Department of Environmental Conservation

Division of Hazardous Waste Remediation

National Semiconductor Corporation Hemlock Street Facility Inactive Hazardous Waste Site

Site Number 4-01-027
Albany County, New York

New York State Superfund

Record of Decision

January 1995

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor*

DECLARATION STATEMENT - RECORD OF DECISION

National Semiconductor Inactive Hazardous Waste Site
Town of Colonie, Albany County, New York
Site No. 401027

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the National Semiconductor inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). 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 upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the National Semiconductor Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography 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, if not addressed by implementing the response action selected in this ROD, presents a current or potential threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the National Semiconductor and the criteria identified for evaluation of alternatives the NYSDEC has selected to continue groundwater recovery and treatment, assisted by soil vapor extraction and treatment, plus continued groundwater monitoring. The components of the remedy are as follows:

1. Operation of the groundwater treatment system will continue. Ten recovery wells withdraw the groundwater, pass it through the treatment system, and discharge it to the surface waters. Quality of the discharge water must meet the substantiative requirements of a SPDES permit.

2. Soil vapor extraction and treatment will continue. Vacuum extraction technology uses wells screened in the unsaturated (or vadose) zone to draw air through the contaminated soil. Groundwater recovery enhances the vapor extraction system by exposing more unsaturated soil as the groundwater elevation is lowered. Granular activated carbon filters are being used to treat soil vapor before the vapor is discharged to the atmosphere. National Semiconductor Corporation must meet the substantive permit requirements for an air discharge point.

3. Long-term monitoring is a key part of the proposed remedy. While the two treatment systems are in operation, the groundwater will be sampled on a periodic basis to enable the Department and National Semiconductor Corporation to monitor the efficiency and effectiveness of the remedy. This monitoring will continue after completion of the remedy, to confirm the effectiveness of the remedial action.

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 statutory preference for remedies that reduce toxicity, mobility, or volume as a principal element.

January 10, 1995
Date

Ann Hill DeBarbieri
Deputy Commissioner

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RECORD OF DECISION

"NATIONAL SEMICONDUCTOR"

Town of Colonie, Albany County, New York
Site No. 401027
Date of Issuance: October 28, 1994

SECTION 1: SITE LOCATION AND DESCRIPTION

The National Semiconductor site (#401027) is located at 5 Hemlock Street, in the Town of Colonie, Albany County. The 1+ acre property contained a chemical storage area approximately 25' x 25'.

Adjacent land use includes Campito's Plumbing and Heating, Vellano Brothers' Inc., and businesses to the south and east of the site along Hemlock Street. This commercial neighborhood is near the Albany County Airport. Please see figure #1.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

Xciton, Inc., used chlorinated solvents in their manufacturing of semiconductors from 1971 until 1982. Xciton, Inc., stored these solvents in a 25' x 25' area north of the building. Poor "housekeeping", spillage, and leakage from 55 gallon drums led to soil and groundwater contamination. National Semiconductor Corporation purchased the assets of Xciton in 1982 and discontinued using trichloroethylene. The entire operation was stopped about 1 year later in 1983.

2.2: Remedial History

Initial investigations in 1983 and 1984 led to the installation of a groundwater treatment system in 1987. The air stripper tower began continuous operation in June of 1988. This IRM pumps contaminated groundwater into the top of an aluminum tower, and clean air is blown in from the bottom. The contamination in groundwater evaporates (volatilizes) into the clean air and is released to the environment at a controlled rate which meets the requirements of an air permit and a water discharge permit. This IRM has contained the isolated contamination plume north of the building.

Additional investigations led to the installation of a soil vapor extraction system in the summer of 1993. A blower creates a vacuum which extracts the contaminated soil vapor (air). The vapors travel through the blower, and the contamination is removed from the air by a granulated activated carbon filter before discharging the air to the atmosphere.

SECTION 3: CURRENT STATUS

National Semiconductor Corporation, initiated a Remedial Investigation/ Feasibility Study (RI/FS) on February 3, 1992 to address the contamination at the site.

3.1: 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 is an accumulation of focused investigations that were conducted between 1983 and 1991. A report entitled "Remedial Investigation Report: Former National Semiconductor Corporation - Hemlock Street Facility" dated January 1993 has been prepared describing the field activities and findings of the RI in detail. A summary of the RI follows:

The RI activities consisted of the following:

- *An initial investigation to define the horizontal and vertical extent of soil and groundwater contamination at the solvent storage area was conducted in 1983, and included the installation of nine monitoring wells.*
- *A groundwater treatment pilot study was conducted in 1985.*
- *To assist in finalizing the design of the groundwater treatment air stripping tower, nine additional monitoring wells were installed at the north and south ends of the building in 1987.*
- *A soil gas survey was conducted in October of 1990 to supplement the information at the south end of the building and help to design a soil remediation program.*
- *An additional subsurface investigation consisted of advancing five soil borings and converting them into groundwater monitoring wells. Three of the monitoring wells replaced damaged unusable existing wells, and the last two formed a cluster downgradient of pumping wells 9 & 10 at the south end of the building for monitoring purposes.*

The analytical data obtained from the RI was compared to Applicable Standards, Criteria, and Guidance (SCGs) in determining remedial alternatives. Groundwater, drinking water and surface water SCGs identified for the National Semiconductor site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. For the evaluation and interpretation of soil and sediment analytical results, NYSDEC soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used to develop remediation goals for soil.

Based upon the results of the remedial investigation in comparison to the SCGs and potential public health and environmental exposure rates, certain areas and media of the site require remediation.

Groundwater contamination is being contained by continued extraction and treatment of the groundwater. The highest detections of each compound of concern have been: up to 7900 ppb for trichloroethene, up to 3900 ppb for 1,2 dichloroethene, up to 650 ppb for 1,1,1 trichloroethane, and up to 125 ppb for 1,1 dichloroethane. The groundwater standard for each of these compounds is 5 ppb.

Soil contamination is being addressed by a vapor extraction system. The highest detection of trichloroethene was up to 19.0 ppm. A typical contaminant level is currently 2.5 ppm, compared to a clean-up goal of 0.7 ppm.

Significant threat to the environment has been minimized by controlling the migration of the plume and reducing the toxicity of the soil. Once the remedy is completed the significant threat is expected to be eliminated. These conditions constitute that the site is being properly closed and will continue to be managed. A Class 4 status will be pursued for this site.

3.2 Interim Remedial Measures:

Interim Remedial Measures (IRMs) were conducted at the site based on findings as the RI progressed. An IRM is implemented when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

The groundwater treatment IRM began continuous operation in June of 1988. An aluminum tower is the container which holds the contaminated groundwater being pumped into the top, and clean air is being blown in from the bottom. The groundwater and clean air are intimately mixed allowing for the chlorinated solvents in the groundwater to evaporate into the air (volatilize) and the air is finally released into the atmosphere at a controlled rate.

The soil treatment IRM began continuous operation in September of 1993. A blower creates a vacuum in each of six soil vapor extraction wells. The air that is contaminated with chlorinated solvent vapors is withdrawn by the blower and the contamination is then removed from the air by a granulated activated carbon filter, prior to discharging to the atmosphere.

3.3 Summary of Human Exposure Pathways:

No completed human exposure pathways exist. A possible human exposure pathway at the National Semiconductor site is a potential use of groundwater. The area is serviced by public water, and groundwater in this area is not currently used.

3.4 Summary of Environmental Exposure Pathways:

No environmental exposure pathways have been identified. However, the groundwater resource has been contaminated. The IRMs now in operation have shown to be effectively remediating this

source of contamination. Due to the potential for future human use of this environmental resource, continued efforts for contaminant removal, as described below, are appropriate.

SECTION 4: ENFORCEMENT STATUS

The NYSDEC and the National Semiconductor Corporation entered into an IRM Consent Order for soil vapor treatment on 11/12/91, and a RI/FS Consent Order on 2/03/92. The Orders obligate the responsible party to implement the IRM and a RI/FS.

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6NYCRR 375-1.10. These goals are established under the guideline of meeting all standards, criteria, and guidance (SCGs) and protecting human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to the public health and to 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:

- *Reduce, or eliminate the contamination present within the soils on site.*
- *Mitigate the impacts of contaminated groundwater to the environment.*
- *Prevent, to the extent possible, migration of contaminants in the groundwater.*
- *Provide for attainment of SCGs for groundwater quality at the limits of the area of concern (AOC).*
- *Continued monitoring of the groundwater.*

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the National Semiconductor site were identified, screened and evaluated in a Feasibility Study. This evaluation is presented in the report entitled Feasibility Study Report: Former National Semiconductor--Hemlock Street Facility, dated September 10 and revised December 23, 1993. A summary of the detailed analysis follows.

6.1: Description of Alternatives

The potential remedies are intended to address the contaminated groundwater and soil at the site.

No Further Action

The no further action alternative is typically evaluated as a basis for comparison. This alternative recognizes the remediation of the site completed to date under the IRMs. It requires continued

monitoring only, to evaluate the effectiveness of the remediation completed to date under the IRMs. The groundwater treatment system and soil vapor treatment system would both be shut off.

This is an unacceptable alternative as the site would remain in its present condition, and human health and the environment would not be adequately protected. An annual cost of $10,000 to $12,000 for continued monitoring could be expended for more than 30 years.

Groundwater Treatment Only

This alternative would involve continuation of the groundwater extraction and treatment only. It would require the shutdown of the soil vapor extraction and treatment system. Monitoring would continue to evaluate any changes in conditions. The cost to construct the groundwater treatment system was $231,000. An additional $1,225,000 in present worth expenses are estimated to be spent on operation and maintenance over a twenty year period. Total estimated cost in 1994 dollars is $1,456,000.

Groundwater Treatment Plus Soil Vapor Extraction

This alternative involves the continuation of both IRMs to completion. The groundwater treatment IRM and the soil vapor extraction IRM were installed and continue to operate, but have not reached groundwater standards and soil clean-up standards that are protective of groundwater, respectively. Monitoring would continue to evaluate any changes in conditions. The cost to construct the groundwater treatment plus soil vapor extraction was $343,000. An additional $889,000 in present worth expenses are estimated to be spent on operation and maintenance over a ten year period. Total estimated cost in 1994 dollars is $1,232,000.

Groundwater Treatment Plus Soil Excavation

The soil vapor extraction system would be shut down. 180-370 cubic yards of contaminated soil would be excavated from the source area and disposed of off-site. Groundwater treatment would continue to address the contamination plume. Monitoring would continue to evaluate any changes in conditions.

Groundwater Treatment, Soil Vapor Treatment and Soil Excavation

This alternative includes the continuation of both IRMs to completion and removal of the source soils (up to 370 cu. yds.). Monitoring would continue to evaluate any changes in conditions.

6.2 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 (6NYCRR 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 contained in the Feasibility Study.

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 No Further Action alternative is not expected to comply with SCGs. All the other alternatives are expected to comply.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective. The No Further Action alternative is not expected to be protective, and will no longer be considered as a potential remedy. All the other alternatives are expected to be protective.

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 implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared with the other alternatives. Groundwater treatment plus soil vapor extraction provides minimal adverse impact and a relatively short period of time to reach the remedial objectives. Both of the alternatives utilizing excavation would cause significant potential short-term adverse impacts. These potential short-term impacts include direct human contact, inhalation of vapors by the excavation crew, and a temporary increase in groundwater contamination by disturbing the soils.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of alternatives after implementation of the response actions. 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. All alternatives using soil vapor extraction and/or soil excavation are expected to leave only a minimal amount of residual waste 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. All alternatives using soil vapor extraction and/or soil excavation are expected to significantly reduce the toxicity and mobility of the waste.

6. Implementability. The technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction, the reliability of the technology, and the ability to monitor the effectiveness of the remedy. Administratively, the availability of the necessary personnel and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc. Both alternatives that involve the excavation of source soils are significantly more difficult to implement. The building foundations would need to be supported and stabilized. The groundwater elevation would need to be continuously lowered during the excavation.

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. Because the alternatives involving excavation of source soils are difficult to implement, and would potentially expose the excavation crew to contaminates. with about the same expected reduction in toxicity and mobility; they were not considered during

the detailed cost analysis. The cost of both alternatives involving excavation were not estimated and do not appear on Table 1. The cost of continued monitoring for the "no further action" alternative was not estimated because of its unprotective nature, and does not appear on Table 1.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - During the preparation of Records of Decision, concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan are evaluated. A " Responsiveness Summary" is then prepared that describes public comments received and how the Department will address the concerns raised. In this particular case, no comments were received, therefore, the final remedy selected is the proposed remedy.

SECTION 7: SUMMARY OF THE SELECTED ALTERNATIVE

Based upon the results of the RI/FS, and the evaluation presented in Section 7, the NYSDEC is proposing Groundwater Treatment Plus Soil Vapor Extraction as the remedy for this site.

This selection is based upon the protective qualities of groundwater treatment plus soil vapor extraction by reducing the toxicity of the source soils. The total cost is only two-thirds the cost of groundwater treatment alone because the site remediation time-frame is anticipated to be half the time (10 years versus 20 years).

The estimated present worth cost to implement the remedy is $1,232,000. The cost to construct the remedy is $343,000 the estimated present worth average annual operation and maintenance cost for 10 years is $90,000.

The elements of the selected remedy are as follows:

1. Operation of the groundwater treatment system will continue. Ten recovery wells withdraw the groundwater, pass it through the treatment system, and discharge it to surface waters. Quality of the discharge water must meet the substantive requirements of a SPDES permit.

2. Soil vapor extraction and treatment will continue. Vacuum extraction technology uses wells screened in the unsaturated (or vadose) zone to draw air through the contaminated soil. Groundwater recovery enhances the vapor extraction system by exposing more unsaturated soil as the groundwater elevation is lowered. Granular activated carbon filters are being used to treat soil vapor before the vapor is discharged to the atmosphere. National Semiconductor Corporation must meet the substantive permit requirements for an air discharge point.

3. Long-term monitoring is a key part of the proposed remedy. While the two treatment systems are in operation, the groundwater will be sampled on a periodic basis to enable the Department and National Semiconductor Corporation to monitor the efficiency and

effectiveness of the remedy. This monitoring will continue after completion of the remedy, to confirm the effectiveness of the remedial action.

SECTION 8: HIGHLIGHTS OF COMMUNITY PARTICIPATION

A public meeting was held at the William K. Sanford Town Library, located in the Town of Loudonville, on September 7, 1994 at 6:30 p.m. The public meeting was arranged to discuss the proposed remedial action plan and answer the questions of the attendees. No one attended.

The public comment period began on August 30, 1994 and ended on September 30, 1994. No comments were received by the Department or by National Semiconductor's Consultant, C.T. Male Associates, P.C.

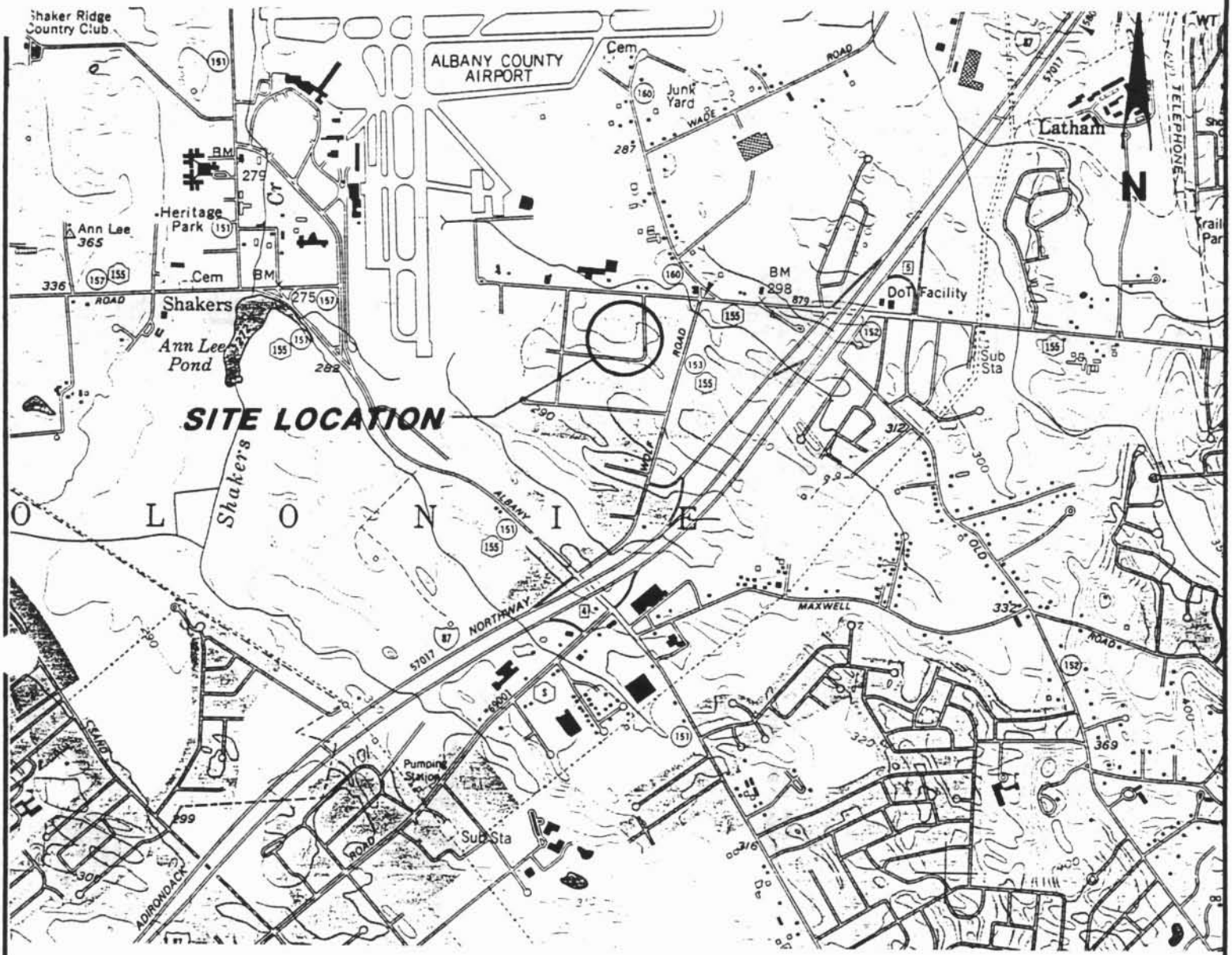
Normally, a responsiveness summary is prepared to address comments, questions and concerns raised during the community participation proces. Since no comments were received, no responsiveness summary has been included.

FIGURE 1

SITE MAPS

1a - Site Location

1b - Well Locations



MAP REFERENCE : D.O.T. ALBANY QUADRANGLE, 1983 SERIES

FIGURE 1

Date	RECORD OF WORK	Appr.

Drafter: GLP Checker:

Appr. by: Proj. No. 86.424

SITE LOCATION MAP
NATIONAL SEMICONDUCTOR CORPORATION
HEMLOCK ST. FACILITY

TOWN OF COLONIE | COUNTY OF ALBANY, NEW YORK

C. T. MALE ASSOCIATES, P.C.
50 Century Hill Drive, P.O. Box 727, Latham, NY 12110
(518) 786-7400
Engineering Surveying Architecture Landscape Architecture
Laboratory Services Computer Services

SCALE: 1" = 2000' | DATE: DECEMBER 16, 1991

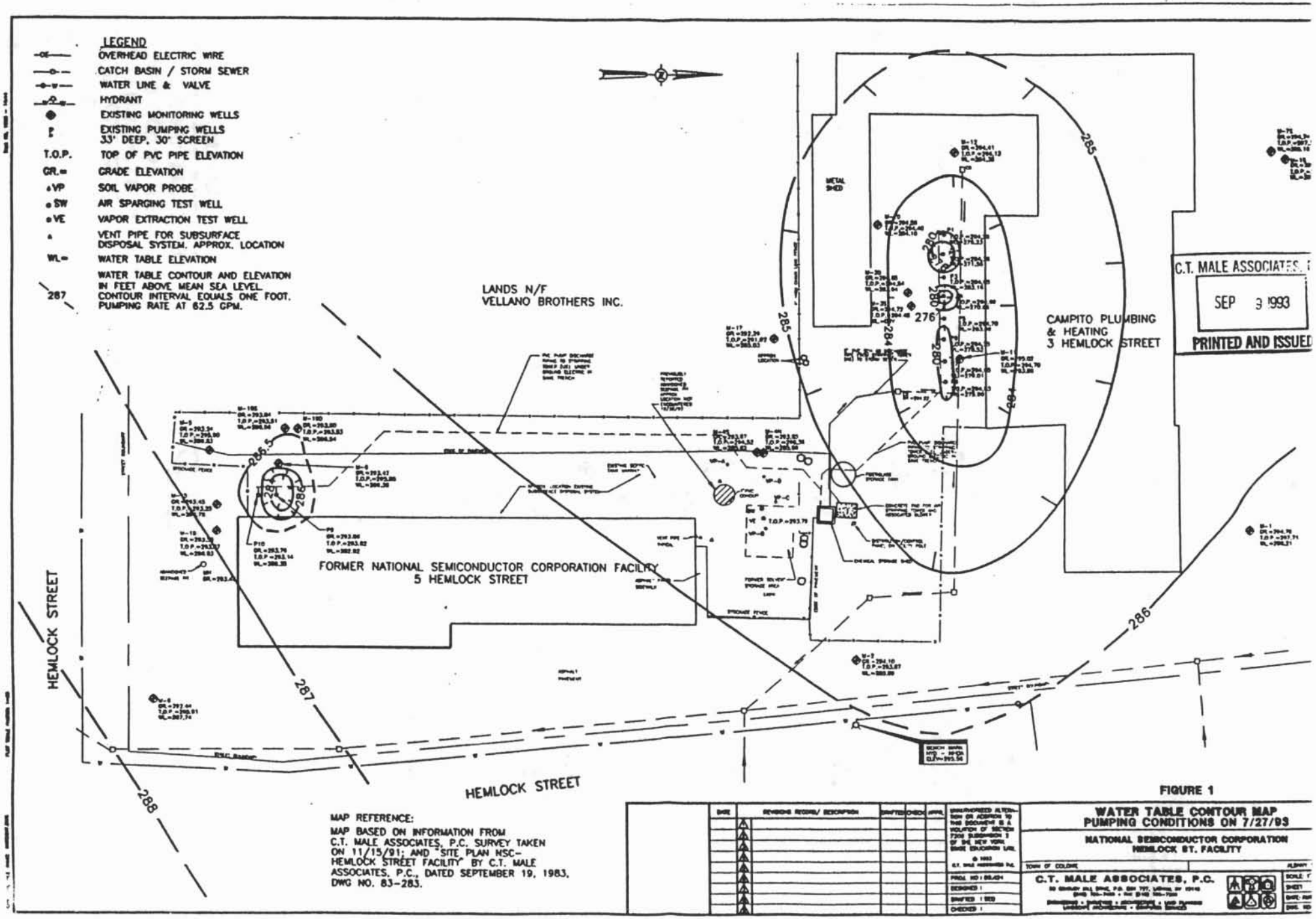

LEGEND
OVERHEAD ELECTRIC WIRE
CATCH BASIN / STORM SEWER
WATER LINE & VALVE
HYDRANT
EXISTING MONITORING WELLS
EXISTING PUMPING WELLS 33' DEEP, 30' SCREEN
T.O.P. TOP OF PVC PIPE ELEVATION
GR.= GRADE ELEVATION
VP SOIL VAPOR PROBE
SW AIR SPARGING TEST WELL
VE VAPOR EXTRACTION TEST WELL
VENT PIPE FOR SUBSURFACE DISPOSAL SYSTEM, APPROX. LOCATION
WL= WATER TABLE ELEVATION
287 WATER TABLE CONTOUR AND ELEVATION IN FEET ABOVE MEAN SEA LEVEL. CONTOUR INTERVAL EQUALS ONE FOOT. PUMPING RATE AT 62.5 GPM.
LANDS N/F
VELLANO BROTHERS INC.
CAMPITO PLUMBING
& HEATING
3 HEMLOCK STREET
FORMER NATIONAL SEMICONDUCTOR CORPORATION FACILITY
5 HEMLOCK STREET
HEMLOCK STREET
HEMLOCK STREET
METAL SHED
C.T. MALE ASSOCIATES, P.C.
SEP 3 1993
PRINTED AND ISSUED
MAP REFERENCE:
MAP BASED ON INFORMATION FROM C.T. MALE ASSOCIATES, P.C. SURVEY TAKEN ON 11/15/91; AND "SITE PLAN NSC-HEMLOCK STREET FACILITY" BY C.T. MALE ASSOCIATES, P.C., DATED SEPTEMBER 19, 1983, DWG NO. 83-283.
WATER TABLE CONTOUR MAP
PUMPING CONDITIONS ON 7/27/93
NATIONAL SEMICONDUCTOR CORPORATION
HEMLOCK ST. FACILITY
TOWN OF COLONIE
C.T. MALE ASSOCIATES, P.C.

FIGURE 1

TABLE 1

Evaluation of the Various Remedial Alternatives

	No Further Action	Ground-water Treatment Only	Ground-water Treatment Plus Soil Vapor Extraction	Ground-water Treatment Plus Soil Excavation	Ground-water & Soil Vapor Treatment Plus Soil Excavation
Compliance with SCG's	No	Yes	Yes	Yes	Yes
Portection of Human Health & Environ-ment	No	Yes	Yes	Yes	Yes
Short-Term Effective-ness	Good	Good	Good	Poor	Poor
Long-Term Effective-ness	Poor	Good	Good	Good	Good
Reduction of Tox.,Mob., Vol	Poor	Good	Good	Good	Good
Implement-ability	Easy	Moderate	Moderate	Difficult	Difficult
Cost	**	$1,456,000	$1,232,000	**	**

**See Page 9, Item 7.

T A B L E 2

Monitoring Well Data

TABLE 2 : GROUNDWATER MONITORING RESULTS, VOLATILE ORGANIC ANALYSES, FORMER NATIONAL SEMICONDUCTOR CORPORATION, HEMLOCK STREET FACILITY

CONCENTRATION (ug/l)

LOCATION	11/10/83[1]	1/24 - 25/84[1]	12/31/84[1]	5/14 - 15/84	
	TCE	TCE	TCE	TCE	tDCE
M-1	<1.0	<1.0	<1	<1	<1
M-2	2.9	<1.0	<1	<1	<1
M-3	6,792 (top) 7,981 (botom)	5,831	--	275	793
M-3D	--	--	1,760	--	--
M-4N	2.5	4.4	<1	<1	24.5
M-4S	268	--	--	--	--
M-5	<1.0	<1.0	<1	4.5	16.6
M-6	<1.0	2.7	<1	<1.0	<1.0
M-7(D)	--	1.6	<1	<1.0	<1.0
M-7(S) (shallow)	1.5	2.1	<1	<1.0	<1.0
M-8	--	3.1	<1	<1.0	<1.0
M-9[4]	--	---	---	---	---
M-10	---	---	---	---	---
M-11	---	---	---	---	---
M-12	---	---	---	---	---
M-13[4]	---	---	---	---	---
M-14[4]	---	---	---	---	---
M-15	---	---	---	---	---

TABLE 2 : GROUNDWATER MONITORING RESULTS, VOLATILE ORGANIC ANALYSES, FORMER NATIONAL SEMICONDUCTOR CORPORATION, HEMLOCK STREET FACILITY

CONCENTRATION (ug/l)

LOCATION	8/11/86[1]		5/20/87[1]				5/11/88[1]		9/14/88[2]		1/25/89[3]	
	TCE	tDCE	TCE	tDCE	TCA	DCA	TCE	tDCE	TCE	tDCE	TCE	tDCE
M-1	<1	<1	--	--	--	--	--	--	--	--	--	--
M-2	<1	<1	--	--	--	--	--	--	--	--	--	--
M-3	673	697	--	--	--	--	957	<10	75	<5	72	<1
M-3D	--	--	--	--	--	--	--	--	--	--	--	--
M-4N	<1	92.7	--	--	--	--	<1	3	<1	2	<1	<1
M-4S	527	222	--	--	--	--	928	25	115	<1	65	5
M-5	<1	<1	--	--	--	--	--	--	--	--	--	--
M-6	<1	<1	--	--	--	--	--	--	--	--	--	--
M-7(D)	<1	<1	--	--	--	--	--	--	--	--	--	--
M-7(S) (shallow)	<1	<1	--	--	--	--	--	--	--	--	--	--
M-8	<1	<1	--	--	--	--	--	--	--	--	--	--
M-9[4]	--	--	--	--	--	--	--	--	40	<1	30	<1
M-10	--	--	<1	<1	<1	<1	--	--	--	--	6	<1
M-11	--	--	604	<1	<1	<1	18	<1	500	<5	70,705	<500
M-12	--	--	2	<1	<1	<1	--	--	--	--	4	<1
M-13[4]	--	--	2	<1	644	125	67	<10	--	--	--	--
M-14[4]	--	--	140	<1	<1	<1	7	<1	--	--	--	--
M-15	--	--	<1	<1	--	--	--	--	--	--	--	--

TABLE 2 : GROUNDWATER MONITORING RESULTS, VOLATILE ORGANIC ANALYSES, FORMER NATIONAL SEMICONDUCTOR CORPORATION, HEMLOCK STREET FACILITY

CONCENTRATION (ug/l)

LOCATION	April/May 1989[3]		8/15/89[3]		11/24-27/89[2]		4/6/90[2]		7/23/90[2]	
	TCE	tDCE	TCE	tDCE	TCE	tDCE	TCE	tDCE	TCE	tDCE
M-1	--	--	--	--	--	--	--	--	<5	<5
M-3	36	<1	46.7	1.5	19.7	<1	<25	<25	6	<5
M-3D	--	--	--	--	--	--	--	--	--	--
M-4N	<5	<5	<1	<1	<1	<1	<5	<5	<5	<5
M-4S	39.7	12.1	53.3	21	58	2	91	13	41	<5
M-5	--	--	--	--	--	--	--	--	<5	<5
M-6	--	--	--	--	--	--	--	--	<5	<5
M-7(S)	--	--	--	--	--	--	--	--	<5	<5
M-9[4]	8	<1	1,850	<50	35	<1	<5	<5	6	<5
M-10	6	<1	6.2	<1	5	<1	<5	<5	<5	<5
M-11	777	5.5	77.2	<10	113	<1	55	<5	24	<5
M-12	4.2	<1	4.1	<1	4	<1	<5	<5	<5	<5
M-13[4]	--	--	--	--	--	--	--	--	--	--
M-14[4]	--	--	--	--	--	--	--	--	--	--
M-15	--	--	--	--	--	--	--	--	<5	<5

TABLE 2 : GROUNDWATER MONITORING RESULTS, VOLATILE ORGANIC ANALYSES, FORMER NATIONAL SEMICONDUCTOR CORPORATION, HEMLOCK STREET FACILITY

CONCENTRATION (ug/l)

LOCATION	11/8/90[2]						1/30 - 2/1/91[2]							
	TCE	tDCE	TCA	MC	DCA	cDCE	TCE	tDCE	TCA	MC	DCA	cDCE	VC	DCE
M-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M- 3	7	<5	<5	<5	<5	<5	4.4	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5
M- 3D	60	<5	<5	5	<5	<5	69	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5
M- 4N	<5	<5	<5	<5	<5	<5	<0.5	0.7	<0.5	<0.5	<0.5	12	<0.5	<0.5
M- 4S	39	<5	<5	<5	<5	<5	26	1.9	<0.5	<0.5	<0.5	24	<0.5	<0.5
M-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-6	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-7(S) (shallow)	--	--	--	--	--	--	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5
M- 9[4]	6	<5	<5	<5	<5	<5	6.5	<0.5	2.0	<0.5	<0.5	<0.5	<0.5	<0.5
M-10	<5	<5	150	<5	<5	<5	0.6	3.9	4.7	<0.5	8.5	99	3.4	0.9
M-11	<5	<5	<5	<5	<5	<5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5
M-12	<5	<5	<5	7	<5	<5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
M-13[4]	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-14[4]	--	--	--	--	--	--	--	--	--	--	--	--	--	--
M-15	--	--	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

TABLE 2 : GROUNDWATER MONITORING RESULTS, VOLATILE ORGANIC ANALYSES, FORMER NATIONAL SEMICONDUCTOR CORPORATION, HEMLOCK STREET FACILITY

CONCENTRATION (ug/l)

LOCATION	7/10 - 7/12/91 (2)							
	TCE	tDCE	TCA	MC	DCA	cDCE	VC	DCE
M-1	--	--	--	--	--	--	--	--
M-3	5.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
M-3D	24	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
M-4N	0.7	0.8	<0.5	<0.5	<0.5	11	<0.5	<0.5
M-4S	16	<0.5	<0.5	<0.5	<0.5	2.1	<0.5	<0.5
M-5	--	--	--	--	--	--	--	--
M-6	--	--	--	--	--	--	--	--
M-7S	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
M-9(4)	2.4	<0.5	<0.6	<0.5	<0.5	0.5	<0.5	<0.5
M-10	250	2.9	31	<0.5	8.7	106	2.0	4.8
M-11	1.5	<0.5	<0.5	<0.5	<0.5	17	<0.5	<0.5
M-12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
M-15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
M-16	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
M-18	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
M-19S	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.1	<0.5
M-19D	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

TABLE 2 : GROUNDWATER MONITORING RESULTS, VOLATILE ORGANIC ANALYSES, FORMER NATIONAL SEMICONDUCTOR CORPORATION, HEMLOCK STREET FACILITY

CONCENTRATION (ug/l)

LOCATION	1/28 - 1/29/92 (2)							
	TCE	tDCE	TCA	MC	DCA	cDCE	VC	DCE
M-1	--	--	--	--	--	--	--	--
M-3 (5)	--	--	--	--	--	--	--	--
M-3D	29	<0.5	<0.5	<0.5	<0.5	1.7	<0.5	<0.5
M-4N	<0.5	0.8	<0.5	<0.5	<0.5	10.4	<0.5	<0.5
M-4S	9.7	0.7	<0.5	<0.5	<0.5	10.6	<0.5	<0.5
M-5	--	--	--	--	--	--	--	--
M-6	--	--	--	--	--	--	--	--
M-7S	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
M-9(4)	1.8	<0.5	<0.5	<0.5	<0.5	2.4	1.0	<0.5
M-10	7.5	<0.5	<0.5	<0.5	<0.5	11.2	<0.5	<0.5
M-11	1.0	<0.5	<0.5	<0.5	<0.5	1.7	<0.5	<0.5
M-12	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
M-15	--	--	--	--	--	--	--	--
M-16	--	--	--	--	--	--	--	--
M-17	30	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
M-18	--	--	--	--	--	--	--	--
M-19S	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
M-19D	--	--	--	--	--	--	--	--
SW	<0.5	<0.5	<0.5	<0.5	<0.5	15	<0.5	<0.5
VE	134	<2.5	<2.5	<2.5	<2.5	100	<2.5	<2.5

TABLE 2 : GROUNDWATER MONITORING RESULTS, VOLATILE ORGANIC ANALYSES, FORMER NATIONAL SEMICONDUCTOR CORPORATION, HEMLOCK STREET FACILITY

CONCENTRATION (ug/l)

LOCATION	7/27 - 7/28/92 (2)							
	TCE	tDCE	TCA	MC	DCA	cDCE	VC	DCE
M-1	--	--	--	--	--	--	--	--
M-3 (5)	--	--	--	--	--	--	--	--
M-3D	6	<1	<1	<1	<1	--	<5	<1
M-4N	<1	<1	<1	<1	<1	--	<5	<1
M-4S	16	<10	<10	<10	<10	<10	<10	<10
M-5	--	--	--	--	--	--	--	--
M-6	<10	<10	<10	<10	<10	<10	<10	<10
M-7S	<10	<10	<10	<10	<10	<10	<10	<10
M-9(4)	<10	<10	<10	<10	<10	<10	<10	<10
M-10	57	<10	<10	<10	<10	--	<50	<10
M-11	<1	<1	<1	<1	<1	--	<5	<1
M-12	<1	<1	<1	<1	<1	--	<5	<1
M-15	--	--	--	--	--	--	--	--
M-16	--	--	--	--	--	--	--	--
M-17	16	<10	<10	<10	<10	<10	<10	<10
M-18	--	--	--	--	--	--	--	--
M-19S	<1	<1	<1	<1	<1	--	<5	<1
M-19D	--	--	--	--	--	--	--	--
SW	<1	<1	<1	<1	<1	<1	<5	<1
VE(5)	--	--	--	--	--	--	--	--

TABLE 2 : GROUNDWATER MONITORING RESULTS, VOLATILE ORGANIC ANALYSES, FORMER NATIONAL NATIONAL SEMICONDUCTOR CORPORATION, HEMLOCK STREET FACILITY

TCE = Trichloroethylene

tDCE = trans 1,2 - dichloroethylene

TCA = 1,1,1 - trichloroethane

MC = methylene chloride

DCA = 1,1 - dichloroethane

cDCE = cis 1,2 - dichloroethylene

VC = vinyl chloride

DCE = 1,1 - dichloroethene

-- = not sampled

(1) Results of samples taken prior to the start-up of the groundwater remediation system.

(2) Results of samples taken while the air stripping tower was in operation.

(3) Results of samples taken while the air stripping tower was not in operation.

(4) M-13 was not sampled after the 5/11/88 sampling event due to an obstruction in the well. M-14 was not sampled after the 5/11/88 sampling event since it was destroyed on June 29, 1988 by a subcontractor of the property owner. Since M-9 is in the vicinity of former M-14, it was substituted for M-14.

(5) Not able to be sampled since well was dry due to depressed water table.

LR/sg

APPENDIX A
ADMINISTRATIVE RECORD

- "Engineer's Report" Groundwater Contamination Investigation" April 23, 1984.
- "Engineering Report: Groundwater Remediation" December 1985.
- "Site Specific Health and Safety Plan" Revised November 1987, Revised May 1991.
- "Soil Investigation and Remediation Report" February, 1990 revised March 5, 1990.
- "Proposed Soil Gas Survey Investigation Work Plan" October 29, 1990.
- Soil Gas Survey Remedial Investigation Report November 30, 1990.
- "Operation and Maintenance Manual: Former National Semiconductor Corporation, Hemlock Street Facility" January 28, 1991 revised September, 1991.
- "Subsurface Investigation Work Plan: Former National Semiconductor Corporation Site, Hemlock Street Facility," March 20, 1991 revised May 3, 1991.
- "Subsurface Investigation Report: National Semiconductor Corporation, Hemlock Street Facility" July 1991.
- Subsurface Investigation Report: Former National Semiconductor Corporation Site," July 16, 1991.
- Order on Consent, Index #A4-0271-91-07, November 12, 1991 for an Interim Remedial Measure.
- "Remedial Investigation Report" Former National Semiconductor Corporation--Hemlock Street Facility" December 20, 1991 revised January 1993.
- Order on Consent, Index #A4-0235-90-06, February 3, 1992 for RI/FS.
- "IRM Program Work Plan: Vapor Extraction System" December 20, 1991 revised March 1992.
- "Feasibility Study Report: Former National Semiconductor--Hemlock Street Facility", September 10, 1993 and revised December 23, 1993.
- "Operation, Maintenance and Monitoring Manual, Volume 2: Soil Vapor Extraction System IRM Program." December 8, 1993.

- SPDES Permit NY-0205109 Effective March 29, 1994 and modified January 20, 1994.
- "Inactive Hazardous Waste Disposal Sites in New York State: Site List by Counties; Volume 4" April 1994, p. 21 and 22.
- "Notice of Public Meeting" Proof of Publication, The Times Union, August 30, 1994.
- Public Participation Plan" August 31, 1994.