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PRELIMINARY CLOSE OUT REPORT

New Hampshire Plating Company Superfund Site
Merrimack, New Hampshire

September 2006

I. INTRODUCTION

This Preliminary Close Out Report (PCOR) documents the completion of all significant physical, remedial construction activities, which were completed by the U.S. Environmental Protection Agency Region I (EPA), at the New Hampshire Plating Company Superfund Site (the "Site"). The PCOR was prepared in accordance with *Close Out Procedures for National Priorities List Sites* (OSWER Directive 9320.2-09A-P). EPA and the State of New Hampshire conducted a pre-final inspection on September 27, 2006, and other than minor "punch list" items, no outstanding construction items were identified.

II. SUMMARY OF SITE CONDITIONS

Background

The New Hampshire Plating Company Superfund Site is a thirteen-acre former electroplating facility located in Merrimack, New Hampshire. The Site is surrounded primarily by industrial and commercial properties to the north and east, undeveloped property to the south, and commercial and residential properties to the west. The Merrimack River is located less than 500 feet to the east. Figure 1 shows the Site and surrounding areas.

The New Hampshire Plating Company operated as an electroplating facility from 1962 to 1985. During the course of operations, the facility discharged electroplating wastes to a series of four lagoons, contaminating soil and groundwater with a variety of metals (arsenic, cadmium, chromium, lead, manganese, and nickel), cyanide, and a variety of chlorinated organic solvents including trichloroethylene (TCE) and tetrachloroethylene (PCE). The lagoon system was constructed to allow the facility to discharge electroplating wastes into a primary infiltration lagoon (Lagoon 1) with the overflow from the primary lagoon going to a secondary lagoon (Lagoon 2). Two additional overflow lagoons (Lagoons 3 and 4) were utilized during periods of high discharge from the facility. The facility reportedly discontinued the use of chlorinated solvents for de-greasing operations in the late 1970s.

In September 1998, the Site was listed on the National Priorities List (NPL). The Site consists of a single operable unit (OU).

Removal Action Activities

In June 1987, the New Hampshire Department of Environmental Services (NHDES) initiated interim response measures at the Site that included treating sludge and process wastewaters in Lagoon 1 with approximately 127 tons of lime and 800 gallons of sodium hypochlorite solution to stabilize the waste materials. The Site was subsequently referred to EPA.

In October 1989, EPA initiated a time-critical removal action to excavate, stabilize, and store contaminated sludge and soil in an on-Site solidified materials storage cell. This activity involved mixing contaminated sludge and soil with an ash/mortar/cement mixture and encapsulating the material in a high density polyethylene (HDPE)-covered storage cell. The storage cell was approximately 6,300 cubic yards (yd³) in size. A soil cover, made up of

approximately 4,400 yd³ of clean fill from an off-Site source, was placed over the storage cell. Other activities conducted by EPA included the off-site disposal of approximately 5,000 tons of soils to a secure landfill and the consolidation of approximately 5,600 yd³ of contaminated soils from the overflow lagoon areas in Lagoon 1 under an HDPE cover.

In 1994, EPA conducted a non-time critical removal action to demolish and remove the former electroplating building and an underground storage tank from the property.

Enforcement Actions

In 1989, EPA initiated cost recovery activities during the initial removal actions. The New Hampshire Plating Company ceased operations and filed their last known tax return in 1985. In 1991, the business was dissolved and no known assets were identified. EPA determined that the only potentially responsible parties (PRPs) were the former owner/operators; however, a cost recovery case was determined to be not viable because the PRPs were insolvent and did not have the financial ability to contribute significantly to past or future expenditures. The decision not to pursue costs was documented in a Cost-Recovery Closeout Memorandum dated December 30, 1996.

Remedial Construction Activities

The September 1998 Record of Decision (ROD) set forth the selected source control and groundwater restoration remedy for the entire Site. The ROD called for on-Site treatment of metals-contaminated soils by chemical fixation, natural attenuation of contaminated groundwater in the overburden aquifers, and institutional controls to allow for acceptable re-development and prevent future ingestion of contaminated groundwater.

A remedial design (RD) of the cleanup approach specified in the ROD, including a pilot study of the chemical fixation process, was completed in December 2002. Initiation of soil cleanup activities began in December 2004. In the future, a long term groundwater monitoring program and a New Hampshire groundwater management zone (GMZ) will be established as part of the natural attenuation remedy specified in the ROD.

At the New Hampshire Plating Company Site, the soil treatment of metals-contaminated soils via chemical fixation has been completed along with other critical remedial construction activities. Specifically, completed remedial components of the selected remedy include:

- Treatment of approximately 95,000 tons of metals-contaminated soils by chemical fixation to prevent the leaching of metal contaminants to groundwater above the interim groundwater cleanup levels identified in the ROD;
- Consolidation and backfilling of treated soils within former lagoon areas 1 and 2;
- Grading and compaction of all treated soils to assure that flood-storage capacity is maintained;

- Evaluation of the on-Site solidified materials storage cell and compliance with substantive RCRA delisting requirements for this material;
- Testing and crushing of the on-Site solidified materials storage cell and placing it with the treated soils within the former lagoon areas;
- Mitigation of unavoidable impacts to on-Site wetlands through the purchase and preservation of the Grassy Pond area in Litchfield, NH and the Green's Pond wetland area in the Town of Merrimack, NH.

With the completion of all soil treatment activities, metals-contaminated soils have been rendered non-leachable, and none of the minor punch list items identified during the September 27, 2006 pre-final inspection effect the functioning of the remedy. The minor punch list items that remain to be completed in Fall 2006 include:

- Completing the placement of two feet of clean cover soil over the treated soils to provide added certainty that potential risks to ecological receptors have been mitigated beyond the reduction in metals bioavailability indicated by the confirmed reduction in metals leachability and solubility documented by EPA's remedial contractor;
- Final grading of the clean cover soil to assure that flood-storage capacity is maintained;
- Vegetating the clean cover soil to provide for erosion control of the clean cover soil and the underlying backfilled treated soils;
- Installing replacement monitoring wells to create a network of wells suitable for long-term groundwater monitoring;
- Repairing and replacing portions of the existing chain-link fence that surrounds the Site; and
- Physical demobilization of all construction and support equipment.

It is anticipated that completion of the above minor punch list activities and final demobilization will occur by December 2006.

Additional remedial components of the selected remedy to be completed after final demobilization include:

- Restoration of contaminated groundwater in the shallow and deep overburden aquifers by monitored natural attenuation (MNA);
- Establishment of a Groundwater Management Zone (GMZ) and a groundwater monitoring network within the GMZ consistent with New Hampshire's Groundwater Management Zone program (Attached Figure 5 from the ROD depicts the proposed GMZ);

- Establishing institutional controls that restrict the use of contaminated groundwater for drinking water purposes until groundwater cleanup levels are achieved and to limit land use to activities that do not result in excavation below the soil cover; and
- Review of the remedy at least once every five years after the initiation of remedial action at the Site since hazardous substances, pollutants, or contaminants will remain at the Site, as required by law.

The ROD also specifies interim groundwater cleanup levels, which are included in an attachment to the PCOR. When the interim groundwater cleanup levels have been achieved and have not been exceeded for a period of three consecutive years, a risk assessment will be performed on the residual groundwater contamination to determine whether the remedial action is protective. If, after review of the risk assessment, the remedial action is determined to be protective, a final decision document will be prepared to finalize the groundwater cleanup levels for the Site.

The remedial action selected for implementation at the New Hampshire Plating Company Site is consistent with CERCLA and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300 *et seq.*, as amended. The selected remedy is protective of human health and the environment, will comply with all applicable or relevant and appropriate requirements (ARARs), and is cost effective.

Redevelopment Potential

The New Hampshire Plating Company Site is comprised of two parcels which are currently undeveloped, but zoned for commercial use. The Site is surrounded primarily by commercial properties. The Site property has been owned by the former owners of the defunct New Hampshire Plating Company; however, the property is essentially orphaned as the former business is long since dissolved, one of the owners is not locatable, and the other owner is deceased with heirs not willing to accept the property interest. In the meanwhile, the property has accrued significant local property tax arrearages. The Town of Merrimack conducted a public reuse planning process for the Site with a \$99,050 Superfund Redevelopment Initiative Pilot grant provided by EPA in 2000, and the Town has expressed a potential interest in acquiring the property through tax foreclosure for recreational use that might include soccer or baseball fields. Since then, EPA and NHDES have held several meetings with town officials to discuss environmental and long term monitoring issues pertaining to the Site should they acquire and reuse the property in the future.

As a practical matter, uses that require the construction of buildings or other significant structures would be limited due to the institutional controls that will be placed on the Site to protect the soil cover and limit land use to activities that do not result in excavation below the soil cover. As such, recreational use comprised of playing fields could be compatible with the Site.

III DEMONSTRATION OF CLEANUP ACTIVITY QUALITY ASSURANCE AND QUALITY CONTROL

EPA reviewed the remedial technical specifications and construction plans for compliance with quality assurance and quality control (QA/QC) protocols. Construction activities at the Site were determined to be consistent with the ROD, the remedial design plans and specifications, and the remedial action technical specifications issued as part of the remedial action subcontract.

The construction contractor adhered to an approved construction quality assurance plan (CQAP). The CQAP incorporated all EPA and State requirements. All confirmatory inspections, independent testing, audits, and evaluations of materials and workmanship were performed in accordance with the construction drawings, technical specifications, and CQAP. Construction quality assurance was performed by the EPA remedial action contractor. The EPA RPM and State project manager visited the Site approximately weekly during construction activities to review and oversee construction progress and evaluate and review QA/QC results and activities. Deviations or non-adherence to QA/QC protocols, drawings, or specifications were properly documented and resolved.

A Quality Assurance Project Plan (QAPP), which was prepared by the EPA remedial action contractor and approved by EPA, incorporated all EPA and State QA/QC procedures and protocols. Appropriate sampling and analytical methods were used for all confirmation and monitoring samples during remedial action activities. EPA has determined that all analytical results are accurate to the degree needed to assure the satisfactory performance of the remedial action.

IV ACTIVITIES AND SCHEDULE FOR SITE COMPLETION

Remaining activities scheduled for the Site include the completion of the minor punch list items previously noted, establishment of a GMZ and a long-term environmental monitoring program within the GMZ, and the implementation of additional institutional controls within the GMZ. It is estimated that interim groundwater cleanup levels will be attained throughout the designated GMZ area within 26 to 58 years.

It is estimated that all remedial activities will be completed according to the schedule below:

Schedule for Site Completion

Task	Estimated Date	Responsible Organization
Final Contract Site Inspection	November 2006	EPA/NHDES
Operational and Functional Determination	September 2007	EPA/NHDES
Interim Remedial Action Report	September 2007	EPA
Long-Term Remedial Action Start	September 2007	EPA
First Statutory Five-Year Review	December 2009	EPA
Implementation of Institutional Controls ¹	September 2010	EPA/NHDES
Long-Term Remedial Action Completion	September 2017	EPA
Operations and Maintenance Start	September 2017	NHDES
Operations and Maintenance Completion	September 2032	NHDES
Final Groundwater Cleanup Level Decision Document	September 2032	EPA
Final Site Inspection ²	September 2032	EPA
Final Close Out/Final Remedial Action Report ²	September 2032	EPA
NPL Site Deletion ²	September 2032	EPA

Note: The initiation of remedial action, December 20, 2004, was documented in an EPA memo to the project file.

¹Planned institutional controls consist of designating a New Hampshire Groundwater Management Zone (GMZ) and land use restrictions.

²The Final Site Inspection and Final Close Out/Final Remedial Action Report are contingent on the Site being eligible for NPL site deletion. At a minimum, it is estimated that groundwater cleanup levels will be achieved 26 years after the completion of source control measures (2006 + 26 years = 2032).

All preliminary completion requirements for the Site have been met as specified in OSWER Directive 9320.2-09A-P. Specifically, a pre-final inspection was conducted by EPA and the State of New Hampshire which verifies that all significant physical construction activities integral to the remedial action have been completed. Each component of the remedial action was inspected, and no further significant construction activities, other than minor punch list items that do not effect the functioning of the remedy, are required.

V. SUMMARY OF REMEDIATION COSTS

The extramural construction costs of the remedial action are approximately \$13.1 million.

The overall costs of the selected remedy are summarized below:

Estimated Remedial Action Costs for New Hampshire Plating Company Superfund Site

Cost Item	Cost	Comments
Capital Cost	\$13,100,000	Chemical fixation treatment of approximately 95,000 tons of metals-contaminated soils, backfilling of treated soils, and soil cover construction.
Wetland Compensation Cost	\$1,631,000	Two wetlands areas were purchased in 1998 and 2002 to offset loss of on-Site wetlands.
Net Present Worth of O&M Costs	\$319,350	Environmental monitoring for 10 years, maintenance of soil cover, and 5 year reviews
Total Net Present Worth Cost	\$15,050,350	

O&M = Operations and Maintenance.

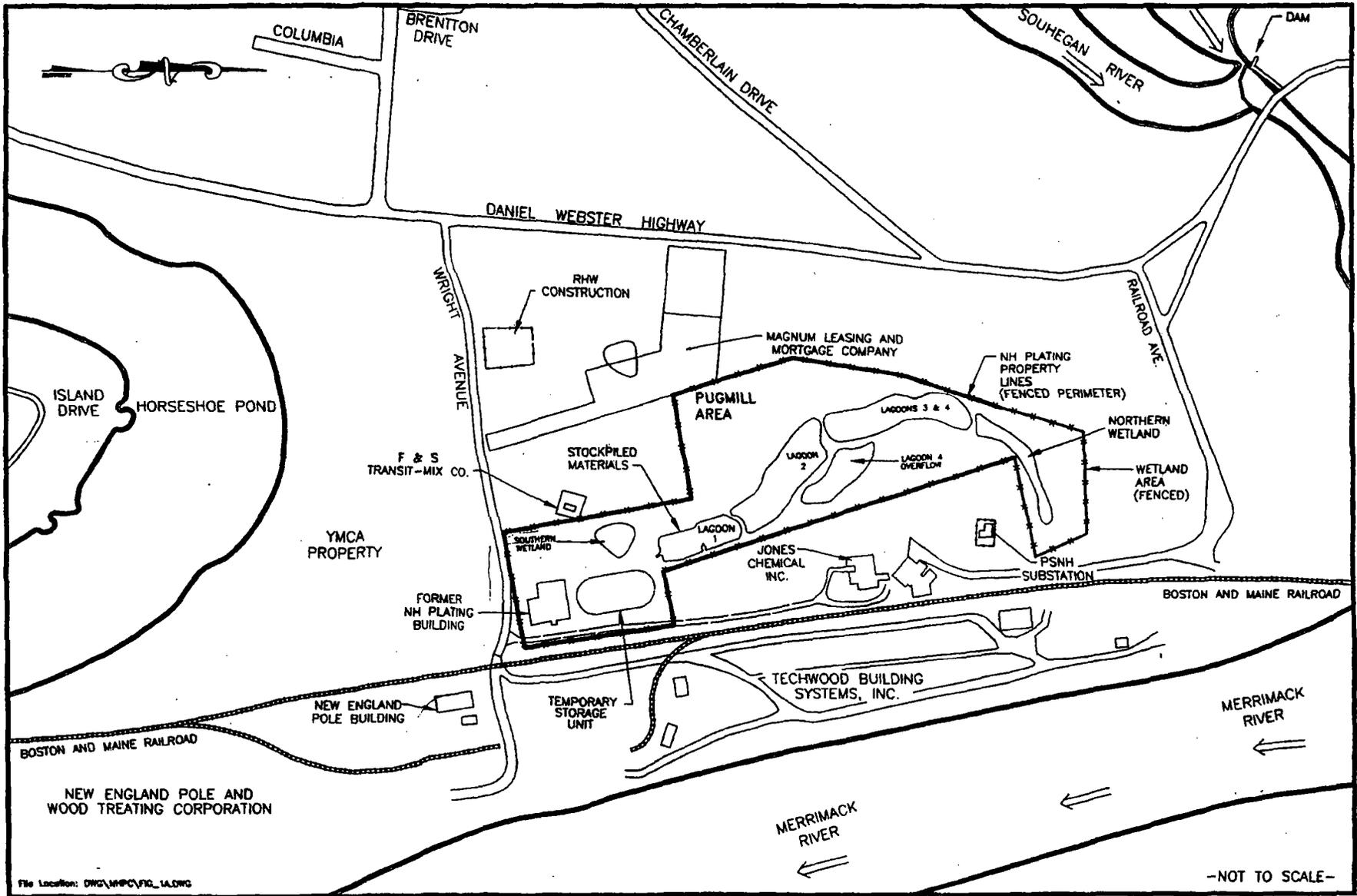
VI. FIVE-YEAR REVIEW

Upon completion of this remedy, hazardous substances, pollutants, contaminants will remain at the Site above levels that allow unlimited use and unrestricted exposure. Pursuant to CERCLA §121(c) and as provided in the current guidance on Five-Year Reviews (OSWER Directive 9355.7-03B-P, June 2001), EPA must conduct a statutory five-year review. The initial Five-Year Review Report will be completed in December 2009.

Susan Studlien
Susan Studlien, Director
Office of Site Remediation and Restoration

09/28/06
Date

NEW HAMPSHIRE PLATING COMPANY SITE MERRIMACK, NEW HAMPSHIRE



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New Hampshire Plating Company Site

File Location: DWG\MHPC\FIG_14.DWG

SOIL CLEANUP LEVELS
NEW HAMPSHIRE PLATING COMPANY SITE, MERRIMACK, NH
units: (mg/kg)

Contaminant of Concern	Protection of Groundwater [edge of waste] (1)				
	NHPC Bldg.	Lagoon 1 & S. Wetland	Lagoon 2	Lagoons 3 & 4	N. Wetland
Arsenic	84.2	148	196	115	121
Beryllium	--	--	--	--	--
Cadmium	3.3	6.42	2.55	2.42	1.78
Chromium	212000	114000	141000	145000	102000
Cyanide (2)	26000	26000	26000	26000	26000
Lead	50.5	96.4	53.8	43.2	35.9
Manganese	61.7	118	66.9	54.2	44.1
Nickel	262	510	177	181	126

Contaminant of Concern	Human Health (3)		Environmental Receptors			Background	CRDL	Detected Site Concentration		
	Indust.	Resid.	Shrew	Robin	Heron	(4)	(5)	Average	Maximum	Frequency
Arsenic	5.4	0.9	--	--	--	6.3	2	5.3	11.5	80/81
Beryllium	2.2	1.3	--	--	--	0.96	1	0.71	1.4	81/81
Cadmium	140	108	5.6	12.4	14.5	BD	1	162.4	1277	413/772
Chromium	--	--	--	--	--	16.2+	2	119.6	403	110/402
Cyanide	--	--	--	--	--	BD		41.73	509	46/74
Lead	--	--	--	--	--	BD	0.6	84.3	3742	95/403
Manganese	--	--	--	--	--	215.0	3	128	309	69/81
Nickel	--	--	--	--	--	10.0	8	50.8	214	90/402

NOTES:

(1) Soil concentration estimated by groundwater modeling, if leached, would result in MCL or health-based limit in groundwater at each source area's eastern edge.

(2) CN soil concentration estimated based on soil-water partitioning, only. Attenuation and transport not taken into consideration.

(3) Included for comparison purposes.

(4) Inorganics concentrations identified in background surficial soil location BKG-C6.

(5) EPA Contract Required Detection Limit (metals).

BOLD italics font indicates final remediation goals which are based on Cadmium.

*Pure Product: pure contaminant at source will not produce a contaminant conc. exceeding exposure criteria at the exposure point.

+ Background and CRDL concentrations for total chromium.

-- Not a COC, PRG not developed for this contaminant.

NA Not analyzed.

BD Below analytical method detection limit (ICP Metals Analysis).

INTERIM GROUNDWATER CLEANUP LEVELS
NEW HAMPSHIRE PLATING COMPANY SITE, MERRIMACK, NH
units: (ug/L)

Contaminant of Concern	Human Health Risk		ARARs		Background Conc. (1)	CRDL/CRQL (2)
	Carcinogen (1.0E-06)	Toxicant (HI=1.0)	Federal MCL	State AGQS		
Arsenic	0.05	11	50	50	5.0	10
Cadmium	NA	18	5	5	ND	5
Chromium	NA	37,000	100	100	ND	10
Cyanide	NA	730	200	200	ND	10
Lead	NA	NA	15*	15	ND	3
Manganese	NA	180	--	--	51.0	15
Nickel	NA	730	100	100	21.0	40
1,1,1-Trichloroethane	NA	2,800	200	200	--	1
1,1-Dichloroethene	0.07	330	7	7	--	1
1,2-Dichloroethene	NA	330	70/100+	70/100+	--	1
1,2-Dichloroethane	0.20	28	5	5	--	1
Chloroform	0.28	370	100		--	1
Trichloroethene	2.50	220	5	5	--	1
Tetrachloroethene	1.40	370	5	5	--	1
Vinyl Chloride	0.03	NA	2	2	--	2

NOTES:

(1) Inorganics concentrations identified in background shallow groundwater sample location MW-210S

(2) EPA Contract Required Detection Limit (inorganics)/Quantitation Limit (organics)

Federal MCL: Safe Drinking Water Act Maximum Contaminant Level for drinking water

State AGQS: New Hampshire Ambient Groundwater Quality Standards

NA Not Applicable or Not Analyzed (in background column)

ND Not Detected

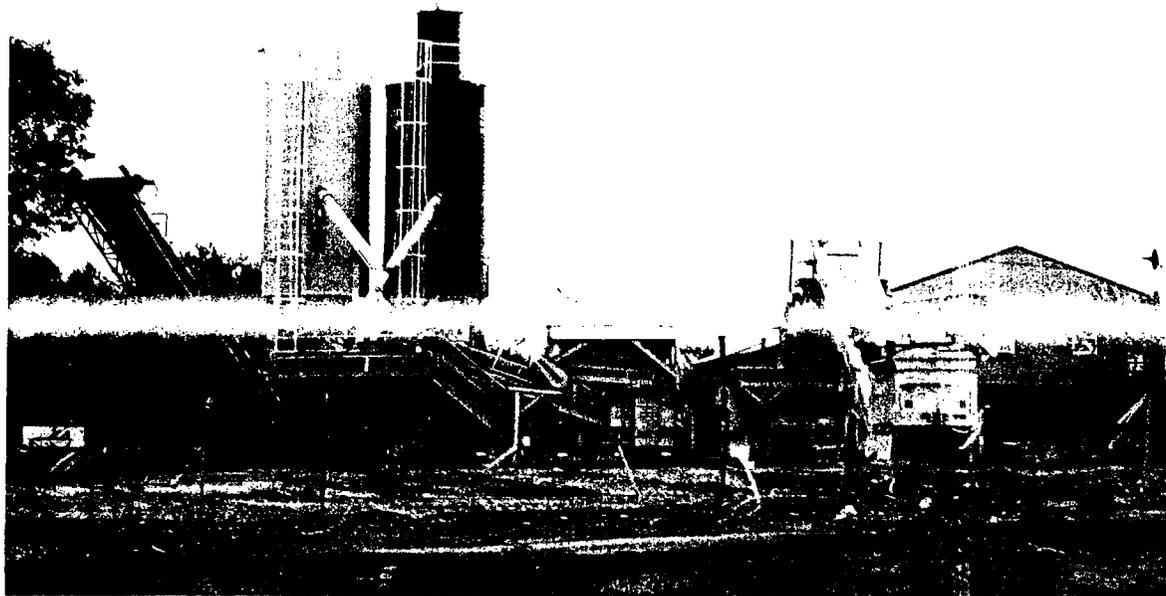
-- No PRG developed for this contaminant and PRG type

* Action Level

+ Cis-DCE=70/ Trans-DCE=100

Final cleanup levels are in BOLD italics font

Photograph No. 1 of the Soil Treatment System



Photograph No. 2 of Backfilled, Graded, and Compacted Treated Soils

