Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Former Cavalier & Electronic Site
Village of Salt Point, Dutchess County
Site Number 3-14-092

June 1998

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* JOHN P. CAHILL, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Former Cavalier Gage & Electronics Inactive Hazardous Waste Site
Village of Salt Point, Dutchess County, New York
Site No. 314092

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Former Cavalier Gage & Electronics 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 Former Cavalier Gage & Electronics 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 C 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site, have been addressed by implementing the interim response action identified in this ROD, and therefore the site no longer represents a current or potential threat to public health and the environment.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 Former Cavalier Gage & Electronics 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 operation of the granulated active carbon filter groundwater treatment system on well WSW-3. Groundwater monitoring at wells WSW-2 and WSW-3 including monthly sampling of WSW-3 during the quarter of the anticipated contamination spikes in the groundwater.
- Compliance with year-by-year groundwater remediation goals, to be set by NYSDEC and NYSDOH.
- Deed restriction.

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.

6/15/98
Date

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

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SECTION 1: SITE LOCATION AND DESCRIPTION

This site is located along Hibernia Road in the Village of Salt Point, in the Town of Pleasant Valley, Dutchess County, and is 23 acres in size. (Site No. 3-14-092). The site contains two one-story buildings which were constructed as a residence and an out building. The site is about 550 ft. northeast to the closest residence. The main building is now used as a children's daycare center called the Rainbow's End Daycare Center. There is a proposal to use a separate building to the east as a nursery school. A topographic map and site map are attached (Figures 1 and 2)

SECTION 2: SITE HISTORY

2.1 Operational/Disposal History

- 1950's - 1967: Residence
- 1967 - 1985: Operated by Cavalier Gage and Electronics, small electronics parts assembled, chlorinated solvents used.
- Mid - 1970's: Operated by Micri Corporation similar operation of the prior company.
- 1978 - 1985: Operated again by Cavalier Gage and Electronics. No TCA purchased (TCA principal groundwater contaminant).
- 1985 - 1988: Site not occupied.
- 1988 - Present: Occupied by Rainbow's End Daycare Center.
- 1992: Dutchess County DOH detected VOCs water supply survey.
- 2/92: Drinking water treatment system installed.
- 7/92: New drinking well installed with a carbon filter.

During the period when the site was used for industrial manufacturing of electronic components, chlorinated solvents were used. The storage and disposal practices of the manufacturing operators are not clear, but chlorinated solvents used in the operation were detected in the water supply well and the existing septic tanks in 1992.

It is surmised that the former septic system contaminated the bedrock aquifer. The chlorinated solvents were disposed to that septic system and were released to the environment by the original leach field.

2.1.1 Septic Tanks Use History

A chronology of the use of septic tanks at the site follows (Figure 4):

- The Old Septic Tank was the first tank in use. It was abandoned in 1994 during the septic system upgrade. It was sampled in 1992 and only chloroform at 2.7 ppb was detected.

- The 1987 Septic Tank is still in use and contained volatile organics when it was sampled in 1992.
- Both tanks were connected to a leach field located under the parking lot.
- The 1994 Septic Tank was built to upgrade the septic system. The effluent from the 1994 Septic Tank and 1987 Septic Tank are now discharged into a newly constructed leach field north of the Main Building. The original leach field under the parking lot has been disconnected from the new system.

2.2 Remedial History

In August 1992 the site was listed on the New York State Registry of Inactive Hazardous Waste Disposal Sites as a class 2 site. In December 1994, the Cavalier Gage & Electronic Corp. signed an Order on Consent for an RI/FS. In March 1995, Cavalier Gage & Electronic Corp. stated that it was in financial trouble and was unable to conduct the RI/FS. The Cavalier Gage & Electronic Corp. requested a one year postponement to start the RI/FS. In 1996 Cavalier Gage & Electronic Corp. went out of business. In February 1997, the property owner signed a new RI/FS Order on Consent. The original RI/FS workplan drafted in 1995 was used.

Certain remedial measures were conducted to protect the public health, including the installation of a new water supply well and water treatment system. The supply well and its treatment system is being monitored by the Dutchess County Department of Health.

SECTION 3: CURRENT STATUS

In response to a determination that the presence of hazardous waste at the Site presents a significant threat to human health and the environment, the property owner, Dominic Cavalieri has recently completed a Remedial Investigation/Feasibility Study (RI/FS).

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 was conducted by completing a number of sequential tasks. A report entitled "Remedial Investigation and Feasibility Study" (January 1998) has been prepared describing field activities and findings of the RI in detail.

The RI included the following activities:

- Interviews with site employees and the owners of Cavalier to determine solvent use and disposal.
- Review of historical aerial photographs.
- Sampling on-site wells.
- Sampling off-site well.
- Sampling septic tanks.
- Sampling soil in areas used by children.

- Soil gas survey.
- Geoprobe borings to investigate depth to rock, depth to groundwater and to collect samples.
- Sampling air in buildings for VOCs.
- Risk Assessment

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Former Cavalier site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. NYSDEC TAGM 4046 soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used as SCGs for soil. USEPA Guidance Document for Risk Assessment, EPA/50/189/002 dated Decemeber 1989, was used to perform a risk assessment using indoor air data.

Based upon the results of the remedial investigation in comparison to the SCGs and potential public health and environmental exposure routes, groundwater required remediation. These are summarized below. More complete information can be found in the RI Report.

Chemical concentrations are reported in parts per billion (ppb), and parts per billion by volume (ppbv) for air samples. For comparison purposes, SCGs are given for each medium.

3.1.1 Nature of Contamination:

As described in the RI Report, many soil, groundwater, septic tank, soil vapor and indoor air samples were collected at the site to characterize the nature and extent of contamination. All of these samples were analyzed for volatile organic compounds (VOCs). The principal VOCs detected in site bedrock groundwater are 1,1,1-trichloroethane (TCA), 1,1-dichloroethane (1,1-DCA), and 1,1-dichloroethene (1,1-DCE). Other media are not significantly impacted.

3.1.2 Extent of Contamination

Table 1 summarizes the extent of contamination for the contaminants of concern in groundwater, surface soil, subsurface soil, septic tanks, soil gas and indoor air, and compares the data with the appropriate SCGs.

Groundwater

Three VOCs have been detected in site groundwater above SCGs: TCA, 1,1-DCE, 1,1-DCA. The NYS groundwater standard is 5 ppb for the three VOCs detected. There are three wells on site that are all bedrock wells. Well WSW-1 was the first water supply well for the site and was abandoned in 1992. There is no information on the construction or depth of this well. Well WSW-2 is an open borehole bedrock well with approximate depth of 500ft. Well WSW-3 is an open borehole bedrock well with approximate depth of 475 ft. The highest concentration detected on site was in the former water supply well, WSW-2 at 130 ppb of TCA, 220 ppb of 1,1-DCA and 18 ppb of 1,1-DCE in 1992. These VOCs were generally detected at a concentration of 100 ppb or less in WSW-3, the current water supply well. The nearby residential well at 30 Hibernia Rd. has had no detects for VOCs since 1992. The one apparent exception took place when 0.5 ppb of TCA was detected during the sampling event in May 1997. The result, however, was due to laboratory error. Figure 2.

Surface Soil

Two common laboratory contaminants, methylene chloride and chloroform were found in one soil sample, each at concentrations well below SCGs.

Subsurface Soil

Subsurface soil sampling were collected using a Geoprobe, a sampling tool used to collect soil and groundwater samples. Subsurface soil samples were taken from ten locations within the boundaries of the parking lot, which was the location of the Old Septic Tank and original leach field. Three VOCs (TCA, TCE, PCE) were detected in subsurface soil samples collected in the parking lot. The VOCs concentrations were all at least 100 times lower than SCGs. The location of the Geoprobe samples are shown in Figure 3.

Indoor Air

In July 1996, indoor air samples were taken from three locations in the main building: the infant room, the front room, and the basement. The basement (which is not occupied) air sample contained TCA at a concentration of 9.6 ppbv, which was determined to pose no unacceptable risk. Indoor air samples were collected again in April 1998 in four locations in the main building: the Infant room, the Toddler room (front room), the Young 3's room, and the basement. The only sample with a detectable concentration was the basement sample with 8.4 ppbv of TCA, which was determined to pose no unacceptable risk.

Septic Tanks

In 1994, the site's septic system was upgraded and the Old Septic Tank and original leach field were abandoned. The Old Septic Tank was pumped out and disconnected from the septic system. The 1987 Septic Tank and Old Septic Tank historically contained low concentrations of VOCs principally 1,2,4-trimethylbenzene (1,2,4-TMB) and toluene. These chemicals are associated with septic tank cleaners. The last sampling, conducted in 1992, detected 1,2,4-TMB at 89 ppb and toluene at 49 ppb in the supernate of the 1987 Septic Tank. The system had been pumped on: Decemeber 1992, April 1994, and December 1997. VOCs have not been used on site for approximately 10 years. The 1994 Septic Tank has not been sampled because VOCs have not been used since its construction. Figure 4.

Soil Gas

The soil gas survey included the area of the original leach field under the parking lot. There were no soil gas detections. See Figure 5 for the soil gas survey map.

3.2 Summary of Human Exposure Pathway

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 4 of the RI Report.

An exposure pathway is how an individual may come into 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.

As discussed above in section 3.1.1, the only significantly impacted media is bedrock groundwater. This groundwater lies at a depth of at least 10 feet beneath the developed portion of the site. Well WSW-3 is the water supply for the site. The site water supply system is equipped with a granulated activated carbon (GAC) treatment system which is operated under Dutchess County Department of Health approval. Well WSW-3 was sampled in February 1998 with total VOCs less than 5 ppb. It is sampled and maintained regularly. During indoor air sampling a detectable level of TCA was found in the basement of the building. The basement is not occupied, and therefore the occupants of the building are not exposed to the TCA.

The closest resident is 550 ft. from the site and the resident's water supply well has been monitored since 1992. No VOC contamination has been detected in this well above the NYS drinking water standard.

Therefore, there are no complete exposure pathways at this site.

3.3 Summary of Environmental Exposure Pathways:

This section summarizes the types of environmental exposures which may be presented by the site. Based on the very tight nature of the bedrock, the presence of transformation products indicating that natural attenuation is occurring, the fact that Wappinger Creek is approximately 600 ft. from the site, and the size of Wappinger Creek, it is surmised that no impact is occurring to the environment from bedrock groundwater.

SECTION 4: 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 Cavalier Gage & Electronic Corp. entered in Consent Order, Index # D3-0001-93-04 on December 1994. Cavalier Gage & Electronic Corp. expressed financial trouble in 1995 and went out of business in 1996.

The NYSDEC and Dominic Cavalieri entered in a Consent Order, Index # W3-0774-96-08 on February 7, 1997. The Order obligates the responsible party to implement a RI/FS remedial program. Upon issuance of the Record of Decision, the NYSDEC will approach the PRPs to implement a monitoring, and operation and maintenance program under an Order on Consent.

SECTION 5: SUMMARY OF THE REMEDIAL GOALS AND SELECTED ACTION

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 NYSDEC believes that the point of use treatment with granulated activated carbon, and on-site and off-site groundwater monitoring, will accomplish this objective provided that it continues to be operated and maintained in a manner consistent with the design.

Based upon the results of the RI, the NYSDEC selected no further action with continued groundwater monitoring, operation and maintenance as the preferred remedial alternative for the site. The PRP would br required to submit an operation and maintenance plan for the water supply treatment system for approval by the NYSDEC and NYSDOH. Supply well WSW-3 would be used as a monitoring well and would be sampled quarterly in compliance with year by year goals that will be established by the NYSDEC. In anticipation of the contamination spikes in the groundwater, monthly sampling of WSW-3 would be conducted during that quarter spanning the period from November to January. The target goal for each on site well is 5 ppb for each VOCs groundwater concentration by

fifteen years. The goals would be based on exponential curves with the curves being drawn from historical peak values to 5 ppb over a 15 year period. The curves would project the decreasing contamination rate over time. The curves would be used to compare with the groundwater concentration data to insure that the target goal would be met. If the concentration substantially exceeds the goals, the NYSDEC would determine whether addition remedial action is required at the site.

The drinking water supply well WSW-3 would be sampled quarterly in accordance with Sub-Part 5 of the NYS Sanitary Code, and monthly during the period of anticipated contamination spikes in the groundwater.

Additionally, a deed restriction will be imposed on the property, to prevent the installation of any new drinking water well. Unless otherwise notified by the NYSDOH, installation of any new well will require a NYSDOH approved treatment system to render the water potable.

SECTION 6: COMMUNITY ACCEPTANCE

Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan have been evaluated. The "Responsiveness Summary" included as Appendix A presents the public comments received and the Department's response to the concerns raised.

In general the public comments received were supportive of the selected remedy. However, several comments pertaining to the groundwater treatement system, groundwater monitoring frquency, resampling the indoor air, and notification of site conditions to new users of the day care center were received.

Table 1

Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	FREQUENCY of DETECTION	SCG (ppb)
Groundwater	Volatile Organic Compounds (VOCs)	1,1,1-TCA	ND-130	40 of 65	5
		1,1-DCA	ND-220	26 of 65	5
		1,1-DCE	ND-18	19 of 65	5
		1,2-DCA	ND-0.76	2 of 65	5
		Vinyl Chloride	ND-0.90	1 of 65	2
Septic Tank Supernate {1}	Volatile Organic Compounds (VOCs)	1,1,1-TCA	ND-5	1 of 3	
		1,1-DCA	ND-24	1 of 3	
		Toluene	ND-340	2 of 3	
		1,2,4-TMB*	ND-54	2 of 3	
		1,3,5-TMB*	ND-4	1 of 3	
		Chloroform	ND-2.7	1 of 3	
Surface Soil	Volatile Organic Compounds (VOCs)	Methylene Chloride	ND-2.1	1 of 6	100
		Chloroform	ND 8.8	1 of 6	300
Soil Gas	Volatile Organic Compounds	All	All-ND	None of 24	
Subsurface Soil	Volatile Organic Compounds (VOCs)	1,1,1-TCA	0.5 - 1.0	10 of 10	800
		TCE	ND-0.6	3 of 10	700
		PCE	ND-0.6	1 of 10	1,400
Indoor Air	Volatile Organic Compounds	1,1,1-TCA	ND-9.6**	2 of 7	100

* Trimethylbenzene ** ppbv

{1} Sampled twice in 1992

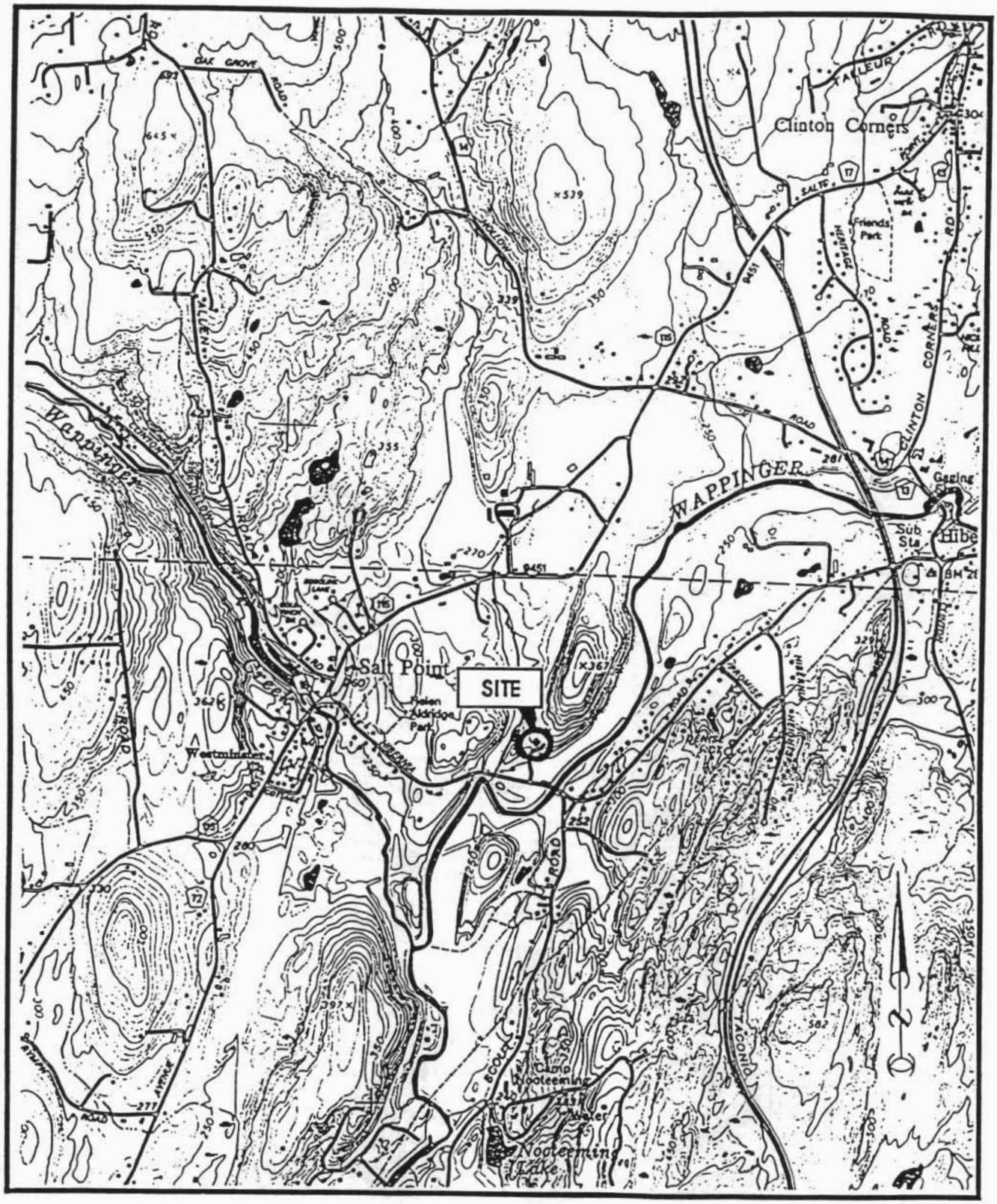


Figure 1

Site Location Map
A Portion of the U.S.G.S.
7 1/2 Minute Salt Point Quadrangle

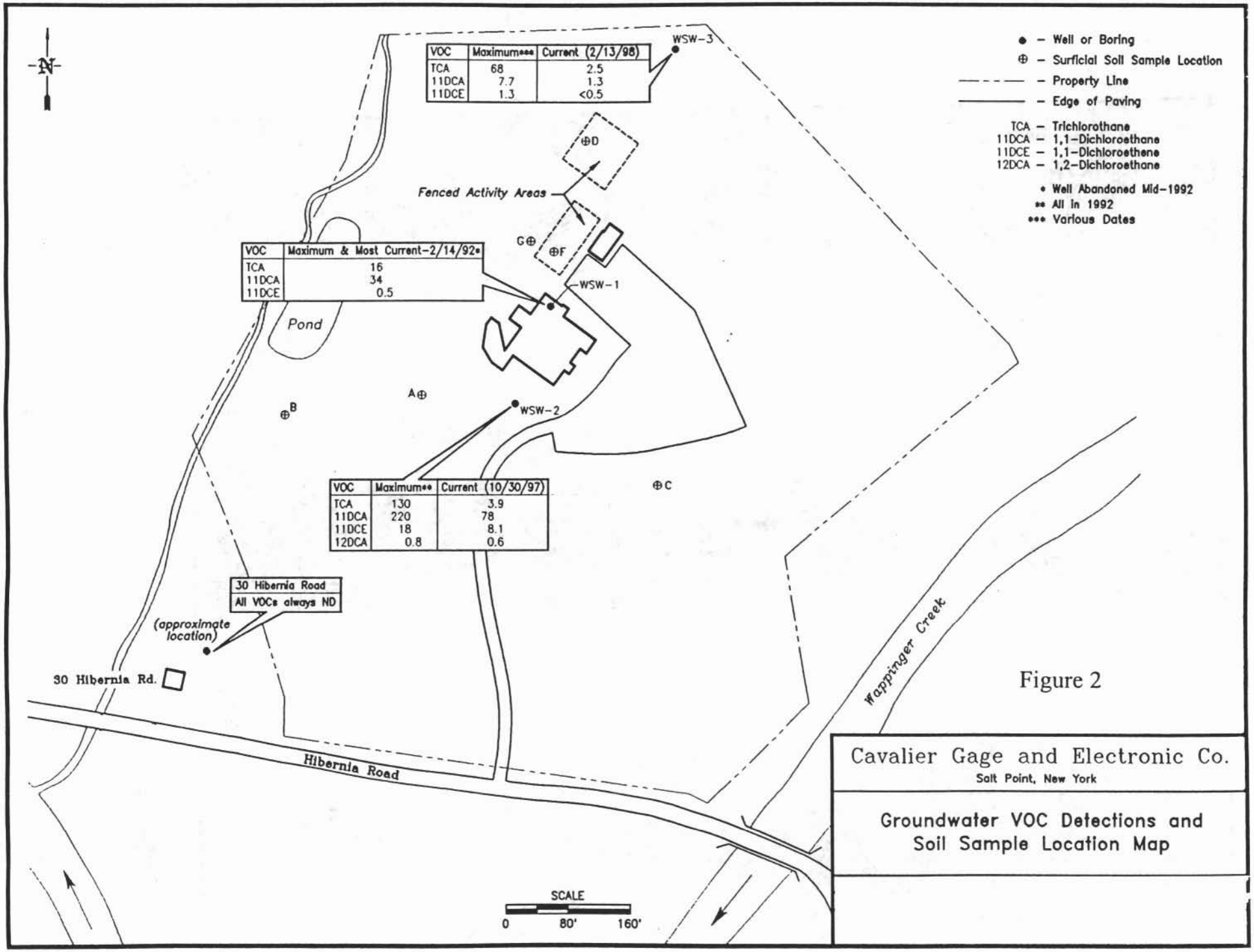


Figure 2

Cavalier Gage and Electronic Co.
Salt Point, New York

Groundwater VOC Detections and Soil Sample Location Map

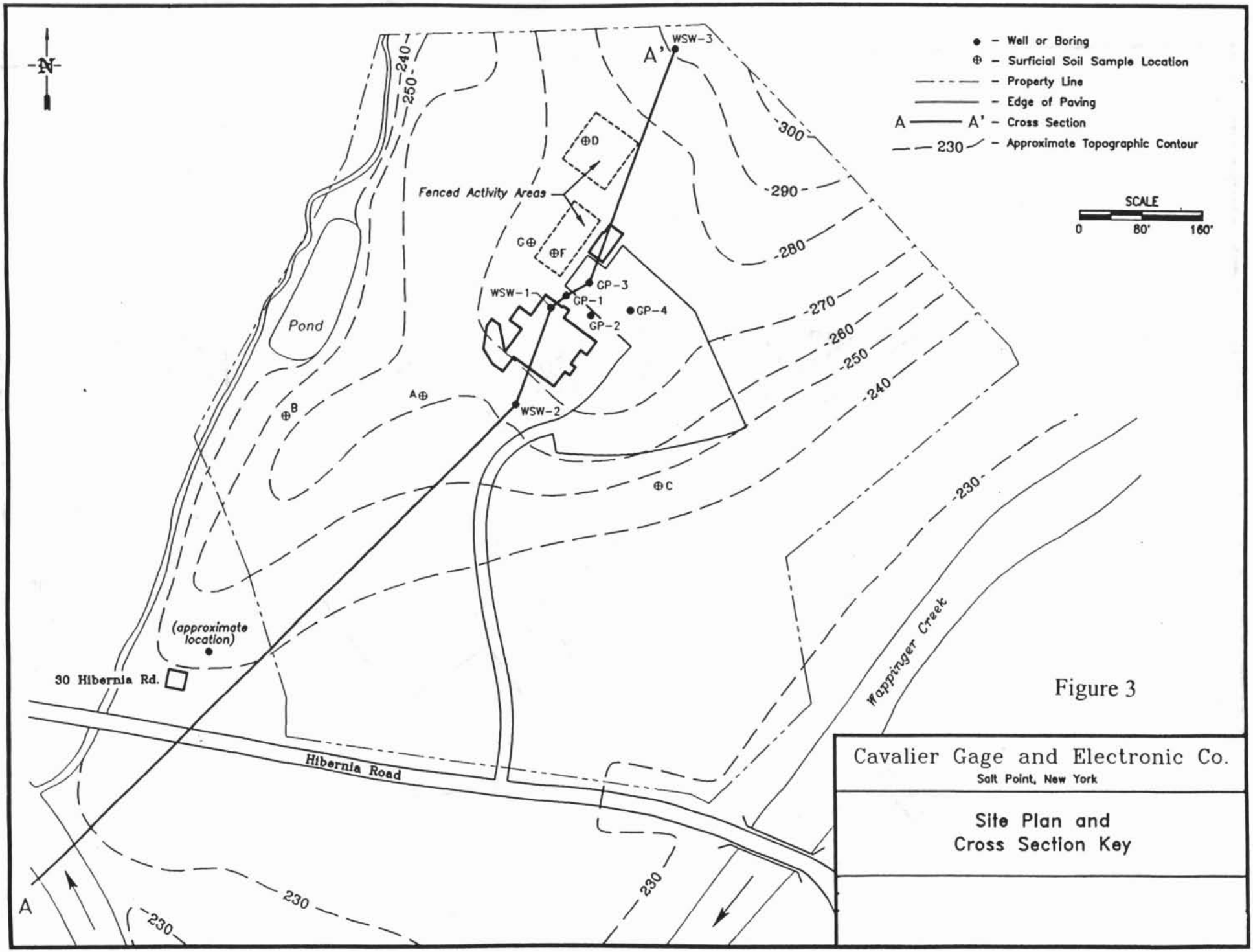


Figure 3

Cavalier Gage and Electronic Co.
Salt Point, New York

Site Plan and
Cross Section Key

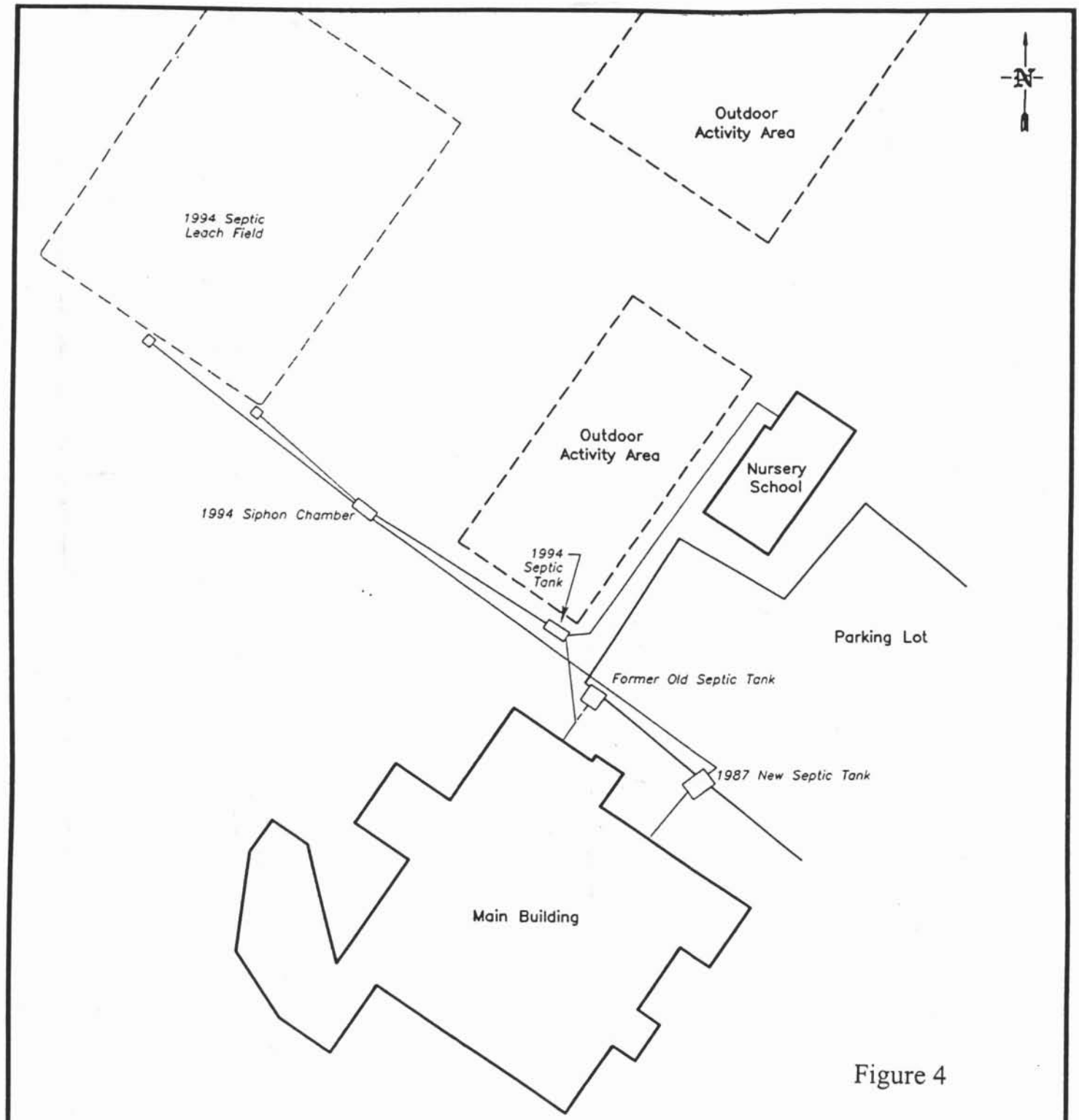


Figure 4

Cavalier Gage and Electronic Co.
Salt Point, New York

Site Plan Detail

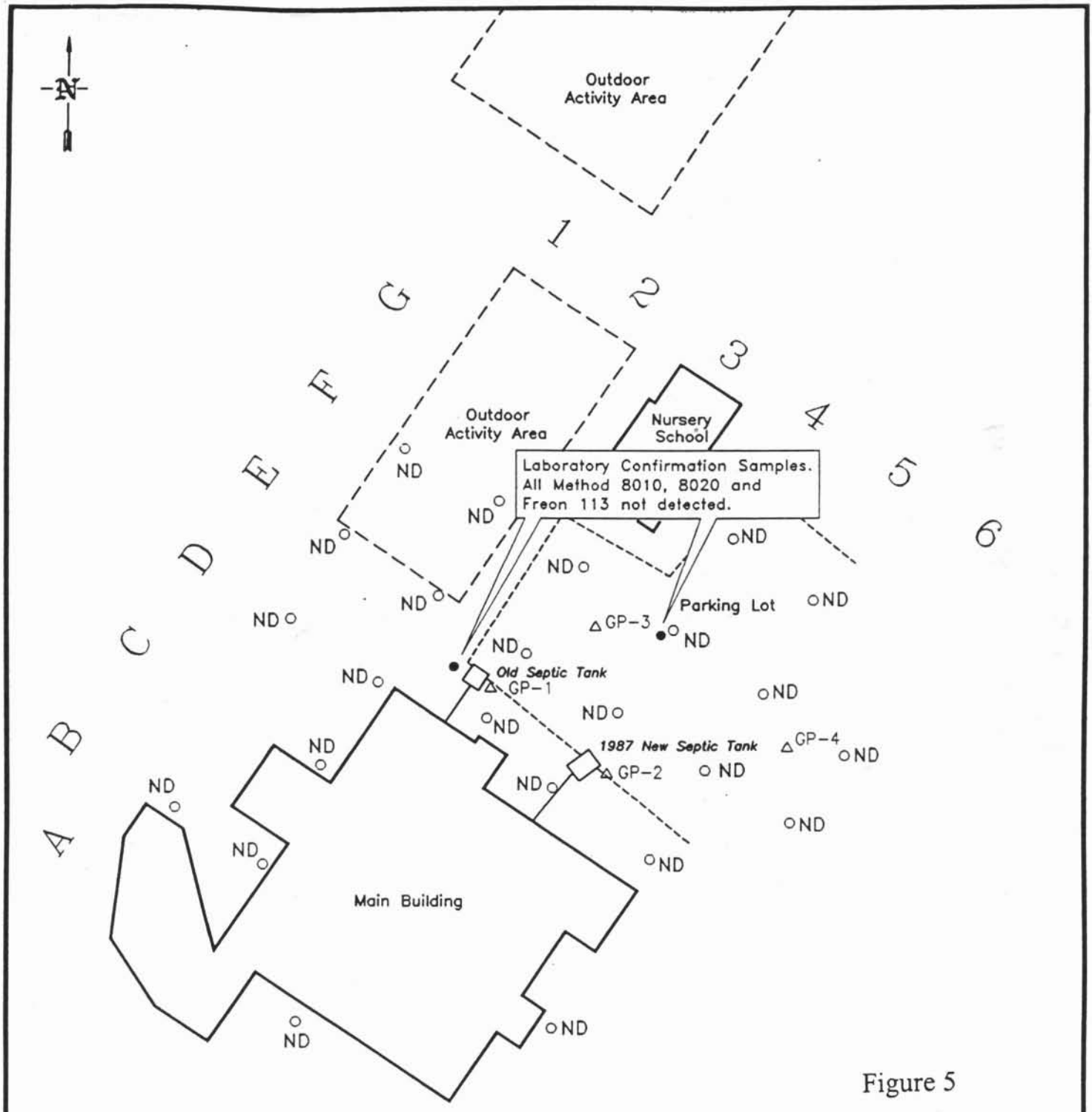


Figure 5

○ – Field PID Soil Gas Sampling Location
△ – Geoprobe Location
ND – Not Detected in PID Survey
● – Laboratory Soil Gas Sample Location

Approximate Scale
0 20' 40'

Cavalier Gage and Electronic Co.
Salt Point, New York

Soil Gas Survey Results

Groundwater Results

WSW-3 (New Water Supply Well)

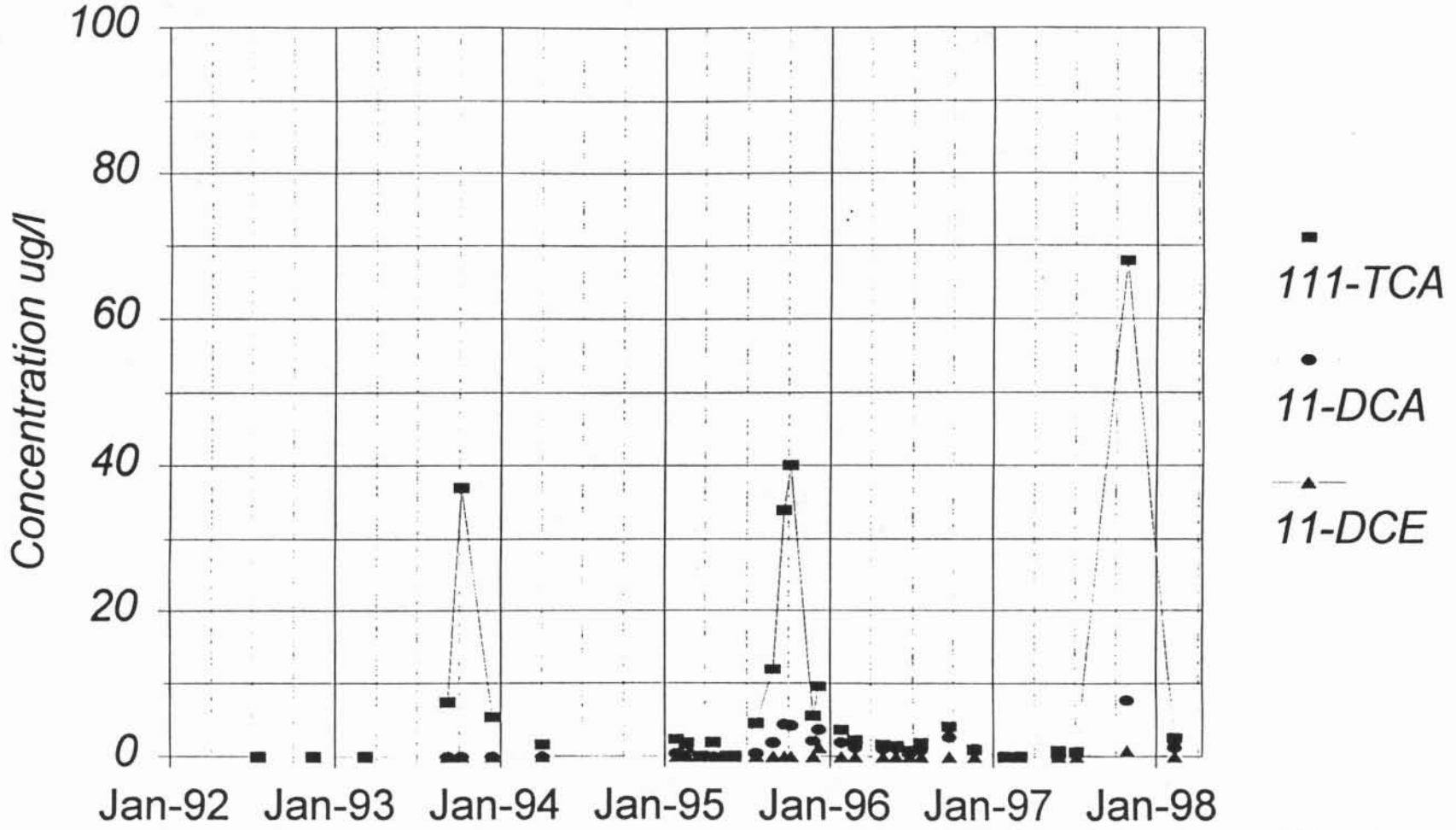


Figure 6

Appendix A

Responsiveness Summary

Glossary of Abbreviations

Center	Rainbow's End Child Development Center
DCHD	Dutchess County Health Department
DEC	New York State Department of Environmental Conservation
GAC filter	granulated activated carbon filter
NYSDOH	New York State Department of Health
PRPs	Potentially Responsible Parties
ROD	Record of Decision
RI	Remedial Investigation
VOCs	volatile organic compounds

Preamble

The New York State Department of Environmental Conservation held a public meeting on March 16, 1998 at the Pleasant Valley Fire House Company No. 1 to discuss the Proposed Remedial Action Plan (PRAP) and to receive public comments. The comment period began on March 9, 1998 and ended on April 7, 1998.

Present at the meeting were representatives from DEC, NYSDOH, DCHD, and the Center.

DEC's responses to the comments raised at the meeting or received in writing are listed below. For clarity, the comments and responses are grouped under topical headings, and may not be *ad verbatim* quotes. The topical headings are; past and on-going actions, future actions, health risks, and general issues.

Past and On-going Actions

Comment 1. If the water is being treated, why is the site still a class 2?

Response: Even though the drinking water is being treated and human health protected, the groundwater is still being impacted by contamination. This impact to the environment causes this site to remain a Class 2 until a decrease in the groundwater contaminant concentration can be ascertained.

Comment 2. Was there any testing done for VOCs between 1988 and 1992?

Response: The DCHD has no record of sampling for VOCs at this site between 1988 and 1992. Testing for these compounds was not required under Part 5 of the State Sanitary

Code until 1992.

Comment 3. How deep was the subsurface soil sampling?
Response: The subsurface soil samples were collected at depths of five and ten feet below the ground surface.

Comment 4. Are the old septic tanks still in place?
Response: Yes, the old septic tanks are still in place. There are two septic tanks that were investigated; the old septic tank that was installed when the main building was constructed, and the septic tank that was installed in 1987. The old septic tank was pumped and disconnected from the present septic system in 1994. The 1987 septic tank is still in use and was pumped out in December 1992, April 1994, and December 1997.

Comment 5. Is the septic system the source of the contamination?
Response: While it is suspected that the septic system had released the contamination into the environment in the past, the level of contamination detected in the septic system during the RI does not indicate that it is a continuing source of contamination.

Comment 6. Is the old well (WSW-2) connected to the water supply?
Response: There are two old wells, WSW-1 and WSW-2. WSW-2 is disconnected from the supply system through a stop valve. WSW-1 is completely disconnected from the water supply system. The jet pump in WSW-1 has been removed and the well is no longer accessible. Access to the water supply system is controlled by a lock to which the President and Director have the only keys.

Comment 7. Are the WSW-3 concentrations shown on graph (Figure 6) from pre-filtered samples?
Response: Yes, the graph shows concentrations for pre-filtered samples.

Comment 8. Why are there contamination spikes?
Response: The contamination spikes are most likely due to seasonal influences.

Comment 9. Is the filter removing all the contamination, even during spikes in concentration?
Response: Yes, the contamination spikes are being totally removed by the GAC filter system.

Comment 10. What is being done about the spikes now?
Response: The groundwater from well WSW-3 is being treated, and the GAC filter is removing all contamination, even during spikes. The sampling frequency has been increased to monthly during the spike period.

Comment 11. When do the contamination spikes occur?
Response: The contamination spikes seem to occur in late fall and early winter.

Comment 12. How long do the filters last?

Response: The system at the Center consists of two sets of primary and secondary filters working in parallel. Water from the well is treated first by passing it through the primary filters and then through the secondary filters. When then there is a break-through in any of the primary filters, both primary filters are removed and replaced by the secondary filters. A new pair of filters is used to replace the secondary filters. The last such replacement took place two years after new secondary filters were installed. The decision to change filters is made primarily on the basis of sampling results.

Comment 13. Is there a bypass on the filter?

Response: Yes. It is required for emergency purposes. The Center is in the process of installing a tamper-proof lock to prevent an inadvertent or unauthorized use of the by-pass valve. Only the President would have the key to the lock.

Comment 14. Who monitors the groundwater data?

Response: The groundwater data for this site is being monitored by the DEC.

Comment 15. Is the GAC filter system acceptable to the NYSDOH for use at this site?

Response: NYSDOH finds the GAC treatment system in use at the Center acceptable.

Comment 16. Could DEC have been more aggressive in finding and cleaning up the source of contamination?

Response: It is always the goal of an RI to identify the source of contamination. An expeditious cleanup of the site is contingent upon the removal or treatment of the source. However, despite an extensive investigation, the source of significant contamination was not found at the site. It is believed that a concentrated source may no longer exist.

Comment 17. Presumably, the location of the source of the VOC's could be (in decreasing order of likelihood): a) the leach field or dry well(s) for the original septic system, b) another dry well elsewhere on the property (e.g., under or directly adjacent to the building as might be used for basement or roof water drainage), or c) one or more storage barrels buried somewhere on the property. Why weren't these possibilities discussed, and why wasn't more effort made to find the source?

Response: The RI included interviews with Ms. Betty Wagner and Mr. Dominic Cavalieri, formerly managers with Cavalier Gage, to elicit information on past waste management practices and on any on-site waste disposal areas. No on-site disposal areas were reported. Historical aerial photographs were also reviewed. During the RI, several media were sampled to locate the source of the contamination including soil, groundwater, and the soil gas. The RI as well investigated the septic system and old leach field. The results of the sampling did not indicate that there was still a

contamination source on site.

Comment 18. Was the array of geoprobe water samples (none or which were under the building or to the northwest of the original septic system) adequate to detect a contaminant source of limited spatial extent, as might be the case with a single dry well?

Response: It is conceivable that a single dry well whose history and location is undeterminable from records and interviews may have escaped discovery during the field investigation. An RI does not purport to cover every square inch of a site. However, a dry well with a significant level of contamination would have been identified during the investigation or manifested itself through higher contaminant concentrations in groundwater than has been hitherto been encountered at the site.

Comment 19. The data show that the contaminant plume is not diffused throughout the bedrock groundwater as is suggested in the report, but rather is located at a downgradient point that is only drawn on by the well at the dry point in the annual cycle when other sources have been depleted. Why wasn't this information used to shed light on the location of the contaminant source?

Response: This line of reasoning could be brought to a conclusion if all the bedding planes, faults and fractures in the the bedrock at the site were mapped three dimensionally and piezometric heads along preferential groundwater pathways were determined. An uncontrollable increase in the groundwater contaminant concentration would warrant such an addition to the investigation.

Comment 20. Were potential costs and risks considered in the evaluation of alternatives?

Response: The alternatives were evaluated by using DEC's procedures on selecting remedial alternatives. The criteria against which the alternatives are analyzed are:

Compliance with NYS Standards, Criteria and Guideline (SCGs)
Protection of human health and the environment
Shortterm effectiveness
Longterm effectiveness and permanence
Reduction of toxicity, mobility and volume
Implementability
& Cost, when the above criteria have been met.

Future Actions

Comment 21. Why is the site going to be reclassified after the ROD is issued?

Response: The site will be reclassified only if the goals, as described in Section 5 of this ROD, are achieved during the first 3 years after the ROD is issued, and is projected to do so in the succeeding years due to natural attenuation and groundwater usage.

Comment 22. Since the groundwater is showing spikes, should not the soil be resampled?

Response: Soils and soilgas samples were collected and analyzed during the RI. Neither the

soil nor the soil-gas analytical results suggests any substantial soil contamination source.

Comment 23. Are the contamination spikes a concern to the DEC?
Response: Yes. The year-by-year goals that will be established by the DEC for WSW-3 will require a sustained decrease in the annual maximum concentration.

Comment 24. Can quarterly monitoring be increased to monthly monitoring?
Response: The operation maintenance and monitoring of the filter system over the last five years has proven that contamination can be removed by system. However, the PRP has agreed to conduct monthly sampling during anticipated spikes in groundwater.

Comment 25. What agency has the authority to take immediate corrective action should water samples fail standards?
Response: The DCHD and the NYSDOH can and will take immediate corrective action should water samples fail standards.

Comment 26. Does an air cleaning or venting system like the one used for radon emissions needed to clean or vent the air in the basement?
Response: An air cleaning or venting system is not needed for the basement. The VOC contamination detected in the basement is unlike radon. Radon emanates from certain types of bedrock and the emission lasts almost indefinitely . The low level of VOC contamination detected in the basement near an existing well is very likely a release from the groundwater. This contamination source is finite and the air levels are already below indoor air guidelines. Overtime the concentration are expected to decrease as the contamination decreases in the groundwater.

Comment 27. When will indoor sampling be conducted again?
Response: The indoor air sampling has been conducted in the main building on April 9, 1998, in four locations in the main building: the Infant room, the Toddler room, the Young 3's room, and the basement. The only sample with a detectable concentration was the basement sample with 8.4 ppbv of TCA, which was determined to pose no unacceptable risk.

Comment 28. Are there other strategies that would work even better to limit exposure?
Response: The selected remedy eliminates any exposure. Other strategies that would perform as well are the use of bottled water and a municipal water supply.

Comment 29. What happens if the year by year goals are not met?
Response: If the year by year goals are not met, other feasible alternatives will be studied. One possible option is pumping and treating the other contaminated wells on site. This treated water would not be used as potable water, but would be properly discharged

or used as recharge of the groundwater.

Comment 30. Will the Center choose a less effective remedy because of a lack of money in the budget?

Response: The DEC will not permit any change in the operation, maintenance, and monitoring of the system without its prior approval.

Comment 31. Why not consider an alternative where water is pumped from existing well #1 and well #2, treated and returned to the ground (e.g., via the new septic system) as at least a partial attempt at longterm remediation, and as a way to keep the contaminant plume away form well #3?

Response: The purpose of setting up the yearbyyear goals is to weigh alterrnatives should the goals not be achieved. Pumping other wells is definitely one of the alternatives that will be considered (See response to comment 29). The maximum concentration in the supply well thus far does not warrant an immediate implementation of an additional remedy.

Comment 32. What would happen if the Center stops using water and the contaminant plume starts moving offsite towards the nearby stream or residence?

Response: The Center could stop using the treated water if bottled water or municipal water is made available. However, the Department will revise the year-by-year goals and continue to monitor the groundwater quality should the PRP choose to discontinue the groundwater treatment. If the established goals are exceeded, the PRP will be required to implement a DEC approved remedial measure.

Comment 33. Who will be responsible for assessing the need for any additional corrective actions and the adequacy of operation and maintenance of the existing system 5 or 10 years from now?

Response: The DEC, NYSDOH and DCHD will continue to assess the environmental impacts and health issues until the site is deemed to no longer pose a significant threat to public health and environment. Additionally, the Operation and Maintenance Section of the Division of Environmental Remediation tracks all sites undergoing long term remediation, and takes appropriate action to correct any deficiency.

Comment 34. The site should be inspected after a period of heavy rainfall for the possible presence and location of ground water seeps.

Response: An inspection of the site will be conducted as suggested.

Comment 35. Soils should be sampled from various locations around the site to investigate possible spills, and tested in the field using either an organic vapor analyzer with a gas chromatograph attachment (OVA/GC with a FID detector) or a photoinonization detector (PID) using a high energy lamp designed to detect the compounds of

concern. The area between the building and the pond and seep areas should be covered, additional samples from the fenced activities areas should be included, and any other areas suggested by the site layout, topography or stressed vegetation. The samples can be collected using a hand-operated instrument (probe or auger), conditions permitting.

Response: Such additional work would be considered if the contaminant concentrations do not decrease in accordance with the goals. It should be noted the even during spikes, the concentration in the untreated water is only about 60 ppb.

Comment 36. If elevated readings are detected a separate sample in that location should be collected using appropriate methods, such as immersion of soil sample in methanol or water to prevent loss of volatiles during sample collection and analysis.

Response: DEC realizes that the standard practice of sampling and analysis of soil can result in a measurable loss of volatile compounds. However, mass and concentration of contamination at "sources", as commonly understood, are discernible even after such losses using standard protocols. Any additional investigation or remedial action will be contingent upon the selected remedy failing to meet the year-by-year goals for concentration reduction that will established for the supply well.

Comment 37. The pond water should be analyzed at least twice, during dry conditions and just after a wet period when seeps might occur. The sampling should be done in cooler portions of the year.

Response: This suggestion will be considered when preparing the sampling workplan.

Health Impacts

Comment 38. Shouldn't a cautionary notice be posted at the site?

Response: It is not required to post a cautionary notice unless there is some uncontrolled exporsure to hazardous waste on site. There is no exposure to hazardous waste on this site.

Comment 39. What are the health effects from the VOCs, especially for children?

Response: It is important to note that this information provides a general overview of health effects from long-term exposure to 1,1,1-trichloroethane (TCA) and 1,1-dichloroethane which are the contaminants of concern at the site. Much of the information is from studies with laboratory animals. Additional information comes from studies of workplace exposure or from accidental human exposures. These large doses are much higher than the levels found in the groundwater at the Center. It is also important to note that exposures to the chemicals are not occurring at the site as the drinking water supply is treated before use. Without exposure , there are no health effects posed.

1,1,1-trichloroethane: Some industrial workers exposed to large amounts of 1,1,1-

trichloroethane have had liver, nervous system and cardiovascular system damage. Exposure to high concentrations of this chemical causes liver, nervous system and cardiovascular system damage in laboratory animals. Chemicals which cause adverse health effects in exposed industrial workers and laboratory animals may also pose a risk to humans who are exposed to lower levels over long periods of time.

1,1-dichloroethane: There is some evidence that 1,1-dichloroethane causes cancer in laboratory animals exposed to high levels over their lifetimes. Chemicals that cause cancer in laboratory animals also may increase the risk of cancer in humans who are exposed to lower levels for long periods of time. Exposure to high levels of 1,1-dichloroethane damages the kidneys of laboratory animals and has caused delayed growth in the offspring of animals exposed during pregnancy.

Comment 40. What does the Risk Assessment say about the potential for health effects at the site?
Response: The Risk Assessment prepared for this site concludes that constituents at the site do not present any unacceptable health impacts.

Comment 41. What about indoor air exposure at the Center?
Response: Indoor air sampling conducted at the site did not indicate elevated levels of VOCs in two occupied portions of the building; the infant room and a playroom. However, one site-related compound, 1,1,1-trichloroethane, was found in the air sample collected in the basement. The sample was collected near an open container of untreated well water that had been purged for groundwater sampling purposes. Puging this well is no longer needed to collect samples, therefore no containers of untreated well water will be stored in the basement. The concentration (9.6 part per billion by volume) of this compound measured in the basement is very low, but slightly higher than levels routinely found in indoor air. Exposure to this chemical at this concentration is not expected to cause health effects. This compound is also present in many common household products, so it is hard to say whether its presence in the basement is caused by contamination beneath the building.

General Issues

Comment 42. What does the classification codes of sites mean?
Response: The following are the descriptions of the classification codes for inactive hazardous waste disposal sites:

Class 1- Site causing or presenting an imminent danger of causing irreversible or irreparable damage to the public health or the environment; immediate action is required.

Class 2 - Site being significant threat to the public health or the environment; action required.

Class 3 - Site does not present a significant threat to the environment; action may be deferred.

Class 4 - Site properly closed; requires continued management.

Class 5 - Site properly closed, no evidence of present or potential adverse impact; no further action required.

Comment 43. How reliable are the environmental sampling results?
Response: In New York State, laboratories that analyze environmental samples must be certified by the NYSDOH. All environmental samples are analyzed using USEPA methods and procedures.

Comment 44. Do household products have chemicals that are found as contaminants in the groundwater at the site?
Response: The VOCs that were detected on the site are also used in many household products such as spot removers and paint cleaners.

Comment 45. What household products would affect indoor air?
Response: There are many household products that could affect indoor air. It depends on the product, how it's used, and the amount used. For example, the following products may affect indoor air quality; paints, paint removers, carpeting, upholstery and drape cleaners.

Comment 46. Are soil samples subject to seasonal effects?
Response: Seasonal effects on soils are not as marked as on groundwater and soil-gas. However, changes in soil-gas or groundwater flows through soil can affect the soil contaminant concentration.

Comment 47. Are GAC filters common? And are they effective?
Response: Yes, GAC filters are commonly used to treat private and public water supplies contaminated with VOCs. This has proven to be an effective technology and many of these systems are currently in use, particularly on Long Island where groundwater wells provide the sole source of drinking water.

Comment 48. What is the data on failure of these filters?
Response: No data regarding failure of GAC filter systems has been compiled by DEC.

Comment 49. How many sites in Dutchess County use such filters.?
Response: DEC and NYSDOH have required 30 GAC filters on water supply wells in Dutchess County. The Dutchess County DOH has required additional GAC filters, the exact number of which is not certain. Private residences may also decide to use GAC

filters on their water supply well.

Comment 50. Are there any legal requirements to inform all users of a facility, such as a day care center with its frequent turnover of users, that it is an inactive hazardous waste disposal site?

Response: The legal requirement is limited to informing the property owner (Mr. Dominic Caverlieri), the operator of the Center, the adjacent property owners, and local government officials.

Comment 51. If there are no laws, how can we or the DEC bring an enactment of a law requiring such notification?

Response: Any new law to change DEC's notification procedure would have to be enacted by the New York State Legislature. For this site, DEC can partially meet the requirement with a more active citizen participation program. The Center has agreed to include the drinking water quality data in the parent's handbook that will be presented to every parent.

Comment 52. What interest does Mr. Dominic Caverlieri have in this site?

Response: Mr. Caverlieri owns the property.

Comment 53. Who will assume the responsibility of bearing the cost of the water treatment system and monitoring after Mr. Caverlieri?

Response: The DEC will ask the Center or other PRPs identified by the DEC to assume responsibility.

Comment 54. If economics wasn't a mitigating factor, would you change the classification of the site?

Response: Economics is not a mitigating factor for reclassifying an inactive hazardous waste site. Reclassification of an inactive hazardous waste site is based on the contamination levels and the threat to public health and the environment.

Comment 55. Why is the USEPA standard for 1,1,1-trichloroethane (TCA) 200 parts per billion (ppb) and New York State's 5 ppb?

Response: There is little information on the toxicity of TCA especially with respect to ingestion. The USEPA drinking water standard of 200 micrograms per liter (mcg/l) for TCA is mainly based on the results of a laboratory study of mice exposed to TCA by inhalation for 14 weeks (which is only about 10% of their life span). In general, two year ingestion exposure studies are required to adequately characterize chronic (long-term) toxicity and carcinogenic potential. Since there are inadequacies in the toxicological data and uncertainties regarding the possible effects to chronic exposures, the degree of confidence in the derivation of the USEPA's drinking water standard for TCA is low. In New York State, TCA is considered a "principal organic

contaminant" for which the drinking water standard is 5 mcg/l. Under New York State regulations , the 5 mcg/l standard applies until it has been demonstrated that a contaminant does not pose an unreasonable risk to human health. Since TCA does not meet this criterion, application of the 5 mcg/l standard is appropriate.

Appendix B

Written Comments

Statement of:

Marc Osten
238 Pumpkin Lane
Clinton Corners, NY 12514

Parent of one child, Daniel Osten at Rainbow's End
Elementary School Teacher - Traver Road Primary School, Pleasant Valley, NY

I enter today hearing with several biases which I want to make clear.

First I am here as a parent and I'm sure I need not say more regarding how **important** this process is to me.

Second, I am here as a member of the parent body at Rainbow's End. I currently work closely with parents at the center to help enhance **communication** between the parent body and the center's staff and administration.

Third, I'm here as a worker. We, the parents of Rainbow's End, cherish the staff so dearly. They are the lifeblood of the center. I am **concerned** about their needs.

Lastly, I am here as a **skeptic**. Before working with young children, I spent many years working with communities and workers around the country to limit their exposure to hazardous chemicals. My work brought me in contact with the difficult world of toxic chemicals. Through my work I directly witnessed or learned about disturbing things like:

- corporations shadily affecting federal and state health and environmental regulations for their financial benefit
- clusters of cancer or birth defects among workers in factories
- environmental testing laboratories indited for presenting fraudulent data to EPA
- 'risk assessment' standards being used to decide how many people can contract a particular disease to justify the use of a certain chemical
- state agencies, like DEC, persecuting their own workers who sided with communities that had legitimate concerns

Most of us know that economics has played too large a part in determining acceptable standards for exposure to chemicals in society. We know that powerful lobbying by corporate interests has impacted the vigilance with which EPA and state agencies like DOH and DEC can work. We need not pretend that we live in a democracy where the common folk, us here tonight, have much say. Despite this, we know that efforts have been made to protect the public. Over the years, powerful citizens groups and responsible leaders in government have worked to enact laws that have helped. Many of us have worked to keep your, DEC and EPA's feet to the fire to enforce the existing laws. No doubt things are better today in many respects. We need not look any further than the phase-out of lead in gasoline to realize we've made some progress.

I am thankful that we here tonight do not have to deal with a highly acute toxic incident. Despite that, there is great concern here. Those disturbing things I mentioned earlier give me reason to pause whenever I'm confronted with issues regarding toxic chemical exposure and state regulation.

No I'm not an hysterical parent incapable of understand the details. No I'm not a radical-reactionary environmentalist unwilling to listen to the facts. I come here tonight because of the **importance** of the issue, in hopes that **communication** will foster proper solutions to our **concerns** but with **skepticism** that I use to protect myself and my family.

I'd like to address several different issues. First the chemicals that are involved.

Chemicals

In 1987 and 1988 the EPA developed a toxicity data matrix of chemicals that are part of Toxic Release Inventory. The matrix was built by looking at available studies and assessments and then that information was compared to EPA's own criteria for determining if a given chemical is associated with a given hazard. The chemical I am most concerned about of the three in question tonight is 1,1,1-trichloroethane. In some studies it has been linked to reproductive disorders, it is obviously an environmental hazard and is considered a persistent chemical. The fact it is persistent and retains its toxicity for

a long time is of great concern.

To be honest, I'm insulted when I'm told that eating a certain number of teaspoons of peanut butter is equal to my child's intact of 1,1,1-trichloroethane over a certain period of time. Just because we as consumers are exposed to toxic chemicals in many household cleaners, in our foods or in our workplaces doesn't make it ok. To learn from *Environmental Standards, Inc.* that 18% of monitored drinking water wells in the U.S. contain 1,1,-dicholoethane doesn't make me feel any better. Some of us have taken the initiative to protect ourselves more vigilantly. We set standards that might be tighter than EPA's. We make conscious and careful choices. We grow organic foods at home that we preserve and eat all year. We carefully chose non-toxic cleaners to use in our homes. We live in areas that have cleaner air than urban centers. We make choices!

Now Reagan told us that trees cause pollution and a Dupont executive explained to us that water is a toxic chemical - if you drown in it. I doubt that any of us here wants to appear unreasonable or 'reactionary', but we do want to be treated as intelligent and thoughtful people who crave information and your expertise to solve the problem at hand. This stuff is dangerous and that is why we are here. Having said that, I'd like to address the issue of exposure.

Exposure

The data we have in hand looks at various exposure points at the

center - air, water, soil. My goal in life is to minimize my exposure everywhere I can. Yes, I drove my car here tonight and tomorrow when I fill the tank I'll be exposed, in small doses, to highly toxic benzene. I'm no fool. I know I can't live in a bubble. Despite that I am vigilant in limiting exposure wherever I can. At Rainbow's End I want us to try. **Tell me, if economics wasn't a mitigating factor, would you change the classification of this site? Would you be more aggressive in finding and cleaning up the source of contamination?** Now maybe the existing system is working well to limit exposure below state of federal limits. **However are there other strategies that would work even better to limit exposure? Should we use reputable, and tested bottled water suppliers instead of well water? Are there other options?** We want to know. We need to know. **Who will pay for the continued upkeep of the existing remediation system? What happens if the levels continue to spike in the fall? How are the year by year goals being set?**

And what about indoor air exposure at the center? I hear a lot of discussion about drinking water. Clearly, our new and fast growing experience with indoor chemical exposure gives us reason to pause. We now are learning that indoor air exposure to toxic chemicals is one of the most serious and pervasive in society. **Shouldn't we install a state of the art air filtration system to deal with the 9.6 ppbv found in the basement? If not then, why?**

OK - so here we are on the verge of a new classification. My sense is there are a hierarchy of questions/responsibilities. First, **why is the site being reclassified?** Beyond that, if it is reclassified, **what are the economic ramifications for Rainbow's End? Will the existing owners of the site continue to pay for remediation? If they can not afford to who will? Will the center be forced to choose less effective remediation strategies because of a lack of money in the budget?** I know these questions must loom in the back of some people's minds.

The bottom line - I'm shooting for '0' exposure. In a perfect world where corporate influences didn't dominate the law, I suspect you'd shoot for the same '0' exposure policy. I want you to shoot straight and tell me what we at Rainbow's End can do to move towards that goal. Don't tell me the chemicals won't hurt us. We know that exposures are everywhere. We know/hope that what we read about acceptable limits at the center is true. How can we challenge that. Most of us, even the most skeptical, have to accept on faith that the testing and analysis is accurate and the levels are safe. Even in light of all I said earlier about corporate influence in setting standards, I'm still willing to accept that a certain level of true health protection exists. That's not a battle I'm here to fight. I want to know what my/our options are. Let the center's owners, Donna, the staff, the parents know that and then we'll decide what to do. We'll look at the

economic facts. Let us as the parents of these children set the 'risk assessment' benchmarks. I accept that economics controls your decisions as much as health does but give me power through knowledge so I can take action.

Thank-you

Alan R. Berkowitz, Ph.D.
6 Cottage Street
Salt Point, New York 12578
Home Telephone: 914-266-5112
Work Telephone: 914-677-7657
Facsimile: 914-677-6455
E-Mail: BerkowitzA@ecostudies.org

April 7, 1998

Mr. Keith Brown, Project Manager
DEC, Region 3
21 South Putt Corners Rd.
New Paltz, New York 12561-1696

Dear Mr. Brown:

This letter expresses concerns about the Proposed Remedial Action Plan (PRAP) for the Cavalier Gage & Electronics (#314092) Inactive Hazardous Waste Disposal Site on Hibernia Road in Salt Point based on the Remedial Investigation/Feasibility Study (RI/FS) prepared by Groundwater Sciences Corporation (GSC) dated 12 January 1998. I am writing as a parent of children in the Rainbow's End school, and as a citizen concerned about the environment. While my doctorate is in plant ecology and not in a field directly related to groundwater contamination, I have had course work in environmental geology and groundwater, and have worked as an ecologist at the Institute of Ecosystem Studies in Millbrook, New York, for the past 13 years.

My concerns fall into three areas: 1) the failure of the RI/FS to more precisely identify the source of the contaminants at the site; 2) the inadequacy of the RI/FS's consideration of alternatives; and 3) the need for the adopted plan to more thoroughly protect the long-term safety of the drinking water supply at Rainbows End.

1) The failure of the RI/FS to more precisely identify the source of the contaminants at the site.

The RI/FS pays relatively little attention to discussing likely locations for the source of the TCA and other volatile organic carbon (VOC) contaminants at the site. Such identification would be extremely useful, both as a potential location for direct mitigation through removal, and to guide investigation and possible mitigation of the underlying bedrock aquifer. Presumably, the location of the source of the VOC's could be (in decreasing order of likelihood): a) the leach field or dry well(s) for the original septic system, b) another dry well elsewhere on the property (e.g., under or directly adjacent to the building as might be used for basement or roof water drainage), or c) one or more storage barrels buried somewhere on the property. Why weren't these possibilities discussed, and why wasn't more effort made to find the source? Surely it is possible to follow the outflow pipe(s) from the original and the 1987 septic tanks to their associated leach fields or dry wells. Are there records from local construction and/or septic system installation companies about the location of the septic systems at this site? The presence of TCA in the basement air, not treated as a "hit" in the discussion of soil sources of VOC's, could indicate a persistent source of contaminant under or directly adjacent to the building. Again, why wasn't this possibility considered? Was the array of geoprobe water samples (none of which were under the building nor to the northwest of the original septic system) adequate to detect a contaminant source of limited spatial extent, as might be the case with a single dry well?

2) The inadequacy of the RI/FS's consideration of alternatives.

There are two striking patterns in the data on VOC levels in the two active wells on the site which are not adequately discussed nor, apparently, taken into account in the consideration of alternatives in the RI/FS:

First, is the increase in TCA levels in the new well #3 from zero when the well first was installed to significant levels in 1997, coupled with a decrease in levels in well #2 during the same time period. There are two points here: 1) These data indicate that at least part of the contaminant plume is, in fact, mobile and responsive to bedrock groundwater pumping (suggesting that mitigation through pump-and-treat wells away from the water supply well might actually work, contrary to the generic statements about their impracticality in the RI/FS). 2) There is a possibility that TCA levels could be increasing in well #3 to the point where other alternatives might be preferable (switching back to well #2 or changing the way the carbon filtration system is operated and monitored).

Second, is the striking periodicity in TCA levels in well #3. The significance of the sharp rise in levels in the middle of the autumn in three of the four years sampled is not discussed, nor is the explanation for the absence of a rise in the fourth year. However, these data show that the contaminant plume is not diffuse throughout the bedrock groundwater as is suggested in the report, but rather is located at a down-gradient point that only is drawn on by the well at the dry point in the annual cycle when other sources have been depleted. Why wasn't this information used to shed light on the location of the contaminant source? Should Rainbow's End consider other alternatives, such as switching to another water source either every few years or every autumn?

The RI/FS very quickly dispenses with the two alternatives that might actually remediate the VOC contamination on the site and presents the status quo - treating the current water supply well water with carbon filtration and ongoing monitoring - as the only feasible alternative. If more effort had been made at identifying the source of the contamination, and at taking into consideration the patterns discussed above, other alternatives might have been given greater weight. For example, why not consider an alternative where water is pumped from existing wells well #1 and well #2, treated and returned to the ground (e.g., via the new septic system) as at least a partial attempt at long-term remediation, and as a way to keep the contaminant plume away from well #3? If the source of the contaminant was found, then a pump-and-treat well directly below would be another alternative worth considering. In considering the relative merits of the three alternatives presented, the RI/FS fails to give any weight to the desirability of long-term mitigation of the contamination on the site, either for environmental quality or for coping with the possibility of a significant increase in the contaminant level in well #3 over time. As a second long-term scenario that might enter into cost and benefit estimations, what would happen if Rainbow's End stops using water and the contaminant plume starts moving off-site towards the nearby stream or residence? The estimated costs for the pump-and-treat alternative are not explained, and the tone of the argument is such that the reader comes away convinced that the authors did not give this alternative careful and fare consideration.

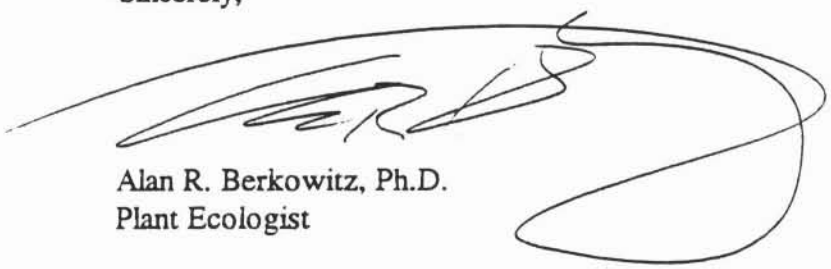
3) The need for the adopted plan to more thoroughly protect the long-term safety of the drinking water supply at Rainbows End.

Given the uncertainty about the extent, location and mobility of the contaminant plume, and the patterns in contaminant level discussed above, it is imperative that a more thorough monitoring program be put in place. This must include raw and tap water sampling at more than quarterly intervals as indicated by the temporal variability in the data. At the present time, this suggests that at least monthly sampling is required from September through November, to determine whether the annual peak in TCA levels in well #3 persists, increases over time, becomes more prevalent through the year, etc. However, rather than setting an invariable schedule for the next 30 years at this time, the monitoring scheme must be responsive. There must be contingencies plans if peak TCA levels continue to rise or if the peak spreads into other parts of the year (e.g., due to plume migration or severe drought). These contingency plans need to go beyond monitoring and include possible alternative scenarios such as changing water supplies if contaminant levels exceed those that can reliably be treated by carbon filtration. Who will be responsible for assessing the need for such actions 5 or 10 years from now? Were these potential costs and risks considered in the evaluation of alternatives?

In summary, I encourage the DEC and other responsible parties and agencies to seek ways of strengthening the science underlying the Proposed Remedial Action Plan. The selected alternative might, indeed, be the best choice, but the RI/FS's arguments are based almost entirely on simple economic estimates, blanket generalizations about the difficulty of mitigation, and an unsatisfactory lack of information and consideration of the data that is or should be available. Furthermore, there needs to be better monitoring of water quality given the variable nature of contaminant levels over time, with contingency plans in place for reconsidering options if circumstances change for the worse (as they appear to be doing in well #3) rather than for the better (as seems to be the implicit "hope" underlying the report's recommendations).

Thank you for this opportunity to comment, and for your consideration. I would be happy to discuss these matters with you, and wish you good luck in helping resolve this very important matter.

Sincerely,



Alan R. Berkowitz, Ph.D.
Plant Ecologist

cc: Donna Thomas, Rainbow's End Director

TRIEGEL & ASSOCIATES, INC.
CONSULTANTS IN GEOLOGY & THE ENVIRONMENT

2570 BLVD. OF THE GENERALS, SUITE 125
NORRISTOWN, PENNSYLVANIA 19403
610-539-2500 • Fax: 610-539-2511

April 6, 1998

Keith Browne, Project Manager
DEC, Region 3
21 South Putt Corners Rd.
New Paltz, NY 12561-1696

Re: Former Cavalier Gage & Electronics
#314092
Inactive Hazardous Waste Disposal Site

Dear Mr. Browne:

This letter is intended to provide you with written comments on the investigation and remedial activities which have been undertaken at the above-referenced site. I have reviewed information presented in the NYSDEC Fact Sheet, excerpts from the Proposed Remedial Action Plan of March 1998, a Fact Sheet on Chlorinated Hydrocarbons prepared by Environmental Standards, Inc., and have discussed this project with you and Mr. Larry Roach of Ground Water Sciences. I have also discussed the situation with my sister, Dr. Johanna Triegel, whose daughter attends the Rainbow's End Child Development Center and who has been to the site a number of times. She provided me with information on the site layout, the physical nature of the site, and what portions of the site are routinely used or occasionally accessed by the children at the Center.

Based on this information, I have the following comments and recommendations:

1. According to you and Mr. Roach, the water supply is treated with activated carbon, with the canisters arranged in a serial fashion. Samples of water are currently collected quarterly from a point between the canisters to test for breakthrough of the contaminants prior to reaching the last canister. The method detection limit for the compounds of concern is 0.5 ug/L. Mr. Roach informed me that the frequency of sampling would be increased to six per year to investigate the spike in concentration observed in the fall of each year. He also stated that we now have a period of record

starting in 1992, and that typically the carbon system lasts one to two years prior to breakthrough. Based on this information, the treatment system and monitoring appear to be adequate.

2. Mr. Roach also informed me that they will be doing additional indoor air sampling, while the heating system is running, which I agree with.
3. It was assumed during the original investigation that the source of the contamination was the former septic system associated with the main building. No significant source of contaminated in this area was confirmed, possibly due to cleaning of the system. I can find no information that other areas of the site were investigated for possible spills or intentional discharges, aside from limited soil sampling (five locations outside the septic system area).
4. I question the reliability of the method used to collect the soil samples in the five locations for volatile organics analyses. There has been much research over the last several years which shows that substantial amounts of volatiles can be lost during the sampling and analysis process. I would recommend that if any additional laboratory sampling of soils is required (see Item 6 below), then methods such as immersion of the soil sample in methanol or equivalent demonstrated methods be used. I am enclosing a copy of one article with discusses this issue, as well as copies of the current and draft proposed ASTM standards describing the sampling methods.
5. The nature and extent of the ground water plume and the direction of flow has not been defined. This arises in part on the use of existing wells which are basically arranged in a linear fashion (i.e., not the traditional triangular layout), and possibly due to fracture flow patterns. Topography would suggest that a ground water divide exists along the ridge line running in a southwesterly direction, through the main building. Hence, a spill or discharge on the west side of the building would result in the highest ground water concentrations occurring to the west, not in the areas monitored by existing wells. There was only one soil sampling point in that area (Point B), and no monitoring wells. It is not know if the soil is contaminated in this area (either directly by a spill or through ground water seeps), or if contaminated water is reaching the pond or is accumulating in the pond's sediments. Although the compounds do volatilize from the surface of water bodies, I have tested flowing streams next to sites contaminated with volatiles which have measurable concentrations in the streams. In a pond with little flowing water to agitate the surface or dilute the concentrations, I would expect the potential impact to be more pronounced. My sister informs me that the children do have access to the hillside, and have had a field trip to inspect the pond. Hence, although the drinking water pathway has been eliminated, there is still a potential for direct exposure to contaminated soils or water, or ingestion via direct contact with those media, if they are contaminated.
6. I recommend that the following additional investigations be undertaken:
    a. The site should be inspected after a period of heavy rainfall for the possible presence and location of ground water seeps.
    b. Soils should be sampled from various locations around the site to investigate possible spills, and tested in the field using either an organic vapor analyzer with a gas chromatograph attachment (OVA/GC with a FID detector) or a photoionization detector (PID) using a high energy lamp designed to detect the

compounds of concern. The area between the building and the pond and seep areas should be covered, additional samples from the fenced activities areas should be included, and any other areas suggested by the site layout, topography or stressed vegetation. The samples can be collected using a hand-operated instrument (probe or auger), conditions permitting.

c. If elevated readings are detected, a separate sample in that location should be collected using a appropriate method (see Item 4) for laboratory confirmation.
d. The pond water should be analyzed at least twice, during dry conditions and just after a wet period when seeps might occur. The sampling should be done in cooler portions of the year.

7. I would like to be placed on the mailing list (at the address given on the letterhead) for any additional information or decisions which will be made regarding this site, and reserve the right to comment on that material, or any new information with comes to light.
8. In short, I agree that what has been done to date and what is planned is appropriate, but that additional testing on a modest scale is needed to ensure that all probable areas have been addressed. Considering that the exposed population in this case are very young children, and the most vulnerable to the effects of exposure, I believe that these steps are reasonable.

I appreciate your cooperation, and that of the Center and their consultant in this matter.

Sincerely,

Elly K. Triegel

Elly K. Triegel, Ph.D., P.G., C.P.S.S.
President

cc: Johanna Triegel, M.D.

Appendix C

Admininstrative Record

Proposed Remedial Action Plan, March 1998

Remedial Ivestigaton and Feasibility Study, January 1998

Risk Assessment on Current Groundwater Conditions at the Raindows End Day Care and Activity Center, October 1994

Remedial Ivestigation Work Plan Former Cavalier Gage and Electronic Co., Inc. Site, June 1993

Citizen Participation Plan Former Cavalier Gage and Electronic Co., Inc. Site, April 1994