Department of Environmental Conservation

Division of Environmental Remediation

Environmental Restoration
Record of Decision

Hudson River Waterfront - DeLaval Property
City of Poughkeepsie, Dutchess County, New York

Site Number B00190-3

March 2005

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* DENISE M. SHEEHAN, *Acting Commissioner*

DECLARATION STATEMENT
ENVIRONMENTAL RESTORATION RECORD OF DECISION

Hudson River Waterfront - DeLaval Property Environmental Restoration Site
City of Poughkeepsie (C), Dutchess County, New York
Site No. B00190-3

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Hudson River Waterfront - DeLaval Property site, an environmental restoration site. The selected remedial program was chosen in accordance with the New York State Environmental Conservation Law and is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300), as amended.

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Hudson River Waterfront - DeLaval Property environmental restoration site, and the public's input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

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

Description of Selected Remedy

Based on the results of the Site Investigation/Remedial Alternatives Report (SI/RAR) for the Hudson River Waterfront - DeLaval Property site and the criteria identified for evaluation of alternatives, the NYSDEC has selected source removal, soil cover, bulkhead construction, and natural attenuation. The components of the remedy are as follows:

- A bulkhead consisting of sheet piling would be constructed at the shoreline in AOC-1 and AOC-2/3 to serve as a barrier to preclude contamination in the soils and groundwater from impacting the Hudson River during and following remediation.

- Removal of approximately 12,900 cubic yards of material representing grossly contaminated soil from AOC-1 and AOC-2/3 for off-site for disposal. An abandoned underground storage tank (UST) and buried pipeline would also be removed at this time.

- Placement of a cover consisting of either a minimum of 12 inches of clean fill or impervious features such as paved parking areas, walkways, and buildings, as appropriate for the planned development.

- Imposition of an institutional control in the form of an environmental easement.

New York State Department of Health Acceptance

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

Declaration

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

MAR 3 1 2005

Date

Dale A. Desnoyers, Director
Division of Environmental Remediation

TABLE OF CONTENTS

SECTION **PAGE**

Environmental Restoration
RECORD OF DECISION

Hudson River Waterfront - DeLaval Property Site
City of Poughkeepsie, Dutchess County, New York
Site No. B00190-3
March 2005

SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has selected a remedy for the Hudson River Waterfront-DeLaval Property site located in the city of Poughkeepsie, Dutchess County, New York. The presence of hazardous substances has created threats to human health and/or the environment that are addressed by this remedy.

The 1996 Clean Water/ Clean Air Bond Act provides funding to municipalities for the investigation and cleanup of brownfields. Under the Environmental Restoration (Brownfields) Program (ERP), the state provides grants to municipalities to reimburse up to 90 percent of eligible costs for site investigation and remediation activities. Once remediated the property can then be reused.

As more fully described in Sections 3 and 5 of this document, the site's historic industrial use coupled with its use as a landfill have resulted in the presence of harmful substances including various volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and heavy metals. These hazardous substances have contaminated both the soils and groundwater at the site, and have resulted in:

- a threat to human health associated with potential exposure to contaminated soil, groundwater, and soil gas vapors.

- an environmental threat associated with the impacts of contaminants to local groundwater, soil, and the adjacent Hudson River.

To eliminate or mitigate these threats, the NYSDEC has selected the following remedy to allow for the future commercial and recreational use of the site:

- The removal of all grossly contaminated soil and contamination sources via excavation and off-site disposal.

- The covering of residually contaminated areas with asphalt or a minimum of 12" of clean soil to reduce exposure. A demarcation layer of geotextile fabric will be installed prior to placement of the soil cover.

- Continued monitoring to assess the effectiveness of the remedy and natural attenuation of residual contaminants left in place at the site.

- Imposition of an institutional control in the 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 or recreational uses only, (c) restrict use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the Dutchess County Department of Health, and (d) require the property owner to complete and submit to the NYSDEC an Institutional Control/Engineering Control (IC/EC) certification.

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

SECTION 2: SITE LOCATION AND DESCRIPTION

The DeLaval property which comprises the Hudson River Waterfront site is located in the City of Poughkeepsie, Dutchess County, New York. The site lies southwest of the intersection of Rinaldi Boulevard and Pine Street (see Figure 1) and encompasses an area of roughly 13.4 acres with over 2,200 feet of direct waterfront along the Hudson River. The property is currently vacant and is largely overgrown by grass and other various forms of vegetation. The land consists of a single parcel, bordered to the north by a former sewage treatment plant, to the east by railroad tracks, to the south by petroleum bulk storage tanks, and the Hudson river to the west.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

The DeLaval property has been in use since at least 1887, at which time it was occupied by a tannery, a carpentry shop, two coal sheds, and a pair of homes. Sometime between 1922 and 1945, the Spoor Lasher Company, a supplier of construction materials (concrete, stone, asphalt), occupied a storehouse on the property. Following this use, the DeLaval Company manufactured various types of stainless steel farming equipment, including cream separators, milking machines, and centrifuges. Historical maps indicate the site continued to be used for industrial manufacturing through the early 1960s. However, by the late 1960s, the site was vacant and continues to be vacant today.

The specific waste disposal practices related to the aforementioned operations are not definitively known. However, site investigations have revealed a landfill area on the southern portion of the property shown as Area of Concern #1 (AOC-1) on Figure 2. Further minor convenience dumping has been observed at various locations on site. Also it was discovered that

two underground fuel oil storage tanks were located on the site in 1952 which may have contributed to the contamination in several areas.

3.2: Remedial History

There have been several investigations performed to assess environmental conditions at the DeLaval property. The initial studies were conducted by the City through a consultant prior to entering the Environmental Restoration Program (ERP). A Phase I Environmental Site Assessment Report for the Procida Waterfront Property, December 1999, also included assessments for three other parcels of land in the vicinity. Based on the findings, it was decided to further evaluate the site. A second more detailed investigation was conducted at the site and summarized in the report titled Phase II Subsurface Investigation Report of the DeLaval Property, May 2001. Based on the subsurface data, four areas of concern (AOC) were identified on the property.

In 2003, the City entered the ERP and submitted a Remedial Alternatives Report (RAR) Work Plan that formally stated the measures to be taken to evaluate potential remedies for the DeLaval site. A RAR was submitted in April of 2004, that thoroughly evaluated possible remedial options for the site and also presented a viable solution to the environmental issues identified during the previous investigations at the DeLaval property. Review of the RAR, however, indicated data gaps in the previous investigations. The NYSDEC requested that a supplemental investigation be conducted to ensure that all areas of the site requiring remediation were identified and fully delineated.

In the summer of 2004, a supplemental remedial investigation was conducted under the ERP to fill the data gaps and provide a full understanding of the nature and extent of contamination present at the site. The investigation findings are presented in Section 5 below.

SECTION 4: ENFORCEMENT STATUS

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

Since no viable PRPs have been identified, there are currently no ongoing enforcement actions. However, legal action may be initiated at a future date by the state to recover state response costs should PRPs be identified. The City of Poughkeepsie will assist the state in its efforts by providing all information to the state which identifies PRPs. The City will also not enter into any agreement regarding response costs without the approval of the NYSDEC.

SECTION 5: SITE CONTAMINATION

The City of Poughkeepsie has recently completed a supplementary site report (SI) to determine the nature and extent of any contamination by hazardous substances at this environmental restoration site.

5.1: Summary of the Supplementary Site Investigation

The purpose of the early site investigations and the supplementary SI was to define the nature and extent of any contamination resulting from previous activities at the site. The subsurface site investigation was conducted between 2000 and 2001**.** The supplementary site investigation was completed in 2004. Figure 2 shows the location of test pits, soil borings, and monitoring wells installed during the supplementary investigation. The field activities and findings of the investigations are described in the Phase II Subsurface Investigation Report and the Supplemental Investigation Summary Report.

The following activities were conducted during the combined investigations:

- Research of historical information;
- A magnetometry survey to determine the presence of potentially buried underground structures;
- A soil gas survey to determine if a suspected landfill area was generating methane gas through degradation of wastes and assess possible vapor exposure pathways;
- Excavation of one hundred sixty-three (163) test pits to locate underground drainage/leach fields, determine the depth of wastes, determine the extent of buried structures such as underground storage tanks (USTs) and pipelines, and to collect subsurface soil and waste samples for chemical analysis;
- Collection of twenty-nine (29) discrete surface soil samples from the upper two inches of soil to evaluate the potential for direct exposure to surficial contamination;
- Installation of thirty-six (36) soil borings and twenty-three (23) monitoring wells for analysis of soils and groundwater, as well as physical properties of soil and hydrogeologic conditions, and;
- Collection of approximately twenty-three (23) discrete groundwater samples from monitoring wells.

To determine whether the soil and groundwater contain contamination at levels of concern, data from the investigation were compared to the following Standards, Criteria and Guidance values (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 “Techical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels".

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

5.1.1: Site Geology and Hydrogeology

Based on the Dutchess County, New York Soil Conservation Survey, the DeLaval site's soil is Udorthents. This type of soil is characterized as being deep, well-drained, and having been altered by cutting and filling.

The bedrock for the site was mapped in the Geologic Map of New York, Lower-Hudson Sheet (1970) as the Trenton Group and Metamorphic equivalents. These rocks are described as the Taconic Melange, which is a mixture of Early Cambrian through Middle Ordivician pebble to block-size clasts, in a pelitic matrix of Middle Ordovician (Barneveld) age.

Bedrock outcrops occur at the southern boundary of the site and bedrock was encountered approximately 20 feet below grade at two soil boring locations in the southern portion of the site. Bedrock was observed to consist of dark grey shale at these locations

The surficial deposits encountered during test pitting support the presumption that the site is underlain by fill. The depth of the fill ranges from 2 to 11 feet across the site. Excavation of the test pits indicate that much of the site is fill material, including a significant amount of construction and demolition debris from the demolition of buildings that once occupied the site. Soils encountered beneath the fill and in areas where fill was not encountered generally consists of silt and fine sand.

The static depth to groundwater at the site ranged from 5 to 7 feet below grade. The groundwater fluctuations are believed to be due to tidal changes in the river elevation of the adjacent Hudson River. Shallow groundwater flow is largely influenced by the tidal fluctuations of the Hudson River, with a general flow direction to the west toward the river.

5.1.2: Nature of Contamination

As described in the SI report, many soil, groundwater samples were collected to characterize the nature and extent of contamination of the site. As summarized in Table 1, the main categories of contaminants that exceed their SCGs are volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), and metals.

Petroleum-related VOCs were present above SCGs in both soil and groundwater. Soil saturated with fuel oil was observed along with a sheen on the groundwater when encountered in a test pit excavated in the northeastern area of the site, identified in the reports as Area of Concern No. 2. Petroleum odors and heavy staining of the soils were also observed in this area, as well as in test pits excavated in the southeast portion of the site suspected of being used as a landfill, identified in the reports as Area of Concern No. 1 (see Fig 2).

Numerous SVOCs were detected in the soil samples collected at the site. The SVOCs consisted primarily of a group of compounds known as polynuclear aromatic hydrocarbons (PAHs). PAHs are compounds that are part of the makeup of petroleum or asphalt products, roofing products, soot from open burning, exhaust emissions from internal combustion engines, among other sources. As could be expected at a former industrial property such as this, PAH compounds were found widespread across the site in both surface and subsurface soils. PAH compounds most commonly detected above SCGs include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene.

Inorganics, or metals, were also detected in soil at the site at concentrations above SCGs. Specific metals most commonly detected include arsenic, cadmium, chromium, lead, silver, and mercury.

Polychlorinated biphenyls (PCBs) were detected above SCGs in the southern area of the site in surface and subsurface soils and groundwater.

The extent of contamination and the media affected are detailed below.

5.1.3: Extent of Contamination

Table 1 summarizes the degree of contamination for the contaminants of concern in the soils and groundwater in each area by comparing the data with the SCGs for the site. Note that the chemical concentrations are reported in parts per billion (ppb) for water and parts per million (ppm) for soil. For comparison purposes, where applicable, SCGs are provided for each medium.

Four areas of concern (AOC) have been designated for the DeLaval site based on the site investigations. A brief description of each AOC is provided to better understand the discussion regarding the extent of contamination that follows. See Figure 2 for the AOC locations.

Area of Concern #1 (AOC-1) - This area was used as an industrial landfill and is located toward the south end of the property.

Areas of Concern #2 and #3 (AOC-2/3) - These areas were initially thought to be distinct areas of contamination. Additional investigations suggest that the areas are likely connected and contain similar contamination. AOC-2 is located in the north-central section of the site along the river. AOC-3 is located east of AOC-2. Both contain significant petroleum contamination in the soil. During the field program, an abandoned buried pipeline and UST were discovered. The tank, estimated at 4,000-gallon capacity, and the pipeline appear to have contributed to the observed petroleum contamination. Also, substantial amounts of C&D debris and other industrial fill material make up the majority of these AOCs.

A relieving, platform-style concrete retaining wall constructed at various times during the development of the site exists along the entire length of shoreline at the site. This structure includes a buried concrete bulkhead or cutoff wall which is significantly preventing the migration of petroleum to the river. The condition of the existing wall varies from completely intact to eroded and dilapidated.

Area of Concern #4 (AOC-4) - This area is located along the eastern side of the property, adjacent to the railroad tracks (Figure 2). A former paint shop was located in this area.

Waste Materials

A variety of fill and waste materials were encountered in AOC-1, including silt, sands, cobbles, metal lathe millings, brick, fire brick, concrete, scrap metal, glass, ceramic tile, wood, asphalt roofing material, slag, and tires. Concrete, tires, steel tire rims, plastic, glass, scrap metal, a rusted and crushed drum, a plastic pool liner, wood, and metal shavings covered with a white grease-like lubricant were encountered at a depth of 0.7 to 14 feet below the ground surface. A variety of fill materials, including concrete, brick, scrap metal, wood, and slag were identified in the test pits excavated within AOC-2/3.

Surface Soil

A number of SVOCs were detected in the surface soil samples collected across the DeLaval property. Phenanthrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene, were detected in excess of the NYSDEC recommended soil cleanup objective concentrations. With the exception of five of the the soil samples collected across the site, at least one SVOC was detected in excess of the cleanup objective concentration.

Aroclor-1260 was the only PCB congener detected in the surface soils on the DeLaval property. It was detected in 11 of the 30 surface soil samples collected from the DeLaval property, mainly along north side of AOC-1 and the northern one-third of the property. However, Aroclor-1260 was only detected in three samples exceeding the TAGM 4046 guidance value of 1 ppm along the north end of AOC-1, with concentrations up to 3.4 ppm.

Metals contamination was also identified in a majority of the surface soils collected from the DeLaval property. Arsenic, cadmium, chromium, lead, silver, and mercury were the most commonly occurring metals detected above the SCGs. Maximum concentrations detected during the SI include arsenic at concentrations up to 24.8 ppm, cadmium up to 8.7 ppm, chromium up to 627 ppm, lead up to 908 ppm, silver up to 240 ppm, and mercury up to 1.3 ppm.

Subsurface Soil

Contamination in the subsurface soils is limited to the four AOCs at the site. Petroleum- related VOCs, PAHs, and metals contamination are widespread in AOC-1 and AOC2/3. AOC-4 contained low-level PAH contamination and was observed to have solvent odors in test pits.

TAGM 4046 guidance values were exceeded in AOC-1 for VOCs, SVOCs, PCBs, and heavy metals. VOC compounds included benzene detected at one location at 2.3 ppm xylenes at two location up to 2.5 ppm, and 1,1,1-trichloroethane at one location at 2.3 ppm. SVOCs were more prevalent, consisting of PAHs at concentrations several times the TAGM 4046 guidance values. PCBs were detected in one subsurface sample at 11 ppm, slightly above the TAGM 4046 guidance value of 10 ppm. Heavy metals were detected above TAGM 4046 guidance values at eight locations and

included arsenic, mercury, barium, cadmium, chromium, lead, and silver.

SVOCs and heavy metals were detected in AOC-2/3 above TAGM 4046 guidance values. PAHs were found at most test pit locations at concentrations several times the guidance values. Heavy metals were detected at similar frequency and concentrations as found in AOC-1.

Most of the subsurface soil identified as requiring remediation in AOC-1 and AOC-2/3 was based on observations that met the grossly contaminated criteria. Grossly contaminated soil means any soil that contains free product or mobile contamination that is identifiable visually, through odor, by elevated contaminant vapor levels, or is otherwise readily detectable.

Evidence of petroleum contamination was encountered along the western edge of AOC-1 as strong petroleum odors and heavy black staining of the soils.

A test pit was excavated along the south side of the suspected location of a six-inch steel pipe used for the transmission of fuel oil in AOC-2. The pipe was located and found to be in relatively poor condition and the soils surrounding the pipe appeared saturated with fuel oil (reportedly No. 6 fuel oil).

The fuel oil pipeline was located approximately four feet below grade and was apparently installed over a concrete slab. While the slab is believed to have reduced the vertical migration of the petroleum contamination, the pad was noted to be in poor condition or absent in some locations. It was determined that the top two feet of fill material was relatively free of petroleum contamination, while the approximately two feet of contaminated soil immediately above the pipe were stained and had a strong petroleum odor. In locations where the concrete slab was broken up or missing, the petroleum contamination was identified to be deeper than four feet.

The horizontal extent of contamination was estimated to be between 15 to 25 feet north and south of the pipe line. While it appeared that most of the petroleum had migrated along the top of the concrete slab, some additional contamination was also found near the edges of the concrete pad. The contamination apparently extends along majority of the length of the pipeline, which extends from the bulkhead along the Hudson River eastward to a point approximately 20 feet east of the gravel access road that traverses the property from north to south.

While investigating along the pipe line, an approximately 4,000-gallon underground storage tank (UST) containing fuel oil, sludge, and/or groundwater was encountered along the south side of the pipeline. A majority of the tank was not unearthed at the time of the investigation, and, therefore, the overall condition of the tank is unknown.

Several fill materials were also encountered in the test pits installed in AOC-4, including concrete, brick, slag, wood, and several cobbles. While no significant staining was observed on the soils in AOC-4, PID readings ranging from 23 to 31 ppm and a solvent-like odor emanating from the test pits were noted. Other than a slight sheen on the groundwater table observed in test pit TP-41, there was no field evidence of groundwater contamination in the test pits excavated in AOC-4.

Groundwater

Black groundwater with a moderate to strong petroleum odor and with sheen on the surface was encountered in a number of the test pits in AOC-2/3. The sheen ranged from discoloration on the groundwater surface to the formation of small oil droplets on the water surface. It is unclear whether the black color observed in the groundwater was attributable to the petroleum contamination, the presence of slag and other fill materials in the subsurface, or septic conditions associated with potential anaerobic breakdown of the contaminants. However, a petroleum odor typically coincided with the presence of the sheen.

Based on analytical data from the investigations at the site, chemical impacts to groundwater are minimal. 1,2,4-trimethylbenzene was detected above SCGs in one sample, as was naphthalene, p-& m-xylene, and cis-1,2-dichloroethene. PCBs were detected above SCGs on two occasions from one well located in AOC-1 at a concentration of 4.7 ppb on the first occasion and 0.31 ppb on the second sampling. Lead was detected above the SCGs in one sample collected from monitoring wells.

Soil Gas

Soil gas results from the survey conducted in AOC-1 indicate there is no active methane gas generation in the vicinity of the landfill.

5.2: Interim Remedial Measures

An interim remedial measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the SI/RAR. There were no IRMs performed at this site during the SI/RAR.

5.3: Summary of Human Exposure Pathways:

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the human exposure pathways can be found in Section {1.2.5.2} of the Remedial Alternatives Report found in the document repositories listed at the beginning of this document.

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.

Under the current land use at the site, construction workers and trespassers could be exposed to site contamination in surface soil. Construction workers could also be exposed to contamination in subsurface soil and groundwater. During excavation work, construction workers could come in direct contact with contaminated groundwater, potentially resulting in dermal exposures or exposure through the inhalation of soil particles or vapors released from groundwater.

Depending on future land use conditions at the site, future residents and construction workers could be exposed to contamination present in surface soil. Future residents and construction workers could come in direct contact with contaminated subsurface soils and groundwater if excavation work is conducted on the site. Inhalation of soil particles or vapors released from groundwater may also occur as a result of excavation.

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 following pathways for environmental exposure have been identified: (1) the potential for direct animal contact with the contaminated soils on site and; (2) threat to surface waters and sediments being contaminated by surface run-off or leaching from the subsurface contaminated soils on site should the existing bulkhead fail. If conditions observed during remedial construction suggest that contaminants have migrated through the existing bulkhead, additional evaluation of potential off-site impacts to sediments would be performed. Remedial action(s) would then be planned as appropriate.

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

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

The proposed future use for the DeLaval Property is for both commercial and recreational purposes.

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

- exposures of persons at or around the site to contaminated soils or groundwater,
- the release of contaminants from soil into groundwater that may create exceedances of groundwater quality standards,

- the possible migration of contamination to off-site media, notably the Hudson River's water and sediments,

- the release of contaminated vapors from subsurface soils into ambient air through excavation,
- the potential for contaminated vapor intrusion into any future buildings constructed at the site, and

- the sources of soil and groundwater contamination.

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

- ambient groundwater quality standards, and,

- the restoration of the subsurface soil to an acceptable standard consistent with the proposed use of the site.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost-effective, and comply with other statutory requirements. Potential remedial alternatives for the DeLaval Site were identified, screened, and evaluated in the RAR 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 five following potential remedies were considered to address the contaminated soils, surface water, and groundwater at the DeLaval property site.

Alternative 1: No Further Action

Present Worth: *$70,000*
Capital Cost: *$38,550*
Annual OM&M:
(Years 1-30): *$2,000*

The No Further Action alternative recognizes remediation of the site consists only of the placement of the institutional controls necessary to restrict the use of the land and groundwater on the site.

No further monitoring would be conducted on the site and the only active removal of contaminants would be through natural processes. Thus, this alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Alternative 2: Removal and Disposal of All Contaminated Subsurface Media

Present Worth: *$17,350,000*
Capital Cost: *$17,330,000*
Annual OM&M:
(Years 1-2): *$10,000*

Under Alternative 2, all contaminated soils exceeding the SCGs in the AOCs, as well as the waste materials in AOC-1 and the UST and six-inch pipe containing weathered fuel oil in AOC-2/3, would be excavated and disposed in a permitted off-site facility. Due to the widespread, low-level contamination found in the surface soils during the supplemental investigation, this alternative would include placement of a minimum of 12 inches of clean soil over areas designated as greenspace or asphalt or concrete in areas designated for walkways and parking. This would eliminate the potential for exposures to the surface soils and residual contaminants. In the areas of the clean soil cover, a geotextile demarcation layer would be required.

Approximately 86,600 cubic yards of contaminated soil and debris would be excavated from the AOCs for off-site disposal. The excavations would be backfilled with clean fill or with surplus surface soil generated elsewhere on the site during final grading activities. To effectively dewater the excavations and facilitate the excavations beneath the water table, approximately 43,500 square feet of sheeting (2,900 lineal feet around the AOCs by fifteen feet deep) and approximately 10 pumping wells around the AOCs would be required. It has been assumed that the extracted groundwater can be treated using GAC to remove the contaminants, although other methods of treating the water or off-site disposal could be considered during the remedial design.

An institutional control in the 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 or recreational uses only, (c) restrict use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Dutchess County Department of Health,and (d) require the property owner to complete and submit to the NYSDEC an IC/EC certification would be required.

Alternative 3: Source Removal, Soil Cover, Bulkhead, and Natural Attenuation.

Present Worth: *$7,860,000*
Capital Cost: *$7,779,000*
Annual OM&M:
(Years 1-10): *$10,000*

Similar to Alternative 2, Alternative 3 would remove the UST and underground fuel line and contaminated soils, but excavation would be limited to those soils that are grossly contaminated and/or contain free product in AOC-1 and AOC-2/3. It is estimated that 12,900 cubic yards of

grossly contaminated material would be excavated for off-site disposal. The proposed area of excavation in AOC-1 coincides with the highest levels of chromium and lead detected in subsurface soils sampled during the SI. The excavations would be backfilled with clean fill or with surplus surface soil generated elsewhere on the site during final grading activities. Subsequently, the AOCs would be covered using asphalt/concrete surfaces or a minimum of 12" of clean fill consistent with covering the remaining portions of the site in order to reduce exposures to the surface soils and residual contaminants.

To restrict potential migration of contaminants migrating towards the Hudson River during excavation activities, a ballasted bulkhead wall would be installed down gradient of AOC-1 and AOC-2/3 adjacent to the Hudson River. The ballasted bulkhead would be constructed of rigid vinyl sheeting driven along the shoreline, with the placement of ballast in the form of rip rap at the base to provide stability, as determined necessary during the remedial design. The bulkhead wall would serve both as a containment structure during the excavations and remain in place as a shoreline stabilization structure at the completion of remediation. The existing relieving platform bulkhead would be removed and the ballasted bulkhead wall installed prior to removal of the grossly contaminated soil in AOC-1 and AOC-2/3. It is estimated that 1,100 feet of ballasted bulkhead would be installed during the remediation of the site, shown as hardwall bulkhead on Figure 3.

This alternative would also include institutional controls 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 or recreational uses only, (c) restrict use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Dutchess County Department of Health, and (d) require the property owner to complete and submit to the NYSDEC an IC/EC certification. Additionally, a vapor barrier and active sub-slab depressurization system would be constructed beneath any future buildings at the site. Finally, residual contaminants in groundwater would be monitored to assess natural attenuation through the installation of monitoring wells. Natural attenuation is the process by which many of the contaminants present naturally break down due to a number of reactions occurring in soil and the groundwater. It is estimated that sampling would be necessary for approximately 10 years.

Alternative 4: Source Removal, Soil Cover, Bulkhead, and Enhanced Biodegradation.

Present Worth: *$8,680,000*
Capital Cost: *$8,637,000*
Annual OM&M:
(Years 1-5): *$10,000*

Alternative 4 would consist of the same activities as in Alternative 3 with the exception that enhanced biodegradation would be employed in place of the natural attenuation. Enhanced biodegradation would consist of injecting chemicals or nutrients into the subsurface soils to accelerate the natural degradation processes associated with the residual contaminants, rather than using natural attenuation alone to control them. Thus, the monitoring time needed would be assumed to be less than that associated with Alternative 3 (about 5 years) because of the enhanced biodegradation. This alternative would also require the same institutional controls as Alternative 3, placing restrictions on the use of site land and groundwater.

Alternative 5: Source Removal, Soil Cover, Bulkhead, and LTTD.

Present Worth: *$9,600,000*
Capital Cost: *$9,557,000*
Annual OM&M:
(Years 1-5): *$10,000*

Alternative 5 would consist of the same activities as in Alternative 3, with the exception that treatment of the residually contaminated soil would be accomplished through low temperature thermal desorption (LTTD) rather than natural attenuation. LTTD separates contaminants from soil by heating it in a chamber in which organic contaminants and certain metals are vaporized. A gas or vacuum system transports vaporized contaminants to an off-gas (i.e., air emission) treatment system. The design of a system aims to volatilize contaminants, while attempting not to oxidize them. Residually contaminated soil would be excavated from the AOCs and processed through a LTTD unit temporarily staged at the site. Once successfully treated, the soil could be placed back into the excavations in a controlled fashion (e.g., proper compaction), thus reducing the amount of clean fill that would be imported to the site and the cost of the fill material.
This alternative would also require the same institutional controls as Alternatives 3 and 4, placing restrictions on the use of site land and groundwater.

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 environmental restoration projects in New York State. A detailed discussion of the evaluation criteria and comparative analysis is included in the RA report.

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

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

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

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

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

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

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

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

7. Cost-Effectivness. Capital costs and operation, maintenance, and monitoring costs are estimated for each alternative and compared on a present worth basis. Although cost-effectiveness is the last balancing criterion evaluated, where two or more alternatives have met the requirements of the other criteria, it can be used as the basis for the final decision. The costs for each alternative are presented in Table 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 SI/RAR reports and the PRAP have been evaluated. The responsiveness summary (Appendix A) presents the public comments received and the manner in which the NYSDEC addressed the concerns raised.

In general, the public comments received were supportive of the remedy. Several comments were received, however, pertaining to concerns over the potential for the site to have impacted surface water and sediments in the Hudson River and contaminated media remaining at the site at the completion of the remedy.

SECTION 8: SUMMARY SELECTED REMEDY

Based on the Administrative Record (Appendix B) and the discussion presented below, the NYSDEC has selected Alternative 3, Source Removal, Soil Cover, Bulkhead, and Natural Attenuation as the remedy for this site. The elements of this remedy are described at the end of this section. Figure 3 illustrates the AOCs to be remediated, and the location of the bulkhead. Figure 4 illustrates a conceptual plan for redevelopment of the site.

The selected remedy is based on the results of the SI and the evaluation of alternatives presented in the RAR. Alternative 3 has been selected because, as described below, it will satisfy the threshold criteria and provides the best balance of the primary balancing criteria described in Section 7.2. It will achieve the remediation goals for the site by removing the most contaminated soils and any existing contamination sources, thus eliminating the most important and immediate hazards to

human health and the environment. The capping of AOCs will further reduce exposure to any remaining contaminants, which will be treated in time with natural attenuation to achieve the desired project cleanup goals for soil and groundwater quality. Alternatives 2, 4, and 5 will also satisfy the threshold criteria for remediation, yet will not be as practically implemented or will be less certain to succeed. Issues such as these lead to the five balancing criteria becoming critical in the decision-making process.

Alternative 2 would be unfeasible mainly due to the excessive costs and short-term impacts from the major excavations with little added benefit associated with it. While Alternatives 4 and 5 may remediate the residual contamination in groundwater and soil faster than Alternative 3, the risks presented would not be considered very high and could be avoided by taking the proper precautions. Therefore, there would be no significant benefit to incurring the extra costs associated with either Alternative 4 or 5.

From analysis of the above criteria, Alternative 3 was chosen because it will provide a satisfactory and feasible approach to the problem. It will be the easiest alternative to implement and will be the most cost-effective option regarding the remediation success achieved per amount of capital spent.

The estimated present worth cost to implement the proposed remedy is $7,860,000. The cost to construct the remedy is estimated to be $7,779,000, and the estimated average annual operation, maintenance, and monitoring costs for the 10 years is $10,000.

The elements of the proposed remedy are as follows:

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

2. A bulkhead consisting of sheet piling will be constructed at the shoreline in AOC-1 and AOC-2/3 to serve as a barrier to preclude contamination in the soils and groundwater from impacting the Hudson River during and following remediation. It is anticipated AOC-1 will require 370 feet of bulkhead, AOC-2/3 will require 720 feet.

3. Approximately 12,900 cubic yards of material representing grossly contaminated soil from AOC-1 and AOC-2/3 will be excavated for off-site for disposal. The UST and buried pipeline will also be removed at this time. Excavations will be backfilled with the material derived from the site grading in the next bullet. If additional material is necessary to achieve proper grade, clean fill meeting the TAGM 4046 guidance values will be imported to the site.

4. The site will be cleared of heavy vegetation and graded to allow placement of a cover consisting of either a minimum of 12 inches of clean fill or impervious features such as paved parking areas, walkways, and buildings, as appropriate for the planned development. Any surplus surface soil resulting from the grading will be used as backfill for the excavations in AOC-1 and AOC-2/3. Prior to placement of the clean fill, a geotextile fabric will be placed over the areas of the site to be revegetated to serve as a demarcation layer for any future ground-intrusive activities at the site following development. Additionally, a

vapor barrier and active sub-slab depressurization system will be constructed beneath any future buildings at the site.

5. Since the remedy results in contamination above unrestricted levels remaining at the site, a site management plan (SMP) will be developed and implemented. The SMP will include the institutional controls and engineering controls necessary to (a) address residual contaminated soils that may be excavated from the site during future redevelopment, including soil characterization and, where applicable, disposal/reuse in accordance with NYSDEC regulations, (b) provide for the operation and maintenance of the components of the remedy, including the active sub-slab depressurization systems required during the construction of future buildings, (c) monitor the groundwater, and (d) identify any restrictions of on-site development to recreational or commercial reuse or groundwater use.

6. The SMP will require the property owner to provide an Institutional Control/ Engineering Control (IC/EC) certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department for a period to be approved by the NYSDEC that will certify that the institutional controls and engineering controls put in place are unchanged from the previous certification and nothing has occurred that will impair the ability of the control to protect public health or the environment or constitute a violation or failure to comply with any operation an maintenance or soil management plan.

7. Imposition of an institutional control in the form of an environmental easement that will (a) require compliance with the approved site management plan, (b) limit the use and development of the property to commercial or recreational uses only, (c) restrict use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Dutchess County Department of Health, and (d) require the property owner to complete and submit to the NYSDEC an IC/EC certification on a periodic basis determined by the NYSDEC.

SECTION 9: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the Hudson River Waterfront - DeLaval Property site environmental restoration process, a number of Citizen Participation activities were undertaken to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

1. Repositories for documents pertaining to the site were established.

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

3. A Fact Sheet was sent to the site mailing list announcing the availability of the Proposed Remedial Action Plan and scheduled a public information meeting.
4. A public meeting was held on February 17, 2005 to present and receive comment on the PRAP.

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

TABLE 1
Nature and Extent of Contamination
May 2001 - July 2004

SURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Semivolatile Organic Compounds (SVOCs)	Benzo(a)anthracene	0.14 - 150	0.224	23 of 30
	Benzo(a)pyrene	0.16 - 100	.061	24 of 30
	Benzo(b)flouranthene	0.085 - 180	1.1	18 of 30
	Benzo(k)flouranthene	0.15 - 64	1.1	10 of 30
	Chrysene	0.081 - 130	0.4	21 of 30
	Dibenz(a,h)anthracene	0.1 - .012	0.014	2 of 30
	Flouranthene	.014 - 320	50	2 of 30
	Indeno(1,2,3-cd)pyrene	0.088 - 16	3.2	2 of 30
	Phenanthrene	.013 - 92	50	1 of 30
	Pyrene	0.13 - 260	50	2 of 30
PCBs	Aroclor 1260	0.05 - 3.6	1	3 of 30
Inorganic Compounds (Metals)	Arsenic	4.89 - 24.8	7.5	20 of 30
	Barium	15.1 - 374	300	2 of 30
	Cadmium	0.973 - 8.7	1 or SB (1.93)	25 of 30
	Chromium	5.94 - 627	10 or SB (15.8)	17 of 30
	Lead	22.8 - 908	400	22 of 30
	Selenium	.0602 - 3.2	2	6 of 30
	Silver	0.149 - 240	SB (.117)	12 of 30
	Mercury	0.02 - 1.3	0.1	21 of 30

TABLE 1
Nature and Extent of Contamination
May 2001 - July 2004

SUBSURFACE SOIL	Contaminants of Concern	Concentration Range Detected (ppm)[a]	SCG[b] (ppm)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds	Acetone	0.034 - 3.5	0.200	4 of 22
	Benzene	0.043 - 2.3	0.060	3 of 31
	Chlorobenzene	0.490 - 13	1.7	1 of 29
	Xylene (total)	0.016 - 6.2	1.2	3 of 34
Semivolatile Organic Compounds (SVOCs)	Benzo(a)anthracene	0.13 - 11	0.224	18 of 33
	Benzo(a)pyrene	96 - 14	.061	17 of 33
	Benzo(b)flouranthen	0.077 - 19	1.1	8 of 33
	Chrysene	0.12 - 13	0.4	15 of 33
PCBs	Aroclor-1254	.097 - 11	10	1 of 21
Inorganic Compounds (Metals)	Arsenic	0.306 - 35.5	7.5	12 of 21
	Barium	10.1 - 1,900	300	4 of 21
	Cadmium	0.307 - 21.7	1 or SB (1.93)	11 of 21
	Chromium	4.17 - 1,730	10 or SB (15.8)	13 of 21
	Lead	16.4 - 17,200	400	12 of 21
	Selenium	0.564 - 9.18	2	7 of 21
	Silver	0.206 - 1.13	SB (.117)	7 of 21
	Mercury	0.01 - 1.4	0.1	7 of 21

TABLE 1
Nature and Extent of Contamination
May 2001 - July 2004

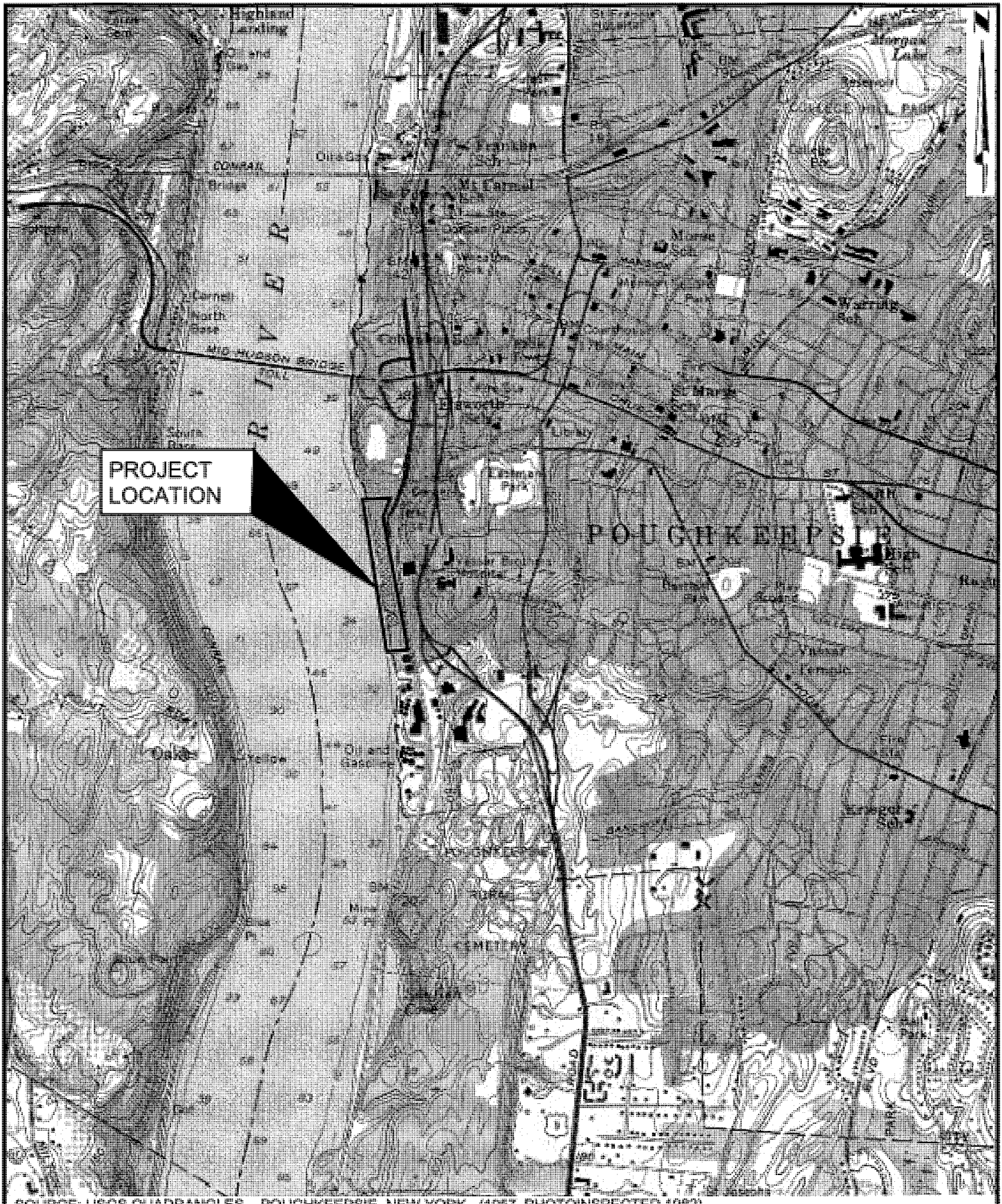
GROUNDWATER	Contaminants of Concern	Concentration Range Detected (ppb)[a]	SCG[b] (ppb)[a]	Frequency of Exceeding SCG
Volatile Organic Compounds	Naphthalene	7 - 79	10	1 of 16
	1,2,4-Trimethylbenzene	5 - 15	5	2 of 16
	1,3,5-Trimethylbenzene	5	5	1 of16
	Xylene (total)	3 - 14	5	3 of 16
	cis-1,2-Dichloroethene	0.77 - 49	5	1 of 10
	Trichloroethene	0.67 - 5	5	1 of 10
PCBs	Aroclor-1260	0.31 - 4.7	0.09	2 of 9
Inorganic Compounds (Metals)	Lead	21 - 39.2	25	1 of 8

[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

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual OM&M	Total Present Worth
No Action	$38,550	$2,000 (30 years)	$70,000
Removal and Disposal of All Contaminated Subsurface Media	$17,330,000	$10,000 (2 years)	$17,350,000
Source Removal, Soil Cover, Bulkhead, and Natural Attenuation.	$7,779,000	$10,000 (10 years)	$7,860,000
Source Removal, Soil Cover, Bulkhead, and Enhanced Biodegradation.	$8,637,000	$10,000 (5 years)	$8,680,000
Source Removal, Soil Cover, Bulkhead, and LTTD	$9,557,000	$10,000 (5 years)	$9,600,000



SOURCE: USGS QUADRANGLES – POUGHKEEPSIE, NEW YORK. (1957, PHOTOINSPECTED 1982).

CLOUGH HARBOUR & ASSOCIATES LLP
III Winners Circle, Albany, New York 12205
www.cloughharbour.com

SCALE: 1"=2000'±

DATE: JANUARY 2005

FIGURE 1

SITE LOCATION MAP

DELAVAL PROPERTY

CITY OF POUGHKEEPSIE
COUNTY OF DUTCHESS, STATE OF NEW YORK

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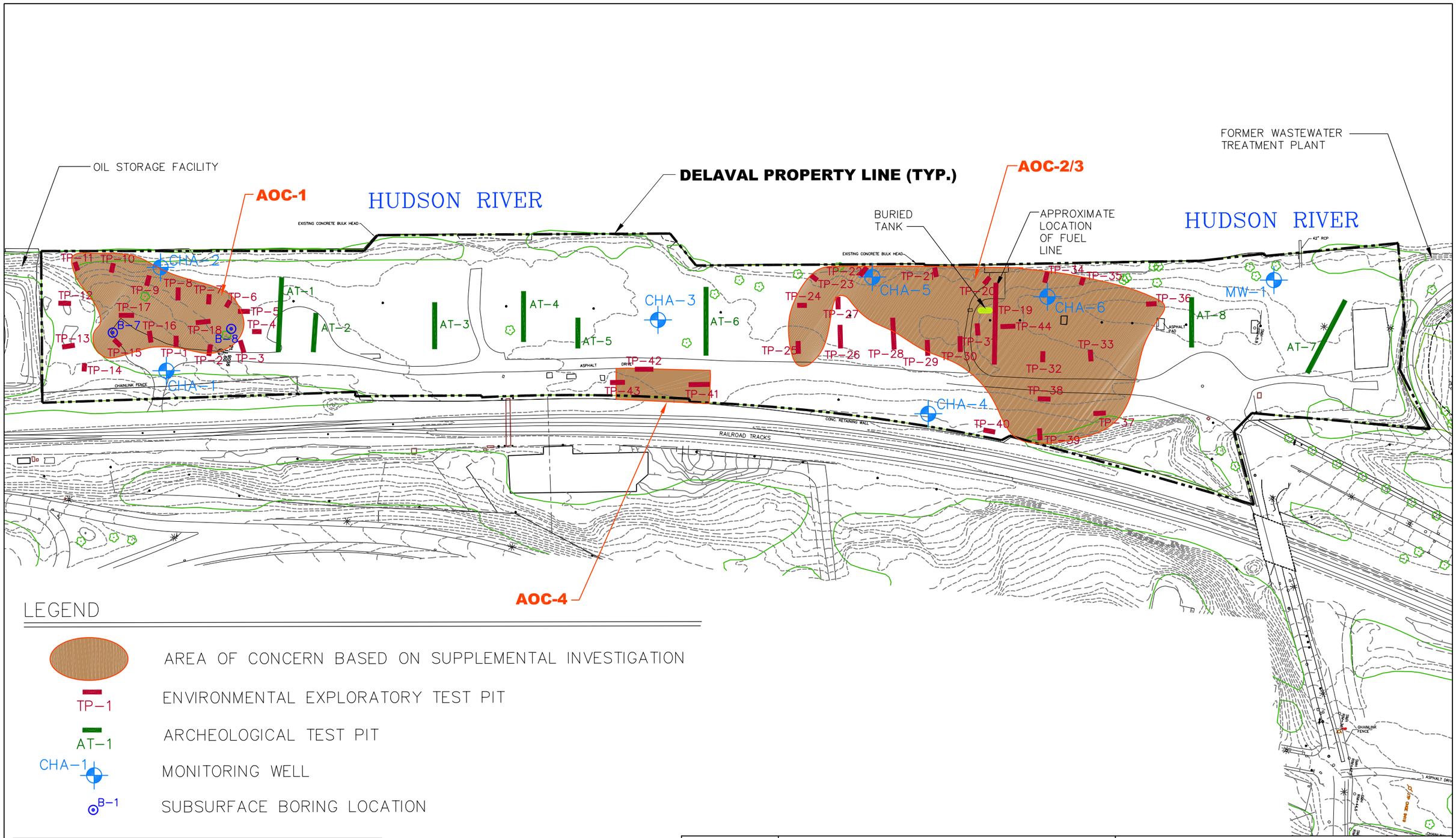

LEGEND

- AREA OF CONCERN BASED ON SUPPLEMENTAL INVESTIGATION
- TP-1 — ENVIRONMENTAL EXPLORATORY TEST PIT
- AT-1 — ARCHEOLOGICAL TEST PIT
- CHA-1 — MONITORING WELL
- B-1 — SUBSURFACE BORING LOCATION

NOTE:

BASEMAP PROVIDED FROM THE CHAZEN COMPANIES (TCC) PHASE SUBSURFACE INVESTIGATION REPORT, DATED MAY 2001.

0 150 300

Scale in feet

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III Winners Circle, PO Box 5269, Albany, NY 12205
www.cloughharbour.com

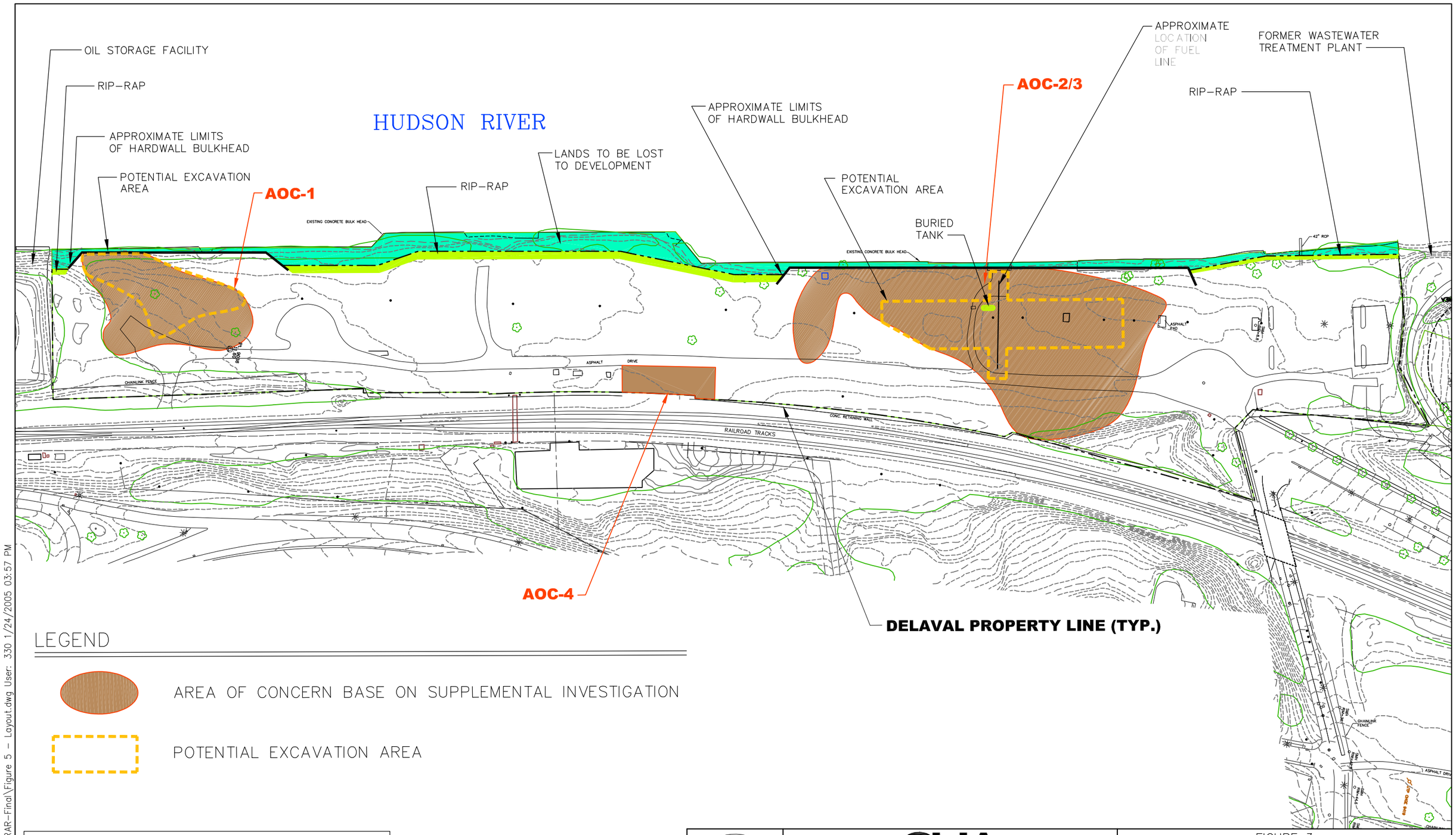
11205.1011.1102

DATE: JANUARY 2005

FIGURE 2

SAMPLE LOCATION PLAN & AREAS OF ENVIRONMENTAL CONCERN

DEVAVAL PROPERTY
CITY OF POUGHKEEPSIE
DUTCHESS COUNTY, STATE OF NEW YORK



LEGEND

AREA OF CONCERN BASE ON SUPPLEMENTAL INVESTIGATION

POTENTIAL EXCAVATION AREA

NOTE:

BASEMAP PROVIDED FROM THE CHAZEN COMPANIES (TCC) PHASE SUBSURFACE INVESTIGATION REPORT, DATED MAY 2001.

0 150 300

Scale in feet

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11205.1011.1102 | DATE: JANUARY 2005

FIGURE 3
AREAS OF ENVIRONMENTAL CONCERN
&
PROPOSED EXCAVATION AREAS
DELAVAL PROPERTY
CITY OF POUGHKEEPSIE
DUTCHESS COUNTY, STATE OF NEW YORK

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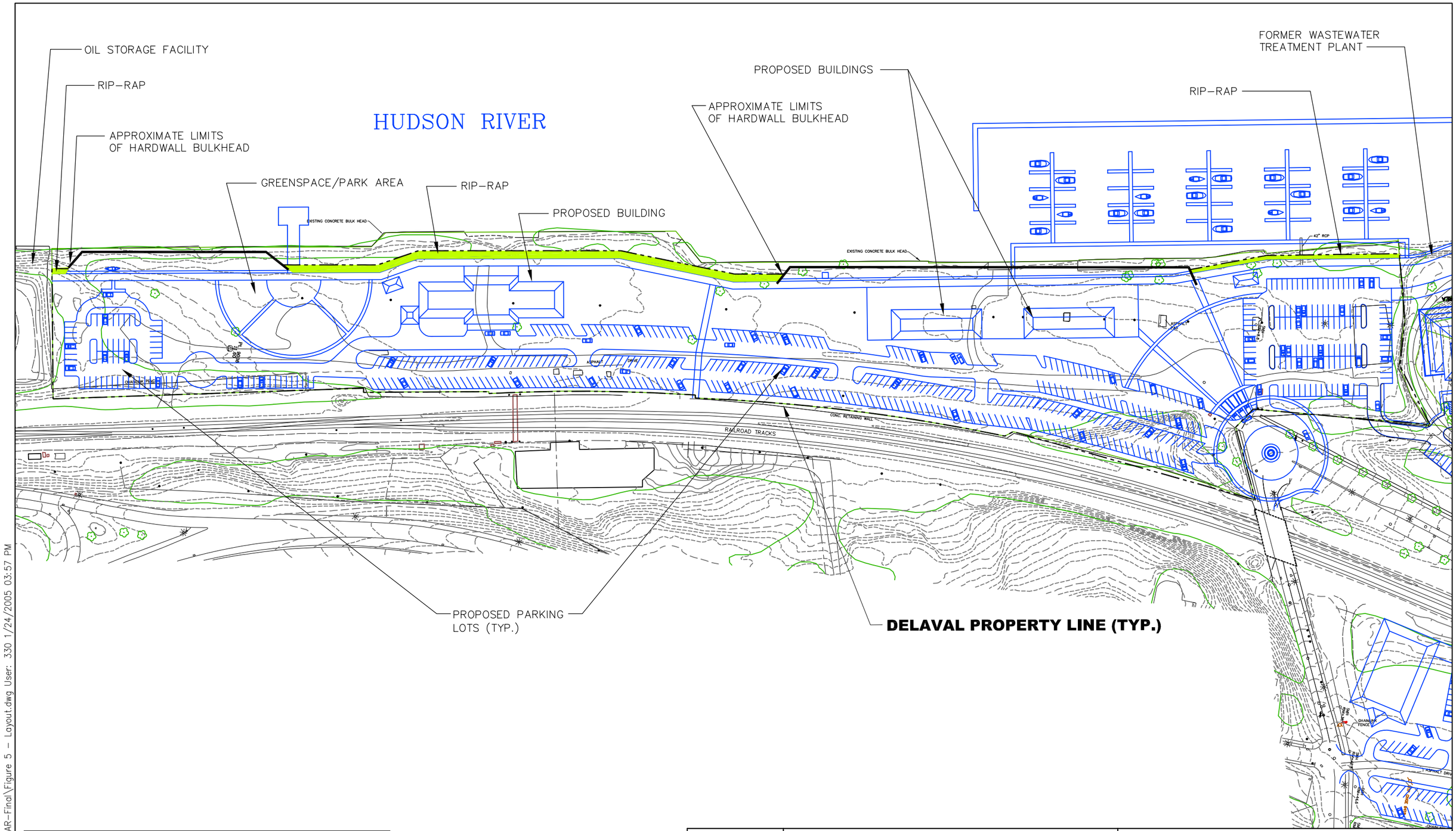

NOTE:

BASEMAP PROVIDED FROM THE CHAZEN COMPANIES (TCC) PHASE SUBSURFACE INVESTIGATION REPORT, DATED MAY 2001.

0 150 300

Scale in feet

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11205.1011.1102 | DATE: JANUARY 2005

FIGURE 4
CONCEPTUAL LAYOUT PLAN
DELAVAL PROPERTY
CITY OF POUGHKEEPSIE
DUTCHESS COUNTY, STATE OF NEW YORK

File: M:\11205\Rpt\RAR-Final\Figure 5 - Layout.dwg User: 330 1/24/2005 03:57 PM

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Hudson River Waterfront - DeLaval Property Environmental Restoration Site
City of Poughkeepsie, Dutchess County, New York
Site No. B00190-3

The Proposed Remedial Action Plan (PRAP) for the Hudson River Waterfront - DeLaval Property site, was prepared by the New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) and was issued to the document repositories on February 1, 2005. The PRAP outlined the remedial measure proposed for the contaminated soil and groundwater at the Hudson River Waterfront - DeLaval Property site.

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

A public meeting was held on February 17, 2005, which included a presentation of the Site Investigation (SI) and the Remedial Alternatives Report (RAR) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. The public comment period for the PRAP ended on March 18, 2005.

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

COMMENT 1: Who prepared the Supplementary Investigation Report and Remedial Alternatives Report, and to whom do they answer?

RESPONSE 1: The City’s consultant, Clough Harbour and Associates, LLP, conducted the studies and prepared the reports. Under the ERP, a municipality typically enters a contract with an environmental consultant to perform the work on their behalf. The NYSDEC provides oversight to ensure the project is completed according to the requirements of the program and prepares and presents the PRAP for public comment.

COMMENT 2: Is the contamination identified in the surface soil samples limited to the Areas of Concern (AOCs) or is it site wide?

RESPONSE 2: Surface soil contamination was detected in excess of the NYSDEC recommended soil cleanup objective concentrations site wide, and the soil cover system will address this.

COMMENT 3: Do the AOCs go to the river bank and if so, were sediments sampled?

RESPONSE 3: AOC-1 and AOC -2/3 extend to the river bank. Sediments were not sampled during any of the investigations, however provisions for additional evaluation have been included in the proposed remedy should evidence of contaminant migration to the river be observed during remedial construction. During the course of the remedial program it will become clear if migration from the AOCs to the river is occuring. However, due to the potential for sediments to have originated from locations beyond the site along the Hudson River or its tributaries, it may be difficult to determine if the site is the source of the contaminants, if present, in samples collected adjacent to the site.

COMMENT 4: How deep were the test pit excavations? How deep were the soil borings?

RESPONSE 4: The test pits were typically excavated to a minimum depth of twelve feet below the ground surface (bgs) unless the groundwater table or large debris (e.g. concrete foundations or bedrock) were encountered at a shallower depth. Some were excavated as deep as nineteen feet bgs. The test pits were six-foot wide trenches that varied in length from six to seventy feet. The borings were advanced to a depth ranging from twelve to twenty feet bgs at which point native materials were typically encountered.

COMMENT 5: It was mentioned that debris was encountered during test pit excavations in AOC-1. Was the debris located below the water table? Will you be digging below the water table during the remedial construction?

RESPONSE 5: Debris in AOC-1 was encountered both above and below the water table. Excavation of grossly contaminated debris and soil will be performed during the remedial construction, below the water table where necessary.

COMMENT 6: What type of time frames can we expect for the ROD, the administrative work to process a City Application, and to get a grant awarded?

RESPONSE 6: The NYSDEC expects to issue the ROD by the end of March 2005. Once issued, the City can apply for the remediation grant which could take several months to be formally approved. However, any costs associated with the remedial efforts incurred after the issuance of the ROD, including remedial design and remedial construction, are eligible for reimbursement

COMMENT 7: What is the time frame to request bids for the remediation work?

RESPONSE 7: A typical remedial design for a site of this complexity takes three to six months to complete. A bid package which includes the plans and specifications would be developed and once advertised, at least 30 days must be allowed for receipt of bids.

COMMENT 8: Please explain the concept of natural attenuation. Does natural attenuation work to reduce the concentration of metals contamination?

RESPONSE 8: Natural attenuation refers to the collective natural processes that continue to break down or otherwise diminish concentrations of organic chemical compounds in soil and groundwater, including volatile organic compounds (VOCs) and some semi-volatile organic compounds (SVOCs). Natural attenuation does not apply to the reduction in concentration of metals contamination.

COMMENT 9: Because of the Hudson River, the issue of groundwater remediation seems complex. Is the site contaminating the river? Would recovery wells have any effect as an additional part of the remedy if the river is actually going back and forth under the site every day?

RESPONSE 9: The assessment of groundwater contamination during the Supplemental Investigation through sampling of monitoring wells, indicated impacts to groundwater at the site are minimal. Given the massive volume of water in the river and low concentrations of contaminants in the groundwater, any analytical results would be insignificant with regard to establishing a contaminant migration link to the site.

The proposed remedy addresses groundwater contamination through the removal of the sources of contamination, with the expected result of diminishing groundwater contamination through natural attenuation (see Response 8) once the primary sources are no longer contributing contaminants to the groundwater system. Due to the close proximity to the river, any groundwater treatment system would likely be overwhelmed by the tidal influences, significantly reducing any effectiveness toward improving groundwater conditions.

COMMENT 10: There is porosity in the existing bulkhead. How do you stop the site from contaminating the river?

RESPONSE 10: As discussed in Response 9, the primary means of reducing contamination to groundwater, which in turn will reduce contaminant migration, is through source removal. The proposed remedy also includes the placement of vinyl sheet piling along the shoreline adjacent to AOC-1 and AOC-2/3. The purpose of the sheet pile is twofold. First, it would be installed prior to the excavation of the grossly contaminated material, providing a barrier to contaminant migration to the river during the disruptive process of source removal. Secondly, the sheet piling will be left in place to prevent future erosion and transport of any residually contaminated soil. With the source material gone, and only residual levels of contaminants remaining, the sheet pile would serve as an engineering control further reducing the potential for contaminant transport.

COMMENT 11: Whether this site is the cause of river contamination or not, why aren't the river sediments tested anyway?

RESPONSE 11: See Response 3.

COMMENT 12: Will the vinyl pile sheeting be able to be driven deep enough into the ground, and do you know if it can stand up to the rigors of winter ice scraping against it year after year?

RESPONSE 12: The vinyl sheet pile will be designed and installed to withstand the rigors of the seasonal changes encountered in the Hudson River. The vinyl material, which has been proposed, has been used elsewhere in similar conditions with favorable results. In fact, vinyl is preferred over traditional steel for achieving a seal and withstanding corrosive environments such as the salinity of the river water. The Site Management Plan that will be developed and implemented as part of the required Environmental Easement for the site will include an inspection of the bulkhead on a periodic basis to ensure continued effectiveness.

COMMENT 13: Why did you reject Alternative 5? I'd rather see the site issues completely redressed.

RESPONSE 13: Alternative 5 differs from Alternative 3 only in that low temperature thermal desorption (LTTD) technology would be used to treat the residually contaminated soil. This would require excavation of the residually contaminated soil, processing it through a LTTD unit brought to the site, and replacing the treated soil back in the excavation. As explained in Section 8 of the PRAP, Alternative 3 is proposed because it would achieve the remediation goals for the site by removing the most-contaminated soils and any existing contaminant source areas, thus eliminating significant threats to human health and the environment. The capping of AOCs would further reduce exposure to any remaining contaminants. While Alternative 5 has the added component of treatment, thus remediating the residual contamination in groundwater and soil faster than Alternative 3, the risks presented by any residuals (under Alternative 3) would not be considered very high and could be avoided by taking the proper precautions. Therefore, there would be no significant benefit to incurring the extra costs associated with Alternative 5.

COMMENT 14: How will contaminated material be handled and removed from the site. How will you handle potential community exposures during remedial construction?

RESPONSE 14: These issues will be addressed in detail in the Remedial Design for the site. Materials are handled so that contamination is contained during excavation and transportation to an approved disposal facility, possibly employing methods such as lining a temporary staging area to prevent contact with the surrounding ground surface and the use of lined and covered trucks. All equipment would be decontaminated prior to leaving the site to travel on public roads.

The site Health and Safety Plan will include requirements to monitor fugitive vapors and dust (particulates) at the work site to ensure there are no exposures to the surrounding community. This plan will include a Community Air Monitoring Plan. Action levels will be developed which would trigger additional engineering controls such as wetting the soil or stopping work until more favorable conditions are present to accomplish the work safely.

COMMENT 15: How are particulates monitored during construction activities? What are the protocols?

RESPONSE 15: Air monitoring for both vapors and particulates is performed at upwind and downwind locations and compared to assess if the construction activities are causing potential airborne migration of contaminants. Protocols for monitoring can be found in the New York State Department of Health's Generic Community Air Monitoring Plan (CAMP), which is included as Appendix 1A of the NYSDEC DRAFT DER-10 Technical Guidance for Site Investigation and Remediation (DER-10). The generic CAMP can be modified for site specific conditions. DER-10 is available for review on the NYSDEC website at http://www.dec.state.ny.us/website/der/guidance/der10dr.pdf. The provisions of the CAMP will be included in the site Health and Safety Plan.

COMMENT 16: Is the material to be removed from the AOCs below groundwater?

RESPONSE 16: See Response 5. Similar conditions exist in AOC-2/3. Much of the grossly contaminated material is associated with petroleum wastes which tend to float on the water table. As the tide cycle causes the water table to fluctuate, so does the floating waste petroleum, impacting material within the zone of high and low water table through direct contact. Construction activities will, to the extent possible, be performed to coincide with periods of low tide to reduce the necessity to excavate significantly below the water table.

COMMENT 17: Has a contractor been selected to perform the remedial action? What is the selection process.

RESPONSE 17: The remedial design for the project will result in the development of a bid quality set of contract plans and specifications to perform the work. At that point, the City will advertise for bids through publishing a notice of the proposed project in the local and regional newspapers and in publications with statewide circulation to get the best possible response. The bids will be reviewed by the City and NYSDEC. The lowest responsive responsible bidder will then be offered a contract to perform the work.

COMMENT 18: What happens if, during the remediation/excavation, you discover other trouble spots or that the contamination is worse than you expected?

RESPONSE 18: The remedial approach will be implemented as conceptually described in this document. Construction will proceed until all the goals of the remedy are met. If conditions encountered during construction indicate an AOC is larger than expected and there is a need for additional sheet pile bulkhead, it will be installed. If the volume of contaminated material requiring excavation and off site disposal is greater than anticipated, the excavation will expand as necessary to ensure complete removal. The characterization and estimation of volumes provided in the RAR and PRAP are to provide a basis for comparison of remedial alternatives and a basis for unit pricing during the bidding process. The estimates are not to place limits on the amount of work authorized to perform the cleanup of the site.

COMMENT 19: How did you come up with the figures for the cost of the remediation?

RESPONSE 19: Cost estimates are developed based on current rates for construction, transportation, disposal, etc. and used in a comparative analysis for each remedial alternative. The volumes of material for these estimates are derived from the site investigation data and consistently applied to each remedial alternative to provide a fair comparison. The resulting cost estimate is just that, an estimate, that will likely change depending on the bids received and the actual amount of work necessary to complete the project.

COMMENT 20: Don't you eliminate competitive bidding if you say what the cost is going to be before the bids go out?

RESPONSE 20: No. As discussed in Response 19, the costs are simply estimates at this point. The contract plans and specifications will break the project down into detailed components for the remedial project that will require a bidding contractor to provide unit costs for each component.

COMMENT 21: I'm very concerned about the mobile contaminants at the bulkhead and their effect on our community's water supply. Why don't you replace the entire bulkhead with vinyl sheeting rather than just the sections you are proposing?

RESPONSE 21: There are some contaminants associated with the site that are considered mobile, others that are not. The City’s water supply intake is located about 1.75 miles north of the site, extending 1000 feet off shore at a depth of approximately 50 feet. Given the location of and distance to the water intake, there is little if any possibility the supply is threatened by the contaminants identified at the site. The remedy, when implemented, will further eliminate any potential for exposure to site related contamination. In general, mobile contaminants include the petroleum wastes that can potentially migrate on their own as a non aqueous phase liquid (NAPL) or partially dissolve in groundwater. These contaminants have been identified in AOC-1 and AOC-2/3. The contaminants that tend to bind to soil particles, including the polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs),

and metals are not considered to be mobile as they do not exist as a NAPL or dissolve readily in groundwater. These contaminants were found to exist in the subsurface in AOC-1 and AOC-2/3 and more widespread at lower concentrations in surface soil across the entire site.

AOC-1 and AOC-2/3 have the vinyl sheet pile proposed as an essential component of the remedy due to the potential for encountering mobile petroleum wastes in those areas, as discussed in Response 10. The remaining areas of the site near the shoreline have been found to either have no impacts or contain low level surface soil contamination, which will be addressed with the minimum 12 inches of clean soil cover over the entire site component of the remedy. Installation of the vinyl sheet pile bulkhead beyond the proposed limits for remediation purposes is not warranted at this time. If it is found during the design or construction that an AOC extends further than expected, an extension of the vinyl sheet pile bulkhead will be considered.

One of the remedial goals for this site is to eliminate or reduce to the extent practicable the possible migration of contamination to off-site media, notably the Hudson River's water and sediments. Based on the evaluation of remedial alternatives, it is expected that the proposed remedy will achieve this goal.

COMMENT 22: The Environmental Restoration Program (ERP) is for the rehabilitation of public land. How can you spend ERP money on this site, since we know the City is giving the land to a developer? Aren't you just giving state money to a developer?

RESPONSE 22: The site is currently owned by the City of Poughkeepsie. It is understood that their plans include redevelopment of the property through a long term lease to a private developer. Under the ERP, if a municipality sells or leases a property, the proceeds are to be distributed as follows: 1) the municipality retains the amount is has spent for acquisition of the property (including back taxes owed) and its share of the Environmental Restoration Project. 2) The State is reimbursed for funds it has provided under the State Assistance Contract. 3) The municipality keeps the remainder.

COMMENT 23: I'm concerned that there hasn't been an archeological assessment of the cove area, adjacent to the Former City of Poughkeepsie Sewage Treatment Plant site. This area was filled in 1804, and could have significant information or artifacts to uncover.

RESPONSE 23: Archeological studies have been performed at both the Hudson River Waterfront - DeLaval Property site and the Former City of Poughkeepsie Sewage Treatment Plant site, an adjacent Brownfield Cleanup Program site, in compliance with the State Environmental Quality Review (SEQR) requirements for the overall redevelopment project being conducted by the City of Poughkeepsie.

COMMENT 24: Please explain whether the areas to be covered will be covered with soil or asphalt. Is the cost presented for Alternative 3 for soil only or would it include asphalt?

RESPONSE 24: The purpose of the minimum 12 inch soil cover to be placed over the entire site is to prevent direct contact with contaminated surface soil. To accomplish this goal, the soil cover can be substituted with alternative durable material such as asphalt or concrete. Cost estimates have been derived on the assumption that only soil would be used, however if the development of the site includes asphalt for parking and walkways, then the soil cover could be substituted in those areas. The reimbursement of costs to cover those areas would be based on whichever material costs less.

COMMENT 25: The cost difference between Alternatives 3 and 4 is about $1 million. From a remediation standpoint, what does the extra million dollars bring in terms of the effectiveness of the remedy? Would it impact the time for the remedy to work?

RESPONSE 25: As discussed in Section 8 of the PRAP, the effectiveness of Alternatives 3 and 4 are essentially the same. Alternative 4 may remediate the residual contamination in groundwater and soil faster than Alternative 3, however the risks presented would not be considered very high and could be avoided by taking the proper precautions. Therefore, there would be no significant benefit to incurring the extra costs associated with Alternative 4.

COMMENT 26: Please explain where the demarcation barrier will be used.

RESPONSE 26: A demarcation barrier will be placed beneath the minimum 12 inch soil cover to serve as an indicator to future workers such as landscapers, that they are at the interface between clean soil cover and potentially contaminated soil. There will be no need for a demarcation barrier beneath paved areas as it is anticipated any work breaching the pavement would require permits from the City. It will be the City's responsibility to ensure the Site Management Plan is followed.

COMMENT 27: What is the demarcation barrier made of?

RESPONSE 27: A demarcation barrier can be a landscaping filter fabric, plastic snow fence, etc. The only requirement is that it is placed continuously over the affected area and is easily recognizable.

COMMENT 28: At the time of the Draft Environmental Impact Statement, the estimated costs for the Hudson River Waterfront - DeLaval Property site remediation was about $1 million. What has happened since then to make the cost so much more now?

RESPONSE 28: The Supplemental Investigation identified more contamination in the form of grossly contaminated soil and debris in AOC-1 and AOC-2/3 including an the abandoned underground storage tank (UST), as well as confirmed widespread surface soil contamination. These two developments have resulted in higher remediation costs primarily due to the need for the sheet pile bulkhead to protect the Hudson River and the need for a minimum 12 inch soil cover over the entire site. There are also increased costs associated with removing the UST and the increased volume of contaminated soil and debris that will require off site disposal.

COMMENT 29: In Figure 4 of the PRAP, you have a "Concept Plan" for the site. When was that plan decided upon?

RESPONSE 29: The concept plan in Figure 4 was provided by the City as a possible use for the property once remediated, but has not been finalized. With the exception of whether an area is to be covered with a minimum 12 inch soil cover or pavement, the redevelopment plans have little impact on the selection of site remedy. The remedial design, however, will take into account the redevelopment plans which are expected to be finalized prior to remedial construction.

COMMENT 30: To move from investigation to remediation, shouldn't there be a SEQR step? When does that happen?

RESPONSE 30: Yes, compliance with SEQRA must be demonstrated at the time of application for the remediation grant. Compliance with the SEQRA is demonstrated by providing a negative declaration, or in the event an environmental impact statement was prepared, a Findings Statement, with the application. If the environmental assessment results in a negative declaration, SEQRA responsibilities end notwithstanding appropriate publication requirements. If a positive declaration is issued by the lead agency, then a Final Environmental Impact Statement and Findings Statement must be prepared before the action can go forward and before NYSDEC can approve the application. SEQRA determinations (negative declaration or findings statement) must be submitted as part of a complete application.

COMMENT 31: If the property is leased afterwards, how does that effect the 90%-10% split for funding?

RESPONSE 31: See Response 22.

COMMENT 32: It seems that the remedy will just encapsulate the site and leave the remaining problems of the bulkhead.

RESPONSE 32: The residual contamination at the site will, in effect, be encapsulated or contained by the sheet pile bulkhead and clean soil cover. Remediation of the

site will result in the removal of portions of the existing bulkhead adjacent to AOC-1 and AOC-2/3, to be replaced with the vinyl sheet pile bulkhead. Redevelopment plans include the removal of the remaining portions of the existing bulkhead to be replaced with a "soft" shoreline consisting of rip-rap. It should be noted that the rip-rap in these areas is not part of the proposed remedy and would not be considered an eligible cost under the ERP.

COMMENT 33: Doesn't the DEC's Estuary Program prefer a "softer" shoreline on the Hudson River and not a bulkhead?

RESPONSE 33: As discussed in Response 32, a rip-rapped shoreline is planned as part of the redevelopment of the site.

COMMENT 34: Please provide a better sense as to what is meant by gross contamination? What are the thresholds? How will it be determined when to stop removing the effected media?

RESPONSE 34: Grossly contaminated media means soil, fill or debris, sediment, surface water or groundwater which contains free product or mobile contamination that is identifiable either visually, through strong odor, by elevated contaminant vapor levels or is otherwise readily detectable without laboratory analysis. Excavations to remove grossly contaminated media for off-site disposal will continue until the free product or mobile contamination is no longer observed using the above criteria.

COMMENT 35: I read that there is new legislation which can provide community groups with technical assistance or grants in situations like this. Does that provision apply to the ERP program, and if so, how would we proceed to get such assistance?

RESPONSE 35: The reference is to Technical Assistance Grants (TAGs). TAGs are not available under the ERP.

In a letter dated March 18, 2005, Mr. Basil Seggos of Riverkeeper, submitted comments on the PRAP. The letter contained several numbered, multipoint comments on the PRAP. The comments, followed by the State's response to each point, are provided below. The letter has been included in the Administrative Record.

COMMENT 36: **The PRAP does not specify the Standards, Criteria, and Guidance (SCGs) for this project**. Pursuant to the programs regulations at §375- 1.10 (1)(i), a site's remediation plan must be designed so as to conform to standards and criteria that are generally applicable, consistently applied, and officially promulgated, that are either directly applicable, or that are not directly applicable but are relevant and appropriate, unless good cause exists why conformity should be dispensed with. The PRAP indicates, "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." But, the PRAP does not specify relevant and appropriate guidance.

Further, the PRAP does not mention those standards and criteria that are directly applicable, and others that are relevant and appropriate for this site. In addition, it does not explain whether "good cause" exists to dispense them. This is vital information needed for the public to comment on the PRAP. The regulations also require that consideration be given to guidance determined to be applicable on a case-specific basis. But, the relevant guidance and how it was applied to this project was not offered for public comment. This is also necessary to understand the PRAP.

RESPONSE 36: Section 5.1 of the PRAP provides a detailed list of the SCGs applicable to this project. Specifically, 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. The soil SCGs are based on the NYSDEC "Technical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels". Compound specific SCG values are provided for each of the impacted media at the site in Table 1 of the PRAP.

COMMENT 37: **The remedy selection is inadequate**. Programs regulations at §375-4.8 (c) instruct DEC Staff to select the property's remedial action "upon due consideration of the factors set forth in sections 375-1.10(c) (1) to 375-1.10(c) (7), inclusive, with the goal of the remedial action being described in section 375-1.10(b) ." These factors include:

- Overall protectiveness of public health and the environment.
- Short-term effectiveness.
- Long-term effectiveness.
- Reduction of toxicity, mobility, and volume with treatment. A site-specific remedy that permanently and significantly reduces the volume, toxicity, and/or mobility of the hazardous wastes and/or constituents thereof is to be preferred over a remedy that does not do so.
- Feasibility. A feasible remedy is one that is suitable to site conditions, capable of being successfully carried out with available technology, and that considers, at a minimum, implementability and cost-effectiveness.
- Community acceptance.

At this juncture, in light of the department's failure to provide standards, criteria and guidance for the clean-up, the remedy selection is unsupported.

Moreover, the proposed remedy to remove just the "grossly contaminated" material from four specific areas is inadequate to properly protect public health and the environment. The PRAP defines "grossly contaminated soil" as "any

soil that contains free product or mobile contamination that is identifiable visually, through odor, by elevated contaminant vapor levels, or is otherwise readily detectable." However, such definition is not supported in the law or the regulations. The Department must provide the appropriate regulatory authority that allows for removal of only "grossly contaminated" material and explain the justification for removing only "grossly contaminated" material.

RESPONSE 37: It should be noted that the PRAP is a summary document of the SI/RAR. The RAR contains a detailed presentation of the remedial goals for the project, the remedial alternatives, the evaluation criteria by which those alternatives are compared, and the detailed analysis that results in the proposal of the remedy. In order for a remedy to be considered, it must satisfy the first two evaluation criteria, or threshold criteria. Those criteria are: 1) Protection of Human Health and the Environment, and 2) Compliance with New York State Standards, Criteria, and Guidance (SCGs). Alternatives 2 through 5 presented in the PRAP satisfy the threshold criteria.

During the test pit excavation and soil boring investigative phases of the project, several areas of grossly contaminated media, primarily consisting of petroleum saturated or stained soil and debris, were encountered and delineated. Because the gross contamination was readily recognizable as free product and a potentially mobile source of contamination to surrounding environmental media, collection of samples for laboratory analysis was not necessary for confirmation. All areas of gross contamination were within the AOCs. The AOCs identified at the site were defined based on the observed gross contamination areas as well as analytical results of environmental samples collected during the investigation. These samples were selected for analysis because they did not contain gross contamination and were used to further expand the boundaries of the AOCs based on exceedances of the SCGs. The remedial approach of removing the grossly contaminated material is targeted at eliminating the mobile sources of contamination and required by draft DER-10. While the remedy may result in soil that exceeds the SCGs remaining within an AOC, the analytical data indicates the contaminant concentrations at those locations will be effectively addressed through the containment components of the sheet pile bulkhead and minimum 12" soil cover.

DER-10 Section 5.1 (e) states:

> Free product determined to be present is to be treated or removed when practicable, or contained when treatment or removal are not practicable. Decisions regarding the practicability of addressing the above will be made by the DER on a case by case basis.

The removal of grossly contaminated soil from specific areas is one of several components comprising the proposed remedy, which when combined provide a remedy that is protective of human health and the environment.

COMMENT 38: **Public hearing**. Riverkeeper's position is that the department must provide further information on the PRAP and hold the public hearing for a complete record before making a final determination on the remedial action. Programs regulations at §375-4.8 (c) required DEC Staff to hold a public hearing on the proposed remedial action "[i]f those who submit comments are members of the affected community and raise significant substantive issues on the proposed remedial action plan." We believe that Riverkeeper on behalf of its local members and other local environmental interests have raised significant substantive issues of the PRAP and, therefore, a public hearing must be called.

The regulations (§375-4.8 (c)) authorize the department to select a remedial action different from the one originally proposed, based upon reconsideration of the original proposal after evaluation of comments received, if any, and after further reflection. We urge the Department to consider Alternative 2: Removal and Disposal of All Contaminated Subsurface Media.

RESPONSE 38: The site documents, including the RAR and PRAP have been available for a 45 day public comment period, during which a public meeting was held to present the proposed remedy and accept questions and comments. Numerous questions and comments were received during the comment period, as addressed in this Responsiveness Summary, however there were no concerns or new information that provide cause for a re-evaluation of the remedial alternatives.

The detailed analysis of the remedial alternatives revealed that Alternative 2 would not result in any significant benefit over Alternatives 3, 4, and 5. While it would result in a greater reduction in the volume of contaminants, the difficulties in implementation, the potential short term adverse impacts during construction, and the nearly $10 million increase in cost compared to Alternative 3, all led to Alternative 3 being the preferred remedy over Alternative 2.

In a letter dated March 21, 2005, Mr. Rich Schiafo of Scenic Hudson, Inc. submitted comments on the PRAP. The letter contained several numbered, multipoint comments, grouped by topic, on the PRAP. The comments, followed by the State's response to each point, are provided below. The letter has been included in the Administrative Record.

COMMENT 39: **Cleanup goals.** Specific cleanup goals are not articulated in the PRAP. The PRAP indicates, "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." The PRAP, however, does not specify relevant and

appropriate guidance. Hence, it would be assumed that the standards being alluded to are, in part:

- Technical and Administrative Guidance 4046 Soil Cleanup Objectives
- PCB cleanup criteria in 40 CFR Part 76 1
- ambient groundwater quality standards

We would urge the Department to clearly define cleanup levels for contaminants of concern. The cleanup goal for PCBs in surface soils should be 1 ppm and 10 ppm for subsurface soil. In addition, since the site is made up largely of fill, the cleanup objectives for the semivolatile organic compounds (polycyclic aromatic hydrocarbons) and the metals should be more clearly spelled out. The cleanup goal for lead should be no greater than 400 ppm. Specific cleanup levels should also be identified for other metals. Has the department identified background levels for the site? The final remedy should provide assurance that specific cleanup levels can be met.

The proposed remedy does not meet the remediation goals as outlined in the PRAP, particularly concerning groundwater contamination, contaminated vapor intrusion and protection of the Hudson River's water and sediment.

RESPONSE 39: Section 5.1 of the PRAP provides a detailed list of the SCGs applicable to this project. Specifically, 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. The soil SCGs are based on the NYSDEC "Techical and Administrative Guidance Memorandum (TAGM) 4046; Determination of Soil Cleanup Objectives and Cleanup Levels".

Compound specific SCG values are provided for each of the impacted media at the site in Table 1 of the PRAP. The SCGs (cleanup levels) provided in Table 1 for PCBs are 1ppm for surface soil and 10ppm for subsurface soil, and for lead the SCGs are 400ppm for both surface and subsurface soil. If a compound or metal is not shown in Table 1, it is because it was not detected above the SCGs for a specific media. Metals results are typically compared to the concentrations in background samples collected from a nearby, up-gradient site where the suspected impact is minimal. In the case of the Hudson River Waterfront - DeLaval property site, the adjoining properties are known to be impacted. The sample collected in the northeast corner of the site (SS-29) had no detectable concentrations of SVOCs or PCBs, and the metal concentrations in this sample were either near or below the Eastern Background Concentrations. Therefore, the metal concentrations detected in surface soil sample SS-29 were considered to represent "background" conditions and used as a basis of comparison.

The remediation goals for this site, as detailed in Section 6 of the PRAP, are expected to be met by the proposed remedy. Note that the PRAP includes

provisions for further evaluation if evidence of off site impacts is observed during construction, as well as provisions for the installation of a sub-slab depressurization system beneath any future structures build on the site.

COMMENT 40: **Proposed Remedy.** As indicated in the PRAP - petroleum-related VOC's, PAHs and metals contamination are found throughout the site. "Metals contamination was also identified in a majority of the surface soils collected from the DeLaval property." The proposed remedy to remove 12,900 cubic yards of "grossly contaminated" material from four specific areas is inadequate to properly protect public health and the environment.

The PRAP defines "grossly contaminated" soil as "any soil that contains free product or mobile contamination that is identifiable visually, through odor, by elevated contaminant vapor levels, or is otherwise readily detectable." "Most of the subsurface soil identified as requiring remediation... was based on observations." Can the Department please provide the justification for removing only "grossly contaminated" material? In addition, please provide the appropriate regulatory authority or 'guidance' that allows for removal of only "grossly contaminated" material.

We urge the Department to choose the more comprehensive remedy identified in the PRAP - Alternative 2: Removal and Disposal of All Contaminated Subsurface Media. All contaminated soils (86,600 cubic yards) exceeding State Standards, Criteria and Guidance (SCG's) would be removed under this alternative providing a more long-term and far-reaching solution to the problem.

If DEC deems that removal of all 86,600 cubic yards is not feasible and/or cost-prohibitive, we would urge the Department to consider a remedy that is more comprehensive and protective than the one proposed. Removing contaminated material based on visual inspection is unacceptable.

RESPONSE 40: In order for a remedy to be considered, it must satisfy the first two evaluation criteria, or threshold criteria. Those criteria are: 1) Protection of Human Health and the Environment, and 2) Compliance with New York State Standards, Criteria, and Guidance (SCGs). Alternatives 2 through 5 presented in the PRAP all satisfy the threshold criteria. The detailed analysis of the remedial alternatives revealed that Alternative 2 would not result in any significant benefit over Alternatives 3, 4, and 5. While it would result in a greater reduction in the volume of contaminants, the difficulties in implementation, the potential short term adverse impacts during construction, and the nearly $10 million increase in cost compared to Alternative 3, all led to Alternative 3 being the preferred remedy over Alternative 2.

Also see Response 37.

COMMENT 41: **Cover.** Areas of this site may require more that 12 inches of clean fill. We urge the Department to explore using additional cover. The use of the geotextile fabric as a demarcation layer is an important aspect to this remedy and should be used wherever clean fill cover is used.

We also urge the DEC to use only clean fill as backfill and would suggest that soil generated elsewhere on the site not be used as backfill during final grading activities.

RESPONSE 41: The proposed remedy includes a minimum 12 inch clean soil cover to be placed over the entire site with a demarcation barrier immediately beneath it. Only clean fill, certified to meet TAGM 4046 guidelines will be used for the soil cover. Soil generated elsewhere on site will be used as backfill for the excavations from the removal of grossly contaminated soil and will be below the demarcation barrier and clean soil cover. Also see Responses 24 and 26 above.

COMMENT 42: **Residual Contamination.** The proposed remedy would leave behind significant contamination that is likely to continue to present a public health and environmental threat. We are concerned that residual PCBs, arsenic, lead, mercury and PAHs will continue to exceed cleanup standards. Due to the significance of residual contamination, the public health and environmental impact of residuals must be addressed in a quantitative way.

RESPONSE 42: The proposed remedy is a containment remedy with source removal that includes components to eliminate exposure pathways. Also see Response 21 above.

COMMENT 43: **Groundwater.** The proposed remedy lacks a groundwater component. The PRAP clearly indicates that the groundwater is contaminated. "Black groundwater with a moderate to strong petroleum odor and with a sheen on the surface was encountered in a number of the test pits in AOC 213."

The sheen on the water surface is a violation of the New York State Ambient Water Quality Standards (6NYCRR Part 703.2).

It appears groundwater treatment is warranted. At the very least, a long-term monitoring program should be established to stay aware of the groundwater problem and its potential to move through this site and off-site.

RESPONSE 43: Any contaminated groundwater or groundwater containing a sheen or product will be addressed during the removal of grossly contaminated media. Since the remedy results in contamination above unrestricted levels remaining at the site, a site management plan (SMP) will be developed and implemented, as discussed in Section 8 of the PRAP. The SMP includes groundwater monitoring. Also see Responses 9 and 10 above.

COMMENT 44: **Handling and Processing of Soils**. It appears that the land-based actions will require some handling and processing of materials. The PRAP does not discuss the handling and processing of contaminated materials. It is assumed this will be part of remedial design. All contaminated materials should be handled in a way that is protective of public health and the environment.

Appropriate controls should be put in place to control dust and the potential loss of contaminants to the air. Containment should occur during excavation of soils. Storage and transportation systems and equipment should be enclosed to minimize unnecessary release of contaminants into the environment during the remediation process. Containment and air protections can include simple cover such as tarping, evacuating trapped air, using negative pressure in storage buildings and running air through filters before it is released.

The public should be given more information regarding the handling and processing of contaminated and treated material.

RESPONSE 44: All points raised under this topic will be addressed during the remedial design. Also see Responses 14 and 15 above.

COMMENT 45: **Institutional Controls**. The institutional controls identified do not appear comprehensive and adequate, however the monitoring, maintenance and enforcement of these controls will dictate their value. Therefore, the annual certification of these controls, including deed notices, access controls and long term monitoring, is imperative and we urge the Department to work closely with the City to see that these controls are strictly enforced.

An institutional control should be added to the existing proposal to assure the protection of the bulkhead against damage from berthing vessels. This should be handled in the design and a prohibition be made against berthing of vessels which could exert forces or stresses during storms that exceed the design parameters.

RESPONSE 45: As stated in Section 8 of the PRAP, an institutional control in the 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 or recreational uses only, (c) restrict use of groundwater as a source of potable or process water without necessary water quality treatment as determined by the Dutchess County Department of Health, and (d) require the property owner to complete and submit to the NYSDEC an IC/EC certification on a periodic basis determined by the NYSDEC will be implemented.

COMMENT 46: **Remedial Design**. We strongly urge the Department to keep the process open and transparent during the remedial design and implementation phase so that all stakeholders can stay informed and continue to have input into this remedy.

We request that the Department identify public input opportunities in the remedial design process that clearly articulate the role the public can play in shaping the remedy.

RESPONSE 46: The remedial design will be made available to the public.

COMMENT 47: **Recommendations for Remedial Design.** The remedial design phase evaluation should include but not be limited to:

a) Design of backfill of excavated areas to prevent "holes" from becoming "sinks" for residual contaminants.

b) Evaluation of the impact of residuals on uptake by local biota and consumption by humans and wildlife.

RESPONSE 47: The backfill materials and placement procedures will be addressed in the remedial design. Additionally, the periodic inspection and certification required in the environmental easement will identify any problems should they occur.

The impact of residual contamination is addressed through the elimination of exposure pathways. Also see Response 21 above.

COMMENT 48: **Additional Sampling**. The PRAP indicates that visual observation will be the primary way that "grossly contaminated soils" will be removed. We strongly urge that additional sampling be conducted during remedial design to verify the remedy and resolve uncertainties and that visual observation not be relied upon.

Additional data is also necessary to analyze the potential impacts of residual contamination and to better understand the data that should be collected during a post-construction phase monitoring program.

Additional contaminant data is necessary to analyze the potential impacts of residual contamination and to better understand the data that is to be collected during the post-construction phase monitoring program, including sediment, biota and surface water data.

Additional sampling should be done based on the possibility that soil generated elsewhere on the site may be used as backfill during final grading activities.

RESPONSE 48: The points raised under this topic will be addressed during the remedial design, which may include a pre-design study to better delineate the volume of soil to be removed and the availability of on-site soil suitable for use as backfill.

COMMENT 49: **Monitoring and Maintenance**. Construction phase and post-construction phase monitoring are very important. The PRAP does not clearly indicate how long a monitoring and maintenance would be required. Due to the contamination that may remain at this site we would urge the Department to require a minimum of a 30-year monitoring and maintenance program. If after 30 years, data reveals that site contamination persists, the monitoring and maintenance program should be extended for a longer period of time.

Important issues during the construction phase are:

a) Airborne exposure by contaminated dust, which should be mitigated by the cover. A comprehensive community air monitoring program should be set up during design and implementation. Monitoring during design will establish a baseline for assessing impacts during remediation.

In addition, the Community Health and Safety Plan should set up a mechanism for keeping the community informed about health and safety issues such as air quality during the construction and implementation of the remedy.

b) Other community issues such as noise, odor, and traffic should also be part of the Community Health and Safety Plan (CHASP). We urge the Department to involve the community in the development of the CHASP.

c) Discharges to the river. Every effort should be made to minimize release to the river during both remedial actions. There should be baseline, short term and long term monitoring of both the fill and in the river of all contaminants of concern to assess containment.

RESPONSE 49: Monitoring requirements will be detailed in the environmental easement, which will be included with the deed to the property. Periodic evaluation of the monitoring will be performed and the requirements modified accordingly, based on the results.

Extensive efforts, including the placement of the vinyl sheet pile bulkhead, will be made to ensure there are no releases to the river during construction. Monitoring will be conducted at this time. If a release is detected, mitigative measures will be employed as required. Also see Responses 14 and 15 above. Details will be provided in the remedial design.

COMMENT 50: **Long-term Monitoring.** If the Department moves forward with this cleanup as is proposed and significant contamination is left in place, such residual contamination must be monitored. The details of the Department's approach to periodically evaluating the short and long-term impacts of residual contamination are lacking, as is an assessment of cleanup goals. The goals of the cleanup, the design of the cleanup, and the elements of a long term

monitoring program need to be clearly articulated to ensure success of remediation. We urge the Department to do this with considerable public input.

In addition, the details of the Department's approach to establish a long-term monitoring program for groundwater is lacking. These details must be clearly and specifically identified. Again, we urge the Department to do this with considerable public input.

Due to the groundwater and other contamination that may remain at this site, we would urge the Department to establish a minimum of a 30-year monitoring and maintenance program. If after 30 years, data reveals that groundwater contamination persists, the monitoring and maintenance program should be extended for a longer period of time. Monitoring data should be readily available to the public.

If the Department moves forward with this cleanup as is proposed and contamination is left in place, we urge that the Department allow for the possibility that a future remedy may prove to be more effective.

RESPONSE 50: See responses 43 and 49.

If the long-term monitoring indicates that the remedy is not effective, modifications to the remedy may be considered at that time.

COMMENT 51: **Soil Gases.** The PRAP indicates that a survey was done and found that there is no active methane gas in the vicinity of the landfill. This survey for methane gas however, is inadequate.

As you are aware, the Department currently has out for public review and comment a soil vapor guidance document. It appears this proposed guidance was not used to examine this site. We urge the Department to scrutinize the DeLaval property based on the proposed soil vapor guidance to better understand current and potential exposures to contaminated subsurface vapors and to determine actions that may be necessary to prevent or mitigate exposures and to remediate vapor contamination.

RESPONSE 51: As part of the SMP, sub-slab depressurization systems will be required on all new buildings constructed on the site. Also see Response 39 above.

COMMENT 52: **Treatment of Contaminated Soils**. At other sites the Department has explored potential treatment options for dealing with contaminated soils. Finding useful practical alternatives to landfilling that are also protective of the environment and public health is necessary in efforts to remediate this and other hazardous waste sites.

Treatment can increase the overall effectiveness of the cleanup and reduce the need for landfilling. Any short-term increased costs of applying treatment technologies over landfilling provide long term benefits and reduces costs of maintaining and monitoring hazardous waste landfills for years into the future.

RESPONSE 52: Remedial alternatives including enhanced bioremediation and low temperature thermal desorption were evaluated to address the residually contaminated soil at the site.

The remedial design may include further evaluation of treatment options for the grossly contaminated material to be removed from the site. Factors to be considered would include waste characterization requirements to determine the suitability of a specific treatment, costs of the treatment, hauling distance to available facilities, and overall benefit to the environment.

COMMENT 53: **Alternative Treatment Options**. Scenic Hudson endorses the exploration and use of treatment technologies as alternatives to landfilling. Treatment options, such as soil washing, should be explored for the DeLaval site. While exploring such options, the public must be kept adequately informed.

We also urge the DEC to explore another potential treatment technology for use at this site - the enzymatic method of decontamination being promoted by Oil-Free Technologies, Inc. While this treatment technology is not yet proven in the U.S., we encourage the Department to explore the potential to pilot this and other emerging technology so as to help determine their usefulness at remediating PCB contaminated sites. More information about this process can be found at http://www.oilfreetech.com/.

RESPONSE 53: See Response 52 above.

COMMENT 54: **Contamination and Remediation of Hudson River Sediment**. This site investigation and proposed remedy lack investigation and characterization of contamination in the Hudson River.

The PRAP indicates that a retaining wall at the site, which includes a buried concrete bulkhead or cutoff wall, "is significantly preventing the migration of petroleum to the river." Absent any investigation and characterization of contamination of Hudson River sediment, is this conclusion being drawn based on visual inspection?

According to a report entitled Contaminant Assessment and Reduction Project Water by Dr. Simon Litten, NYSDEC, August 2003, there are elevated PCBs levels in suspended sediment at the Poughkeepsie water intake; "USGS used TOPS to sample at Poughkeepsie in the Poughkeepsie water intake and found the highest average concentration, 92 ng/L." (p. 63)The report can be found at: http://www.dec.state.ny.us/website/dow/bwam/CARP/carp.pdf.

It is unacceptable to leave the possible characterization and remediation of contaminated river sediments to visual inspection. The PRAP states, "If conditions observed during remedial construction suggest that contaminants have migrated through the existing bulkhead, additional evaluation of potential off-site impacts to sediments would be performed. Remedial actions would then be planned as appropriate."

We strongly urge the Department to adequately and appropriately investigate and characterize Hudson River sediment contamination prior to remedial construction. Proper planning and timing of remedial activities for both on and off-site contamination makes much more sense than waiting to see if a problem is observed in the river during remedial construction.

RESPONSE 54: As discussed in Response 3, given the long industrial history of the Hudson River and the fact that there are strong tidal currents causing the river to flow both north and south, it would be very difficult to attribute any sediment contamination, if found, directly to the site without first identifying a contaminant migration pathway.

Because of the volume of petroleum wastes observed behind the concrete bulkhead, the long duration it has remained in place, and the lack of observed significant discharge in the river, it was concluded that the bulkhead was providing containment of the wastes. The proposed remedy acknowledges that better containment of specific AOCs is required, which will be provided by the vinyl sheet pile bulkhead.

COMMENT 55: **Fish Advisories.** The PRAP fails to mention that a potential route of exposure to PCBs is through the consumption of contaminated fish. This is particularly important because the proposed development will be setting up designated fishing spots.

Determining if the DeLaval property is a source of PCBs and other contaminants to the Hudson River is critical to carrying out a comprehensive remedial effort that is protective of public health and the environment and will ultimately restore this site and the river.

Hudson fiver fish contaminant data that was previously collected for the Poughkeepsie area should also be reviewed and referenced in this PRAP. If there is insufficient data for this site, additional fish sampling should be conducted to determine the extent of contamination in this area. Collection of such data will also provide comparative sampling results which will be important for pre- and post construction monitoring.

The risk to human health from the consumption of contaminated fish is not being addressed by fish consumption advisories. Two separate Hudson River angler surveys, (Health Consultation: 1996 Survey of Hudson River Anglers -

New York State Department of Health 2000), and (Hudson River Angler Survey, Hudson River Sloop Cleanvater, 1993) have shown that the majority of people who catch fish are eating them, or sharing them with others, despite these advisories. In addition, the Food and Drug Administration's tolerance level of 2.0 is based on a commercial market-basket approach to fish consumption in which fish are obtained by consumers from various places in the market. This approach presumes a dilution by the market.

The DEC and the DOH should recognize that human health risks are much greater as there is the potential for anglers to catch and consume and share more highly contaminated fish from this specific Superfund site. Anglers in Poughkeepsie will be returning to this same site over and over and will continue to consume contaminated fish. Considerably lower levels of PCBs in fish, perhaps 0.5 ppm (EPA Hudson River PCBs Superfund Site) should be considered in such a comparison and in setting cleanup goals for this site.

The fishing piers being proposed for this site must have warning signage. We strongly suggest that the posting and maintenance of such signs be part of the institutional controls required for this site.

Another institutional control should be the a requirement that the NYSDEC and the NYS Department of Health require local community health education regarding the dangers of consuming contaminated fish.

In addition, the risks to human health from the consumption of contaminated fish underscore the overwhelming need to remove the source of contamination to the fish (contaminated sediment) to speed the recovery of this resource.

RESPONSE 55: The site represents approximately 2000 feet of shoreline along the Hudson River, at which point the river is more than one half of a mile in width and located approximately midway along a stretch of more than 175 miles where the river flows freely under the strong influence of the tide, from the Troy dam to the mouth in New York City. The site had slight exceedances of cleanup values for PCBs in surface soil in three out of thirty samples, and one exceedance at 11ppm (cleanup value is 10 ppm) out of twenty-one samples for subsurface soil. Therefore, the State does not consider it necessary to issue additional advisories or warnings beyond the NYSDOH Fish Advisories for the Hudson River, contained in the NYS Freshwater Fishing Regulations.

COMMENT 56: **"Green" Cleanup**. We urge the Department to design the remedy so that implementation minimizes the impact on the natural environment and the local community. We urge the Department to incorporate the following principles into the design and implementation of this remedial action.

RESPONSE 56: Noted.

COMMENT 57: **Energy efficiency**. Equipment used in all phases of remedial action should be energy efficient.

RESPONSE 57: Noted.

COMMENT 58: **Low-sulphur fuels**. To minimize odors and other air emissions emitted to the local community we urge the Department to require the use of low- sulphur fuel in remediation equipment.

RESPONSE 58: Noted.

COMMENT 59: **Air Emissions.** The strictest air emissions standards must be adhered to in operation of the thermal desorption unit. Any exceedances of such standards should force the shutdown of the unit until the problem can be remedied and strict air emissions standards can be meet.

RESPONSE 59: Not applicable as thermal desorption technology is not a component of the proposed remedy.

COMMENT 60: **Volatilization**. As previously mentioned, there is the potential for airborne exposure by contaminated dust that should be mitigated by some type of cover system.

Appropriate controls should be put in place to minimize dust and the potential loss of contaminants to the air. Containment should occur during excavation of soils and dredging. Storage and transportation systems and equipment should be enclosed to minimize unnecessary release of contaminants into the environment during the remediation process. Containment and air protections can include simple cover such as tarping, evacuating trapped air, using negative pressure in storage buildings and running air through filters before it is released.

RESPONSE 60: See Responses 14 and 15 above.

COMMENT 61: **Summary**. This proposed remedy falls short on several fronts. Too much contamination will be left in place. In addition, characterization, cleanup and protection of the Hudson hver, groundwater contamination, and the potential for soil vapor contamination are not adequately addressed. We anticipate that the State will choose, design and implement a remedy that is more protective of public health and the environment than the one currently proposed. We urge the State to issue a Record of Decision in a timely fashion; however, we also urge that the State involve and engage the public in these decision-making processes.

If the Department moves forward with this cleanup as is proposed and considerable contamination is left, we urge that the Department allow for the possibility that a future remedy may prove to be more effective.

RESPONSE 61: As discussed in the PRAP and throughout this Responsiveness Summary, a remedy that is protective of human health and the environment has been thoroughly evaluated and proposed in accordance with the procedures specified in the State laws and regulations. Remedial alternative 3 satisfies the threshold criteria and evolved as the best remedial approach through the application of the balancing criteria in the detailed analysis of the alternatives considered.

APPENDIX B

Administrative Record

Administrative Record

Hudson River Waterfront - DeLaval Property
Site No. B00190

1. Proposed Remedial Action Plan for the Hudson River Waterfront - DeLaval Property site, dated March 2005, prepared by the NYSDEC.

2. "Supplemental Investigation Summary Report", January 2005, prepared by Clough Harbour & Associates, LLP.

3. "Final Remedial Alternatives Report", January 2005, prepared by Clough Harbour & Associates, LLP.

4. "Environmental Restoration Program Citizen Participation Plan", November 2004, prepared by Clough Harbour & Associates, LLP.

5. "Supplemental/Pre-design Remedial Investigation Work Plan", July 2004, prepared by Clough Harbour & Associates, LLP.

6. "Brownfield Program Remedial Alternatives Report Work Plan", January 2004, prepared by Clough Harbour & Associates, LLP.

7. Fact Sheet announcing the availability of the Proposed Remedial Action Plan, February 2005.

8. Letter dated March 18, 2005 from Mr. Basil Seggos, Riverkeeper.

9. Letter dated March 21, 2005 from Mr. Rich Schiafo, Scenic Hudson, Inc.