equipment, fluids treatment equipment and air inlet wells. Within the extraction wells, the vacuum line is installed immediately above the NAPL surface. The vacuum applied to the well, using the vacuum pump, removes the NAPL accumulated in the well by entrainment with extracted vapor. Figure 10 provides a conceptual illustration of the mechanics of a vacuum enhanced NAPL recovery system.

Vacuum enhanced NAPL recovery systems are operated at a vacuum that maximizes NAPL and air removal from the formation while minimizing the amount of groundwater that is extracted. The limited amount of groundwater would be allowed to recharge to the shallow onsite aquifer following treatment.

Vacuum enhanced NAPL recovery systems can be installed within recovery wells. However, vacuum enhanced NAPL recovery systems cannot be installed within recovery wells located within NAPL recovery trenches because recovery trenches would short-circuit air withdrawal from the formation.

Waste materials generated during construction of this remedy would be limited to the installation of the air injection and recovery wells. Disposal of NAPL would occur as described in Alternative 2. Alternative 5 would require that the estimated 0.4 gallons per minute of extracted groundwater and NAPL recovered from the 11 vacuum enhanced NAPL recovery wells be separated and the groundwater be treated and discharged. The groundwater treatment operations proposed for Alternative 5 (through the discharge stage) are as follows:

- An oil/water separator with solids settling;

- metals removal using ultrafiltration;

- removal of organic compounds using carbon adsorption;

- additional metals removal using ion exchange; and

- recharge of treated groundwater to the shallow onsite aquifer.

This technology is expected to remove or biodegrade 60% to 80% of the total amount of NAPL that is present in subsurface soil. NAPL removal is estimated to occur at a rate of approximately 5 gpd/well of OU-II NAPL from the four OU-II NAPL areas and biodegradation of NAPL is estimated to occur at a rate of 5 gpd/well from the four OU-II NAPL areas.

6.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6NYCRR 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 contained in the Feasibility Study.

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 no action alternative is unacceptable as it does not address the remedial action objectives for OU-II NAPL. Specifically, since no OU-II NAPL would be removed, offsite migration of NAPL would not be prevented. However, this alternative presumes that long-term monitoring of OU-II NAPL and groundwater would be implemented and natural sediment deposition in the Croton Bay sediment area would continue to occur naturally. In addition, the existing access and use restrictions would be maintained.

Alternatives 2, 3, 4 and 5 would achieve compliance for all SCGs for the onsite contaminant source. These alternatives would remove OU-II NAPL to the extent practicable, which varies based on the technology proposed in each alternative, while eliminating or minimizing impacts to the underlying groundwater. These alternatives would also include monitoring of downgradient groundwater and NAPL and restricting access and use of OU-II NAPL areas. In addition, natural sediment deposition in Croton Bay would continue to occur.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

The no action alternative would not be protective of the environment and human health as the potential to be exposed to onsite contamination would remain. In addition, this alternative would not address the potential for offsite migration of OU-II NAPL. The existing access and use restrictions would, however, be maintained.

Alternatives 2, 3, 4, and 5 would be protective of human health and the environment with respect to the contaminant source and would eliminate or minimize impacts to the underlying groundwater. These alternatives would also include monitoring of downgradient groundwater and NAPL and restricting access and use of OU-II NAPL areas.

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.

Since there are no actions proposed for Alternative 1 and OU-II NAPL does not at the present time pose any unacceptable risk to human health or the environment, there are no short-term effects associated with this alternative.

Alternatives 2, 4 and 5 include design and construction of a NAPL recovery system. Implementation of these alternatives pose very limited short-term effects during the following work: recovery trench installation (Alternatives 2 and 4); transportation of wastes generated during trench construction (Alternatives 2 and 4); and transportation of recovered OU-II NAPL to an offsite disposal facility.

Alternative 3 includes excavation and offsite disposal of OU-II NAPL and associated subsurface soil. Implementation of this alternative would pose short-term effects during excavation and transportation to an offsite landfill. Based on the volume of material generated for this alternative, the potential short-term effects, including potential exposure to the community and the environment during transportation, are considerable.

The potential short-term effects from air emissions posed by Alternatives 2, 3, 4, and 5 can be mitigated by personnel protection measures or by controlling dust.

4. <u>Long-term Effectiveness and Permanence</u>. 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.

The no action alternative would not be effective in the long term. The onsite contamination would not be removed or contained and additional measures to ensure that the overlying soil is not disturbed would not be implemented. This alternative would not reduce any existing or future potential risks from the onsite contamination.

Alternatives 2, 3, 4, and 5 rely on removal of OU-II NAPL from the site and offsite disposal and/or offsite incineration of the waste material. Alternatives 2, 4 and 5 include minimal offsite disposal of subsurface soil and offsite incineration of recovered OU-II NAPL. Incineration would permanently destroy all organic compounds in the NAPL including the PCBs and is the most effective long-term approach to the NAPL. As such, these alternatives would provide an adequate and effective level of protection over the long term. However, the amount of NAPL expected to be removed under each of these alternatives varies based on the technology proposed in each alternative. Alternative 2 would remove up to 20% of the NAPL, Alternative 3 up to 100% of the NAPL, Alternative 4 up to 30% of the NAPL and Alternative 5 up to 80% of the NAPL.

Alternative 3 relies on excavation and offsite disposal of OU-II NAPL and associated subsurface soils. Since this alternative relies on relocation of this material to an offsite landfill, its long-term effectiveness and permanence would depend on the reliability of the disposal facility.

Alternatives 2, 3, 4, and 5 would be protective in the long-term with respect to the contaminant source and would eliminate or minimize impacts to the underlying groundwater. These alternatives would also include monitoring of downgradient groundwater and NAPL and restricting access and use of OU-II NAPL areas. In addition, natural sediment deposition in Croton Bay would continue to occur.

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.

The no action alternative would not reduce the toxicity, mobility or volume of the waste.

Alternatives 2, 4, and 5 include removal and offsite incineration of OU-II NAPL, significantly reducing the toxicity, mobility and volume of this waste. Alternative 3 includes offsite disposal of OU-II NAPL at a chemical waste landfill and would reduce the mobility and volume of this waste with respect to the Site. Because a destruction, treatment or immobilization technology is not being employed, this alternative is not as effective for this screening criteria relative to Alternatives 2, 4 and 5. Alternatives 2, 4 and 5 also have varying degrees of long-term permanence directly related to the amount of NAPL each one is capable of recovering, as described previously.

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..

All of the alternatives are implementable. The material and personnel for each alternative should be readily available at a reasonable cost in this region. Potential barriers would be excavation of a limited amount of OU-II NAPL under Alternative 3 that is present beyond the Harmon Railroad Yard property, on Westchester County property. It is expected that this property contains 5% or less of the total OU-II NAPL. In addition, Alternative 4 requires regulatory approval to discharge treated groundwater to Croton Bay and the Hudson River.

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 Section 7.1.

The no action alternative is the least costly alternative. This alternative has no capital costs associated with it and includes only the cost for long-term sampling and analysis of existing monitoring wells.

Alternative 2, NAPL-Only Removal, is the second least expensive alternative followed closely by Alternative 5, Vacuum-Enhanced NAPL Removal. Both have similar operation and maintenance costs, however Alternative 5 requires a higher capital investment. Alternative 4, NAPL Removal Using Groundwater Depression, is nearly three times as costly as Alternative 5, due largely to the high cost of groundwater treatment and disposal. Alternative 3, Excavation and Offsite Disposal of OU-II NAPL, is the costliest alternative evaluated at five times the cost of Alternative 5. The high cost of this alternative is due to the high cost of offsite landfilling of this waste material.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon 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 Proposed Remedial Action Plan have been evaluated. The " Responsiveness Summary" included as Appendix A presents the public comments received and the Department's response to the concerns raised. No significant public comments were received and in general, the public comments received were supportive of the selected remedy.

SECTION 7 SUMMARY OF THE SELECTED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 6, the NYSDEC has selected Alternative 5, OU-II NAPL Removal Using Vacuum-Enhanced NAPL Recovery, as the remedy for this site. Figure 11 illustrates the layout for the vacuum enhanced NAPL recovery components.

Alternative 5, Vacuum-Enhanced NAPL Removal, was selected because it is the most cost effective remedial action which will address the remedial objectives for this site. Specifically, the OU-II NAPL will be eliminated to the extent practicable through the use of vacuum-enhanced recovery wells combined with offsite incineration. While Alternative 2, NAPL-Only Removal, would achieve the same objective for a slightly lower cost, this alternative would not remove as much NAPL because it is a passive technology.

Alternative 3, Excavation and Offsite Disposal of OU-II NAPL, would remove the greatest volume of contamination from the site and could be implemented in the shortest period of time (one year). However, the cost would be five times that of Alternative 5 and has some drawbacks with respect to several of the screening criteria including short-term and long-term effectiveness.

Alternative 4, NAPL Removal Using Groundwater Depression, would also meet the remedial action objectives for this site, however, this technology would not be as effective at removing NAPL relative to Alternative 5 and the cost is estimated to be three times higher.

The estimated present worth cost to implement the remedy is $ 1,881,032. The cost to construct the remedy is estimated to be $1,381,782. The estimated cost to operate and maintain the remedy for the first three years is $206,385. The estimated annual O&M cost for the remaining 27 years of the remedy is $5,980.

The elements of the selected remedy are as follows:

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

2. Vacuum-enhanced removal of OU-II NAPL found within four NAPL areas located adjacent to the former wastewater lagoon (Operable Unit 1);

3. Offsite disposal of all liquid-phase OU-II NAPL at a TSCA and RCRA-permitted incinerator;

4. Long-term groundwater and NAPL monitoring; and

5. Access and use restrictions.

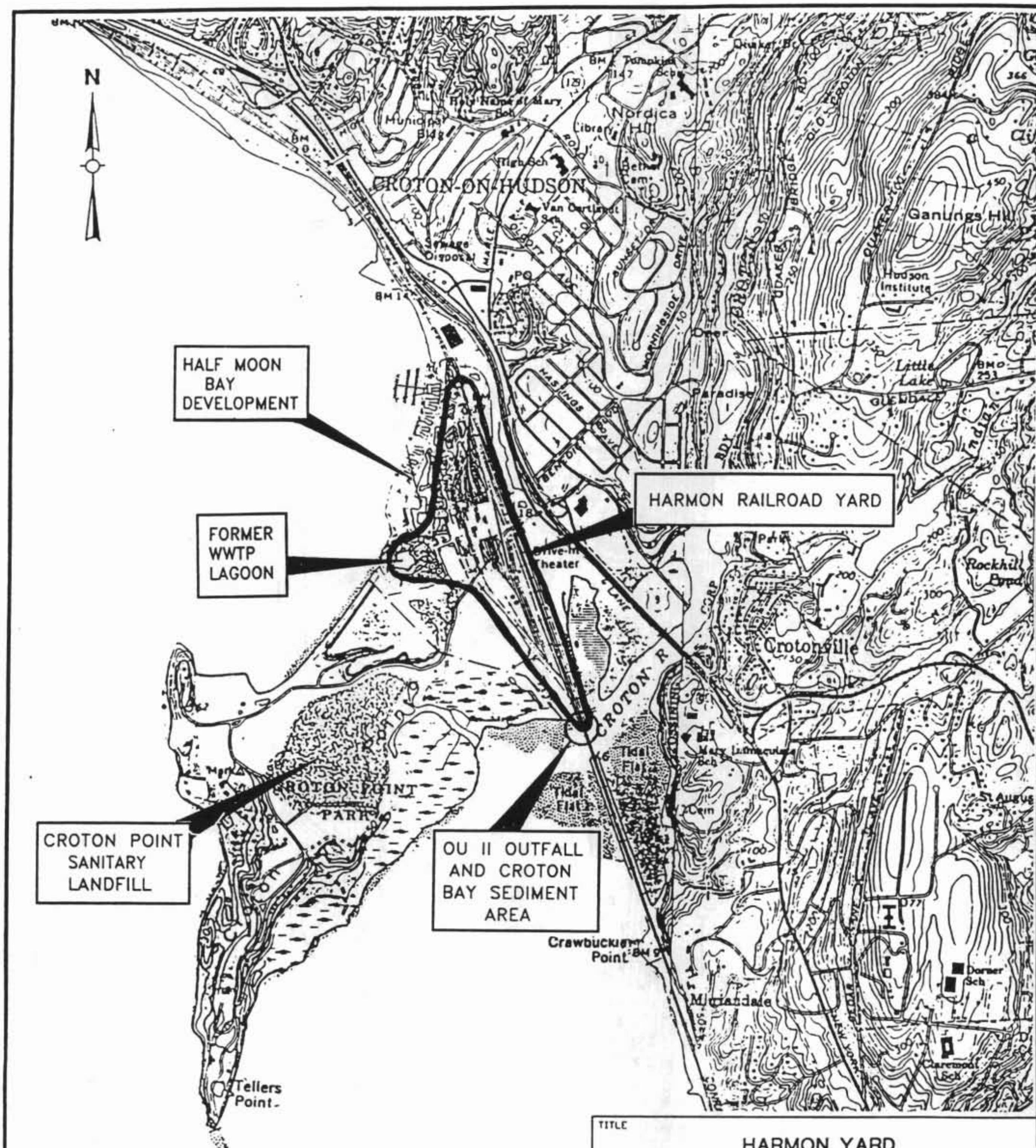
Since the remedy results in untreated hazardous waste remaining at the site, a long-term monitoring program will be instituted. This program will allow the effectiveness of the selected remedy to be monitored and will be a component of the operation and maintenance for the site.

A pilot test will be conducted prior to implementation of this alternative to confirm that this technology will satisfy the remedial objectives for this Site and to optimize the process of NAPL remediation. If the pilot test data or subsequent data collected during full-scale operation of this alternative indicates that this technology fails to meet these objectives, other remedial options which utilize enhanced NAPL recovery technologies will be evaluated at that time.

SECTION 8 HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation (CP) 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 fact sheet was issued and a public meeting was held on July 19, 1994 to present the Remedial Investigation/ Feasibility Study Operable Unit II workplan.
- A meeting was held on February 10, 1998 with the "PCB Committee", a local group of environmentally concerned citizens, adjacent residents and business people.
- A fact sheet was issued and a public meeting was held on February 26, 1998 to present the Proposed Remedial Action Plan for the Site.
- In March 1998 a Responsiveness Summary was prepared and made available to the public to address the comments received during the public comment period for the PRAP, held between February 5, 1998 and March 9, 1998.



TITLE

HARMON YARD
WASTEWATER TREATMENT AREA
OPERABLE UNIT II
SITE LOCATION MAP

PREPARED FOR

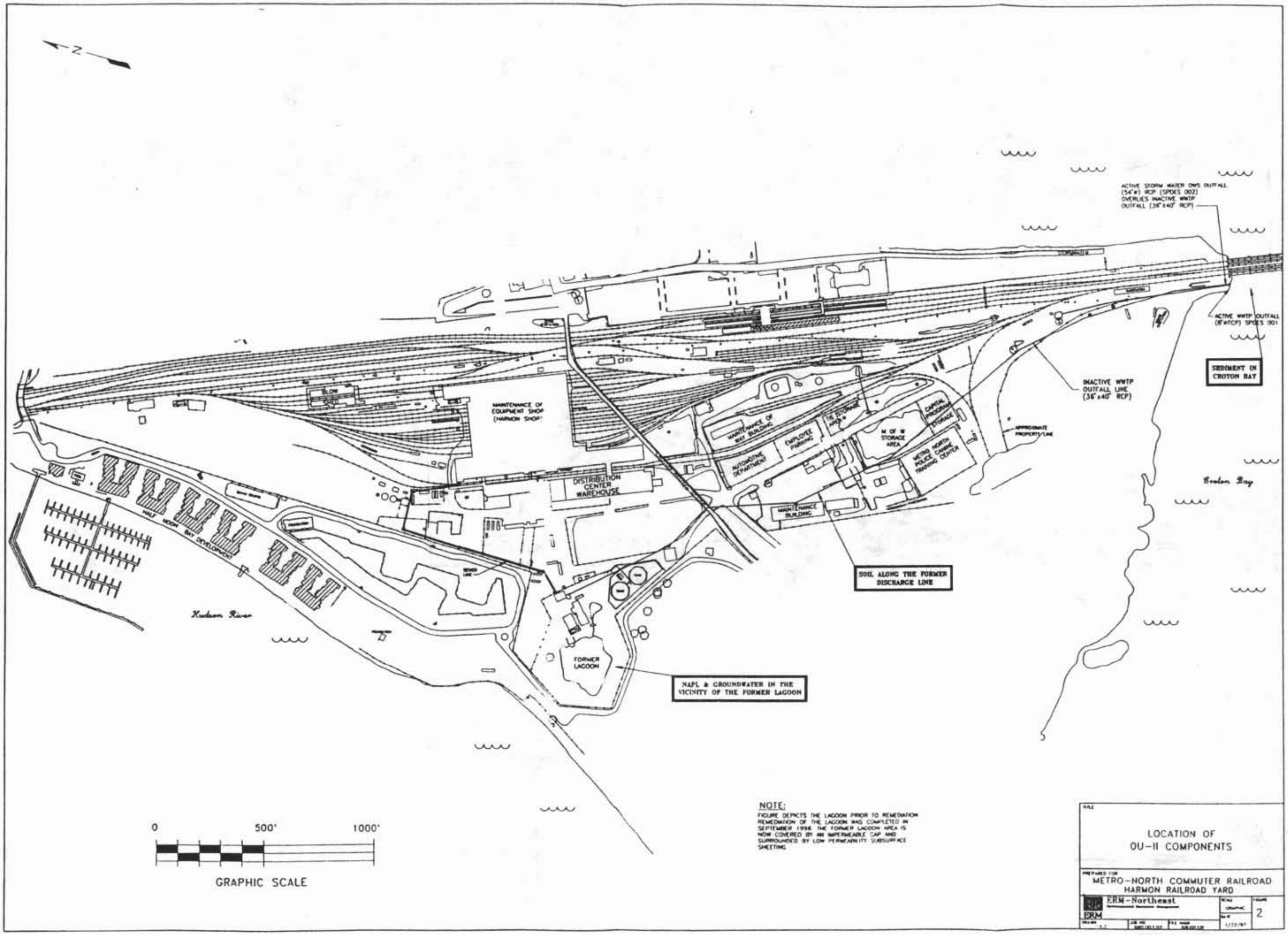
METRO-NORTH COMMUTER RAILROAD

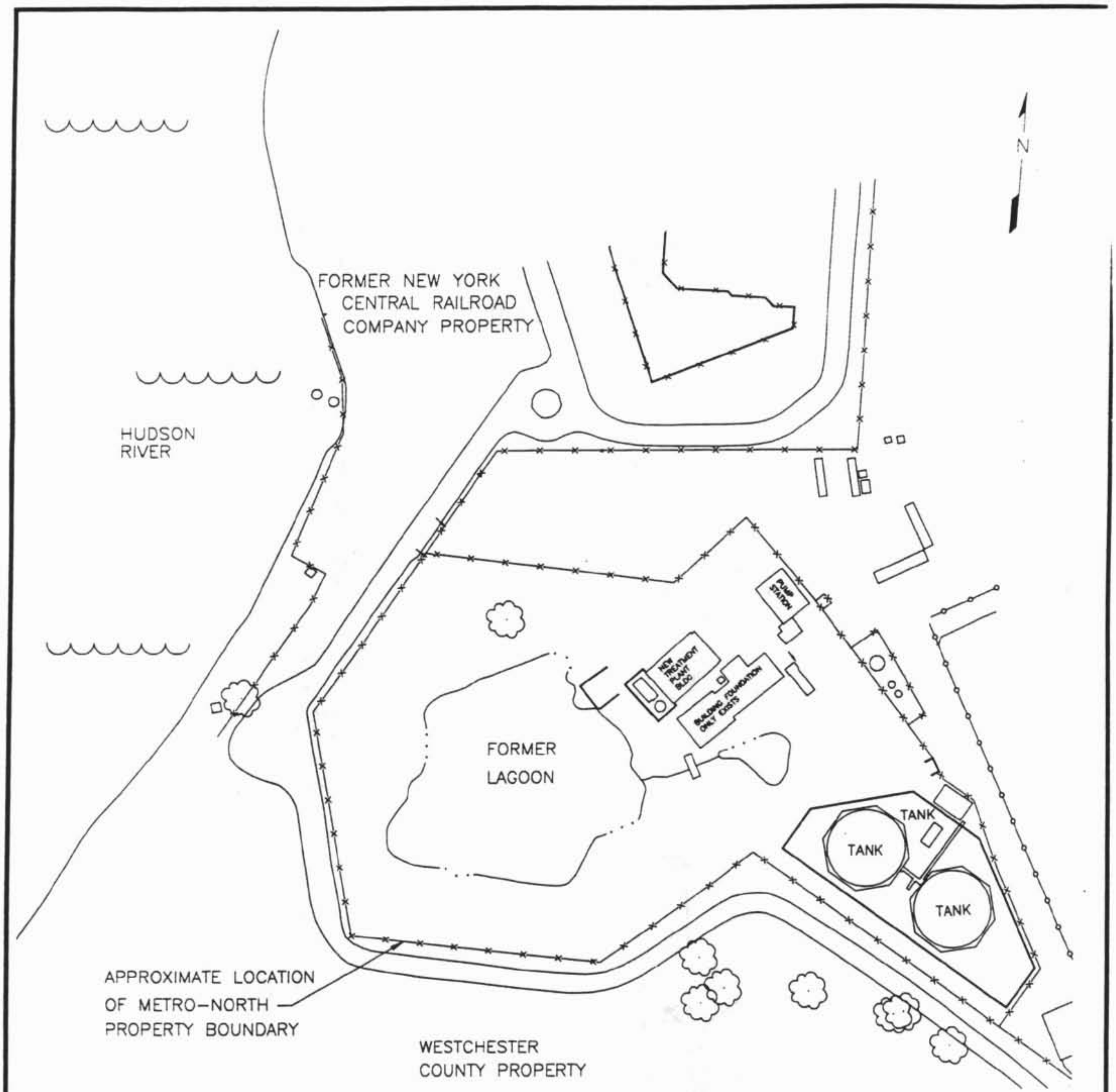
ERM–Northeast, Environmental Resources Management	SCALE: 1" = 2000'	FIGURE: 1
DRAWN: Y.Z. / JOB NO.: 680.003.02 / FILE NAME: CEN–V	DATE: 8/30/96	

NOTE:

OPERABLE UNIT II (OU II) OF THE HARMON YARD WASTEWATER TREATMENT AREA SITE (NYSDEC SITE No. 3–60–010) CONSIST OF THE FORMER LAGOON AREA, THE CROTON BAY OUTFALL AREA AND THE DISCHARGE LINE THAT CONNECTS THEM

SOURCE: U.S.G.S. Quadrangle Map, HAVERSTRAW and OSSINING, N.Y.


N
ACTIVE STORM WATER OWS OUTFALL (54"ø) RCP (SPDES 002) OVERLIES INACTIVE WWTP OUTFALL (36"X40" RCP)
ACTIVE WWTP OUTFALL (8"øRCP) SPDES 001
SEDIMENT IN CROTON BAY
INACTIVE WWTP OUTFALL LINE (36"x40" RCP)
APPROXIMATE PROPERTY LINE
Croton Bay
MAINTENANCE OF EQUIPMENT SHOP (HARMON SHOP)
DISTRIBUTION CENTER WAREHOUSE
MAINTENANCE OF WAY BUILDING
EMPLOYEE PARKING
AUTOMOTIVE DEPARTMENT
TIE STORAGE
M OF W STORAGE AREA
CAPITAL PROGRAM STORAGE
METRO NORTH POLICE CANINE TRAINING CENTER
MAINTENANCE BUILDING
SOIL ALONG THE FORMER DISCHARGE LINE
HALF MOON BAY DEVELOPMENT
Hudson River
FORMER LAGOON
NAPL & GROUNDWATER IN THE VICINITY OF THE FORMER LAGOON
NOTE:
FIGURE DEPICTS THE LAGOON PRIOR TO REMEDIATION REMEDIATION OF THE LAGOON WAS COMPLETED IN SEPTEMBER 1996 THE FORMER LAGOON AREA IS NOW COVERED BY AN IMPERMEABLE CAP AND SURROUNDED BY LOW PERMEABILITY SUBSURFACE SHEETING
0
500'
1000'
GRAPHIC SCALE
LOCATION OF
OU-II COMPONENTS
METRO-NORTH COMMUTER RAILROAD
HARMON RAILROAD YARD
ERM-Northeast
ERM
2



NOTE:

FIGURE DEPICTS THE LAGOON PRIOR TO REMEDIATION. REMEDIATION OF THE LAGOON WAS COMPLETED IN SEPTEMBER 1996. THE FORMER LAGOON AREA IS NOW COVERED BY AN IMPERMEABLE CAP AND SURROUNDED BY LOW PERMEABILITY SUBSURFACE SHEETING.

GRAPHIC SCALE IN FEET

TITLE

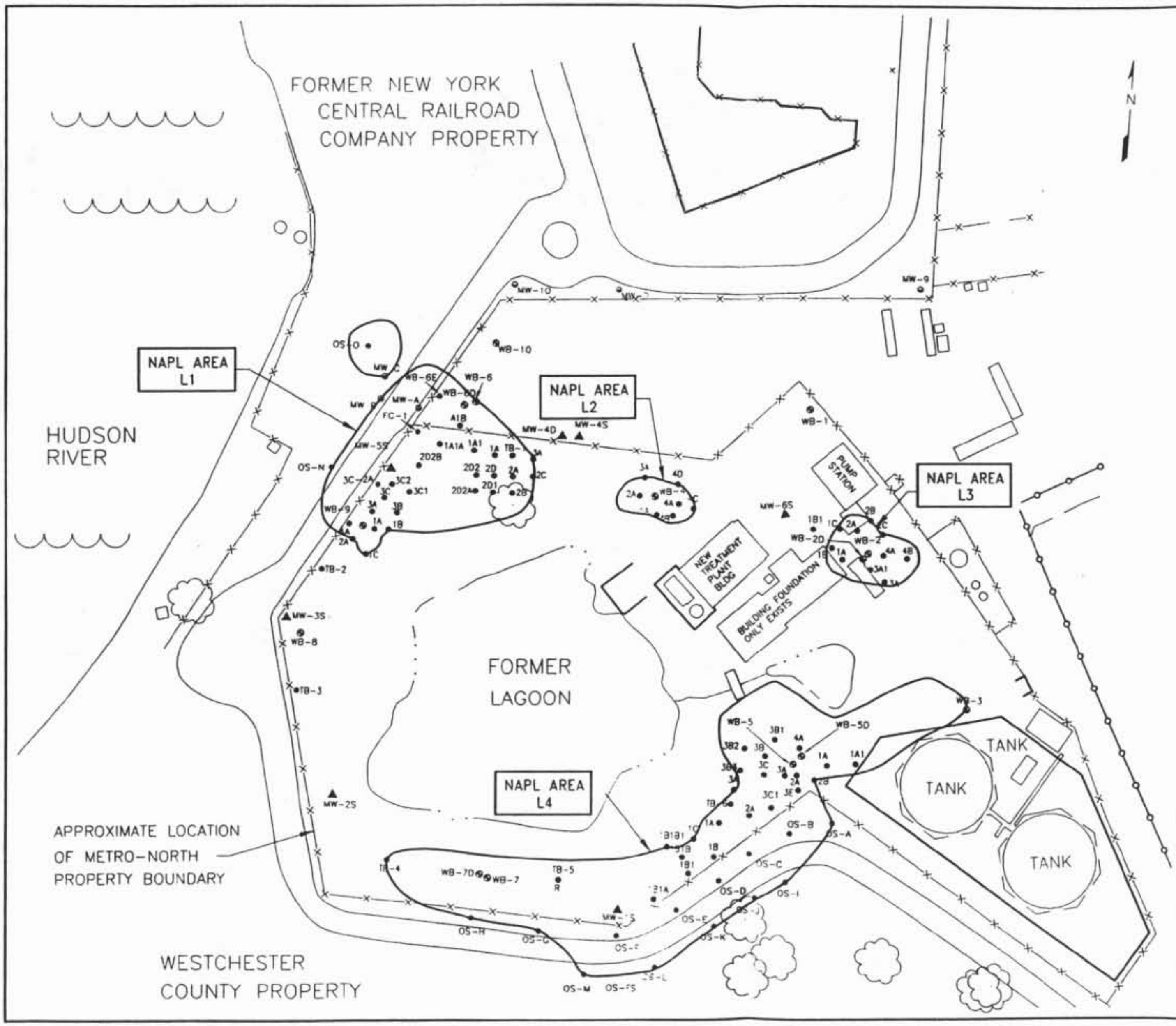
HARMON YARD WASTEWATER TREATMENT AREA

PREPARED FOR

METRO-NORTH COMMUTER RAILROAD

ERM ERM-Northeast Environmental Resources Management

DRAWN:	JOB NO.:	FILE NAME:	SCALE	FIGURE
Y.Z.	680.003.02	6800032D	GRAPHIC	3
			DATE: 1/21/97	



LEGEND

- ⊗ = MONITORING WELLS INSTALLED FRED C. HART, INC.
- ● = TEMPORARY WELLS/BORINGS INSTALLED BY ERM-NORTHEAST
- ▲ = MONITORING WELLS INSTALLED BY METCALF & EDDY
- ⊙ = OFF-SITE WELLS INSTALLED BY OFF-SITE PROPERTY OWNER

NOTE:

FIGURE DEPICTS THE LAGOON PRIOR TO REMEDIATION. REMEDIATION OF THE LAGOON WAS COMPLETED IN SEPTEMBER 1996. THE FORMER LAGOON AREA IS NOW COVERED BY AN IMPERMEABLE CAP AND SURROUNDED BY LOW PERMEABILITY SUBSURFACE SHEETING.

FIGURE SHOWS THE LOCATIONS ALL OF THE WELLS INSTALLED AS PART OF THE OU-II RI; PREVIOUS FRED C. HART AND METCALF AND EDDY INVESTIGATIONS; AND OFF-SITE INVESTIGATIONS PERFORMED BY THE OFF-SITE PROPERTY OWNER SINCE FEBRUARY 1995 MANY OF THE WELLS HAVE EITHER BEEN DESTROYED OR REMOVED

0 40 80

GRAPHIC SCALE IN FEET

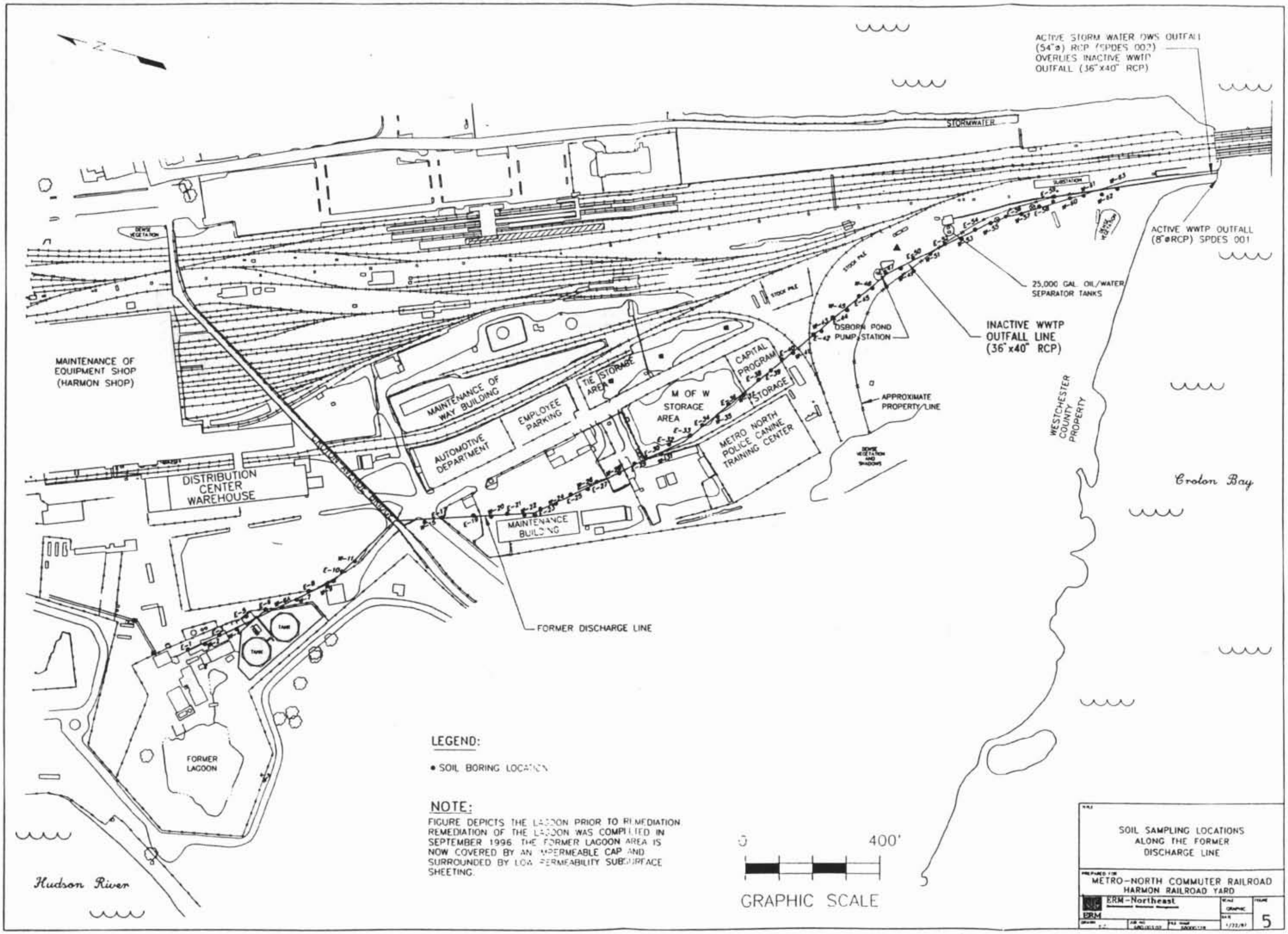
TITLE

MONITORING AND NAPL DELINEATION WELL LOCATIONS

PREPARED FOR

METRO-NORTH COMMUTER RAILROAD

ERM-Northeast Environmental Resources Management			SCALE GRAPHIC	FIGURE 4
DRAWN Y.Z.	JOB NO. 680.003.02	FILE NAME MET-CK96	DATE 1/24/97	



LEGEND:

• SOIL BORING LOCATION

NOTE:

FIGURE DEPICTS THE LAGOON PRIOR TO REMEDIATION. REMEDIATION OF THE LAGOON WAS COMPLETED IN SEPTEMBER 1996. THE FORMER LAGOON AREA IS NOW COVERED BY AN IMPERMEABLE CAP AND SURROUNDED BY LOW PERMEABILITY SUBSURFACE SHEETING.

0 — 400'

GRAPHIC SCALE

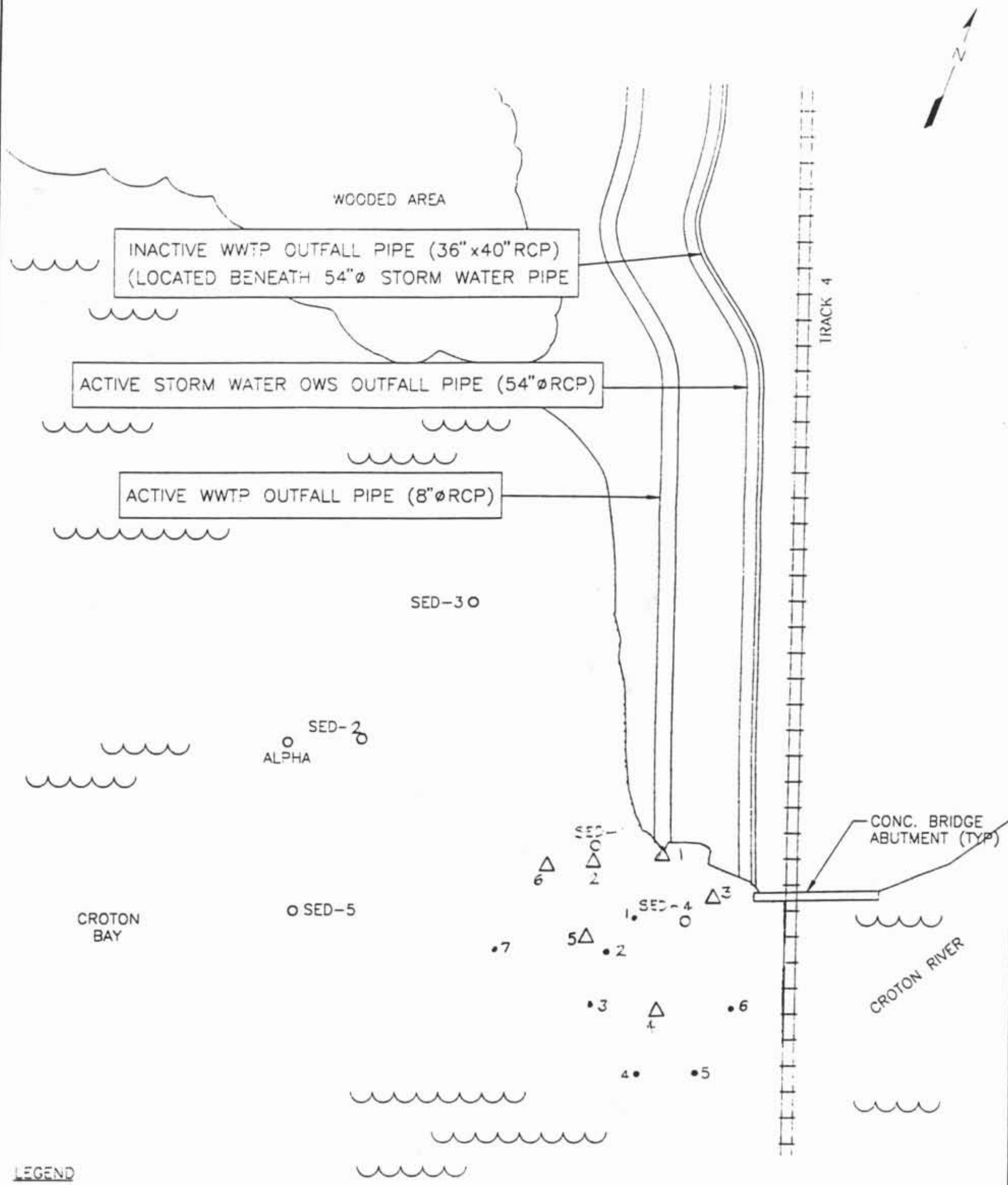
SOIL SAMPLING LOCATIONS ALONG THE FORMER DISCHARGE LINE

PREPARED FOR METRO-NORTH COMMUTER RAILROAD HARMON RAILROAD YARD

ERM-Northeast

SCALE: GRAPHIC

FIGURE 5



LEGEND

5 • SOUNDING POINT

SED-5 O 1992 DAY ENGINEERING SEDIMENT SAMPLING LOCATION

▲ OU II SEDIMENT SAMPLING LOCATION

• OU II SURFACE WATER SAMPLE ALSO COLLECTED FROM THIS LOCATION

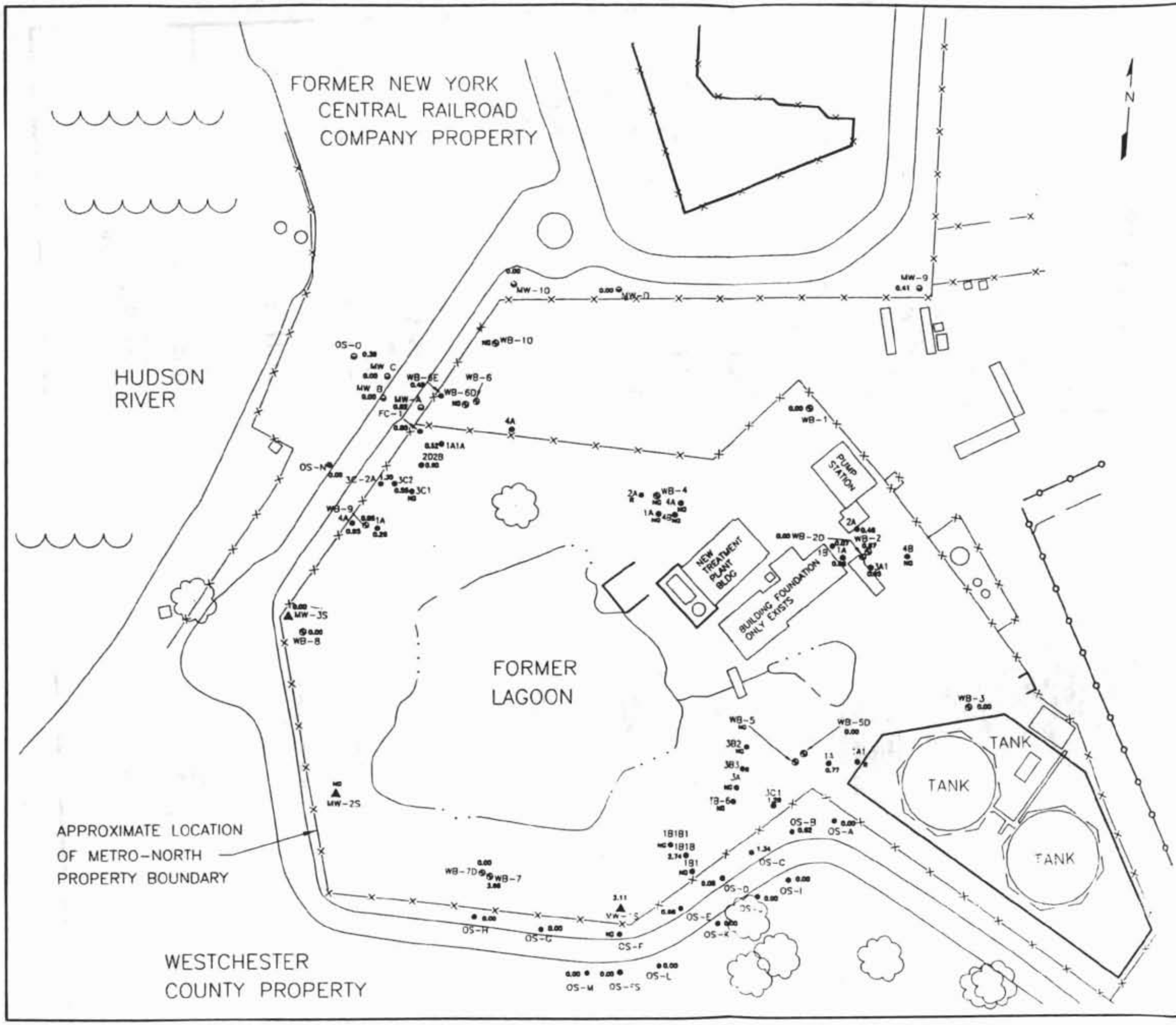
TITLE

CROTON BAY OU II SEDIMENT AND SURFACE WATER SAMPLING LOCATIONS HARMON YARD

PREPARED FOR

METRO NORTH COMMUTER RAILROAD

ERM-Northeast	SCALE NTS	FIGURE 6
DRAWN E.M.F\Y.Z. · JOB NO. 680.001.5 · FILE NAME CRBAY2-2	DATE 1/22/97	



LEGEND

- ⊗ = MONITORING WELLS INSTALLED FRED C. HART, INC.
- ● = TEMPORARY WELLS/BORINGS INSTALLED BY ERM-NORTHEAST
- ▲ = MONITORING WELLS INSTALLED BY METCALF & EDDY
- ⊖ = OFF-SITE WELLS INSTALLED BY OFF-SITE PROPERTY OWNER
- 0.00 = NAPL THICKNESS (FEET)
- NG = NOT GAUGED

NOTE:

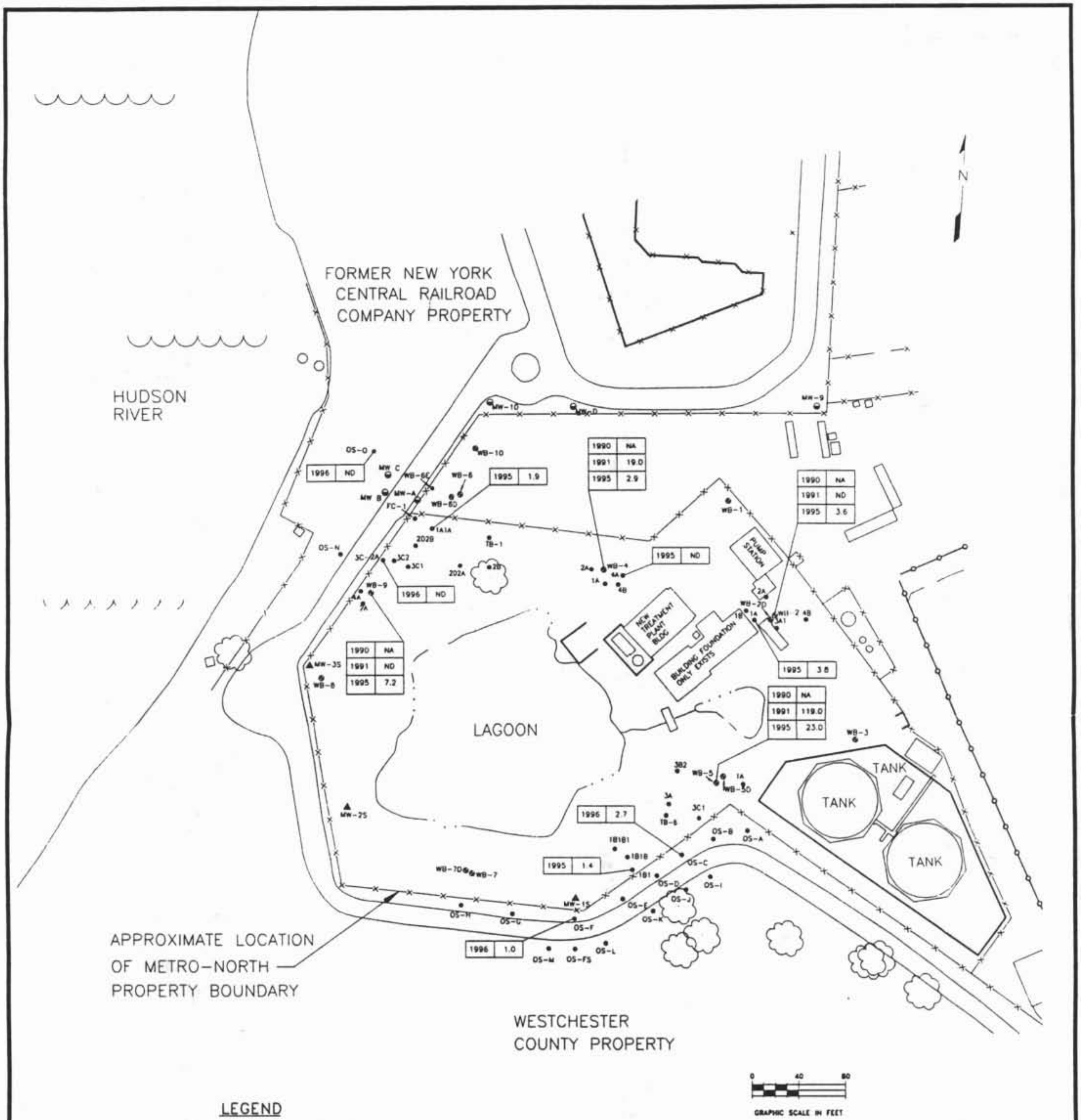
FIGURE DEPICTS THE LAGOON PRIOR TO REMEDIATION REMEDIATION OF THE LAGOON WAS COMPLETED IN SEPTEMBER 1996. THE FORMER LAGOON AREA IS NOW COVERED BY AN IMPERMEABLE CAP AND SURROUNDED BY LOW PERMEABILITY SUBSURFACE SHEETING.

FIGURE SHOWS ONLY THE WELLS THAT EXISTED ON 24 JUNE 1996

0 40 80

GRAPHIC SCALE IN FEET

TITLE			
NAPL THICKNESS MAP 24 JUNE 1996			
PREPARED FOR METRO-NORTH COMMUTER RAILROAD			
ERM-Northeast Environmental Resources Management		SCALE GRAPHIC	FIGURE 7
DRAWN Y.Z.	JOB NO 680 003.02 / FILE NAME 6800032K	DATE 1/24/97	



LEGEND

- ● (Fred C. Hart symbol) = MONITORING WELLS INSTALLED FRED C. HART, INC.
- ● = TEMPORARY WELLS/BORINGS INSTALLED BY ERM-NORTHEAST
- ▲ = MONITORING WELLS INSTALLED BY METCALF & EDDY
- ◒ = OFF-SITE WELLS INSTALLED BY OFF-SITE PROPERTY OWNER
- NA = NOT ANALYZED
- ND = NOT DETECTED

NOTE:

1. FIGURE DEPICTS THE LAGOON PRIOR TO REMEDIATION. REMEDIATION OF THE LAGOON WAS COMPLETED IN SEPTEMBER 1996. THE FORMER LAGOON AREA IS NOW COVERED BY AN IMPERMEABLE CAP AND SURROUNDED BY LOW PERMEABILITY SUBSURFACE SHEETING.
2. PCB CONCENTRATION IN MILLIGRAM PER KILOGRAM (MG/KG)

TITLE

TOTAL PCB CONCENTRATIONS IN NAPL

PREPARED FOR

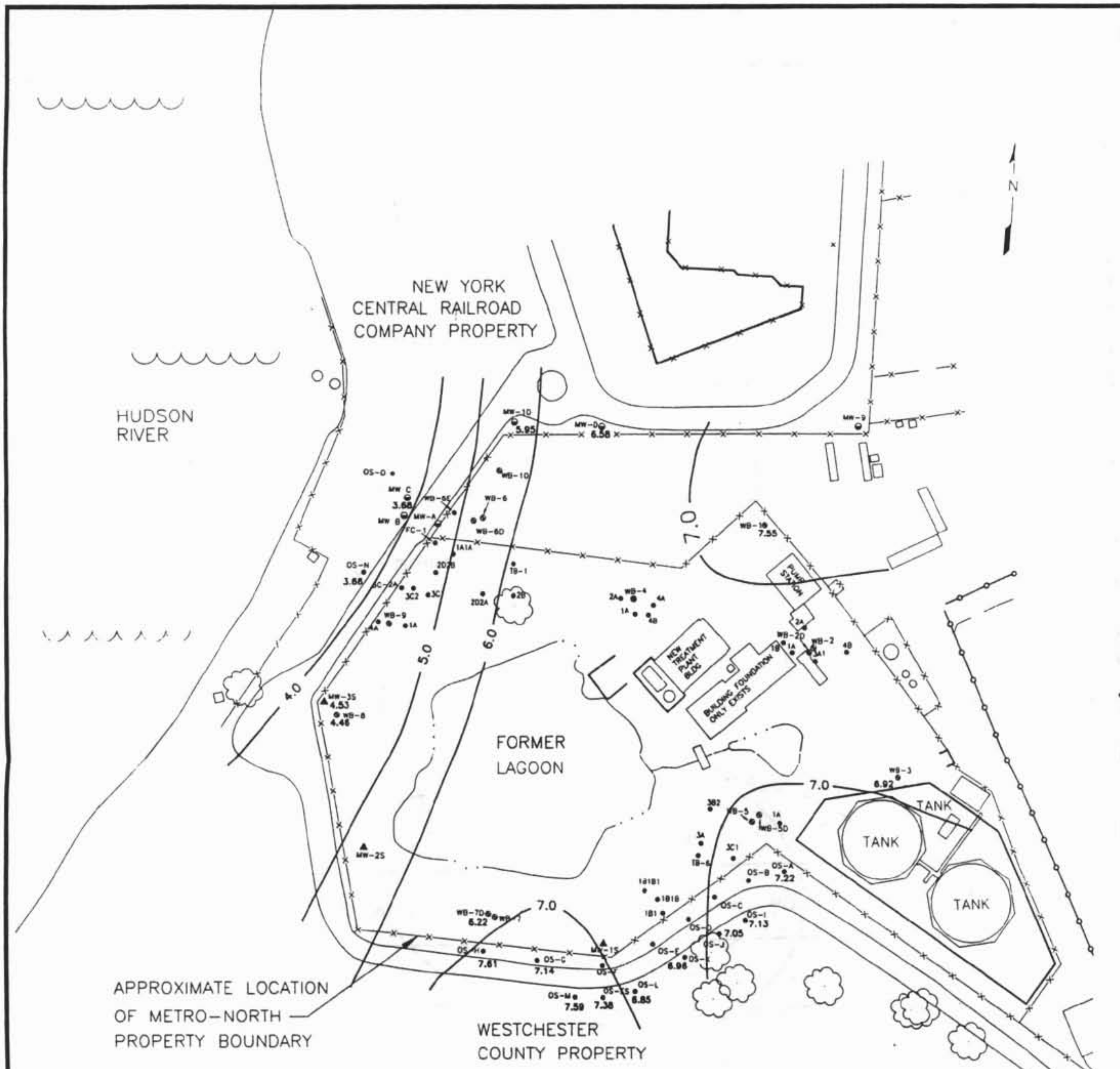
METRO-NORTH COMMUTER RAILROAD

ERM–Northeast
Environmental Resources Management

ERM

SCALE	FIGURE
GRAPHIC	8
DATE	
1/24/97	

DRAWN:	JOB NO.:	FILE NAME:
Y.Z.	680.003.02	6800032L.



LEGEND

- = MONITORING WELLS INSTALLED FRED C. HART, INC.
- = TEMPORARY WELLS/BORINGS INSTALLED BY ERM-NORTHEAST
- = MONITORING WELLS INSTALLED BY METCALF & EDDY
- = OFF-SITE WELLS INSTALLED BY OFF-SITE PROPERTY OWNER
- 7.59 = WATER TABLE ELEVATION (FEET ABOVE MSL)
- —4.0— = WATER TABLE CONTOUR

NOTE:
FIGURE DEPICTS THE LAGOON PRIOR TO REMEDIATION. REMEDIATION OF THE LAGOON WAS COMPLETED IN SEPTEMBER 1996. THE FORMER LAGOON AREA IS NOW COVERED BY AN IMPERMEABLE CAP AND SURROUNDED BY LOW PERMEABILITY SUBSURFACE SHEETING.

THIS FIGURE SHOWS THE WELLS THAT EXISTED ON 24 JUNE 1996

0 40 80
GRAPHIC SCALE IN FEET

TITLE

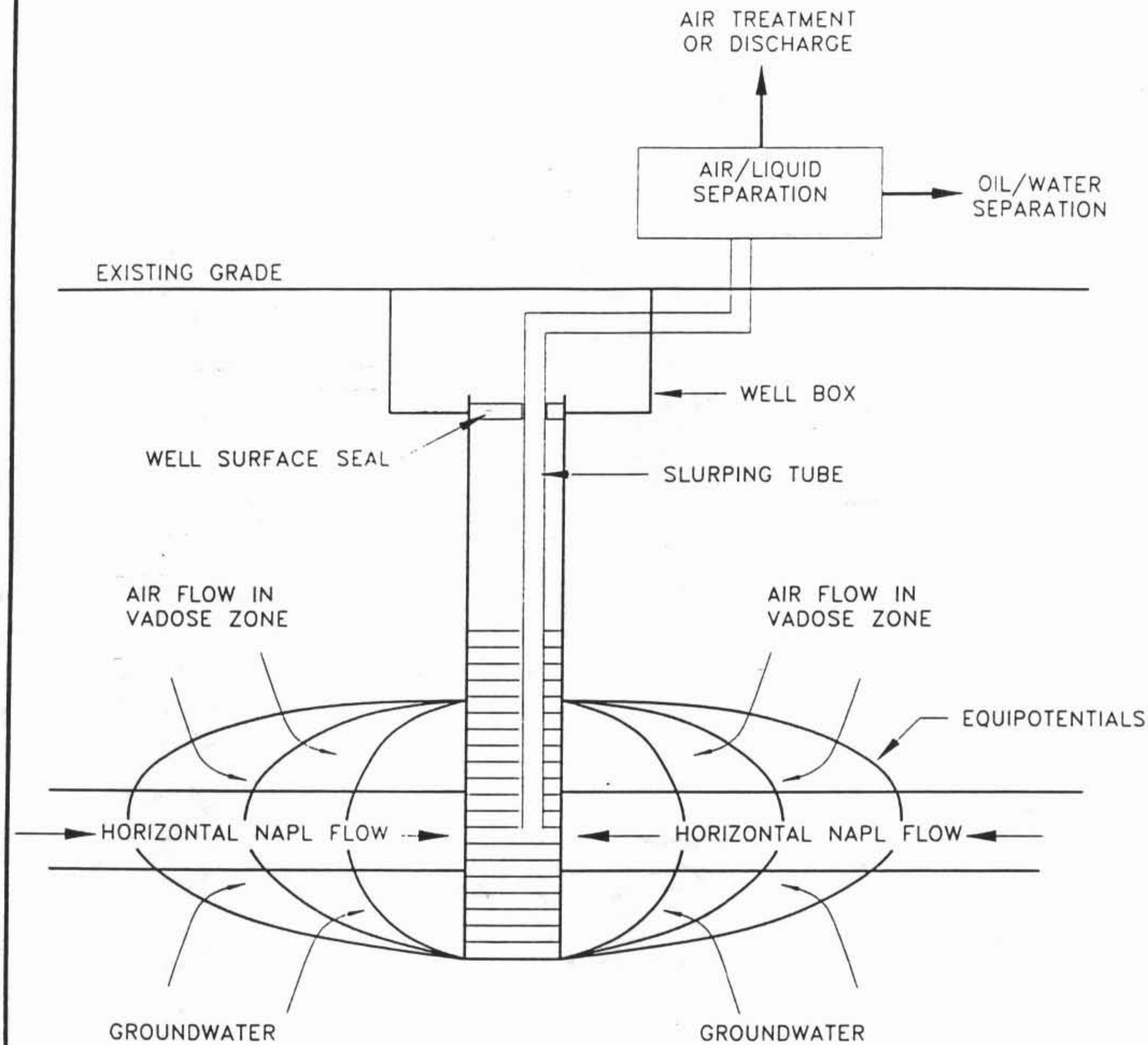
GROUND WATER FLOW MAP 24 JUNE 1996

PREPARED FOR
METRO-NORTH COMMUTER RAILROAD

ERM-Northeast
Environmental Resources Management
ERM

SCALE	FIGURE
GRAPHIC	9
DATE 1/24/97	

DRAWN:	JOB NO.:	FILE NAME:
Y.Z.	680.003.02	6800032M



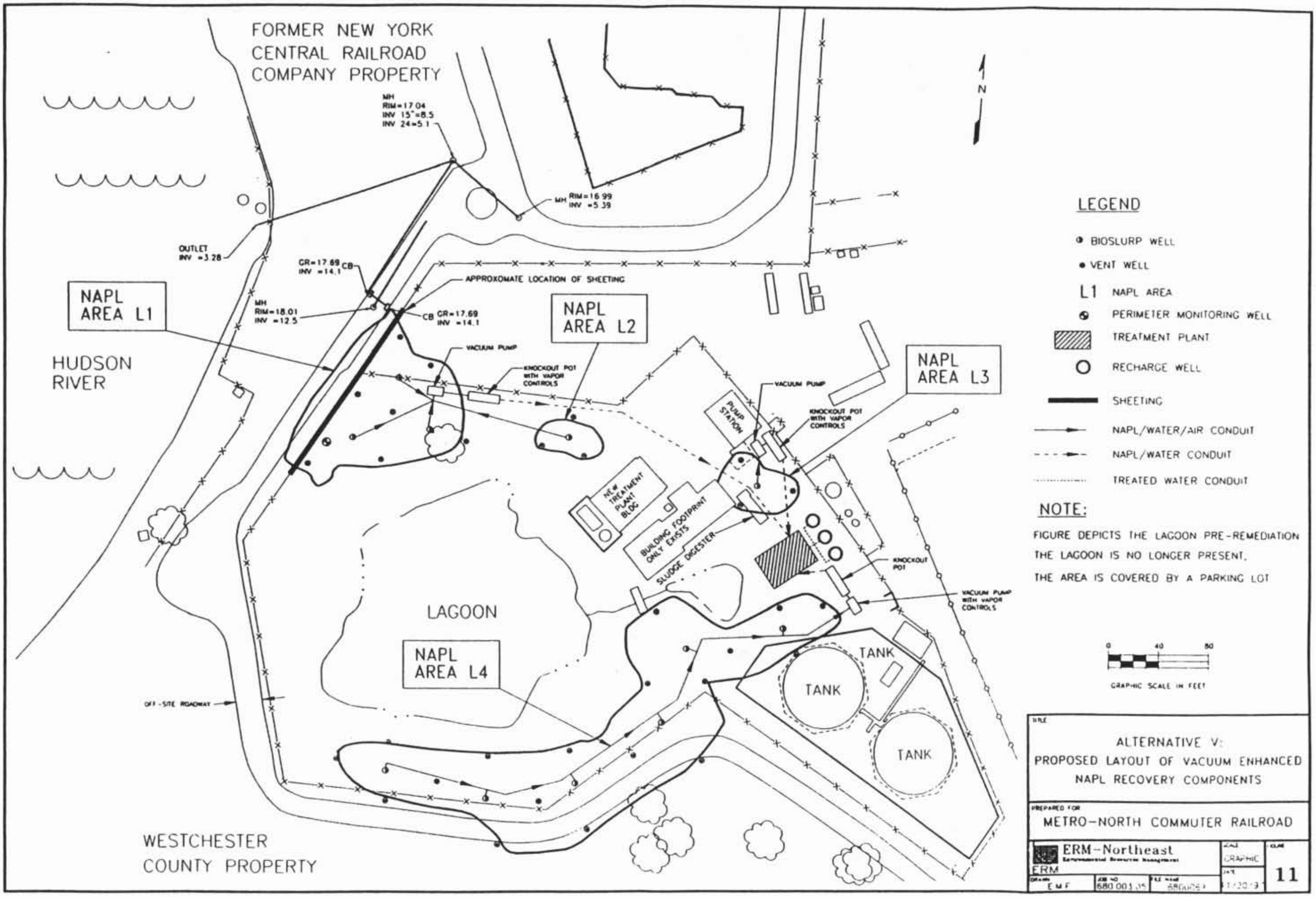
TITLE

SCHEMATIC OF A TYPICAL VACUUM ENHANCED NAPL RECOVERY SYSTEM

PREPARED FOR

METRO-NORTH COMMUTER RAILROAD

ERM-Northeast Environmental Resources Management ERM			SCALE NONE	FIGURE 10
DRAWN: Y.Z.	JOB NO.: 680.003.05	FILE NAME: 68000070	DATE 11/17/97	



FORMER NEW YORK CENTRAL RAILROAD COMPANY PROPERTY
MH RIM=17.04 INV 15"=8.5 INV 24=5.1
MH RIM=16.99 INV =5.39
OUTLET INV =3.28
GR=17.69 CB INV =14.1
APPROXOMATE LOCATION OF SHEETING
MH RIM=18.01 INV =12.5
CB GR=17.69 INV =14.1
NAPL AREA L1
NAPL AREA L2
NAPL AREA L3
NAPL AREA L4
HUDSON RIVER
VACUUM PUMP
KNOCKOUT POT WITH VAPOR CONTROLS
PUMP STATION
NEW TREATMENT PLANT BLDG
BUILDING FOOTPRINT ONLY EXISTS
SLUDGE DIGESTER
KNOCKOUT POT
VACUUM PUMP WITH VAPOR CONTROLS
LAGOON
TANK
TANK
TANK
OFF-SITE ROADWAY
WESTCHESTER COUNTY PROPERTY
N
LEGEND
BIOSLURP WELL
VENT WELL
L1 NAPL AREA
PERIMETER MONITORING WELL
TREATMENT PLANT
RECHARGE WELL
SHEETING
NAPL/WATER/AIR CONDUIT
NAPL/WATER CONDUIT
TREATED WATER CONDUIT
NOTE:
FIGURE DEPICTS THE LAGOON PRE-REMEDIATION
THE LAGOON IS NO LONGER PRESENT.
THE AREA IS COVERED BY A PARKING LOT
0 40 80
GRAPHIC SCALE IN FEET
ALTERNATIVE V:
PROPOSED LAYOUT OF VACUUM ENHANCED NAPL RECOVERY COMPONENTS
PREPARED FOR
METRO-NORTH COMMUTER RAILROAD
ERM-Northeast
ERM
GRAPHIC
EMF
680.003.05
11

TABLE 1

COMPARISON OF HARMON YARD CROTON BAY OU-II, CROTON POINT LANDFILL (CPLF), AND BACKGROUND SEDIMENT DATA

HARMON YARD OU-II RI/FS

CHEMICALS DETECTED IN SEDIMENT	HARMON YARD OU-II NO. OF SAMPLES	HARMON YARD OU-II 95% UCL (1)	CROTON POINT LANDFILL, CROTON MARSH 95% UCL (2)	IONA MARSH BACKGROUND SAMPLE, CPLF RI/FS (3)
VOLATILE ORGANIC COMPOUNDS (in µg/kg)				
Acetone	6	76	79	64
Carbon Disulfide	6	3	7*	ND
2-Butanone	6	27	18	0.026
Carbon Tetrachloride	6	12	ND	ND
Benzene	6	4	ND	ND
Toluene	6	6	20	ND
Chlorobenzene	6	113	ND	ND
SEMI-VOLATILE ORGANICS (in µg/kg)				
2-Methylnaphthalene	6	14259	72*	130
3-Nitroaniline	6	2400	ND	ND
Acenaphthene	6	3300	ND	160
Dibenzofuran	6	2500	42*	120
Fluorene	6	4298	160*	210
Phenanthrene	6	11406	520	1400
Anthracene	6	3700	175	880
Carbazole	6	1900	ND	ND
Fluoranthene	6	4777	1096	5200
Pyrene	6	4512	982	4000
Benzo (a) anthracene	6	1600	554	2700
Chrysene	6	2000	634	2200
bis (2-Ethylhexyl) phthalate	6	730	571	390
Benzo (b) fluoranthene	6	1300	514	1600
Benzo (k) fluoranthene	6	1300	469	1400
Benzo (a) pyrene	6	1100	566	1600
Indeno (1,2,3-cd) pyrene	6	630	365	1100
PESTICIDE ORGANICS (in µg/kg)				
alpha-BHC	6	9	ND	ND
Heptachlor epoxide	6	5	ND	ND
4,4'-DDE	6	48	ND	ND
4,4'-DDD	6	10	ND	ND
4,4'-DDT	6	16	ND	ND
Endrin aldehyde	6	11	ND	ND
PCB COMPOUNDS (in µg/kg)				
Aroclor-1248	6	383	139	ND
Aroclor-1260	6	139	ND	1300
INORGANIC CONSTITUENTS (in mg/kg, ppm)				
Aluminum	6	14703	7486	9475
Arsenic	6	12	6	9.1
Barium	6	123	62	68.3
Beryllium	6	1	5	3.8
Cadmium	6	3	2	ND
Calcium	6	9424	4368	2900
Chromium	6	208	48	60.6
Cobalt	6	14	10	9.4
Copper	6	176	82	62.8
Iron	6	34786	23974	26950
Lead	6	311	84	87.9
Magnesium	6	7062	5336	5080
Manganese	6	728	382	312
Mercury	6	9	3	0.72
Nickel	6	37	26	19.2
Potassium	6	2784	1268	707
Sodium	6	996	957	463
Vanadium	6	46	32	34.2
Zinc	6	374	204	258

* Maximum detected concentration. Detection limit not available to calculate 95% UCL.

NOTES

(1) If 95% UCL exceeds the maximum reported concentration, the maximum reported value is shown.

(2) Values represent the 95% UCL on the mean for concentrations detected in sediment samples in Croton Marsh

(3) Westchester County Department of Public Works, Remedial Investigation Report for Croton Point Sanitary Landfill, June 1993.

[ ] Exceeds Croton Point Landfill and background sediment sample concentrations.

Table 2

Summary of Ground Water Sampling Results
Harmon Railroad Yard Wastewater Treatment Area Operable Unit II
Croton-on-Hudson, NY

Sample Number	NYS Ground Water Standards[1]	WB-1		DUP1 (Dup.WB-1)		WB-2D		WB2-1B		WB-3		WB4-1A		WB-6		WB-7D		WB-8		WB9-2A		MW-2S	
Date Collected	and Guidance Values[2]	4/11/95		4/11/95		4/11/95		4/11/95		4/11/95		4/11/95		4/11/95		4/11/95		4/11/95		4/11/95		4/11/95	
VOLATILE ORGANIC COMPOUNDS (in µg/l)																							
Chloromethane	—	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	U	8	J	10	U
1,2-Dichloroethene (total)		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	1	J	10	U
Benzene	0.7	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	2	J	3	J	1	J
Chlorobenzene	5	10	U	10	U	10	U	62	B	38	B	10	U	10	U	2	J	10	U	10	U	10	U
Ethylbenzene	5	10	U	10	U	10	U	2	J	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Xylene (total)	5	10	U	10	U	1	J	9	J	10	U	1	J	10	U	10	U	10	U	10	U	10	U
Total TICs								384	J	12	J	636	J							7	J	5	J
SEMI-VOLATILE ORGANICS (in µg/l)																							
1,3-Dichlorobenzene	5	10	U	10	U	10	U	1	J	10	U	10	U	10	U	10	U	10	U	10	U	20	U
1,4-Dichlorobenzene	4.7 **	10	U	10	U	10	U	4	J	2	J	10	U	10	U	10	U	10	U	10	U	20	U
1,2-Dichlorobenzene	4.7 **	10	U	10	U	1	J	5	J	2	J	10	U	10	U	4	J	2	J	4	J	3	J
Naphthalene	10 *	10	U	10	U	10	U	10	U	10	U	7	J	10	U	10	U	10	U	10	UJ	20	U
2-Methylnaphthalene	—	10	U	10	U	10	U	410	D	10	U	15		10	U	10	U	10	U	2	J	20	U
Acenaphthene	—	10	U	10	U	10	U	15		10	U	2	J	10	U	10	U	10	U	10	U	20	U
Dibenzofuran	—	25	U	10	U	10	U	13		2	J	10	U	10	U	15		10	U	2	J	15	J
Fluorene	50 *	10	U	10	U	10	U	21		2	J	5	J	10	U	21		10	U	2	J	25	
Phenanthrene	50 *	10	U	10	U	10	U	41		10	U	5	J	10	U	10	U	10	U	10	U	20	U
Anthracene	50 *	10	U	10	U	10	U	4	J	10	U	10	U	10	U	10	U	10	U	10	U	20	U
Carbazole		10	U	10	U	10	U	10	U	10	U	10	U	10	U	3	J	10	U	10	U	20	U
Fluoranthene	50 *	10	U	10	U	10	U	4	J	10	U	10	U	10	U	10	U	10	U	10	U	20	U
Pyrene	50 *	10	U	10	U	10	U	4	J	10	U	10	U	10	U	10	U	10	U	10	U	20	U
bis (2-Ethylhexyl) phthalate	50 *	10	U	1	J	12		2	J	3	J	1	J	2	J	270	D	1	J	10	U	20	U
Total TICs		33	J	31	J	65	J	422	J	81	J	289	J	86	J	360	J	126	J	327	J	217	J
INORGANIC COMPOUNDS (in µg/l)																							
Aluminum	100	4490	*J	3900	J*	316	J*	38900	*J	1190	J*	17000	*J	3740	J*	54.5	BJ*	17100	J*	82900	J*	4020	J*
Arsenic	25	5	UJW	5	UW	5	U	47.2		13.8		6.1	B	5	UJW	5	U	5	U	20.4		5.4	B
Barium	1,000	351		318		282		1400		305		1620		215		378		356		184	B	192	B
Beryllium	3 *	1	U	1	U	1	U	3.2	B	1	U	1	B	1	U	1	U	1	U	3.8	B	1	U
Cadmium	10	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Calcium		244000	JE	238000	JE	124000	JE	143000	JE	158000	JE	509000	JE	38200	JE	168000	JE	145000	JE	128000	JE	114000	JE
Chromium	50	1920	JN*	1120	JN*	17.9	JN*	60.3	JN*	9	BJN	29.6	JN*	355	JN*	9.5	BJN	51.6	JN*	143	JN*	15.8	JN*
Cobalt		11	U	11	U	11	U	112		11	U	43.7	B	11	U	11	U	58.6		49.7	B	16.9	B
Copper	200	159	J*	27.6	J*	32.5	J*	178	J*	39.8	J*	141	J*	80.7	J*	9	U*	76.9	J*	1820	J*	40.9	J*
Iron	500 **	20700	J*	15500	J*	1300	J*	256000	J*	13000	J*	83700	J*	9100	J*	340	J*	32900	J*	124000	J*	22500	J*
Lead	25	3.8	JW*	3.2	JW*	3	U*	84.8	JS*	3	U*	52.5	JS*	42.3	JS*	3.6	J*	10.7	J*	968		3.8	JW*
Magnesium	35,000 *	49900		47600		41900		59600		33200		144000		9300		40900		69100		62700		34400	
Manganese	500 **	537	JE	383	JE	5060	JE	7240	JE	1400	JE	5550	JE	165	JE	5440	JE	3170	JE	3930	JE	15000	JE
Mercury	2	0.2	U	0.2	U	0.2	U	0.2		0.2	U	0.25		0.2	U	0.2	U	0.2	U	0.45		0.2	U
Nickel		311		214		66		143		33	U	67.3		197		33	U	147		150		79.2	
Potassium		8170		8500		4010	B	13200		6100		14600		4600	B	4590	B	6500		10200		3210	B
Silver	50	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	BJ
Sodium	20,000	460000		458000		35800		125000		7670		982000		1130000		108000		59600		77800		33000	
Vanadium	14	19.9	B	16.7	B	8	U	209		8	U	86.6		12.8	B	8	U	44	B	266		11.6	B
Zinc	300	72.9		55.4		6	U	282	U	6	U	116		51.8		6	U	76.8		528		19.2	B
Cyanide	100	10	U	10	U	10	U	10		10	U	10	U	14		10	U	10	U	10	U	10	U

Appendix A
Responsiveness Summary

Harmon Railroad Yard OU-II
Site Number 3-60-010

The issues below were raised during the public meting for the Proposed Remedial Action Plan (PRAP) held on February 26, 1998 at the Village of Croton-on-Hudson Municipal Building on Van Wyck Street, Croton-on-Hudson, New York. In addition, one letter was received during the public comment period (February, 5, 1998 to March 9, 1998) for the PRAP. The purpose of the meeting was to present the PRAP for the Site and receive comments on the PRAP for consideration during the selection of a remedy. A copy of the responsiveness summary is available for public view at the Site's document repositories.

The following are verbal comments received during the public meeting on February 26, 1998:

Question: What are New York State Department of Health's (NYSDOH) thoughts on the Proposed Remedial Action Plan (PRAP)?

Response: The New York State Department of Health (NYSDOH) concurs with the proposed remedy.

Question: Once contaminated sludge was removed from the wastewater lagoon (Operable Unit-I), why was a protective cover put over the area and why was the steel sheeting left in place? Was there a danger remaining from the former lagoon?

Response: There remained oil-contaminated soils below the sludge which were **not** contaminated with polychlorinated biphenyls (PCBs). These soils contained residual levels of oil which do not pose a health or environmental threat. The protective cover and steel sheeting add an extra level of protection as was required by NYSDEC.

Question: How did the non-aqueous phase liquid (NAPL) get into the water in the first place?

Response: The lagoon handled untreated wastewater which consisted of a mix of oil and water. Prior to the lagoon remediation, the oil seeped from the lagoon to the water around the periphery of the lagoon.

Question: Why was the oil found in Operable Unit II (OU-II) not cleaned up sooner?

Response: Metro-North needed the lagoon to "equalize" all of the water generated from the yard until the clean water could be diverted elsewhere. The lagoon handled not only "dirty" wastewater but non-polluting water, primarily storm water. It took Metro-North time to divert these clean waters away from the lagoon. Once this was done, Metro-North was able to begin remediating the lagoon.

Comment: Metro-North was open to the citizen's group and the group was successful in assuring that their needs and concerns were met. Metro-North did a very good job working with the citizens, responding to their concerns and doing some extra things that they were not required to do. Metro-North and New York State Department of Environmental Conservation (NYSDEC) are to be commended on a very good job.

Question: In other vacuum-enhanced extraction systems did anything unexpected occur which should be avoided?

Response: Not really. It is a very low-tech remedial approach. Air is introduced into the oil-contaminated environment and the microbes do most of the work to degrade the oil. Degradation products are not worse than the starting chemicals for petroleum products. A successful operation depends on having enough wells and conducting a pilot test to confirm that the system is working properly.

Question: Is there a danger that the vacuum-enhanced recovery system could force the NAPL to offsite areas?

Response: No. The vacuum pulls the oil toward the wells which are located within the NAPL areas.

Question: At the end of the 3-year operational period what testing will be done to determine whether you are finished?

Response: We will look at the NAPL monitoring wells to determine whether the NAPL is gone, or how much is left, and determine whether to stop the NAPL recovery or continue.

Question: Is money available if more than 3-years is necessary for the remedial action?

Response: Operation and Maintenance (O&M) of the vacuum-enhanced NAPL recovery system is not very expensive. Metro-North will put adequate O&M costs in its operating budget.

Comment: A very good, thorough risk assessment was done for this Site and the conclusions of this Remedial Investigation/ Feasibility Study (RI/FS) flowed from it. No arbitrary conclusions or recommendations were made. An advanced treatment technology is being proposed which is cost effective.

Question: Would Hill, the contractor used for OU-I, be considered for OU-II?

Response: Not necessarily since a different technology is being used. A Request for Proposals (RFP) will be sent out to contractors who have experience with this kind of work.

Comment: There has been a lot of input into the things that have been discussed tonight. Metro-North has been very pro-active in this process.

Question: Once we reach 70%, 80% or 90% removal of NAPL, will the treatment system be removed?

Response: Once NAPL recovery has reached a point where only residual levels are left and it has been decided that the treatment system will be shut off, the recovery systems will be removed. The monitoring wells, however, will be left in place.

Question: Does the 3-year remediation schedule include design and construction?

Response: No. It is expected that the design and construction of the system will take up to two years. Once the system is turned on, remediation is expected to take approximately 3 years.

Question: Will southern access to Half Moon Bay be blocked by this system or wells?
Response: No. The wells will be located within the NAPL areas (this area is currently fenced in) and can be flush mounted (at ground level) so that there are no obstructions.

The following is a written comment received during the public comment period, held from February, 5, 1998 to March 9, 1998:

Letter dated March 4, 1998 from Jon Goplerud, Chairman, Conservation Advisory Council, Village of Croton-on-Hudson, New York to Thomas Gibbons (NYSDEC). Re: Comments on the PRAP and Sediments in Croton Bay.

Comment: The PRAP does not propose a remedy for the contaminated sediments in Croton Bay. We believe that an action is necessary to remediate the Croton Bay.

Response: Section 4.1.1.3.1 of the PRAP and Section 3.1.1.3.1 of the ROD describe sediment contamination in Croton Bay and indicates that some of the contaminants found are comparable to or slightly higher than typical concentrations for this area with the exception of SVOC's related to fuel oils, which are much higher. The fuel oils are being addressed as part of the Spills investigation for the Harmon Railroad Yard. A cutoff trench and wall were installed to mitigate the migration of NAPL toward Croton Bay. The focus of the Operable Unit II investigation was to evaluate impacts from the former wastewater lagoon. The constituent of concern for this investigation is Polychlorinated biphenyls (PCBs). Levels of PCB's in Croton Bay were as high as 0.9 ppm and averaged 0.5 ppm. These levels are comparable to or slightly higher than typical concentrations for this area of the Hudson River. As such, no remedial action is being recommended.

Appendix B
Administrative Record

Harmon Railroad Yard OU-II
Site Number 3-60-010

1. Remedial Investigation/ Feasibility Study Workplan, Operable Unit II, Harmon Railroad Yard/Lagoon, Croton-on-Hudson, New York, January 27, 1994. Prepared for Metro-North Commuter Railroad by ERM-Northeast, Inc.

2. Remedial Investigation/ Feasibility Study Workplan, Operable Unit II, Addendum 1, Harmon Railroad Yard/Lagoon, Croton-on-Hudson, New York, May 3, 1994. Prepared for Metro-North Commuter Railroad by ERM-Northeast, Inc.

3. Remedial Investigation Report, Operable Unit II, Harmon Railroad Yard/Lagoon, Croton-on-Hudson, New York, January 24, 1997. Prepared for Metro-North Commuter Railroad by ERM-Northeast, Inc.

4. Feasibility Study Report, Operable Unit II, Harmon Railroad Yard/Lagoon, Croton-on-Hudson, New York, January 14, 1998. Prepared for Metro-North Commuter Railroad by ERM-Northeast, Inc.

5. Proposed Remedial Action Plan, Operable Unit II, Harmon Railroad Yard/Lagoon, Croton-on-Hudson, New York, February 1998. Prepared by the New York State Department of Environmental Conservation.