Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision
Cardwell Condenser Site
Lindenhurst, Suffolk County
Site Number 1-52-035

March 2002

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* ERIN M. CROTTY, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Cardwell Condenser Inactive Hazardous Waste Disposal Site
Lindenhurst, Suffolk County, New York
Site No. 152035

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedy for the Cardwell Condenser Class 2 inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law. The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Cardwell Condenser inactive hazardous waste disposal site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A listing of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site have been addressed by implementing the interim remedial measure identified in this ROD. The removal of contaminated soil from the site has significantly reduced the threat to public health and the environment. Therefore, a groundwater monitoring program will be implemented to monitor the effectiveness of previous remedial action in preventing further contamination of the groundwater.

Description of Selected Remedy

Based on the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Cardwell Condenser site and the criteria identified for evaluation of alternatives, the NYSDEC has selected no further action with continued groundwater monitoring. The components of the remedy are as follows:

- Continued semi-annual groundwater monitoring of monitoring wells MW-8, MW-9, MW-12 and MW-13 and one additional well, MW-14, to be installed immediately downgradient of leaching pool LP-1.

- Once an operation and maintenance program is in place, the NYSDEC will reclassify the site from a Class 2 to a Class 4, indicating the site is properly closed but requires continued management, on the New York State Registry of Inactive Hazardous Waste Disposal Sites.

New York State Department of Health Acceptance

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

Declaration

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

3/19/2002
Date

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

TABLE OF CONTENTS

RECORD OF DECISION

CARDWELL CONDENSER
Lindenhurst, Suffolk County, New York
Site No. 152035
March 2002

SECTION 1: SUMMARY OF THE RECORD OF DECISION

The New York State Department of Environmental Conservation (NYSDEC) in consultation with the New York State Department of Health (NYSDOH) has selected a remedy for the Cardwell Condenser site, a Class 2 inactive hazardous waste disposal site. As more fully described in Sections 3 and 4 of this document, discharge of process wastewater from plating operations into on-site leaching pools resulted in the disposal of a number of hazardous wastes, including tetrachloroethene (PCE) and trichloroethene (TCE), at the site, some of which were released or migrated from the site to surrounding areas, including the Neguntatogue Creek. These disposal activities resulted in the following significant threats to the public health and/or the environment:

- a significant threat to human health associated with the possibility of consumption of groundwater impacted by contamination from the site.

- a potential threat to human health associated with subsurface contaminants at the site.

- a potential environmental threat associated with the impacts of contaminants to the groundwater resource.

During the course of the investigation certain actions, known as Interim Remedial Measures (IRMs), were undertaken at the Cardwell Condenser site in response to the threats identified above. An IRM is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS. The IRMs undertaken at this site included the removal of contaminated soils from the on-site leaching pools on three occasions between November of 1999 and January 2000.

Based on the success of the above IRMs**,** the findings of the investigation for this site indicate that the site no longer poses a significant threat to human health or the environment, therefore No Further Action with continued groundwater monitoring was selected as the remedy for this site. In addition, the Department will also reclassify the site to a Class 4 site on the New York State Registry of Inactive Hazardous Waste Disposal Sites (the Registry) once an operation and maintenance plan is in place.

SECTION 2: SITE LOCATION AND DESCRIPTION

The Cardwell Condenser site is located on approximately 1.2 acres at 80 Montauk Highway in the Village of Lindenhurst, New York (See Figures 1 and 2). The site is bordered by Montauk Highway to the south, Lincoln Avenue to the west, an undeveloped parcel to the north, and by the Neguntatogue Creek and a small plastics manufacturing facility (Strux Inc.) to the east.

A 17,000 square foot manufacturing and office building and a small storage building are located on the site (see Figure 2). The site property is owned by Normilt Realty.

SECTION 3: SITE HISTORY

3.1: Operational/Disposal History

Cardwell Condenser has operated a facility at this location since 1957. Previously the site was home to Lindenhurst Brewery, which operated at the site from 1933 until the mid 1950s.

Cardwell Condenser manufactures electrical components. The manufacturing process includes chrome plating of the brass and/or aluminum components. Process wastewater from the plating operations was discharged to leaching pools north of the manufacturing building. In 1987 the industrial and sanitary wastewater discharges at the site were connected to public sewers. Due to changes in operations at Cardwell since that time industrial wastewater is no longer generated. Twelve of the fourteen on-site leaching pools were backfilled sometime after 1987. The remaining two leaching pools (LP- 4 & 10 - See Figure 3) received only non-contact cooling water from the two pumping wells (shown on Figure 6). Cardwell no longer does plating operations at the site. The site is currently being used as a retail store.

3.2: Remedial History

In 1986, NYSDEC contracted with a consultant to perform a Phase I investigation of the site. This report concluded that the potential existed for contamination of groundwater.

A Phase II investigation was then performed later in 1986. During this investigation four shallow, water table monitoring wells were installed and groundwater samples taken. The water table is approximately 4 to 7 feet below the ground surface in the vicinity of the site. Contamination, primarily volatile organic compounds such as trichloroethane and methylene chloride, was found in all the monitoring wells. However, the highest concentration of contaminants was found in a well upgradient of the site, and some of the sampling results were questionable. Therefore, the chemical analytical results were considered suspect.

In 1992 a Supplemental Phase II Investigation was conducted to collect additional information needed to classify the site for further action. Three additional deep (65 foot) monitoring wells (MW-5, 6, & 7 - See Figure 6) were installed and all seven wells were sampled in May of 1992. The results indicated that one well (MW-2) was contaminated with volatile organic compounds. Samples from well MW-2 contained 700 parts per billion (ppb) of PCE and 43 ppb of 1,2 dichloroethene (DCE) in the first sampling round, well above the NYSDEC and NYSDOH groundwater standard of 5 ppb. Based on the results of this

sampling the four shallow wells (MW-1, 2, 3, & 4) were resampled in November 1992 and June of 1993. In those two subsequent rounds groundwater samples did not exceed standards for any volatile organic compounds in any of the monitoring wells. The report recommended that the site be classified as a Class 2 inactive hazardous waste disposal site due to the leaching pool contamination and a Remedial Investigation (RI) and Feasibility Study (FS) be performed. The site was listed on the Registry as a Class 2 site in February, 1994.

In October 1994, Cardwell Condenser retained a consultant to conduct a soil and groundwater investigation of the site. Two more monitoring wells (MW-8 & 9) were installed during this investigation. The investigation confirmed groundwater contamination, primarily by PCE, and an area of contaminated soil that might have been a source of the groundwater contamination. The "Groundwater and Soil Investigation Report" (January 1995) from this investigation recommended additional investigation to determine the extent of soil and groundwater contamination.

SECTION 4: SITE CONTAMINATION

To evaluate the contamination present at the site and to evaluate alternatives to address the significant threat to human health or the environment posed by the presence of hazardous waste, Cardwell Condenser has recently conducted a Remedial Investigation and 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 RI was conducted between May 1998 and July 1998. A report entitled Focused Remedial Investigation Report (October, 1998) has been prepared which describes the field activities and findings of the RI in detail.

The RI included the following activities:

- Geophysical survey to determine the locations of the leaching pools present at the site
- Excavation to uncover the leaching pools and sampling of those pools
- Soil sampling from a former drum storage area at the site
- Installation of two monitoring wells
- Groundwater sampling of the two new monitoring wells and five previously existing wells
- Groundwater sampling by direct hydraulic push sampling techniques

To determine which media (soil, groundwater, etc.) are contaminated at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance values (SCGs). Groundwater, drinking water and surface water SCGs identified for the Cardwell Condenser site are based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part 5 of the 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 health-based exposure scenarios. In addition, for soils, site specific background concentration levels can be considered for metal contaminants.

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

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

4.1.1: Site Geology and Hydrogeology

The site is underlain by sand and gravel glacial outwash deposits approximately 80 feet thick. The aquifer in these deposits is referred to as the Upper Glacial aquifer. All the monitoring wells at the site are screened in the Upper Glacial aquifer.

Beneath the Upper Glacial aquifer is the Gardiners Clay, estimated to be approximately 40 feet thick in the vicinity of the site. The Gardiners Clay confines the underlying Magothy aquifer. The Magothy is the primary water supply aquifer on Long Island and is approximately 800 feet thick in the vicinity of the site.

Shallow groundwater from the site flows east southeast toward the Neguntatogue Creek (See Figure 2).

4.1.2: Nature of Contamination

As described in the RI report, many soil and groundwater samples were collected at the site to characterize the nature and extent of contamination. The main categories of contaminants which exceed their SCGs are volatile organic compounds (VOCs), and inorganics (metals).

The primary VOCs of concern in soil and groundwater were PCE, and its breakdown products TCE, DCE and vinyl chloride. However, many other VOCs such as trichloroethane, dichloroethane, and toluene were also present at lower concentrations.

The inorganic contaminants of concern are copper, zinc, chromium and lead. These contaminants were found in the leaching pool soils at concentrations exceeding NYSDECs recommended soil cleanup objectives, but do not appear to be significantly impacting groundwater.

4.1.3: Extent of Contamination

Tables 1, 2 and 3 summarize the extent of contamination for the contaminants of concern in groundwater and compare the data with the SCGs for the site. The following are the media which were investigated and a summary of the findings of the investigation. Table 9 provides an overview of the sampling results.

Groundwater

The primary impact of site contamination is to groundwater. Groundwater samples were taken from 6 shallow (13 to 28 foot deep) monitoring wells (MW-2, 4, 8, 9, 10, & 11), one deep (62 foot) monitoring well (MW-6) and 4 temporary Geoprobe well locations (GP-7, 8, 9, & 10 - See Figure 4 and Tables 1, 2 and 3). Groundwater samples taken from 3 of the 7 monitoring wells (MW-2, 6, 8, & 9) and all 4 Geoprobe locations contained VOCs at concentrations in excess of NYSDEC groundwater standards.

Groundwater from monitoring well MW-9 contained 11 VOCs at concentrations above groundwater standards. The most noteworthy were PCE (279 ppb), and its breakdown products TCE (62.3 ppb), DCE (580 ppb), and vinyl chloride (57.2 ppb). The NYSDEC groundwater standard for PCE, TCE and DCE is 5 ppb. For vinyl chloride the groundwater standard is 2 ppb. Chromium, with a concentration of 51.4 ppb, slightly exceeded the groundwater standard of 50 ppb.

Groundwater from monitoring well MW-8 contained 3 VOCs at concentrations above groundwater standards: PCE (368 ppb), TCE (21.9 ppb), and DCE (23.9 ppb). TCE also slightly exceeded groundwater standards in MW-2 (16.8 ppb).

As shown in Figure 6, four temporary Geoprobe wells (GP-7 though GP-10) were installed along the east edge of the site along the west bank of the Neguntatogue Creek. Shallow groundwater samples from each of these locations exceeded groundwater standards for VOCs. The locations with the highest contamination were GP-9, which contained 660 ppb of DCE, 130 ppb of vinyl chloride, and lesser amounts of PCE and TCE, and GP-8, which contained 180 ppb of DCE and 91 ppb of vinyl chloride.

Soil

Two soil samples, S-1 and S-2, were collected at a depth of 0.5 to 1 foot from two locations within a former drum storage area at the site (See Figure 3 and Tables 4 and 5). Neither of the samples contained contamination in excess of NYSDEC soil cleanup objectives for any VOCs.

NYSDEC's soil cleanup objective is 25 ppm for copper and 20 ppm for zinc or soil background. Sample S-1 contained 387 ppm of copper and 146 ppm of zinc. Sample S-2 contained 310 ppm of copper and 313 ppm of zinc. The levels of copper and zinc detected in these samples are within the ranges commonly observed in surface soil samples from developed areas.

Leaching Pools

Fourteen leaching pools (pools LP-1 through LP-14) were uncovered and soil samples were taken via hand auger 0.5 to 1 foot below the leaching pool bottom. These samples were then analyzed for VOC and metals contamination (See Figure 3). The results of this sampling indicated that VOC and metals contamination was present.

VOC concentrations above NYSDEC's recommended soil cleanup objectives were present in three of those leaching pools (See Table 4). LP-14 had the greatest concentration of VOCs. PCE was present at 2,170 ppm (cleanup objective 1.4 ppm), DCE was present at 244 ppm (cleanup objective 0.25 ppm) and TCE was present at 124 ppm (cleanup objective 0.7 ppm). 1,3-dichlorobenzene, 1,1-dichloroethene, trichloroethane and toluene were also present at concentrations above cleanup objectives.

Detection limits were high for some of the samples taken due to high concentration of contaminants. High concentrations can mask low concentrations of other contaminants and can require that the sample be diluted prior to analysis. Both of these circumstances can result in increased detection limits.

Soils from LP-3 contained 2.7 ppm of DCE and 1.6 ppm of PCE. Soils from LP-11 contained 0.894 ppm of DCE, and 7 ppm of total xylenes (cleanup objective 1.2 ppm). In addition the LP-11 sample contained dichlorobenzenes in excess of cleanup objectives.

All 14 leaching pools exceeded soil cleanup objectives for copper, zinc, chromium and/or lead (See Table 5). The most noteworthy exceedances for each metal were as follows. Copper (cleanup objective 25 ppm) was present at 12,500 ppm in LP-3. Zinc (cleanup objective 20 ppm) was present at 4830 ppm in LP-3. Chromium (cleanup objective 50 ppm) was present in LP-3 at 162 ppm. Lead (cleanup objective 400 ppm) was present in LP-14 at 636 ppm.

Surface Water

Two surface water samples were taken in the Neguntatogue Creek, one upstream and one downstream of the site. Concentrations of VOC contaminants were similar in the upstream and downstream samples, suggesting that the site is not significantly impacting water quality in the Creek. None of the contaminants found in either sample exceeded NYSDEC Class C Water Quality Standards.

4.2: Interim Remedial Measures

An Interim Remedial Measure (IRM) is conducted at a site when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

The results of the Remedial Investigation indicated that VOC and/or metals contamination in leaching pools LP-1, LP-3, LP-8, LP-11, LP-12, LP-13, LP-14 and LP-15 merited immediate remediation via an IRM. Soils from within these eight impacted leaching pools were excavated and disposed of at an off-site facility as the first IRM in November 1999. Based on the results of confirmatory soil samples taken after this removal, more soils were excavated from some of the leaching pools (LP-1, 3, & 15) in late November 1999 and again in January 2000 (LP-1 & 3).

Final endpoint samples showed a marked decrease on the concentration of contaminants in leaching pool soils (See Tables 6 and 7). After the IRMs were completed only LP-1 still contained soils with VOC concentrations exceeding soil cleanup objectives. The remaining concentrations at LP-1 were: PCE 3.5 ppm (down from 240 ppm before the IRMs, soil cleanup objective 1.4 ppm), 2-butanone 2.5 ppm (down from 6.1 ppm, soil cleanup objective 0.3 ppm), and acetone 0.61 ppm (down from 11 ppm, soil cleanup objective 0.2 ppm). Metals concentrations showed similar reductions.

Soil samples were also taken from 3 points just outside one of the more contaminated leaching pools at a depth of 4 to 6 feet. These samples were analyzed for VOCs to determine whether contamination from the leaching pools was migrating to surrounding soils. VOC concentrations in these three samples were well below soil cleanup objectives.

Two additional monitoring wells, MW-12 and MW-13, were also installed during the IRM, one 15 feet north and one 15 feet south of Geoprobe location GP-9 (See Figure 6). Samples from these wells were taken in January 2000, and along with existing monitoring wells MW-8 and MW-9, again in December 2000 and May 2001. These samples were used to determine the effectiveness of the IRM in reducing VOC concentrations in groundwater.

VOC concentrations in groundwater have decreased in most cases since the IRM (See Table 8 and Figure 5) and are anticipated to decrease further over time. The highest remaining concentrations in the May 2001 sampling round were found in MW-9 as 182 ppb of DCE and 86 ppb of PCE, with lower concentrations of vinyl chloride, TCE and trichloroethane that exceeded groundwater standards. The highest remaining concentration in the two new wells adjacent to the Neguntatogue Creek was 24 ppb of DCE in MW-12.

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 3.9 of the RI report.

An exposure pathway is the manner 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:

- Direct contact with and ingestion of subsurface soils is no longer a potential threat as a result of the IRMs conducted at this site.

- Ingestion of groundwater - A survey of public and private water supply wells within one mile downgradient of the site did not identify any supply wells. Concentrations of VOCs in groundwater appear to be decreasing since the IRM was conducted. Therefore, no current threat to drinking water supplies exists, nor is likely to exist in the future, due to the the absence of any existing water supply wells in this area, the decreasing VOC concentrations in groundwater, and the proximity

to saline groundwater (making any new supply wells very unlikely). However, some VOCs still exceed groundwater standards which will necessitate continued groundwater monitoring.

4.4: Summary of Environmental Exposure Pathways

This section describes the types of environmental exposures and ecological risks which may be presented by the site. The following pathway for environmental exposure and/or ecological risks has been identified:

- impact to the groundwater resource above standards.

Although the groundwater in the immediate vicinity of the site is impacted above standards, with the source area now remediated, NYSDEC expects groundwater standards will be achieved through natural attenuation. Continued monitoring of the groundwater is expected to confirm this. Groundwater from the site appears to discharge to the Neguntatogue Creek east-southeast of the site. The site has not impacted the Neguntatogue Creek. None of the contaminants found in the surface water exceeded NYSDEC Class C surface water standards

SECTION 5: ENFORCEMENT STATUS

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

The NYSDEC and Cardwell Condenser entered into a Consent Order on March 10, 1998 (Civil Action No. 97-5121). The Order obligates the responsible parties to implement a RI/FS program. Upon issuance of the Record of Decision the NYSDEC will approach Cardwell Condenser to implement the selected remedy under an Order on Consent.

SECTION 6: SUMMARY OF THE SELECTED REMEDY

The selected remedy for any site should, at a minimum, eliminate or mitigate all significant threats to the public health or the environment presented by the hazardous waste present at the site. The State believes that previous remedial activities, which are described in Section 4.2, Interim Remedial Measures, have accomplished this objective provided that future groundwater monitoring shows a continued decline in groundwater contaminant concentrations.

Based on the results of the investigations and the IRMs that have been performed at the site, the NYSDEC is selecting No Further Action with continued groundwater monitoring as the remedial action for the site.

Once an operation and maintenance plan is in place, the Department will also reclassify the site from a Class 2 to a Class 4, which means the site is properly closed but requires continued management, on the New York State Registry of Inactive Hazardous Waste Disposal Sites.

Continued groundwater monitoring will consist of sampling groundwater twice a year from five monitoring wells. These wells will include four currently existing wells (MW-8, 9, 12, & 13) and one new monitoring well, MW-14, to be installed immediately downgradient of leaching pool LP-1 (See Figure 6). The screen for new monitoring well will be 5 feet long and will be installed straddling the water table. The estimated annual cost for groundwater monitoring is $10,300. The estimated present worth costs to continue groundwater monitoring for a 30 year period are $185,000. However, the groundwater monitoring program will be reevaluated periodically and may be modified before that date if concentrations of VOCs in groundwater continue to significantly decline and either meet or asymptotically approach standards.

SECTION 7: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

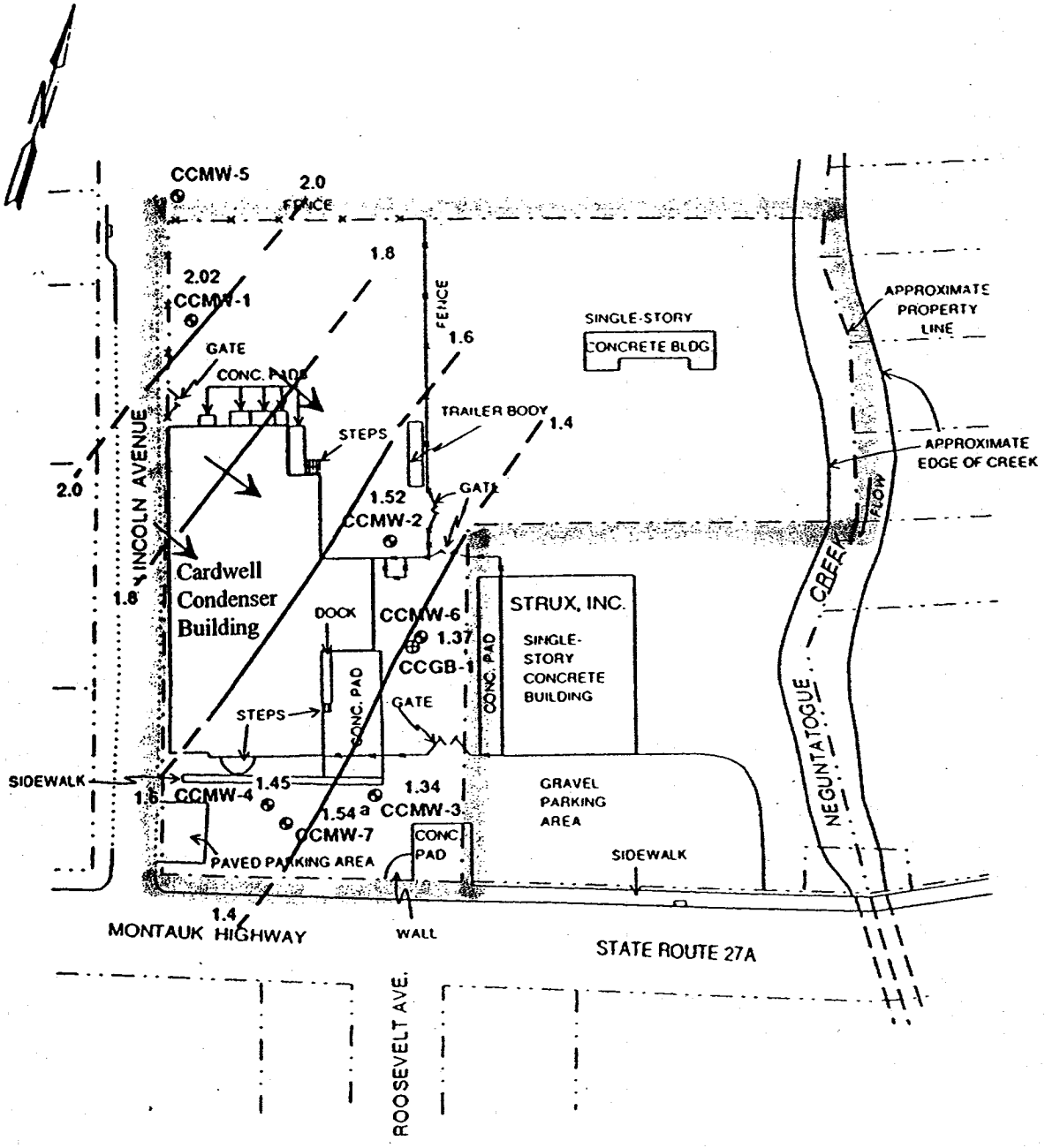
- A repository for documents pertaining to the site was established.

- A site mailing list was established which included nearby property owners, local political officials, local media and other interested parties.

- Results of the RI/FS, IRM and NYSDEC's preferred remedy were presented to the public at a public meeting on November 27, 2001. Comments received from the public are addressed in the Responsiveness Summary, which is attached to this ROD as Appendix A.

SCALE: 1" = 2,000'

Fanning, Phillips & Molnar Engineers		
Figure 1 SITE LOCATION MAP CARDWELL CONDENSER LINDENHURST, NEW YORK		
Drawn By: J.S.	Checked By: L.B.	Date: 8/18/98



LEGEND:

- 2.02 Groundwater elevation in feet above mean sea level
- Groundwater contour, dotted where inferred
- ⊛ Monitoring well location
- ⊕ Geophysics boring location
- a - Noted as possibly anomalous reading in field
- Property Boundary
- → Groundwater Flow Direction

0 100 ft

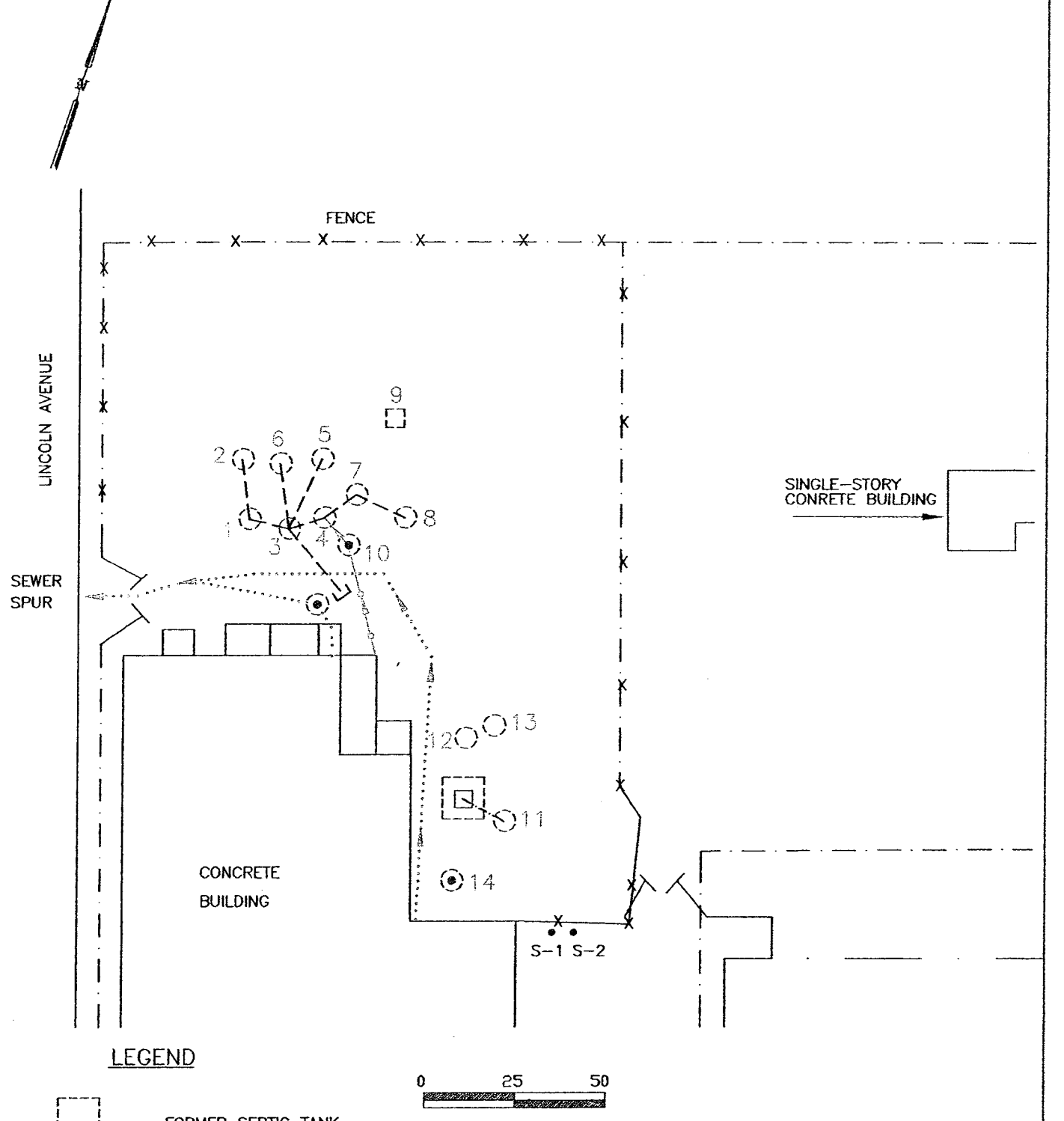
SCALE
1 in. = 100 ft

SOURCE: LAWLER, MATUSKY & SKELLY ENGINEERS, DECEMBER 1993

Fanning, Phillips & Molnar
Engineers

Figure 2
GROUNDWATER CONTOUR MAP
JUNE 15, 1993
CARDWELL CONDENSER
LINDENHURST, NEW YORK

Drawn By: J.S.	Checked By:	Date:

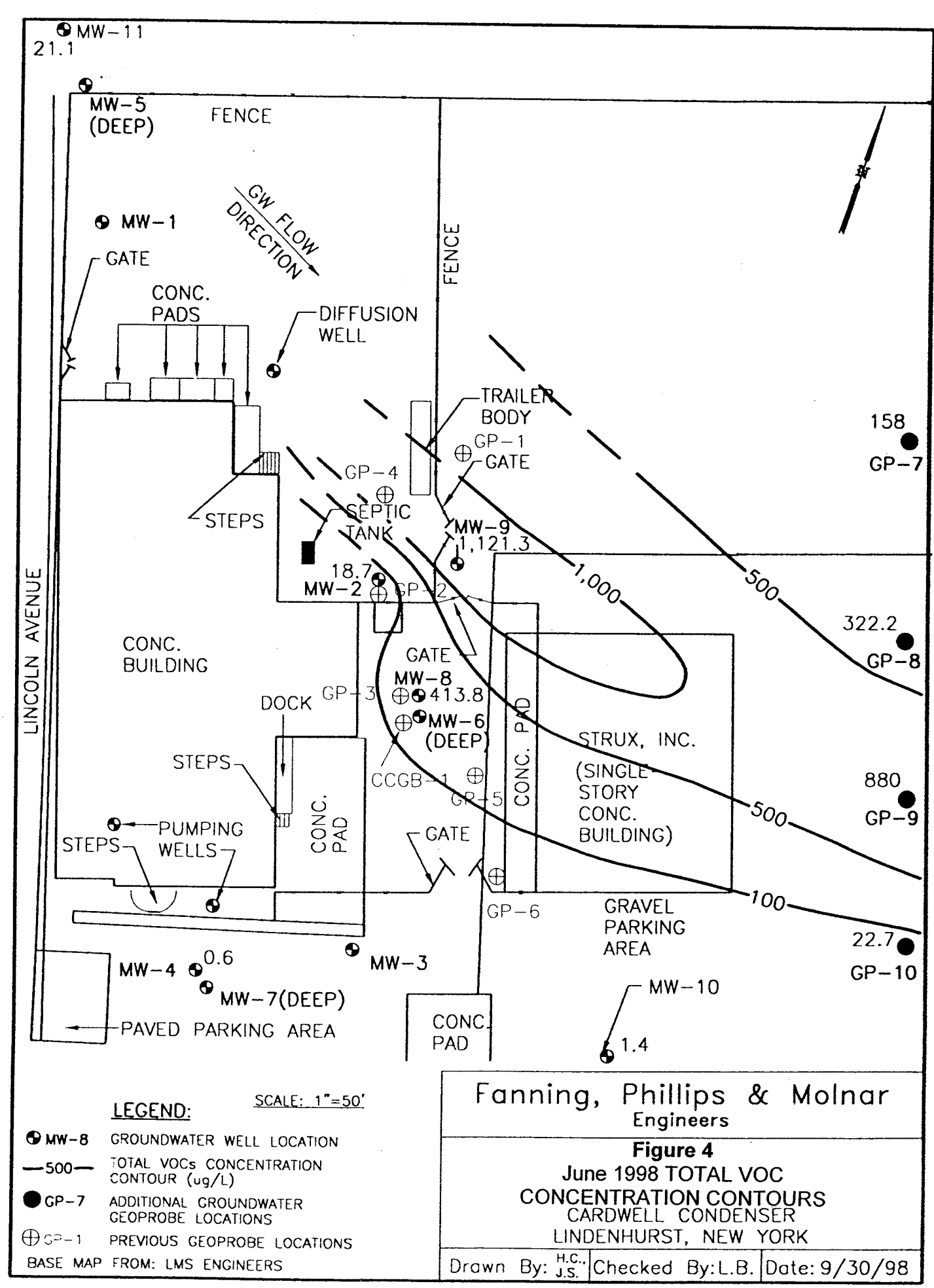


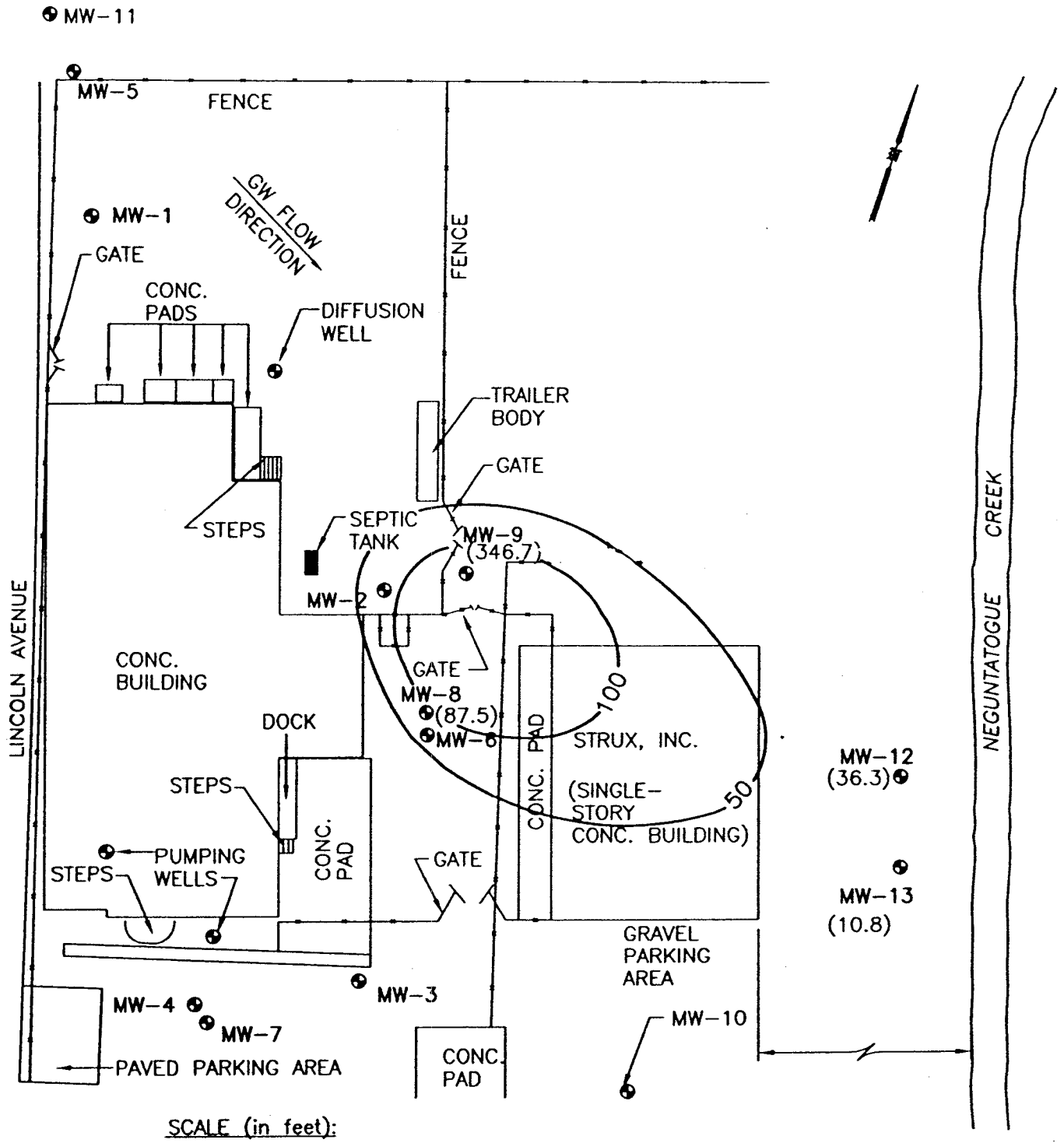
Fanning, Phillips & Molnar
Engineers

Figure 3

LOCATIONS OF LEACHING POOLS SAMPLED
CARDWELL CONDENSER
LINDENHURST, NEW YORK

Drawn By:L.G.	Checked By: L.B.	Date: 5/21/98


MW-11
21.1
MW-5
(DEEP)
FENCE
GW FLOW
DIRECTION
MW-1
GATE
CONC.
PADS
DIFFUSION
WELL
FENCE
TRAILER
BODY
GP-1
GATE
158
GP-7
GP-4
SEPTIC
TANK
STEPS
MW-9
1,121.3
18.7
MW-2
GP-2
1,000
500
322.2
GP-8
CONC.
BUILDING
GATE
MW-8
413.8
MW-6
(DEEP)
DOCK
GP-3
CONC. PAD
STRUX, INC.
(SINGLE
STORY
CONC.
BUILDING)
STEPS
CCGB-1
GP-5
880
GP-9
500
PUMPING
WELLS
STEPS
CONC.
PAD
GATE
100
GP-6
GRAVEL
PARKING
AREA
22.7
GP-10
MW-4
0.6
MW-3
MW-7(DEEP)
MW-10
PAVED PARKING AREA
CONC.
PAD
1.4
LINCOLN AVENUE
LEGEND:
SCALE: 1"=50'
MW-8 GROUNDWATER WELL LOCATION
500 TOTAL VOCs CONCENTRATION CONTOUR (ug/L)
GP-7 ADDITIONAL GROUNDWATER GEOPROBE LOCATIONS
GP-1 PREVIOUS GEOPROBE LOCATIONS
BASE MAP FROM: LMS ENGINEERS
Fanning, Phillips & Molnar
Engineers
Figure 4
June 1998 TOTAL VOC
CONCENTRATION CONTOURS
CARDWELL CONDENSER
LINDENHURST, NEW YORK
Drawn By: H.C., J.S.
Checked By: L.B.
Date: 9/30/98



LEGEND:

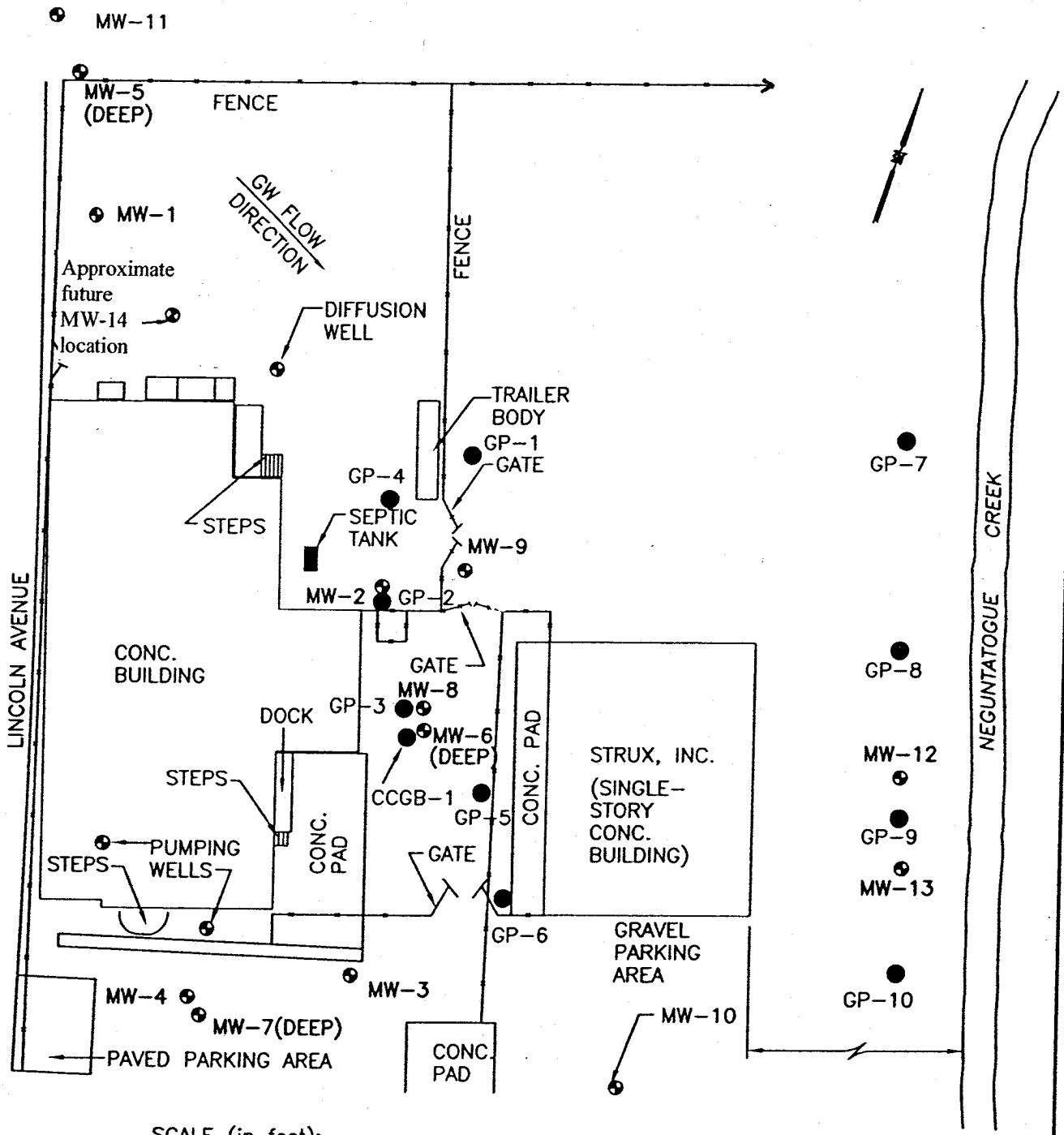
MW-8 (134.9)	GROUNDWATER WELL LOCATION WITH TOTAL VOCS IN MICROGRAMS PER LITER
—100—	TOTAL VOCs CONCENTRATION CONTOUR (ug/L)

BASE MAP FROM: LMS ENGINEERS

FPM GROUP

Figure 5
MAY 2001 TOTAL VOC CONCENTRATION CONTOURS
CARDWELL CONDENSER
LINDENHURST, NEW YORK

Drawn By:H.C.	Checked By:S.D.	Date: 7/30/01



LEGEND:

- MW-8 GROUNDWATER WELL LOCATION
- GP-7 GEOPROBE GROUNDWATER SAMPLE LOCATIONS

BASE MAP FROM: LMS ENGINEERS

Fanning, Phillips & Molnar
Engineers

Figure 6
GROUNDWATER SAMPLING LOCATIONS
CARDWELL CONDENSER
LINDENHURST, NEW YORK

Drawn By: H.C., J.S.	Checked By: S.D.	Date: 10/31/00

Table 1

Volatile Organic Compounds
June 3, 1998 Groundwater Sampling Results
Cardwell Condenser, 80 East Montauk Highway, Lindenhurst, New York

Sample ID Dilution Factor Units	MW-2 1.0 ug/L	MW-4 1.0 ug/L	MW-6 1.0 ug/L	MW-8 5.0 ug/L	MW-9 5.0 ug/L	MW-10 1.0 ug/L	MW-11 1.0 ug/L	FB-3 1.0 ug/L	Trip Blank 1.0 ug/L	NYSDEC Class GA Ambient Water Quality Standard or Guidance Value (ug/L)
Volatile Organic Compounds:										
Vinyl Chloride	10.0 U	10.0 U	10.0 U	50.0 U	67.2	10.0 U	10.0 U	10.0 U	10.0 U	2.0
Chloroethane	10.0 U	10.0 U	10.0 U	50.0 U	9.22 J	10.0 U	10.0 U	10.0 U	10.0 U	5.0
1,1-Dichloroethene	10.0 U	10.0 U	10.0 U	50.0 U	21.0 J	10.0 U	10.0 U	10.0 U	10.0 U	5.0
1,1-Dichloroethane	10.0 U	10.0 U	10.0 U	50.0 U	32.8 J	10.0 U	10.0 U	10.0 U	10.0 U	5.0
1,2-Dichloroethene(total)	1.94 J	10.0 U	10.0 U	23.9 J	580	10.0 U	10.0 U	10.0 U	10.0 U	5.0
1,1,1-Trichloroethane	10.0 U	10.0 U	10.0 U	50.0 U	41.6 J	10.0 U	10.0 U	10.0 U	10.0 U	5.0
Trichloroethene	16.8	0.62 J	10.0 U	21.9 J	62.3	0.722 J	10.0 U	10.0 U	10.0 U	5.0
Benzene	10.0 U	10.0 U	10.0 U	50.0 U	13.9 J	10.0 U	10.0 U	10.0 U	10.0 U	1.0
Tetrachloroethene	10.0 U	10.0 U	10.0 U	368	279	0.652 J	10.0 U	10.0 U	10.0 U	5.0
Toluene	10.0 U	10.0 U	10.0 U	50.0 U	13.9 J	10.0 U	10.0 U	10.0 U	10.0 U	5.0
Chlorobenzene	10.0 U	10.0 U	10.0 U	50.0 U	10.4 J	10.0 U	10.0 U	10.0 U	10.0 U	5.0
Tentatively Identified Volatile Organic Compounds:										
Propane, 2-methoxy-2-methyl-	U	U	U	U	U	U	21.1 J	U	U	-

Notes:

U = The compound was not detected at the indicated detection limit.

J = Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.

ug/L = micrograms per liter. = parts per billion (ppb)

- = No NYSDEC Class GA Ambient Water Quality Standard or Guidance Value established for this compound.

Bold values exceed the NYSDEC Class GA Ambient Water Quality Standard or Guidance Value.

FB = Field Blank

Table 2

Volatile Organic Compounds
August 17, 1998 Groundwater Geoprobe Sampling Results
Cardwell Condenser, 80 East Montauk Highway, Lindenhurst, New York

Sample ID	GP-7	GP-8	GP-11 (GP-8 dup)	GP-9	GP-10	FB-1	Trip Blank	NYSDEC
Dilution Factor	1.0	1.0	1.0	5.0	5.0	1.0	1.0	Class GA Ambient Water Quality
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	Standard or Guidance Value (ug/L)
Volatile Organic Compounds:								
Vinyl Chloride	120	91	100	130	3.0 J	10.0 U	10.0 U	2.0
Methylene Chloride	10.0 U	10.0 U	10.0 U	10 JB	10.0 U	10.0 U	10.0 U	5.0
Acetone	10.0 U	12	34 J	27 J	10.0 U	8.0 J	10.0 U	-
1,1-Dichloroethene	10.0 U	0.7 J	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	5.0
1,2-Dichloroethene(total)	14	180	210	660	17	10.0 U	10.0 U	5.0
Trichloroethene	10.0 U	10.0 U	10.0 U	7.0 J	2.0 J	10.0 U	10.0 U	5.0
Benzene	10.0 U	10.0 U	10.0 U	10.0 U	0.7 J	10.0 U	10.0 U	1.0
Tetrachloroethene	10.0 U	10.0 U	10.0 U	53	10.0 U	10.0 U	10.0 U	5.0
Chlorobenzene	10.0 U	0.7 J	10.0 U	3.0 J	10.0 U	10.0 U	10.0 U	5.0
Tentatively Identified Volatile Organic Compounds:								
2-Propanol_7.27	24 NJ	U	U	U	U	U	U	-
2-Propanol_7.33	U	16 NJ	U	U	U	U	U	-

Notes:

U = The compound was not detected at the indicated detection limit.

J = Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concentration given is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

N = The spiked sample recovery is not within control limits.

ug/L = micrograms per liter = parts per billion (ppb)

- = No NYSDEC Class GA Ambient Water Quality Standard or Guidance Value established for this compound.

Bold values exceed the NYSDEC Class GA Ambient Water Quality Standard or Guidance Value.

FB = Field Blank

Table 3
Total Metals
June 3, 1998 Groundwater Sampling Results
Cardwell Condenser
80 East Montauk Highway, Lindenhurst, New York

Sample ID	MW-2	MW-4	MW-6	MW-8	MW-9	MW-10	MW-11	FB-3	NYSDEC Class GA Ambient Water Quality Standard or Guidance Value (ug/l)
Units	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
Metals:									
Arsenic	3.5 U	3.5 U	3.5 U	3.5 U	6.8 B	3.6 B	3.5 U	3.5 U	25
Chromium	4.6 B	1.7 U	1.7 U	14.7	**51.4**	5.0 B	1.7 U	1.7 U	50
Copper	44.7	9.9 B	8.2 B	7.1 B	53.6	24.3 B	5.0 U	5.0 U	200
Lead	9.9	2.9 U	3.3	2.9 U	2.9 U	4.4	2.9 U	2.9 U	25
Zinc	70.9	29.0	27.9	233	935	269	57.7	5.8 U	-

Notes:

U = The compound was not detected at the indicated detection limit.

B = Reported value is less than the Contract Required Detection Limit but greater than or equal to the Instrument Detection Limit.

ug/L = micrograms per liter = parts per billion (ppb)

- = No NYSDEC Class GA Ambient Water Quality Standard or Guidance value established for this compound.

Bold values exceed the NYSDEC Class GA Ambient Water Quality Standard or Guidance Value.

FB = Field Blank

Table 4

Volatile Organic Compounds
June 2, 1998 Soil Sampling Results
Cardwell Condenser, 80 East Montauk Highway, Lindenhurst, New York

Sample ID	LP-1	LP-2	LP-3	LP-4	LP-5	LP-6	LP-7	LP-8	LP-9	LP-10	LP-11	LP-12	LP-13	LP-14	S-1	S-2	S-2 Dup (S-3	FB-1	Trip Blank	NYSDEC
Matrix	solid	solid	solid	solid	solid	solid	solid	solid	solid	solid	solid	solid	solid	solid	solid	solid	solid	water	water	Recommended Soil
Dilution Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	10.0	1.0	1.0	1.0	1.0	1.0	Cleanup Objective
Units	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	g/Kg	ug/Kg	ug/Kg	ug/L	ug/Kg
Volatile Organic Compounds:																				
Vinyl Chloride	1220 U	12 U	1680 U	13 U	14 U	12 U	26 U	62 U	13 U	12 U	217 J	2440 U	2490 U	170000 U	57 U	13 U	10 U	10 U	10 U	200
Methylene Chloride	1220 U	12 U	1680 U	13 U	14 U	12 U	26 U	62 J	13 U	12 U	1620 U	2440 U	2490 U	170000 U	10 J	13 U	10 U	10 U	10 U	100
Acetone	1220 U	56	1680 U	18	19	20	51	120	13 U	19	1140 J	2440 U	1310 J	101000 J	57 U	13 U	10 U	10 U	10 U	200
1,1-Dichloroethane	1220 U	12 U	1680 U	13 U	14 U	12 U	26 U	62 U	13 U	12 U	1620 U	2440 U	2490 U	43800 J	57 U	13 U	10 U	10 U	10 U	100
1,2-Dichloroethene(total)	1220 U	12 U	2730	13 U	14 U	12 U	26 U	62 U	13 U	12 U	894 J	2440 U	2490 U	244000	57 U	13 U	10 U	10 U	10 U	250*
2-Butanone	1220 U	17	1680 U	13 U	14 U	12 U	26 U	62 U	13 U	12 U	1620 U	2440 U	2490 U	170000 U	57 U	13 U	10 U	10 U	10 U	300
1,1,1-Trichloroethane	1220 U	12 U	1680 U	13 U	14 U	12 U	26 U	62 U	13 U	12 U	232 J	2440 U	2490 U	58600 J	57 U	13 U	10 U	10 U	10 U	800
Trichloroethene	1220 U	12 U	484 J	13 U	1 J	12 U	10 J	62 U	13 U	12 U	1620 U	2440 U	2490 U	124000 J	7 J	13 U	10 U	10 U	10 U	700
Tetrachloroethene	159 J	12 U	1580 J	13 J	27	9 J	150	12 J	6 J	0.9 J	1620 U	2440 U	190 J	2170000	350	27	170	10 U	10 U	1,400
Toluene	1220 U	12 U	1680 U	13 U	14 U	12 U	26 U	62 U	13 U	12 U	601 J	2440 U	2490 U	6970 J	57 U	13 U	10 U	10 U	10 U	1,500
Ethylbenzene	1220 U	12 U	1680 U	13 U	14 U	12 U	26 U	6 J	13 U	12 U	1500 J	2440 U	2490 U	170000 U	57 U	13 U	10 U	10 U	10 U	5,500
Xylenes(Total)	1220 U	12 U	1680 U	13 U	14 U	12 U	26 U	62 U	13 U	12 U	7020	2440 U	2490 U	170000 U	57 U	13 U	10 U	10 U	10 U	1,200
Tentatively Identified Volatile Organic Compounds:																				
C10H22 Alkanes	U	U	11,100 J	U	U	U	37 J	U	U	U	8,590 J	30,600 J	39,270 J	U	U	U	U	U	U	-
C11H24 Alkanes	U	U	7,000 J	U	U	U	U	840 J	U	U	13,900 J	U	40,400 J	U	U	U	U	U	U	-
C12H26 Alkanes	U	U	U	U	U	U	U	U	U	U	U	8,210 J	U	U	U	U	U	U	U	-
C13H28 Alkanes	U	U	23,040 J	U	U	U	68 J	U	U	U	U	307,500 J	86,000 J	U	U	U	U	U	U	-
Unknown Alkanes	35,229 J	U	116,120 J	U	U	U	474 J	26,200 J	U	U	13,100 J	879,800 J	386,200 J	215,000 J	U	U	U	U	U	-
Unknown Alkanes/Unknown	3,000 J	U	U	U	U	U	U	U	U	U	U	U	37,200 J	U	U	U	U	U	U	-
Benzene, 1,2-Dichloro	* U	U	U	U	U	U	U	U	U	U	27,900 J	U	U	U	U	U	U	U	U	7,900
Benzene, 1,3-Dichloro	U	U	U	U	U	U	U	U	U	U	11,900 J	U	U	367,000 J	U	U	U	U	U	1,600
Benzene, 1,4-Dichloro	U	U	U	U	U	U	U	U	U	U	11,800 J	U	U	U	U	U	U	U	U	8,500
Coeluting Unknowns	U	U	U	U	U	U	U	U	U	U	34,600 J	U	U	U	U	U	U	U	U	-
C8H16 Cycloalkanes	U	U	U	U	U	U	U	U	U	U	U	21,400 J	U	U	U	U	U	U	U	-
C9H18 Cycloalkanes	U	U	U	U	U	U	U	U	U	U	14,200 J	U	U	U	U	U	U	U	U	-
C10H20 Cycloalkanes	2,991 J	U	U	U	U	U	U	U	U	U	36,580 U	U	24,600 U	U	U	U	U	U	U	-
C11H22 Cycloalkane	30,980 J	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	-
Decahydrodimethylnaphthalene Isomers	U	U	U	U	U	U	U	U	U	U	26,800 J	U	U	U	U	U	U	U	U	-
Decahydromethylnaphthalene Isomers	7,400 J	U	U	U	U	U	U	U	U	U	41,800 J	U	U	U	U	U	U	U	U	-
Decahydronaphthalene Isomers	U	U	11,400 J	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	-
M-Menthanes, (1S, 3R) - (+) -	U	U	U	U	U	U	U	U	U	U	U	U	16,900 J	U	U	U	U	U	U	-
Methylpropylbenzene Isomers	U	U	U	U	U	U	U	U	U	U	6,190 J	U	U	U	U	U	U	U	U	-
Trimethylbenzene Isomers	U	U	U	U	U	U	U	U	U	U	U	U	7,930 J	U	U	U	U	U	U	-
Unknown Hydrocarbons	2,670 J	U	5,380 J	U	U	U	U	1,540 J	U	U	6,780 J	U	U	U	U	U	U	U	U	-
Unknown Organic Acids	U	U	U	U	U	U	U	U	U	U	U	U	U	159,000 J	U	U	U	U	U	-
Unknowns	15,930 J	U	27,140 J	U	U	U	U	U	U	U	U	U	28,400 J	U	U	U	U	U	U	-
Total Volatile Organic Compounds	**98,358**	**73**	**205,974**	**31**	**47**	**29**	**790**	**28,737**	**6**	**19.9**	**265,744**	**1,247,510**	**668,400**	**3,488,470**	**367**	**27**	**170**	**U**	**U**	**10,000**

Notes:

U = The compound was not detected at the indicated detection limit.

J = Data indicates the presence of a compound that meets the identification criteria. The result is less than the quantitation limit but greater than zero. The concetration given is an approximate value.

B = The analyte was found in the laboratory blank as well as the sample. This indicates possible laboratory contamination of the environmental sample.

ug/L = micrograms per liter

ug/Kg = micrograms per liter = parts per billion (ppb)

- = No NYSDEC Recommended soil Cleanup Objective established for this compound.

* The lower of the NYSDEC Recommended Soil Cleanup Objectives for 1,2-dichloroethene isomers.

Bold values exceed the NYSDEC Class GA Ambient Water Quality Standard or Guidance Value established for this compound.

FB = Field Blank

Table 5

Total Metals

June 2, 1998 Soil Sampling Results

Cardwell Condenser, 80 East Montauk Highway, Lindenhurst, New York

Sample ID Matrix Units	LP-1 solid mg/kg	LP-2 solid mg/kg	LP-3 solid mg/kg	LP-4 solid mg/kg	LP-5 solid mg/kg	LP-6 solid mg/kg	LP-7 solid mg/kg	LP-8 solid mg/kg	LP-9 solid mg/kg	LP-10 solid mg/kg	LP-11 solid mg/kg	LP-12 solid mg/kg	LP-13 solid mg/kg	LP-14 solid mg/kg	S-1 solid mg/kg	S-2 solid mg/kg	S-3 solid mg/kg	FB-1 water ug/L	NYSDEC Recommended Soil Cleanup Objective mg/kg
Metals:																			
Arsenic	0.66 U	0.67 U	0.94 U	0.74 U	0.72 U	0.69 U	1.2 B	0.72 B	0.72 U	1.4 B	0.88 U	0.65 U	0.70 U	2.4 U	3.1	2.9	2.7	3.5 U	7.5 or SB
Chromium	**72.4**	18.7	**162**	**74.8**	**129**	35.9	**144**	**157**	46.9	20.9	7	5	33.1	**50.1**	20.1	11.9	9.6	1.7 U	50
Copper	**231**	**1350**	**12500**	**614**	**428**	**172**	**763**	**410**	**60.8**	**3700**	**338**	16.4	**104**	**1850**	**387**	**310**	**293**	5.0 U	25 or SB
Lead	18.8	55.8	**411**	9.1	54.8	10.8	241	83.7	11.4	212	108	7.8	29.4	**636**	239	181	161	2.9 U	400*
Zinc	**96.7**	**341**	**4830**	**33.6**	**132**	**44.2**	**455**	**98.5**	**24.3**	**474**	**1000**	**105**	**914**	**2460**	**146**	**351**	**313**	7.4 B	20 or SB

Notes:

U = The compound was not detected at the indicated concentration.

B = Reported value is less than the Contract Required Detection Limit but greater than or equal to the Instrument Detection Limit.

mg/kg = milligrams per kilogram = parts per billion (ppb)

mg/L = milligrams per liter

SB = site background

Bold values exceed the NYSDEC Recommended Soil Cleanup Objective.

*The USEPA's Interim Lead Hazard Guidance (July 14, 1994) establishes a residential screening level of 400 ppm.

FB = Field Blank

Table 6
SUMMARY OF CHEMICAL ANALYTICAL RESULTS
LEACHING POOL END-POINT SAMPLES
CARDWELL CONDENSER SITE
LINDENHURST, NEW YORK

Sample No.	LP-1			LP-3			LP-8	LP-11	LP-12	LP-13	LP-14	LP-15		NYSDEC Recommended Soil Cleanup Objectives
Sample Date	11/9/99	11/15/99	1/19/00	11/9/99	11/15/99	1/19/00	11/9/99	11/8/99	11/8/99	11/8/99	11/8/99	11/8/99	1/19/00	
Target Compound List Volatile Organic Compounds in micrograms per kilogram = parts per billion (ppb)														
Chloromethane	6,200 J	U	U	U	U	U	U	U	U	U	U	U	U	-
Methylene chloride	**1,100 JB**	**450 J**	U	**220 JB**	**230 J**	2 J	1 J	U	1 J	1 J	1 J	**5,800 JB**	1 J	100
Styrene	U	U	U	U	**280 J**	U	U	U	U	U	U	U	U	-
Acetone	**11,000 JB**	**2,300 B**	**610 J**	**710 JB**	**2,800 B**	U	12	9 JB	35 B	8 JB	27 B	**11,000 JB**	6 JB	200
1,1-Dichloroethane	U	U	U	U	U	U	U	U	0.5 J	U	0.6 J	U	U	200
1,2-Dichloroethene (total)	U	U	U	U	U	U	U	U	1 J	1 J	3 J	U	14	300
2-Butanone	**6,100 J**	**1,600**	**2,500**	**1,400**	**1,800**	U	2 J	2 J	4 J	U	3 J	**4,500 J**	3 J	300
1,1,1-Trichloroethane	U	U	U	U	U	U	U	U	12	2 J	7 J	**8,000 J**	U	800
Trichloroethene	U	U	U	U	U	U	3 J	0.6 J	9 J	2 J	10 J	**14,000 J**	4 J	700
Tetrachloroethene	**240,000**	**19,000**	**3,500**	**5,600**	**15,000**	4 J	48	2 J	67	26	210	**300,000**	76	1,400
Toluene	U	U	U	U	U	0.5 J	0.5 J	U	2 J	U	0.5 J	**2,400 J**	0.4 J	1,500
Carbon disulfide	U	U	U	U	U	U	U	U	U	2 J	U	U	U	2,700
4-Methyl-2- pentanone	U	U	U	U	U	U	1 J	U	U	U	U	U	U	1,000
Ethylbenzene	U	U	U	U	U	U	U	U	1 J	U	U	U	U	5,500
Xylene (total)	U	U	U	U	U	U	U	U	3 J	U	U	U	0.3 J	1,200
Benzene	U	U	U	U	U	0.2 J	U	U	U	U	U	U	0.5 J	60

Table 7
SUMMARY OF CHEMICAL ANALYTICAL RESULTS
LEACHING POOL END-POINT SAMPLES
CARDWELL CONDENSER SITE
LINDENHURST, NEW YORK

Sample No.	LP-1			LP-3			LP-8	LP-11	LP-12	LP-13	LP-14	LP-15		NYSDEC Recommended Soil Cleanup Objectives
Sample Date	11/9/99	11/15/99	1/19/00	11/9/99	11/15/99	1/19/00	11/9/99	11/8/99	11/8/99	11/8/99	11/8/99	11/8/99	1/19/00	
Select Metals in milligrams per kilogram = parts per billion (ppb)														
Arsenic	U	U	0.75 B	U	U	U	U	U	U	U	U	1.4	U	7.5
Chromium	38.2	20.0	20.6	22.3	48.7	32.0	12.4	32.4	1.6	1.0 B	7.4	10.1	9.5	50
Copper	**236**	**121**	**55.1**	**759**	**916**	**61.0**	**26.3**	18.5	10.8	16.8	11.8	**530**	14.3	25
Lead	19.0	10.8	4.5	34.5	84.7	4.9	5.4	2.0	4.0	U	U	134	1.4	200-500*
Zinc	**111**	**59.8**	13.2	**266**	**456**	16.2	18.7	10.7	**53.8**	8.0	14.7	**713**	15.1	20

Notes:

U = Not detected at or above instrument detection limit.
J = Estimated concentration less than the quantitation limit but greater than zero.
B = For volatile organic compounds, compound detected in an associated blank sample. For metals, detected concentration is above the instrument detection limit and below the contract-required detection lim
– = Not established.
* = Average background levels for lead in metropolitan or suburban areas near highways typically range from 200 to 500 milligrams per kilogram.
NYSDEC = New York State Department of Environmental Conservation.
Bold values exceed NYSDEC Recommended Soil Cleanup Objectives.

TABLE 8

POST IRM GROUNDWATER VOC CONCENTRATIONS CARDWELL CONDENSER SITE LINDENHURST, NEW YORK

Well	MW-8			MW-9			MW-12			MW-13			NYSDEC Class GA Ambient Water Quality Standards
Sample Date	6/3/98	12/5/00	5/21/01	6/3/98	12/5/00	5/21/01	1/5/00	12/7/00	5/21/01	1/5/00	12/5/00	5/21/01	
Volatile Organic Compounds in micrograms per liter = parts per billion (ppb)													
Vinyl Chloride	ND	0.5 J	0.5 J	**57.2**	**7 J**	**24**	ND	0.5 J	2 J	ND	ND	ND	2
Methylene Chloride	ND	0.4 JB	ND	ND	0.2 JB	ND	ND	0.4 J	ND	ND	3 JB	ND	5
Chloroethane	ND	ND	ND	**9.22 J**	ND	0.8 J	ND	ND	ND	ND	ND	ND	5
Acetone	ND	ND	ND	ND	ND	10	ND	7 J	ND	ND	5 JB	ND	-
1,1-Dichloroethene	ND	ND	ND	**21.0 J**	ND	ND	ND	ND	ND	ND	ND	ND	5
1,1-Dichloroethane	ND	ND	ND	**32.8 J**	2 J	**11**	ND	ND	ND	ND	ND	ND	5
1,2-Dichloroethene (total)	**23.9 J**	**8 J**	3 J	**580**	**53**	**182**	3 J	3 J	**24**	2 J	1 J	0.8 J	5
Chloroform	ND	ND	ND	ND	ND	0.4 J	ND	0.2 J	0.3 J	ND	ND	ND	7
1,1,1-Trichloroethane	ND	ND	ND	**41.6 J**	1 J	**10**	ND	ND	ND	ND	ND	ND	5
Trichloroethene	**21.9 J**	**6 J**	4 J	**62.3**	2 J	**20**	**8 J**	5 J	5 J	**20**	**7 J**	**6 J**	5
Benzene	ND	ND	ND	**13.9 J**	ND	0.2 J	ND	ND	ND	ND	ND	ND	1
Tetrachloroethene	**368**	**120**	**80**	**279**	**27**	**86**	**270**	2 J	5 J	**6 J**	4 J	4 J	5
Toluene	ND	ND	ND	**13.9 J**	ND	ND	0.5 J	ND	ND	ND	ND	ND	5
Chlorobenzene	ND	ND	ND	**10.4 J**	ND	0.3 J	0.7 J	ND	ND	ND	ND	ND	5
Styrene	ND	ND	ND	ND	ND	ND	0.4 J	ND	ND	ND	ND	ND	5
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	2 J	ND	ND	ND	ND	ND	50
Xylene (total)	ND	ND	ND	ND	ND	ND	0.6 J	ND	ND	ND	ND	ND	5
2-Butanone	ND	ND	ND	ND	ND	2 J	ND	ND	ND	ND	ND	ND	50

Notes:

ND = Not detected at or above instrument detection limit.
J = Estimated concentration less than the quantitation limit but greater than zero.
B = Compound detected in an associated blank sample.
- = Not established.
NYSDEC = New York State Department of Environmental Conservation.
Bold values exceed the NYSDEC Class GA Ambient Water Quality Standard.

Table 9
Nature and Extent of Contamination
June 2, 1998 through May 21, 2001

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE	FREQUENCY of EXCEEDING SCGs	SCG
Groundwater (ppb)	Volatile Organic Compounds (VOCs)	Tetrachloroethene	ND (10) to 368	9 of 22	5
		Trichloroethene	ND (10) to 62	10 of 22	5
		1,2-Dichloroethene (total)	ND (10) to 660	11 of 22	5
		Vinyl Chloride	ND (10) to 57	7 of 22	2
		Chloroethane	ND (10) to 9	1 of 22	5
		1,1-Dichloroethene	ND (10) to 21	1 of 22	5
		1,1-Dichloroethane	ND (10) to 33	2 of 22	5
		1,1,1-Trichloroethane	ND (10) to 42	2 of 22	5
		Benzene	ND (10) to 14	1 of 22	1
		Toluene	ND (10) to 14	1 of 22	5
		Chlorobenzene	ND (10) to 10	1 of 22	5
	Metals	Chromium	ND (1.7) to 51.4	1 of 7	50
Soils (ppm)	Volatile Organic Compounds (VOCs)	Tetrachloroethene	ND (12) to 2,170	8 of 30	1.4
		Trichloroethene	ND (12) to 124	2 of 30	0.7
		1,2-Dichloroethene (total)	ND (12) to 244	3 of 30	0.3
		1,1-Dichloroethene	ND (12) to 44	1 of 30	0.2
		1,1,1-Trichloroethane	ND (12) to 59	2 of 30	0.8
		Toluene	ND (12) to 7	2 of 30	1.5
		Xylenes (total)	ND (12) to 7	1 of 30	1.2
		1,2-Dichlorobenzene	ND to 28	1 of 30	7.9
		1,3-Dichlorobenzene	ND to 367	2 of 30	1.6
		1,4-Dichlorobenzene	ND to 12	1 of 30	8.5
	Metals	Chromium	1.6 to 162	7 of 30	50
		Copper	11 to 12,500	24 of 30	25
		Lead	ND to 636	5 of 30	SB*
		Zinc	8 to 4,830	23 of 30	20

* SB = Soil background, typically 200-500 ppm

Table includes both pre-IRM and post-IRM sampling results

APPENDIX A

Responsiveness Summary

RESPONSIVENESS SUMMARY

Cardwell Condenser
Proposed Remedial Action Plan
Lindenhurst, Suffolk County
Site No. 152035

The Proposed Remedial Action Plan (PRAP) for the Cardwell Condenser site was prepared by the New York State Department of Environmental Conservation (NYSDEC) and issued to the local document repository on November 15, 2001. This Plan outlined the preferred remedial measure proposed for the remediation of the contaminated soil, sediment and groundwater at the Cardwell Condenser site. The preferred remedy is no further action with continued groundwater monitoring.

The release of the PRAP was announced via a notice to the mailing list, informing the public of the PRAP's availability.

A public meeting was held on November 27, 2001 which included a presentation of the Remedial Investigation (RI) and the Feasibility Study (FS) as well as a discussion of the proposed remedy. The meeting provided an opportunity for citizens to discuss their concerns, ask questions and comment on the proposed remedy. These comments have become part of the Administrative Record for this site. One written comment was received. The public comment period for the PRAP ended on December 15, 2001.

This Responsiveness Summary responds to questions and comments raised at the November 27th public meeting and to the 12/14/01 letter.

The following are the comments received at the public meeting, with the NYSDEC's responses:

COMMENT 1: A 1991 Long Island Regional Planning Board Study comparing the Neguntatogue Creek and the Beaver Dam Creek, located further east in Suffolk County, indicates that the Neguntatogue contains very heavy concentrations of heavy metals such as copper, lead, zinc and cadmium. What is the possibility that these heavy metals originated from this site and were carried into the creek? Was this study looked at during the investigation?

RESPONSE 1: Neither the NYSDEC nor Cardwell Condenser's consultant was aware of this study so it was not evaluated during the Remedial Investigation. However, the findings of the RI show that the Cardwell Condenser site is unlikely to have significantly contributed to metals contamination in the Neguntatogue Creek. Metals concentrations in groundwater were low, with only one sample being marginally above groundwater standards for one heavy metal (chromium). There is no indication that plating wastes were ever disposed of at the surface,

which could have resulted in heavy metals contamination migrating to the creek via surface runoff. No pipes were found that would indicate direct discharge to the creek. All plating wastewater appears to have been disposed of in the subsurface leaching pools.

COMMENT 2: The 1991 Long Island Regional Planning Board Study indicated that one of the chemicals of concern at this site, PCE, was present in Beaver Dam Creek water. Unfortunately the study did not look into the same contaminants in the Neguntatogue Creek. Do you know why the study did not note any of this type of contamination in the Neguntatogue?

RESPONSE 2: The study likely did not include any new field work and was just an evaluation of existing data. That data may not have included sampling for volatile contamination in the Neguntatogue. Surface water samples taken from the Neguntatogue Creek during the RI indicated no violations of NYSDEC Class C Water Quality Standards.

COMMENT 3: I remember in the 1970's seeing an outfall to the creek in Neguntatogue Park with pools of what appeared to be metal shavings around it.

RESPONSE 3: Since Neguntatogue Park is upstream from the Cardwell site, any piping connection between the observed outfall and Cardwell would have to pass through properties not owned or leased by Cardwell's owners, and therefore any relationship to the Cardwell site is very unlikely.

COMMENT 4: What is the history of Cardwell being involved with plating operations?

RESPONSE 4: Cardwell conducted plating operations from 1957 to 2001.

COMMENT 5: What are the health issues to the community in relation to the heavy metals as well as the VOCs? I assume Cardwell is no longer considered to be a threat since they continue to operate.

RESPONSE 5: Currently, no completed exposure pathways exist at this site. Therefore, there are no community health issues in relation to the heavy metals or VOCs. Cardwell no longer does plating operations at the site and the site is currently being used as a retail store. In addition, Cardwell has been connected to the public sewers since 1987, so no on-site releases have occurred since that time.

COMMENT 6: What is the significant threat to the public health?

RESPONSE 6: NYSDEC and NYSDOH believe this site no longer presents a significant threat to the public health due to the removal of approximately 2 cubic yards of contaminated soils from the on-site leaching pools. There is no exposure to the

contaminated groundwater since no supply wells were identified during a survey of public and private water supply wells within one mile downgradient of the site. Concentrations of VOCs in groundwater have been decreasing since the IRM was conducted. Therefore, no current threat to drinking water supplies exists, nor is likely to exist in the future, due to the absence of any existing water supply wells in this area, the decreasing VOC concentrations in groundwater, and the proximity to saline groundwater. However, some VOCs still exceed groundwater standards which will necessitate continued groundwater monitoring.

COMMENT 7: Is there a food chain contamination risk? How would you relate the contamination from the site to a PCB problem in striped bass?

RESPONSE 7: The VOC contaminants we have at the site are water soluble and are therefore not accumulated in the tissues of fish and passed up the food chain. In contrast, PCBs are oil soluble and thus tend to accumulate in the fatty tissue of fish and migrate up the food chain to larger fish such as striped bass. No PCB contamination was found at the Cardwell site.

COMMENT 8: If individuals were exposed to site chemicals in significant amounts what are some of the health effects?

RESPONSE 8: Long term exposures to high levels of tetrachloroethene, the contaminant of concern at the site, can cause impacts including effects on the neurological system, liver and kidneys. To the best of our knowledge, no one in the community was exposed to PCE from this site. Therefore, no health effects are expected due to PCE contamination at this site.

A letter dated December 14, 2001 was received from Brian D. Ward of Lindenhurst which included the following comments:

"Upon review of a 1991 Long Island Planning Board's study of the Neguntatogue, it is clear that heavy metals, the same heavy metals used at Cardwell, were discovered in extremely high concentrations in close proximity to the Cardwell Condenser site. This data demonstrates the high probability of mutually high sediment concentrations of PCE and/or DCE in the Neguntatogue sediments.

Although a spokesperson for the consulting firm retained by Cardwell stated that no outflow pipe into the Neguntatogue existed, I testified otherwise stating that in the early to mid 1970's I personally witnessed an outflow pipe at the southernmost border of the park, but on the Cardwell site, that appeared to be depositing a metallic-like substance into the Neguntatogue. When the substances were handled the seemingly crystalline appearance dissolved."

RESPONSE: The relevant portion of the report entitled "Evaluation of Land Use Impacts on Environmental Quality in Urban and Semi-Rural Streams Tributary to the Great

South Bay, Long Island, New York" (March 1990) was reviewed by NYSDEC based on this comment. The analytical results found in this report show that the Neguntatogue Creek sediment sample taken immediately north of Montauk Highway in the area where groundwater from the site discharges to the creek had concentrations of metals well below the guidance values for sediments. The concentrations of metals in sediments at this location was actually slightly lower than the concentration found in the next upgradient sample. Only south of Montauk Highway in the vicinity of several boatyards in the marine reaches of Neguntatogue Creek do the metals concentrations become elevated. Pore water samples taken in late 2001 from Neguntatogue Creek sediments indicated that the concentration of PCE, DCE and other VOCs is similar to the concentrations found in nearby monitoring wells MW-12 and MW-13. These VOC concentrations are expected to decrease as the VOC concentrations in the monitoring wells have done since the completion of the IRM.

In response to the information provided concerning a discharge pipe on the Cardwell property, an inspection of the Neguntatogue Creek bank was conducted along the Cardwell and park properties. No evidence of a discharge pipe could be identified. No record of a discharge pipe from the Cardwell facility was found in company records and engineering drawings.

APPENDIX B

Administrative Record

Appendix B
Administrative Record

Cardwell Condenser Site
Site Number 1-52-035

1) Engineering Investigations at Inactive Hazardous Waste Sites, Phase II Investigation, Cardwell Condenser Corporation, Site No. 1-52-035, December 1993. Prepared for the New York State Department of Environmental Conservation by Lawler, Matusky & Skelly Engineers.

2) Focused Remedial Investigation Report for Cardwell Condenser, Site No. 1-52-035, October 1998. Prepared by Fanning, Phillips & Molnar

3) Interim Remedial Measures Report for Cardwell Condenser, Site No. 1-52-035, May 2000. Prepared by FPM Group.

4) Focussed Feasibility Study for Cardwell Condenser, Site No. 1-52-035, August 2001. Prepared by FPM Group.

5) Proposed Remedial Action Plan, Cardwell Condenser, Lindenhurst, New York, November 2001. Prepared by the New York State Department of Environment Conservation.