RECORD OF DECISION

Mercury Refining Site

Towns of Colonie and Guilderland, Albany County, New York

United States Environmental Protection Agency
Region II
New York, New York

September 2008

DECLARATION FOR THE RECORD OF DECISION

Site Name and Location

Mercury Refining Site
Towns of Colonie and Guilderland, Albany County, New York

Superfund Identification Number: NY00048148175

Statement of Basis and Purpose

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy for the Mercury Refining Site (Site), which is chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), 42 U.S.C. §§9601-9675, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting the remedy for the Site.

The information supporting this remedial action decision is contained in the Administrative Record. The index for the Administrative Record is attached to this document (Appendix III).

The State of New York concurs with the selected remedy.

Assessment of the Site

Actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of Selected Remedy for Soils and Groundwater - Cap Maintenance, Groundwater Monitoring, In-Situ Solidification/Stabilization, Limited Soil Excavation and Institutional Controls, and for Sediments - Removal and Disposal

The response action described in this document represents the only planned remedy for the Mercury Refining Site. It addresses mercury contamination in the soils, groundwater and sediments.

The major components of the selected remedy include the following:

- Excavation and off-Site disposal of surface soils and subsurface soils above the water table from the Mercury Refining Property and adjoining properties (*i.e.*, Albany Pallet and Box Company (Albany Pallet), Allied Building Products Corporation (Allied Building) and

Diamond W. Products Incorporated (Diamond W.) which exceed the cleanup level for mercury in soil of 5.7 parts per million (ppm) for industrial property usage. These soils also include the soils associated with the stormwater sewer/catch basin systems. Verification sampling will be performed to confirm the effectiveness of the remedy. Clean soil will be backfilled into the excavated areas.

- Solidification/Stabilization involving mixing or injection of treatment agents at the Mercury Refining and Allied Building properties to immobilize contaminants in surface soils, subsurface soils,[1] and soils below the water table where the groundwater has a dissolved mercury concentration which exceeds the cleanup level of 0.7 parts per billion (ppb) for mercury in groundwater. Pilot testing will be performed before treatment and verification sampling will be performed after treatment to confirm the effectiveness of the remedy in immobilizing contaminated soils and achieving groundwater standards.

- Imposition of institutional controls in the form of environmental easements/restrictive covenants to restrict future development/use of the Site. Specifically, environmental easements/restrictive covenants will be filed in the property records of Albany County. The easements/covenants will at a minimum: (a) limit the Site to industrial uses; (b) preserve the integrity of the existing clay cap on the southern portion of the Mercury Refining Property; (c) preserve the integrity of the solidified/stabilized mass; (d) prevent the excavation of soils which lay beneath the Phase 1 Building, which housed Mercury Refining's operations, and the Container Storage Building, which was used to store incoming mercury bearing material for processing, unless the excavation follows a Site Management Plan (see below); and (e) restrict the use of groundwater as a source of potable or process water until groundwater quality standards are met.

- Development and implementation of an EPA-approved Site Management Plan (SMP). The SMP, will, among other things, address long-term operation and maintenance (O&M) of the Site, and future excavation of soils, including, but not limited to, soils beneath the Phase 1 and Container Buildings on the Mercury Refining Property, and soils on the Albany Pallet Property, the Allied Building Property, and the Diamond W. Property, which will not be remediated by this remedy, to insure that the soils are properly tested and handled to protect the health and safety of workers and the nearby community. The approved SMP will also require an evaluation of the potential for vapor intrusion at all existing buildings on-Site and/or those to be constructed in the future, and mitigation, if necessary, in compliance with the SMP. Finally, the SMP will provide for the proper management of all Site remedy components post-construction and shall include: (a) monitoring of groundwater to ensure that, following Site remediation, the contamination has attenuated and the groundwater has been remediated; (b) monitoring and maintenance of institutional controls; (c) a provision for operation and maintenance of the clay cap; (d) periodic certifications by the owners/operators of the Site properties or other party implementing the remedy that the institutional and engineering

[1] This would include soils beneath the existing asphalt/concrete cap but not soils beneath the Container Storage Building or the existing clay cap.

controls are in place; and (e) a provision to manage the demolition or alteration of the existing buildings on-Site, if such demolition or alteration is required in the future, to protect the health and safety of the workers and the nearby community and to ensure proper disposal of any building debris.

- Removal, dewatering and disposal of the mercury-contaminated sediments in the Unnamed Tributary exceeding the cleanup level for mercury in sediments of 1.3 ppm.

- Verification sampling will be performed to confirm the effectiveness of the remedy.

- Sampling of the fish, surface water and sediments in the Patroon Creek, the Unnamed Tributary and the I-90 Pond to assess impacts on the biota on an annual basis for five years. Sampling thereafter will be based on the results of the five annual sampling rounds, as reported within the first five-year review. Should conditions change with regard to the I-90 Pond dam (i.e., the dam is repaired, removed, or if it should fail), EPA will evaluate the potential impact of any significant releases and, if necessary, take or require response actions to mitigate their potential impact.

- In accordance with CERCLA and because the remedy will result in contaminants remaining on-Site above levels that will allow for unlimited use and unrestricted exposure, the Site remedy will be reviewed at least once every five years.

Statutory Determinations

The selected remedy meets the requirements for remedial actions set forth in CERCLA §121. It is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. In keeping with the statutory preference for treatment that reduces toxicity, mobility or volume of contaminated media, the heavily contaminated soils below the water table, defined as principle threat wastes, will be treated.

The selected remedy satisfies the statutory preference for permanent solutions. The use of treatment through solidification in one area and the removal of a portion of the contaminated soils above the groundwater and other soils which are associated with the stormwater sewer/catch basin systems will eliminate exposure pathways while not interfering with future development of the Site for industrial use. The remedy will be protective of the groundwater through the removal of mercury contaminated soils above the water table and treatment of contaminated deeper soils and groundwater, and through institutional controls and long-term groundwater monitoring. The remedy will also be protective of ecological receptors through the removal of contaminated sediments at the stormwater outfall. The SMP will ensure that all parts of the remedy remain protective of human health and the environment.

In accordance with CERCLA and because the remedy will result in contaminants remaining on-Site above levels that will allow for unlimited use and unrestricted exposure, the Site remedy will be reviewed at least once every five years.

ROD DATA CERTIFICATION CHECKLIST

The ROD contains the remedy selection information noted below. More details may be found in the Administrative Record file for this Site.

- The chemical of concern for the Site is mercury (see pages 17 through 23 of the ROD);
- Baseline risk represented by the chemicals of concern (see ROD pages 17 through 25 and TABLES 1 through 6, 8 and 9);
- Current and reasonably anticipated future land use assumptions used in the baseline risk assessment and ROD (see ROD page 16);
- Cleanup levels established for chemicals of concern and the basis for these levels (see ROD pages 25 and 26);
- Estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (see ROD pages 41 through 43, and TABLES 10 and 11); and
- Key factor(s) that led to selecting the remedy (*i.e.*, how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision)(see ROD pages 43 and 44).

George Pavlou, Acting Director
Emergency & Remedial Response Division
EPA - Region II

Date 9/30/08

ROD FACT SHEET

SITE

Site name: Mercury Refining Superfund Site
Site location: Towns of Colonie and Guilderland, Albany County, New York

EPA Region: 2
HRS score: 44.58
EPA Site ID No: NY00048148175

ROD

Date signed:
Operable unit: 1
Selected Remedy: Cap Maintenance, Groundwater Monitoring, In-Situ Solidification/Stabilization, Limited Soil Excavation and Institutional Controls for Soil and Groundwater and Removal and Disposal of Contaminated Sediments

Capital cost: $9.6 million
Annual O & M cost: $1.4 million
Present-worth cost: $11,080,000

LEAD

United States Environmental Protection Agency

Primary Contact: Thomas Taccone, Remedial Project Manager, (212) 637-4281
Secondary contact: Kevin Lynch, Chief, Western New York Remediation Section, (212) 637-4287

WASTE

Waste Type: Soils, Groundwater and Sediments Contaminated with Mercury

Waste Origin: Mercury Reclamation Operations Conducted by the Mercury Refining Company, Inc.

Contaminated Media: Soils, Groundwater and Sediments

DECISION SUMMARY

Mercury Refining Site

Towns of Colonie and Guilderland, Albany County, New York

United States Environmental Protection Agency
Region II
New York, New York

September 2008

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SITE NAME, LOCATION AND DESCRIPTION

The Site includes the Mercury Refining Company, Inc. (MERECO) Property, which is located at 26 Railroad Avenue on the border of the Towns of Guilderland and Colonie, Albany County, New York (MERECO Property). This approximately 0.68-acre lot was used as a mercury reclamation facility. Figure 1 (see Appendix I) shows the MERECO Property location. The areas to the north, east, and west of the MERECO Property are principally light industrial with some commercial use and warehousing. The Albany Pallet and Box Company (Albany Pallet) lies to the north of the Property, Allied Building Products Corporation (Allied Building) is located east of the Property and Diamond W Products Incorporated (Diamond W) is located west of the MERECO Property. A CSX Railroad right-of-way is located south of the Property. The closest residence is located approximately one-quarter mile north of the Site.

The Site is defined by the extent of contamination associated with MERECO's past reclamation processes and includes the MERECO Property, the western portion of the Allied Building Property, the southern portion of Diamond W, the southern portion of the Albany Pallet Property, and a portion of an unnamed tributary to Patroon Creek (the Unnamed Tributary), which is located immediately south of the MERECO Property.

The Unnamed Tributary received and continues to receive, contaminated stormwater drainage from the southern edge of the MERECO Property. Approximately 1,600 feet downstream of the MERECO Property, the tributary converges with Patroon Creek. Approximately one mile downstream of the MERECO Property there is a dam in the Creek which forms the I-90 Pond. The Creek flows over the dam's spillway and enters the Hudson River approximately 5 miles from the stormwater outfall. The dam is owned and maintained by the City of Albany, New York.

The northeastern portion of the MERECO Property is currently covered by a concrete and asphalt cap which is a single-layer cap. The cap was installed to reduce the infiltration of rain water and to prevent direct contact with underlying soils which are contaminated with mercury. The southern portion of the Property is covered by a single-layer clay cap which was installed after the excavation and off-Site disposal of mercury and polychlorinated biphenyl (PCB)-contaminated soils in 1985. The Property currently includes two buildings and is surrounded by a chain link fence. One of the buildings, called the Phase 1 Building, houses the past and current operation of MERECO. The other building, called the Container Storage Building, has been used to store incoming material for processing in the Phase 1 Building. A commercial asphalt roadway and a wide business driveway provide access to the MERECO Property.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Site History

MERECO was founded in 1955. The facility used retorts (specialized ovens to distill and recover

mercury) to reclaim mercury from mercury batteries and other mercury-bearing materials, such as thermometers, fluorescent bulbs, spill debris, and dental amalgams. The recovered mercury was then refined and marketed. The retorts were contained in the old Retort Building which was located just north of the Container Storage Building (see Figure 2). MERECO also collected and brokered silver powders and small quantities of other precious metals.

Before 1980, waste contaminated with mercury was dumped over an embankment of the Unnamed Tributary. From 1980 to 1998, waste batteries and other mercury-containing materials were stored in drums on wooden pallets within paved areas of the MERECO Property prior to disposal.

The results of initial sampling performed by the New York State Department of Environmental Conservation's (NYSDEC's) Division of Fish and Wildlife in 1981 and 1982 indicated the presence of PCBs and mercury contamination in soils on the southern edge of the MERECO Property and on the embankment to the Unnamed Tributary. Results of further sampling confirmed the presence of these contaminants in soils at the MERECO Property, and mercury contamination in Creek sediments. In 1983, the Site was placed on the federal National Priorities List (NPL). At that time, the NYSDEC assumed the role of lead agency for directing and overseeing Site investigation and cleanup.

Under a September 1985 judicial Consent Decree with New York State, MERECO excavated and removed approximately 2,100 cubic yards (cy) of mercury-contaminated soils and debris, and 300 cy of PCB-contaminated soils, from contaminated areas at the MERECO Property and from the (former) Owasco River Railway Property (now CSX railroad) south of MERECO's Property line. The excavated area was backfilled with clean fill and covered with a clay cap. Contaminated soil was also found beneath the old Retort Building and, after being sealed with plastic sheeting, was left in place. A concrete cap was also poured over the portion of the MERECO Property which now serves as the floor of the Container Storage Building, which was constructed in 1989.

On June 9, 1989, MERECO entered into an Administrative Order on Consent under State law with NYSDEC. The 1989 Order called for identification and remediation of mercury-contaminated areas, both on and off of the MERECO Property, and a program to evaluate and abate migration of mercury and other contaminants from the facility, including mercury emissions from both permitted (the retorts) and fugitive air sources. As part of these evaluations, MERECO was required to conduct an investigation of Patroon Creek.

On September 14, 1989, a fire destroyed the Hand Shop building which was located on the eastern portion of the Property, and which was used for storing and housing mercury purification operations and for processing silver oxide batteries. Approximately 224 cy of charred building material and destroyed equipment debris were shipped from the Property for secure land disposal. Soil samples collected in November 1989 in the former Hand Shop building area identified hot spots of mercury contamination which were subsequently removed. The Hand Shop building was replaced in 1991 with the Phase 1 building. This building is currently used by MERECO as an office and for processing incoming material which contain precious metals.

Another fire occurred on April 10, 1991 at the Break Trailer which was located in the western portion of the MERECO Property. The fire also spread to an adjacent storage trailer. The Break Trailer had been used as a changing area/break room for employees. One-third of the trailer was also used for manual sorting and weighing of incoming mercury-containing materials to be processed.

MERECO's response to the 1989 Order was considered inadequate by NYSDEC. Another Order on Consent was signed by MERECO and NYSDEC in February 1993, under State law. The 1993 Order called for the establishment of a schedule for the completion of all activities, a permanent remedy for the abatement of emissions and migration of pollutants, quarterly groundwater monitoring for ten years, remediation/removal of contaminated soils beneath the old Retort Building and long-term monitoring of areas surrounding the Site. The 1993 Order also involved payment for civil penalties and natural resource damages.

Construction of the new retorts was completed on February 15, 1994. The retorts were installed in the Phase 1 Building which was fitted with reportedly state-of-the-art air pollution control equipment to control emissions from the retorts. In the fall of 1994, MERECO demolished the old Retort Building and installed an asphalt and concrete cap over the area. At this time, MERECO also dismantled a stainless steel trailer that had been located just north of the old Retort Building. In 1995, MERECO conducted a soil investigation beneath the asphalt and concrete cap. The investigation found visible free phase mercury in the soil from just below the concrete to depths of approximately 13 feet and 18 feet.

MERECO received a Hazardous Waste Corrective Action Management Permit pursuant to the Resource Conservation and Recovery Act (RCRA) from NYSDEC on December 31, 1996, for controlling the generation and storage of waste at the MERECO Property and for completing the investigation and remediation of contamination at the Property and surrounding areas. All unfinished work required by the previous consent orders were subsumed into the permit.

From 1997 through 1999, MERECO evaluated potentially suitable corrective measures for the soils beneath the old Retort Building and hired Kiber Environmental to conduct treatability studies for two potentially suitable technologies: physical treatment and in situ (in place) stabilization/solidification. In April of 1998, NYSDEC approved MERECO's work plan for implementing the treatability studies. MERECO conducted the studies in 1999.

In November 1999, after unsuccessfully working with MERECO to fully comply with the terms of its RCRA permit, NYSDEC requested that EPA take over as lead agency for the Site under CERCLA. In September 2000, EPA initiated a Remedial Investigation (RI)/Feasibility Study (FS), which, while based on data collected under NYSDEC as the lead agency, also generated additional data to complete a full characterization of the Site.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Proposed Plan addressing contamination at the Site was prepared by EPA and released in March 2008. A notice of the Proposed Plan and public comment period was placed in the Albany Times

Union on March 30, 2008, consistent with the requirements of the NCP 40 CFR §300.430(f)(3)(i)(A). The public notice established a thirty-day comment period from March 30, 2008 to April 30, 2008. In response to a written request to extend the public comment period, the comment period was extended to May 30, 2008. A second notice was placed in the Albany Times Union on April 13, 2008 to announce the thirty-day extension of the comment period. The Proposed Plan and all relevant documents in the Administrative Record (see Administrative Record Index, Appendix III) were made available to the public at two information repositories, namely: the EPA Superfund Records Center at 290 Broadway, New York, New York 10007 and the William K. Sanford Town Library, 629 Albany Shaker Road, Albany, New York 12211.

EPA hosted a public meeting on April 22, 2008, at the Fuller Road Firehouse to discuss the Proposed Plan and the alternatives considered for the Site. At this meeting, representatives from EPA answered questions about the contamination at the Superfund Site and the proposed remedial alternative. EPA's responses to comments received during the public meeting, along with responses to other written comments received during the public comment period, are included in the attached Responsiveness Summary (Appendix V). Also included in Appendix V, are copies of the transcript of the public meeting as well as the comment letters.

SCOPE AND ROLE OF RESPONSE ACTION

Cleanup at the Site is currently being addressed as one operable unit (OU). This ROD describes the comprehensive long-term remediation plan for the entire Site and is expected to be the only ROD issued for the Site.

SUMMARY OF SITE CHARACTERISTICS

Site characteristics are described more completely in the RI report, which was finalized by EPA on December 4, 2003. The purpose of the RI was to define the nature and extent of contamination in on-Site surface and subsurface soils, surface water and groundwater at the MERECO Property and its adjoining properties and in the surface water and sediments of the Patroon Creek, the Creek's Unnamed Tributary and the I-90 Pond. EPA's fieldwork for the RI was conducted from September 2000 to July 2003.

To determine whether the soils, sediments, surface water, or groundwater contain contamination at levels of concern, the analytical data were compared to applicable or relevant and appropriate requirements (ARARs), or other relevant guidance if no ARARs were available.

Results of these investigations are summarized below.

Physical Site Conditions

The Mercury Refining Superfund Site lies on the west side of the Hudson Valley in the

Hudson-Mohawk River Basin, and is approximately five miles northwest of the Hudson River and the central business district of Albany. A small unnamed stream (the Unnamed Tributary) flows along the southwestern boundary of the Site and joins a channelized segment of Patroon Creek approximately 1,600 feet further to the southeast.

Geology and Hydrogeology

According to the U.S. Department of Agriculture's 1992 *Soil Survey of Albany County, New York,* the soils at the MERECO Property are classified as Urban Land. This soil classification describes nearly level to strongly sloping areas where asphalt, concrete, buildings, or other impervious materials cover more than 85 percent of the land's surface. Slopes range from 0 to 15 percent. Included in this unit are small areas of mostly miscellaneous fill. The unit has very few areas that retain the original soil characteristics for that location due to its disturbance during building activities.

The undeveloped area south of the MERECO Property, south of the railway, consists of soils classified as Udipsamments. This soil classification describes nearly level to very steep areas of disturbed sandy soils. Slopes range from 0 to 45 percent. These soils are well drained to somewhat excessively drained. These soils typically consists of about 40 percent cuts of mostly brown or yellowish-brown loamy fine sand and sand or Colonie or Elnora soils; 30 percent fills of mixed sandy material moved from the upper part of the Colonie or Elnora soils; 10 percent Urban land; and 20 percent other soils.

Site data for the MERECO Property also indicates that groundwater flows generally in a southerly direction toward the Unnamed Tributary which flows into Patroon Creek. Three rounds of groundwater measurements were collected from December 2001 to July 2003, as part of EPA's RI. The water level data showed that the hydraulic gradient doubled from the December readings to the March readings, indicating that this zone is also strongly influenced by surface runoff and precipitation.

The water level measurement data also reveal a vertical downward gradient such that the gradient could promote the downward migration of any mercury dissolved in the groundwater.

Summary of Data Collected while NYSDEC Served as Lead Agency

The following is a summary of the various investigations of the Mercury Refining Site performed under the direction of the NYSDEC between 1981 and 1999. Chemical concentrations reported below are in parts per billion (ppb) or parts per million (ppm).

In 1981, 1983, 1984, and 1985, samples were collected from sediments of the Unnamed Tributary, Patroon Creek, and the I-90 Pond and were analyzed for total mercury. In 1981, NYSDEC collected sediment samples from the bank of the Unnamed Tributary at the stormwater sewer outfall. The samples were not tested for mercury content; however visual inspection of the samples revealed globules of mercury in the samples. In 1983, mercury concentrations in the Unnamed Tributary sediments ranged from 4.7 to 8.6 ppm. In 1984 and 1985, mercury concentrations in the Unnamed Tributary, Patroon Creek, and the I-90 Pond ranged from not detected to 2.3 ppm.

Four groundwater monitoring wells were installed at the Site in 1985 and are still present. The wells were sampled quarterly by MERECO from 1991 to 2001. During this period, the concentration of mercury in the groundwater from the downgradient wells ranged from non detect to 54 ppb, which was detected in monitoring well OW-1.

The Wildlife Pathology Unit of NYSDEC conducted a major study in 1989 which included the MERECO Property, portions of the properties which border MERECO, the Unnamed Tributary, Patroon Creek, and the I-90 Pond. Sediment samples collected near the stormwater outfall, which discharges from the MERECO Property to the Unnamed Tributary, revealed mercury concentrations from 3.2 to 154 ppm. Samples collected from just south of the railroad tracks and the Allied Building Property contained mercury which ranged from 1.99 to 16 ppm. The highest mercury in the soils ranged from 275 to 497 ppm which was found to the east of the Property at and just beyond the fence line with the Allied Building Property. Soil samples collected at a greater distance from the Property perimeter were much less contaminated (*i.e.*, less than 10 ppm).

MERECO collected surface and subsurface soil samples from its Property in 1995 pursuant to the 1993 Order. Additional samples were collected in 1997 from the properties surrounding the MERECO Property, pursuant to MERECO's New York State hazardous waste corrective action permit. Visible mercury contamination was observed in soil from several sample locations which extended to a depth of at least 30 feet below the ground surface (bgs) on the MERECO Property. For the 1997 investigation, soil samples were collected from 0 to 6 inches and 6 to 12 inches bgs. Mercury concentrations were highest in samples from locations bordering the MERECO Property to the east and north. The highest mercury concentration (150 ppm) was collected at 6 to 12 inches bgs from a sample east of the old Retort Building.

In 1999, NYSDEC analyzed 59 tissue samples from fish caught along the length of Patroon Creek. Mercury was detected in all samples at concentrations ranging from 0.007 to 0.914 ppm.

Because only limited documentation on the quality of the historic data is available, EPA could not use these data as a basis for determining the risks associated with the Site. However, EPA did use the historic data as a guide for determining the number and location of samples for the RI.

EPA's Remedial Investigation Results

The field work and sampling performed by EPA during the RI characterized the nature and extent of contamination in the soils, surface water, sediments, fish tissue and groundwater at the Site. A general discussion of these findings is presented below. The RI report contains a more complete examination of the analytical results. This information is available in the Administrative Record (index attached as Appendix III).

Screening Criteria

Site-specific screening criteria were evaluated in the RI for all compounds for which samples were analyzed. The nature and extent of contamination discussion below focuses on contaminants that exceeded the Site-specific screening criteria. Generally, for each medium, the site-specific screening criteria are the most conservative value of the Federal or State value. The site-specific screening criteria utilized in this evaluation were as follows:

Soil Screening Criteria: Site-specific soil screening criteria include the following:

- EPA Region IX residential soil preliminary remediation goals (PRGs), adjusted to a cancer risk of $1x10^{-6}$ and a non-cancer hazard index of 1.0;
- NYS Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, No. 94-HWR-4046, January 24, 1994.[2]
- Site background data.

Sediments Screening Criteria: The site-specific sediments screening criteria include the following:

- Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Ontario Ministry of the Environment, 1993; and
- New York State Guidance for Screening Contaminated Sediments Division of Fish, Wildlife and Marine Resources, January 25, 1999.

Surface Water Screening Criteria: The site-specific surface water screening criteria include the following:

- New York Ambient Water Quality Standards and Guidance Values, August 4, 1999. Source of Drinking Water (surface water); New York Ambient Water Quality Standards and Guidance Values, August 4, 1999. Human Consumption of Fish (fresh water).

Groundwater Screening Criteria: The site-specific groundwater screening criteria include the following:

- National Primary Drinking Water Standards;
- New York Ambient Water Quality Standards and Guidance Values, August 4, 1999; and
- NYS Department of Health (NYSDOH) Drinking Water Quality Standards.

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2 The Remedial Investigation report used NYSDEC's TAGM document for screening the soil data. During the FS, EPA compared the RI sample data to NYSDEC's soil cleanup regulations at 6 NYCRR Part 375, which were promulgated on December 31, 2006.

Fish Screening Criteria: The site-specific screening criteria for fish consumption include the following:

- EPA Region 3 risk-based concentration for human consumption of fish.

Indicator Contaminants

Indicator contaminants were selected to focus the evaluation of the nature and extent of contamination in soil, sediments, surface water and groundwater. As a first step in the indicator contaminant selection process, analytical data collected during the RI were evaluated for frequency of detections and magnitude of exceedances of screening criteria. The Human Health Risk Assessment (HHRA) contaminants of potential concern (COPC) were reviewed to determine which contaminants contributed the most to risks and historical activities and analytical data were reviewed to determine which contaminants were related to Site operations.

- Mercury
- Methylmercury
- Arsenic
- Nickel
- Cadmium
- Chromium
- Manganese
- Polychlorinated Biphenyls
- Polyaromatic Hydrocarbons
- Thallium
- Silver

With the exception of mercury and methyl mercury, all of the COPCs were eliminated from further evaluation. EPA's reasons for eliminating them are as follows:

- Polyaromatic Hydrocarbons (PAHs) – The remedial investigation detected PAHs at concentrations which exceeded the screening criteria in background samples as well as in downstream samples. MERECO is located in an industrial area and PAHs are associated with many industrial processes including general air pollution.

- Polychlorinated Biphenyl (PCBs) - Historical records show that PCB-bearing material was brought to the MERECO Site. PCB remediation activities also occurred at the Site in the past. PCBs were detected above the screening level in the sediments of the Unnamed Tributary, the Patroon Creek and the I-90 Pond. However, PCBs were detected both upstream, in background sediments samples, as well as in downstream samples. With the exception of one sediment sample from the I-90 Pond, all PCB Aroclors were detected below 1 ppm which has been established by New York as being acceptable to ecological receptors in an industrial setting (see 6 NYCRR Part 375) . In 2001, one I-90 Pond sample indicated a concentration of 4.4 ppm of PCB Aroclor 1260. In 2004, another sample was collected at the same location, but no PCBs were detected. In addition, Aroclor 1260 was not detected above soil screening levels on-Site. This Aroclor also was not detected as part of the investigatory work performed in accordance with the September 1985 Consent Decree between MERECO and New York State which required MERECO to remove 300 cubic yards of PCB contaminated soils from the Site.

- Manganese and Arsenic - Manganese and arsenic were detected in the soils consistently within a narrow range of concentrations on-Site and off-Site. On- and off-Site concentrations of these minerals were similar. Also, neither arsenic nor manganese was found at elevated concentrations in those areas on the Mercury Refining Property which have elevated concentrations of mercury (e.g., the soils beneath the old Retort Building). Since on-Site concentrations of manganese and arsenic are consistent with background concentrations and since these minerals are naturally occurring in the soils and the aquifer, EPA believes that elevated concentrations of manganese and arsenic at monitoring well OW-3 (see Figure 3 and the discussion on groundwater sample results below) are not Site-related. While manganese is associated with past Site activity, it was not found at elevated concentrations in those areas on the Property which have elevated concentrations of mercury (i.e., the soils beneath the old Retort Building), nor was it found on-Site at concentrations which were above background.

- Chromium and Thallium - Neither of these metals are associated with past operations of MERECO. Chromium was not found to contribute to an unacceptable risk at the Site. Thallium was detected in one of three groundwater samples from monitoring well OW-3 but was not found above its soil screening level.

- Silver, Nickel and Cadmium – All three metals were components of batteries and were brought on-Site for processing. However, they were not found at elevated concentrations in areas on the Property which have elevated concentrations of mercury (e.g., the soils beneath the old Retort Building). Also, none of the metals contribute unacceptable risk at the Site.

Soil Samples

The soil investigation program consisted of surface and subsurface soil samples. Subsurface and surface samples were collected at the MERECO Property and at the adjoining properties. In addition, surface soil samples were collected from areas downwind of MERECO's retort furnaces in the prevailing wind direction (southeast). The samples were analyzed for organic and inorganic parameters.

Inorganic contaminants were widely distributed in subsurface soil samples collected on the MERECO Property. The highest detected concentrations of mercury, were observed in samples collected from four locations (MW-05D, SBD-02, SBD-03, and SBD-04), all within 100 feet of the eastern border of the Property. The highest concentration of mercury, 38,000 ppm, was detected in the sample collected approximately 10 feet below the ground in the boring located for the installation of monitoring well MW-05D (see Figure 3, Appendix I). Beads of elemental mercury were observed in samples from MW-05D down to a depth of 56 feet below ground surface (bgs). In addition to MW-05D, mercury was detected above its screening criterion at depths ranging from 4 to 18 ft bgs in samples across the Site. The mercury distribution suggests that contamination in the subsurface was likely the result of

spills or discharges in a fairly limited area.

Due to its high specific gravity, the major direction of elemental mercury migration in subsurface soils is downward. Beads of elemental mercury were also observed near the bottom of boring MW-05D, near the surface of a clay layer. The limitation of visible elemental mercury to shallower depths in soil borings located in the eastern portion of the MERECO Property suggests that it has not reached the confining layer at all locations. Although elemental mercury has a low solubility in water, elemental mercury observed in the soil boring samples will continue to be a potential source of groundwater contamination.

Because of the possibility of air deposition of mercury from the operations of MERECO, samples were collected from an area to the southeast of the MERECO facility, which is used for recreation, as evidenced by an All Terrain Vehicle (ATV) trail. During dry weather, ATVs generate significant quantities of dust, which increases the potential for human exposure and migration of contaminants via the air pathway. Mercury, manganese and arsenic exceeded their screening criterion in the off-Property surface soil samples. Mercury was detected at concentrations which ranged from 0.24 ppm to 1.3 ppm. Manganese and arsenic were detected at concentrations which were slightly above their screening criterion of 340 ppm and 2.4, respectively. Manganese was detected at 366 ppm to 442 ppm and, arsenic was detected at 2.6 ppm to 6.9 ppm. However, as indicated above, concentrations of manganese and arsenic which were detected on the ATV trail, the MERECO Property and the adjoining properties are consistent with the background concentrations and thus are naturally occurring minerals. These minerals also were not found in high concentrations in those areas of the Site which are contaminated with mercury.

The concentrations of mercury detected at the ATV trail were not high enough to contribute to air pathway risks. The mercury contamination that was detected is most likely related to wet and dry deposition of mercury emissions from historical Site operations.

Sediments Samples

In 2001, sediments samples were taken from the catch basins on the MERECO Property. Mercury was detected in all of the catch basin sediments samples. Methyl mercury was detected in three of the catch basins at concentrations ranging from 61 ppb to 263 ppb. Although the methyl mercury to total mercury ratios were low, ranging from 0.1 to 1 percent, some methylation of mercury is occurring in the sediments. Methyl mercury was widely distributed in the catch basins, indicating that the catch basins provide a suitable environment for methylation of mercury. Methyl mercury is more toxic than metallic mercury and more readily bioaccumlates and biomagnifies up the food chain. Although a number of other organic compounds exceeded sediments screening criteria, they are not believed to be associated with Site activities. The organic contaminants detected are likely derived from runoff associated with the industrial nature of the overall area and with previous applications of pesticides.

One catch basin is still used to collect runoff. Effluent from this catch basin is discharged directly to the Unnamed Tributary. Contaminated water continues to discharge from the effluent pipe connected to the inactive catch basin system into the Unnamed Tributary. Analysis of surface water samples collected from the basins detected mercury ranging from 0.75 ppb to 36.8 ppb. All the other catch basins have been closed; however, the closure method does not prevent mercury from reaching the Unnamed Tributary. Based on contaminant levels detected in the active catch basin and the discharge pipe, the catch basin system remains a pathway for mercury to enter the surface water and sediments.

Sediments samples were also collected from the Unnamed Tributary, Patroon Creek, and the I-90 Pond in 2001. Approximately one-half of the samples were co-located with surface water samples. Two samples were collected upstream of the Site in the Unnamed Tributary and Patroon Creek to provide background concentrations. Sediments samples were analyzed for full organic parameters, metals and total and methyl mercury.

Mercury was detected at 38 ppm in the surface sediments in the Unnamed Tributary which receives stormwater discharge from the MERECO Property. Mercury was also detected in the surface sediments of the I-90 Pond at 1.2 ppm. Methyl mercury was detected in all sediments grab samples. Methyl mercury concentrations ranged from 1.3 ppb to 4.78 ppb in the I-90 Pond and 0.84 ppb to 12.61 ppb at the outfall.

Additional sediments samples were collected in 2004 from the following surface water bodies: Inga's Pond, Rensselaer Lake, and the Unnamed Tributary, upstream of the MERECO Property; and the Unnamed Tributary, Patroon Creek and I-90 Pond, downstream of the MERECO Property. Figure 1 shows the location of these water bodies.

Overall, the sample results for the 2004 samples were similar to the 2001 results. However, there was a general decrease in the surficial concentration of metals in the I-90 Pond including mercury from 2001 to 2004. The surficial concentrations ranged from nondetect to 0.86 ppm. The decrease in surficial sediments concentrations could be attributable to sedimentation, stream flow, a decrease in source materials and the passage of time. The 2004 sampling indicated elevated concentrations of mercury in the I-90 Pond in sediments at depths of 2 to 3 feet. At these depths, concentrations ranged from 0.16 ppm to 2.6 ppm.

With regard to PCBs, results from the samples collected in 2004 of the Unnamed Tributary, Patroon Creek and the I-90 Pond were similar to the results obtained in 2001. Results for 2001 ranged from 0.41 ppm (Aroclor 1260) in the background (upstream) segment of the Unnamed Tributary to 4.4 ppm (Aroclor 1260) in sediments collected from the I-90 Pond. The 2004 results ranged from 0.68 ppm (Aroclor 1254) in sediments from the upstream Inga's Pond to 1.1 ppm (Aroclor 1260) in the downstream I-90 Pond. In 2004, another sample was collected next to the location from where the 2001 sample detected the PCB Aroclor 1260 at a concentration of 4.4 ppm. This 2004 sample did not detect PCBs. For the 2001 and the 2004 sampling events, 4.4 ppm of Aroclor 1260 was the highest concentration of PCBs detected. Aroclor 1260, however, was not detected in the soils at the MERECO Property above its screening level. This along with the detection of Aroclors 1260 and 1254

up and down stream of the MERECO Property, has led to EPA's conclusion that the PCBs are not a contaminant of concern for the Site.

Surface Water Samples

A total of two rounds of samples were collected from Inga's Pond and Rensselaer Lake in 2001 and in 2004, which are upstream of the MERECO Property. Both rounds also included samples from the Unnamed Tributary, Patroon Creek, and the I-90 Pond which are downstream. Figure 1 shows the location of these water bodies. The Unnamed Tributary flows from Inga's Pond. Patroon Creek flows from Rensselaer Lake which is upstream of the confluence of the Unnamed Tributary and the Creek. Samples were collected upstream of the Site to provide background data downstream of the Site. Surface water samples were analyzed for organic and inorganic parameters. The samples also were analyzed for total and methyl mercury.

Surface water samples rarely exceeded the organic or inorganic screening criteria. The maximum concentration of seventeen metals decreased in 2004 when compared to 2001. Mercury was not detected above its screening level in 2001 or 2004. Methyl mercury, which has no screening value, was detected at maximum concentrations of 0.86 ppb in 2001 and 0.094 ppb in 2004.

Groundwater Samples

In 2001, five deep monitoring wells (MW-01D, MW-02D, MW-05D, MW-06D, and MW-07D) and one shallow monitoring well (MW-07S) were installed. See Figure 3. The wells were located to determine the nature and extent of contamination in the groundwater and to monitor the groundwater quality upgradient and downgradient of the Site. Three deep wells were installed on-Site, two of which were nested with the existing wells OW-1 and OW-2, respectively. The third deep well, MW-05D, was installed in the center of the asphalt and concrete cap in the area with the greatest amount of free, elemental mercury contamination. A deep well (MW-07D) and a shallow well (MW-07S) were installed upgradient in a background location and a deep well was installed south of the Unnamed Tributary in a downgradient location (MW-06D).

Three rounds of groundwater samples were collected from four existing wells installed prior to EPA's involvement at the Site, and the six newly installed wells. All samples were analyzed for low detection levels of volatile organic compounds (VOCs), semi-VOCs, pesticides, PCBs, and inorganic chemicals.

The first two rounds collected samples from all ten wells and were conducted in 2001 and in 2002. The third round of sampling, which occurred in 2003, included sampling of monitoring well MW-05D and the four pre-existing monitoring wells. Vertical profile groundwater samples were also collected to define further the extent of groundwater contamination using direct push technology and were only analyzed for mercury.

The three rounds of groundwater monitoring well samples detected mercury in MW-05D at concentrations of 11.1 ppb, 19.8 ppb and 22.5 ppb which exceeded the New York State Water Quality Standard (NYSWQS) limit of 0.7 ppb and the federal and New York State maximum contaminant level (MCL) for drinking water of 2 ppb. All three rounds of samples were unfiltered and collected in accordance with an EPA approved quality assurance project plan. The highest total mercury concentration observed in the vertical profile samples (also unfiltered) was 901 ppb, which was located approximately 40 feet downgradient from MW-05D (see Figure 3). The profile samples collected around the perimeter of the MERECO Property indicate that the mercury contaminant plume is primarily contained within the boundaries of the MERECO Property.

Manganese was detected upgradient at concentrations which ranged from non detect to 3,470 ppb. No MCL has been established for manganese. With the exception of OW-3, downgradient concentrations ranged from non detect to 1,690 ppb of manganese. The New York water quality limit for manganese is 300 ppb. Arsenic was detected at concentrations which ranged from not detected to 19.2 ppb, exceeding the federal and New York State MCL of 10 ppb.

For the three rounds of sampling, samples collected from the already, existing monitoring well OW-3, located downgradient of MW-05D (see Figure 3, Appendix I) detected the highest concentrations of manganese (45,800 ppb), iron (60,500 ppb), sodium (65,300 ppb), thallium (37.2 ppm) and arsenic (19.2 ppb). Mercury was not detected in OW-3. Manganese and arsenic were also detected in the soils consistently within a narrow range of concentrations on-Site and off-Site. On- and off-Site concentrations of these minerals were similar. Also, neither arsenic nor manganese was found at elevated concentrations in those areas on the Property which have elevated concentrations of mercury (i.e., the soils beneath the old Retort Building). Manganese was detected in the soils at 349 ppm to 575 ppm. Arsenic was detected in the soils at concentrations which ranged from 2.6 ppm to 7.8 ppm. The upper ranges slightly exceeded the Site background concentrations for manganese and arsenic of 559 ppm and 6.9 ppm, respectively. Thallium was found in the catch basin surface water and in one of three rounds of groundwater samples from monitoring well OW-3 above its screening level. However, thallium was not found in the soil samples collected on or off-Site. Since the on-Site concentrations of manganese and arsenic are consistent with background concentrations and these minerals are naturally occurring in the soils and the aquifer, and since thallium was not detected in soil above its screening level, EPA believes that elevated concentrations of manganese, arsenic and thallium at OW-3 are not Site-related. However, this will be confirmed by additional sampling which will be conducted during the pre-design phase of the selected remedy for the Site.

Based on analytical results collected during the vertical profile event and groundwater sampling for rounds 1, 2, and 3, the lateral and vertical extent of the groundwater plume has been adequately characterized and defined. Groundwater contamination does not appear to be migrating off-Site, primarily due to the low solubility of elemental mercury in water and mercury's propensity to form complexes and sorb to aquifer materials. The distribution of contamination appears to be related to MERECO work areas, where mercury releases

occurred. A small portion of the plume is also shown to be on the adjacent Allied Building Property, to the east of MERECO.

Fish Tissue

Fish samples were collected in 2001 to support the ecological risk assessment and the human health risk assessment. Because results from the 2001 effort indicated a potential ecological impact on fish and other biota, additional fish samples were collected in 2004 as part of the baseline ecological risk assessment ("BERA"). The samples were analyzed for full organic parameters, metals and total and methyl mercury.

Pesticides detected in fish samples are not known to be Site-related and their concentrations are similar in both background and downstream samples which indicates that the Site is not a source of pesticide contamination. Regarding PCBs and Aroclor 1260, in particular, the highest concentrations detected in fish downstream and upstream of the Site were 410 ppb (I-90 Pond) and 98 ppb (Inga's Pond). The highest concentration of Aroclor 1254 found in fish caught upstream of the Site was 80 ppb; the highest level of Aroclor 1254 detected downstream of the Site in the I-90 Pond was 130 ppb. Aroclors 1254 and 1260 were commonly detected in all fish samples. In addition, Aroclor 1260 was not detected above the soil screening level for PCBs on-Site. While Aroclor 1254 was detected on Site above screening levels, it was not detected in the soil above 1 ppm, which is well below the NYSDEC's clean up objective of 25 ppm for sites which are zoned for industrial use.

As mentioned above, data collected while the NYSDEC served as lead agency indicated concentrations of mercury in fish which ranged from 7 ppb to 914 ppb within the lower reaches of Patroon Creek. The RI detected mercury in fish tissue at 110 ppb in a sample from the I-90 Pond and 220 ppb and 130 ppb in two fish caught between MERECO and the I-90 Pond. Mercury concentrations in fish collected for the BERA ranged from 48 ppb in fish collected from the background portion of the Unnamed Tributary to 175 ppb in fish from the Unnamed Tributary.

Generally, mercury found in fish tissue is in the form of methyl mercury, which is available for biomagnification in the food chain. Biomagnification is the process whereby small concentrations of contaminants, such as mercury, increase through the consumption of bioaccumulated chemicals contained in smaller prey. Fish tissue were sampled and analyzed to evaluate the potential for ecological and human health effects.

Fate and Transport

As part of its studies, EPA evaluated the fate and transport of indicator contaminants at the Site. Mercury is relatively insoluble in water and shows a high tendency to adsorb to soil or organic matter in soil, or be suspended in aqueous media. However, the data shows mercury contamination on-Site in those areas where MERECO conducted its mercury reclamation operations and upgradient and downgradient of the Site as far as the most downgradient sampling location (SD-14).

Of the major metal contaminants found at the Site in various media, only arsenic, lead, manganese, thallium, and mercury were detected in the groundwater samples. The low ratio of mercury dissolved in groundwater to mercury in Site soils is consistent with the expected fate of mercury, in which, instead of dissolving into groundwater, mercury adheres or accumulates within Site soils, sediments, and biota in nearby streams, tributaries, and the I-90 Pond. However, soils within the Property appear to have moved off the Property, contaminating the sediments of the streams and soils in the vicinity of MERECO, via stormwater flow in the catch basins. MW-05D shows high mercury levels in groundwater whereas, in the adjacent boring, SBD-04, mercury levels drop off, indicating that the contaminant is (within subsurface soils) restricted to the vicinity of monitoring well MW-05. This was confirmed by a third round of groundwater data which was collected in July 2003. Analysis of that data confirmed that the contaminant plume of mercury is relatively stable over the sampling timeframe and does not appear to be migrating off the MERECO Property.

EPA also performed an analysis of the potential for the erosion of the uncontaminated surface layer and resuspension of the deeper, contaminated sediments in the I-90 Pond, during flood events such as a 100-year storm. The analysis indicated that sediments are unlikely to become resuspended during a major storm event, using the critical water velocity and shear stresses which would be induced by such a storm. Also, the top two feet of sediments in the I-90 Pond are relatively uncontaminated. This buildup of sediments in the pond supports the fact that the pond is a depositional environment, so that the possibility for contaminated sediments migrating down stream of the pond is remote.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The Site is currently zoned for industrial use, including commercial and industrial uses. Based on discussions with officials in the Towns of Guilderland and Colonie, New York, the anticipated use for the Site is industrial. EPA's remedy will be consistent with the Towns anticipated future use of the Site.

Ecology

Threatened, Endangered Species and Sensitive Environments

An ecological characterization of the Site was conducted in May 2002, characterizing the Site's terrestrial and aquatic communities in terms of vegetative composition, wildlife habitat, and observed/expected wildlife usage. Additionally, potential wetlands associated with the Site were evaluated by reviewing state and federal wetland mapping, soil type information, and flood plain information, and supplemented with field observations.

The federally-listed endangered species, the Karner blue butterfly (*Lycaeides melissa samuelis*) has been reported by the United States Fish and Wildlife Service (USFWS) to be located within the area of the Site. The habitat necessary to support this species was not observed. The NYSDEC State-listed rare, threatened, and endangered species were

reviewed and no threatened or endangered species were observed on Site.

No Federal- or State-mapped wetland areas are associated with the Site. However, some localized wetlands may exist along the fringe of the Unnamed Tributary. A wetlands delineation will be performed during the remedial design to confirm the extent of the wetlands area and any affected wetlands to the Unnamed Tributary will be restored. Terrestrial communities at the Site are described in terms compatible with the ecological communities described in *Ecological Communities of New York State* (New York Heritage Program 2002) and include: industrial, successional old field, and successional hardwoods. The aquatic habitats associated with the Site were evaluated. The primary species expected to utilize the Unnamed Tributary, Patroon Creek, and the I-90 Pond either as a habitat or as a food source are the frog, turtle, small fish, aquatic invertebrates, raccoon, mink, and muskrat.

SUMMARY OF SITE RISKS

As part of the RI/FS, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land, groundwater, surface water, and sediment uses. The baseline risk assessment includes a human health risk assessment and an ecological risk assessment. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD summarizes the results of the baseline risk assessment for the Site.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification* – uses the analytical data collected to identify the contaminants of potential concern at the site for each medium, with consideration of a number of factors explained below; *Exposure Assessment* - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways (e.g., ingesting contaminated well-water) by which humans are potentially exposed; *Toxicity Assessment* - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and *Risk Characterization* - summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks. The risk characterization also identifies contamination with concentrations which exceed acceptable levels, defined by the National Contingency Plan (NCP) as an excess lifetime cancer risk greater than $1 \times 10^{-6} - 1 \times 10^{-4}$ or a Hazard Index greater than 1.0; contaminants at these concentrations are considered chemicals of concern (COCs) and are typically those that will require remediation at the site. Also included in this section is a discussion of the uncertainties associated with these risks.

Hazard Identification

In this step, the chemicals of potential concern (COPCs) in each medium were identified based on such factors as toxicity, frequency of occurrence, fate and transport of the contaminants in the environment, concentrations, mobility, persistence, and bioaccumulation. Analytical information that was collected to determine the nature and extent of contamination revealed the presence of mercury and methyl mercury in soils, groundwater, and sediments at the Site at concentrations of potential concern. Based on this information, the risk assessment focused on surface soils, subsurface soils, groundwater and sediments, and contaminants which may pose significant risk to human health.

Mercury and methyl mercury were identified as the COCs at the Site in sediments, groundwater, and surface and subsurface soils. A comprehensive list of all COPCs can be found in the baseline human health risk assessment (BHHRA) in the administrative record. Mercury and methyl mercury are the only chemicals which require remediation at the Site.

Exposure Assessment

Consistent with Superfund policy and guidance, the BHHRA is a baseline human health risk assessment and therefore assumes no remediation or institutional controls to mitigate or remove hazardous substance releases. Cancer risks and noncancer hazard indices were calculated based on an estimate of the reasonable maximum exposure (RME) expected to occur under current and future conditions at the Site. The RME is defined as the highest exposure that is reasonably expected to occur at a site. For those contaminants for which the risk or hazard exceeded the acceptable levels, the central tendency estimate (CTE), or the average exposure, was also evaluated.

The Site is currently zoned for commercial/industrial use. According to the historical and current land use and the surrounding Property use, as well as discussions with the Towns of Guilderland and Colonie, it is expected that the future land use for this area will remain consistent with current industrial use. The BHHRA evaluated potential risks to populations associated with both current and potential future land uses.

Although the groundwater is not currently used for drinking, it is designated by the State as a potable water supply, meaning it could be used in the future as a drinking water source and thus needs to be evaluated as such.

Contaminants in surface water did not exceed their conservative health-based screening values and were therefore not quantitatively evaluated.

Exposure pathways were identified for each potentially exposed population and each potential exposure scenario for the groundwater, soils, and sediments. For soils, the exposure pathways evaluated included incidental ingestion of soils by Site workers and construction workers. Groundwater was evaluated as a future potable water supply for residential populations. Therefore, exposure pathways assessed in the BHHRA for the groundwater include future ingestion of groundwater by residents and inhalation of volatiles in

groundwater by residents while showering. Potentially exposed populations associated with sediments included recreational users of Patroon Creek and the Unnamed Tributary. A list of all exposure pathways can be found in Appendix II, Table 1.

Ecological risk was assessed for wildlife which use Patroon Creek and the Unnamed Tributary, including the Belted Kingfisher.

Typically, exposures are evaluated using a statistical estimate of the exposure point concentration, which is usually an upperbound estimate of the average concentration for each contaminant, but in some cases may be the maximum detected concentration. A summary of the exposure point concentrations for the COCs in each medium can be found in Appendix II, Table 2, while a comprehensive list of the exposure point concentrations for all COPCs can be found in the BHHRA.

Toxicity Assessment

Under current EPA guidelines, the likelihood of carcinogenic risks and noncancer hazards due to exposure to Site chemicals are considered separately. Consistent with current EPA policy, it was assumed that the toxic effects of the Site-related chemicals would be additive. Thus, cancer and noncancer risks associated with exposures to individual COPCs were summed to indicate the potential risks and hazards associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Toxicity data for the human health risk assessment were provided by the Integrated Risk Information System (IRIS) database, the Provisional Peer Reviewed Toxicity Database (PPRTV), or another source that is identified as an appropriate reference for toxicity values consistent with EPA's directive on toxicity values. This information is presented in Appendix II, Table 3 (noncancer toxicity data summary) and Appendix II, Table 4 (cancer toxicity data summary). Because mercury is not a carcinogen, carcinogenic toxicity values are not available for mercury; therefore, mercury is not quantitatively evaluated for carcinogenic health effects in the BHHRA (see Table 4, Appendix II).

Risk Characterization

Noncarcinogenic risks were assessed using a hazard index (HI) approach, based on a comparison of expected contaminant intakes and benchmark comparison levels of intake (reference doses, reference concentrations). Reference doses (RfDs) and reference concentrations (RfCs) are estimates of daily exposure levels for humans (including sensitive individuals) which are thought to be safe over a lifetime of exposure. The estimated intake of chemicals identified in environmental media (*e.g.*, the amount of a chemical ingested from contaminated drinking water) is compared to the RfD or the RfC to derive the hazard quotient (HQ) for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds within a particular medium that impacts a particular receptor population.

The HQ for oral and dermal exposures is calculated as below. The HQ for inhalation exposures is calculated using a similar model that incorporates the RfC, rather than the RfD.

HQ = Intake/RfD

Where: HQ = hazard quotient
Intake = estimated intake for a chemical (mg/kg-day)
RfD = reference dose (mg/kg-day)

The intake and the RfD will represent the same exposure period (i.e., chronic, subchronic, or acute).

As previously stated, the HI is calculated by summing the HQs for all chemicals for likely exposure scenarios for a specific population. An HI greater than 1.0 indicates that the potential exists for noncarcinogenic health effects to occur as a result of site-related exposures, with the potential for health effects increasing as the HI increases. When the HI calculated for all chemicals for a specific population exceeds 1.0, separate HI values are then calculated for those chemicals which are known to act on the same target organ. These discrete HI values are then compared to the acceptable limit of 1.0 to evaluate the potential for noncancer health effects on a specific target organ. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to a carcinogen, using the cancer slope factor (SF) for oral and dermal exposures and the inhalation unit risk (IUR) for inhalation exposures. Excess lifetime cancer risk for oral and dermal exposures is calculated from the following equation, while the equation for inhalation exposures uses the IUR, rather than the SF:

Risk = LADD x SF

Where: Risk = a unitless probability (1×10^{-6}) of an individual developing cancer
LADD = lifetime average daily dose averaged over 70 years (mg/kg-day)
SF = cancer slope factor, expressed as [1/(mg/kg-day)]

These risks are probabilities that are usually expressed in scientific notation (such as 1×10^{-4}). An excess lifetime cancer risk of 1×10^{-4} indicates that one additional incidence of cancer may occur in a population of 10,000 people who are exposed under the conditions identified in the assessment. Again, as stated in the NCP, the acceptable risk range for Site-related exposure is 10^{-6} to 10^{-4} with the goal of protection being 10^{-6}.

As set forth in Tables 5 (noncancer health effects) and 6 (cancer health effects) the risks and hazards associated with the Site are:

Recreational Users of Patroon Creek, the Unnamed Tributary of the Creek and the I-90 Pond: Risks and hazards were evaluated for recreational consumption of fish caught from these surface water bodies. HI values and excess lifetime cancer risks associated with fish consumptions were within acceptable levels.

Current and Future Site Workers: Risks and hazards were evaluated for Site workers exposed to inhalation of mercury vapors in indoor air. The calculated HI is 40. Excess lifetime cancer risks are within acceptable levels for Site-related contaminants. However, EPA's selected remedy for this Site cannot address this exposure pathway since the release of mercury vapor has and is occurring solely within an active workplace, and indoor sources are likely contributing significantly to the indoor air concentrations. The release of hazardous substances, such as mercury, occurring within an active facility, such as Mercury Refining, is not a release under CERCLA. Therefore, the indoor inhalation exposure pathway cannot be addressed by using CERCLA authority.

Future Construction Workers: Risks and hazards were evaluated for incidental ingestion of, dermal contact with, and inhalation of particulates released from surface and subsurface soils. The HI is 70 for construction workers; mercury is the most significant contributor to the total hazard. Excess lifetime cancer risks are within acceptable levels for Site-related contaminants.

Future Groundwater Use: Risks and hazards were evaluated for ingestion of and dermal contact with tap water using a residential exposure scenario. The HI is 30 for the adult resident and 250 for the child resident; for both the adult and the child, mercury is the most significant contributor to the total hazard. Excess lifetime cancer risks are within acceptable levels for Site-related contaminants. In addition, the maximum detected concentration of mercury in groundwater (22.5 ug/L) also exceeds the New York State Water Quality Standard (NYSWQS) limit of 0.7 ug/L and the federal and New York State maximum contaminant level (MCL) for drinking water of 2 ug/L.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data.

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the

actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment provides upper-bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

More specific information concerning public health risks, including a quantitative evaluation of the degree of risk associated with various exposure pathways is presented in the risk assessment report.

These noncancer health hazards indicate that there is significant potential risk from direct exposure to soils and groundwater to potentially exposed populations. For these receptors, exposure to mercury in soils and groundwater results in an HI above the threshold of 1. The concentration of mercury is also in excess of both the NYS WQS of 0.7 ug/L and the federal and State MCL of 2 ug/L.

Ecological Risk Assessment

A Screening Level Ecological Risk Assessment (SLERA) was completed in 2003 and indicated a potential for risk to ecological receptors from exposure to chemicals detected in surface water, sediments, and soils at and in the vicinity of the Site. The SLERA used conservative assumptions to determine ecologically related COPCs and their associated risks to ecological receptors. In accordance with EPA's *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (Interim Final) (USEPA 1997), and because of the potential for ecological risk indicated by the SLERA, EPA concluded that a site-specific baseline assessment of ecological risk (BERA) was warranted.

The BERA used a multiple-lines-of-evidence approach to evaluate ecological risk, including food chain modeling, site-specific toxicity testing and tissue analysis. Risks to fish, amphibians, birds (*i.e.*, piscivorous, carnivorous, and insectivorous birds), and mammals (*i.e.*, piscivorous and insectivorous mammals) were determined through the food chain modeling. Risks posed by direct contact with sediments were assessed using the toxicity tests. Additionally, fish tissue concentrations were compared to effects-based fish tissue concentration values to indicate if mercury present in fish tissue is at concentrations which are

associated with adverse effects.

The potential exposure pathways shown on Figure 4, Appendix II, include those related to both aquatic and terrestrial environments. The process used for selection of COCs for this Site revealed elevated concentrations of mercury in sediments, but not in surface water, floodplain soils, or other environments outside of aquatic systems. The potential exposure pathways associated with terrestrial environments were therefore neither assessed in the BERA nor are they highlighted in Figure 4.

Appendix II, Table 7 shows average and maximum concentrations detected in sediments for the COCs identified and average concentrations of mercury in biological samples. Only mercury concentrations are shown for biological samples as mercury is the sediments COC with the most significant potential to bio-accumulate in and adversely affect upper trophic level receptors.

The BERA determined that mercury and other contaminants in study area sediments exhibit the potential to cause adverse effects in certain representative receptors (*e.g.*, benthic invertebrates and piscivorous birds). The sources of contamination contributing to these findings appear to include both those related to the Site (direct risks from mercury in sediments in the Unnamed Tributary, in particular in the area adjacent to the Site) and those from other, unidentified sources (*e.g.*, direct risks from PAHs are highest in Inga's Pond, upgradient of the Site).

Ecological risks associated with sediments were evaluated by the calculation of hazard quotients (HQs). An HQ of 1.0 serves as the critical threshold for risk. Calculated HQs which are greater than 1 indicate the potential for elevated risk. The HQs were calculated by dividing the maximum and mean concentrations of mercury and methyl mercury in the sediments by toxic reference values (TRV) for each contaminant. The respective TRVs for mercury and methyl mercury, of 0.18 ppm and 1.77 ppm, respectively, are threshold values above which adverse effects may be observed in fish and benthic invertebrate organisms. The derivation and selection of these values are explained further in the BERA. HQs for food chain risk were conducted to evaluate bio-accumulative effects of mercury on birds and mammals. The HQs were calculated by dividing the (maximum or mean) concentration of mercury and methyl mercury by an appropriate LOAEL (the lowest observed adverse effect level concentration) which is a receptor specific literature value.

HQs for direct contact and consumption of sediments contaminated with mercury, methyl mercury and other non-Site related contaminates are presented on Table 8, Appendix II. Potential risk (HQ greater than 1.0) was calculated at several locations for mercury (*i.e.*, Rensselaer Lake, Inga's Pond, I-90 Pond, and the Unnamed Tributary). HQs exceeded 1.0 for methyl mercury for all locations except for Rensselaer Lake where no data were available. HQs for background sampling locations collected upstream of the Site ranged from 1.7 at Rensselaer Lake to 101 for the segment of the Unnamed Tributary that is upstream of the Site, for mercury and methyl mercury. Methyl mercury is the major contributor of elevated HQ values calculated for the sediment samples collected upstream and downstream of the

Site. The highest HQ was calculated for sediments at the MERECO stormwater outfall, which contains elevated levels of mercury and methyl mercury contamination that can act as a source of contamination to ecological receptors downstream. The HQs calculated for mercury and methyl mercury at the outfall were 50 and 910, respectively.

An elevated HQ for mercury was also calculated for the sediments in the I-90 Pond. However, there is currently a two-foot layer of less contaminated sediments at the surface of the pond which, as discussed above, functions as a cap which isolates the subsurface sediments which are more contaminated. Moreover, tissue samples from fish collected from the pond did not contain mercury above 0.2 ppm which is a threshold concentration for mercury in fish. Mercury in tissue above this threshold can cause adverse effects on growth, reproduction, development and behavior.

Because the I-90 Pond is depositional and because there are no plans to maintain the pond's water depth by periodic dredging, the top layer of sediments will increase in thickness. The top six inches, which represents the biologically active zone, will become less contaminated as this layer thickens. An analysis conducted of the near-term possibility of a storm event removing this top layer determined that such an event is remote.

The analysis of risk from food chain modeling considered two exposure scenarios. Scenario 1 is based on the Site foraging factor (SFF) calculated as the ratio of the Site area to the average foraging area for the receptor of concern. Scenario 2 makes less conservative assumptions and estimates (generally higher) SFFs based on habitat suitability and availability and best professional judgment regarding receptor foraging behavior. Scenario 2 HQs are probably more realistic where prey is abundant and available, but Scenario 1 HQs represents a reasonable exposure that does not favor any particular location. The areas that were modeled include Inga's Pond (upstream of the Site), portions of the Unnamed Tributary which are upstream of the Site, the Unnamed Tributary (Adjacent to and downstream of the Site), Patroon Creek downstream from the confluence with the Unnamed Tributary, and the I-90 Pond, downstream of the Site.

As shown in Table 9, Appendix II, most of the food chain model HQs are less than 1 for most receptors. The risks from food chain exposure are expressed as a dose range: No Observable Acute Effects Level (NOAEL) to Lowest Observable Acute Effects Level (LOAEL). Doses that remain below the NOAEL suggest no risk and doses that exceed the LOAEL suggest the clearest indicator of risk. The model indicated an elevated risk (HQ of 1.4) using the LOAEL at the Unnamed Tributary for only the Kingfisher.

Based on data from the SLERA and BERA, potential ecological risks associated with mercury contaminated sediments exist. Although mercury contamination has been found in the sediments of I-90 Pond, the ecological risks in this area are considered acceptable for reasons including the background mercury concentrations upstream of the Site and the existing and continued accumulation of the top layer of sediments on the pond. However, as indicated previously, sediments near the outfall in the Unnamed Tributary was found to have the highest risk (an HQ of 910) to insects and benthic organisms through direct contact or

consumption of mercury-contaminated sediments and is the only area that poses a risk to the Kingfisher through the bioaccumulative effects of mercury through the food chain (an HQ of 1.4). Consequently, the ecological risks associated with the sediments in this area are considered unacceptable and should be addressed.

Basis for Action

Based upon the results of the RI and human health and ecological risk assessments, EPA has determined that the response action selected in this ROD is necessary to protect the public health and welfare and the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are media-specific goals to protect human health and the environment. RAOs provide a general description of what a cleanup will accomplish (*e.g.*, restoration of groundwater). The RAOs are identified following the identification of COPCs, identification of potential federal and state ARARs and other guidance to be considered (TBCs), development of site-specific risk-based cleanup levels, and, finally, selection of the cleanup levels based on the ARARs, guidance values, or risk-based values. ARARs at a site may include other federal and state environmental statutes and regulations. Other federal or state advisories, criteria, or guidance are TBCs, which are not required by the NCP, but may be very useful in determining what is protective of a site or how to carry out certain actions or requirements. Cleanup levels are the more specific endpoint concentrations or risk levels for each exposure route that are believed to provide adequate protection of human health and the environment based on preliminary site information.

The RI results indicate that surface and subsurface soils and groundwater at the MERECO Property and portions of the adjoining properties are contaminated with mercury. The baseline human health risk assessment indicates that mercury poses a future health risk to Site workers through ingestion and direct contact with soil and to adults and children through ingestion of groundwater The following RAOs have been identified for the contaminated soils and groundwater:

- Prevent or minimize potential future human exposures including ingestion and dermal contact with mercury-contaminated soils in excess of 5.7 ppm, which is based on New York State's Soil Cleanup objectives at 6 NYCRR Part 375 for industrial use;

- Prevent or minimize potential ingestion of mercury-contaminated groundwater and minimize mercury contamination in soils as a source of groundwater contamination at the facility. The cleanup level will be applied to the subsurface in the aquifer where the groundwater has a dissolved mercury concentration which exceeds the NYSWQS of 0.7 ppb.

The BERA indicates that detected concentrations of mercury in sediments within the Unnamed Tributary present risks to ecological receptors. The RAO identified for sediments is:

- Remediate mercury-contaminated sediments in the Unnamed Tributary to levels that are protective of the biota such that the most significant impacts are eliminated.

The clean up level for sediments is derived from sediment screening values identified in NYSDEC's Technical Guidance for Screening Contaminated Sediment, 1994. The primary sediments cleanup level is 1.3 ppm, which is the severe effect level ("SEL"). According to this guidance, sediments which are above this concentration are likely to result in significant harm to benthic aquatic life and should be remediated. With the exception of the sediments at the MERECO stormwater outfall, where EPA found mercury in the sediments at 38 ppm, the RI did not detect mercury above a concentration of 1.2 ppm in the sediments of the Patroon Creek, the Unnamed Tributary or the biological active surface layer of sediments of the I-90 Pond. Tissue samples from fish which were caught downstream of the Site at the Unnamed Tributary had a concentration of 0.22 ppm of mercury, which slightly exceeded the tissue threshold effect concentration 0.2 ppm for fish. Tissue concentrations above this threshold may result in sub-lethal, adverse affects to fish populations. No other tissue sample from fish caught upstream or further downstream of the Site exceeded the threshold. Because the highest detected concentration of mercury in the sediments at the Site is close to the SEL with no severe effect observed in fish, EPA believes that the SEL is an appropriate cleanup level for the Site

Estimated Areas to be Remediated

Estimates were made of the quantity of contaminated soils and sediments present at the Site. These estimates were determined based on the contaminant data presented in the RI report that exceeded the cleanup levels identified above. Quantity estimates for each media are presented below.

Location	Depth	Area	Volume of Soils	Volume of Sediments
Storm Sewer	0- 10'	1,300 ft^2	480 yd^3	-
Sediments at Outfall	0-2'	1,500 ft^2	-	110 yd^3
Soils on and West of the MERECO Property	1'	36,100 ft^2	1340 yd^3	-
Soils on and East of the MERECO Property	0'-10'	7,600 ft^2	450 yd^3	-
Subsurface Soils[3]	66'	5,900 ft^2	14,400 yd^3	-
TOTAL		52,400 ft^2	16,670 yd^3	110 yd^3

[3] - The amount of subsurface soils to be treated using solidification/stabilization will depend on the volume of groundwater with a dissolved mercury concentration which exceeds the NYSDEC water quality standard of 0.7 ppb.

Location Descriptions and Assumptions:

Sediments: EPA estimates the sediments to be remediated at the stormwater outfall will include an area which is approximately 100 feet long by 15 feet wide by two feet deep. Mercury is present in the sediments here at a maximum concentration of 38 ppm. Sediments to be remediated at the stormwater outfall are shown on Figure 2 (Appendix 2).

Soils: Soils to be remediated at the eastern and western portions of the MERECO Property include the storm sewer and portions of the Diamond W., Allied Building and Albany Pallet properties which are contaminated with mercury at concentrations which exceed 5.7 ppm. Soils in these areas include Areas A, B, C and D on Figure 2. The highest mercury concentration detected in the surface soil is 150 ppm at 0-2' bgs on the Allied Building Property.

An area of subsurface soils will also have to be remediated. The area includes soils which contain groundwater with a dissolved mercury concentration of greater than 0.7 ppb. The remediation of these soils will also extend to the ground surface. This area is located on and around MERECO's processing and office building and the container storage building and includes area E on Figure 2. The highest mercury concentration in Area E is 38,800 ppm at 13' bgs. Area E also includes free-phase mercury which is visible down to 60' bgs. The water table is 10' bgs and clay is at 61' bgs.

Groundwater: Area E is defined by the area of contaminated groundwater which exceeds the NYSWQS limit of 0.7 ppb. The contaminated groundwater that is co-located with the mass of contaminated soil, while not migrating beyond this Area still presents a risk and will be addressed by the remediation of the contaminated soils. (See Principal Threat Waste section at page 37). Since mercury binds to the soil particles, traditional groundwater pump and treat remedies were not evaluated.

DESCRIPTION OF REMEDIAL ALTERNATIVES FOR SOILS AND GROUNDWATER

CERCLA requires that each selected remedy be protective of human health and the environment, be cost-effective, comply with ARARs, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

Detailed descriptions of the remedial alternatives for meeting the Site cleanup levels can be found in the FS Report. The alternatives include a no action alternative and three action alternatives. These alternatives are presented below.

The implementation time for each alternative reflects only the time required to construct or implement the remedy and not the time required to negotiate with potentially responsible parties, design the remedy, or procure contracts for design and construction.

Alternative 1 - No Action

Capital Cost:	$ 0
Annual Operation and Maintenance (O&M):	$ 0
Present Worth:	$ 69,120
Time to Implement:	0 months

Under this alternative, no further action would be implemented, and the current status of the Site would remain unchanged. This alternative would not involve reducing the toxicity, mobility, or the volume of the contaminants in the soils or the groundwater. Institutional controls would not be implemented to restrict future Site development or use.

Because this alternative would result in contaminants remaining on-Site above levels that would allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. The present worth estimate for this alternative includes the cost to conduct these reviews over a thirty year period.

Alternative 2 – Limited Soil Excavation, Cap Maintenance, Groundwater Monitoring and Institutional Controls

Capital Cost:	$2.9 Million
Annual Operation and Maintenance (O&M):	$96,000
Present Worth:	$4.1 Million
Time to Implement:	Less than 12 months

Alternative 2 consists of the following components:

- Inspection and, if necessary, repair of the existing concrete/asphalt and clay caps.
- Excavation of storm sewer/catch basins and surrounding soils to be disposed of off-Site.
- Excavation of surface and subsurface soils above the water table which are outside of the capped areas on-Site and which exceed the cleanup level for soil of 5.7 ppm of mercury.
- Disposal of excavated soils in accordance with applicable regulatory requirements at off-Site facilities.
- Backfill with clean soil into excavated zones.
- Implementation of institutional controls to address future development/use of the Property, to protect the concrete/asphalt and clay caps, to prohibit future demolition or alteration of the existing Site buildings unless such work is performed in accordance with the Site Management Plan (SMP), and restrict groundwater use.

- Implementation of a SMP to address future development/use of the Property, long-term maintenance of the existing asphalt/ concrete and clay caps, and long-term groundwater monitoring.
- Five-year reviews.

Cap Maintenance and Repair and Soils Excavation: This alternative involves repairing the existing concrete/asphalt and clay caps on Site to reduce the amount of rain water infiltrating through the soils, thereby reducing the transport of contaminants to the groundwater. This alternative also includes excavation and off-Site disposal of surface and subsurface soils above the water table from areas A, B, C and D, as noted on Figure 2, Appendix I, which contain mercury which exceeds the cleanup level of 5.7 ppm. The soils in Areas A, B, C and D are outside of the existing caps and include soils associated with the stormwater sewer/catch basin systems. This alternative does not include excavation and disposal of contaminated material below the caps since the material extends to an approximate depth of 66 feet. Excavation of this material is not feasible given the proximity of the CSX railroad and the two buildings on the MERECO Property. The exact amount of soil to be excavated would be delineated in a pre-design investigation.

Backfill: If the backfill comes from on-Site, the excavation would be backfilled with clean fill meeting the cleanup level concentration. If the backfill comes from off-Site sources, the clean fill will meet the requirements for soil covers and backfill as set forth in 6 NYCRR Section 375-6.7. The backfilled excavation areas would be graded and compacted to allow for proper Site drainage. The existing cover layer material (vegetative or asphalt) for each area would be restored at the surface.

Institutional Controls: Institutional controls in the form of environmental easements/restrictive covenants would be implemented to restrict future development/use of the Site. Specifically, environmental easements/restrictive covenants would be filed in the property records of Albany County. The easements/covenants would at a minimum: (a) limit the Site to industrial uses; (b) preserve the integrity of the asphalt/concrete cap; (c) preserve the integrity of the clay cap; (d) prevent the excavation of soils which lay beneath the Phase 1 and Container Storage Buildings unless the excavation follows a Site Management Plan (see below) and; (e) restrict the use of groundwater as a source of potable or process water until groundwater quality standards are met.

Long Term Monitoring and Site Management Plan (SMP): An SMP, would, among other things, address long-term operation and maintenance (O&M) of the Site, and the future excavation of soils including soils beneath the Phase 1 and Container Buildings on the Mercury Refining Property to insure that the soils are properly tested and handled to protect the health and safety of workers and the nearby community. The approved SMP will also require an evaluation of the potential for vapor intrusion at all existing buildings on-Site and/or those to be constructed in the future, and mitigation, if necessary, in compliance with the SMP. Finally, the SMP will provide for the proper management of all Site remedy components post-construction and shall include: (a) monitoring of groundwater to ensure that, following Site remediation, the contamination is attenuating and groundwater quality

continues to improve; (b) monitoring and maintenance of institutional controls; (c) operation and maintenance of the asphalt/concrete and clay caps; (d) periodic certifications by the owners/operators of the Site properties or other party implementing the remedy that the institutional and engineering controls are in place; and (e) management of the demolition or alteration of the existing buildings on-Site, if such demolition or alteration is required in the future, to protect the health and safety of the workers and the nearby community and to ensure proper disposal of any building debris.

Five-year Reviews of the Site: Because this alternative would result in contaminants remaining on-Site above levels that would allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years.

Alternative 3 - Cap Maintenance, Groundwater Monitoring, In-Situ Solidification/Stabilization, Limited Soil Excavation and Institutional Controls

Capital Cost:	$9.2 Million
Annual Operation and Maintenance (O&M):	$ 82,000
Present Worth:	$10.3 Million
Time to Implement:	12 months

Alternative 3 consists of the following components:

- Removal and disposal of the concrete/asphalt caps.
- Excavation of storm sewer/catch basins and surrounding soils which exceed the cleanup level for soil of 5.7 ppm and disposal off-Site in accordance with applicable regulatory requirements.
- Excavation of surface and subsurface soils above the water table which exceed the cleanup level for surface soils of 5.7 ppm of mercury.
- Disposal of excavated soils at off-Site facilities, in accordance with applicable regulatory requirements.
- Backfill with clean soil into excavated zones.
- Perform treatability testing to optimize treatment results.
- Treatment through solidification of surface and subsurface soils where the groundwater has a dissolved mercury concentration above the cleanup level of 0.7ppb.
- Post-remediation sampling to verify achievement of the cleanup level for soils and groundwater.
- Implementation of institutional controls to restrict future development/use of the Property, to protect the existing clay cap and the solidified/stabilized mass, to prohibit future demolition or alteration of the existing Site buildings unless such work is performed in accordance with the SMP and to restrict groundwater use.
- Implementation of a SMP to address future development/use of the Property, long-term maintenance of the clay cap, and long-term groundwater monitoring.
- Five year reviews.

Removal and Disposal of the Concrete and Asphalt Caps: Prior to remediation, the overlying concrete and asphalt (in Areas A through E) would be removed and disposed of off-Site. Once the concrete and asphalt layer is removed, the exposed soils would be covered by 6-mil or heavier polyethylene sheeting for dust control while work is not actively taking place at that area. In addition, portions of the chain link fence and the wooden shed would need to be demolished. The concrete, asphalt and other demolished materials is not expected to contain mercury contamination thus, for cost estimating purposes, it is assumed that these materials would be disposed of in a non-hazardous (RCRA Subtitle D) landfill. This assumption is based on the December 1994 report prepared by the Mercury Refining Company entitled, 'Furnace Building Demolition.' The report indicates that after the old furnace building was demolished, the underlying concrete slab was swept and vacuumed. However, the asphalt and concrete material to be removed will be tested to ensure proper disposal

In-Situ Solidification/Stabilization and Excavation of Soils: This alternative includes excavation and off-Site disposal of surface and subsurface soils above the water table in areas A, B, C and D and shallow soils in Area E which contain mercury and which exceed the cleanup level of 5.7 ppm (see Appendix, I, Figure 2) These soils also include the soils associated with the stormwater sewer/catch basin systems.

Additionally, this alternative includes solidification /stabilization which will be conducted in Area E (as depicted on Figure 2) on surface and subsurface soils[4] and soils below the water table where the groundwater has a dissolved mercury concentration which exceeds the NYSDEC water quality standard of 0.7 ppb. Solidification/stabilization refers to treatment processes which mix or inject binding agents into the contaminated material to immobilize and encapsulate the contaminants. This results in chemical bonding of the contaminant to reduce its solubility and soil permeability, thereby limiting contact with groundwater and stormwater. This remedy also reduces the exposed surface area, further limiting exposure to groundwater and stormwater. This reduces the contact of groundwater/stormwater with the contaminants by reducing the permeability of the soil matrix. Groundwater and soil sampling would also be performed following the remedial action to confirm that the soils and groundwater which surround the solidified mass are below the cleanup levels for soils and groundwater.

The remediation of Site soils in the plume of dissolved mercury would eliminate the source of potential future groundwater contamination because it will prevent leaching from the contaminated soil mass to the groundwater. Most of the soils in the plume are highly contaminated with mercury. Any groundwater which is not immediately treated will be restored through the natural processes of dispersion and dilution.

Treatability tests on this technology were performed under the direction of MERECO, while the NYSDEC served as the lead agency. The tests showed that the technology was able to stabilize Site soils with mercury contamination. This alternative also includes a pilot test of

4 This would include soils beneath the existing asphalt/concrete cap but not soils beneath the Container Storage Building or the existing clay cap.

this technology. The test would be performed in order to maximize the effectiveness of the technology and to support the design of its application at the Site.

Backfill: If the backfill comes from on-Site, the excavation would be backfilled with clean fill meeting the cleanup level concentration. If the backfill comes from off-Site sources, the clean fill will meet the requirements for soil covers and backfill as set forth in 6 NYCRR Section 375-6.7. The backfilled excavation areas would be graded and compacted to allow for proper Site drainage. The existing cover layer material (vegetative or asphalt) for each area would be restored at the surface.

Post-Remediation Verification Sampling: Samples of the treated soils would be collected to determine whether the cleanup levels for soils and groundwater have been met. The samples would be analyzed for Synthetic Precipitation Leaching Procedure (SPLP) and total inorganic mercury. Additional sampling may be required during the execution of the alternative.

Institutional Controls: Institutional controls in the form of environmental easements/restrictive covenants to restrict future development/use of the Site would be implemented. Specifically, environmental easements/restrictive covenants would be filed in the property records of Albany County. The easements/covenants would at a minimum: (a) limit the Site to industrial uses; (b) preserve the integrity of the clay cap; (c) preserve the integrity of the solidified/stabilized mass; (d) prevent the excavation of soils which lay beneath the Phase 1 and Container Storage Buildings unless the excavation follows a Site Management Plan (see below); and; (e) restrict the use of groundwater as a source of potable or process water until groundwater quality standards are met.

Long Term Groundwater Monitoring and Site Management Plan: Long-term operation and maintenance of the Site would be accomplished through the development and implementation of an EPA approved SMP. The SMP, would, among other things, address long-term operation and maintenance (O&M) of the Site and the future excavation of soils, including soils beneath the Phase 1 and Container Buildings on the Mercury Refining Property, which are not remediated, to insure that the soils are properly tested and handled to protect the health and safety of workers and the nearby community. The approved SMP would also require an evaluation of the potential for vapor intrusion at all existing buildings on-Site and/or those to be constructed in the future, and mitigation, if necessary, in compliance with the SMP. Finally, the SMP would provide for the proper management of all Site remedy components post-construction and shall include: (a) monitoring of groundwater to ensure that, following Site remediation, the contamination has been remediated; (b) monitoring and maintenance of institutional controls; (c) operation and maintenance of the clay cap and the solidified mass; (d) periodic certifications by the owners/operators of the Site properties or other party implementing the remedy that the institutional and engineering controls are in place; and (e) management of the demolition or alteration of the existing buildings on-Site, if such demolition or alteration is required in the future, to protect the health and safety of the workers and the nearby community and to ensure proper disposal of any building debris.

Five-year Reviews of the Site: Because this alternative would result in contaminants

remaining on-Site above levels that would allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years.

Alternative 4 – Cap Maintenance, Groundwater Monitoring, Electrochemical Treatment, Limited Soil Excavation and Institutional Controls

Capital Cost:	$20.8 Million
Annual Operation and Maintenance (O&M):	$ 82,000
Present Worth:	$21.9 Million
Time to Implement:	36 months

Alternative 4 consists of the following components:

- Removal and disposal of the concrete/asphalt caps.
- Excavation of storm sewer/catch basins and surrounding soils which exceed the cleanup level for soils of 5.7 ppm and disposal off-Site in accordance with applicable regulatory requirements.
- Excavation of surface and subsurface soils above the water table from Areas A, B, C and D which exceed the cleanup levels for surface soils of 5.7 ppm of mercury.
- Disposal of excavated soils at off-Site facilities, in accordance with applicable regulatory requirements.
- Backfill with clean soil into excavated zones.
- Perform treatability testing to optimize treatment results.
- In-situ treatment of surface and subsurface soils and groundwater in Area E utilizing electrochemical treatment where the groundwater has a dissolved mercury concentration above the cleanup level of 0.7 ppb.
- Post remediation sampling to verify achievement of the soils and groundwater cleanup levels.
- Implementation of institutional controls to restrict future development/use of the Property, to protect the integrity of the clay cap and to restrict groundwater use.
- Implementation of an SMP to address future development/use of the Property, long-term maintenance of the existing clay cap, and long-term groundwater monitoring.
- Five-year reviews.

Removal and Disposal of the Concrete and Asphalt Caps: Prior to remediation, the overlying concrete and asphalt (for Areas A through E) would be removed and disposed of off-Site. Once the concrete and asphalt layer was removed, the exposed soils would be covered by 6-mil or heavier polyethylene sheeting for dust control while work is not actively taking place at that area. In addition, portions of the chain link fence and the wooden shed would need to be demolished. Since the concrete, asphalt and other demolished materials should not contain mercury contamination, for cost estimating purposes it is assumed they would be disposed of in a non-hazardous (RCRA Subtitle D) landfill. However, this assumption would be verified through testing prior to disposal.

Electrochemical Treatment and Excavation of Soils: This alternative would include excavation and off-Site disposal of surface and subsurface soils above the water table from areas A, B, C and D (as depicted on Figure 2, Appendix I) which contain mercury which exceeds the cleanup level of 5.7 ppm. The soils include soils associated with the stormwater and sewer/catch basin systems.

Additionally, this alternative includes electrochemical treatment which will be conducted in Area E (as depicted on Figure 2) on surface and subsurface soils[5] and soils below the water table where the groundwater has a dissolved mercury concentration which exceeds the NYSDEC water quality standard of 0.7 ppb. Electrochemical treatment involves the burying of electrodes in the soils. When the induced electrical current is passed through the soils, the soil particles become polarized. These polarized soil particles discharge electricity, causing metals to migrate towards and be deposited on the electrodes. The electrodes, with deposited mercury, would be removed at the end of the treatment process. This technology may also involve the addition of chemical amendments which may be necessary to assist in extraction and mobilization of mercury in the soils.

A laboratory scale treatability study was undertaken for EPA in 2006 by the Mississippi State University to determine whether electrochemical treatment technology could be used to remove mercury from contaminated soils and groundwater from the Site. The study used electrochemical test cells to evaluate the technology. Various chemical amendments were added to the cells to assist in extracting and mobilizing the mercury in the soils. The study showed that the addition of the chemical amendment potassium iodide resulted in a 98.5 percent reduction of mercury in the soils.

This remediation technology would eliminate the source of potential future groundwater contamination (the contaminated soils) but would also remediate the groundwater by polarizing the mercury in the groundwater causing it to migrate to the electrodes. Groundwater sampling would also be performed following the remedial action on an annual basis for the first five years. Sampling and the performance of five-year reviews thereafter would be based on the results of previous sampling rounds. This technology would be run until the concentration of mercury in the groundwater reaches 0.7 ppb or until the rate of mercury removal from the soils becomes negligible and reaches a steady state.

Backfill: If the backfill comes from on-Site, the excavation would be backfilled with clean fill meeting the cleanup level concentration. If the backfill comes from off-Site sources, the clean fill will meet the requirements for soil covers and backfill as set forth in 6 NYCRR Section 375-6.7. The backfilled excavation areas would be graded and compacted to allow for proper Site drainage. The existing cover layer material (vegetative or asphalt) for each area would be restored at the surface.

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5 This would include soils beneath the existing asphalt/concrete cap but not soils beneath the Container Storage and Phase 1 Buildings or the existing clay cap.

Post-Remediation Verification Sampling: Samples of the treated soils would be collected to determine whether the cleanup levels for soils and groundwater have been met. The samples would be analyzed for Synthetic Precipitation Leaching Procedure (SPLP) and total inorganic mercury. Additional sampling may be required during the execution of the alternative.

Institutional Controls: Institutional controls in the form of environmental easements/restrictive covenants to restrict future development/use of the Site would be implemented. Specifically, environmental easements/restrictive covenants would be filed in the property records of Albany County. The easements/covenants would at a minimum: (a) limit the Site to industrial uses; (b) preserve the integrity of the clay cap; (c) prevent the excavation of soils which lay beneath the Phase 1 and Container Storage Buildings unless the excavation follows a Site Management Plan (see below) and; (d) restrict the use of groundwater as a source of potable or process water until groundwater quality standards are met.

Long Term Groundwater Monitoring and Site Management Plan: Long-term operation and maintenance of the Site would be accomplished through the development and implementation of an EPA approved SMP. The SMP, would, among other things, address long-term operation and maintenance (O&M) of the Site and the future excavation of soils beneath the Phase 1 and Container Buildings on the Mercury Refining Property which are not remediated, to insure that the soils are properly tested and handled to protect the health and safety of workers and the nearby community. The approved SMP would also require an evaluation of the potential for vapor intrusion at all existing buildings on-Site and/or those to be constructed in the future, and mitigation, if necessary, in compliance with the SMP. Finally, the SMP would provide for the proper management of all Site remedy components post-construction and shall include: (a) monitoring of groundwater to ensure that, following Site remediation, the contamination is attenuating and groundwater quality continues to improve; (b) monitoring and maintenance of institutional controls; (c) operation and maintenance of the clay cap; (d) periodic certifications by the owners/operators of the Site properties or other party implementing the remedy that the institutional and engineering controls are in place; and (e) management of the demolition or alteration of the existing buildings on-Site, if such demolition or alteration is required in the future, to protect the health and safety of the workers and the nearby community and to ensure proper disposal of any building debris.

Five-year Reviews of the Site: Because this alternative would result in contaminants remaining on-Site above levels that would allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years.

DESCRIPTION OF REMEDIAL ALTERNATIVES FOR SEDIMENTS

Sediments Alternative 1: No Action

Capital Cost:	$0
Annual Operation and Maintenance (O&M):	$0
Present Worth:	$69,000
Time to Implement:	0 months

Under this alternative, no further action would be implemented, and the current status of the Site would remain unchanged. This alternative would not involve reducing the toxicity, mobility, or the volume of the contaminants in the sediments. Institutional controls would not be implemented to restrict future Site development or use.

Because this alternative would result in contaminants remaining on-Site above levels that would allow for unlimited use and unrestricted exposure, CERCLA requires that the Site be reviewed at least once every five years. The present worth estimate for this alternative would be the cost to conduct these reviews.

Sediments Alternative 2: Contaminated Sediments Removal and Disposal

Capital Cost:	$360,000
Annual Operation and Maintenance (O&M):	$64,000
Present Worth:	$780,000
Time to Implement:	3 months

Sediments Alternative 2 consists of the following components:

- Removal and dewatering of contaminated sediments from the Unnamed Tributary.
- Post remediation sampling to verify achievement of sediments cleanup levels.
- Sediments sampling to assess future risks to the biota.
- Five year reviews.

Sediments Removal and Disposal: This alternative would include the removal of mercury contaminated sediments from the Unnamed Tributary, dewatering of removed sediments, transportation and disposal of dewatered sediments at an off-Site landfill. Specifically, the sediments targeted for removal are located in the vicinity of the MERECO stormwater outfall wherever the sediments exceeds the cleanup level of 1.3 ppm. Verification sampling would be conducted after the removal of mercury contaminated sediments to ensure that the sediments cleanup objective of 1.3 ppm is achieved. If necessary, the dredged area would be backfilled with clean soil. In addition, excavation of the tributary sediments will result in temporary, localized disturbance to the wetlands that exist along the tributary. Affected wetlands of the Unnamed Tributary will be restored.

Sediments Monitoring: Sampling of the fish, surface water and sediments in Patroon Creek, the Unnamed Tributary and the I-90 Pond to assess Site impacts on the biota on an annual basis for five years and to determine if mercury contamination in the surface sediments stays below the cleanup level of 1.3 ppm. Sampling thereafter would be based on a review of the first five years of data. However, should conditions change with regard to the I-90 Pond dam (i.e., the dam is repaired, removed, or if it should fail) EPA will evaluate the potential impact of any significant releases and, if necessary, take or require response actions to mitigate their potential impact.

PRINCIPAL THREAT WASTES

Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430 (a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for the migration of contamination to groundwater, surface water, or air, or act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or will present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of alternatives, using the modified remedy selection criteria which are described below. This analysis provides a basis for making a statutory finding that the modified remedy employs treatment as a principal element.

The mercury contamination at the Site in Area E is considered to be highly toxic and could present a significant risk to human health. Accordingly, the highly contaminated soils in this Area are defined as principal threat wastes. In addition to the high concentrations of mercury detected, the subsurface soils in Area E also contain beads of pure elemental mercury. Although the mass of mercury contaminated soils are immobile, the mercury contamination will not degrade or otherwise lose its high toxicity over time and will remain a source of groundwater contamination. Additionally, the aquifer is classified a 'Class GA' water body by New York State regulations at 6 NYCRR Part 701, as a potable source of drinking water. Unless addressed, Area E will remain a significant future, potential health threat to construction workers who may come into contact with the soils, and to future Site residents who may consume the groundwater.

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, EPA considered the factors set out in CERCLA Section 121, 42 U.S.C. §9621, by conducting a detailed analysis of the viable remedial alternatives pursuant to the NCP, 40 C.F.R. §300.430(e)(9), and OSWER Directive 9355.3-01 (*Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA: Interim Final*, October 1988). The detailed analysis consisted of an assessment of the individual alternatives against each of nine evaluation criteria and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

The following "threshold" criteria are the most important and must be satisfied by any alternative in order to be eligible for selection:

1. *Overall protection of human health and the environment* addresses whether or not a remedy provides adequate protection and describes how risks posed through each

exposure pathway (based on a reasonable maximum exposure scenario) are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. *Compliance with ARARs* addresses whether or not a remedy would meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and regulations or provide grounds for invoking a waiver. Other federal or state advisories, criteria, or guidance are TBCs. TBCs are not required by the NCP, but the NCP recognizes that they may be very useful in determining what is protective of a site or how to carry out certain actions or requirements.

The following "primary balancing" criteria are used to make comparisons and to identify the major tradeoffs between alternatives:

3. *Long-Term effectiveness and permanence* refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met. It also addresses the magnitude and effectiveness of the measures that may be required to manage the risk posed by treatment residuals and/or untreated wastes.

4. *Reduction of toxicity, mobility, or volume through treatment* is the anticipated performance of the treatment technologies, with respect to these parameters, a remedy may employ.

5. *Short-term effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup levels are achieved.

6. *Implementability* is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7. *Cost* includes estimated capital, O&M, and present worth costs.

The following "modifying" criteria are used in the final evaluation of the remedial alternatives after the formal comment period, and may prompt modification of the preferred remedy that was presented in the Proposed Plan:

8. *State acceptance* indicates whether, based on its review of the RI/FS report, Human Health and Ecological Risk Assessment, and Proposed Plan, the State concurs with, opposes, or has no comments on the selected remedy.

9. *Community acceptance* refers to the public's general response to the alternatives described in the RI/FS report, Human Health and Ecological Risk Assessment, and Proposed Plan.

A comparative analysis of these alternatives for the soil and groundwater, based upon the evaluation criteria noted above, follows.

Overall Protection of Human Health and the Environment

Alternative S1 would not be protective of human health and the environment since soils and groundwater exceeding the remediation cleanup levels would remain in place. Alternative S2 would provide protection to human health through capping and institutional controls, however it would not be fully protective because most of the mercury contaminated soils and free-phase mercury would remain in the subsurface soils where they have the potential to contribute to contamination in the groundwater that would not be addressed and pose a risk to future on-Site construction workers. Alternative S2 would provide some protection since contaminated surface soils would be disposed of off-Site. Alternatives S3 and S4 would be protective of human health and the environment since contaminated groundwater, which is considered potable by New York State, as well as surface and subsurface soils would be either remediated or removed from the Site.

Compliance with ARARs

EPA has identified New York State's soil cleanup objective of 5.7 ppm for mercury for an industrial facility as an ARAR, TBC or other guidance to address contaminated surface and subsurface soils above the water table at the Site. The NYSWQS are chemical-specific ARARs for the groundwater and are being used to address soils below the water table. Alternatives S1 and S2 would not meet the ARARs for groundwater since the groundwater which exceeds the cleanup criteria would remain in place and no measures would be implemented to reduce or eliminate the dissolution of mercury into the groundwater. Alternatives S3 and S4 could meet the ARARs for groundwater, since the contaminated subsurface soils and groundwater would be treated. All location- and action-specific ARARs would be achieved under Alternatives S2, S3 and S4.

Long-Term Effectiveness and Permanence

Alternative S1 would not be effective or permanent since no remedial action would be implemented. Alternative S2 would be more effective and permanent than Alternative S1, but less than Alternatives S3 and S4, since untreated principle threat waste would remain on-Site. Alternative S3 would be permanent since it would remove and dispose of surface and subsurface soils off-Site and would treat contaminated subsurface soils in Area E, which contains the Site's principle threat waste, using solidification/stabilization. Under Alternative S4, mercury contamination in the surface and subsurface soils above the water table would be removed and sent off-Site. The surface and subsurface soils and the groundwater in Area E would be permanently removed through electrochemical treatment, including the principle threat wastes in Area E.

Regarding Alternative S3, two solidification/stabilization treatability studies have been performed on Site soils and both studies were able to treat the soils to below the RCRA TCLP[6] limit of 0.2 ppm. Another treatability study would be required optimize application of the technology. The use of electrochemical treatment in Alternative S4 would be permanent but its effectiveness would need to be determined by a treatability test on-Site. The effectiveness of electrokinetics has not been fully demonstrated, although a bench-scale study demonstrated that the technology could potentially attain the cleanup levels under laboratory conditions. An on-Site treatability test would be required to confirm the effectiveness and to obtain design parameters for this technology.

Reduction in Toxicity, Mobility or Volume (TMV) through Treatment

Since Alternative S1 does not include treatment or excavation, it would not reduce the TMV of contaminated soils through treatment. Alternative S2 would not reduce the TMV of the contaminated subsurface soils through treatment because capping is not considered a treatment technology. S2, S3 and S4 would reduce the on-Site volume and mobility through excavation and off-Site disposal/treatment but not the toxicity of Site surface soils. Alternative S3 and S4 would provide a greater degree of TMV than S2 and would fully address the health risks posed by the principle threat wastes in Area E. Alternative S3 would reduce the toxicity of the highly contaminated subsurface soils through solidification/stabilization. Alternative S4 would reduce the TMV of subsurface soils through electrochemical treatment.

Short-Term Effectiveness

Alternative S1 would have the fewest short-term impacts and the least amount of intrusive construction activities and would not require MERECO or adjacent businesses to suspend or relocate operations. Alternatives S2, S3 and S4 would have more short-term impacts than S1 due to the removal of contaminated surface soils at the MERECO Property and its adjoining properties. Alternatives S3 and S4 would have somewhat greater short-term impacts than alternative S2 due to the temporary risk and disturbance created by treatment activities at the MERECO Property and its adjoining properties which would require MERECO to suspend or relocate operations during construction and which would utilize a portion of an adjacent property for a staging area. Alternative S3 and S4 would also have more short-term impacts than Alternative S2 on on-Site construction workers due to additional construction activities and a longer period of project duration, about one year for Alternative S3 and about three years for Alternative S4. However, these short-term impacts can be readily addressed through a combination of air monitoring, engineering controls (including the use of dust suppressants, if necessary), along with the appropriate use of personnel protective equipment. Such measures would be used to minimize the short-term impacts of S2, S3 and S4 and would protect the local community and the public.

Implementability

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6 - TCLP refers to the Toxicity Characteristic Leachate Procedure under RCRA which measures the leachability and mobility of certain toxic contaminants such as mercury from the soil into the groundwater.

Alternative S1 would be easiest to implement both technically and administratively. Alternative S2 would be the second easiest to implement. Alternatives S3 and S4 would be more difficult to implement than Alternative S2 based upon the additional construction activities required. Alternative S3 is considered more technically implementable than Alternative S4, since solidification/ stabilization has been more widely used and is more commercially available. Alternative S4 involves the use of an innovative technology that is only available through a limited number of vendors and has not been demonstrated on a full-scale basis for mercury in the United States. However, a recently completed bench-scale test of electrokinetics indicated that it could likely be effective in removing mercury from the Site soils.

Cost

The estimated capital, annual operation and maintenance (O&M), which includes monitoring, and present-worth costs for each of the soils/groundwater remediation alternatives are presented below. All present worth costs were calculated using a discount rate of 7 percent.

Alternative	Capital Cost	Annual O&M	Present Worth
S-1	$0	$0	$69,120
S-2	$2,871,891	$96,000	$4,136,858
S-3	$9,206,521	$82,000	$10,297,587
S-4	$20,831,978	$82,000	$21,923,045

State Acceptance

NYSDEC concurs with the selected remedy for soils and groundwater.

Community Acceptance

Community acceptance of the selected remedy for soils and groundwater (Cap Maintenance, Groundwater Monitoring, In-Situ Solidification/Stabilization, Limited Soil Excavation and Institutional Controls) was assessed during the public comment period. EPA believes that the community generally supports this approach. Specific responses to public comments are addressed in the Responsiveness Summary (Appendix V). EPA received comments from a few of the potentially responsible parties (PRPs) for the Site. The PRPs generally preferred Alternative S2 over Alternative S3. EPA considered these and other similar comments from the PRPs and EPA's response to these comments is in the Responsiveness Summary. For the reasons set forth below under Selected Remedy, EPA has concluded that Alternative S3 is the correct remedy.

A comparative analysis of sediments alternatives, based upon the evaluation criteria noted above, follows.

Overall Protection of Human Health and the Environment

Alternative SD1 would not be protective of the biota, since sediments exceeding the mercury cleanup goal would remain in place. Alternative SD2 would be protective of the biota because contaminated sediments above the cleanup level for sediments would be removed. There is currently no risk to human health due to contaminated sediments.

Compliance with ARARs

While there are currently no federal or New York State promulgated standards for contaminated sediments, there are TBCs, one of which is the New York State's Technical Guidance for Screening Contaminated Sediment, 1994. The sediments cleanup level contained in NYSDEC's guidance is based on values in published literature (Long, E.R., and L.G. Morgan, 1990 - the Potential for Biological Effects of Sediment-Sorbed Contaminants Tested in the National States and Trends Program and the National Oceanic Atmospheric Administration (NOAA) Technical Memorandum, No.5, OMA52, NOAA National Ocean Service, Seattle, Washington.). The sediments cleanup level of 1.3 ppm for mercury represents the Effects Range-Median or the concentration midway in the range of values associated with biological effects.

Long-Term Effectiveness and Permanence

Alternative SD1 would not be effective or permanent, since no remedial action would be implemented. Alternative SD2 would be effective and permanent since contaminated sediments would be removed.

Reduction in Toxicity, Mobility or Volume through Treatment

Neither Alternatives SD1 nor SD2 would reduce the toxicity of contaminated sediments since neither alternative involves treatment. Alternative SD2 would reduce potential mobility and volume of contaminated sediments at the Site via the relocation of the contaminated sediments to a landfill. Alternative SD1 would have no effect on mobility or volume.

Short-Term Effectiveness

Alternative SD1 would have no short-term impacts, since no action would be implemented. In consideration of the limited temporary increase in potential impacts to construction workers, human health and the environment during implementation, Alternative SD2 would have moderate short-term impacts in comparison to Alternative SD1. Both alternatives would have minimal impact to nearby residents, because the Site is located in an industrial area.

Implementability

Alternative SD1 would be easiest to implement, technically and administratively. Alternative SD2 would be more difficult to implement technically, however it involves common technologies and readily available equipment.

Cost

The follow table compares the alternatives for the sediments. All present worth costs were calculated using a discount rate of 7 percent.

Alternative	Capital Cost	Annual O&M	Present Worth
SD-1	$0	$0	$69,120
SD-2	$360,000	$64,000	$780,000

State Acceptance

NYSDEC concurs with the selected remedy alternative for sediments.

Community Acceptance

Community acceptance of the selected remedy for sediments (Contaminated Sediments Removal and Disposal) was assessed during the public comment period. EPA believes that the community generally supports this approach. Specific responses to public comments are addressed in the Responsiveness Summary (Appendix V).

SELECTED REMEDY

Summary of the Rationale for the Selected Remedy

Based upon an evaluation of the alternatives and consideration of community acceptance, EPA has selected Alternative S-3 (Cap Maintenance, Groundwater Monitoring, In-Situ Solidification/Stabilization, Limited Soil Excavation and Institutional Controls) and Alternative SD-2 (Contaminated Sediments Removal and Disposal) as the remedy for the Mercury Refining Superfund Site.

The selected remedy will provide the best balance of tradeoffs among the alternatives with respect to the evaluating criteria, as described below.

Applying the NCP's nine criteria and given the anticipated future land use of the Site, Alternative S3 will provide the most cost-effective solution for addressing Site risks including the principle threat wastes. Excavation of soils exceeding the soil cleanup level and

solidification/stabilization of soils which contain groundwater which exceeds the cleanup level for groundwater is consistent with the future industrial land use of the Site. Excavation of the soils will prevent any risk from direct contact. Solidification/stabilization of the deeper soils will prevent risks associated with the contaminated groundwater and will address the principle threat wastes. In addition, the SMP will ensure the proper handling, treatment, and disposal of soils, including but not limited to, soils beneath the Phase 1 and Container Storage Buildings or any other on-Site soils, including soils on the adjoining properties (i.e. Diamond W., Albany Pallet and Allied Building), which may not be remediated by this alternative. The SMP will also address vapor intrusion at the existing and future buildings on-Site and potential demolition and/or alteration of the buildings currently on-Site.

EPA is not selecting a specific groundwater remedy, such as pump and treat, because the solidification/stabilization treatment process will effectively immobilize the existing volume of contaminated groundwater which underlies the Site. In addition, institutional controls will be required to prevent the use of groundwater at the Site until groundwater quality standards are met.

Alternative SD-2 also provides the most cost-effective means, using the nine criteria, of addressing the impact of contaminated sediments on ecological receptors at the MERECO stormwater outfall. A wetlands delineation will also be performed during the remedial design to confirm the extent of the wetland area. Affected wetlands of the Unnamed Tributary will be restored and monitored to ensure that restoration is complete.

Given the above factors, the selected alternatives S-3 and SD-2 provide the best balance of trade-offs among the potential alternatives evaluated with respect to the evaluating criteria. EPA believes that the selected remedy will be protective of human health and the environment, will comply with ARARs, TBCs and other guidance, will be cost-effective, and will utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. SS-2 was not chosen since it does not address the risk due to the mercury in the soils below the existing concrete/asphalt caps, the soils at depth, nor the area of dissolved mercury in the aquifer. S-4 was not chosen since electrochemical treatment is not a technology which has been widely used or proven and would be significantly more expensive to perform. SD-1 is not protective of human health and the environment nor does it comply with ARARs, TBCs and other guidance.

Description of Selected Remedy

Following is a summary of the selected remedy:

- Excavation and off-Site disposal of surface soils and subsurface soils above the water table from the Mercury Refining Property and adjoining properties (*i.e.*, Albany Pallet and Box Company (Albany Pallet), Allied Building Products Corporation (Allied Building) and Diamond W. Products Incorporated (Diamond W.) which exceed the cleanup level for mercury in soil of 5.7 parts per million (ppm) for industrial property usage. These soils also include the soils associated with the

stormwater sewer/catch basin systems. Verification sampling will be performed to confirm the effectiveness of the remedy. Clean soil will be backfilled into the excavated areas.

- Solidification/Stabilization involving mixing or injection of treatment agents at the Mercury Refining and Allied Building properties to immobilize contaminants in surface soils, subsurface soils,[7] and soils below the water table where the groundwater has a dissolved mercury concentration which exceeds the cleanup level of 0.7 parts per billion (ppb) for mercury in groundwater. Pilot testing will be performed before treatment and verification sampling will be performed after treatment to confirm the effectiveness of the remedy in immobilizing contaminated soils and achieving groundwater standards.

- Imposition of institutional controls in the form of environmental easements/restrictive covenants to restrict future development/use of the Site. Specifically, environmental easements/restrictive covenants will be filed in the property records of Albany County. The easements/covenants will at a minimum: (a) limit the Site to industrial uses; (b) preserve the integrity of the existing clay cap on the southern portion of the Mercury Refining Property; (c) preserve the integrity of the solidified/stabilized mass; (d) prevent the excavation of soils which lay beneath the Phase 1 Building, which housed Mercury Refining's operations, and the Container Storage Building, which was used to store incoming mercury bearing material for processing, unless the excavation follows a Site Management Plan (see below); and (e) restrict the use of groundwater as a source of potable or process water until groundwater quality standards are met.

- Development and implementation of an EPA-approved Site Management Plan (SMP). The SMP, will, among other things, address long-term operation and maintenance (O&M) of the Site, and future excavation of soils including, but not limited to, soils beneath the Phase 1 and Container Buildings on the Mercury Refining Property, to insure that the soils are properly tested and handled to protect the health and safety of workers and the nearby community. The approved SMP will also require an evaluation of the potential for vapor intrusion at all existing buildings on-Site and/or those to be constructed in the future, and mitigation, if necessary, in compliance with the SMP. Finally, the SMP will provide for the proper management of all Site remedy components post-construction and shall include: (a) monitoring of groundwater to ensure that, following Site remediation, the contamination has attenuated and the groundwater has been remediated; (b) monitoring and maintenance of institutional controls; (c) a provision for operation and maintenance of the clay cap; (d) periodic certifications by the owners/operators of the Site properties or other party implementing the remedy that the institutional and engineering controls are in place; and (e) a provision to manage the demolition or alteration of the existing buildings on-Site, if such demolition or alteration is proposed in the future, to protect the health

[7] This would include soils beneath the existing asphalt/concrete cap but not soils beneath the Container Storage Building or the existing clay cap.

and safety of the workers and the nearby community and to ensure proper disposal of any building debris.

- Removal, dewatering and disposal of the mercury-contaminated sediments in the Unnamed Tributary exceeding the cleanup level for mercury in sediments of 1.3 ppm.

- Verification sampling will be performed to confirm the effectiveness of the remedy.

- Sampling of the fish, surface water and sediments in the Patroon Creek, the Unnamed Tributary and the I-90 Pond to assess impacts on the biota on an annual basis for five years. Sampling thereafter will be based on the results of the five annual sampling rounds, as reported within the first five-year review. Should conditions change with regard to the I-90 Pond dam (i.e., the dam is repaired, removed, or if it should fail), EPA will evaluate the potential impact of any significant releases and, if necessary, take or require response actions to mitigate their potential impact.

- In accordance with CERCLA and because the remedy will result in contaminants remaining on-Site above levels that will allow for unlimited use and unrestricted exposure, the Site remedy will be reviewed at least once every five years

Summary of Estimated Remedy Costs

The total estimated present worth cost for the selected remedy for the Site includes an estimated $10,300,000 for addressing contaminated soils and groundwater and an estimated $780,000 for removing contaminated sediments from the Site. These estimates include $82,000 per year in operation and maintenance costs for 30 years for the soils and groundwater alternative and $64,000 per year to monitor the impact of the sediments removal for 30 years. The information in these cost estimate summaries are based on the best available information regarding the anticipated scope of the soils and groundwater remediation outlined in Alternative S-3 and the scope of sediments remedy set forth in Alternative SD-2. These are order-of-magnitude engineering cost estimates that are expected to be within +50 to -30 percent of the actual cost of the project. Changes in the cost elements are likely to occur as a result of updated information on the quantities of soils and sediments that require excavation, and particularly on the volume of the deeper soils which will be solidified in Area E, and on the hazardous or non-hazardous disposal requirements for the Site soils and sediments. These elements will be refined during the pre-design investigation and remedial design of the components of this alternative. Changes in the cost of the remedy may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Difference, or a ROD Amendment, depending on the extent of the necessary change.

Expected Outcomes of Selected Remedy

Implementation of the chosen soils/groundwater remedy (Alternative S-3) will eliminate potential risks associated with exposure to contaminated soils and groundwater. Excavation and removal of soils and sediments from the Site which exceeds the cleanup level for soils of

5.7 ppm and the cleanup level for sediments of 1.3 ppm, respectively, and solidification of soils which contains groundwater that exceeds the cleanup level for groundwater of 0.7 ppb will allow for continued industrial use of the Site, will prevent leaching of mercury into the groundwater and address the impact of contaminated sediments on ecological receptors in the Unnamed Tributary to the Patroon Creek. Implementation of a Site Management Plan and institutional controls will ensure continued protection of human health and the environment after the removal and solidification aspects of the remedy are completed. Construction of the remedy is expected to take approximately 1 year. This does not include the time required to negotiate with potentially responsible parties, design the remedy, procure contracts for design and construction, or put institutional controls in place.

The cleanup levels, summarized on pages 25 and 26, are based on ARARs, TBC, guidance values, or risk-based values (e.g., EPA and/or NYSDEC standards and guidance).

STATUTORY DETERMINATIONS

Under CERCLA Section 121, 42 U.S.C. §9621, and the NCP, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that when complete the selected remedial action for this Site must comply with applicable, or relevant and appropriate environmental standards established under Federal and State environmental laws unless a waiver from such standards is justified. The selected remedy also must be cost effective and utilize permanent solutions and alternative treatment technologies or resource-recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous substances. The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment. Alternatives S-3 and SD-2 are protective of human health because they will eliminate human exposure to contaminated soils, groundwater and sediments that could be encountered based on reasonably anticipated future land use. Alternative S-2 also employs institutional controls and provides a Site Management Plan to protect human health and the environment from contaminated soils left in place. Alternative SD-2 is protective of the environment because it will eliminate ecological receptor exposure to contaminated sediments likely to be encountered in the Unnamed Tributary to the Patroon Creek.

Compliance with ARARs and TBCs

EPA has selected a cleanup level of 5.7 ppm of mercury for soils on industrial use property based on New York State's Soil Cleanup Objectives at 6 NYCRR Part 375. The ARAR for groundwater is based on the NYSWQS, which is a chemical specific ARAR for groundwater

in the saturated soils. The cleanup level for groundwater is also being used to target deeper soils at the Site which are below the water table. The cleanup level for sediments was selected from the NYSDEC's Technical Guidance for Screening Contaminated Sediment, 1994

Alternative S-3 will achieve the cleanup levels for soils and groundwater Site-wide; Alternative SD-2 will achieve the cleanup level for sediments at the MERECO stormwater outfall in the Unnamed Tributary.

The remedy will comply with the following ARARs, Other Criteria, Advisories, or Guidances identified for the Site and will be demonstrated through monitoring, as appropriate.

Chemical-Specific ARARs, TBCs and other Guidance	
Federal	**New York State**
Drinking Water Standards and Regulations National Primary Drinking Water Standards (40 CFR Part 141). The drinking water standards (maximum contaminant levels (MCL))	Groundwater Standards and Guidances • New York State Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations (6 New York Environmental Conservation Rules and Regulations [6 NYCRR] Part 703). The standard for mercury in Class GA groundwater is 0.7 ppb. • New York State Department of Health Drinking Water Standards (10 NYCRR Part 5) sets MCLs for public drinking water supplies. The State MCL for mercury is 2 ppb. Soil Guidelines Remedial Program Soil Cleanup Objectives (6 NYCRR Subpart 375-6, Table 375-6.8(b) Sediment Guidelines Technical Guidance for Screening Contaminated Sediments (Revised 1999)

Chemical-Specific ARARs, TBCs and other Guidance	
Federal	**New York State**
Wetlands and Flood plains Standards and Regulations: o Statement on Procedures on Flood plain Management and Wetlands Protection o RCRA Location Standards (40 CFR 264.18) o Flood plain Executive Order (EO 11988) o Wetlands Executive Order (EO 11990) o National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321: 40 CFR 1500 to 1508) o Clean Water Act (CWA) Section 404 (b)(1) Guidelines for Specification of Disposal Sites for Dredge or Fill Material; Section 404 (c) Procedures; 404 Program Definitions; 404 State Program Regulations. Wildlife Habitat Protection Standards and Regulations: o Fish and Wildlife Coordination Act (16 USC § 661) o Fish and Wildlife Conservation Act (16 USC § 2901 o Endangered Species Act (16 USC § 1531) Historic Preservation Standards and Regulations: o National Historic Preservation Act (40 CFR Part 6.301)	Wetlands and Flood plains Standards and Regulations : o New York Wetland Laws (6 NYCRR Part 663 Confirm w/DEC). o New York Freshwater Wetland Permit Requirements and Classification (Articles 663 and 664) o Flood plain Management Regulations - Development Permits (500 ECL Article 36) Wildlife Habitat Protection Standards and Regulations (6 NYCRR): o Endangered and Threatened Species of Fish and Wildlife (Part 182). Resource Management Services Use and Protection of Waters (6 NYCRR Part 608)

Chemical-Specific ARARs, TBCs and other Guidance	
Federal	**New York State**
Federal Standards and Guidelines General - Site Remediation: • Resource Conservation and Recovery Act (RCRA): Identification and Listing of Hazardous Waste (40 CFR 261); Standards Applicable to Generators of Hazardous Waste (40 CFR 262); Standards Applicable to Owners and Operators of Treatment, Storage, and Disposal Facilities (40 CFR 264). • Occupational Safety and Health Administration (OSHA) Worker Protection (29 CFR 1904, 1910, 1926). • 40 CFR 61 National Emission Standards for Hazardous Air Pollutants, Subpart E- National Emission Standard for Mercury. Emissions limits listed in section 61.52 are relevant and appropriate. Transportation and Disposal of Hazardous Waste: • Hazardous Materials Transportation Regulations (49 CFR 107: 171, 172, 177 to 179). • Standards Applicable to Transporters of Hazardous Waste (40 CFR 263, Subpart D). • Land Disposal Restrictions (40 CFR 268). Discharge: • National Pollutant Discharge Elimination System (40 CFR 122, 125) Off-Gas Management: • National Ambient Air Quality Standards (40 CFR 50).	New York Solid and Hazardous Waste Management Regulations (6 NYCRR): • Hazardous Waste Management System - General (Part 370) • Solid Waste Management Regulations (Part 360) • Identification and Listing of Hazardous Waste (Part 371) • Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities (Part 372) • Standards for Universal Waste (Part 374-3) • Land Disposal Restrictions (Part 376) Discharge (6 NYCRR): • The New York Pollutant Discharge Elimination System (Part 750-757) • *New York Standards and Specifications for Erosion and Sediment Control*; for structures related to post-construction controls, the *New York State Stormwater Management Design Manual.* Disposal of Hazardous Waste (6 NYCRR): • Waste Transporter Permit Program (Part 364) Off-Gas Management: • New York General Provisions (6 NYCRR Part 211) • New York Air Quality Standards (6 NYCRR Part 257) • New York State Department of Environmental Conservation (DAR-1) Air Guide 1), Guidelines for the Control of Toxic Ambient

Chemical-Specific ARARs, TBCs and other Guidance	
Federal	**New York State**
	Contaminants. • New York State Department of Health Generic Community Air Monitoring Plan • Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites (TAGM #4031)

Cost-Effectiveness

A cost-effective remedy is one whose costs are proportional to its overall effectiveness (NCP §§300.430(f)(1)(i)(B)). Overall, effectiveness is based on the evaluations of long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Based on the comparison of overall effectiveness to cost, the selected remedy meets the statutory requirement that Superfund remedies be cost effective (NCP §§300.430(f)(1)(ii)(D)) in that it is the least-cost action which will achieve the cleanup levels within a reasonable time frame. Alternative S-3 is approximately half the cost of Alternative S4 ($10.3 million vs. $ 20.8 million) and is also protective of human health and the environment and will attain ARAR requirements. While Alternative S2 is less costly than the selected remedy, Alternative S-2 would not achieve ARARs for groundwater nor would it permanently address the toxicity associated with the principle threat wastes at the Site.

The selected remedy has undergone a detailed cost analysis. In that analysis, capital costs and O&M costs have been estimated and used to develop present-worth costs. In the present-worth cost analysis, annual costs were calculated for 30 years using a seven percent discount rate (consistent with the FS and Proposed Plan). For a detailed breakdown of costs associated with the selected remedy see Appendix II, Tables 10 and 11.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

EPA has determined that the selected remedy represents the maximum practicable extent to which permanent solutions and treatment technologies can be utilized at the Site and provides the best balance of tradeoffs among the alternatives with respect to the balancing criteria set forth in 40 CFR §300.430(f)(1)(i)(B). The selected remedy is more costly than Alternative 2, however, it will more effectively and permanently address the risk associated with the Principle Threat waste in Area E. The selected remedy also will not remove the mercury contamination from Area E through treatment, which would be accomplished by Alternative 4, but it will use a technology which is more reliable and can reduce the mobility and toxicity

of mercury. The remedy is also less costly, more implementable and is expected to be just as effective as Alternative 4 in the long-term, while being protective of human health and the environment and meeting ARAR requirements.

Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment as a principal element is not completely satisfied through the implementation of the selected remedy because only certain soils on-Site will be treated. Principle Threat wastes are found in Area E of the Site which contains highly contaminated soils along with beads of pure elemental mercury. The groundwater and the soils below the water table in Area E will be solidified and stabilized to immobilize the mercury and therefore this portion of the remedy satisfies the statutory preference for treatment. The other contaminated soils at the Site, which will be excavated and disposed of off-Site, will not be treated; however, their removal is protective of human health and the environment, given the anticipated future land use at the Site. Any remaining soils which are not excavated are unlikely to be disturbed given the anticipated future Site use, but in the event that they are, a Site Management Plan will be developed and implemented to ensure their proper handling and treatment. Periodic groundwater monitoring will be performed to confirm that source removal actions have a positive impact on groundwater quality.

Five-Year Review Requirements

Because the selected remedy results in contaminants remaining on-Site above levels that would allow for unlimited use and unrestricted exposure, a review of Site conditions will be conducted no less often than every five years after completion of the construction of the remedy. The Site reviews will include an evaluation of the remedy components to ensure that the remedy remains protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

There were no significant changes from the preferred remedy presented in the March 2008 Proposed Plan.

APPENDIX I

FIGURES

FIGURE		DESCRIPTION
FIGURE 1	-	Site Map
FIGURE 2	-	Remedy Description
FIGURE 3	-	Groundwater Sampling Locations
FIGURE 4	-	Potential Ecological Exposure Pathways

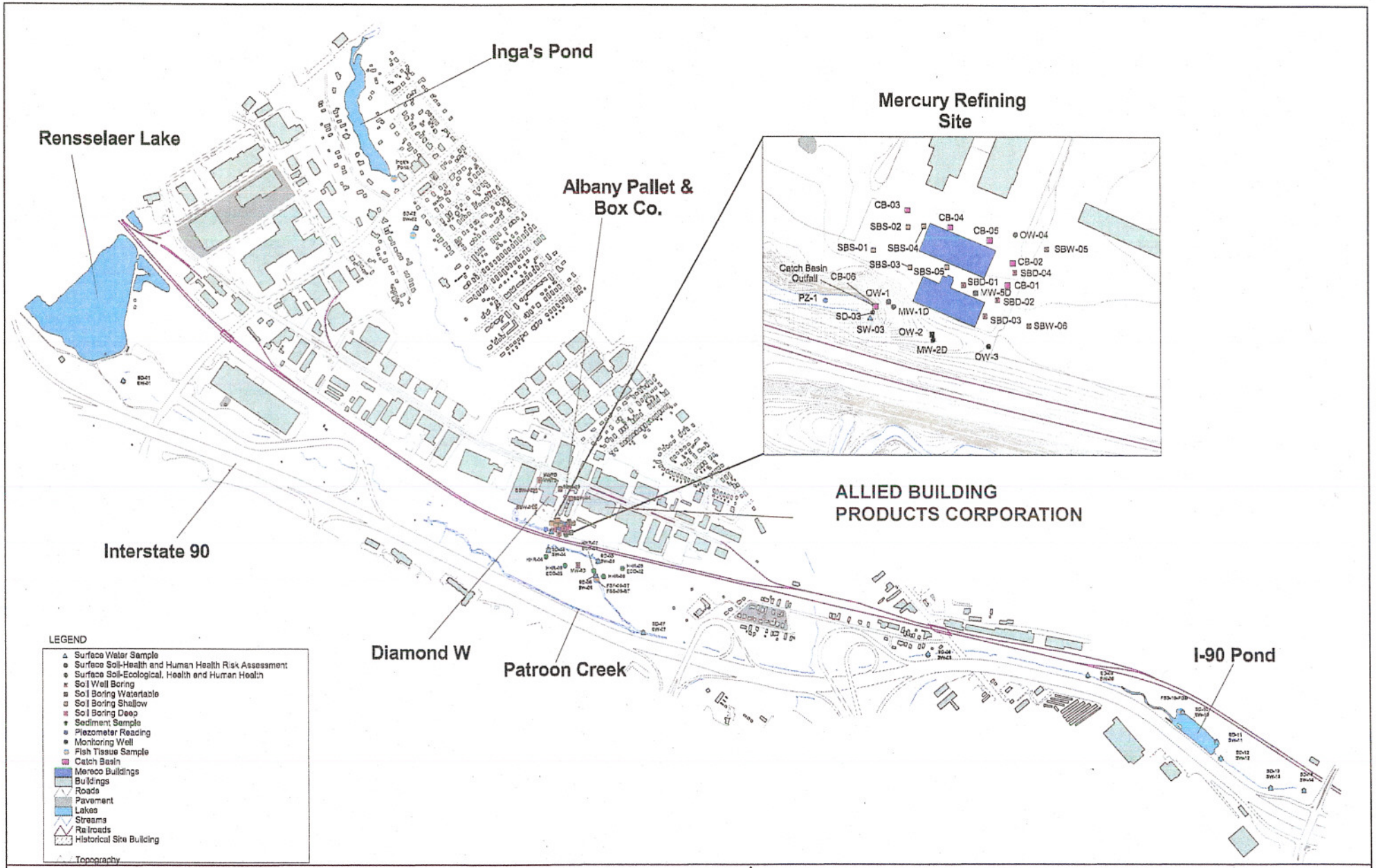


Figure 1
Site Map
Mercury Refining Site
Colonie, New York

CDM

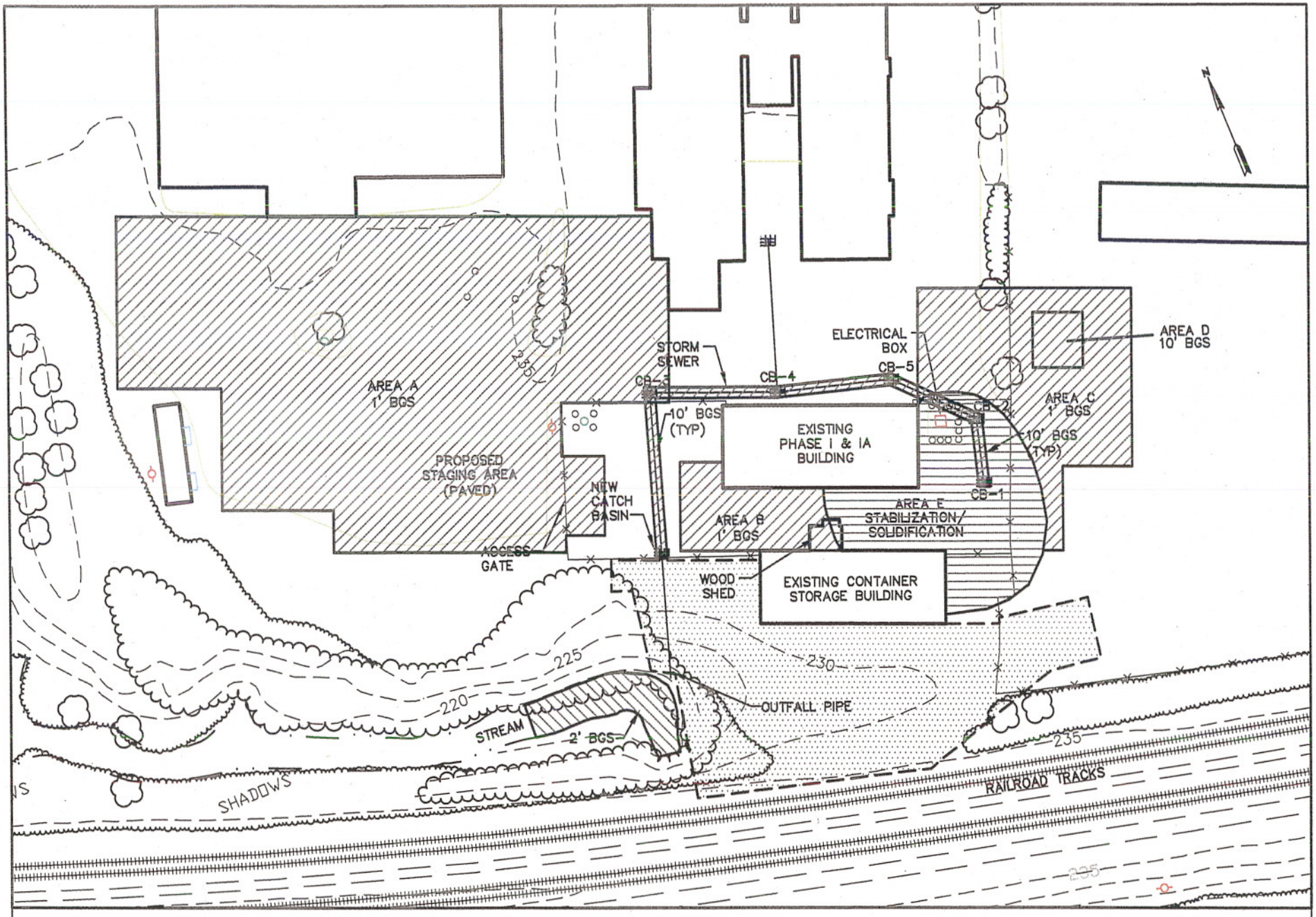
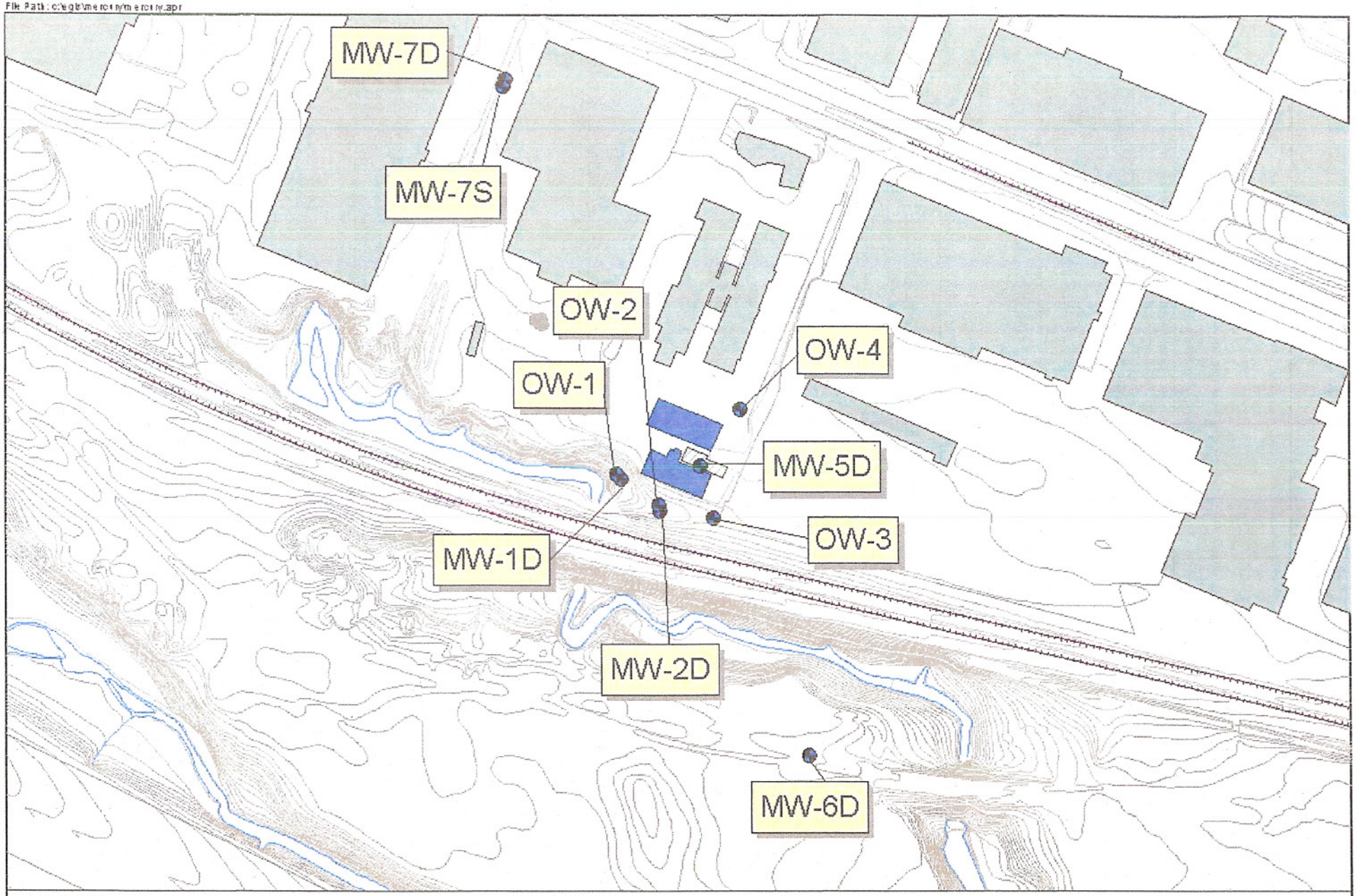


FIGURE 2
SITE MAP FOR SOIL ALTERNATIVES
MERCURY REFINING SUPERFUND SITE
COLONIE, NEW YORK

File Path: c:\egis\mercury\mercury.apr



LEGEND

- Groundwater Samples
- Buildings
- Roads
- Pavement
- Site Buildings
- Streams
- Railroads
- Topography
- Historical Site Building

MW = Monitoring Well
OW = Observation Well

N

0 100 200 Feet

Figure 3
Groundwater Sample Locations
Mercury Refining Site
Colonie, New York

CDM

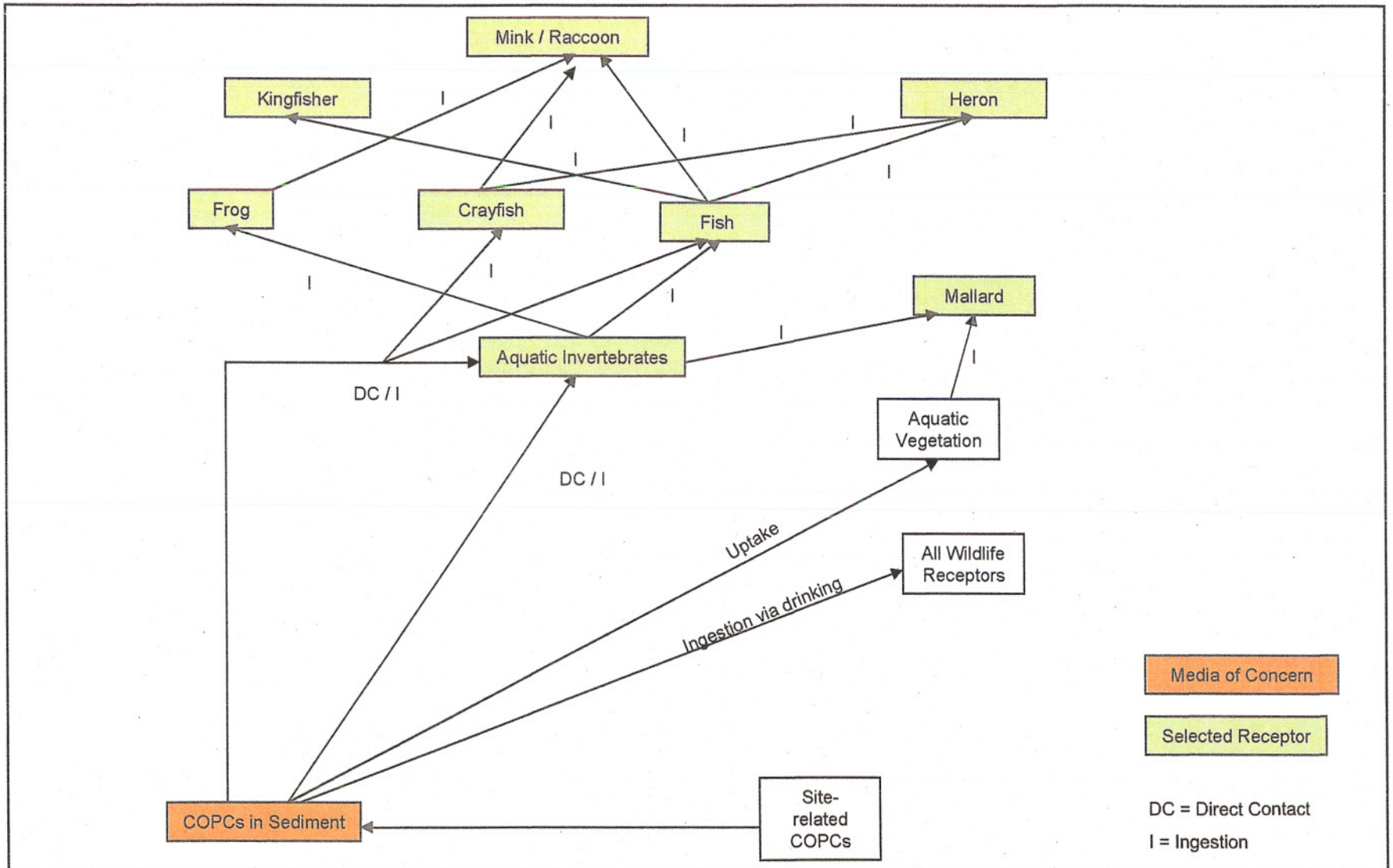


Figure 4
Ecological Site Conceptual Exposure Model (SCEM)
Mercury Refining Site
Colonie, New York

CDM

APPENDIX II

TABLES

TABLE 1

SELECTION OF EXPOSURE PATHWAYS

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/ Future	Sediments	Sediments	Patroon Creek Watershed (Tributary, Creek, I-90 Pond)	Recreational	Adult	Dermal	Off-Site	Quant	Waders may have exposed skin surface in contact with sediments.
			Patroon Creek Watershed (Tributary, Creek, I-90 Pond)	Recreational	Adolescent (12 -18 years)	Ingestion	Off-Site	Quant	Waders may incidentally ingest sediments.
	Surface Water	Surface Water	Patroon Creek Watershed (Tributary, Creek, I-90 Pond)	Recreational	Adult	Dermal	Off-Site	Quant	Waders may have exposed skin surface in contact with surface water.
			Patroon Creek Watershed (Tributary, Creek, I-90 Pond)	Recreational	Adolescent (12 -18 years)	Ingestion	Off-Site	Quant	Waders may incidentally ingest surface water.
	Fish	Fish Tissue	Patroon Creek Watershed (Tributary, Creek, I-90 Pond)	Recreational	Adult	Ingestion	Off-Site	Quant	Recreational users may catch and eat fish from the tributary.
			Patroon Creek Watershed (Tributary, Creek, I-90 Pond)	Recreational	Adolescent (12 -18 years)	Ingestion	Off-Site	Quant	Recreational users may catch and eat fish from the tributary.
			Patroon Creek Watershed (Tributary, Creek, I-90 Pond)	Recreational	Child (0-6 years)	Ingestion	Off-Site	Quant	Children may eat fish caught by recreational users of the tributary.
			Patroon Creek Watershed (Tributary, Creek, I-90 Pond)	Subsistence	Adult	Ingestion	Off-Site	Qual	Potential risks from subsistence fish ingestion will be evaluated qualitatively.

			Patroon Creek Watershed (Tributary, Creek, I-90 Pond)	Subsistence	Adolescent (12 -18 years)	Ingestion	Off-Site	Qual	Potential risks from subsistence fish ingestion will be evaluated qualitatively.
			Patroon Creek Watershed (Tributary, Creek, I-90 Pond)	Subsistence	Child (0-6 years)	Ingestion	Off-Site	Qual	Potential risks from subsistence fish ingestion will be evaluated qualitatively.
	Surface Soil	Surface Soil	ATV Trail	Recreational	Adolescent (12-18 years)	Dermal	Off-Site	Quant	ATV Trail users may have exposed skin surface in contact with soil.
			ATV Trail	Recreational	Adolescent (12-18 years)	Ingestion	Off-Site	Quant	ATV Trail users may incidentally ingest soil.
		Air	ATV Trail	Recreational	Adolescent (12-18 years)	Inhalation	Off-Site	Quant	ATV Trail users may inhale fugitive dust.
	Indoor Air	Indoor Air	MERECO	Worker	Adult	Inhalation	On-Site	Quant	Workers may inhale volatiles that migrate from the subsurface to indoor air.
Future	Surface Soil	Surface Soil	MERECO	Worker	Adult	Dermal	On-Site	Quant	Workers may have exposed skin surface in contact with soil.
			MERECO		Adult	Ingestion	On-Site	Quant	Workers may incidentally ingest soil.
			MERECO	Trespasser	Adolescent (12–18 years)	Dermal	On-Site	Quant	Trespassers may have exposed skin surface in contact with soil.
			MERECO			Ingestion	On-Site	Quant	Trespassers may incidentally ingest soil.
			Bordering MERECO	Worker	Adult	Dermal	On-Site	Quant	Workers may have exposed skin surface in contact with soil.
					Adult	Ingestion	On-Site	Quant	Workers may incidentally ingest soil.
		Outdoor Air	MERECO	Worker	Adult	Inhalation	On-Site	Quant	Workers may inhale fugitive dust.
			MERECO	Trespasser	Adolescent (12-18 years)	Inhalation	On-Site	Quant	Trespassers may inhale fugitive dust.
			Bordering MERECO	Worker	Adult	Inhalation	On-Site	Quant	Workers may inhale fugitive dust.
	Subsurface Soil	Subsurface Soil	MERECO	Construction Worker	Adult	Dermal	On-Site	Quant	Workers may have exposed skin surface in contact with soil.
			MERECO	Construction Worker	Adult	Ingestion	On-Site	Quant	Workers may incidentally ingest soil.
		Outdoor Air	MERECO	Construction Worker	Adult	Inhalation	On-Site	Quant	Workers may inhale volatiles/particulates.
	Groundwater	Groundwater	Tap Water	Resident	Adult	Dermal	Off-Site	Quant	Groundwater is not presently used. Assumes potable use in future.
			Tap Water	Resident	Adult	Ingestion	Off-Site	Quant	Groundwater is not presently used.

									Assumes potable use in future.
			Tap Water	Resident	Child	Dermal	Off-Site	Quant	Groundwater is not presently used. Assumes potable use in future.
			Tap Water	Resident	Child	Ingestion	Off-Site	Quant	Groundwater is not presently used. Assumes potable use in future.
			Vapors in Bathroom	Resident	Adult	Inhalation	Off-Site	Quant	Groundwater is not presently used. Assumes potable use in future.
			Vapors in Bathroom	Resident	Adult	Inhalation	Off-Site	Quant	Groundwater is not presently used. Assumes potable use in future.

Quant = Quantitative risk analysis performed; Qual = Qualitative analysis performed.

Summary of Selection of Exposure Pathways

The table describes the exposure pathways associated with the groundwater that were evaluated for the risk assessment, and the rationale for the inclusion of each pathway. Exposure media, exposure points, and characteristics of receptor populations are included.

TABLE 2

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Ground- water	Mercury	0.1	22.7	µg/L	7/16	12	µg/L	97.5% Chebyshev

97.5% Chebyshev: 95% Upper Confidence Limit for Nonparametric Data; Chebyshev

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Point	Chemical of Concern	Concentration Detected		Concentration Units	Frequency of Detection	Exposure Point Concentration (EPC)	EPC Units	Statistical Measure
		Min	Max					
Subsurface Soil	Mercury	0.06	27950	mg/Kg	14/18	17000	mg/Kg	95% Chebyshev

95% Chebyshev: 95% Upper Confidence Limit for Nonparametric Data; Chebyshev

Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations

This table presents the chemicals of concern (COCs) and exposure point concentrations (EPCs) for each of the COCs detected in soil and groundwater (i.e., the concentration that will be used to estimate the exposure and risk from each COC in soil and groundwater). The table includes the range of concentrations detected for each COC, as well as the frequency of detection (i.e., the number of times the chemical was detected in the samples collected at the site), the EPC and how it was derived.

TABLE 3

Non-Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Absorp. Efficiency (Dermal)	Adjusted RfD (Dermal)	Adj. Dermal RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates of RfD:
Mercury	Chronic	3E-04	mg/kg-day	100%	2.1E-05	mg/kg-day	Immune System	1000	IRIS	11/10/04

Pathway: Inhalation

Chemical of Concern	Chronic/ Subchronic	Inhalation RfC	Inhalation RfC Units	Inhalation RfD	Inhalation RfD Units	Primary Target Organ	Combined Uncertainty /Modifying Factors	Sources of RfD: Target Organ	Dates:
Mercury	Chronic	3E-04	mg/m3	8.6e-05	mg/kg-day	CNS	30	IRIS	11/10/04

Key

NA: No information available
IRIS: Integrated Risk Information System, U.S. EPA
CNS: Central Nervous System

Summary of Toxicity Assessment

This table provides non-carcinogenic risk information which is relevant to the contaminants of concern in soil and groundwater. When available, the chronic toxicity data have been used to develop oral reference doses (RfDs) and inhalation reference doses (RfDi).

TABLE 4

Cancer Toxicity Data Summary

Pathway: Oral/Dermal

Chemical of Concern	Oral Cancer Slope Factor	Units	Adjusted Cancer Slope Factor (for Dermal)	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Mercury	NA	$(mg/kg/day)^{-1}$	NA	$(mg/kg/day)^{-1}$	C	IRIS	11/10/04

Pathway: Inhalation

Chemical of Concern	Unit Risk	Units	Inhalation Slope Factor	Slope Factor Units	Weight of Evidence/ Cancer Guideline Description	Source	Date
Mercury	NA	$(mg/m^3)^{-1}$	NA	$(mg/kg\text{-}day)^{-1}$	D	IRIS	11/10/04

Key:

IRIS: Integrated Risk Information System. U.S. EPA
NA: No information available
that limited human

EPA Weight of Evidence:

A - Human carcinogen
B1 - Probable Human Carcinogen-Indicates
data are available
B2 - Probable Human Carcinogen-Indicates sufficient evidence in animals associated with the site and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E- Evidence of noncarcinogenicity

Summary of Toxicity Assessment

This table provides carcinogenic risk information which is relevant to the contaminants of concern in soil and groundwater. Toxicity data are provided for both the oral and inhalation routes of exposure.

TABLE 5

Risk Characterization Summary – Noncarcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child & Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Ground-water	Ground-water	Tap Water	Mercury	Immune	4	200	1	241
							Groundwater Hazard Index Total [1] =	280
							Total Immune System HI =	240

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Primary Target Organ	Non-Carcinogenic Risk			
					Ingestion	Inhalation	Dermal	Exposure Routes Total
Soils	Soils	Soils	Mercury	Immune	70	<1	<1	70
							Soils Hazard Index Total [1] =	70
							Total Immune System HI =	70

The HI Total represents the summed HQs for all chemicals of potential concern at the site, not just those chemicals requiring remedial action which are shown here.

Summary of Risk Characterization - Non-Carcinogens

The table presents hazard quotients (HQs) for each route of exposure and the hazard index (sum of hazard quotients) for all routes of exposure. The Risk Assessment Guidance for Superfund states that, generally, a hazard index (HI) greater than 1 indicates the potential for adverse non-cancer effects.

TABLE 6

Risk Characterization Summary - Carcinogens

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child & Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Tap Water	Mercury	NA	NA	NA	NA
						Total Risk =	NA

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Concern	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Soils	Soils	Soils	Mercury	NA	NA	NA	NA
						Total Risk =	NA

Summary of Risk Characterization - Carcinogens

The table presents cancer risks for each route of exposure and for all routes of exposure combined. As stated in the National Contingency Plan, the acceptable risk range for site-related exposure is 10^{-6} to 10^{-4}. EPA does not quantitatively evaluate mercury as a carcinogen.

Table 7

Mean and Maximum Concentrations of COCs in Sediment and Biota
Mercury Refining Company
Colonie, New York

Sediment COCs	Rensselaer Lake		Inga's Pond		Background - Unnamed Tributary		Unnamed Tributary		Background - Patroon Creek		Patroon Creek Downstream of Confluence		I-90 Pond	
COC	mean	max	mean	max	mean	max	mean	max	mean	max	mean	max	mean	max
Mercury (total)	0.31	0.31	0.33	0.33	0.06	0.09	1.29	9	0.03	0.03	0.16	0.43	0.77	2.6
Mercury (methyl)	No	Data	0.00124	0.00124	0.000295	0.00033	0.002347	0.0091	0.00057	0.00101	0.000373	0.00122	0.001434	0.00478
Vanadium	39.1	39.1	51.4	51.4	10.5	13	11	15	6.35	6.7	8.97	12.4	18.6	32.9
Aroclor-1260	nd	nd	nd	nd	410	410	nd	nd	nd	nd	nd	nd	2750	4400
Benzo(a)pyrene	nd	nd	6600	6600	895	980	194	500	31.5	44	650	2000	2132	3600
Benzo(k)fluoranthene	nd	nd	4800	4800	775	1200	198	710	26	26	449.7	1200	1425	2400
PAHs (total)	nd	nd	83560	83560	15450	15450	3251	9733	359	587	8759.3	25300	13325	18980

Note:
Mean values of Aroclor-1260 based on detected values only (nd not included)
All values are in mg/kg
max: maximum

Biota COCs		Fish	Frog	Crayfish	Aquatic Invertebrates*
Rensselaer Lake	mean total Hg	No Data	nd	nd	nd
	mean methyl Hg	No Data	nd	nd	nd
	mean Aroclor-1260	No Data	No Data	No Data	No Data
Inga's Pond	mean total Hg	0.118	No Data	nd	nd
	mean methyl Hg	0.118	No Data	nd	nd
	mean Aroclor-1260	0.1625	nd	nd	nd
Background - Unnamed Tributary	mean total Hg	0.048	No Data	0.092	0.13
	mean methyl Hg	0.048	No Data	0.092	0.13
	mean Aroclor-1260	0.060	No Data	nd	No Data
Unnamed Trib.	mean total Hg	0.175	0.92	0.61	0.24
	mean methyl Hg	0.175	0.92	0.61	0.24
	mean Aroclor-1260	0.0947	No Data	No Data	No Data
Background - Patroon Creek	mean total Hg	No Data	No Data	nd	nd
	mean methyl Hg	No Data	No Data	nd	nd
	mean Aroclor-1260	No Data	No Data	nd	No Data
Patroon Creek Downstream of Confluence	mean total Hg	No Data	No Data	0.087	0.18
	mean methyl Hg	No Data	No Data	0.087	0.18
	mean Aroclor-1260	No Data	No Data	nd	No Data
I-90 Pond	mean total Hg	0.102	nd	nd	0.13
	mean methyl Hg	0.102	No Data	nd	0.13
	mean Aroclor-1260	0.2469	nd	0.081	nd

Notes:
All concentrations in mg/kg
Fish - combined, all species and sampling events
* - all aquatic invertebrates except crayfish (primarily insects)
All biota data based on combined 2001 and 2004 data sets
nd - sampled but COC not detected
No Data - receptor not observed or location not sampled
Concentrations of total Hg and methyl Hg are equal in biota - based on the assumption that all Hg in biota is methyl Hg
Hg - Mercury
mg/kg - milligram per kilogram
PAHs - Polycyclic aromatic hydrocarbons

Table 8

Hazard Quotients (HQ) for Sediment COCs
Mercury Refining Company
Colonie, New York

Sediment COC	TRV	Units	Rensselaer Lake				Inga's Pond				Background Unnamed Tributary			
			mean conc	mean HQ	max conc	max HQ	mean conc	mean HQ	max conc	max HQ	mean conc	mean HQ	max conc	max HQ
Mercury (Total)	0.18	mg/kg	0.31	**1.7**	0.31	**1.7**	0.33	**1.8**	0.33	**1.8**	0.06	0.3333	0.09	0.50
Methyl mercury	0.00001	mg/kg	0.00146	**146**	0.00146	**146**	0.00124	**124**	0.00124	**124**	0.000295	**29.5**	0.00033	**33**
Vanadium	57	mg/kg	39.1	0.69	39.1	0.686	51.4	0.90	51.4	0.90	10.5	0.18	13	0.23
PCBs (Aroclor-1260)	63,000	µg/kg									410	0.0065	410	0.0065
PCBs (Aroclor-1260)	60	µg/kg									410	**6.9**	410	**6.9**
Benzo(a)pyrene	370	µg/kg					6600	**18**	6600	**44**	895	**2.4**	980	**2.6**
Benzo(k)flouranthene	423	µg/kg					4800	**11**	4800	**11**	775	**1.8**	1200	**2.8**
Total PAHs	4,000	µg/kg					83560	**21**	83560	**52**	15450	**3.9**	15450	**3.9**

Sediment COC	TRV	Units	Background Patroon Creek				Patroon Creek downstream of Confluence				I-90 Pond			
			mean conc	mean HQ	max conc	max HQ	mean conc	mean HQ	max conc	max HQ	mean conc	mean HQ	max conc	max HQ
Mercury (Total)	0.18	mg/kg	0.05	0.28	0.07	0.389	0.138	0.77	0.32	**1.8**	0.49	**2.7**	1.1	**6**
Methyl mercury	0.00001	mg/kg	0.00057	**57**	0.00101	**101**	0.0003	**30**	0.00044	**44**	0.00174	**174**	0.00478	**478**
Vanadium	57	mg/kg	6.35	0.11	6.7	0.118	10.08	0.18	12.4	0.2	18.1	0.3	24	0.42
PCBs (Aroclor-1260)	63,000	µg/kg									2,750	0.044	4,400	0.070
PCBs (Aroclor-1260)	60	µg/kg									2,750	**46**	4,400	**74**
Benzo(a)pyrene	370	µg/kg	31.5	0.09	44	0.119	805	**2.2**	2000	**5**	1,823	**5**	3,100	**8**
Benzo(k)flouranthene	423	µg/kg	203	0.480	380	0.898	642.5	**1.5**	1200	**2.8**	1,191	**2.8**	2,000	**4.7**
Total PAHs	4,000	µg/kg	359	0.09	587	0.147	11325	**2.8**	25300	**6**	13,325	**3.3**	18,980	**5**

Sediment COC	TRV	Units	Unnamed Tributary			
			mean conc	mean HQ	max conc	max HQ
Mercury (Total)	0.18	mg/kg	1.5	**8.33**	9	**50**
Methyl mercury	0.00001	mg/kg	0.00195	**195**	0.0091	**910**
Vanadium	57	mg/kg	11.78	0.21	18.4	0.323
PCBs (Aroclor-1260)	63,000	µg/kg				
PCBs (Aroclor-1260)	60	µg/kg				
Benzo(a)pyrene	370	µg/kg	211.4	0.57	500	**1.4**
Benzo(k)flouranthene	423	µg/kg	212.2	0.502	710	**1.7**
Total PAHs	4,000	µg/kg	3206.5	0.80	9733	**2.4**

Notes:

1. Blank cells indicate no data or non-detect data
2. PCBs-(Aroclor-1260) values are based on a total of only three samples of detections (2 in I90 Pond and 1 in Bkg. Unnamed Tributary)

TRV: Toxicity Reference Value
PAH: Polycyclic aromatic hydrocarbons
HQ: Hazard Quotient
max: maximum
conc: concentration
COC: Contaminant of concern
PCB: Polychlorinated biphenyl
Red indicates the hazard quotient is greater than 1

A

Table 9
Summary of Risks - Food Chain Modeling (HQ 1.0 threshold)
Mercury Refining Company
Colonie, New York

	Mink					Raccoon					Great Blue Heron				
	Inga's Pond	Background Unnamed Tributary	Unnamed Tributary	Patroon Creek downstream Confluence	I-90 Pond	Inga's Pond	Background Unnamed Tributary	Unnamed Tributary	Patroon Creek downstream Confluence	I-90 Pond	Inga's Pond	Background Unnamed Tributary	Unnamed Tributary	Patroon Creek downstream Confluence	I-90 Pond
Methyl mercury Scenario 1	Based on SFF = Area of site (subarea) / Area Foraging or Home Range (EPA 1993) - Sediment source = methylmercury														
NOAEL HQ	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2.6	1.4	8.0	NM	<1
LOAEL HQ	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NM	<1
Methyl mercury Scenario 2	Based on estimated SFF which considers habitat availability and suitability (mink/raccoon = 0.20, GBH = 0.667, kingfisher = 1.0) - Sediment source = methylmercury														
NOAEL HQ	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2.4	<1	6.5	NM	1.63
LOAEL HQ	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NM	<1
Total Mercury Scenario 1	Based on SFF = Area of site (subarea) / Area Foraging or Home Range (EPA 1993) - Sediment source = total mercury														
NOAEL HQ	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2.6	1.4	8.2	NM	<1
LOAEL HQ	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NM	<1
Total Mercury Scenario 2	Based on estimated SFF which considers habitat availability and suitability (mink/raccoon = 0.20, GBH = 0.667, kingfisher = 1.0) - Sediment source = total mercury														
NOAEL HQ	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2.4	<1	6.5	NM	1.7
LOAEL HQ	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	NM	<1
Aroclor 1260 Scenario 1	Based on SFF = Area of site (subarea) / Area Foraging or Home Range (EPA 1993)														
NOAEL HQ	NM	<1	NM	NM	<1	NM	<1	NM	NM	<1	NM	<1	NM	NM	<1
LOAEL HQ	NM	<1	NM	NM	<1	NM	<1	NM	NM	<1	NM	<1	NM	NM	<1
Aroclor 1260 Scenario 2	Based on estimated SFF which considers habitat availability and suitability (mink/raccoon = 0.20, GBH = 0.667, kingfisher = 1.0)														
NOAEL HQ	NM	<1	NM	NM	<1	NM	<1	NM	NM	<1	NM	<1	NM	NM	<1
LOAEL HQ	NM	<1	NM	NM	<1	NM	<1	NM	NM	<1	NM	<1	NM	NM	<1

	Mallard					Belted Kingfisher				
	Inga's Pond	Background Unnamed Tributary	Unnamed Tributary	Patroon Creek downstream Confluence	I-90 Pond	Inga's Pond	Background Unnamed Tributary	Unnamed Tributary	Patroon Creek downstream Confluence	I-90 Pond
Methyl mercury Scenario 1	Based on SFF = Area of site (subarea) / Area Foraging or Home Range (EPA 1993)									
NOAEL HQ	<1	<1	<1	<1	<1	9.8	4.0	14.6	NM	8.5
LOAEL HQ	<1	<1	<1	<1	<1	<1	<1	1.4	NM	<1
Methyl mercury Scenario 2	Based on estimated SFF which considers habitat availability and suitability (mink/raccoon = 0.20, GBH = 0.667, kingfisher = 1.0)									
NOAEL HQ	<1	<1	1.8	1.3	<1	9.8	4.0	14.6	NM	8.5
LOAEL HQ	<1	<1	<1	<1	<1	<1	<1	1.4	NM	<1
Total Mercury Scenario 1	Based on SFF = Area of site (subarea) / Area Foraging or Home Range (EPA 1993)									
NOAEL HQ	<1	<1	<1	<1	<1	9.9	4.0	14.8	NM	8.6
LOAEL HQ	<1	<1	<1	<1	<1	<1	<1	1.4	NM	<1
Total Mercury Scenario 2	Based on estimated SFF which considers habitat availability and suitability (mink/raccoon = 0.20, GBH = 0.667, kingfisher = 1.0)									
NOAEL HQ	<1	<1	1.9	1.3	<1	9.9	4.0	14.8	NM	8.6
LOAEL HQ	<1	<1	<1	<1	<1	<1	<1	1.4	NM	<1
Aroclor 1260 Scenario 1	Based on SFF = Area of site (subarea) / Area Foraging or Home Range (EPA 1993)									
NOAEL HQ	NM	<1	NM	NM	<1	NM	<1	NM	NM	<1
LOAEL HQ	NM	<1	NM	NM	<1	NM	<1	NM	NM	<1
Aroclor 1260 Scenario 2	Based on estimated SFF which considers habitat availability and suitability (mink/raccoon = 0.20, GBH = 0.667, kingfisher = 1.0)									
NOAEL HQ	NM	<1	NM	NM	<1	NM	<1	NM	NM	<1
LOAEL HQ	NM	<1	NM	NM	<1	NM	<1	NM	NM	<1

Notes:

NM = not modeled (input data insufficient or all non-detect)

NOAEL = No observed adverse effect level

LOAEL = Low observed adverse effect level

Red indicates that the hazard quotient is greater than 1

HQ: Hazard Quotient

SFF: Site foraging factor

The difference between Scenarios 1 and 2 is based on different assumptions regarding Site Foraging Factors (SFFs)

The difference between total mercury and methyl mercury risk estimates is from differences in sediment mercury concentrations (total vs methyl). In both cases the dose-based TRVs are based on methyl mercury

Risk Summary Bullets:

Mink	No Risk - All COCs/Scenarios
Raccoon	No Risk - All COCs/Scenarios
Great Blue Heron	Risk for Hg only (Max HQ = 8.1, HQs at UT>IP>I-90>BkgUT)
Mallard	Slight risk (HQ near or slightly exceeds 1.0) for Hg only (Max HQ = 1.9, HQ at UT>PCdsConf.>BkgUT>1-90)
Belted Kingfisher	No Risk Aroclor 1260
Conclusion:	Risk for Hg, highest of all receptors (Max HQ = 14.7, HQ at UT>IP>I-90>BkgUT)

A

Table 10
Remedy Cost Estimate for Soil and Groundwater
Mercury Refining Site
Colonie, New York

Line Item	Quantity	Unit Cost	Units	Capital Cost	O&M/Future Costs	
					Annual*	Present Worth
CAPITAL COSTS						
Construction Costs						
(1) Site Preparation						
(a) Work Plans (including WP, QAPP, CQCP, Chem QCP)	1,000	$90	HR	$90,000		
(b) Health and Safety Plan	80	$90	HR	$7,200		
(c) Mobilization/Demobilization	1	$600,000	LS	$600,000		
(d) Concrete/Asphalt Demolition	480	$175	CY	$84,000		
(e) Concrete/Asphalt Waste Disposal Sampling	11	$500	EA	$5,500		
(f) Misc Demo (Fence, Wood Shed, etc)	1	$1,000	LS	$1,000		
(g) Polyvinyl Coated Nylon Tarpaulin	50,900	$0.85	SF	$43,265		
(h) Waste Disposal (RCRA Subtitle D Landfill)	720	$125	TON	$90,000		
(i) Site Survey	6	$2,600	ACRE	$15,600		
Subtotal 1				**$936,565**		
(2) Sewer Remediation						
(a) Temporarily Relocate Electrical Box	1	$10,000	LS	$10,000		
(b) Excavate Soil and Storm Sewers (with Backhoe)	480	$7	CY	$3,360		
(c) Excavate Catch Basins	5	$1,000	EA	$5,000		
(d) Excavate Soil and Storm Sewers (by Hand)	50	$60	CY	$3,000		
(e) Trench box	30	$250	DAY	$7,500		
(f) Waste Disposal Sampling	3	$700	EA	$2,100		
(g) Waste Transport and Disposal (Offsite Treatment & Subtitle D)	720	$220	TON	$158,400		
Subtotal 2				**$189,360**		
(3) Remedial Treatment -Disposal and Solidification/Stabilization						
Excavation and Disposal, Areas A, B, C & D						
(a) Excavate with Backhoe (surface soil)	1,430	$7	CY	$10,010		
(b) Excavate by Hand (surface soil)	360	$60	CY	$21,600		
(c) Waste Transport and Disposal (surface soil, Subtitle D Landfill)	2,700	$125	TON	$337,500		
Solidification/Stabilization, Area E						
(d) Treatability Testing	1	$2,500	LS	$2,500		
(e) Solidification/Stabilization Treatment	14,400	$150	CY	$2,160,000		
(f) Verification Sampling (including QC samples)	100	$700	EA	$70,000		
(g) Transport and Disposal of Excess Soil (Subtitle D)	1,500	$125	TON	$187,500		
Subtotal 3				**$2,789,110**		
(4) Storm Sewer Restoration						
(a) Backfill of soil (with Compaction)	400	$25	CY	$10,000		
(b) Pipe Bedding (Screened Gravel, Backfill with Compaction)	80	$50	CY	$4,000		
(c) New Catch Basins	6	$2,500	EA	$15,000		
(d) New Sewer Pipe (Assume 12")	260	$15	LF	$3,900		
Subtotal 4				**$32,900**		
(5) Site Restoration						
(a) Backfill with Compaction (Areas A, B, C, and D)	1,790	$13	CY	$23,270		
(b) New Concrete Pavement Areas A, B, C, D, and E (Assume 6")	5,700	$50	SY	$285,000		
(c) Misc Restoration	1	$10,000	LS	$10,000		
Subtotal 5				**$318,270**		
Construction Subtotal				**$4,266,205**		
Contractor Health and Safety (10% of Construction Subtotal)				$426,621		
General Contractor's Construction Management (30% of Construction Subtotal)				$1,279,862		
General Contractor Fee (10% of Construction Subtotal)				$426,621		
Construction Total				**$6,399,308**		
Permitting and Legal (2% of Construction Total)				$127,986		
Engineering				$400,000		
Services During Construction (5% of Construction Total)				$319,965		
Contingency (20% of Construction Total)				$1,279,862		
(6) Deed Notice	80	$100	HR	$8,000		

Table 10
Remedy Cost Estimate for Soil and Groundwater
Mercury Refining Site
Colonie, New York

Line Item	Quantity	Unit Cost	Units	Capital Cost	O&M/Future Costs	
					Annual*	Present Worth
(7) Pre-Design Investigation						
(a) Project Management	750	$100	HR	$75,000		
(b) Workplan/Quality Assurance Project Plan/Health & Safety Plan	720	$100	HR	$72,000		
(c) Procurement of Subcontracts	240	$100	HR	$24,000		
(d) Sampling	2,400	$100	HR	$240,000		
(e) Data Management	300	$100	HR	$30,000		
(f) Data Validation and Data Usability Report	400	$100	HR	$40,000		
(g) Data Evaluation and Report	800	$100	HR	$80,000		
(h) Site Survey	4	$2,600	ACRE	$10,400		
(i) Drilling Subcontractor	1	$50,000	LS	$50,000		
(j) Sample Analysis (Total Hg, Total Mn)	300	$100	EA	$30,000		
(k) IDW (includes sampling)	1	$20,000	LS	$20,000		
Pre-Design Investigation Subtotal				**$671,400**		
Total Captial Costs				**$9,206,521**		
OPERATIONS & MAINTENANCE COSTS (for 30 years)						
(8) Annual Inspections (30 years)	40	$100	HR		$4,000	$49,636
(9) Annual Repairs - Mobilization (30 years)	1	$2,000	LS		$2,000	$24,818
(10) Annual Repairs - Clay Cap (30 years)	500	$11	SF		$5,500	$68,250
Contractor Health and Safety (10% of Sum of Annual Repairs & Inspection)					$1,150	$14,270
Contractor Overhead (30% of Sum of Annual Repairs & Inspection)					$3,450	$42,811
(11) Long-term Groundwater Monitoring (Annual for 30 years)						
(a) Field Crew (3 people 5 days)	150	$100	HR		$15,000	$186,136
(b) Travel Expenses	5	$750	DAY		$3,750	$46,534
(c) Equipment	1	$5,000	LS		$5,000	$62,045
(d) Sample Analysis	10	$350	EA		$3,500	$43,432
(e) Data Validation	40	$100	HR		$4,000	$49,636
(f) Data management/analysis	80	$100	HR		$8,000	$99,272
(g) Report	80	$100	HR		$8,000	$99,272
Operation & Maintenance Subtotal						**$786,113**
Project Management and Support (30% of O&M Subtotal)						$235,834
Total Operation & Maintenance						**$1,021,947**
(12) Five Year Review	320	$100	HR		$32,000	$69,120
TOTAL ESTIMATED COSTS				**$9,206,521**		**$1,091,067**
NET PRESENT WORTH OF COSTS				**$10,297,587**		

* Assume cost occurs every year for 30 years, except for 5 year review which occurs every five years for 30 years.

Table 11
Remedy Cost Estimate for Sediment
Mercury Refining Site
Colonie, New York

Line Item	Quantity	Unit Cost	Units	Capital Cost	O&M/Future Costs	
					Annual*	PW
CAPITAL COSTS						
Construction Costs						
(1) Site Preparation						
(a) Workplan	300	$35	HR	$10,500		
(b) Health and Safety	80	$35	HR	$2,800		
(c) Mobilization/Demobilization	1	$20,000	LS	$20,000		
(d) Clearing and Grubbing	0.50	$8,000	ACRE	$4,000		
(e) Build Access to Stream	1	$15,000	LS	$15,000		
Subtotal 1				**$52,300**		
(2) Excavation of Stream Soils						
(a) Excavate Stream Soils	111	$60	CY	$6,660		
(b) Waste Disposal Sampling	5	$700	EA	$3,500		
(c) Fly Ash	73	$85	TON	$6,205		
(d) Waste Transport and Disposal (RCRA Subtitle D Landfill)	218	$125	TON	$27,294		
(e) Stream By-pass System (pump, re-routing hose, hay berms)	1	$5,000	LS	$5,000		
(f) Bathymetric Survey	3	$1,500	DAY	$4,500		
Subtotal 2				**$53,159**		
(3) Site and Wetland Restoration						
(a) Misc Site Restoration	1	$10,000	LS	$10,000		
(b) Wetland Restoration	1	$20,000	LS	$20,000		
Subtotal 3				**$30,000**		
Construction Subtotal				**$135,459**		
Contractor Health and Safety (10% of Construction Subtotal)				$13,546		
Contractor Overhead & Profit (30% of Construction Subtotal)				$40,638		
Construction Total				**$189,643**		
Permitting and Legal (2% of Construction Total)				$3,793		
Engineering				$75,000		
Services During Construction (5% of Construction Total)				$9,482		
Contingency (20% of Construction Total)				$37,929		
(4) Pre-Design Investigation						
(a) Project Management (Included in Soil Remedy)						
(b) Workplan/Quality Assurance Project Plan/H&S Plan (Included in Soil Remedy)						
(c) Procurement of Subcontracts (Included in Soil Remedy)						
(d) Sampling	40	$100	HR	$4,000		
(e) Data Management	20	$100	HR	$2,000		
(f) Data Validation and Data Usability Report	40	$100	HR	$4,000		
(g) Data Evaluation and Report	40	$100	HR	$4,000		
(h) Bathymetric Survey	3	$1,500	DAY	$4,500		
(i) Mobilization/Demobilization/Misc Equipment	1	$20,000	LS	$20,000		
(j) Sample Analysis (Total Hg)	20	$50	EA	$1,000		
Subtotal 4				**$39,500**		
Total Captial Costs				**$355,347**		

Table 11
Remedy Cost Estimate for Sediment
Mercury Refining Site
Colonie, New York

Line Item	Quantity	Unit Cost	Units	Capital Cost	O&M/Future Costs	
					Annual*	PW
OPERATIONS & MAINTENANCE COSTS						
(5) Long-term Sediment Monitoring of I-90 Pond (Annual for first five years and every five years from years 5 to 30)						
(a) Field Crew	80	$100	HR		$8,000	$44,360
(b) Travel Expenses	5	$750	DAY		$3,750	$20,794
(c) Equipment	1	$20,000	LS		$20,000	$110,901
(d) Sample Analysis (Total Hg and PCBs)	28	$250	EA		$7,000	$38,815
(e) Data Validation	28	$100	HR		$2,800	$15,526
(f) Data management/analysis	40	$100	HR		$4,000	$22,180
(g) Report	40	$100	HR		$4,000	$22,180
						$0
Operation & Maintenance Subtotal						**$274,756**
Project Management and Support (30% of O&M Subtotal)						$82,427
Total Operation & Maintenance						**$357,183**
(6) Five Year Review	320	$100	HR		$32,000	$69,120
TOTAL ESTIMATED COSTS				**$355,347**		**$426,303**
NET PRESENT WORTH OF COSTS				**$781,650**		

APPENDIX III

ADMINISTRATIVE RECORD INDEX

MERCURY REFINING COMPANY SITE
ADMINISTRATIVE RECORD
INDEX OF DOCUMENTS

3.0 REMEDIAL INVESTIGATION

3.2 Sampling and Analysis Data/Chain of Custody Forms

P. 300001 - 300024 Report: Analytical Results, New York State Department of Environmental Conservation, Atomic Absorption, prepared by Recra Research, Inc., June 14, 1982.

P. 300025 - 300071 Report: Extent of PCB Contamination, Mercury Refining Co. Inc., prepared by Conestoga-Rovers and Associates Limited, July 18, 1985.

P. 300072 - 300129 Report: Mercury Refining Company, Inc., RCRA Facility Investigation, Task I Report on Current Conditions, prepared by Mercury Refining Company, Inc., Albany, New York, May 1997.

P. 300130 - 300455 Report: Mercury Refining Company, Inc., RCRA Facility Investigation, Interim Corrective Measures, Sampling Visit Report, prepared by Mercury Refining Company, Inc., Albany, New York, November, 1997.

P. 300456 - 300466 Report: Mercury Refining Company, Inc., RCRA Facility Investigation, AOC-4, -5, & -6 Soil Sampling Report, AOC-2 Sediment Sampling and Cleaning Report, Draft Report, prepared by Mercury Refining Company, Inc., Albany, New York, January 1998.

P. 300467 - 300479 Letter dated March 27, 1998, to Mr. Howard S. Brezner, Environmental Engineer II, New York State Department of Environmental Conservation Region 4, from Mr. John-Eric Andersson, Environmental Coordinator, Mercury Refining Company, Inc., re: Enclosed laboratory report for the quarterly groundwater samples collected on March 10, 1998.

P. 300480 - 300506 Letter to Ms. Margaret O'Brien, New York State Department of Environmental Conservation Region 4, from Ms. Vicki G. Schlierer, Regulatory Affairs Paralegal, Young & Ritzenberg, Attorneys at Law, re: Enclosed copy of Mercury Refining Company, Inc., Order on Consent #D3-0001-96, 1998 Third Quarter Groundwater Monitoring Results, December 17, 1998.

P. 300507 - 300701 Letter Report to Mr. Leo Cohen, Mercury Refining Company, from Mr. Steven Hall, Project Manager/Associate, and Mr. Robert Semenak, Treatability Department Manager/Associate, Kiber Environmental Services, Inc., re: Mercury-Contaminated Soil Treatability Study, Addendum Report, June 10, 1999.

P. 300702 - 300708 Letter dated May 23, 2000, to Mr. Howard S. Brezner, Environmental Engineer II, New York State Department of Environmental Conservation Region 4, from Mr. Leo Cohen, Mercury Refining Company, Inc., re: Enclosed laboratory reports for the quarterly groundwater samples collected on March 3, 2000.

P. 300709 - 300721 Letter dated August 4, 2000, to Mr. Howard S. Brezner, Environmental Engineer II, New York State Department of Environmental Conservation Region 4, from Mr. Leo Cohen, Mercury Refining Company, Inc., re: Enclosed laboratory reports for the quarterly groundwater samples collected on July 12, 2000.

P. 300722 - 300735 Facsimile to Mr. Thomas Taccone, U.S. EPA, from Mr. Howard S. Brezner, New York State Department of Environmental Conservation Region 4, re: Enclosed Mercury Refining 10/25/00 Groundwater Sampling Results, November 27, 2000.

P. 300736 - 300749 Letter dated March 22, 2001, to Mr. Howard S. Brezner, Environmental Engineer II, New York State Department of Environmental Conservation Region 4, from Mr. Leo Cohen, Mercury Refining Company, Inc., re: Enclosed reports on samples taken from monitoring wells on February 9, 2001.

P. 300750 - 300976 Memorandum to Mr. Thomas Taccone, Remedial Project Manager, U.S. EPA, Region II, from Mr. Michael A.

Mercado, Environmental Scientist, U.S. EPA, Region II, re: Sampling Event Report for Mercury Refining Inc., Colonie, New York, October 30, 2003. (Attachment: Report: Sampling Report and Data Presentation, Mercury Refining, Colonie, New York, Groundwater Sampling Event June 10 to July 17, 2003, prepared by Mr. Michael A. Mercado, Environmental Scientist, U.S. EPA, Region II, undated.)

3.3 Work Plans

P. 300977 - 301109 Report: Remedial Action Master Plan, Mercury Refining Company Site, Albany County, New York, prepared by NUS Corporation, prepared for U.S. EPA, August 1984.

P. 301110 - 301314 Plan: Final Work Plan, Volume I, Mercury Refining Superfund Site, Remedial Investigation/Feasibility Study, Colonie, New York, Work Assignment No. 040-RICO-0276, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region II, March 13, 2001.

P. 301315 - 301794 Plan: Final Quality Assurance Project Plan, Mercury Refining Company Site, Remedial Investigation/Feasibility Study, Colonie, New York, Work Assignment No. 040-RICO-02N4, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region II, August 24, 2001.

3.4 Remedial Investigation Reports

P. 301795 - 301885 Report: Proposal to Conduct a Field Investigation of PCB Contamination at the Owasco River Railway, Inc. Site in Albany County, New York, prepared by Clement Associates, Inc., prepared for The Penn Central Corporation, September 17, 1984.

P. 301886 - 301913 Letter to Nancy L. Girard, Esq., DeGraff, Foy, Conway, Holt-Harris & Measley, from Mr. David A. Bernat, Associate Counsel, The Penn Central Corporation, re: Mercury Refining/Owasco, February 18, 1986. (Attachment: Report: An Investigation of PCB Contamination at the Mercury Refining Site, Albany, New York, prepared by Clement Associates, Inc., prepared for The Penn Central Corporation, February 12, 1986.)

P. 301914 - 302065 Report: Mercury Refining Co., Inc., Processors of Mercury and Silver, Final Report, Remedial Program, Albany Plant Site, prepared by Conestoga-Rovers & Associates Limited, prepared for New York State Department of Environmental Conservation, March 7, 1986.

P. 302066 - 302627 Report: Technical Memorandum Data Summary Report, Mercury Refining Superfund Site, Remedial Investigation/Feasibility Study, Colonie, New York, Work Assignment No.: 040-RICO-0276, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region II, September 9, 2002.

P. 302628 - 302846 Report: Pathways Analysis Report, Mercury Refining Company Site, Remedial Investigation/Feasibility Study, Colonie, New York, Work Assignment No.: 040-RICO-0276, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region II, October 11, 2002.

P. 302847 - 303108 Report: Draft Screening Level Ecological Risk Assessment, Mercury Refining Company Site, Remedial Investigation/Feasibility Study, Colonie, New York, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region II, January 31, 2003.

P. 303109 - 303396 Report: Final Remedial Investigation Report, Mercury Refining Company Site, Remedial Investigation/Feasibility Study, Colonie, New York, Work Assignment No.: 040-RICO-0276, Volume I, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region II, February 28, 2003.

P. 303397 - 304219 Report: Final Remedial Investigation Report, Mercury Refining Company Site, Remedial Investigation/Feasibility Study, Colonie, New York, Work Assignment No.: 040-RICO-0276, Volume II, Appendices A-L, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region II, February 28, 2003.

P. 304220 - 304245 Report: Quality Assurance Project Plan Addendum, Mercury Refining Company Site, Remedial Investigation/Feasibility Study, Colonie, New York, Work Assignment No.: 040-RICO-0274, prepared by CDM Federal Programs Corporation, prepared for

U.S. EPA, Region II, May 23, 2003.

P. 304246 - 304559 Report: Final Human Health Risk Assessment Report, Mercury Refining Company Site, Remedial Investigation/Feasibility Study, Colonie, New York, Work Assignment No.: 040-RICO-0276, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, June 18, 2003.

P. 304560 - 304628 Report: Final Technical Memorandum Groundwater Contamination Delineation Report, Mercury Refining Superfund Site, Remedial Investigation/Feasibility Study, Colonie, New York, Work Assignment No.: 140-RICO-0276, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region II, November 12, 2003.

3.5 Correspondence

P. 304629 - 304669A Memorandum to Mr. Anthony Adamczyk, from Mr. Lawrence C. Skinner, Principal Fish and Wildlife Ecologist, re: Mercury Refining, February 24, 1992. (Attachment: Report: Draft Evaluation Of Off-Site Contamination Associated With A Mercury Recycling Facility: Mercury Refining Company, (Colonie, N.Y.), undated.

P. 304670- 304670 Email message to Mr. Thomas Taccone, U.S. EPA, Region II, from Ms. Dorothea Richardson, CDM Federal Programs Corporation, re: Historical data, October 23, 2002.

P. 304671 - 304671 Memorandum to Ms. Reyhan Mehran, NOAA; Mr. Charles Merckel, USFWS; Mr. Steve Ferreira, DEPP-SPMM; Mr. John Cantilli, DEPP-WPB; Mr. Michael Clemetson, DESA-HWSB, from Mr. Thomas Taccone, Remedial Project Manager, U.S. EPA, Region II, re: Draft Screening Level Ecological Risk Assessment; Mercury Refining Superfund Site, February 3, 2003. (No attachment.)

P. 304672 - 304675 Memorandum to Mr. Thomas Taccone, Remedial Project Manager, U.S. EPA, Region II, from Mr. Steven J. Ferreira, Environmental Scientist, U.S. EPA, Region II, re: Mercury Refining Superfund Site, Draft Remedial Investigation Report, February 25, 2003.

P. 304676 - 304678 Memorandum to Ms. Mindy Pensak, EPA Region II BTAG Coordinator, from Ms. Reyhan Mehran, NOAA, re: Mercury Refining Company Superfund Site, Draft

Screening Level Ecological Risk Assessment, Mercury Refining Company Site, Remedial Investigation/Feasibility Study, Colonie, New York, January 31, 2003, April 1, 2003.

P. 304679 - 304681 Memorandum to Mr. Thomas Taccone, Remedial Project Manager, U.S. EPA, Region II, from Ms. Mindy J. Pensak, Coordinator, Biological Technical Assistance Group, U.S. EPA, Region II, re: Biological Technical Assistance Group Review, Mercury Refining, Inc. Site, April 7, 2003.

P. 304682 - 304684 Letter to Mr. Demetrios Klerides, P.E., Site Manager, CDM Federal Programs Corp., from Mr. Thomas Taccone, Remedial Project Manager, U.S. EPA, Region II, re: EPA Comments on CDM Federal's Draft Screening Level Ecological Risk Assessment, Mercury Refining Superfund Site; Work Assignment 040-RICO-0276, April 22, 2003.

P. 304685 - 304686 Email message (with attachment) to Ms. Mindy Pensak and Mr. Michael Clemetson, U.S. EPA, Region II, from Mr. Thomas Taccone, U.S. EPA, Region II, re: BTAG's Review of the FS for Mercury Refining, April 28, 2003.

P. 304687 - 304687 Email message to Mr. Thomas Taccone, U.S. EPA, Region II, from Mr. Michael Clemetson, U.S. EPA, Region II, re: BTAG's Review of the FS for Mercury Refining, April 29, 2003.

P. 304688 - 304689 Memorandum to Mr. Thomas Taccone, Remedial Project Manager, U.S. EPA, Region II, from Mr. William Sy, Chemist, Hazardous Waste Support Branch, U.S. EPA, Region II, re: Review of the Quality Assurance Project Plan (QAPP) Addendum for the RI/FS at Mercury Refining Company Site, Colonie, New York, June 4, 2003.

P. 304690 - 304692 Letter to Mr. Demetrios Klerides, P.E., Site Manager, CDM Federal Programs Corp., from Mr. Thomas Taccone, Remedial Project Manager, U.S. EPA, Region II, re: CDM Federal's Technical Memorandums for the Groundwater Delineation and Baseline Ecological Risk Assessment; Mercury Refining Superfund Site; Work Assignment 040-RICO-0276, October 16, 2003.

7.0 ENFORCEMENT

7.3 Administrative Orders

P. 700001 - 700020 Letter to Mr. David A. Bernat, Senior Attorney, The Penn Central Corporation, from Mr. David A. Engel, Assistant Counsel, Division of Environmental Enforcement, New York State Department of Environmental Conservation, re: Owasco River Railway, Inc., Order on Consent, August 6, 1984. (Attachment: Order on Consent, Index #T040584, State of New York: Department of Environmental Conservation, In the Matter of a Field Investigation to Identify the Threat to the Environment caused by Disposal of Hazardous and Industrial Wastes Upon the Inactive Hazardous Waste Site by The Owasco River Railway, Inc., Respondent, August 2, 1984.)

P. 700021 - 700043 State of New York: Department of Environmental Conservation, Order on Consent In the Matter of the Abatement of a Condition Likely to Cause Irreversible Damage to Natural Resources Pursuant to Article 71 of the Environmental Conservation Law of the State of New York (ECL), and of the Alleged Violations of ECL Articles 11, 17, 19 and 27 by Mercury Refining Company, Inc., Respondent, June 9, 1989.

P. 700044 - 700061 State of New York: Department of Environmental Conservation, Order on Consent, Modification File No. R4-0882-90-11, In the Matter of the Abatement of a Condition Likely to Cause Irreversible Damage to Natural Resources Pursuant to Article 71 of the Environmental Conservation Law of the State of New York (ECL), and of 17, 19 and 27 by Mercury Refining Company, Inc., Respondent, February 8, 1993.

P. 700062 - 700071 Letter to Kevin M. Young, Esq., Young & Rowe, from Ms. Ann Lapinski, Assistant Regional Attorney, Region IV, New York State Department of Environmental Conservation, re: Order on Consent, R4-1752-94-09, December 2, 1996. (Attachment: State of New York: Department of Environmental Conservation, Order on Consent, File No. R4-1752-94-09, In the Matter of Violations of Article 27, Title 9 of the Environmental Conservation Law; by Mercury Refining Company, Inc., Respondent,

December 2, 1996.)

P. 700072 - 700087 New York State Department of Environmental Conservation, Order, Index Number: D3-0001-96-12, In the Matter of 26 Railroad Avenue Site by Mercury Refining Company, Inc., Respondent, and MWS New York, Inc., Respondent, May 7, 1998.

7.4 Consent Decrees

P. 700088 - 700173 United States District Court, Northern District of New York, Consent Judgment, Index No. 83-CV-1054, State of New York, Plaintiff, against Mercury Refining Company, Inc., and Martin Corbit Associates, Inc., Owasco River Railway, Inc., and John Doe, Defendants, August 23, 1985.

P. 700174 - 700256 United States District Court, Northern District of New York, Consent Judgment, Index No. 83-CV-1054, State of New York, Plaintiff, against Mercury Refining Company, Inc., and Martin Corbit Associates, Inc., Owasco River Railway, Inc., and John Doe, Defendants, August 26, 1985.

P. 700257 - 700272 Memorandum to Ms. Marie Kautz, Bureau of Environmental Protection, New York State Department of Environmental Conservation, from Mr. Kevin Walter, Division of Environmental Enforcement, New York State Department of Environmental Conservation, re: Enclosed signed copy of the consent judgment, Mercury Refining Site, Colonie (T), Albany County, December 30, 1985. (Attachment: United States District Court, Northern District of New York, Consent Judgment, Index No. 83-CV-1054, State of New York, Plaintiff, against Mercury Refining Company, Inc., Martin Corbit Associates, Inc., Owasco River Railway, Inc., and John Doe, Defendants, August 23, 1985.)

7.7 Notice Letters and Responses - 104e's

P. 700273 - 700283 Letter to Mr. James E. Evans, General Counsel, American Financial Group, Inc., from Mr. Ray Basso, Strategic Integration Manager, Emergency and Remedial Response Division, U.S. EPA, re: Owasco River Railway, Inc., Mercury Refining Superfund Site, Towns of Colonie and Guilderland, Albany County, New York, Request for Information Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act, 42

U.S.C. Section 9601 et seq., December 8, 2003.

P. 700284 - 700289 Letter to Mr. Tom Taccone, Project Manager, Emergency and Remedial Response Division, U.S. EPA, from Mr. Jonathan A. Conte, Blank Rome LLP, re: Mercury Refining Superfund Site/Former Owasco River Railway Property, enclosed American Premier Underwriters' (f/k/a The Penn Central Corporation) response to U.S. EPA's CERCLA Section 104(e) Requests regarding the subject site, March 8, 2004.

MERCURY REFINING COMPANY SITE
ADMINISTRATIVE RECORD UPDATE #1
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1.0 SITE IDENTIFICATION

1.6 Correspondence

P. 100001 - 100004 Memorandum (with attachment) to Mr. Irving Bonsel, New York State Department of Environmental Conservation, from Mr. Robert Olazagasti, New York State Department of Environmental Conservation, re: Mercury Refining, Inc., June 15, 1982.

3.0 REMEDIAL INVESTIGATION

3.2 Sampling and Analysis Data/Chain of Custody Forms

P. 304693 - 304726 Memorandum to Mr. Jack Harmon, OSC, Removal Action Branch, U.S. EPA Region 2, from Ms. Smita Sumbaly, Data Reviewer, RST Region II, re: Mercury Refining, Inc. Site, Data Validation Assessment, March 12, 2003.

P. 304727 - 304776 Letter (with attachments) to Mr. Leo Cohen, Mercury Refining Company, from Mr. Thomas Taccone, Project Manager, Western New York Remediation Section, U.S. EPA, Region 2, re: Indoor Air Sampling Results for the Mercury Refining Superfund Site, September 13, 2004.

3.3 Work Plans

P. 304777 - 304805 Letter to Mr. Thomas Taccone, Remedial Project Manager, U.S. EPA, Region 2, from Ms. Jeanne Litwin, REM, RAC II Technical Operations Manager, CDM, re: Final Quality Assurance Project Plan Addendum, Mercury Refining Company Site, Remedial Investigation/Feasibility Study, Colonie, New York, June 13, 2003.

P. 304806 - 304855 Report: Final Quality Assurance Project Plan Addendum For Supplemental Sediment Sampling, Remedial Investigation/Feasibility Report, Mercury Refining Site, Colonie, NY, prepared by CDM, prepared for U.S. EPA, Region 2, October 12, 2004.

3.4 Remedial Investigation Reports

P. 304856 - 305388 Report: Final Baseline Ecological Risk Assessment, Mercury Refining Site, Colonie, New York, prepared by CDM Federal Programs Corporation, prepared by U.S. EPA, Region 2, May 6, 2005.

3.5 Correspondence

P. 305389 - 305391 Letter (with attachment) to Mr. Bill Christensen, Spills Division, NYS Department of Environmental Conservation, Region 4, from Mr. Jordan Wolf, Environmental Scientist, CDM, re: Freedom of Information Act (FOIA) Request, Remedial Investigation/Feasibility Study, Mercury Refining Site, Colonie, NY, October 7, 2004.

7.0 ENFORCEMENT

7.3 Administrative Orders

P. 700290 - 700391 Letter (with attachment) to Chief, Pesticides and Toxic Substances Branch, U.S. EPA, Region 2, and Rudolph S. Perez, Esq., Office of Regional Counsel, U.S. EPA, Region 2, re: In re Mercury Refining Co. (Docket #II-TSCA-PCB-92-0239), March 16, 1994. (Attachment: Report: Mercury Refining Company, Report on PCB/Mercury Separation Process, In the matter of Mercury Refining Company, Inc., Docket No. II TSCA PCB-92-0239).

MERCURY REFINING COMPANY SITE
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3.0 REMEDIAL INVESTIGATION

3.3 Work Plans

305392 - 305447 Report: Bench Scale Treatability Study for the Electrokinetic Remediation of Soil from the Mercury Refining Site, Colonie, New York, Quality Assurance Program Plan, prepared by R. Mark Bricka and Brad Hensarling, Mississippi State University, prepared for U. S. EPA, Region 2, September 1, 2005.

305448 - 305504 Report: Treatability Study Work Plan (TSWP) for the Mercury Refining Site - Colonie, New York, prepared by R. Mark Bricka and Brad Hensarling, Mississippi State University, prepared for U. S. EPA, Region 2, September 30, 2005.

MERCURY REFINING COMPANY SITE
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2.0 REMOVAL RESPONSE

2.7 Correspondence

P. 200001 - 200002 Memorandum to Mercury Refining Superfund Site File from Mr. Thomas Taccone, Remedial Project Manager, U.S. EPA, Region 2, re: Use of Superfund Response Authority to Address Indoor Air Contamination at the Mercury Refining Superfund Site, March 13, 2006.

3.0 REMEDIAL INVESTIGATION

3.2 Sampling and Analysis Data/Chain of Custody Forms

P. 305505 - 305524 Memorandum to Mr. Mark Moore, New York State Department of Environmental Conservation, from Mr. Kevin Walter, New York State Department of Environmental Conservation, re: Mercury Refining, Colonie (T), Albany County, June 18, 1985. (Attachment: Report: PCB Sampling Program of April 24, 1985, Mercury Refining Co., Inc., May 30, 1985.

3.4 Remedial Investigation Reports

P. 305525 - 305651 Letter to Kevin Walter, Esq., Division of Hazardous Waste Enforcement, New York State Department of Environmental Conservation, from Mr. Dean S. Sommer, Assistant Attorney General, State of New York, Department of Law, re: Mercury Refining, December 14, 1983. (Attachment: Report: Site Investigation, Mercury

Refining Co., Inc., prepared for Whiteman, Osterman & Hanna, November 1983.)

P. 305652 - 305655 Report: Baseline Ecological Risk Assessment for Sediment (0-6 inches), Mercury Refining Company, Colonie, New York, prepared by CDM, prepared for U.S. EPA, Region 2, July 6, 2007.

P. 305656 - 305658 Report: Statement of Findings for Wetlands, Mercury Refining Company Site, Colonie, New York, undated.

4.0 FEASIBILITY STUDY

4.3 Feasibility Study Reports

P. 400001 - 400351 Report: Project Report, Bench Scale Test of Electrokinetics (EK) Treatment of Mercury Contaminated Soils at the Mercury Refining Superfund Site, Colonie, New York, prepared by Mr. R. Mark Bricka, Mississippi State University, prepared for U.S. EPA, Region 2, May 2007.

P. 400352 - 400592 Report: Final Feasibility Study Report, Mercury Refining Site, Remedial Investigation/Feasibility Study, Colonie, New York, prepared by CDM Federal Programs Corporation, prepared for U.S. EPA, Region 2, January 25, 2008.

10.0 PUBLIC PARTICIPATION

10.9 Proposed Plan

P. 10.00001- 10.00018 Mercury Refining Superfund Site, Towns of Guilderland and Colonie, Albany County, New York, EPA Announces Proposed Plan, prepared by U.S. EPA, Region 2, March 2008.

11.0 TECHNICAL SOURCES AND GUIDANCE DOCUMENTS

11.3 State Guidance

P. 11.00001- 11.00045 Report: Technical Guidance for Screening Contaminated Sediments, prepared by New York State Department of Environmental Conservation, Division of Fish, Wildlife and Marine Resources, January 25, 1999.

MERCURY REFINING COMPANY SITE
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6.0 STATE COORDINATION

6.3 Correspondence

P. 600001 - 600004 Letter to Mr. George Pavlou, Director, Emergency & Remedial Response Division, U.S. EPA, Region 2, from Mr. Dale A. Desnoyers, Director, Division of Environmental Remediation, New York State Department of Environmental Conservation, re: Mercury Refining Superfund Site, NYSDEC Site No. 401025, Proposed Remedial Action Plan, March 24, 2008.

MERCURY REFINING COMPANY SITE
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10.0 PUBLIC PARTICIPATION

10.1 Comments and Responses

MERCURY REFINING COMPANY SITE
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3.0 REMEDIAL INVESTIGATION

3.2 Sampling and Analysis Data/Chain of Custody Forms

P. 305659 - 305692 Letter to Ms. Margaret Rogers, New York State Department of Environmental Conservation, Office of Environmental Quality, Region 4, from Mr. Leo Cohen, Mercury Refining Company Incorporated, re: Enclosed Kiber Environmental Services report dated November 8, 1999 on additional treatability studies performed on soil samples, November 10, 1999.

APPENDIX IV

STATE LETTER OF CONCURRENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation, 12th Floor
625 Broadway, Albany, New York 12233-7011
Phone: (518) 402-9706 • **FAX:** (518) 402-9020
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

SEP 30 2008

Mr. George Pavlou
Director, Emergency & Remedial Response Division
USEPA, Floor 19-#E38
290 Broadway
New York, NY 10007-1866

RE: Mercury Refining Superfund Site
NYSDEC Site No. 401025
Record of Decision

Dear Mr. Pavlou:

The New York State Department of Environmental Conservation and the New York State Department of Health have reviewed the above referenced Record of Decision. (ROD). The State concurs with the selected remedy as stated in the September 2008 ROD, and as summarized below.

- Excavation and off-site disposal of surface soils and subsurface soils above the water table from the Mercury Refining Property and its adjoining properties (i.e., Albany Pallet and Box Company (Albany Pallet), Allied Building Products Corporation (Allied Building) and Diamond W. Products Incorporated (Diamond W.) which exceed the cleanup level for mercury in soil of 5.7 parts per million (ppm) for industrial property usage. These soils also include the soils associated with the stormwater sewer/catch basin systems. Verification sampling will be performed to confirm the effectiveness of the remedy. Clean soil will be backfilled into the excavated areas.

- Solidification/Stabilization involving mixing or injection of treatment agents at the Mercury Refining and Allied Building properties to immobilize contaminants in surface soils, subsurface soils,[1] and soils below the water table where the groundwater has a dissolved mercury concentration which exceeds the cleanup level of 0.7 parts per billion (ppb) for mercury in groundwater. Pilot testing will be performed before treatment and verification sampling will be performed after treatment to confirm the effectiveness of the remedy in immobilizing contaminated soils and achieving groundwater standards.

[1] This would include soils beneath the existing asphalt/concrete cap but not soils beneath the Container Storage Building or the existing clay cap.

- Imposition of institutional controls in the form of environmental easements/restrictive covenants to restrict future development/use of the Site. Specifically, environmental easements/restrictive covenants will be filed in the property records of Albany County. The easements/covenants will at a minimum: (a) limit the Site to industrial uses; (b) preserve the integrity of the existing clay cap on the southern portion of the Mercury Refining Property; (c) preserve the integrity of the solidified/stabilized mass; (d) prevent the excavation of soils which lay beneath the Phase 1 Building, which housed Mercury Refining's operations, and the Container Storage Building, which was used to store incoming mercury bearing material for processing, unless the excavation follows a Site Management Plan (see below); and (e) restrict the use of groundwater as a source of potable or process water until groundwater quality standards are met.

- Development and implementation of an EPA-approved Site Management Plan (SMP). The SMP, will, among other things, address long-term operation and maintenance (O&M) of the Site, and future excavation of soils, including, but not limited to, soils beneath the Phase 1 and Container Buildings on the Mercury Refining Property, and soils on the Albany Pallet Property, the Allied Building Property, and the Diamond W. Property, which will not be remediated by this remedy, to insure that the soils are property tested and handled to protect the health and safety of workers and the nearby community. The approved SMP will also require an evaluation of the potential for vapor intrusion at all existing buildings on-site and/or those to be constructed in the future, and mitigation, if necessary, in compliance with the SMP. Finally the SMP will provide for the proper management of all Site remedy components post-construction and shall include: (a) monitoring of groundwater to ensure that, following Site remediation, the contamination has attenuated and the groundwater has been remediated; (b) monitoring and maintenance of institutional controls; (c) a provision for operation and maintenance of the clay cap; (d) periodic certifications by the owners/operators of the Site properties or other party implementing the remedy that the institutional and engineering controls are in place; and (e) a provision to manage the demolition or alteration of the existing buildings on-Site, if such demolition or alteration is required in the future, to protect the health and safety of the workers and the nearby community and to ensure proper disposal of any building debris.

- Removal, dewatering and disposal of the mercury-contaminated sediments in the Unnamed Tributary exceeding the cleanup level for mercury in sediments of 1.3 ppm.

- Verification sampling will be performed to confirm the effectiveness of the remedy.

- Sampling of the fish, surface water and sediments in the Patroon Creek, the Unnamed Tributary and the I-90 Pond to assess impacts on the biota on an annual basis for five years. Sampling thereafter will be based on the results of the five annual sampling rounds, as reported within the first five-year review. Should conditions change with regard to the I-90 Pond dam (i.e. the dam is repaired, removed, or if it should fail), EPA will evaluate the potential impact of any significant releases and, if necessary, take or require response actions to mitigate their potential impact.

- In accordance with CERCLA and because the remedy will result in contaminants remaining on-Site above levels that will allow for unlimited use and unrestricted exposure, the Site remedy will be reviewed at least once every five years.

If you have any questions, please contact Robert Cozzy at (518) 402-9768.

Sincerely,

Dale A. Desnoyers
Director
Division of Environmental Rmediation

cc: B. Davidson
T. Taccone, USEPA

ec: S. Ervolina
R. Cozzy
J. Aversa
R. Quail
K. Goertz, Region 4
M. Schuck, NYSDOH
J. Crua, NYSDOH
S. Bates, NYSDOH
G. Litwin, NYSDOH
J. LaPadula, USEPA
K. Lynch, USEPA

APPENDIX V

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
FOR THE
RECORD OF DECISION
MERCURY REFINING SUPERFUND SITE
TOWNS OF COLONIE AND GUILDERLAND, ALBANY COUNTY, NEW YORK

INTRODUCTION

This Responsiveness Summary provides a summary of citizens' comments and concerns received during the public comment period related to the Mercury Refining Superfund Site ("Site") *Superfund Proposed Plan* and provides the responses of the U.S. Environmental Protection Agency ("EPA") to those comments and concerns. All comments summarized in this document have been considered in EPA's final decision in the selection of the remedy for the Site.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The Remedial Investigation/Feasibility Study ("RI/FS") Report, March 2008, Proposed Plan and other documents in the Administrative Record were made available to the public in the information repositories maintained at the EPA Docket Room in the Region 2 offices at 290 Broadway in Manhattan and at the William K Sanford Town Library, 629 Albany Shaker Road, Albany, New York.

A notice of the commencement of the public comment period, the public meeting date, the preferred remedy, contact information, and the availability of the above-referenced documents was published in the *Albany Times Union* on March 30, 2008. In addition, notices were sent to the Site mailing list. The public comment period ran from March 30, 2008 to May 30, 2008. EPA held a public meeting on April 22, 2008 at 7:00 P.M. at the Fuller Road Firehouse, Colonie, New York, to present the findings of the RI/FS, the Proposed Plan, and to answer questions from the public about the Site and the remedial alternatives under consideration. Local residents, state and local government officials, and potentially responsible party (PRP) representatives attended the public meeting. In general, public comments related to EPA's choice of the remedy for the soil, groundwater and sediments given the risk at the Site, the effectiveness the chosen remedy, the sufficiency of EPA's data, and the impact of the remediation on local residents and businesses.

SUMMARY OF COMMENTS AND RESPONSES

Comments were received at the public meeting and in writing. Written comments were received from:

- David P Rosenblatt, Esq. on behalf of the Mereco Site Interim Action Working Group, May 30, 2008.

- Christopher J. Sutton, Esq. on behalf of Qwest Communications International, Inc., May 30, 2008
- Elizabeth Kerry, May 26, 2008, Private Citizen

The transcript from the public meeting can be found in Appendix V of the ROD.

Letters submitted during the public comment period can be found in Appendix V of the ROD.

A summary of the comments provided at the public meeting and in writing, as well as EPA's responses to them, are provided below. The comments and responses have been organized into the following topics:

- Ecological Assessment and the I-90 Pond
- Health and Safety
- Extent of Contamination
- The Preferred Remedy
- Operations and Maintenance

ECOLOGICAL ASSESSMENT AND THE I-90 POND

1. COMMENT: Are Inga's Pond and Rensselaer Lake contaminated with mercury? If so, did the contamination come from the Mercury Refining Site?

EPA RESPONSE: EPA does not believe that the low concentrations of mercury which were detected in the sediments of Patroon Creek, just downstream of Rensselaer Lake, and in the sediments of Inga's Pond came from the Site. The portions of Patroon Creek and Inga's Pond that were sampled are located approximately one mile upstream of the Site. The samples were collected in these locations to determine background concentrations for the Site. Metals, including mercury, occur naturally at varying concentrations in soils. In order to determine whether the mercury concentrations found at the Mercury Refining Site are naturally occurring or whether the concentrations are a result of releases from the Site, EPA must compare the levels found at the Site to background levels. The background samples showed mercury in the sediments of the Creek, but not at levels above the Site cleanup level for sediment of 1.3 parts per million (ppm). As explained in greater detail in the Feasibility Study and in the Proposed Plan, this concentration was used to identify sediments which contain enough mercury to cause harm to benthic aquatic life.

2. COMMENT: Has EPA tested any of the other animals in the area like muskrats?

EPA RESPONSE: Mercury is known to bioaccumulate in fish and animal tissue and, to a much lesser degree, in plants. The Baseline Ecological Risk Assessment (BERA) utilized biological samples from crayfish, frogs and amphipods to calculate ecological Site risks. Other organisms, which are higher on the food chain, such as the mink, the mallard and the Kingfisher were not sampled. The risks for these other

organisms were calculated using food chain modeling and were found to be acceptable for all organisms except the Kingfisher.

The BERA used a multiple-lines-of-evidence approach to evaluate ecological risk, including food chain modeling, site-specific toxicity testing and tissue analysis. Risks to fish, amphibians, birds (i.e., piscivorous, carnivorous, and insectivorous birds), and mammals (i.e., piscivorous and insectivorous mammals) were determined, as indicated above, through food chain modeling. Specific risks to the muskrat were not evaluated. Additionally, fish tissue concentrations were compared to effects-based fish tissue concentration values to indicate if mercury present in fish tissue is at concentrations which are associated with adverse effects. The food chain model used in the BERA is a widely accepted model for conducting ecological risk assessments. The approach and process of the food chain model can be found in a 1993 EPA document entitled Wildlife Exposure Factors Handbook, EPA/600/R-93/187.

3. COMMENT: EPA indicates that the upstream data bear no relation to the Site. What about the fish and wildlife that became contaminated downstream and traveled upstream? Is EPA taking into consideration the migration of wildlife?

EPA RESPONSE: The migration of wildlife is a complicating factor when performing an ecological risk assessment. EPA acknowledges that some wildlife may not stay in one location and may cover a much larger area. The home ranges of receptors were therefore taken into account in the food chain modeling performed as part of the BERA, to determine the potential adverse effects of contaminants at the Mercury Refining Site on migrating wildlife.

To protect biota from being contaminated downstream of the Site and traveling upstream, cleanup objectives have been developed for contaminated sediments which EPA believes could adversely affect the biota through direct contact or through the bioaccumulation of mercury through the food chain. EPA's BERA calculated risks for both types of exposures. The food chain model indicated an elevated risk at the Unnamed Tributary, specifically due to contaminated sediments at the Mereco stormwater outfall, for the Kingfisher. Significant risk was calculated for insects and benthic organisms through direct contact or consumption of contaminated sediments at the stormwater outfall. The outfall sediment is also a source of contamination to ecological receptors downstream. Therefore, the BERA concluded that significant risks are posed by the sediment at the Mercury Refining outfall, and they will be addressed by the remedy.

HEALTH AND SAFETY

4. COMMENT: Once the design is completed and the contractor begins work, what is the interaction between the contractor, EPA, and the local fire department or HAZMAT in case there is an incident?

EPA RESPONSE: During the remedial design, before the physical on-Site remedial action is implemented, a Health and Safety Plan will be developed to address potential hazards posed by conditions at the Site and the remedial action itself. A component of the plan will address Site communications and potential emergency situations such as fires. The local fire department will be provided with a copy of the Site Health and Safety Plan. Also an on-Site health & safety officer will be designated who will be responsible for coordinating all emergency response actions including communication with local authorities (i.e., fire department).

5. COMMENT: Are people in the immediate area of the Site at risk from dust generated from the excavations, especially on windy days? Will monitors be set up so EPA can warn the people in case of an accident? What controls will EPA have in place to protect against dust during excavation activities?

EPA RESPONSE: Dust suppressants, such as water and/or foam will be used to minimize the generation of dust and therefore the likelihood that dust particles will migrate into the community. Additionally, an air monitoring program will be implemented during the excavation work to monitor dust and contaminants such as mercury. Monitors will be placed upwind and downwind of the remediation. Certain monitors will be placed near or at the Site perimeter to allow for added protection to the community. All activities will be temporarily stopped until levels are reduced if the concentrations exceed a pre-determined threshold level which will be identified in the Site Health and Safety Plan. The levels will be set low enough to include a margin of safety so that any activities can be stopped or modified before elevated levels of mercury are released. The New York State Department of Health (NYSDOH) will assist in reviewing the monitoring plan which will include details such as the placement and operation of the air monitors and also the notification of NYSDOH in the event that any exceedances occur.

6. COMMENT: In the case of an accident, will residents, especially those close to the Site, be immediately notified? How will EPA notify nearby residents of any releases that may occur during the remedial action?

EPA RESPONSE: A Health and Safety Plan is required and will be adhered to for the on-Site workers so that appropriate action is taken to prevent injuries or accidents. An accident or an occurrence that directly affects the neighboring community on a Site such as this is unlikely to occur based on EPA's experience with other similar remediation sites. In the unlikely event of an accident, the nearby residents will immediately be notified as per the Site Health and Safety Plan. One of those safeguards is a community air monitoring plan (See Response to Comment 5, above). If a significant release were to occur, the residents in the neighborhood will be notified and appropriate action will be taken. Major and minor incidents and any associated follow-up corrective actions will be documented on-Site. Incident reports will be maintained by the Health and Safety Officer. A decision as to the best method to utilize for community notification will be made as part of the drafting of the Health and Safety Plan.

EXTENT OF CONTAMINATION

7. COMMENT: Has EPA taken into consideration unknown contamination contributed by the railroad such as pesticides used to kill weeds?

EPA RESPONSE: During the RI, EPA collected soil samples on and around the Mercury Refining property and the railroad tracks. The samples were analyzed for a full suite of organic and inorganic compounds, including pesticides. Some pesticides were found, but not at levels which would warrant a cleanup action.

8. COMMENT: Is there any impact on the residential areas north of the Site? Have they been tested?

EPA RESPONSE: Mercury was detected in the surface soil at 0.3 ppm, approximately 300 feet from the northern edge of the Mercury Refining property. This concentration is below the NYSDEC soil cleanup objective for mercury (0.81ppm) for residential properties. Another sample which was collected approximately 350 feet from the northern edge did not reveal the presence of mercury. The nearest residences are located to the north of the Site, approximately one quarter mile away.

9. COMMENT: Did EPA collect samples downstream of the I-90 Pond?

EPA RESPONSE: EPA sampled sediments beyond the I-90 Pond. The furthest downstream sample was located approximately 1,000 feet downstream of the Pond. EPA found 0.32 ppm of mercury at this location, which is well below the cleanup level of 1.3 ppm for sediments.

10. COMMENT: There is a lot of contamination in the I-90 Pond from the 1953 fallout, the NL Industries Site, and the Mercury Refining Site. Also, there have been two previous studies which indicate a high rate of cancer within a five-mile radius of these Sites.

EPA RESPONSE: Anyone with concerns or questions about the former NL Industries Site may contact the New York State Department of Environmental Conservation or the New York State Department of Health for more information. The NL Site is not part of the study area for the Mercury Refining Superfund Site. Consequently, no sample data were collected to evaluate risks associated with the NL Site. However, EPA analyzed sediments from the I-90 Pond and tissue from fish caught from the Pond as part of the Mercury Refining Remedial Investigation ("RI"). The data did not indicate an unacceptable cancer risk due to human exposure to the pond sediments, but it did show the possibility of a slight increase in cancer risk due to consumption of fish from the Pond. A significant portion of the cancer risk was due to the presence of polychlorinated biphenyls (PCBs) in the fish tissue samples. However, PCBs are not a contaminant of concern for the Site and therefore will not be addressed by this remedy. As discussed in the Proposed Plan and in the Record of Decision, PCBs were found in the Unnamed Tributary, Patroon Creek and the I-90 Pond.

EPA collected sediment data in 2001 and 2004 as part of the RI and the PCB data for each sample event were largely similar. The results for the 2001 event ranged from 0.41 ppm of Aroclor 1260 in the background (upstream) segment of the Unnamed Tributary to 4.4 ppm of Aroclor 1260 in sediments collected from the I-90 Pond. (Different commercial mixtures of PCBs are classified as "Aroclors," and the different Aroclor names reflect the percent chlorine (by weight) for each mixture. Aroclor 1260, for example, is 60 percent by weight of chlorine.) In 2004, the results ranged from 0.68 ppm of Aroclor 1254 in sediments from the upstream Inga's Pond to 1.1 ppm of Aroclor 1260 detected downstream in the sediments of the I-90 Pond. Another sample was collected in 2004 next to the location in the I-90 Pond where the 2001 sample detected the PCB Aroclor 1260 at a concentration of 4.4 ppm. This sample did not detect PCBs. For the 2001 and the 2004 sampling events, 4.4 ppm of Aroclor 1260 was the highest concentration of PCBs detected. Aroclor 1260, however, was not detected in the soils at the MERECO property above its screening level. This along with the detection of Aroclors 1260 and 1254 up and downstream of the MERECO property, has led to the conclusion that the PCBs detected in the sediment are not a contaminant of concern for the Site.

11. COMMENT: The Vertical Profile groundwater data collected as part of the remedial investigation overstates the magnitude of on-site groundwater contamination. Vertical Profile data are suitable only for screening purposes, not evaluation of groundwater quality. Vertical profiling utilizes a direct push tool and bailers or oscillating inertial pumps to create a surging effect that mobilizes particles which can lead to uncertain results. The NCP requires that remedial decisions be based on scientifically defensible, valid data. Screening tools such as vertical groundwater profiling devices do not produce this level of data. Only one of fifteen filtered Vertical Profile samples exceeded the groundwater standard of 0.7 ppb. The extent of mercury impact to groundwater most likely is smaller than indicated by the Vertical Profile data.

EPA RESPONSE: EPA did not rely only on Vertical Profile data but also on data for monitoring well MW-05D which clearly established that the groundwater was contaminated above the cleanup level for groundwater of 0.7 ppb. The Vertical Profile data were used to estimate the extent of the groundwater contamination to be addressed.

Vertical Profile data obtained with direct push technology (DPT) is routinely used for both screening purposes and as a means of obtaining groundwater quality data. The groundwater sampling procedure employed at the Mereco Site involved extraction of a sample at designated intervals with a peristaltic pump. New polyethylene tubing was switched in before each new sample was taken to reduce cross-contamination. The samples were analyzed at a certified laboratory in compliance with quality-assurance standards and constitute quality, defensible groundwater samples. Nevertheless, EPA anticipated that higher turbidity may be associated with DPT well points compared to monitoring wells, and that mercury tends to adhere to particles, and thus collected both filtered (dissolved) and unfiltered (total) groundwater samples. While, the results from the Vertical Profile investigation showed dissolved mercury concentrations to be less

than total concentrations, the data still indicate, along with the monitoring well data, that a plume of contaminated groundwater exists. The Feasibility Study used the sample results from the vertical sample location VPW-02 and the groundwater data monitoring well MW-05D to estimate the extent of the plume.

12. COMMENT: Mercury is not migrating off–Site and is not expected to do so. Applying solidification/stabilization (SS) is an overly conservative approach that is not warranted by the data. Furthermore, applying SS to the limited portion of the aquifer in which mercury is exceeding the groundwater standard will not restore the aquifer. Since the groundwater downgradient of the area targeted for SS treatment already meets groundwater standards, there is little benefit in applying SS. It is also likely that most, if not all, of the possible downward mercury migration has already occurred since the release of elemental mercury ceased more that two decades ago and most of the release occurred well before that time, due to changes in MERECO waste storage and disposal practices at the Site. Finally, most of the mercury is in the form of elemental mercury and there is no evidence of methyl mercury originating from the subsurface soils in the groundwater or the surface water. The low level of dissolved mercury in the groundwater is not indicative of high oxidative subsurface soils on the Site.

EPA RESPONSE: The conclusion that mercury has not migrated very far is based on data collected for the RI which confirmed that most of the plume of dissolved mercury is on the Mercury Refining property with some of the plume on the Allied Building Products property. Releases did not cease two decades ago, and are ongoing. There is also a potential for future releases.

Elemental mercury is also a highly toxic metal. The concentrated mass of mercury in Area E will not break down or otherwise be diffused through natural processes nor can the aquifer be restored through more traditional treatment of the groundwater (e.g. pump and treat or air sparging) since mercury has a strong tendency to bind to soil particles which makes in-situ removal using traditional methods impracticable. This contamination has been determined by EPA to be a Principle Threat Waste which can pose significant health risks to anyone exposed to the soil or to anyone who may consume the groundwater from Area E. The fact that the mercury contamination tends to adsorb onto the soil and is relatively immobile or that the groundwater which is downgradient of Area E does not exceed groundwater standards does not change the fact it remains a potential future threat to human health.

Because of the large amount of elemental mercury in Area E, mercury has in fact dissolved into the groundwater as evidenced by groundwater samples collected from MW-05D and from Vertical Profile sample VPW-02. Groundwater samples from both sample locations exceeded the MCL for mercury of 2 ppb and the New York State Water Quality Standard (NYSWQS) limit of 0.7 ppb. Elemental mercury also emits mercury vapor which can adversely affect construction workers who could work in Area E. The Site risk assessment calculated a significant noncancer risk (HI of 40) for construction workers who work in this area.

Simply maintaining the existing caps on-Site, as contemplated by Alternative S-2, would not address the Principle Threat Wastes posed by the mass of contamination in Area E. Section 300.430(a) of the NCP states EPA's intention to address principle threats through treatment. Passive remedial measures for addressing a principle threat, such as capping or institution controls, may be used in combination with treatment but should not substitute for treatment. By utilizing solidification and stabilization treatment technology, along with institutional controls and the maintenance of the clay cap, the Principle Threat Wastes in Area E will be appropriately addressed.

13. COMMENT: Did EPA investigate all the depths in the Unnamed Tributary of the Patroon Creek and the I-90 Pond?

EPA RESPONSE: As part of the RI, EPA analyzed the top six inches of sediment from samples collected from the Unnamed Tributary to Patroon Creek, the Patroon Creek; and the I-90 Pond (The I-90 Pond is also known as the Three Mile Reservoir). Sediments samples were also collected to a depth of one foot in the Unnamed Tributary at two depositional areas: the Mercury Refining stormwater outfall, and at a location which is a short distance downstream of the outfall. Additional sampling will be performed at the stormwater outfall prior to remediation to define better the volume of contaminated material. No additional sampling is necessary at the downstream area since it was determined not to be contaminated above the Site cleanup concentration of 1.3 ppm. At the I -90 Pond, samples were collected to a depth of 3 feet. However, EPA does not plan to collect deeper samples in the pond since the deeper sediments are isolated by the pond's top layer of relatively uncontaminated sediment which continues to thicken thereby isolating the deep, more contaminated sediments.

14. COMMENT: If the sediment contamination is down so deep, why dredge it up?

EPA RESPONSE: EPA's selected remedy specifies the removal of surficial and deeper sediments at the Mercury Refining stormwater outfall which discharges into the Unnamed Tributary of the Patroon Creek. Elevated levels of mercury exist at or near the surface at the outfall. Mercury was detected in the sediments at the outfall at 38 ppm at a depth of 2 to 4 inches and 29 ppm at a depth of 4 to 6 inches. Shallow contamination is a source of contamination to ecological receptors downstream during periods of high water flow. During these periods, the rate of surface water flow increases which in turn erodes areas of contaminated sediments and carries them downstream.

Regarding the sediments of the I-90 Pond, EPA performed an analysis of the potential for the erosion of the relatively uncontaminated surface layer and resuspension of the deeper, more contaminated sediments during flooding events such as a 100-year storm. The analysis indicated that sediments are unlikely to become resuspended during a major storm event due to the critical water velocity and shear stresses which would be induced by such a storm. Also, the top layer of sediment in the Pond continues to thicken so that the possibility of contaminated sediment migrating downstream of the Pond is unlikely. Therefore, the deeper sediments in the Pond will not be removed. Also, as

stated in the description of the selected remedy, the fish, surface water, and sediments in Patroon Creek, the Unnamed Tributary, and the I-90 Pond will be sampled to assess any future impacts on the biota on an annual basis for five years. Sampling beyond the first five years will be based on the results of the initial sampling rounds which will be reported within the first five-year review of the Site. Also, if conditions should change with regard to the I-90 Pond dam (i.e., the dam is repaired, removed, or if it should fail), EPA will evaluate the potential impact of any significant releases and, if necessary, take or require response actions to mitigate their potential impact.

15. COMMENT: Since mercury doesn't normally leach into water and since the I-90 Pond sediments are above the cleanup criteria for sediment and the concentration of mercury in the pond's surface water is low, can EPA also assume that the Site soils will never impact the groundwater?

EPA RESPONSE: The deeper soils at the Site in Area E are heavily contaminated. The levels are so high that mercury has leached from the soil into the groundwater. Therefore, EPA cannot assume that the soils will never impact the groundwater. The soils in Area E will be remediated.

16. COMMENT: EPA's Proposed Plan follows the completion of the Remedial RI in February 2003 and issuance of an amended FS in March 2008, which was prepared with admitted data deficiencies. The data compiled for the RI are insufficient to support the remedial alternative identified by EPA in the Proposed Plan. This pattern was repeated with EPA's initial selection of a preferred remedy in 2006. By failing to collect sufficient data to support EPA's preferred remedy, and by failing to reopen the RI to allow for additional data collection to support its preferred remedy, EPA has "short-circuited" the FS process in a manner which is inconsistent with the NCP.

EPA RESPONSE: Contrary to the commentor's assertion, the FS that was issued by EPA in March 2008 was not an amended FS, nor had EPA selected a preferred remedy in 2006. The commentor also asserts "admitted deficiencies," but EPA is not aware of any such admissions nor does the commentor specifically identify them. The commentor may have inadvertently seen an incomplete, working draft FS in 2006. However, that draft was not finalized until 2008 and no remedial decision was made prior to the issuance of the Proposed Plan. EPA does not believe that the information generated by the RI was insufficient to proceed to the FS. Section 300.430 of the NCP, states that the purpose of a Superfund remedial investigation is to collect enough data to characterize the site and to evaluate potential remedial alternatives. The RI sufficiently characterized the nature and extent of contamination at the Site which has allowed EPA to identify mercury and methyl mercury as the contaminants of concern. This information also has allowed for a complete assessment of human health and ecological risk pathways so that all Site risks have been identified. Data on the nature and extent of contamination were sufficient for EPA to perform a feasibility study which identified and screened all potential alternatives for the contaminated media. EPA therefore disagrees that the RI is incomplete.

THE PREFERRED REMEDY

17. COMMENT: Did EPA perform an analysis of how much it would cost to completely excavate the site?

EPA RESPONSE: The FS evaluated excavation as a potential alternative, but it did not pass the NCP's screening criteria for remedial alternatives. The FS found that excavation of the entire Site was not feasible because of the proximity to the railroad tracks and the depth of the contamination. The contamination in Area E is approximately 50 to 60 feet below ground surface and shoring to these depths would be infeasible. Excavation was screened out for deeper soils due to the high cost of implementation and possibly impracticability, but not for the shallower, more accessible soils.

18. COMMENT: How much soil will be excavated?

EPA RESPONSE: Based on the results of the RI/FS, approximately 2,270 cubic yards of soil will be excavated and disposed of off-Site and approximately 14,400 cubic yards will be treated in situ on-Site. In order to delineate the actual excavation and treatment areas, additional samples will be collected during the remedial design phase. The actual excavation and treatment areas may be larger or smaller than estimated during the RI/FS, but the cleanup criteria will remain the same. In addition, sampling will be performed after the remedial action is completed to confirm that the remedial goals are met.

19. COMMENT: Is EPA going to excavate any soil above 5.7 parts per million at the Diamond W. Property?

EPA RESPONSE: Yes. Figure 4-1 of the ROD shows the approximate area to be excavated at the Diamond W. Property.

20. COMMENT: Why can't EPA just place a deed restriction that says the Site can't be developed?

EPA RESPONSE: According to Section 121(b) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. §9621(b), and Section 300.430 (a)(1)(iii)of the NCP, EPA is expected to use treatment to address the Principle Threat Wastes at a site. Section 40 CFR 300.430(a)(1) (iii)(D) of the NCP states that institutional controls should not be preferred over an active response measure. Passive controls, such as institutional controls, may be used in combination with an active response action but they can not replace them. In the case of EPA's selected remedy, institutional controls will be used in combination with solidification/stabilization and excavation, to prevent exposure to soils which may not be treated or removed from the Site, to ensure that the Site remains industrial, to protect the mass of solidified soil, to prevent the disturbance of the existing clay cap and to prevent anyone from drinking contaminated groundwater at the Site.

21. COMMENT: How long will the stabilized soil remain stabilized?

EPA RESPONSE: Stabilization is a permanent treatment technology that has been used on a number of contaminated sites in New York as well as for stabilizing nuclear waste, mine waste, and other metallic contaminants. Stabilization/solidification results in an irreversible change in the mobility of the contaminant. Laboratory tests have simulated the long-term stresses associated with weathering. Long-term monitoring at other sites has confirmed that the technology can be effective. EPA and the New York State Department of Environmental Conservation are confident that, by using the proper binding agents, stabilization/stabilization will be an effective long-term remedy for Site soils. Long-term monitoring along with inspection and maintenance of engineering and institutional controls will help to ensure that future releases do not occur. As noted below in the response to Comment 33, a pilot study of this technology will be performed. EPA expects that the study will, in part, confirm the effectiveness of solidification/stabilization treatment agents in stabilizing the mercury contamination.

22. COMMENT: Is the sediment at the MERECO outfall the only sediment that will be excavated?

EPA RESPONSE: Yes.

23. COMMENT: When does EPA expect the remedial action to start?

EPA RESPONSE: EPA expects to start the remedial action (actual construction) in approximately 2 years. Prior to construction,, EPA will contact the major potentially responsible parties (PRPs) for the Site to negotiate a consent decree for their performance of the remedial design and remedial action and payment of EPA's past costs. If EPA and the major PRPs reach a settlement, the consent decree is then lodged with the Court and published for public comment. After the settlement becomes effective, the PRPs would prepare the remedial design which must be approved by EPA. If EPA cannot negotiate a consent decree, there are other enforcement options available to EPA including unilateral issuance of an administrative order and/or performance of the remedy followed by a cost recovery action.

24. COMMENT: Has any of the excavation work been done yet?

EPA RESPONSE: No excavation work has been performed in the areas targeted for excavation in the remedy. However, as discussed in the Proposed Plan and the RI/FS, some areas on the MERECO property were excavated in 1985.

25. COMMENT: Will the remedial action occupy a large area of the Allied Building Products property.

EPA RESPONSE: The selected remedy will be implemented so as to minimize the impact on Allied Building Products' operations. The area to be remediated on the

Allied Property encompasses in an area of approximately 26,000 square feet. To the extent possible, all remedial work at the Allied Property will be limited to this area.

26. COMMENT: EPA has not adequately correlated the Site's risk to human health and the environment to an appropriate alternative. EPA's preferred remedy is overly aggressive for a low-risk site. Why doesn't EPA select Alternative 2, which is cheaper, requires no disturbance, but monitors what's already in place?

EPA RESPONSE: Solidification and stabilization of contaminated soil and groundwater and excavation of lesser contaminated soils, which is the selected remedy for the Site, will be protective of human health and the environment, and will comply with applicable or relevant and appropriate requirements (ARARs), To-Be-Considered (TBCs) and other guidance. The selected remedy was evaluated against each of the NCP's nine criteria and offers a permanent solution to address the Site contamination. Alternative S2 was not selected since it would not address the mercury contamination in the soils below the existing concrete/asphalt cap or the plume of dissolved mercury in the aquifer. Therefore, the capping alternative would not be as protective to construction workers who may, in the future, come into contact with the contaminated soil or anyone who may consume the contaminated groundwater on-site.

27. COMMENT: EPA's Proposed Plan contains poorly defined remedial action objectives (RAOs). EPA should provide a more detailed description of the RAOs.

EPA RESPONSE: Consistent with EPA policy, the FS, which is part of the Administrative Record for the Site, provides a description of the RAOs for the Site. The FS derived the RAOs from a review of existing federal and New York State regulations, and guidance which apply to mercury in groundwater, soil and sediments. During the FS, EPA compared the Site data to New York State soil cleanup objectives. Consistent with EPA policy, the Proposed Plan, which is based on the FS, identifies the RAOs.

28. COMMENT: The RAOs identified in the Proposed Plan could be attained by selecting Alternative S-2 (repair and maintenance of the existing caps on the Site) as the preferred remedy.

EPA RESPONSE: As indicated in the Proposed Plan and above, the capping alternative would not completely address the RAOs for soil or groundwater nor would it address the Principle Threat Wastes in Area E of the Site. Repairing and maintaining the existing clay and asphalt caps would not effectively prevent future exposure to construction workers who could be exposed to the contaminated soils nor would it effectively prevent future consumption of contaminated groundwater. According to Section 300.430 (a)(1)(iii) of the NCP, EPA expects to use treatment as the means of addressing principle threats posed by the Site. The capping alternative also would not address the contaminated groundwater, which is classified as a 'Class GA' water body by New York State regulations at 6 NYCRR Part 701, as a potable source of drinking water.

29. COMMENT: Unacceptable human exposure does not exist at the Site. The Site is in active use and any hypothetical future risk could be controlled through the application of engineering and institutional controls. Also, New York State's Brownfield Cleanup Program specifies that the top one foot of exposed soil should not exceed the Site background values for the contaminants of concern so that it is not necessary to remove or otherwise treat soil containing mercury at concentrations which are beneath structures or capped areas or from depths greater that one foot below the ground surface to provide for industrial use of the Site.

EPA RESPONSE: Section 300.430(d)(2)(v) of the NCP requires that the remedial investigation evaluate "actual and potential exposure pathways." EPA has determined that unacceptable risk exists for the Site. In other words, the risks exceed the thresholds in the NCP. Future Site redevelopment could involve on-Site construction work below the top one foot of soil and also involve groundwater use. Both are potential exposure pathways, which would pose significant risks to construction workers or to anyone who would consume the groundwater from Area E. Application of only containment-type engineering and/or institutional controls at the Site would also not meet the preference for treatment under the Superfund program.

New York State Brownfield regulations do not apply to Superfund sites which are listed on the National Priorities List (NPL) and therefore cannot be applied to the Mercury Refining Site. However, approximately the top one foot of soils in Areas A, B, C and D of the Site does exceed the Site cleanup level for soil of 5.7 ppm and will be excavated. The actual depth of the contaminated soil will be determined by further sampling during the remedial design. This cleanup level has been established using the NYSDEC Part 375 soil cleanup objectives to be protective of human receptors at sites which are zoned for industrial use.

30. COMMENT: EPA's preferred remedy presents short-term risks to human health and the environment. The preferred remedy involves excavation, retorting and relocation of mercury-contaminated soils that do not currently present a risk to human health and the environment. Excavated soil will present an unacceptable short-term risk to humans.

EPA RESPONSE: As indicated in Section 4.2.3.5 of the FS, implementation of the selected remedy for soil and groundwater (S-3 solidification with soil excavation and institutional controls) would be performed without significant risk to the community. The Site includes private properties which are surrounded by a fence. A Site Health and Safety Plan will be developed to address any potential short-term hazards such as low-level generation of fugitive dust or contaminant emissions which may occur during construction. Operational controls, along with emissions monitoring for relevant contaminants during construction work, will be established to minimize these impacts. The Health and Safety Plan will also require Site workers to wear appropriate personal protective equipment (PPE) to minimize exposure to contamination. Therefore, any short-term risks during implementation of the remedy are expected to be minimal and can be mitigated. EPA disagrees with the commentor's assertion that mercury-contaminated

soils present an unacceptable short-term risk to human health and the environment under the Superfund Program.

31. COMMENT: The NCP requires that the FS be correlated to the achievement of the RAOs, be cost-effective, and that it employ institutional controls where appropriate. To ensure that the remedy is responsive to these requirements, EPA should reopen the RI to allow for collection of a complete data set and revisit the FS to incorporate the new data.

EPA RESPONSE: Under the Superfund program, an FS involves an analysis of numerous factors in addition to cost-effectiveness and the appropriateness of institutional controls. That analysis was done for this Site. The data collected during the RI were sufficient for EPA to perform both the human health and ecological risk assessments and to identify and screen all potential remedial alternatives in the FS. Reopening of the RI the FS or the RI/FS reports is unnecessary, since they support the remedy selected for the Site.

32. COMMENT: The application of solidification and stabilization to the mass of mercury contaminated soil and groundwater will not restore the aquifer. The process will simply make the aquifer less permeable.

EPA RESPONSE: Traditional methods of aquifer restoration such as pump and treat or air sparging would not be effective due to mercury's strong tendency to bind to saturated and unsaturated soil particles. As mentioned above in the response to Comment 12, this tendency makes in situ removal using traditional methods costly and inefficient. Solidification and stabilization will address the Principle Threat Wastes in Area E of the Site. Area E poses significant future risks to construction workers and to anyone who may consume the mercury-contaminated groundwater. Implementing the remedy will eliminate the potential for exposure to the area of contaminated groundwater. While solidification/stabilization will make Area E impermeable, the groundwater will flow around the solidified mass. Any groundwater which is not immediately treated will be restored through the natural processes of dispersion and dilution.

33. COMMENT: The complex behavior of mercury makes it a challenging contaminant to treat by solidification/stabilization. Factors which can impede the effectiveness of solidification/stabilization (SS) include: incomplete mixing, high moisture content, particle size, pH and redox potential and material inconsistencies.

EPA RESPONSE: EPA acknowledges that the complex behavior of mercury makes it a challenging contaminant to treat and many factors can affect the effectiveness of the treatment. However, the USEPA report entitled "Treatment Technologies for Mercury in Soil, Waste and Water" (USEPA, 2007), which the commentor cites, recommends solidification/stabilization for treating mercury contaminated soil and indicates that SS is the most often used treatment technology for mercury-contaminated soil and wastes. More importantly, the Mercury Refining Company performed two

laboratory-scale treatability studies using Site soils demonstrating that SS is a viable treatment technology for the mercury-contaminated soil at this Site.

Because the factors cited by the commentor can impede the effectiveness of SS, the performance of a pilot-scale treatability study will be necessary to obtain the proper formulation of SS reagent(s) and design parameters for in-situ treatment at the Site. EPA will require that the design and performance of this treatability study be under conditions that will be representative of actual Site conditions. Information obtained from this treatability study will be used to refine the design and the cost estimate of the full-scale remedy.

34. COMMENT: The treatability tests performed for the MERECO Site do not represent the actual conditions under which SS will be applied. Importantly, the tests did not demonstrate the ability of the technology to treat contamination to a depth of 66 feet. A site-specific treatability study will be needed to simulate conditions under which SS would be applied at the Site including groundwater chemistry, soil moisture and physical properties of the slurry mixes. Information from such a study could result in material increases in the cost of the remedy.

EPA RESPONSE: Treatability tests performed by Kiber (1999a) at MERECO 's request were able to stabilize soil collected from the Site with mercury contamination of 1,430 mg/kg to below the Resource Conservation and Recovery Act Toxicity Characteristic Leaching Procedure limit of 0.2 mg/L (40 CFR 261). The existing soil sample data indicates that the majority of soil at the Site contains concentrations of mercury below 1,430 mg/kg, although concentrations up to 38,800 mg/kg and elemental mercury have been observed in one borehole "hot spot." It is assumed that soils at concentrations higher than 1,430 mg/kg would also achieve a TCLP result of less than 0.2 mg/L through physical encapsulation of the contaminants which reduces the solubility and therefore the leachability of mercury. The treatability tests demonstrated that SS is a viable treatment technology for the soil on-Site. Contamination at a depth of 66 feet may only affect the method of delivering the SS treatment agents, but will not materially affect the technology.

As mentioned in the response to the above comment, pilot testing will be conducted to demonstrate the effectiveness of SS. Treatability testing would be performed using representative contaminated soil samples from the Site in order to optimize the treatment results and to achieve the desired treated waste strength and durability. As mentioned above, SS technology is not limited by the depth of contamination at the Site; solidifying/stabilization agents can be applied to contamination at a depth of 66 feet with the correct equipment.

35. COMMENT: There are no case studies demonstrating the effectiveness of in-situ solidification/stabilization of mercury contamination in the saturated zone.

EPA RESPONSE: Solidification/stabilization has been used at numerous EPA, DOD, and private party sites with mercury contamination. The EPA report, entitled

"Treatment Technologies for Mercury in Soil, Waste and Water" (USEPA, 2007), lists several sites where this technology has been successfully applied. With the correct formulation of treatment reagents and the correct equipment for delivering the reagents to the contaminated soil, this technology should successfully treat contamination to the required depth in the saturated zone. The use of either in-situ augering or grout injection could be used in and around the contaminated area. Grout injection is a technology that has been well proven in the field. The remedial pre-design and design will include engineering controls and testing for the effectiveness of the remedy including a treatability study.

36. COMMENT: Alternative S-3, which uses solidification/stabilization to treat the deeper contaminated groundwater, has the potential to exacerbate groundwater contamination during implementation.

EPA RESPONSE: EPA has included a provision in the remedy to perform a pre-design investigation to fully delineate the extent of contamination prior to implementing the remedy. Techniques to prevent off-site migration of contamination during implementation of the remedy include isolating the area to be treated by first treating the outside perimeter of the contaminated area to create an impermeable vertical barrier and then proceeding with SS treatment towards the center.

37. COMMENT: The existing buildings limit the area to which SS can be applied; mercury will remain adjacent to and beneath the buildings after treatment.

EPA RESPONSE: EPA realizes that there may be contaminated soil underneath the buildings on-Site. However, EPA does not expect that a significant amount of contamination will be inaccessible to treatment. The pre-design investigation will refine the treatment area which will include soil and groundwater that contains dissolved mercury which exceeds the New York Groundwater Quality Standard of 0.7 ppb. During the design, every effort will be made to include treatment of contaminated soil under the buildings. A geotechnical evaluation will be conducted as part of the pre-design to assess the use of angle drilling for the application of SS underneath the building(s). During the remedial investigation of the Site, elemental mercury was observed and high concentrations of mercury were detected in the subsurface soil borings. The highest levels of contamination were observed to occur within a small area along the eastern border of the property. The mercury distribution suggests that contamination in the subsurface was likely the result of spills or discharges in a fairly limited area. In addition, due to its high specific gravity, the major direction of elemental mercury migration in subsurface soils is vertically downward so that most of the contamination should not be underneath the buildings.

38. COMMENT: The need for excavation to 10 feet below the ground surface at Area D is not supported by the data.

EPA RESPONSE: Soil samples from boring SBW-5, which were collected as part of the RI, indicate the presence of mercury-contaminated soil which extends at least

to a depth of 6 to 8 feet. This location will be sampled again as part of the pre-design investigation. The exact depth of excavation for Area D will be based on the pre-design data. The excavated depth of Area C, which surrounds Area D, is assumed to be approximately the top one foot of soil based on historic and more recent sample data. However, the actual depth of contamination in Area C will also be confirmed by pre-design sampling.

39. COMMENT: The cost estimate for Alternative S-3 has a higher degree of uncertainty than for S-2, given the technology limitations and challenges associated with applying SS in the saturated zone to a depth of 66 feet. The unit cost does not reflect: 1) the increased level of effort when SS is applied at depths greater than 40 feet; 2) the fact that the greater depth may require smaller augers which would reduce the production rate; and 3) the fact that the treatability study may indicate that higher quantities of treatment agents may be required. Also, the auger spacing may need to be reduced, the treatment process may spread the groundwater contamination and the RAOs may not be met so that the treatment process may need to be repeated.

EPA RESPONSE: EPA's cost estimate was performed in accordance with standard engineering practices for developing a cost estimate and conforms to EPA's RI/FS guidance. Based on recent solidification/stabilization projects completed in EPA Region 2, EPA believes that the total estimate for the remedy falls within the required accuracy for Superfund remedy estimates of plus 50 percent to minus 30 percent. With regard to the claim that the treatment process may spread the groundwater contamination, as stated above in response to Comment 36, the design will specify engineering controls to prevent the migration or spread of contamination during implementation. An example of such controls for SS implementation may include isolating the area to be treated by first treating the outside perimeter of the contaminated area to create an impermeable vertical barrier and then proceeding with SS treatment towards the center.

40. COMMENT: The cost estimates for all the alternatives increased dramatically from the Draft FS to the Final FS.

EPA RESPONSE: The draft FS, which was never released by EPA, was a working document and, as such, did not contain the final costs estimates, the ultimate cleanup levels, nor did it specify all of the various components for each of the potential remedial alternatives. The final FS accurately reflects the final remedy, the potential alternatives, the final cost estimates as well as the final set of RAOs.

41. COMMENT: Alternative S-3 does not meet Green Remediation criteria compared with Alternative S-2.

EPA RESPONSE: While EPA supports the principles of green remediation, this initiative cannot be used as a selection criterion for a federal Superfund remedy. The only criteria that are used are the nine criteria which are set forth in the NCP for evaluation of potential remedial alternatives for a site.

OPERATION AND MAINTENANCE

42. COMMENT: The Proposed Plan says that the Site will to be reviewed once every five years. Is that for a specific duration or is that indefinite?

EPA RESPONSE: Section 121(c) of CERCLA, 42 U.S.C. §9621(c), requires that a Site be reevaluated no less than every five years whenever hazardous substances remain on-Site at levels that do not allow for unlimited use and unrestricted exposure after completion of a remedial action. This reevaluation is conducted every five years as long as hazardous substances remain on-site and have the potential to present an unacceptable risk to human health and the environment. In the case of the Mercury Refining Site, the hazardous substances will permanently remain on-Site, so five-year reviews will be ongoing. Every five years, the Site will be evaluated to ensure that the remedial action continues to be protective of human health and the environment. The five-year review will evaluate information required by the Site Management Plan including monitoring data for the Unnamed Tributary, the Patroon Creek and the I-90 Pond. If necessary, additional samples will be collected to close any data gaps which may prevent a complete review.

43. COMMENT: The I-90 Pond monitoring program is not justified since EPA has already evaluated the potential for movement of contaminated sediment during a storm event. Annual monitoring for five years, then every five years to 30 years, is more extensive than necessary, to confirm that conditions are stable.

EPA RESPONSE: As indicated in the RI/FS and the Proposed Plan, mercury was found in the deeper sediments of the I-90 Pond at concentrations which were above the RAO of 1.3 ppm. EPA performed an analysis of the potential for erosion of the Pond's relatively uncontaminated surface layer and resuspension of the deeper, more contaminated sediments, during a flooding event such as a 100-year storm. The analysis indicated that sediments are unlikely to become resuspended and move past the I-90 Pond during such an event. However, this analysis is predictive and not based on actual data. Monitoring is necessary to confirm that the contamination remains isolated.

Regarding the commentor's point that the monitoring is excessive, the remedy specifies sampling yearly for five years. Sampling thereafter would be based on a review of the first five years of data. EPA believes that yearly sampling for five years is necessary to establish enough data on which to determine whether the sediments in the I-90 Pond are adequately contained.

ENVIRONMENTAL PROTECTION AGENCY

In the Matter

of

A Public Meeting on the Proposed Plan For

MERCURY REFINING SUPERFUND SITE

TRANSCRIPT OF PROCEEDINGS had at a public meeting held by the Environmental Protection Agency at the Fuller Road Firehouse, 1342 Central Avenue, Colonie, New York on the 22nd day of April, 2008, commencing at approximately 7 p.m.

P R E S I D I N G:

KEVIN LYNCH, Chief of Western New York Remediation Section

THOMAS TACCONE, Project Manager

MICHAEL SIVAK, Risk Assessor

P R O C E E D I N G S

MS. KRISTEN SKOPECK: Good evening.

Thank you for coming to the public meeting in regards to the Mercury Refining Superfund Site.

My name is Kris Skopeck, I am the Public Involvement Coordinator. My card is on the back table. If you have any questions that don't get answered tonight you can e-mail me, call me, and I will make sure that the appropriate person answers the question and I'll get right back to you.

I would like to introduce some of the people that are going to be speaking tonight.

First we have Kevin Lynch. He is the Chief of Western New York Remediation Section for EPA. He is going to be talking tonight about the laws and regulations.

We also have Tom Taccone, he's the Project Manager. He is going to give you the site background and talk about the remedial investigation.

We also have Mike Sivak. He is the Risk Assessor, and he's going to talk about Risk Assessment.

We also have Sharon Kivowitz, she is the Project Attorney.

We have Frank Tsang, he is a contractor

to EPA.

Also, there is Maureen Schuck, she is the Department of Health, Public Health Specialist.

We have Brian Davidson, he is the

Department of Environmental Conservation Project Manager for this site.

So, these are key folks in the room.

With that, now that you know who everyone is, would you go ahead and start Kevin.

MR. LYNCH: Thank you, Kristen.

I am going to give a quick synopsis of the law and our regulations, the rules that we have to use when we go and select a remedy for a site.

The law that we work under is fairly unique because most of what the regulatory agencies do is regulate. It's kind of more of a thou shalt not type of thing then go out, positively go out and do things like clean up the environment.

In fact, up to 1979 EPA had no way to go out there and actively go out and clean up the environment. So, Congress at that time, 1980, passed a Comprehensive Environmental Response, Compensation and Liability Act known as CERCLA, which I had to read it because nobody ever uses the word because it's also known as the Superfund.

What it did is it did create this fund of some 1.8 billion dollars that we can use to address abandoned and hazardous waste sites. That is a lot of money, therefore, it became known as the Superfund. One of the things we found out is that it really isn't a lot of money to tackle problems like this. There are a lot more sites out there than anybody thought there was when they passed the law, and they're also a lot more complicated and a lot more expensive to

clean up.

The law also gave us another way to pay for this, and that is to take an enforcement action. What this is, is the responsible parties for the site, this could be anybody who owned or operated the site, transported materials that got to the site, or generated those materials that ended up at the site, can be liable and responsible to clean up, to do the studies and do the clean up.

Now, they don't have to have broken any laws, they don't have to have broken any regulations. It is just a simple matter of if their materials are part of the problem, they must be part of the solution.

There are two ways we can approach a site to clean it up. One is a removal action, which is a short-term action, sometimes they are called emergency

removals. This is where we can come into a community where if there is a problem, let's say a warehouse is found with leaking drums that are an explosive problem, we can go in and clean up those drums. If we find that people are drinking contaminated water, we can go and give them an alternate water supply.

The other way, for a more permanent solution, is what we call a remedial action. What we are looking at tonight is a remedial action which is a more permanent action is what we want to take.

Now, in order to do this the site has to

go on the National Priorities List. How that happens is the site gets nominated to the EPA, usually by the State, in this instance it was the State Department of Environmental Conservation. They will give us information on the site, and we will take that information and go out and do a little study of our own if we need to. It looks at things like what is at the site, what are the substances at the site, where is it, is it in the water, is it in the air, what's the population around it. We will plug this different information into a mathematical model and it comes up with a number. If it's above a certain number it's eligible for the National Priorities List. If not, then we can't spend the money, usually the states take care

of the sites that don't make it.

Now, this site did make the National Priorities List, and when it does our regulations, which are called the National Contingency Plan, require us to go out and do a study called a remedial investigation and a feasibility study. A remedial investigation is a study to determine what the nature and extent of the contamination is. We want to find out what's out there and where it's going.

How we do that is we go out and do an environmental study. We take samples of the groundwater. We look at the geology. We take samples of the soil, the air, the water in order to determine what contaminants are out in the environment, where are they, and where are they going. Once we discover that, we do a risk assessment

because we want to know what is the problems that these things can cause. If it does cause an unacceptable risk, we do what is called a feasibility study.

A feasibility study is a study of various alternative solutions to the problem. We look at different alternatives and the regulations have nine criteria that we have to use.

One is the overall protection of human health and the environment, which is the most important

one. We are not allowed to select a remedy that is not protective of human health.

We have to comply with ARAR. ARAR stands for Applicable, Relevant and Appropriate Requirements, which basically means if there is environmental laws out there, either federal, state or local regulations and laws, then we have to follow them.

We look at long term effectiveness and permanence. We want to go out there and permanently fix the situation. We don't want to go out there and do something and then every couple of years have to go out there and do it again.

We look at reduction in toxicity, mobility, or volume through treatment. Our preference is to go out there and treat the contaminants, to destroy them, or to immobilize them so they can't move, or reduce them.

We also look at short term

effectiveness. What we want to make sure is what we're doing out there isn't worse than the problem that is out there already. We don't want to expose people to hazards by trying to fix another hazard.

We look at implementability. It has to be something that we can go out there and do. There are a lot of theories, a lot of ways to destroy contaminants, but if you can't actually go out there and do it at the site, it really isn't that good.

Cost is an important element.

State acceptance. We have been working with the Department of Environmental Conservation on this very closely, and they right now support our proposed plan.

The last but not least, is community acceptance. How we determine community acceptance is what we are doing tonight.

What we do is we put together a summary of that investigation, the feasibility studies, into what we call a proposed plan. That proposed plan has what we believe is the best solution.

What we have done is we have put this proposed plan together and we're having the public meeting.

Tom is going to present a summary of the remedial investigation/feasibility study. Michael is going to give a summary of the risk assessment, and Tom is going to do another summary of the feasibility study and present what we think is the best thing to do out there.

What we want then is public comment. We

want anyone who is interested to comment on the plan, tell us what you think of the plan. Any comments that are given

to us today are taken by the stenographer, we will have a record of them.

Also, the public comment period is open until May 30th. We will put up Tom's address, it is also in the proposed plan. Any written comments we will definitely be looking for also.

Tom.

MR. TACCONE: Thank you, Kevin.

I am Tom Taccone. I am the Project Manager for the Mercury Refining Superfund Site.

This evening I would like to provide you with a brief history of the site, summarize EPA's remedial investigation feasibility of the site, summarize the proposed plan, talk about the next steps, and answer any questions.

Mercury Refining began operation in 1955 and continued in operation until 1998. Mercury Refining, also known as MERECO, reclaimed mercury from mercury bearing materials such as batteries, thermometers, and electrical switches. The reclamation process was done using specialized ovens called retorts. The ovens would heat the material, the mercury would boil off and it would be recondensed into a more purified form. Sloppy operations, poor housekeeping, disposal of residual

material on site, and two fires resulted in soil, sediment and groundwater contamination.

In the early 1980s sampling by the New York State Department of Environmental Conservation, that's the DEC, detected high levels of mercury in sediments of an unnamed tributary to the Patroon Creek that flows along the southern edge of the property.

In September 1983 the site was listed on EPA's National Priorities List. At that time the DEC served as the Lead Agency for overseeing the investigation and clean up of the site.

This map shows the location of the site. This is Railroad Avenue. Access to the site is through a driveway that is between Diamond W and Albany Pallet. This is the CSX Railroad. This is the unnamed tributary I mentioned; it flows under the railroad tracks along the southern portion of the property, and joins up with Patroon Creek approximately 1600 feet downstream.

During the 1980's the DEC ordered the company to investigate and clean up the soil on and around the property and the Patroon Creek tributary.

In 1985 MERECO removed 2000 tons of mercury contaminated soil and 400 tons of PCB contaminated soil under a consent decree between the company and New

York State. That excavated area is this area right here. It was backfilled with clean fill and a clay cap was placed over this area. In this area right here an asphalt

concrete cap was placed.

In this area here Mercury Refining in the 1950s through 1994 had operated their retorts, and the operations at that time resulted in some fairly significant contamination in this area.

Then in 1994 the company installed new retorts in this building right here, the Phase I building. The incoming mercury bearing material to be processed was stored in the container storage building.

Then in 1996 the DEC issued MERECO a Hazardous Waste Corrective Action Permit. This permit regulated the storage of the incoming material and required Mercury Refining to complete the investigation and clean up work started in the previous directives.

In November 1999, after unsuccessfully working with Mercury Refining to comply with the permit and directive, the DEC asked EPA to assume the role as Lead Agency for overseeing investigation and clean up.

In the year 2000 EPA initiated a remedial investigation/feasibility study that Kevin just mentioned, and the study, also called the RI/FS is

conducted by the EPA Superfund program to determine the nature and extent of contamination at a site and to identify potential alternatives for remediating the contamination.

The remedial investigation involves soil and groundwater samples at the Mercury Refining property

and it's adjoining property. The investigation also involved the collection of water and sediment samples at Rensselaer Lake, which is an upstream water body of the creek, and Inga's Pond, which is an upstream water body of the tributary. Samples were also taken along the tributary and the creek and down to another water body called the I-90 Pond. The I-90 Pond is about a mile from the site. Water and sediment samples were also collected at the pond.

The remedial investigation also found mercury in the surface soil at Mercury Refining at concentrations up to 43 parts per million; at the Diamond W property, located here, the concentration was 15 and a half parts per million; the Albany Pallet property, located here, the concentration is up to 27 parts per million; and at the Allied Building Products property concentrations of 33 parts per million.

Subsurface soil contamination was found in this egg shaped area right here. This is where all the

old retorts were located. In that area pure mercury exists in bead form and high concentrations, almost up to 39,000 parts per million exist.

A groundwater monitoring well was located approximately in that area right there. Concentrations of mercury were detected from 11 to 22 parts per billion. That contamination is estimated to extend to the edge of that egg shaped area.

Sediment samples were also collected. The Mercury Refining property has a stormwater collection

system that discharges into the tributary, and in this area right here sediment contamination was detected at concentrations up to 38 parts per million.

The pond was also sampled and elevated concentrations were found in the pond. Surface sediment the concentration was from non-detect to 1.2 parts per million. Deeper sediments were more contaminated with concentrations up to 2.6 parts per million. Mercury was not detected above 1 part per million in the rest of the creek or the tributary.

The remedial investigation data was also used to form risk assessment of human health and ecological receptors.

Now, Mr. Michael Sivak, a Risk Assessor

in EPA's Region 2 Office, will present the findings of the human health and the ecological assessment.

MR. SIVAK: The Superfund law does require EPA to conduct risk assessments for both human health and the environment, that's part of our mandate.

What is risk assessment? The way I like to explain risk assessment is that the purpose of it is to answer two primary questions.

Let's take a step back. We already talked about the remedial investigation. We learned the nature and the extent of the contamination. So we know what kind of chemicals are out there and where they are located. So, based on that the risk assessment tries to

answer two questions.

The first is what are the risks right now. If people are exposed to this contamination where it exists, the way the land is developed and the way the groundwater is being used, what are the risks right now to human health and to receptors in the environment, and then in the future if no remedial action is taken. If we were to just walk away from the site and not do anything what would be the risk in the future to human health and the environment if no remedial action is taken.

The way that we answer those two

questions is through this four step risk assessment process. Now, the process differs a little bit from the human health side to the ecological side, but basically it is a similar four step process: What chemicals have been identified, who or what will be exposed now and in the future, what types of health effects are associated with these chemicals, and what are the potential risks.

We look at the information from the first three questions and we run it through some models and render some calculations and we identify what are the potential risks associated with these exposures.

The Superfund law actually contains what are considered acceptable levels of risks under the law. So, we look at these potential risks and we compare them to what the law says are acceptable and allowable.

So, in the human health risk assessment we went through all of that process. We looked at how the

site is currently used. It is currently a commercial operating facility. We looked at what future uses of the site and what future use of the groundwater might be, and what we determined was that the primary chemical that we are concerned with at the site is mercury. We didn't see much of anything else in our remedial investigation that is associated with the site. So, basically, it's all mercury

all the time.

What we came up with is that in the future if we don't do anything, if we just walk away from the site, future exposure to contaminated soils, primarily by construction workers because they are going to be digging in the soil, they are going to be exposed to the soils that right now are covered under pavement, things like that, but those construction workers they are going to be exposed to that. Those types of risk result in unacceptable non-cancer risks.

Tom talked a little bit as well about the groundwater. There is one well, and he'll probably get into that a little bit later, but there is one well, that MW-05D area, which is the one located in the former retort area between the two buildings, where we did see some very localized, very limited groundwater contamination above the federal drinking water standards and the state drinking water standards, and in the future if that groundwater is used as a drinking water source, then that would result in unacceptable risks.

It is important for everybody in this room to know that right now your drinking water is fine. You are getting your drinking water from public water supplies, you are not getting your drinking water from

anything that is associated with this site. This is in the future. Since the State classifies the groundwater as a potable water supply, we have to evaluate that. That's a law, we have to evaluate that. So, that's how we come up with the second scenario. It is very important that you all know that your drinking water right now is absolutely fine.

As far as the cancer risk goes, EPA doesn't evaluate mercury as a carcinogen. So, we don't really have any unacceptable carcinogenic risk.

Now, for the ecological component of the risk assessment for this site, Tom talked about the samples that we collected from some of the surface water bodies. We looked at the unnamed tributary. We looked at the I-90 Pond. We looked at Patroon Creek. We looked at several different areas. What we basically found as a result of the ecological risk assessment is that there is a stormwater outfall where we did have some elevated levels of mercury in the sediment there. Then in the I-90 Pond which we saw is very far downstream, about a mile downstream from the facility, we did detect some levels of mercury in the sediment, but we also found that those mercury contaminated sediments are buried. They are buried below about two feet of clean sediment. So, just through

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natural sedimentation and natural deposition, the mercury contaminated sediment has been buried. It's not really bio-accessible.

So, those were the results of the risk assessment, and that information has led up into the next step which is the feasibility study where we look at a variety of alternatives that would address these risks that we just talked about, the human health risk from exposure to contamination in the deep soils and that groundwater area, and then these ecological type risks that we just discussed.

MR. TACCONE: Treatability studies were performed on two types of technologies for this site: electrochemical treatment, the EPA funded a study, it was conducted over a two year period, it was conducted by Mississippi State University, and it found that electrochemical technology could treat the contaminated soil and groundwater. It was done in a lab setting. The soil with an average of almost 3300 parts per million mercury could be treated to a level just below 50.

The other type of technology is solidification/stabilization. Two studies were performed by MERECO under DEC oversight. The studies also found that this type of technology could treat heavily contaminated

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soil to a level that is below .2 parts per million.

The remedial investigation data was also used to compile and perform a feasibility study. This study is performed to identify potential alternatives for addressing the contamination. Kevin spoke about this a little bit, but I will also review with you the criteria that the feasibility uses for evaluating the alternatives.

There are nine of them.

The alternative's ability to protect human health and the environment, to meet regulatory requirements and standards, how effective it is in the long term, how permanent the alternative is, the alternative's ability to reduce toxicity, mobility and volume through some type of treatment, how effective it is in the short term, how implementable it is both administratively and technically, it's cost, whether there is State acceptance, and whether there is community acceptance.

The feasibility study also identified remedial action objectives, and these objectives are set for each type of media that is contaminated; by media, I mean soil, groundwater, or sediment.

For soil, a number of 5.7 has been set. Soil above 5.7 is considered a threat to people.

Groundwater, the level is .7 parts per

billion. This is based on New York DEC's water quality program for protecting groundwater.

And finally, sediment, the level is 1.3 parts per million, levels above that are considered to have a significant effect on aquatic life.

The 5.7 is going to be applied to Areas A, B, C and E, that's for the soil.

The groundwater is in this area here, and we are going to be using .7 parts per billion.

The contaminated sediment at the outfall, 1.3 parts per million.

The feasibility study identified four alternatives for contaminated soil and groundwater and two for sediment.

The alternatives for soil and groundwater are shown on this slide.

The first is no action. EPA is always required to have a no action alternative. This serves as a baseline upon which to compare the other alternatives.

The second alternative is to maintain and repair the caps that are on the property, the clay and the asphalt concrete cap would be repaired and maintained. Also, this alternative would involve the excavation of contaminated soil from Areas A through D. Also,

institutional controls would be imposed to protect the caps to make sure that they remain intact, to prevent the use of groundwater, and to maintain the zoning of Mercury Refining and it's adjoining properties as industrial, to monitor the groundwater, and this alternative would take approximately one year to implement.

The third alternative is to solidify the contaminated soil and groundwater in Area E, to excavate

the surface soil in Areas A through D, to impose the institutional controls as I just discussed, to monitor the groundwater, and this alternative would also take approximately one year.

The fourth alternative is to use that electrochemical treatment that I mentioned before that we did a treatability study on, electrokinetics would be applied to Area E, contaminated soil from Areas A through D would be removed, the institutional controls again, the same institutional controls would be applied, the groundwater would be monitored, and this alternative would take approximately three years to implement.

The cost for these alternatives are presented in this slide.

The no action alternative, of course, would involve no up-front costs, or costs to maintain and

operate the remedy, however, there is a cost of $70,000 associated with no action, and this is to review the site every five years. Because you are leaving contamination behind, the law requires that the site be evaluated for any type of threat it still might present.

The second alternative, excavation and capping, this alternative would involve a 2.9 million dollar cost to excavate the soil and repair the caps; 1.2 million dollars would be required to monitor the site for the institutional controls and maintain the caps, for a total cost of 4.1 million.

The third alternative is excavation with

solidification, 9.2 million would be required to implement this alternative to excavate the soil and solidify the soil; 1.1 million dollars to monitor the site, the institutional controls and to maintain the cap, for a total cost of 10.3 million.

The last alternative using electrokinetics with excavation involves a capital cost of 20.8 million in order to take the soil and apply electrokinetics; operational maintenance cost is 1.1 million, for a total cost of 21.9 million dollars.

A separate feasibility study analysis was also done for the sediment.

Again, we have no action which serves as our baseline.

The other alternative is to remove the sediment from the outfall. In addition to removing the sediment, the surface water, fish tissue and sediment of the unnamed tributary and the pond would be monitored, and this alternative would take approximately three months to implement. The cost of the second alternative as presented here, again, we have no action $70,000 to review the site every five years since you are leaving contamination behind. The sediment removal would be about $360,000 to remove the sediment, another $360,000 would be required to monitor the pond and the tributary for fish tissue, water and sediment, for a total cost of $780,000.

The EPA's proposed plan proposes

alternative three, and that is to excavate the soil from Areas A through D, to solidify the soil in Area E, the excavated area would be backfilled, Area E would be solidified, institutional controls would be placed on the cap to make sure it remains intact, to prevent the use of groundwater, to maintain the property zoning at Mercury Refining and it's adjoining properties as industrial.

Then the sediment, we are proposing sediment removal. So, the sediment at the outfall would be

removed and the water, the fish, and the sediment of the tributary and pond would be monitored.

The next step for the site. The proposed plan was public noticed in the Albany Times Union on March 30th, and the public comment period was for 30 days, until April 30th. However, EPA has received a request for another 30 days, so that the public comment period is now until May 30th. All comments should be sent to me, I will show my address in a moment.

Comments on the plan. EPA will accept the comments, will review them, and prepare a written response to the comments.

EPA will then make a final decision on the alternative which then becomes the remedy, the final remedy for the site. The remedy would then be designed, it would be implemented, constructed, the remedy would then be monitored to see how effective it is. Once it is determined to be effective, the site would be removed from NPL.

Questions?

Yes.

MS. MARY RYAN: Can you identify the areas that that excavation is going to take place?

MR. TACCONE: Sure.

State your name, please?

MS. RYAN: I'm Mary Ryan.

MR. TACCONE: The areas that would be excavated include Areas A - -

MS. RYAN: What is Area A, where is it?

MR. TACCONE: This whole area, the crosshatched area.

MS. RYAN: Where is Central Avenue and where are the railroad tracks?

MR. TACCONE: The railroad tracks aren't here.

Central Avenue is up here.

MS. RYAN: In other words, it's between Central and Railroad?

MR. TACCONE: This is Railroad Avenue right up here. We were just looking at the crosshatched area over here, that's Area A.

MS. RYAN: Are there any businesses on that that we could identify?

MR. TACCONE: This is Diamond W, that's a business.

That's Albany Pallet. It was a business

at one time; no one is operating right there.

This is Mercury Refining, it's a

business.

The name is changed to Albany Building & Supply - - excuse me, Allied Building & Supply.

This is CSX railroad here.

MS. RYAN: And how contaminated is Rensselaer Lake?

MR. TACCONE: Rensselaer, there was some low levels of mercury found there, but it wasn't at a level that would warrant any kind of clean up or action.

MS. CLAUDIA KIRBY: Claudia Kirby.

What is the level for a lake like that, how many parts per million would have to be found in Rensselaer Lake or Inga's Pond?

MR. TACCONE: Well, for this site if it was in the sediment it would have to be above 1.3 parts per million, and it wasn't at that level.

Rensselaer Lake is upstream of the property.

MR. SIVAK: The samples we collected at Rensselaer Lake were collected as kind of a background. You know, this is an industrial area, and quite honestly, we have mercury pretty much everywhere on the planet from general use. So, when we are investigating things like mercury at a site we really do have to go and sort of find

an upgradient location. What that means is we have to find an area that has not been effected by our site so we can sort of compare everything, and that's why we went to Rensselaer Lake. If we found something at Rensselaer Lake, then that's important for us because that tells us - - it's a comparison for our downgradient samples that we collect.

MS. KIRBY: So you're saying actually that the mercury found in Rensselaer Lake has no relationship whatsoever to this?

MR. SIVAK: Correct.

MR. MIKE HERCHENRODER: Mike Herchenroder.

Now, you say there is no relation in being upstream. What about the fish and wildlife that gets contaminated downstream and goes upstream? You're not taking into consideration the migration of wildlife to add to that?

MR. SIVAK: That's one of the complicating factors we always have when we are looking at ecological risk assessment is that they don't stay in one area, the wildlife component, they have a much larger range, and we just don't have as much information about where they might be exposed as we do when we are doing a human health risk assessment.

One of the reasons why when we do the ecological risk assessment we look at our sediments, but we also oftentimes look at fish tissue and we look at things

like that. For example, if we do collect fish tissue at sites and we find it has mercury levels in the fish tissue, we don't know if that comes from the downgradient portion or the upgradient portion. That's why we have to look at the sediment. That's why our remedy is to remediate the sediment at the outfall. That's why we looked at the sediment in the I-90 Pond because that's important, that is likely to be affected by our site. The sediment contamination that we found in the I-90 Pond is not really in the bio-available zone, and that's why our preferred remedy is monitoring of those sediments to insure that they stay in that area.

MR. HERCHENRODER: Now, what you're calling the I-90 Pond, you're talking about the Three Mile Waterworks?

MR. TACCONE: Yes, I think that's the same water body.

MR. HERCHENRODER: Because there is a lot of contamination of numerous things in that pond, which I'm sure you're aware of. You've got the '53 fallout, you've got the NL Industries, and you've got the mercury

situation here.

There has been two previous studies and there is a high rate of cancer in that area within a five mile radius. The first two was lost politically. The NL Industries is regrouping, there is a group there that is trying to bring everything back and get all the facts with the cancer study.

MR. LYNCH: When we did the study on Mercury Refining we took samples in the pond again. When we do our studies what we look at is what is there today; what is in the surface, what is in the bio-available zone where fish can take, and that's what we use to do the eco risk assessment also.

MR. HERCHENRODER: Well, you know, all that sediment just east of Central Avenue, that is more recent, where if you get down into the pond itself, that hasn't been filled in by all this development, et cetera, that is going on.

MR. LYNCH: Actually, the sediments in the surface of the pond are actually cleaner than the sediments that are deep in the pond because it is an area where because the dam is there things will settle out, but the sediment that is there now is actually cleaner than the deeper sediments.

One of the things we looked at when we did the study is the question of what happens in a storm, can these things be exposed if things scour out. We did a model and we looked at a hundred year storm and determined that it shouldn't scour out those things, so the deeper contamination should not become exposed and wouldn't be available to the biota. Since it was just a model, that's the reason why we are going back and every year going out and sampling the fish, and the sediment, and the water, to make sure the model is right.

MR. HERCHENRODER: Have you tested any of the other animals in the area, muskrats?

MR. TACCONE: I think we modeled - - We took insect samples. We did a food chain model to go up to birds, that was done. We didn't physically sample tissue from birds, or muskrats, or something like that.

Yes.

MR. TOM ELLIS: My name is Tom Ellis. I live in Albany.

Did the EPA do any analysis of how much it would cost to completely excavate the site?

MR. TACCONE: We evaluated that alternative, but it didn't pass our screening criteria. It proved, I think, infeasible because of the proximity to the

railroad tracks. The contamination in that Area E I mentioned goes down 50 to 60 feet, and to get down that far would be very expensive to shore up the ground. It was screened out. Shallow excavation was not. We are using that for the shallow soils.

MR. ELLIS: I've got a couple of other questions.

How does EPA weigh the various criteria? Is there like a graph or a chart where you show how each of those criteria are weighed?

MR. TACCONE: We don't have a scoring system. It's evaluated sort of qualitatively, one against the other using the nine criteria that I described.

MR. LYNCH: That is contained in the

feasibility study in the entire study. The proposed plan is just a summary of it.

MR. ELLIS: Where is the feasibility study?

MR. TACCONE: It's at the Sanford Library.

MR. ELLIS: Who is going to pay for the clean up?

MR. TACCONE: The companies that - - Many companies sent material to Mercury Refining, in fact,

thousands, and we have kind of massaged that list down to two groups, the majors and smaller parties called diminimous parties that sent less than one percent of the weight of all the parties that we could locate.

MS. SHARON KIVOWITZ: That was also above 200 pounds.

MR. TACCONE: Less than 200 pounds they are exempt by law. The diminimous parties will be offered soon a settlement offer where they will pay for, I think, 30 percent of our estimated cost of ten million dollars. The majors, about 15 companies, will then be asked to implement the clean up.

Will they have access to the money the diminimous parties send?

MS. KIVOWITZ: Whatever money we collect in the diminimous settlements, as well as money that we collected in an ability to pay settlement that we have

already finalized with the Mercury Refining company and the owner/operator of the company, that money went into a special account in the Superfund that is designated for this site. Whatever money we collect from the diminimous settlements will also go into that special account. Some of that will be available to the major parties to help with their clean up, and some will be paid back to EPA to pay

for our capital costs.

What will happen is EPA is about to go out with a revised settlement offer. We did do a settlement offer with diminimous parties back in 2006, I would say, and we received a number of comments on that offer, and we have been dealing with those comments and working on the proposed plan, and we are now going to be revising that diminimous settlement and going out with a new settlement very shortly. Hopefully, we will settle with a number of those parties, it's about 380 parties. Hopefully, we will settle with those, we will collect some money.

After the Record of Decision, which Tom had mentioned earlier, after the Record of Decision is issued, we will then go back to those 14 or 15 major parties and ask them to sign a consent decree with EPA that would require them to do the remedial design, the remedial action, pay for EPA's past costs and EPA's oversight costs. We will start those negotiations after the Record of Decision has been issued. So, hopefully, it will be paid for.

MR. KEVIN YOUNG: Kevin Young.

How much soil are you going to excavate, do you know, volume-wise?

MR. TACCONE: I think it's 16,000 cubic feet; is that right, Frank?

This is Frank Tsang, he's with CDM, the contractor with EPA.

MR. TSANG: We have a summary. If it's 10 cubic yards, for excavation/disposal it's about 1800. Then for treatment about 14,000.

MR. LYNCH: One of the things we will be doing in the design phase is we will be going out and taking more samples to determine exactly the areas that will be excavated, and also exactly the area that will be treated. We did take a certain amount of samples during the feasibility study, but it really isn't enough samples to actually design the remedy to go out and do it. Where Tom showed everything was nice and square where we thought the contamination was. We will actually be going out to make sure that we're not missing some. The area may get larger, it may get smaller that we will do, but the concentrations that Tom talked about, the remedial action of it, the concentrations that will be met. When the excavation is done there will also be testing done to make sure that we have made those.

MR. YOUNG: At Diamond W you are going to excavate any soil above 5.7 parts per million?

MR. LYNCH: Correct.

MR. YOUNG: Is that just the top few inches?

MR. TACCONE: The data that we have, it's 12 and 6 inches.

MR. LYNCH: I don't think we found anything below that.

Yes, sir.

MR. ERIC LARSON: You said that you're recommending Plan 3 which is solidification of the mercury substance.

MR. LYNCH: Correct.

MR. LARSON: It says in your presentation that MERECO came up with a solution for that. Has that been done at other sites besides this one?

MR. TACCONE: Mercury Refining did a treatability study. That was done under DEC. It's a conventional technology, its been used at many other sites.

MR. LYNCH: Actually, we just did one at the Ludlow Sand & Gravel site in Paris, New York this year; it worked very well.

MR. LARSON: It says that it needs to be reviewed once every five years, is that for a specific duration or is that indefinitely?

MR. LYNCH: As long as contamination is left on the site above human health. . .If it's not

unrestricted use, then it's every five years forever.

MR. CHRIS O'NEILL: I have a couple of questions in relation to institutional controls.

MR. LYNCH: Yes.

MR. O'NEILL: It looks like you're talking about institutional controls similar on all three or four sites, like for example, groundwater use, I think you said the groundwater contamination was only in the middle of the Mercury Refining site.

MR. LYNCH: Correct.

MR. O'NEILL: Then my other question is related to what happens if the adjacent parties don't agree to institutional controls being applied to their property?

MR. TACCONE: The groundwater institutional control will only apply to those properties that are affected by the groundwater problem, it wouldn't effect the other property. I think the proposed plan is written like that.

Now, as far as not agreeing, I don't know, maybe Sharon can address that.

MR. KIVOWITZ: We believe that we will be able to get those parties to agree. We'll work with

them.

MR. O'NEILL: Through financial compensation, or something?

MS. KIVOWITZ: That might be one way.

We will be talking with those parties in

the near future and assessing their responsibility, if any.

We believe that we have the right to require that those institutional controls be placed on those properties, not without some compensation if that's what is required.

MR. O'NEILL: Even if they are completely third parties you have the authority to tell them they need to - -

MS. KIVOWITZ: It's contaminated property.

We will be talking in the near future with those parties.

MR. YOUNG: The institutional controls on those properties will be what, just that they have to remain industrial?

MR. TACCONE: That's one.

Then if the property has got a cap there's going to be a control on the cap, you can't disrupt the cap.

The groundwater is another one.

MS. KIVOWITZ: The clay cap that is existing there currently does go on to another property.

MR. TACCONE: It goes on to Allied a little bit.

MS. KIVOWITZ: So, we will have to protect the integrity of that cap as well.

MR. LYNCH: Yes, sir.

MR. TOM WITH: Tom With, Safety Officer,

Fuller Road Fire Department.

Once the plan is decided and the contractor comes in and begins work what is the interaction between the contractor, EPA and the local fire department or HAZMAT, in case there is an incident where something has to be remediated by the fire department, by a local HAZMAT crew?

MR. TACCONE: Every time we begin a project, a field project, we do something called a Health and Safety Plan, and that has in it emergency procedures. It also has on it routes for emergencies.

There will be a Health & Safety Officer who will be in contact with your department to arrange for emergencies.

MR. WITH: Thank you.

MR. LYNCH: Yes, sir.

MR. HERCHENRODER: Have you taken into consideration some of the contamination from the railroad that they used for killing weeds, et cetera, that they won't tell you what they used?

MR. TACCONE: We did soil samples on and around the Mercury Refining property and around the tracks. We sampled for organic and inorganic compounds, and pesticides didn't show up as a problem. There was some pesticides found, but it wasn't levels that would indicate a threat.

MR. LYNCH: Yes.

MS. JOSEPHINE ROSSI: I have a couple of questions for clarification purposes.

I'm Josephine Rossi. I live nearby.

I'm not clear on what the I-90 Pond is and the tributary, and Rensselaer Lake, and the Waterworks. Isn't Rensselaer Lake at the end of - - is it on Fuller Road?

MR. TACCONE: Kevin is going to show a map and I can explain.

The I-90 Pond was formed, I think, in the 1800s. There is a dam, the creek was dammed up, and I think it was used for water supply purposes a hundred plus

years ago.

MS. ROSSI: Where is it?

MR. TACCONE: It's one mile downstream in the creek.

MS. ROSSI: I don't know where these places are, that's why I asked the question.

MR. TACCONE: We'll have to wait for the map then.

MS. ROSSI: My other question, I'll ask it now, is regarding the sediment.

You said there is three plans regarding sediment in the I-90 Pond and tributaries, I think, the EPA decided it is going to dredge up, I guess. My question is if the contamination is down so deep in the sediment why dredge it up?

MR. TACCONE: We're talking about two

areas. The first area of sediment problem is at the outfall. Mercury Refining has a stormwater discharge system. It collects water when it rains, the system collects the rainwater and it is discharged into the creek, the unnamed tributary. Contamination from the site washed off, got into the catch basins, was collected in the pipes and flowed and was discharged into the creek here. That's why this area right here has 38 parts per million of

mercury; it's elevated.

The stormwater outfall is located right here. This is Mercury Refining.

The I-90 Pond is located here. The I-90 Pond has contamination that is deep. It's a depositional area, meaning that matter in the water as it gets into the pond settles out. So, the area that is not contaminated continues to thicken. It thickens as time goes on. So that the contamination is isolated and it becomes more isolated as this layer gets deeper.

MS. ROSSI: Give me, please, a landmark.

MR. WITH: Everett Road.

MR. TACCONE: It could be Everett Road.

MR. LYNCH: This is I-90 Pond.

MR. TACCONE: This is Interstate I-90.

MR. WITH: Just under the underpass on the left as you're going into Albany.

MS. ROSSI: And the unnamed tributary?

MR. TACCONE: The unnamed tributary is

this right here. It meets up with the creek here. Then it flows down and the pond is formed by the dam I mentioned.

Yes, sir.

MR. LARSON: Eric Larson, again.

The residences north of the site, is

there any impact on that area? Specifically has that been tested?

MR. LYNCH: The area up here?

MR. LARSON: Yes.

MR. TACCONE: We took samples beyond the railroad tracks, I guess this way.

We haven't found any, no.

MR. LARSON: There was no contamination north of the site?

MR. TACCONE: We took samples and the contamination was going down.

The contamination at this site is very localized and focused.

MR. LARSON: As far as anything residential there is no impact?

MR. TACCONE: I don't think so.

It would be in the order of background.

Yes.

MS. ROSSI: My other question, Josephine Rossi again, the dredging up of the sediment is proposed for what now?

MR. LYNCH: This area.

MR. TACCONE: The outfall, right at the

outfall. The outfall goes into the tributary.

MS. ROSSI: Is that where the contamination is deep?

MR. TACCONE: No, that's the pond.

MS. ROSSI: Then my other question is, if you do excavation what have you got in place for like dust, soil dust being raised?

MR. LYNCH: That depends on the site itself. On the site itself they will use dust suppression techniques because it is something we are concerned about, you're right, contaminated dust blowing off the site could expose people. So, they will be using dust suppression. Sometimes it's as simple as just keeping everything wet.

Also, a Health and Safety Plan will be put together, as Tom had mentioned before. There will be two; one will be for the workers, and the other is the community health and safety plan. That will talk about the efforts that will be taken to keep the contamination on the site. That will also include air monitoring. There will be monitors on the perimeter of the site to make sure that this dust isn't coming off the site. If we find dust is coming off the site, all the work is stopped until they correct it.

MS. ROSSI: Well, then my final question would be why do all of that? If you have option number

two, I believe it was, which was to put the caps on, keep what is in place now you've already done work, monitor the caps, it's cheaper, everything is in place, you're not disturbing anything, why don't you go with that?

MR. LYNCH: The biggest expense is the solidification of the soil that is deep that is affecting the groundwater. That's by far the majority of the cost.

MR. TACCONE: It also addresses the future possibility of people being exposed if they need to construct on the site because then you would be digging into this contaminated area, and people who would be working in the excavated area would be exposed and the levels there are quite high.

MEMBER OF THE AUDIENCE: As opposed to just deed restricting it so you can't develop there?

MR. LYNCH: If you wanted to try to deed restrict it and tell somebody they can't even dig on their property, it's a lot different than saying well, the property has to be used for industrial purposes.

When the EPA does a study what we look at is the reasonably anticipated future use of the area, and looking at this area the history is industrial, it is zoned industrial, so when we look at this it will stay industrial. This is what we design our remedy for. The

problem is things can change.

If you told me when I started in this business that the waterfront of Hoboken would ever be used for residential homes, it was just an absolute mess, I

would have laughed at you, and now I can't afford any of the residential homes that are on the waterfront there.

So, things can change, and the institutional controls are such that since we are cleaning this up to industrial standards, just that it does stay industrial.

MEMBER OF THE AUDIENCE: Along with saying things can change, how long is that stabilization stabilized for?

I know it's not indefinite, it's not forever.

MR. TACCONE: Hundreds of years, I would guess, a long time.

MEMBER OF THE AUDIENCE: Is there studies to show that?

MR. TACCONE: I don't know.

MR. LYNCH: We haven't been doing it for hundreds of years, so we don't know.

MS. MAUREEN SCHUCK: As long as there is contamination there it is always going to be monitored.

I also wanted to mention, I'm Maureen Schuck with the State Health Department. We have been involved with working with the EPA, reviewing the remedial investigation and that proposed plan.

We also, along with the State DEC, will be involved when it comes time to do the construction, to do the remediation. We will review the design plans and

recommend the community air monitoring plans and work with them also to insure that the removal process is done that is as protective of public health and community. We will certainly take into consideration, as we do in a lot of projects, where the trucks will be going, make sure the trucks are covered when they are taking contaminated soil away, and listening to community concerns at that time.

Certainly, that will be a little ways down the road.

We will probably recommend that the EPA send out a notice sometime shortly before the remediation takes place so the community is aware of when it is going to occur.

MR. LYNCH: One thing I would like to also add, these are really our reasons why we think this is the best thing to do, but the decision hasn't been made, and that's why we're here today is to hear from the public.

So, if you do think that what really should be selected is alternative number two, or other things should be done, you should definitely write to us, and we do take these things seriously before we make a decision.

MS. KIVOWITZ: We do take down these comments, and your comments here today will be addressed as well as the written comments submitted.

MR. LYNCH: So, our response of why we are suggesting this isn't necessarily the final word.

MR. TACCONE: You should send the comments to me. That's my address and e-mail.

MEMBER OF THE AUDIENCE: Just a quick follow-up to the sediment issue here.

Really, the only excavated sediment would be right at that outfall?

MR. TACCONE: Yes.

MEMBER OF THE AUDIENCE: You did look all down the unnamed tributary, the Patroon Creek and into the reservoir and you did not see anything above any sediment sample criteria regardless of depth?

MR. LYNCH: I didn't say regardless of depth. In the pond, the deeper sediment in the pond is dirtier than the surface stuff.

MEMBER OF THE AUDIENCE: But is it above

the sediment clean up criteria?

MR. LYNCH: Yes.

MEMBER OF THE AUDIENCE: You are not getting that because?

MR. LYNCH: Because it is not available, it is not bio-available. It's very deep, and we did do a model to see what the chance was in a hundred year storm that these would be exposed, and the modeling said that they should not be exposed. So, all we will be doing to make sure the model is right is we will be monitoring that for at least the next five years, but right now there is no exposure so we're not going to dig it up.

MEMBER OF THE AUDIENCE: Would you take the same plan of approach for the deep soils on site?

MR. LYNCH: The deep soils on site, they're contaminating the groundwater where the deep soils are. That's why we're stabilizing them.

MEMBER OF THE AUDIENCE: The mercury doesn't leach so if the results are above the same criteria for sediment in the pond it will never impact the groundwater?

MR. LYNCH: No, those levels are much lower than the levels on site. The area we are doing on site is right where those retorts were, right where mercury

was dripping and moving vertically down through the soil.

MS. RYAN: It is my understanding that the companies who are responsible for this problem are the ones who are going to be paying for it?

MR. TACCONE: Yes.

MR. PAUL WHEELER: Paul Wheeler.

I know you said that the action could take probably about a year. What is the time frame to getting to that point where you start?

MR. LYNCH: That will probably be about two years.

What we will do, at the end of the comment period we will take all the comments, we will put them together into what we call a Response and Summary. We will present them to our management who will make the final decision, publish that decision, and then we will start a period of negotiation with these responsible parties which will probably take about six months to do that.

After they sign the consent decree, it will get lodged with the court. We will then do the remedial design which can take up to a year.

So, we're thinking before we would ever see a shovel in the soil it will be two years.

MR. TACCONE: Gentleman in the back.

Yes, sir.

MR. DON CSAPOSS: My name is Don Csaposs.

Relative to that question about the time line, to what extent is that time line potentially impacted by your ability to effect financial settlements with the contributory entities?

MR. LYNCH: It definitely has an effect, that's a good question.

MR. CSAPOSS: I mean, is there a tipping point?

MR. LYNCH: The law says we have to go into a period of negotiations for 120 days before we can start, and that's what we try to use as a deadline saying we have 120 days, but oftentimes when you're getting close and ironing out the details that does get extended. That's why we're saying six months we think is a good time frame.

MR. CSAPOSS: Is there a percentage of those contributory entities that you have to get to sign off before you can proceed?

MR. LYNCH: The statute is what they

call joint and severally. What that means is that any one of them is liable to pay for the whole thing. So, what we would do is we would open discussions with all 15 of the

people, and who is going to sign on with us will sign on with us, they will get contribution protection so other people can't come after them, and a lot of times they will go after the people who don't sign to contribute to it.

If none of them say yes, that they will do it, we have the ability to order them to do it. If we order them to do it and they still say no, we then have a choice of either you can go to the court to tell the courts to make them do it, or we can do it ourselves and then what they have done is open themselves up to liability for triple damages. If we do it ourselves and go after them to pay us back later, the law says we can ask them for three times the amount of the cost.

So, we've been very successful with people coming in and doing work.

MR. BOB REILLY: Bob Reilly.

I know this will go no place because you have explained what the law is, but it mystifies me how the federal government in 1983 can declare this site contaminated and start remediation and then allow companies to continue operating, then years later say - - obviously be aware of what's happening all through that period in the next 15 years, and then basically sue these people for costs.

My question would be, is there still work going on at the plant at this time?

MR. LYNCH: Yes.

MR. REILLY: Is there any mercury involved?

MR. TACCONE: There is not. He reclaims precious metals, silver, gold, stuff like that.

MR. REILLY: My problem is the federal government comes in, declares this site contaminated, starts remediation, and allows this to continue. Companies continued to bring their products there, and that's all they were doing and now they're held responsible.

Where was the federal government in saying let's stop this. If, in fact, we are going to have confidence in what's happening now, how do we know that there is not contamination occurring now?

MR. TACCONE: Well, the reclamation process has stopped; that stopped in 1998.

After the site was listed in 1983 a large removal was performed in 1985. I mentioned 2000 tons of mercury carrying debris and PCB contaminant debris was removed and taken off site, and that area was capped. The remaining contamination was deeper. At that time the State had the primary responsibility for overseeing the

clean up and the investigation.

MR. LYNCH: At that time they were

working under a permit.

MR. TACCONE: And they were working under a permit also that regulated the storage of the material. So, there was something always in effect, either a clean up operation was going on, the permit was in effect. There was a number of investigations that were done by the DEC, and then EPA took off from there in 2000 and completed it.

MR. LYNCH: We believe it was a much cleaner operation at that point.

I wouldn't be able to say that nothing has been released from that point, but after they did the initial remediation they changed the process, they changed the buildings out there. We believe it was a cleaner operation.

Actually, I don't have the answers to any of the legal questions as to how can we allow something to continue to operate once it becomes a Superfund Site, but I do know it does happen. We do believe that there were efforts made to control the problem from getting worse.

MS. KIVOWITZ: I think the answer to the

question is Congress made a decision that the Superfund Law would be a - - you don't have to show a cause. You're liable if you generated waste that got to the site. You're liable if you owned or operated that site. You're liable if you were a transporter and you chose the site for waste to be disposed of at the site. It's a polluter paying

statute, that's how Congress set it up.

We have sites where we have clean up companies who are cleaning up one site and they send the waste from one site to another site and that becomes a Superfund Site.

It's a hard thing to grapple with because it is so different than most of our other laws where we require someone to be at fault, and then we take an action against them because they are at fault. We don't look for fault here. We need people to clean these sites up. Congress made a decision that it was going to be the polluters that were going to pay for these sites. Even if they were told, this is where you have to dispose of your waste, this is a permitted facility, if that becomes a hazardous waste site at that point, you're liable. It is what it is.

MR. HERB REILLY: About 25 years ago DEC mandated that towns and municipalities of all levels of

government recycle. I know in our township we did, and one of the products we recycled were your heavy metals.

Where did they go? Right there.

Are we on the hook? Are any towns, villages, or counties on the hook, because Answers told us this, you can't bring them here anymore. So, where did we take them? Right down on Railroad Avenue and brought them there.

The threshold, did you say, is 200

pounds? Are you talking the total weight, the batteries and all that stuff? Every municipality that used that exceeded 200 pounds a month.

MS. KIVOWITZ: We don't have the records for that. We have all of Mercury Refining's records. There were a number of municipalities on it, but in the final list we didn't have that many municipalities. We were surprised, actually. We were expecting to see Girl Scout troops, Boy Scout troops, municipalities, and we don't see them, and we have very good records at this site. Not to say that there are no municipalities on it, because there are a lot.

MR. REILLY: They're not going to get double taxed for this whole thing?

MS. KIVOWITZ: There is also the issue

of batteries. There is the Superfund recycling exemption for batteries. EPA made a decision that batteries because of the Superfund Recycling, I believe it's act, batteries are exempt. You probably have all municipalities with batteries, maybe that's where they fall in. We do have very good documentary evidence at this site, particularly since 1980 when substances that came to the site had to be manifested. We have all of the manifests. We have a huge data base of information. Prior to 1980 we have some records, we don't have great records. We have scraps of paper. We have index cards. We have whatever records Mercury Refining Company maintained and was able all these years later to give us.

MR. REILLY: Where does the product now go if it can't be dropped off here and properly disposed of?

MS. KIVOWITZ: There are other mercury recyclers in the country. The biggest one is Mercury Waste Solutions. I believe they're in Wisconsin or Minnesota.

MR. TACCONE: Yes, sir.

MR. HERCHENRODER: You tested in the Three Mile Waterworks vicinity from within. What about on the other side of the falls, did you test on the other side of the falls?

MR. TACCONE: Downstream?

MR. HERCHENRODER: Yes.

MR. TACCONE: We took a couple of samples beyond the reservoir. We took a couple. I think one was like 1.2 parts per million. They were not significant.

MR. HERCHENRODER: Number two.

The reclaiming gold and silver, the process that they're using at this plant, is it chemically done where there is other chemicals that may be contaminating - -

MR. TACCONE: I don't believe so. I think he is collecting the material. He is separating the silver from the casing that it's in, and then selling the silver to someone else. It's a physical process.

Yes, sir.

MR. O'NEILL: Since we have the question about municipalities, is the list of the major 15 contributors a matter of public record, is the list of diminimous parties also a matter of public record, so municipalities could actually check and see if they are on the list?

MS. KIVOWITZ: Well, if you're on the list, you'll be notified. You would have been notified

already, actually, you would know about it.

The list has been revised and a final list will be issued shortly; then, yes, that will be a matter of public record. At this point it is not a final list.

MR. TACCONE: Any other questions?

Yes, sir.

MR. ELLIS: Can you return to the site map again?

Can you explain in a little bit of detail what will happen on each of the sections under the proposed remedy?

MR. TACCONE: Area A will be excavated.

MR. ELLIS: To what depth?

MR. TACCONE: The data we have right now is a half a foot to a foot. So, it will be on the order of that.

We'll sample. If it's above 5.7 we'll remove the soil and test again. If it's above 5.7 we'll remove some more. So, it will be on the order of a couple

feet, I would guess.

MR. LYNCH: Most of the areas are a foot; right?

MR. TACCONE: That's right.

MR. LYNCH: The only area that is more is this one rectangular area here.

The deep area is this area here.

The rest will probably be just about a foot.

MR. ELLIS: How deep will those areas be excavated, do you have a prediction?

MR. TACCONE: Area E is not going to be excavated, that's going to be solidified.

MR. LYNCH: What's going to happen in this area, the first couple of feet will be excavated and sent out mostly because the actual solidification will actually increase the volume, so the soil will come up some. So there will be two or three feet taken off. Most of the time when you do solidification a device that looks like a very large drill rig comes on, drills down to the bottom, the drill rig has nozzles on the bottom, it just mixes the soil up as the material that solidifies it is injected in there, and it just moves upward. So at 60 feet it should be a couple foot higher than it was before. So in order that you don't have a big mound at the site you take a couple feet away. You operate the machinery, you go next-door and bring it up. That will be done down to the

60 foot level in that area.

Every other area in there we will excavate. As Tom said, most of it is a foot.

What we will do, we will be sampling when we're done to make sure we're done, and continue to go back and take some more out if we're not.

Yes.

MS. DORINDA SAVOCA: Dorinda Savoca.

My neighborhood is just north of there, very close, within a quarter-mile of this. While you are excavating this, if it does get airborne where are your monitors going to be set so that you could warn us?

If there was an accident where it became airborne on a windy day, my children are outside in the yard playing, are we going to be notified that there is something in the air at that time? Are my children and I going to be at risk with something like that?

MR. TACCONE: Dust suppressants will be used, and there will be a monitoring system that will be part of the activity.

MS. SAVOCA: I mean, I am so close.

MR. TACCONE: Up-wind and down-wind monitors will be in place. If it goes above a certain level, all activities will stop.

MS. SAVOCA: Is that in height or

distance from the site?

MR. TACCONE: Distance.

MR. SIVAK: When we do excavations at our Superfund contaminated soil sites, unfortunately, or fortunately, we have lots of experience in doing excavations in residential areas. I mean, we live in a very, very heavily populated state, we have two states in our region. We, unfortunately, have lots of experience in excavating soils in residential communities.

The good part of that is we have a lot of experience in developing Community Health and Safety Plans that address exactly your kinds of questions.

When Tom was talking about identifying these airborne concentrations that would tell us that contamination was leaving the site, it's being windborne, or something like that, from something that has happened and our monitors are picking that up, those levels, those concentrations, we are going to set those at levels that are protective. So, we're going to figure out what levels are good and then we are going to drop that a little bit so there is a margin of error in there so there is a measure of safety so that if something does leak, if that happens which we have very good success that it doesn't happen, but if it does it's going to be a not regular occurrence, so

it's going to be a very sporadic kind of thing that is going on. The concentrations that we are going to identify to trigger that are going to be set low enough that those sporadic exposures, we'll call them exposures, are not

going to be at all associated with long term health effects, or even short term health effects. We are going to take all of that into account as we set this up.

MS. SCHUCK: Again, the State Health Department is going to be actively involved in reviewing the monitoring plan, making sure that the placement of the monitors are appropriate.

Certainly, dust should not be leaving the site. You know, there should be controls. We certainly will be involved in the area and if we hear of any concerns we will ask that work stop until - -

MS. SAVOCA: But if there was something like that that happened the residents that are so close in the neighborhood will not be notified, you know, that two weeks ago there was three accidents where the wind picked up, went over the safe level that you say they are going to be set at, we will have no way of knowing.

MS. SCHUCK: It would be very unlikely that that would occur.

The people will be notified. We do have

action levels. My experience with remediation at sites, that rarely happens.

MR. LYNCH: But if it does happen, we would let you know.

MS. SCHUCK: They are not going to dig up everything at once and create a situation where that would be more likely to occur.

MR. LYNCH: If something was to escape,

we would let people know.

MS. RYAN: How would you let them know?

MR. LYNCH: Depending on how it happened. If this was a big dust cloud that went out into the neighborhood, we would either go through the neighborhood and tell people what happened - - actually, if a big dust cloud went through the neighborhood we would get phone calls before we would get a chance to tell people; frankly, people would know, and would be asking us questions, but we would go through the neighborhood.

We will put that into the Health and Safety Plan, notification, if something does happen, if something does get exposed.

MR. WITH: My concern, Tom With again, if people are home and you're knocking on the door, they're notified.

What process even further in your Health and Safety Plan, would you leave a flyer or use like somewhat of a reverse 911 to leave a message on their answering machine that they would be able to get to at a later time?

MR. LYNCH: That's something we could do. We don't have the plan in front of us.

This is usually more of a concern if we're dealing with something like a volatile organic, something that would get off in the air and go.

MS. SCHUCK: Given this contaminant,

given the area, the size, the location from the residential, it's highly unlikely that we are going to have an emergency situation.

We will consider your concerns. What we would prefer is to be involved in taking all precautions so something like that never occurs.

So, it is very, very unlikely, but certainly we will take all the precautions to be extra safe, but it is very unlikely that that situation would happen.

MR. SIVAK: We talked about the Health and Safety Plan. We talked about the fact we haven't developed it yet. We will be developing it based on the

input that we have received tonight. Clearly, the fire department will be involved as well. Like I said, EPA has lots of experience in developing Health and Safety Plans in coordination with communities and fire departments on all of these issues.

MS. ROSSI: You probably went over this, I may have missed it, or didn't grasp it, but I'm looking at the shaded spot there, is that NL Industries, or is that something else?

MR. TACCONE: No, this is the Mercury Refining property. NL Industries is not anywhere near here.

MS. ROSSI: Is that being discussed in any of this?

MR. TACCONE: No.

MS. ROSSI: All right, that's not the issue.

So you're going to be doing the excavating and whatever the proposed plan is on those other?

MR. TACCONE: These areas right here.

MS. ROSSI: And nothing has been done there yet.

MR. TACCONE: Well, there has been some

work done in the past, as I explained.

MR. LYNCH: Work was done in this area in the past, but not in those other areas.

MR. TACCONE: Yes, sir.

MR. HERB REILLY: My name is Herb Reilly again.

Just for your information, and this lady was concerned about notifying people, Albany County does have in operation right now a reverse 911 system and they can tailor their phone calls to any neighborhood, any street. There can be a missing child and they will do it just like that, and they will continue to call until they finally get an answer at that number.

MR. TACCONE: Yes, sir.

MR. RICK FOREMAN: I'm Rick Foreman, Allied Building Products.

I was there for the last excavation. I've been there 23 years.

I think they're pretty accurate with what they're doing. I think you guys can rest. Obviously, I've been there 23 years I went through the last excavation. It went pretty smoothly, they were in and out.

I'm really concerned they're going to tie up a lot of my yard there.

MR. LYNCH: We will try to disturb you as little as possible.

MR. TACCONE: Are there any other questions?

MS. RYAN: I know you're not talking about NL Industries, but has that been cleaned up?

MR. TACCONE: I don't know the status of that.

MR. SIVAK: That is not a federal Superfund Site.

MS. SCHUCK: It is completed.

MS. RYAN: I go by that no less than 365 days. A couple years later I hear it has been contaminated. I've been up there 50 years breathing that contamination.

MS. SCHUCK: I'll talk to you later.

MR. TACCONE: Any other questions?

(No response.)

Thank you for coming.

(The public meeting was concluded.)

C E R T I F I C A T I O N

I, Susanne Lynch, Shorthand Reporter and Notary Public in and for the State of New York, do hereby **CERTIFY** that I recorded stenographically the foregoing testimony taken at the time and place herein stated and the preceding testimony is a true and accurate transcript hereof to the best of my knowledge and belief.

Susanne Lynch

SUSANNE LYNCH

Date: May 2, 2008