C&D POWER SYSTEMS
(C&D BATTERIES)

Town of Deerpark, Orange County, New York
Site No. 3-36-001

PROPOSED REMEDIAL ACTION PLAN
Operable Unit No. 1

February 2002

Prepared by:

Division of Environmental Remediation
New York State Department of Environmental Conservation

C&D Facility from Route 209 Entrance

Site Location: Huguenot, Orange County, New York

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SECTION 1: SUMMARY AND PURPOSE OF THE PROPOSED PLAN

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) is proposing a remedy to address the significant threat to human health and/or the environment created by the presence of hazardous waste at the C&D Power Systems (C&D) site, a Class 2 inactive hazardous waste disposal site. The site has been divided into two operable units. This Proposed Remedial Action Plan (PRAP) addresses on-site soil contamination in the unsaturated (vadose) zone and has been designated as Operable Unit No.1 (OU1). A separate PRAP for Operable Unit No. 2 (OU2), which addresses the on-site and off-site groundwater contamination, and off-site stream sediment and surface water contamination, will be issued at a later date. OU2 has been designated for further environmental investigation and study and is more fully described in Section 3.2. As described in Sections 3 and 4 of this document, Empire Tube Corporation's past waste management practices resulted in the disposal of a number of hazardous wastes, including polychlorinated biphenyls (PCBs), barium, cadmium, fluoride, and lead at the site, some of which have migrated from the site to surrounding areas, including the private potable water supply well; contaminants may also have impacted sediment and surface water of an adjacent stream. Past disposal activities have resulted in the following significant threats to the public health and/or the environment:

- a significant threat to human health associated with the contamination of the soil at the site, and the potential risk of exposure to the contaminants by direct contact and ingestion.

- a significant environmental threat associated with the impacts of contaminants to the groundwater and wildlife exposure to site soils.

In order to eliminate or mitigate the significant threats to the public health and/or the environment caused by the hazardous wastes disposed at the C&D site, the following remedy for OU1 is proposed:

- The excavation and removal of the on-site lagoon soils to a depth of 6 to 8 feet;

- The ex-situ stabilization of the remaining unsaturated contaminated soils, from a depth of 6 to 8 feet down to the groundwater table, to address the metal and PCB contaminated soil at the source area;

- Placement of several feet of clean fill in the lagoon excavation to provide a buffer between the treated waste and the fluctuating groundwater table, replacement of stabilized soils (treated wastes) back into the lagoon excavation, backfill with clean fill to the existing grade of the surrounding areas, and placement of a geomembrane liner/asphalt cover;

- Deed restrictions to be recorded in the chain of title of the property to restrict the future use of the site for industrial use only, mandate the maintenance of a geomembrane liner/asphalt cap, and require notification to the NYSDEC when excavation of the capped area is planned;

- Annual certification by the property owner that the site is in compliance with the institutional controls outlined in this PRAP.

The proposed remedies, discussed in detail in Section 7 of this document, are intended to attain the remedial goals selected for this site in Section 6 of this Proposed Remedial Action Plan (PRAP), to conform with applicable standards, criteria, and guidance (SCGs).

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

The NYSDEC has issued this PRAP as a component of the Citizen Participation Plan developed pursuant to the New York State Environmental Conservation Law and 6 New York Codes, Rules and Regulations Part 375. This document is a summary of the information that can be found in greater detail in the Remedial Investigation (RI), Feasibility Study (FS) and other relevant reports and documents, available at the document repositories.

To better understand the site and the investigations conducted, the public is encouraged to review the project documents at the following repositories:

New York State Department of
Environmental Conservation
21 South Putt Corners Rd
New Paltz, NY 12561
Attn: Michael J. Knipfing
Tel: (845) 256-3154
Hours: 8:30 a.m. - 4:45 p.m.

Port Jervis Library
138 Pike Street
Port Jervis, NY 12771
Tel: (845) 856-7313
Hours: Mon. and Thurs., 10 a.m. - 9 p.m.
Tues., Wed., and Fri., 10 a.m. - 6 p.m.
Sat. 9 a.m. - 5 p.m.

Deerpark Town Hall
Drawer A
420 Route 209
Huguenot, NY 12746
Tel: (845) 856-5705
Hours: Mon.- Fri. 8 a.m. - 4 p.m.

The NYSDEC seeks input from the community on this PRAP. A public comment period has been set from February 16, 2002 through March 17, 2002 to provide an opportunity for public participation in the remedy selection process for this site. A public meeting is scheduled for March 7, 2002 at the Deerpark Town Hall beginning at 7 pm.

At the meeting, the results of the RI/FS will be presented along with a summary of the proposed remedy. After the presentation, there will be time for the public to submit verbal or written comments on the PRAP to the NYSDEC.

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

Comments will be summarized and responses provided in the Responsiveness Summary section of the Record of Decision. The Record of Decision is a summary of past environmental activities and their results and contains the NYSDEC's final selection of the remedy for this OU. Written comments may be sent to Ms. Alicia Thorne at the New York State Department of Environmental Conservation, Division of Environmental Remediation, 11th Floor, 625 Broadway, Albany, NY 12233-7015 through March 17, 2002.

SECTION 2: SITE LOCATION AND DESCRIPTION

The C&D Power Systems (C&D Batteries) site (NYSDEC ID No. 3-36-001) is located at C&D Technologies, Inc., Route 209, Huguenot, Orange County, New York. The site is approximately 4,000 ft north of the junction of US Route 209 and County Route 80 and approximately 4 miles northeast of the City of Port Jervis. The facility, located in the Neversink River Valley, is bordered on the west by Route 209, on the south by the Town of Deerpark Town Hall, and on the north and east by a tributary to the Neversink River. The site is approximately 10 acres in size. A location map and a site map are included as Figures 1 and 2, respectively.

OU1, which is the subject of this PRAP, addresses on-site soil contamination in the unsaturated zone. An operable unit represents a portion of the site which, for technical or administrative reasons, is addressed separately to eliminate or mitigate a release, threat of release, or exposure pathway resulting from the site contamination. OU2 addresses the on-site and off-site groundwater contamination and off-site stream sediment and surface water contamination. Saturated soil contamination will be addressed as on-site groundwater contamination under OU2. A separate PRAP and ROD will be prepared for OU2 at a later date.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

From the year 1959 until at least 1968, the site was used by Empire Tube Corporation (ETC) for the manufacture of black and white television picture tubes. In the manufacturing process, fifteen percent (15%) hydrofluoric acid was used to remove carbon, potassium silicate, phosphorous and barium from the picture tubes. Wastewater containing hydrofluoric acid was disposed of by ETC in an on-site lagoon of approximately 150 ft diameter and a depth of about 15 ft. During 1964, the NYSDOH inspected ETC's waste disposal system and found elevated levels of fluoride. In 1966, a complaint was filed by NYSDOH regarding discharge of industrial wastes into the waters of the State of New York. C&D Power Systems, a manufacturer of industrial lead batteries, primarily used in forklifts, purchased the facility and began operations in the mid-1970s. C&D Power Systems discharged non-contact cooling water into the lagoon until approximately 1982, which resulted in the accumulation of one to two feet of water in the lagoon. It should be noted that since the cessation of the lagoon operations, there has been no standing water in the former lagoon. Over the years, C&D Power Systems changed its name to C&D Batteries and finally to C&D Technologies Inc.

3.2: Remedial History

1981 - NYSDEC directed C&D to conduct soil sampling in the lagoon.

1982 - In connection with C&D's interest in expanding the plant building over the former lagoon, C&D conducted a groundwater study around the lagoon.

1983 - The site was classified as 2a in the New York State Registry of Inactive Hazardous Waste Disposal Sites (the Registry) due to the elevated fluoride levels in groundwater downgradient of the former lagoon and soil in the former lagoon. Class 2a is a temporary classification assigned when there is inadequate and/or insufficient data to allow inclusion of the site in any of the other Registry classifications.

1984 - C&D entered into an Order on Consent with NYSDEC for a groundwater monitoring program.

1988 - A Phase II investigation was conducted and results indicated that the site was not a threat to the environment. However, no analysis for fluoride in either the groundwater or the soil was performed.

1990 - NYSDEC conducted additional groundwater monitoring and found fluoride levels more than ten times above background levels, exceeding the New York Class GA groundwater standard for fluoride. Subsequently the site was reclassified to Class 2, which is defined as a site that presents a significant threat to human health and/or the environment and requires action.

1991 - NYSDEC notified C&D that a Remedial Investigation/Feasibility Study (RI/FS) was required.

1999 - C&D entered into an Order on Consent with the NYSDEC to conduct a RI/FS. Field work for the remedial investigation commenced in August of 1999.

A more complete description of the site history and industrial facilities has been provided in the Remedial Investigation Report of May 2001.

SECTION 4: SITE CONTAMINATION

To evaluate the contamination present at the site and to evaluate alternatives to address the significant threat to human health and the environment posed by the presence of hazardous waste, C&D has recently conducted a Remedial Investigation/Feasibility Study (RI/FS).

4.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site.
The OU1 RI was conducted from July 1999 to December 2001. A report titled Remedial Investigation Report of May 2001 by C&D Technologies, Inc. has been prepared which describes the field activities and findings of the RI in detail. In the early stages of the RI, there were three analytes of concern: barium, fluoride and lead. In addition to the analytes of concern, selected soil samples were analyzed for the full suite of contaminants. These soil samples revealed elevated levels of cadmium and PCBs. Therefore, additional soil sampling to define the vertical and horizontal extent of these contaminants was performed also.

The RI included the following activities:

- Collection of two background surface soil samples;
- Performance of six subsurface soil borings to a maximum depth of 17 feet within the former lagoon with analysis of soil samples for PCBs and cadmium to further evaluate the vertical extent of the soil contamination;
- Gamma scintillation counting on the lagoon surface soils to determine the level of barium radiation;
- Excavation of ten test pits to a maximium depth of 12 feet within the former lagoon with analysis of soil samples to further evaluate the vertical extent of the soil contamination;
- Toxicity Characteristic Leaching Procedure (TCLP) analysis of seven selected soil samples to determine the leachable concentrations of hazardous waste at depth on site;
- Collection of ten surface soil samples within the former lagoon with analysis for PCBs and cadmium to further evaluate the horizontal extent of the soil contamination;
- Redevelopment of the seven existing groundwater monitoring wells from the Phase II Investigation and sampling to provide data for an analysis of groundwater contamination and hydrogeologic conditions;
- In-situ hydraulic conductivity testing of monitoring wells to provide data for an analysis of groundwater and hydrogeologic conditions;

- Collection of four sediment samples from the adjacent tributary to the Neversink River with analysis for barium, fluoride and lead.

To determine which media (soil, groundwater, etc.) are contaminated at levels of concern, the RI analytical data was compared to the NYSDEC's standards, criteria, and guidance values (SCGs). Groundwater, drinking water and surface water SCGs identified for the C&D site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part 5 of New York State Sanitary Code. For soils, NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 provides soil cleanup guidelines for the protection of groundwater, background conditions, and human health exposure scenarios. In addition, site specific soil background concentration levels can be considered for certain classes of contaminants. Guidance values for evaluating contamination in sediments are provided by the NYSDEC "Technical Guidance for Screening Contaminated Sediments".

The RI results, when compared to the SCGs and potential public health and environmental exposure routes, indicate that certain media and areas of the site require remediation. These are summarized below. Detailed information can be found in the RI Report.

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

4.1.1: Site Geology and Hydrogeology

The C&D facility is located in the Valley and Ridge Physiographic Province. This province is characterized by the presence of folded Paleozoic sedimentary rocks that include sandstone, shale, and limestone. The long axis of the folds generally trend northeast-southwest, resulting in distinct parallel ridges oriented in this direction. The Neversink Valley is part of a large trough developed over soluble limestone.

The facility and surrounding area is underlain by glacially deposited sand and gravel that gets coarser with depth. The irregular thickness of the deposit ranges from less than 10 feet to approximately 150 feet. This unit is an unconsolidated principal aquifer with wells yielding approximately 10 to 100 gallons per minute. Depth to groundwater is approximately 30 feet below ground surface. Groundwater flows southeast towards the unnamed tributary to the Neversink River which lies east of the site.

4.1.2: Nature of Contamination

As described in the RI report, many soil, groundwater and sediment samples were collected at the site to characterize the nature and extent of contamination. The main categories of contaminants which exceed SCGs are inorganics (metals), and polychlorinated biphenyls (PCBs). The inorganic contaminants of concern are barium, cadmium, fluoride, and lead. The organic contaminants of concern are PCBs as Aroclor 1254.

4.1.3: Extent of Contamination

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

Soil

During the RI, soil samples collected from the former lagoon were taken at the surface and at various depths down to the groundwater table, which is approximately 15 feet below the lagoon soil surface.

Ten test pits (TP) were dug to a depth of 12 ft, from which a total of 53 soil samples were taken, and analyzed for barium, fluoride, and lead. Barium concentrations in the lagoon soil ranged from 121 to 7,710 ppm at the 4 feet level, while background samples exhibited concentrations at 16 ppm or less. Barium concentrations did not decrease substantially with depth, for at TP-8 (12 ft level), barium was detected at 3,150 ppm. Fluoride levels were comparatively lower, ranging from nondetect (ND) to 327 ppm at the surface. Lead concentrations increased with depth in test pits TP-1,4,6, and 10 but at others, concentrations were highest at the surface. Overall, lead contamination ranged from 8.4 to 13,000 ppm, with the highest contamination in TP-4. Background levels for lead were determined to be 13 ppm or less. Two samples, TP-4 (10' interval) and TP-9 (0' interval), were analyzed for the full suite of TCL/TAL parameters. This analysis revealed cadmium and PCB contamination, specifically Aroclor 1254, along with elevated levels of chromium, copper, mercury, silver and zinc. For more information, please refer to Table 1.

In order to better define the horizontal extent of the PCB and cadmium contamination, 10 surficial soil samples were collected from the former lagoon. Analysis yielded cadmium concentrations from 32.5 to 46,200 ppm and Aroclor® 1254 from 34 to 1,100 ppm.

Based on this sampling, 6 sub-surface soil borings, with split-spoon analysis, were undertaken to better define the vertical extent of the PCB contamination. The borings were advanced to approximately 15 feet to the groundwater table with split-spoon samples taken every 2 feet. PCBs ranged from ND to 580 ppm, with the highest concentration at the 3-5' interval. At the water table, concentrations of cadmium ranged from 1.2 to 1,340 ppm while lead concentrations ranged from 11.4 to 377 ppm. For more information, please refer to Table 1.

Selected soil samples from depths greater than 6 feet were analyzed for leachable concentrations of cadmium and lead via TCLP, which is a process that determines whether a soil is a characteristic hazardous waste. Four out of the seven TCLP samples failed for cadmium with the greatest exceedence at 12 feet in TP-8 with a value of 4.07 milligrams per liter (mg/L), which is above the standard of 1 mg/L. One of the seven failed for lead TCLP at a depth of 10 feet in TP-4 with a value of 5.46 mg/L, which is above the standard of 5 mg/L.

Sediments

Four stream sediment samples were collected and analyzed for barium, fluoride and lead during the remedial investigation. Of the three analytes, only lead has established sediment criteria: a lowest effect level (LEL) of 31 ppm

and a severe effect level (SEL) of 110 ppm. Three out of four samples exceeded the lead LEL, and one of which exceeded the SEL at 195 ppm. Barium was detected in all of the samples with the highest detection in SED-4 at 90.1 ppm while fluoride was detected in two of the four sediment samples with the highest detection in SED-3 at 53.9 ppm. However, analysis for PCBs and cadmium was not conducted but will be performed under OU2.

Groundwater

Groundwater samples were taken and analyzed during the remedial investigation. Fluoride was detected in four of the five downgradient monitoring wells at concentrations that were significantly above the applicable SCGs (NYSDEC groundwater standard). The maximum fluoride concentration found was 10,900 ppb in MW-7 which is significantly above the SCG of 1,500 ppb. Although PCBs were detected in two downgradient monitoring wells, only one well, MW-6, detected a PCB concentration of 0.24 ppb which is above the SCG of 0.09 ppb. Lead was detected above SCGs in one well, MW-6, at 29.4 ppb, in an unfiltered sample. However, the filtered sample did not detect lead at all.

One private well downgradient of the site, which is the only known downgradient private water supply, was found to be impacted with fluoride at 3.85 ppb which is above the NYSDOH drinking standard of 2.2 ppb. Two subsequent samplings found no contamination above the drinking water standards. Water quality in this private potable well will continue to be monitored by Orange County.

On-site and off-site groundwater, including the water quality of this private potable well, will be further investigated and addressed under OU2.

Surface Water

Surface water samples of the unnamed tributary to the Neversink River adjacent to the site were not taken during the remedial investigation. However, the results of the remedial investigation indicate the possibility of surface water contamination, and such sampling will be addressed in a supplemental investigation under OU2.

4.3: Summary of Human Exposure Pathways

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Section 1.5 of the RI report.

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

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

- Inhalation of contaminated dusts
- Direct contact (incidental ingestion and dermal contact) with contaminated surface and subsurface soils

Due to the restricted access of the area through fencing of the C&D property and the lagoon itself, there is presently little possibility of exposure to contamination by ingestion of soil.

Short-term exposure to contaminants in the soils is a concern for workers involved in construction activities that involve disturbance of site soils. Dust inhalation and ingestion of soil particles are the primary routes of potential exposure for construction workers.

4.4: Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures and ecological risks which may be presented by the site. The potential pathway for environmental exposure and/or ecological risks includes the impacts of contaminants to the groundwater and wildlife exposure to surface and subsurface soils in the former lagoon.

SECTION 5: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are owners or users of the site who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers. C&D Power Systems (C&D Batteries), renamed as C&D Technologies, is the PRP for this site.

The NYSDEC and C&D Technologies Inc. entered into an Order on Consent on July 19, 1999. The Order obligates C&D Technologies Inc. to implement a RI/FS. Upon issuance of the Record of Decision the NYSDEC will approach the PRP to implement the selected remedy under a separate Order on Consent.

SECTION 6: SUMMARY OF THE REMEDIATION GOALS

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

The goals selected for this site are:

- Eliminate, to the extent practicable, exposures to contaminants present within the soils on site.
- Eliminate, to the extent practicable, further release of contaminants to the groundwater.
- Eliminate, to the extent practicable, the exposure of wildlife to levels of inorganic compounds and PCBs above standards/guidance values.

SECTION 7: SUMMARY OF THE EVALUATION OF ALTERNATIVES

The selected remedy must be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable. Potential remedial alternatives for the C&D site were identified, screened and evaluated in the report

entitled Feasibility Study Report Operable Unit-1 of November 2001 for C&D Technologies, Inc.

This operable unit addresses on-site soil contamination in the unsaturated zone. On-site soil contamination in the saturated zone will be addressed as on-site groundwater. On-site groundwater, off-site groundwater and off-site stream sediment and surface water have been designated for further environmental investigation, study, and evaluation under OU2.

A summary of the detailed analysis follows. As presented below, the "Time to Implement" reflects only the time required to construct and operate the remedy, and does not include the time required to design the remedy, procure contracts for design and construction or to negotiate with responsible parties.

All soil remedial alternatives that include the disposal of PCB contaminated waste would comply with the Enforcement Directive titled Land Disposal Restrictions Phase IV Supplemental Rule which temporarily defers a portion of the LDR rules that apply to PCBs.

7.1: Description of Remedial Alternatives

The potential remedies are intended to address the contaminated soils in the unsaturated zone at the site and to prevent the ingestion of contaminated groundwater from the downgradient potable supply well. The present worth costs include the operations and maintenance (O&M) costs. For comparative purposes, a time frame of 30 years was used to develop the O&M costs.

No Action

The No Action Alternative is evaluated as a procedural requirement and as a basis for comparison. Under the No Action alternative, the site is allowed to remain in an unremediated state. This alternative would leave the site in its present condition and would not provide any additional protection to human health or the environment.

Present Worth:	$ 0
Capital Cost:	$ 0
Annual O&M:	$ 0
Time to Implement	0

Alternative 1: Excavate And Off-Site Transportation And Disposal

To mitigate the source of contamination, lagoon soils would be excavated to a depth of 14 feet or to the groundwater table, whichever is encountered first. This would remove the surface and subsurface vadose zone soils contaminated with PCBs, metals and flouride above the SCGs.

The top five feet of the lagoon soils (approximately 1813 cubic yards (cy)), is expected to have PCB concentrations greater than 50 ppm and cadmium concentrations significantly above standards. This material would be transported to a Resource Conservation and Recovery Act (RCRA) permitted facility approved to take Toxic Substances and Control Act (TSCA) hazardous waste. The waste would be treated for cadmium toxicity hazardous waste characteristics and, ultimately, disposed. The remaining nine feet of lagoon soils (approximately) is expected to have PCB concentrations less than 50 ppm. These soils would be excavated, transported off-site and

disposed of at a RCRA permitted facility for treatment and disposal of cadmium toxicity characteristic hazardous waste.

Excavation would be discontinued at the groundwater table and, therefore, it is anticipated that minimal dewatering would be necessary. However, any water collected during excavation would be treated as necessary with either an on-site waste water treatment system or at an off-site treatment facility.

The excavated area would then be backfilled with clean fill (approximately 11,000 cy) to the existing grade of the surrounding areas. Monitoring of the groundwater would be performed for an estimated five years to ensure that no residual source of groundwater contamination in the unsaturated zone would be left on site.

Present Worth:	$2,936,000
Capital Cost:	$2,918,000
Annual O&M:	$0
Time to Implement	10 weeks

Alternative 2: Partial Excavation (Top Foot), Disposal, Geomembrane Liner/Asphalt Cap, Institutional Controls, and Long-Term Monitoring

To remove the most highly contaminated PCB and cadmium contaminated soils, the first foot of the lagoon soils (approximately 363 cy) would be excavated and disposed of at an off-site TSCA/RCRA permitted facility. Excavation would be above the groundwater table and, therefore, minimal dewatering would be necessary. The excavated area would be backfilled with clean fill. A geomembrane liner/asphalt cap would be constructed to the existing grade to prevent precipitation infiltration and migration of the contaminants down to the groundwater table. Because contaminated soils would be left untreated on-site, institutional controls would be implemented which would include deed restrictions to be recorded in the chain of title of the property to restrict the future use of the site to industrial use only, mandate the maintenance of the cap, and require notification to the NYSDEC when excavation of the capped area is planned. Because un-treated hazardous waste would be left on-site under the geomembrane liner/asphalt cap, a long-term groundwater monitoring program would necessary.

Present Worth:	$ 709,000
Capital Cost:	$ 646,000
Annual O&M:	$ 4,100
Time to Implement	8 weeks

Alternative 3: Partial Excavation (Top 3 to 4 Feet), Disposal, Geomembrane Liner/Asphalt Cap, Institutional Controls, and Long-Term Monitoring

To remove the majority of the high PCB and cadmium contaminated soils, the first three to four feet of the lagoon soils would be excavated and disposed of at an off-site TSCA/RCRA permitted facility. Excavation would be discontinued significantly above the groundwater table and, therefore, minimal dewatering would be necessary. The excavated area would then be backfilled with clean fill. A geomembrane liner/asphalt cap would be constructed to the existing grade to prevent precipitation infiltration and migration of the contaminants down to the groundwater table. Because contaminated soils would be left untreated on-site, institutional controls would

be implemented which would include deed restrictions to be recorded in the chain of title of the property to restrict the future use of the site to industrial use only, mandate the maintenance of the asphalt cap, and require notification to the NYSDEC when excavation of the capped area is planned. Because untreated hazardous waste would be left on-site under the geomembrane liner/asphalt cap, a long-term groundwater monitoring program would necessary.

Present Worth:	$ 1,133,000
Capital Cost:	$ 1,070,000
Annual O&M:	$ 4,100
Time to Implement	8 weeks

Alternative 4: Excavate (Top 6 to 8 Feet), Disposal, Stabilization, Geomembrane Liner/Asphalt Cap, Institutional Controls, and Long-Term Monitoring

In this alternative, the first six to eight feet of the lagoon soils would be excavated and disposed of at an off-site TSCA/RCRA permitted facility. The remaining lagoon soils would then be excavated to a depth of 14 feet or groundwater table, whichever is encountered first, and stabilized on-site with trisodium phosphate to transform the metal constituents into insoluble metal phosphate compounds. Several feet of clean fill would be placed in the lagoon excavation to provide a buffer between the fluctuations in the groundwater table and the treated soil that would subsequently be placed back into the lagoon. The excavated area would be backfilled with clean fill to the existing grade of the surrounding areas and a geomembrane liner/asphalt cap would be installed over the area to prevent precipitation infiltration.

Bench scale and pilot scale treatability studies would be required to determine the dosing rate and long-term effectiveness of the trisodium phosphate technology on the site specific soils. If trisodium phosphate does not prove to be effective, a more conventional stabilizing agent such as fly ash or lime kiln dust may be chosen for use.

Institutional controls would be implemented, which would include deed restrictions to be recorded in the chain of title of the property to restrict the future use of the site to industrial use only, mandate the maintenance of the asphalt cap, and require notification of the NYSDEC when excavation of the capped area is planned to ensure that the ex-situ stabilized soils that were placed below the cap remain undisturbed. In addition, a long-term groundwater monitoring program would also be conducted.

Present Worth:	$2,360,000
Capital Cost:	$2,297,000
Annual O&M:	$4,100
Time to Implement	12 weeks

7.2 Evaluation of Remedial Alternatives

The criteria used to compare the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6 NYCRR Part 375). For each of the criteria, a brief description is provided, followed by an evaluation of the alternatives against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is included in the Feasibility Study.

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

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

The relevant SCGs for soil at the C&D site are the NYSDEC recommended soil cleanup objectives (RSCO). These values are defined in TAGM 4046 and are determined based on direct human exposures, the protection of groundwater and background levels. Groundwater protection is necessary to protect human health via consumption of the affected aquifer and to protect the surface water quality of the tributary to the Neversink River. Other applicable criteria are regulations promulgated under the Clean Water Act, RCRA and TSCA.

The No Action Alternative would not meet the standards and guidance values for soil cleanup and therefore would not be expected to achieve groundwater and surface water quality standards.

Alternative 1 would meet the NYSDEC soil cleanup objectives and the TSCA cleanup standards for PCB cleanups . Alternative 2 would leave untreated soil on site which would neither meet the SCGs nor the TSCA standards for PCB cleanups. Alternative 3 would not meet the applicable SCGs but it would meet the TSCA standards for PCB cleanups. These two alternatives, Alternative 2 and Alternative 3 would remove soil most heavily contaminated with cadmium, fluoride and PCBs, however it would leave subsurface soils that are well above the applicable SCGs. Alternative 4, which calls for the excavation of the top six to eight feet of the lagoons soils and the ex-situ stabilization of the remaining unsaturated soils, does not leave any untreated soils left on-site and therefore would meet the SCGs.

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

The No Action Alternative would provide no additional protection of public health or the environment. The remaining alternatives would effectively prevent direct human contact with contaminated soils. However, these alternatives differ in the degree of environmental protection they provide.

Alternatives 2 and 3 would prevent rain infiltration with the geomembrane liner/asphalt cap but would leave significant amounts of untreated hazardous waste on site. Alternative 4, Partial Excavation and Ex-situ Stabilization, would effectively render the soil contaminants immobile, eliminating the migration of contaminants, providing a greater degree of environmental protection. Because excavation and off-site disposal (Alternative 1) would eliminate all sources of contamination in the vadose zone, Alternative 1 provides the greatest degree of overall environmental protection. However, none of the soil alternatives would address the soil contamination in the saturated zone, which will be addressed as part of the on-site groundwater under OU2.

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

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

The No Action Alternative would have no short term impact on human health and the environment.
Each of the alternatives involve some excavation, each varying in depth. The alternatives with the least amount of short term impacts would be Alternatives 2 and 3, due to a relatively smaller amount of soil that would be excavated and the shorter duration of construction. Alternatives 1 and 4 would have a greater amount of short term impact due to the larger amount of soil to be excavated and the longer construction duration.

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

The No Action Alternative would provide no long term effectiveness in providing environmental or human health protection.

Alternatives 1 and 4 provide the most long-term effectiveness by eliminating or minimizing long-term residual risks since all the overburden soils with concentrations above the SCGs would be either permanently removed and transported off site for disposal or permanently stabilized and rendered immobile. Alternatives 2 and 3 would provide a lesser degree of long-term effectiveness. The potential for direct contact would be decreased but a potential source of groundwater contamination would be left on site.

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

The No Action Alternative would not reduce the mobility, toxicity, or volume of contaminated soil because the contaminants would remain in the ground and would continue to leach into the groundwater.

Alternative 1, Excavation and Disposal, provides the greatest reduction in contaminant volume, toxicity and mobility by excavating contaminated soil for off-site treatment and disposal. Alternatives 2 and 3 would reduce the toxicity and volume of the contaminated material, but significant quantities of untreated contaminant concentrations would be left on site. However, Alternatives 2 and 3 would reduce the mobility by reducing precipitation infiltration with the geomembrane liner/asphalt cap. Alternative 4, which calls for the off-site treatment and disposal of the top six to eight feet of soils, and stabilization of soils at eight to fourteen feet depth would effectively reduce the mobility of the contaminated material.

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

The No Action Alternative would be the most readily implementable since no construction or operation is necessary.

Each of the other alternatives calls for and varies in the degree of excavation of contaminated soil. Alternative 2, which calls for the least amount of excavation (only the top foot of the lagoon), would be the most implementable. Alternative 3 involves the excavation of the first three to four feet of the lagoon and would provide a high degree of implementability. Alternative 1 involves the excavation and disposal of all the contaminated material and would be implementable. Alternative 4, would require excavation and ex-situ stabilization along with bench scale and pilot scale treatability studies to determine the effectiveness of the stabilizing agent trisodium phosphate. Therefore Alternative 4 would be more difficult to implement.

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

The No Action Alternative would require no additional capital cost, or operation and maintenance cost.

Alternative 1, Excavation and Disposal, is the highest cost alternative under consideration. Alternative 2, (Excavation of Top Foot) would require a relatively low cost to implement. Alternative 3, (Excavation of Top Three to Four Feet), has a somewhat higher cost than Alternative 2 associated with the additional contaminated soils to be excavated for off-site treatment and disposal. Alternative 4, Ex-situ Stabilization, would have a higher cost than Alternatives 2 or 3 to implement but would be more cost effective than Alternative 1.

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

SECTION 8: SUMMARY OF THE PROPOSED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is proposing Alternative 4 (Partial Excavation and Ex-situ Stabilization) as the remedy for OU1 of this site. Alternative 4, Partial Excavation And Ex-situ Stabilization, includes the excavation and removal of the most highly contaminated soils of the lagoon

soils to a depth of 6 to 8 feet to and ex-situ stabilization of the soils from a depth of 8 to 14 feet to address the metal and PCB soil contamination at the source area.

The remedy selection is based on the greater degree of environmental protection, permanence, long-term effectiveness, cost effectiveness and reduction of mobility that partial excavation and ex-situ stabilization would provide. Although partial excavation and ex-situ stabilization would be more difficult to implement, require a bench scale and pilot study program and would create increased short-term exposure risks, these criteria are offset by the greater overall protection of public health and the environment, long-term effectiveness and cost effectiveness. In summary, Alternative 4 appears to be a protective and cost-effective alternative.

The above remedy selection is the preferred remedy for this site and compared favorably to the other alternatives.

The No Action Alternative would provide no environmental protection and is not expected to attain SCGs.

Alternatives 2 and 3 would provide some environmental protection, but would not attain SCGs. Although Alternative 1, Excavation and Disposal, provides the greatest environmental protection, it is also the least cost effective alternative.

The estimated present worth cost to implement the proposed remedy is $2,360,000. The cost to construct the remedy is estimated to be $2,297,000 and the estimated average annual operation and maintenance cost for 30 years is $4,100.

The elements of the proposed remedy are as follows:

1. A remedial design program including bench scale and pilot study programs, to provide the details necessary for the construction, operation and maintenance, and monitoring of the remedial program;

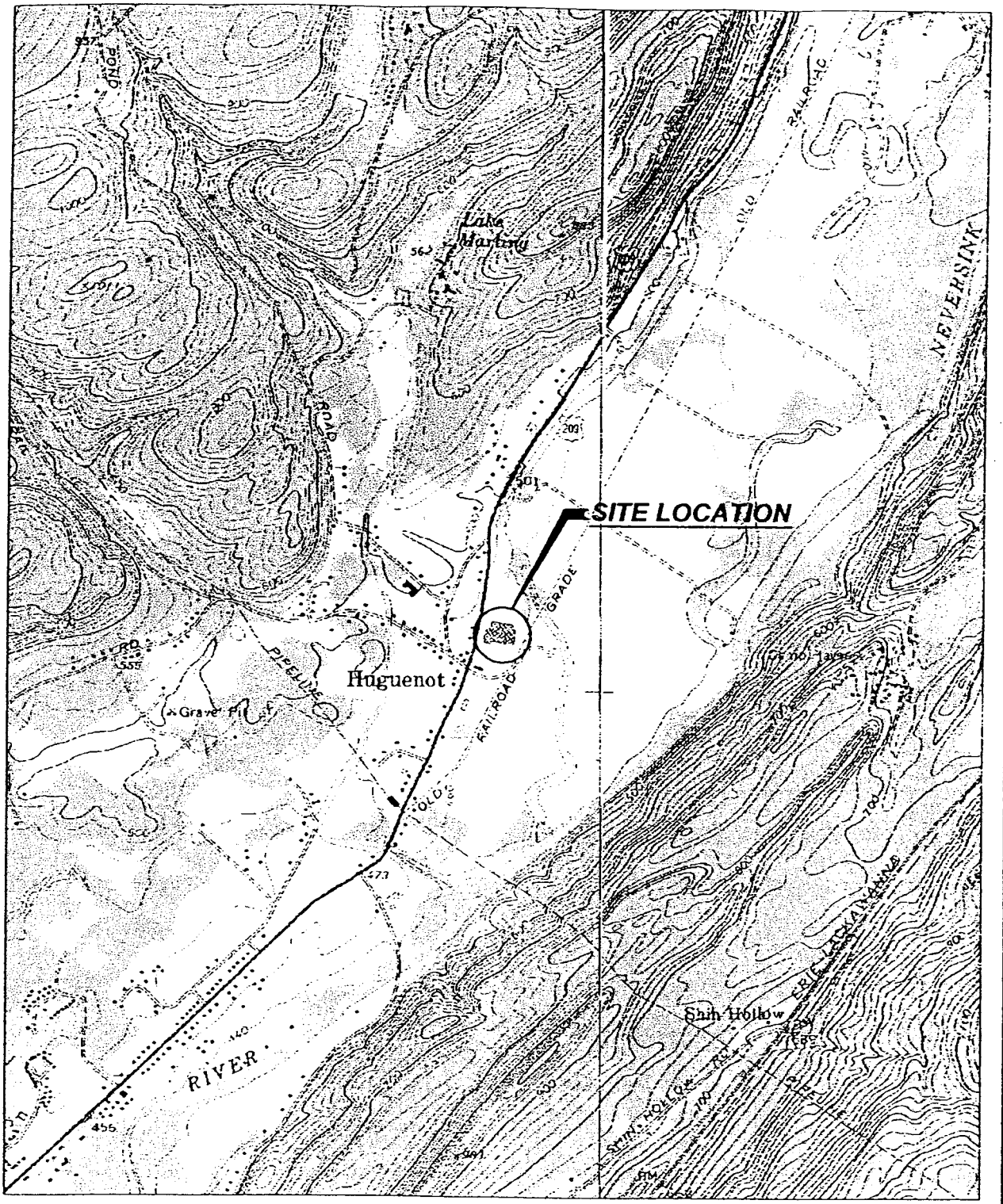
2. Excavation of lagoon soils to a depth of six to eight feet, with transportation off-site for treatment and disposal. Excavation of remaining lagoon soils to a depth of 14 feet or groundwater table, whichever is encountered first, and on-site stabilization. Placement of several feet of clean fill in the lagoon excavation to provide a buffer from the fluctuations in the groundwater. Replacement of stabilized soils back into the lagoon excavation, backfill with clean fill to the existing grade of the surrounding areas, and geomembrane liner/asphalt cover;

3. Implementation of a long-term monitoring program to monitor the effectiveness of the on-site stabilization;

4. Institutional controls in the form of deed restrictions to be recorded in the chain of title of the property to restrict the future use of the site to industrial use only, mandate the maintenance of the cap, and require notification to the NYSDEC when excavation of the capped area is planned; and

5. Annual certification by the property owner to the NYSDEC that the site is in compliance with the institutional controls outlined in this PRAP.

FIGURES



MAP REFERENCE:
PORT JERVIS NORTH & OTISVILLE
USGS QUAD MAPPING

0' 1000' 2000'

FIGURE 1

DELAWARE ENGINEERING, P.C.
28 Madison Avenue Extension
Albany, New York 12203
Phone 518-452-1290
FAX 518-452-1335

SITE LOCATION MAP

C & D TECHNOLOGIES
NYS ROUTE 209
HUGUENOT, NEW YORK

MAY 26, 00

SPRING
SED-1
SED-2
SED-3
SED-4
STREAM
Cooling Water Outlet
Slatkway
8" Pipe
ABANDONED RAILROAD BED
MW-6
EL. 443.58
MW-7
EL. 444.55
MW-8
EL. 443.59
Cooling Water Line Cleanout
MW-9
EL. 443.42
MW-10
EL. 443.35
PINE TREE GROVE
WOODED AREA
OPEN AREA
ASPHALT DRIVEWAY
ASPHALT PARKING LOT
MW-13
EL. 445.82
MW-12
MW-11
SS-UP-02
SS-UP-01
LOADING RAMP
ASPHALT PARKING LOT
MASONRY FACTORY BUILDING
FIRE HYDRANT
MW-1
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP10
SB-1
SB-2
SB-3
SB-4
SB-5
SB-6
RR-SS-0
443
444
445
445.5

LEGEND

- = SOIL BORING
- = SOIL SAMPLE
- = TEST PIT
- = MONITORING WELL
- = FIRE HYDRANT
- = FENCE POST
- = CHAIN LINK FENCE
- = 1ST FLOOR ELEVATION
- = EDGE OF PAVEMENT
- = TREE LINE
- = CONTOUR LINE
- = INDEX CONTOUR LINE
- 465 = ELEVATION
- 443 = GROUNDWATER CONTOUR & ELEVATION
- = INFERRED GROUNDWATER CONTOUR
- = PHOTO LOCATION

GRAPHIC SCALE

100' 0 50' 100' 200' 400'

(IN FEET)
1 inch = 100' ft.

FIGURE 2

DELAWARE ENGINEERING, P.C.
28 Madison Avenue Extension
Albany, New York 12203
Phone 518-452-1290
FAX 518-452-1335

SITE AT
C & D TECHNOLOGIES
NYS ROUTE 209
HUGUENOT, NEW YORK

MAY 22, 2000

Table 1
Nature and Extent of Contamination
Dates of Sampling: August 1999, September 1999, January 2000 and March 2000

MEDIUM	CATEGORY	CONTAMINANT OF CONCERN	CONCENTRATION RANGE	FREQUENCY of EXCEEDING SCGs	SCG
Soils (ppm)	Inorganic Compounds	Barium	128 to 7,710	48 of 53	300
		Cadmium	1.2 to 46,200	24 of 24	1/10
		Chromium	180 to 230	2 of 2	10/50
		Copper	184 to 304	2 of 2	25
		Lead	8.4 to 13,000	38 of 59	305
		Mercury	0.18 to 1.60	2 of 2	0.1
		Silver	1.3 to 14.4	2 of 2	0.1
		Zinc	3,250 to 106,000	2 of 2	20
	Polychlorinated Biphenyls (PCBs)	Aroclor 1254	ND (1) to 1,100	26 of 37	1 (surf) 10 (sub-surface)
Sediment (ppm)	Inorganic Compounds	Barium	15.6 to 90.1	NA	NA
		Fluoride	17.74 to 53.9	NA	NA
		Lead	10.6 to 195	3 of 5	31 (LEL)
		Lead	10.6 to 195	1 of 5	110(SEL)
Groundwater (ppb)	Inorganic Compounds	Fluoride	ND (.001) to 10,800	11 of 17	1,500
		Lead	ND (3.0) to 29.4	1 of 18	25
	Polychlorinated Biphenyls (PCBs)	Aroclor 1254	ND (.050) to 0.24	1 of 10	0.09

LEL - Lower Effects Level (NYSDEC Guidance Value)
SEL - Severe Effects Level (NYSDEC Guidance Value)
NA - Not Available
ND - Non-detect
* Sediment was sampled on September 1999 only

Table 2
Remedial Alternative Costs

Remedial Alternative	Capital Cost	Annual O&M	Total Present Worth
No Action •	$0	$0	$0
Alternative 1 - Excavation and Disposal	$2,918,000	$0	$2,936,000
Alternative 2 - Partial Excavation (Top Foot), Disposal, Geomembrane Liner/Asphalt Cap, Institutional Controls, and Long-Term Monitoring	$646,000	$4,100	$709,000
Alternative 3 - Partial Excavation (Top 3 to 4 Feet), Disposal, Geomembrane Liner/Asphalt Cap, Institutional Controls, and Long-Term Monitoring	$1,070,000	$4,100	$1,133,000
Alternative 4 - Excavate (Top 6 to 8 Feet), Disposal, Ex-Situ Stabilization, Geomembrane Liner/Asphalt Cap, Institutional Controls, and Long-Term Monitoring	$2,297,000	$4,100	$2,360,000