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Environmental Site Assessment Related to Chlorinated Solvent Contamination of a Water Supply Well

Guilford Central School
Guiford, Vermont

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SUMMARY

In July 1995 analysis of tap water at the Guilford Central School detected low levels of 1,1,1-trichloroethane and trichlorothene. Concentrations of these compounds were below State health advisory levels. At that time, the State of Vermont, Water Supply Division (VT WSD) required monitoring of the drinking water every three months. Samples collected in January, March, June, and September 1996 had low levels of these two compounds. In the June sample, carbon tetrachloride was also detected at low level which resulted in a "Do Not Drink" advisory issued to the school on 18 September 1996. The September 1996 results did not detect carbon tetrachloride and the "Do Not Drink" health advisory was rescinded in October 1996 by the Vermont Department of Health. As a result of this persistent contamination and due to concerns of school personnel, the VT WSD contacted the Waste Management Division (VT WMD) to investigate the site to determine the source of contamination. The VT WMD contacted ***BINKERD ENVIRONMENTAL*** to conduct this environmental site assessment, under the direction of Mr. Tim Cropley, Site Manager for the Vermont Waste Management Division.

For this environmental site assessment, ***BINKERD ENVIRONMENTAL*** conducted interviews with VT WSD personnel who had been monitoring the drinking water quality at the school. ***BINKERD ENVIRONMENTAL*** personnel made a site visit on 5 November 1996. During this site visit, interviews were conducted with school personnel, and soil, septic wastewater, and surface water samples were collected. Samples were collected at two leach fields and at other locations. No solvents were detected in any of these samples. After conducting several follow up telephone interviews with former school personnel, contractors who had built the school additions and leach fields, and Guilford Town officials, a second site visit was made on 13 December 1996. Additional samples were collected at a third leach field and septic tank. Soil samples were also collected near the boiler room door that is about 10 feet from the well. No solvents were detected, but soils near the boiler room door are contaminated with hydrocarbons.

This initial investigation has provided information about site history, geology and hydrogeology. Limited sampling was conducted in the shallow subsurface which did not identify any sources of chlorinated solvent contamination. This sampling did indicate that direct surface spills of contaminants on the school's property is possible, as seen by the contamination near the boiler room door.

In spite of this effort, the source of the contamination at the school's water supply well has not been discovered. More field investigation is required to provide additional information. Due to the physical properties and migration patterns of the chemicals under investigation it is necessary to drill to bedrock or to an impeding layer. Two locations are suggested to begin an investigation involving drilling to bedrock: the leach field south of the Town Garage and close to the schools water supply well. Contaminated soils near the boiler room door should be removed as they provide an additional risk to the water supply well and personnel at the school could have exposure to these soils.

1.0 INTRODUCTION

In July 1995 analyses of tap water from an on site water supply well at the Guilford Central School detected low levels of 1,1,1-trichloroethane and trichlorothene.[1] The well is located 10 feet from the school building and is 105 feet deep set in a bedrock aquifer.[2] At that time, the Water Supply Division (VT WSD) required monitoring of the drinking water every three months.[3] Solvents have been consistently measured in drinking water samples since 1995.[4] As a result of this persistent contamination and due to concerns of school personnel, the VT WSD contacted the Waste Management Division (VT WMD) to investigate the site to determine the source of contamination.

The VT WMD contacted ***BINKERD ENVIRONMENTAL*** to conduct this environmental site assessment. ***BINKERD ENVIRONMENTAL*** is subcontracted by Inchcape Testing Services (ITS) to conduct environmental site assessments under their contact number 0963401 with the VT WMD.

For this environmental site assessment, ***BINKERD ENVIRONMENTAL*** conducted interviews with VT WSD personnel who had been monitoring the drinking water quality at the school. ***BINKERD ENVIRONMENTAL*** personnel made a site visit on 5 November 1996. During this site visit, interviews were conducted with school personnel, and soil, septic wastewater, and surface water samples were collected. Samples were collected at two leach fields. No solvents were detected in any of these samples. After conducting several follow up telephone interviews with former school personnel, contractors who had built the school additions and leach fields, and Guilford Town officials, a second site visit was made on 13 December 1996. Additional samples were collected at a third

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[1] July 1995. Letter from Mr. Billy Kahn, Compliance Coordinator, Vermont Water Supply Division, to Mr. Ray Bellville, Custodian, Guilford Central School. July 24, 1995.

[2] Wagner, Heindel, and Noyes, Inc. Well Capacity Testing and Analysis for Existing Water Supply Well. Guilford Central School, Guiford, Vermont. 15 July 1988, pages 1-2.

[3] According to U.S. EPA Phase II Rule CFR 141.24(f)(11) and 141.24(f)(19), if a sample exceeds the method detection limit (MDL) of 0.5 ug/l for any volatile organic compound, the water system must begin quarterly sampling until the results are reliably and consistently below the Maximum Contaminant Level (MCL).

[4] Vermont Water Supply Division. September 1996. Letter from Mr. Billy Kahn, Compliance Coordinator, Vermont Water Supply Division, to Mr. Michael Friel, Principal, Guilford Central School. September 18, 1996.

leach field and septic tank. Soil samples were also collected near the boiler room door that is about 10 feet from the well. No solvents were detected, but the samples near the boiler room door are contaminated with hydrocarbons.

This report contains results of site history review, interviews, site visits, and sample results. Possible contaminant source(s) are discussed and a recommendation for additional work is presented to investigate these possible sources. A recommendation is also included for remediation of contaminated soil near the boiler room door.

2.0 SITE BACKGROUND

2.1 Site Location

The Guilford Central School is located just north of Guilford Center in Guilford, Vermont. The site can be reached from Interstate Exit 1 in Brattleboro, Vermont by driving south on Route 5 to Guilford, Vermont, Figure 1. From Guilford, follow Guilford Central Road west to Bennett Road, just north of Guilford Center, Vermont. After passing the Guilford Center Town Hall on the right, Guilford Central School is visible on a hill. The coordinates of the location of the Guilford Central School are 42 degrees, 47 minutes, 50 seconds north latitude; and 72 degrees, 37 minutes, 30 seconds west longitude.

The Guilford Central School is in a rural area of southeastern Vermont. The largest town nearby is Brattleboro, VT located about five miles to the northeast. The site is located on a knoll as depicted in the U.S. Department of the Interior, Geological Map 42072-G5-TM-025, Figure 2. The contour interval on this U.S. Geological Survey map is 6 meters, about 20 feet. The elevation of the school is about 40 feet higher than the elevation of Bennett Road at the turn off to the school. The elevation in back of the school where there is a playing field is about 8 to 10 feet higher than the level area surrounding the school.

2.2 Ownership History

A land records title search was conducted at the Guilford Center Town Hall on 13 December 1996, Table 1. The earliest record is the transfer of 18 acres, plus or minus, from Wilbur R. Bennett to Herman A. Ashworth in 1941. In 1954, the property was transferred from Mr. Ashworth to the Town School District of Guilford.

Table 1: Recorded Land Title Records Review					
Property: Guilford Central School					
Records Located at: Guilford Center Town Hall					
Search Conducted by: Roger C. Binkerd					
Date of Search: 13 December 1996					
Book	**Pages**	**Grantor**	**Grantee**	**Date**	**Notes**
33	8	Herman A. Ashworth	Town School District of Guilford	3/30/54	17.2 acre farm
30	18	Wilbur R. Bennett	Herman A. Ashworth	6/16/41	17.2 acre farm

2.3 Historical Site Use

In 1941, when the land was transferred from Mr. Bennett to Mr.Ashworth, the land was used for farming. The land was farmed until 1957, three years after the land was transferred from Mr.Asworth to the Town of Guilford School District. Mr. George Houghton, who is a former school director, said that he remembers the property in 1957 and confirms that it was used for farming. According to Mr. Houghton, there was an open field and there were no buildings on the property. Mr. Houghton said that the water supply well was drilled in 1957, at its present location, when the original school building was erected.[5]

A topographic map prepared in 1956 of the site depicts a dirt road to the west (presently named Bennett Road) and a rock wall to the west and south of the property where the school is now located. On this topographic map a "field drive" is depicted that is at about the same location as the present driveway to the front of the school building. No buildings are located on this topographic map.[6]

[5] Telephone interviews on 2 and 12 December 1996, and personal communication in Guilford Center, Vermont, on 13 December 1996, with Mr. George Houghton.
[6] Topographic Map of the Proposed Site for Guilford Consolidated School, Guilford Center, Vermont, drawn by William E. Shumway, P.E., Brattleboro, Vermont, June 1956. On file at Guilford Town Hall.

A 200 percent enlargement of a copy of the Vermont Base Map, Guilford Center, Sheet No. 140032, that was flown in the spring of 1974, is depicted in Figure 3. The distance between the two cross marks on the photograph is 500 meters (about 1640 feet). The original school building and the additional science class rooms on the north end of the school were built in 1968 are shown in this aerial photograph. The location of the water supply well is in the backyard of the school and about ten feet from the building. The playing field is shown north of the school where a baseball diamond is visible. The Town Hall is located adjacent to the school property to the south.

In the spring of 1989, the site was again photographed by the State of Vermont Mapping Program and is depicted in Figure 4. The second addition built in 1988 is depicted by the darker peaked roof on the west side of the building and the expansion on the south side of the building.

Northwest of the site is the Town Garage that was built from 1987 to 1990. A water supply well was drilled in 1990 to a depth of 290 feet, the same year the town garage was first occupied and used.[7]

2.4 Description of Wastewater Disposal Systems

The site plan shown in Figure 5 was adapted from the site plans drawn in 1988 for the second addition.[8] The area of the school building labeled "Existing" in Figure 5 includes the four class rooms added in 1968. The area labeled "school expansion" has been constructed and includes a gymnasium and additional classrooms.

The original leach field is shown on the south side of the building. A 5000 gallon septic tank is located on the right hand side of the main entrance way to the building. This leach field, referred to as the South Leach Field in this report, was originally constructed in 1957 and improved in 1968 when the first addition was built.[9]

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[7] Interview with Mr. Dan Zymbruski, Road Commissioner, 5 November 1996.
[8] Guilford Central School, Overview Plan, Sheet 6 of 6, drawn by Walter W. Schwarz, C.T. Male Associates, Inc., Greenfield Mass. On file at Guilford Central School.
[9] Same as footnote 5.

When the first addition was built in 1968, the leach field on the east side of the building, the 1000 gallon concrete septic tank, and the roof drain were added.[10] Sinks were installed in the science rooms that drain to the septic tank on the east side of the building. There is a bathroom in one of the classrooms connected to the septic tank. At this time, the sinks do not have water supplied to them, but the drains are still connected to the septic tank.[11]

In 1988, the leach field labeled "North Leach Field" was constructed east of the playing field and north of the school. A new fiberglass water storage tank was installed north of the building. Water is pumped from the well to the storage tank. Water is pumped to the school where it is pressurized. The water distribution control panel and pressure tank are in the "boiler room."

An underground storage tank used for heating oil is about fifty feet from the water supply well, Figure 5.

2.5 General Site Description from Photographs

Photographs of the site were taken on 5 November 1996 during the first site visit. The approximate location from where the photographs were taken, and the direction of view, are shown in Figure 6 on the aerial photograph for orientation.

The front of the school is shown in Figure 7, Photo 1. The second addition includes the gym and the white sided class rooms in the front of the building. The main entrance is indicated. The location of the septic tank for the South Leach Field is to the right of the main entrance. Photos 2 and 3 in Figure 8 are additional views on the south side depicting sample locations discussed in Section 5.

[10] Drawn from Plot Plan & Foundation Plan, Addition to Central School, Guilford, Vermont, by John R. Holbrook. Plans on file in Guiford Center Town Hall

[11] Interview with Mr. Ray Belville, Guilford Central School Custodian, 5 November 1996.

Photo 4 in Figure 9 was taken on the west side of the school just north of the gym looking east. The addition for the science class rooms is noticeable from the different color of the bricks. The boiler room door and the water supply well are shown in the inside corner of the back of the school. If you imagine you are at this location and turn around, the view in Photo 8 is seen. A close up of the location of the water supply well and access cover to the well is in Figure 10, Photo 5. The boiler room door is to the left.

A view of the school from the north is in Figure 11, Photo 6. The North Leach Field is to the left. Two monitor wells, MW-1 and MW-2, are on the west side of the leach field and three monitor wells (very shallow and hand dug) are out of view to the left (east). These wells are on a slope. The playing field is to the right, and the baseball backstop is straight ahead.

A view of the east side of the school looking south is in Figure 12, Photo 7. The science class rooms are to the right. Laboratory sinks and a bathroom are in the science room and are connected to the septic tank. The septic tank is located just north of the two posts depicted in this picture. The East Leach Field is in a clearing just beyond the trees shown in the picture. The shed on the left is used to store gardening tools.

Photo 8 in Figure 13 depicts rock outcrops on the west side of the school. The roof drain discharge on the east side of the school is shown in Photo 9, Figure 13. The science class rooms are seen in the distance and the East Leach Field is on the right.

The final photographs are in Figure 14. The Guilford Center Town Hall is shown looking south from the school. The location the water supply well for the town hall is in the backyard. Photo 11 depicts the Guilford Center Town Garage. The water supply well for the town garage is just behind the concrete barricades on the left. The town garage has a septic tank on the west side (left in this photo) and a pump that pumps septic wastewater to a leach field on the northeast side of the building (see Figure 5). A floor drain inside the garage is connected to an oil water separator, then to a separate tank, before wastewater is discharged to a sand pit (leach field) on the south side (front) of

the building. Trucks were washed in the front of the building, but now are only washed inside the garage. From review of a Material Data Safety Sheet (MSDS) supplied by The Road Commissioner, Mr. Dan Zymbruski, the chemical used for cleaning trucks at the Town Garage, Engine Shampoo EC-3, has a specific gravity less than one, which rules out this cleaning agent from the entire class of chlorinated solvents. Wastewater from truck washing and cleaning the floor discharge to the floor drain and eventually to the leach field in front of the garage.[12]

[12] Interview with Mr. Dan Zymbruski, Road Commissioner, 5 November 1996 and 17 January 1997.

3.0 REGIONAL ENVIRONMENTAL SETTING

3.1 Discussion of Site Geology and Hydrogeology

The soil survey of Windham Country, Vermont describes the soils throughout Guilford and Guilford Center, Vermont and extending north to at least Grafton, Vermont as "Tunbridge-Marlow-Lyman: very deep to shallow, gently sloping to very steep, somewhat excessively drained and well trained soils that formed in loamy glacial till and in compact, loamy glacial till, on hills and mountains."[13] Soils at the site of the Guilford Central School are described as 11B, Berkshire and Monadnock fine sandy loams, 3 to 8 percent slopes.[14] From the soil survey description (quote):

- Typically, the surface layer of the Monadnock soils is dark grayish brown fine sandy loam 8 inches thick. The subsoil is 16 inches thick.
- In some areas rock outcrops cover about 1 percent of the surface. In a few areas stones cover as much as 3 percent.
- Permeability is moderate or moderately rapid in the Berkshire soils and moderate in the subsoil and moderately rapid in the substratum in the Monadnock soils. Depth to bedrock is more that 60 inches for both soils.
- Most areas of these soils are farmed. Some areas are wooded.
- There are few limitations to the use of these soils as sites for dwellings and septic tank absorption fields (end quotation).

The above description is general to soil types mapped on site. More specific information is contained in the report on the design of the wastewater disposal system[15] and the evaluation of the water supply well.[16] According to these reports (quote):

- The soil excavations reveal a depth of weathered glacial till ranging from 2.0 to greater than 2.9 feet.
- The results of the point permeability tests revealed geometric mean values of 9.76 feet/day on the eastern site (North Leach Field) and 15.23 feet/day on the western site (replacement site).

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[13] Soil Survey of Windham County, Vermont. U. S, Department of Agriculture, Soil Conservation Service, General Soil Map, 1981.
[14] *Ibid.*, map 123 and soil legend.
[15] Wagner, Heindel, and Noyes, Inc. Guilford Central School, Wastewater Disposal Capacity Evaluation, 8 September 1988.
[16] See footnote 2.

- Two shallow water supplies located to the north of the western site...will not be threatened by the construction of the disposal system.
- Geologic and hydrogeologic data have been collected to establish that the well at the Guilford Central School, is completed in the bedrock aquifer.
- **Very compact glacial (till) in the area surrounding the school and well provide good protection to the well from contaminants in the surface environment. This is demonstrated by the high quality of the well following 30 years of usage.**[17]
- The town office well responded to the pumping of the school well...
- ...The shallow observation well adjacent to the well indicates possible slow leakage into the bedrock aquifer. **However, as evidenced by the good water quality record of the well, this leakage is not resulting in surface contaminants reaching the well**[18] (end quotation).

WH&N, Inc. (now Heindal & Noyes, Inc.) was asked about water quality data referred to in the report. After a search of their files they were unable to find any water quality data.[19] This is unfortunate since, if chlorinated solvents were included in the parameter list, the time frame for the start of contamination may have been determined.

Also, the observation well discussed in the water supply well capacity report was about 30 feet northwest of the water supply well. From the boring log of the observation well, the first 6.5 feet is glacial till with weathered rock, from 6.5 to 16.5 the soils are glacial till with weathered rock, medium dark gray and damp. Refusal on bedrock was encountered at 18 feet. A two inch diameter 10 foot long slotted screen was installed on bedrock. The present status of this well is unknown. It was not searched for by ***BINKERD ENVIRONMENTAL*** on 2 February 1997 and was not found.

[17] Emphasis added.
[18] Emphasis added.
[19] Telephone message from H&N, Inc. on 21 January 1997.

4.0 CONTAMINANT REGIME

4.1 Contaminants of Concern

The primary contaminants of concern (COC) at the Guilford Central School appear to be 1,1,1-trichlorethane, trichloroethene, and carbon tetrachloride. These COC's are chlorinated hydrocarbons. Other potential contaminants are heating oil and septic wastewater. A summary of a few of the chemical properties for the chlorinated hydrocarbons are included in Table 2.

Table 2. Chemical characteristics of chlorinated solvents.

Compound	Molecular Weight	Density, g/cm^3	Solubility
trichloroethene, at 20 degrees Celsius	131.5	1.46	1,100,000 ug/l
carbon tetrachloride at 20 degrees Celsius	153.8	1.59	785,000 ug/l
1,1,1- trichloroethane, at 25 degrees Celsius	133.4	1.35	720,000 ug/l

A carbon atom can have four bonds (shared electrons). Carbon tetrachloride is a single carbon atom with four chlorine atoms forming the bonds on the outer shell. 1,1,1-trichloroethane is two carbon atoms with a single bond between them; three chlorine atoms are attached to one carbon atom, and three hydrogen atoms are attached to the second carbon atom. Trichloroethene is two carbon atoms with a double bond between them; one carbon atom has two chlorine atoms, and the second carbon atom has one chlorine atom and one hydrogen atom.

4.2 Contaminant Fate and Transport

The significant physical property of all of these molecules is that each is significantly denser than water (water has a density of one gram per cm^3). In their pure solvent form (undiluted) they will sink in water. The following is a general description of migration patterns of dense (heavier than water) chlorinated solvents in the subsurface.[20,21]

[20] Schwille, Fredrich. 1988. Dense chlorinated solvents in porous and fractured media. Lewis Publishing, Inc. ISBN 0-87371-121-1.
[21] Lyman, Warren J., et. al. 1992. Mobility and degradation of organic contaminants in the subsurface environments. C. K. Smoley, Inc. ISBN 0-87371-800-3.

The class of chlorinated solvent under investigation, when discharged to the environment in their pure phase, migrate vertically through the vadose zone leaving residual contamination behind. (The vadose zone is the soils above the water table that have pore spaces primarily filled with air.) If the spill is of sufficient size, pure phase chlorinated solvents will tend to migrate vertically until an impeding layer is encountered. The impeding layer could be a compacted glacial till layer, clay layer, or bedrock. If an impeding layer is encountered by pure phase chlorinated solvent, the solvent will spread laterally on top of the impeding layer by gravitational forces. Once the pure phase solvent reaches the aquifer, solvent will dissolve in the groundwater in the aquifer up to its saturation level.

If the spill is not of sufficient quantity, pure phase solvent does not reach the water table. Dissolved phase solvents will contaminate the surface water table as rain water and snow melt migrate through the vadose zone carrying with it dissolved phase chlorinated solvents from residual contamination. Vertical migration will be limited, since the density of the dissolved solvents will be nearly the same as the groundwater. Dissolved solvent can become wide spread depending on the aquifer characteristics.

5.0 PREVIOUS INVESTIGATIONS AND CONTAMINANT SOURCES

5.1 Summary of Drinking Water Data, July 1995 to September 1996

In July 1995 analysis of tap water at the Guilford Central School detected low levels of 1,1,1-trichloroethane and trichlorethene.[22] Concentrations of these compounds were below State health advisory levels. At that time, the State of Vermont, Water Supply Division (VT WSD) required monitoring of the drinking water every three months.[23] Samples collected in January, March, June, September, and December 1996 had low levels of these two compounds (Vermont Department of Health Laboratory results). In the June sample, carbon tetrachloride was also detected at low level which resulted in a "Do Not Drink" advisory issued to the school on 18 September 1996.[24] The September 1996 results did not detect carbon tetrachloride and the "Do Not Drink" health advisory was rescinded in October 1996 by the Vermont Department of Health.[25] Table 3 is a summary of volatile organic data collected from a drinking water tap at the school and directly from the well.

Table 3. Summary of organic compounds in drinking water, concentrations in micrograms per liter, ug/l.

Date	Location, Guilford Central School	1,1,1-trichloro-ethane	trichloro-ethene	carbon tetrachloride
7/10/95	Tap in school	**2.8**	**0.8**	ND
1/14/96	Tap in school	**4.1**	**0.8**	ND
3/18/96	Tap in school	**3.4**	**0.7**	ND
6/26/96	Tap in school	**3.7**	**0.6**	**3.8**
9/18/96	Tap at well	**4.5**	**0.7**	ND
12/17/96	Kitchen Sink	**3.7**	**0.6**	ND

Notes: ND-Not detected, detection level not reported.
All samples analyzed by Vermont Department of Health Laboratory.

[22] See footnote 1.
[23] See footnote 1 and 3.
[24] See footnote 4.
[25] Letter to Mr. Billy Kahn, Compliance Coordinator, Vermont Water Supply Division, from Mr. Bill Bress, Vermont Department of Health, State Toxicologist. October 17, 1996.

The results of the 1,1,1-trichloroethane and trichloroethene appear to be valid since results are reproducible for the last four sampling events over the past year. The one result of carbon tetrachloride appears to be suspect and is, most likely, the result of laboratory error.

The Vermont Ground Water Enforcement Standard for 1,1,1-trichloroethane is 200.0 ug/l (micrograms per liter, which is the same as ppb, parts per billion). Carbon tetrachloride and trichlorethene each have a Groundwater Enforcement Standard of 5.0 ug/l. The Vermont Groundwater Enforcement Standards are the same as the U.S. EPA maximum contaminant levels (MCL) for drinking water. The Vermont Department of Health, Health Advisory Level for carbon tetrachloride is 0.5 ug/l and for trichloroethene it is 3.0 ug/l. Vermont does not have a Health Advisory Limit for 1,1,1-trichloroethane.

5.2 Previous Investigations of Site Contamination

A "Sanitary Survey" of the Guilford Central School water system was conducted by the VT WSD on 19 September 1996.[26] The VT WSD site number is WSID #6634. The sanitary survey was conducted by Mr. Tom Bartholomew and Mr. Billy Kahn from the VT WSD. Representatives from the school were Mr. Michael Friel. Principal, and Mr. Ray Bellville, Custodian.

During this visit Mr. Bartholomew entered the water supply well pit and took a water sample directly from the discharge of the pump, Figure 10, Photo 5.[27] This sample was contaminated, which proves that the well water is contaminated, i.e., the observed contamination is not a result of the distribution system. Mr. Bartholomew also sampled the Town Hall well and the Town Garage well and these samples were clean.[28]

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[26] Letter from Mr. Thomas A. Bartholomew, P.E., Environmental Engineer, to Mr. Michael Friel, Principal, Guilford Central School. October 7, 1996.
[27] Telephone interview with Mr. Tom A. Bartholomew on 24 January 1997.
[28] *Ibid.*

5.3 Possible Contaminant Sources

The main objective of this investigation is to discover the contaminant source or sources. At this time, there are only potential contaminant sources which are discussed in this section.

From the site history, the property was never used for a manufacturing purpose. The historic site use for farming has no need of chlorinated solvents and precludes this use as a potential source.

There is a possibility that solvents were illegally disposed on site. Bennett Road was a dirt road and there was once a field road that gave access to the property. There is no evidence of illegal dumping, and the contamination observed in the water supply water is very low level. If solvents were dumped illegally, one could assume that a significant quantity would have been disposed of resulting in the concentrations in the water supply well being much higher and the distribution of contaminants more wide spread. As noted in section 5.2, the Town Hall well and the Town Garage well are not contaminated. Contamination has only been identified in the school well that sits between these two other wells. These three wells are not at the same elevation. The school well and the Town Hall well are nearly at the same elevation, but the Town Garage well is about 250 feet lower considering the ground surface elevation and the depth to the wells.

On site sources of contamination could originate from any one, or all, of the three on site wastewater disposal fields. Solvents in this case would originate from sinks or toilets in the school. There is no evidence that chlorinated solvents have ever been used at the school. Ms. Donna Harlen, Guilford Central School principal from 1987 to 1990, had no knowledge of chlorinated solvents on site and said she had no idea why these types of chemicals would be at the school.[29] The present principal, Mr. Michael Friel, also has no knowledge of these types of chemicals ever being used on site.[30] One of the school's custodians, Mr. Ray Belville, has been at the school since the 1970's. He does not recall

[29] Telephone interview on 2 December 1996.
[30] Personal interview on 5 November 1996.

chlorinated solvents being on site.[31] Also, the former science teacher from 1986 to 1991, Mr. Gus Hemenway, never used chlorinated solvents in any of his classes at the school.[32] In spite of this absence of first hand knowledge of chlorinated solvents on site, solvents could still have been used on site and discharged to leach fields or directly to the ground surface.

The original leach field south of the school, South Leach Field, has been used since 1957, the year the school was built and the water supply well was drilled. The leach field constructed in 1968 with the first addition, East Leach Field, is suspect since it is connected to the science class rooms and receives not only septic waste from the bathroom in the classroom, but wastewater from sinks used for science experiments in the classrooms. As noted, these sinks are no longer supplied with water, but are still connected to the septic tank and leach field. The third leach field was constructed in 1988 with the second addition and is north to northeast of the site.

It is not known precisely where wastewater moves in the subsurface from any of these wastewater disposal fields. It is likely, from an examination of site topography and the 1988 report by Wagner, Heindal, and Noyes, Inc. (WH&N, Inc.) on the wastewater disposal capacity study, that surface water from the North Leach Field flows toward the east away from the water supply well. Similarly, surface water originating from the East Leach Field most likely flows to the east. Bedrock is apt to be fairly shallow in both locations and it is possible that a connection could be made between these locations and the bedrock water supply well. That is not likely, however, considering that glacial till found below the surface soils is a barrier to vertical migration. A shallow well, installed just thirty feet horizontally, from the water supply well, was apparently unaffected during the water supply testing conducted in 1988 by WH&N, Inc., although some leakage from this monitor well was reported. This may indicate that the surface aquifer and the bedrock aquifer are not hydraulically connected. In spite of this, spills in the surface could reach the bedrock aquifer by preferential pathways such as natural fissures, or by bore holes produced by water supply wells or monitor wells.

[31] Personal interview on 5 November 1996.

Of the wastewater disposal fields, the South Leach Field seems to have the highest possibility of being hydraulically connected to the water supply well. A hydraulic connection has not been established between the South Leach Field and the water supply well. Of the three leach fields, the South Leach Field is the closest to the water supply well. The South Leach Field is lower than the elevation of the school building and between the water supply wells at the Town Hall and the school; these two well have been shown to be hydraulically connected.[33] Even so, contamination originating in the surface aquifer from wastewater disposal would have to penetrate the compact glacial till and enter the bedrock aquifer to contaminate either well. Studies have shown that heavy chlorinated solvents in pure phase do sink, but can be restricted in their vertical migration by compact soil characteristics.[34] This characteristic limits the vertical migration of both pure phase and dissolved phase chlorinated solvents.

Another on site source could be from accidental or intentional disposal of solvents directly to the soils after the school was occupied. Discharge directly to the ground surface could have occurred by contractors building the school or building one of the additions, by custodial staff, or essentially, by anyone having access to the property. Mr. Alan Clark, Clark Contractors, built the second addition. Mr. Clark said they did not use solvents in any of their construction activities.[35] Mr. Clark said that Howard O'Brien or Loney may have built the first addition, but they are both out of business.

There is no manufacturing activity in Guilford Center near the school and off site sources appear limited. There is the possibility of an off site illegal discharge that has contaminated the bedrock aquifer, but the Town Hall well and the Town Garage well did not indicate any contamination when sampled and analyzed by the State in 1996. The Town Hall well is hydraulically connected to the water supply well at the school. The school well is 105 feet deep which puts the well at an elevation of about 645 feet. The

[32] Telephone interview on 24 November 1996.
[33] See footnote 2.
[34] See footnote 20.
[35] Telephone interview on 26 November 1996.

Town Hall well is 70 feet deep, and since the ground at the Town Hall is about 25 feet less than at the school, the two wells are about at the same elevation. Since the Town well is clean and at nearly the same elevation, contamination is not likely originating south of the school.

A possible off site source is from the Town Garage area. The Town Garage was occupied in 1990. Trucks are now washed inside the garage. After the water used for washing passing through an oil water separator, wastewater enters a disposal area on the south side of the garage. Washing trucks inside, instead of outside the building, has the advantage of wastewater passing through the oil/water separator. Dissolved contaminants could still enter the leach field on the south side of the garage, even if trucks are washed inside. Wastewater from truck washing outside would seep into the surface aquifer. The water supply well at the garage is at 275 feet from the surface which places the well about 250 feet lower than the school and Town Hall wells. A clean water sample from the Town garage well does not necessarily indicate that the upper portion of the rock aquifer at the town garage is not contaminated.

6.0 RESULTS OF FIELD INVESTIGATIONS

During the first field investigation on 5 November 1996, plans of the South and North Leach Fields were available from Mr. Ray Belville, Custodian at the Guilford Central School. The location of the septic tank connected to the science class rooms was identified, but the exact location of the East Leach Field (science room septic) was not known at that time.

After telephone interviews with personnel at the Town Hall, it was determined that plans of the East Leach Field were available at the Town Hall.[36] Also, Mr. George Houghton, former owner of a sanitary disposal company, who had worked at the school, offered to find and uncover the septic tank connected to the science rooms.[37] A second field investigation was planned for 13 December 1996 to investigate the East Leach Field as a source of contamination.

Possible Contaminant Source - North Leach Field

During the first investigation, soil samples were collected east and west of the North Leach Field. Soil samples were collected from the bottom of dry monitor wells installed as part of the leach field monitoring system; MW-1 and MW-5, at depths of 5 and 2 feet, respectively. Methylene chloride was detected at low levels in both samples and the trip blank; this is most likely the result of laboratory contamination. No other contaminants were detected in these samples.

Possible Contaminant Source - East Leach Field

A septic water sample was collected from the septic tank connected to the science rooms on 13 December 1996. The sample, labeled "SCIENCE SEPTIC," was taken from the bottom of the septic tank, since the chlorinated solvents are heavier than water, and near the exit, to look for trace residual amounts of solvents. Since the exact location of the leach field was known on 13 December 1996, soils samples were collected at 5 to 7.5 feet and 7.5 to 10 feet in the leach field. These samples are labeled SLF; science

[36] Telephone interview with Ms. Andrea Franklin, Assistant Town Clerk on 27 November 1996, and Ms. Barbara Oles, Town Clerk on 12 December 1996.
[37] Telephone interview on 2 December 1996.

leach field. Soil samples were collected by driving hollow pipe with a jack hammer and recovering soils from inside the pipe. Previously, soil samples were collected near the septic tank and labeled SB-1 (soil boring -1) at depths of 5 to 7 feet and 7 to 10 feet. The low level of methylene chloride detected in SB1 5-7 feet is most likely the result of laboratory contamination. Chloroform (trichloromethane) was detected in SLF 7.5-10 at 0.62 ug/l. The method detection limit for chloroform is 0.5 ug/l, so this result is just above the detection limit of the analysis. Chloroform is a by-product of chlorination, but it is also formed from the decomposition of trichloroethene. A final sample in this area was collected from slightly below the surface at the discharge from the roof drain and labeled "NEDRAIN." This sample was analyzed twice. The first analysis detected methylene chloride, a laboratory contaminant, but no other compounds. The second analysis detected dichlorodifluoromethane, a form of freon, but not the methylene chloride detected in the first analysis. No other contaminants were detected in any of these samples.

Possible Contaminant Source - South Leach Field

A septic water sample was collected from the septic tank near the main door on 5 November 1996. This septic tank is connected to the South Leach Field. Chloroform was detected in the sample labeled "Main Door" at 2.3 ug/l. A soil sample was collected from the leach field at a depth of 2 to 5 feet. Also, soil and surface water samples were collected near the culvert on the east side of the driveway, SWCULVERT. This culvert appears to be down gradient from the south leach field. No other contaminants, except for the chloroform in the sample Main Door, were detected in these samples.

Possible Contaminant Source - Town Garage

Heading north on Bennett Road there is a wet area on the right hand side of the road before the driveway for the Town Garage entrance is reached. This wet area appears to be down gradient from the school and a surface water sample was collected near a culvert. This sample was labeled "Surface." No contaminants were detected in this sample.

Possible Contaminant Source - Surface Spills

Surface soils were screened in the field with a photo-ionization detector (HNU, Model DL-101). Soils adjacent to the boiler room at a depth of about 6 inches had a PID reading of 125 ppm (parts per billion); clean background soils were 0.3 ppm. Samples were collected by digging with a shovel (to be careful for underground wires or pipes) to a depth of 2 feet. Samples were collected, based on PID readings, at 6 inches (BRD-6 INCHES) and 12 inches (BRD-12INCHES) and at two to four feet (BRD-4FEET) by hammering into the ground a hollow pipe. The PID reading at 12 inches was 5 ppm and at four feet it was 1 ppm. No chlorinated compounds were detected in these samples. Since it was known that there were contaminants in these samples based on field observations and the PID measurements, the duplicate sample[38] BRD-6INCHESRE, collected a 6 inches and the original sample collected at 6 inches were submitted for laboratory analysis. This time, instead of analyzing for chlorinated solvents, the laboratory was requested to look for hydrocarbons. A significant number of higher molecular weight hydrocarbons were found. The lighter hydrocarbons such as benzene and toluene were not present. The contaminant in the sample was described as being primarily weathered hydrocarbons; a mix of some straight chain alkanes, aromatics, aliphatics and cyclic alkanes. The total estimated concentration in the duplicate 6 inch sample was about 150,000 ug/kg (micrograms per kilogram; 150 mg/kg).[39]

[38] All samples collected on 13 December 1996 were collected in duplicate and put into controlled storage at the laboratory.

[39] Estimated concentration of hydrocarbons by adding together all compounds found, see Appendix A, Analytical Chemistry Results.

7.0 DISCUSSION

Fact: the Guilford Central School water supply well is contaminated with low levels of chlorinated solvents.

A shallow (less than ten feet) soil boring investigation failed to detect chlorinated solvents in the vicinity of three leach fields. Two of three septic tanks were sampled and found not to contain residual chlorinated solvents. Soil near two surface drainage pipes was not contaminated. Surface water near a drainage pipe south of the school, which most likely contains groundwater seepage, was clean. Surface water, in a low lying area west of the school and south of the Town Garage, was also clean.

It is, of course, disappointing not to find a source for the solvent contamination. This result is not entirely unexpected due to the physical properties and migration patterns of the chlorinated solvents, and the limited shallow subsurface investigation that was conducted. Relatively heavy chlorinated solvents tend to migrate vertically through the vadose zone with little lateral spreading. If the source was due to an intentional spill, for example, one would need to sample **exactly** at the spill site to find residual contamination in the pore space. Vertical migration with reduced lateral spreading in the vadose zone is not restricted to chlorinated solvents. For example, the hydrocarbon contamination next to the boiler room door was not wide spread and soils just a few feet from the contaminated soils were clean.

The leach fields present a much larger area of initial distribution and entrance to the environment. Soil samples in the leach fields should have revealed residual contamination, if present, which is the reason the shallow soil boring program was initiated in the leach fields. The soil samples in the leach fields were not contaminated with residual chlorinated solvents. The North and East leach fields appear to discharge toward the east away from the water supply well. Wastewater from these leach fields would have to migrate through the compact surface glacial till and enter the bedrock aquifer to impact the school's water supply well. There is no evidence to suggest that the contamination observed in the water supply well entered the environment via the

leach fields. In fact, the data collected so far suggests that contamination is not originating from the leach fields on the school property.

The remaining sources are direct spills to the ground surface, either on the school property or on adjacent properties. Indirect discharge, via the leach fields at the Town Garage, is another possible source. As discovered with the hydrocarbon contamination adjacent to the boiler room door, direct spills to the environment can not be ruled out.

At this point there is no evidence to support an off site source of contamination. Chlorinated solvents are not known to have been used at the Town Garage. The chemical used for cleaning trucks at the Town Garage, Engine Shampoo EC-3, has a specific gravity less than one, which rules out this cleaning agent from the entire class of chlorinated solvents. On the other hand, the fact that the water sample from the water supply well at the Town Garage was clean, does not rule out this area as a source area, since that well is about 250 deeper than the well at the school.

8.0 POTENTIAL RISK AND POTENTIAL RECEPTORS

The potential risk at this time is to the drinking water supply well at the Guilford Central School. Well water drinking samples collected at the Town Garage and at the Town Hall did not detect any chlorinated solvents. These wells may become affected in the future and are at risk along with any other drinking water supply wells in the area.

Receptors of chlorinated drinking water are the students, staff, and visitors at the Guilford Central School.

9.0 IDENTIFICATION OF DATA GAPS AND DATA NEEDS

The major data gap is that the source of the chlorinated solvent contamination observed in the drinking water is unknown at this time. This initial investigation has provided information about site history, geology and hydrogeology. Limited sampling was conducted in the shallow subsurface which did not identify any sources of chlorinated solvent contamination. This sampling did indicate that direct surface spills of contaminants on the school's property is possible, as seen by the contamination near the boiler room door.

The following items have been completed:

- The site history has been described.
- The construction history of the school has been described.
- Activities at the town garage have been investigated with emphasis on chlorinated solvent usage.
- The site regional geology and hydrogeology have been described.
- A site plan has been prepared depicting locations of the school, leach field(s), septic tanks, and oil tank.
- A site plan of the vicinity of Guilford Center has been prepared showing the location of the school, town garage, and bedrock supply wells.
- Two, of three, on site septic tanks (water and sludge) have been sampled for chlorinated solvents.
- Samples of shallow soils and groundwater (less than 10 feet) near the leach field(s) have been collected and analyzed, and,
- Interviews have been conducted with the principal, custodian, former school officials, and town residents that have knowledge of site history.

In spite of this effort, the source of the contamination at the school's water supply well has not been discovered. More field investigation is required to provide additional information. Due to the physical properties and migration patterns of the chemicals under investigation it is necessary to drill to bedrock or to an impeding layer. At this

boundary, either pure phase chlorinated solvents could be encountered, depending on the size of the release of solvents, or dissolved phase chlorinated solvents could be detected in the groundwater. The dissolved phase originates from pure phase at the impeding layer or from residual contamination in the vadose zone.

The drilling program should investigate the entire soil profile from the surface to the bedrock. Samples should be collected continuously, screened in the field, and analyzed overnight. This rapid turnaround could be accomplished with an on site gas chromatography screening analysis, such as a head space analysis. This procedure could provide information to determine the best locations for additional drilling while the drilling crew and equipment are mobilized. Two locations to begin with are in the Town Garage leach field south of the building (not the leach field for septic wastewater northeast of the garage) and close to the school's water supply well. Contamination, if spilled near the well, could reach an impeding layer, such as compact glacial till or bedrock, flow toward the well casing and then migrate vertically to the pump. The water supply well or the well casing, could be a conduit for a surface spill to enter the bedrock aquifer, i.e., a spill to the ground surface near the well could migrate vertically until an impeding layer is reached, the glacial till or bedrock. From that point the solvent or dissolved solvent could migrate laterally to the well casing and contaminate the well. Alternatively, contamination could enter the bedrock aquifer through fissures in the bedrock.

The contaminated soil near the boiler room door should be removed. They are an additional threat to the water supply well and personnel at the school could have contact with these contaminated soils.

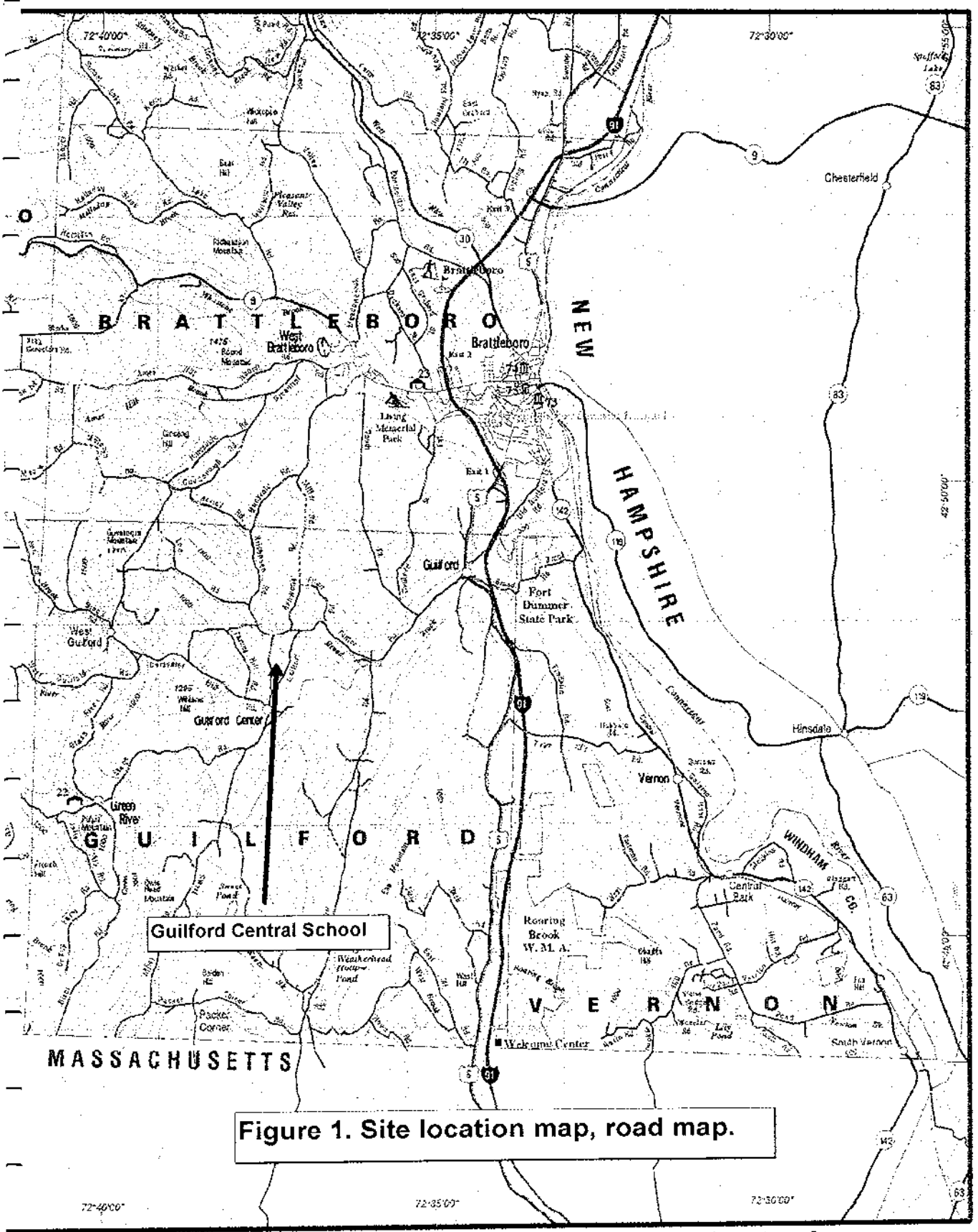


Figure 1. Site location map, road map.

BINKERD ENVIRONMENTAL

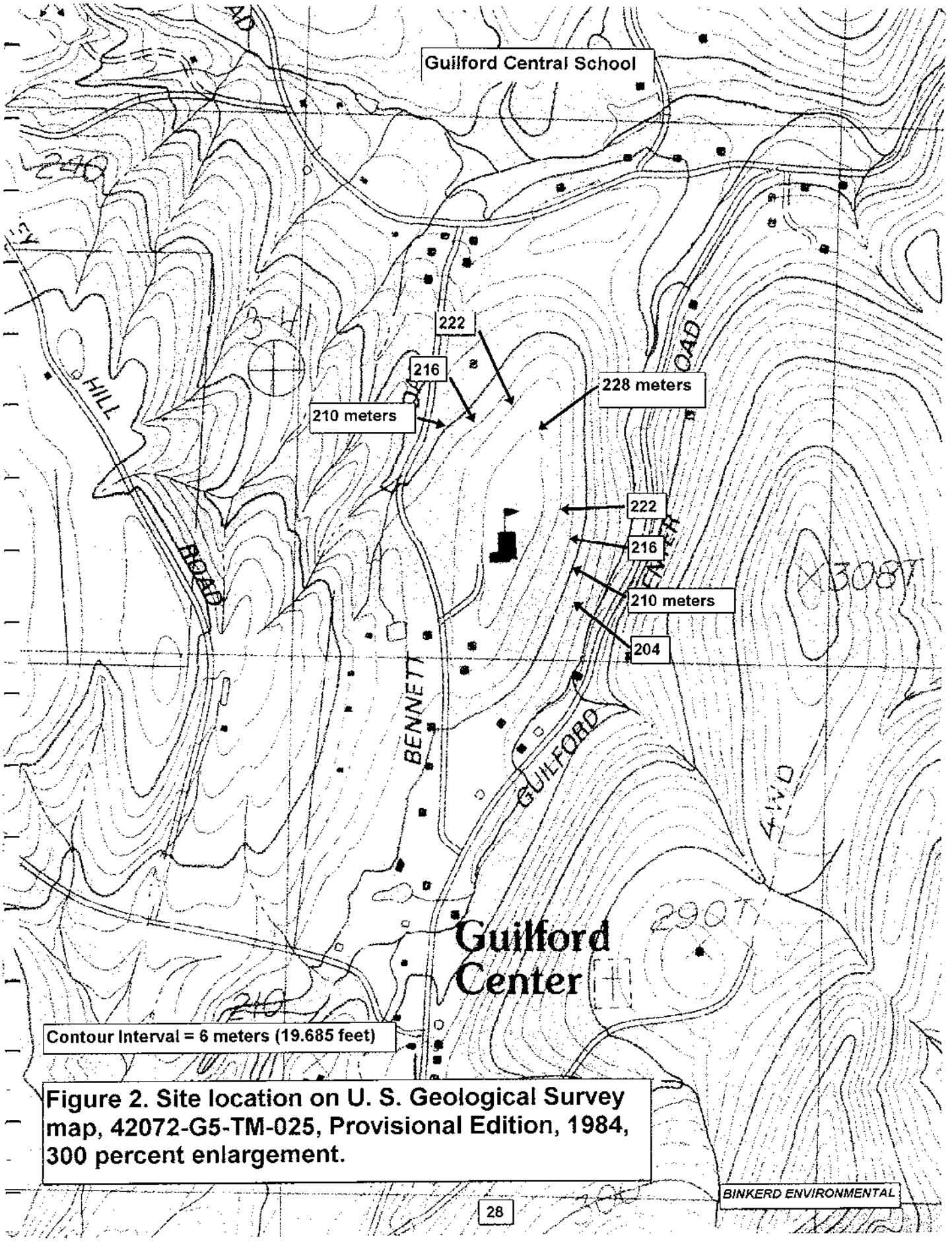


Figure 2. Site location on U. S. Geological Survey map, 42072-G5-TM-025, Provisional Edition, 1984, 300 percent enlargement.

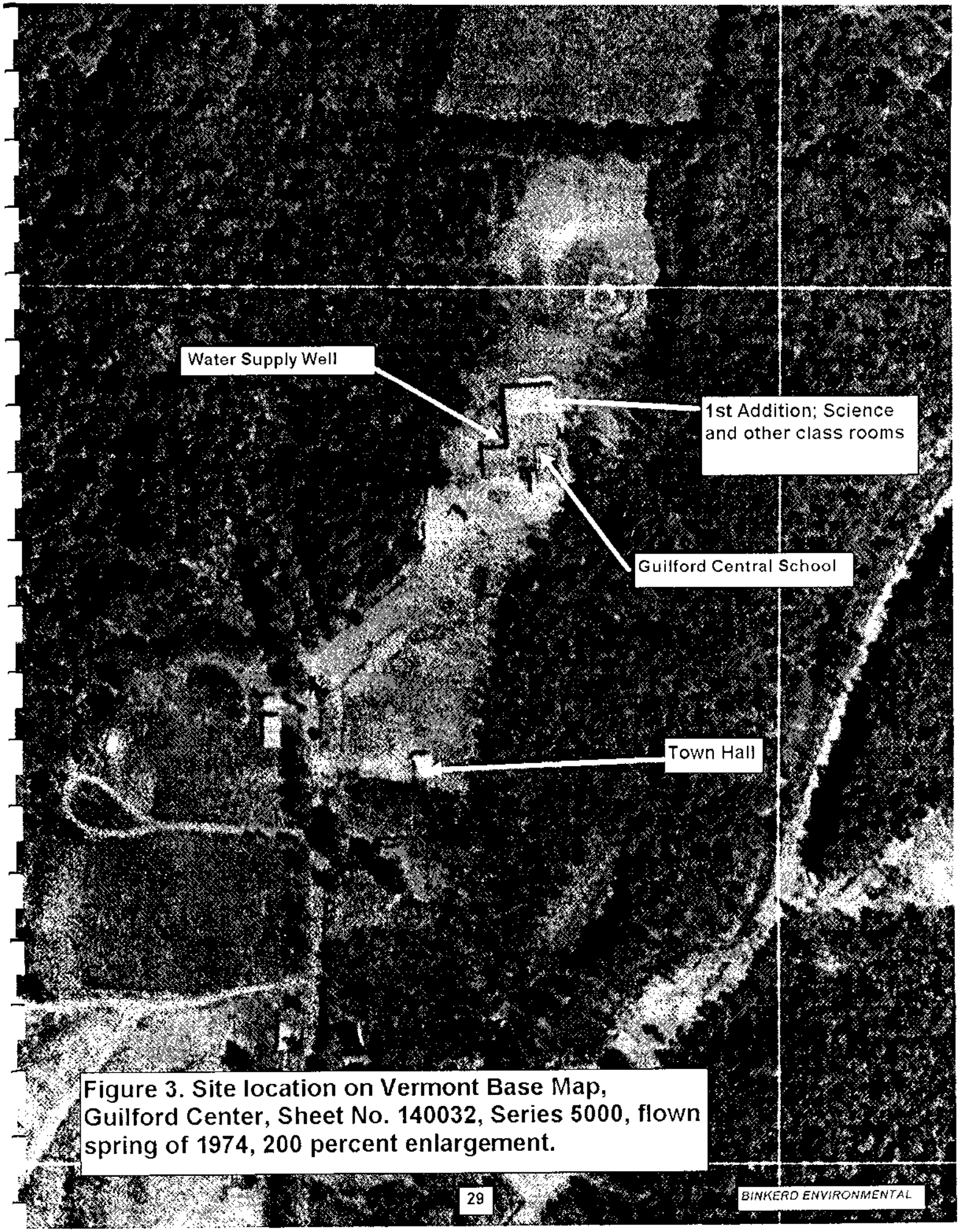


Figure 3. Site location on Vermont Base Map, Guilford Center, Sheet No. 140032, Series 5000, flown spring of 1974, 200 percent enlargement.

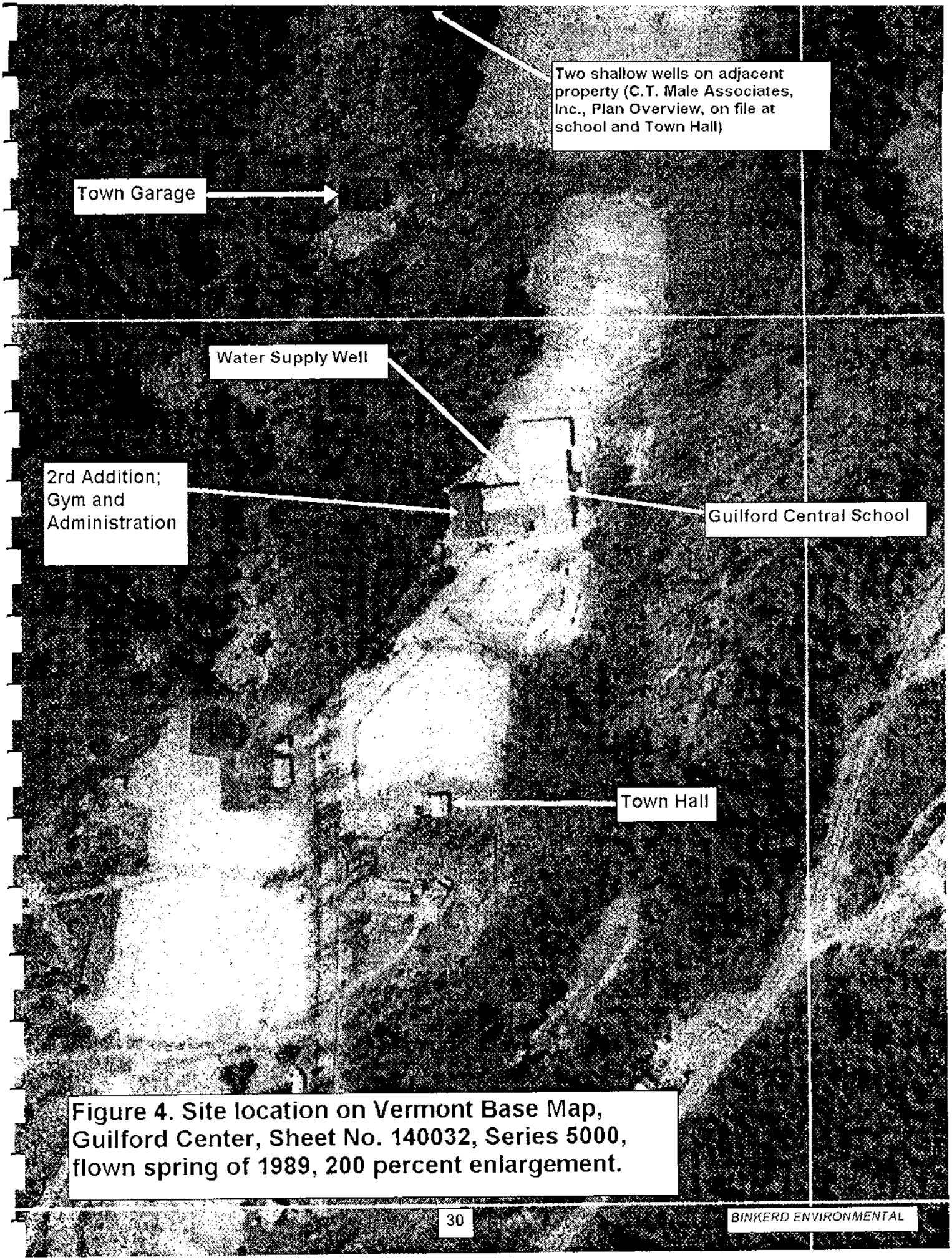


Figure 4. Site location on Vermont Base Map, Guilford Center, Sheet No. 140032, Series 5000, flown spring of 1989, 200 percent enlargement.

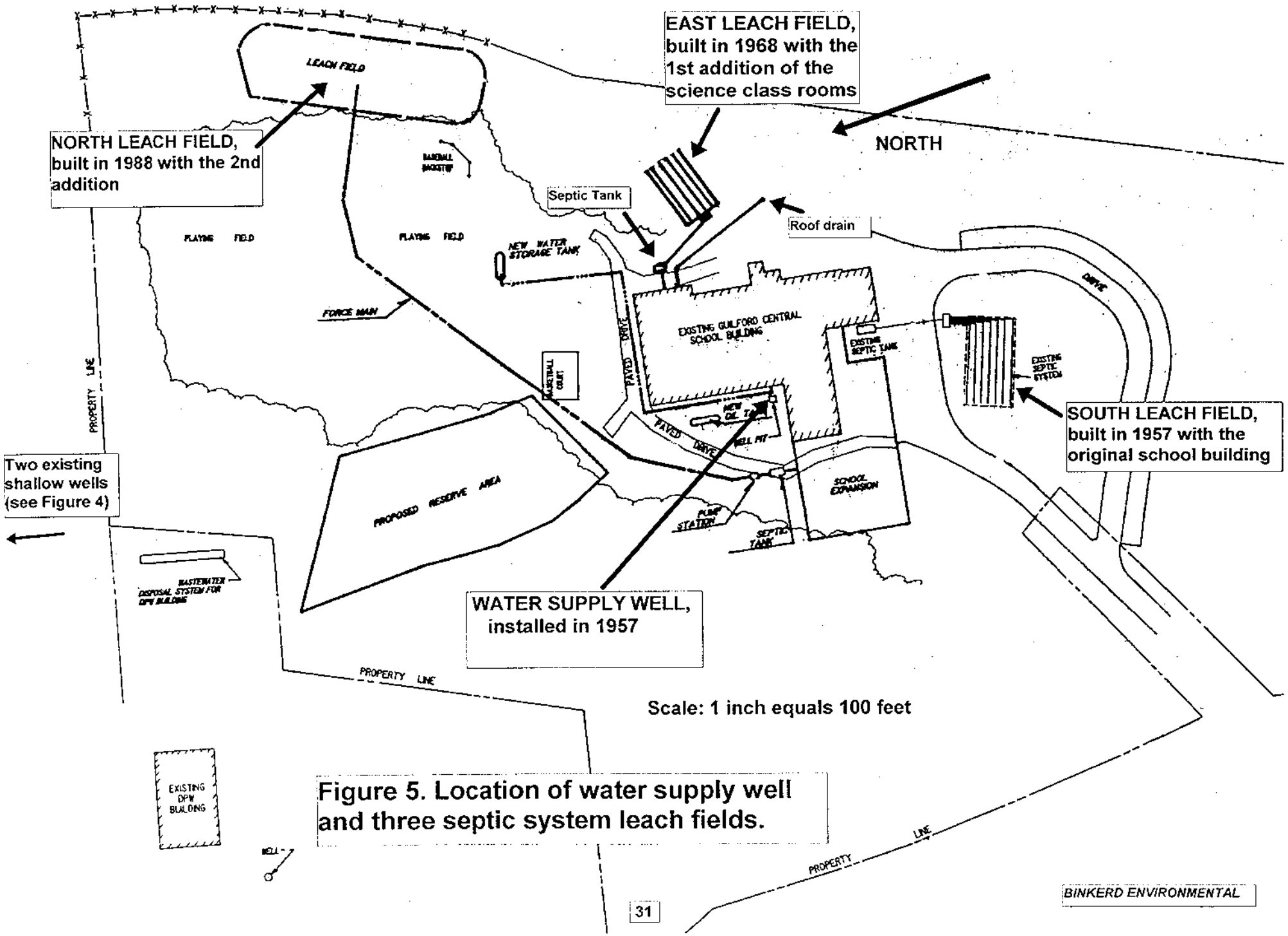


Figure 5. Location of water supply well and three septic system leach fields.

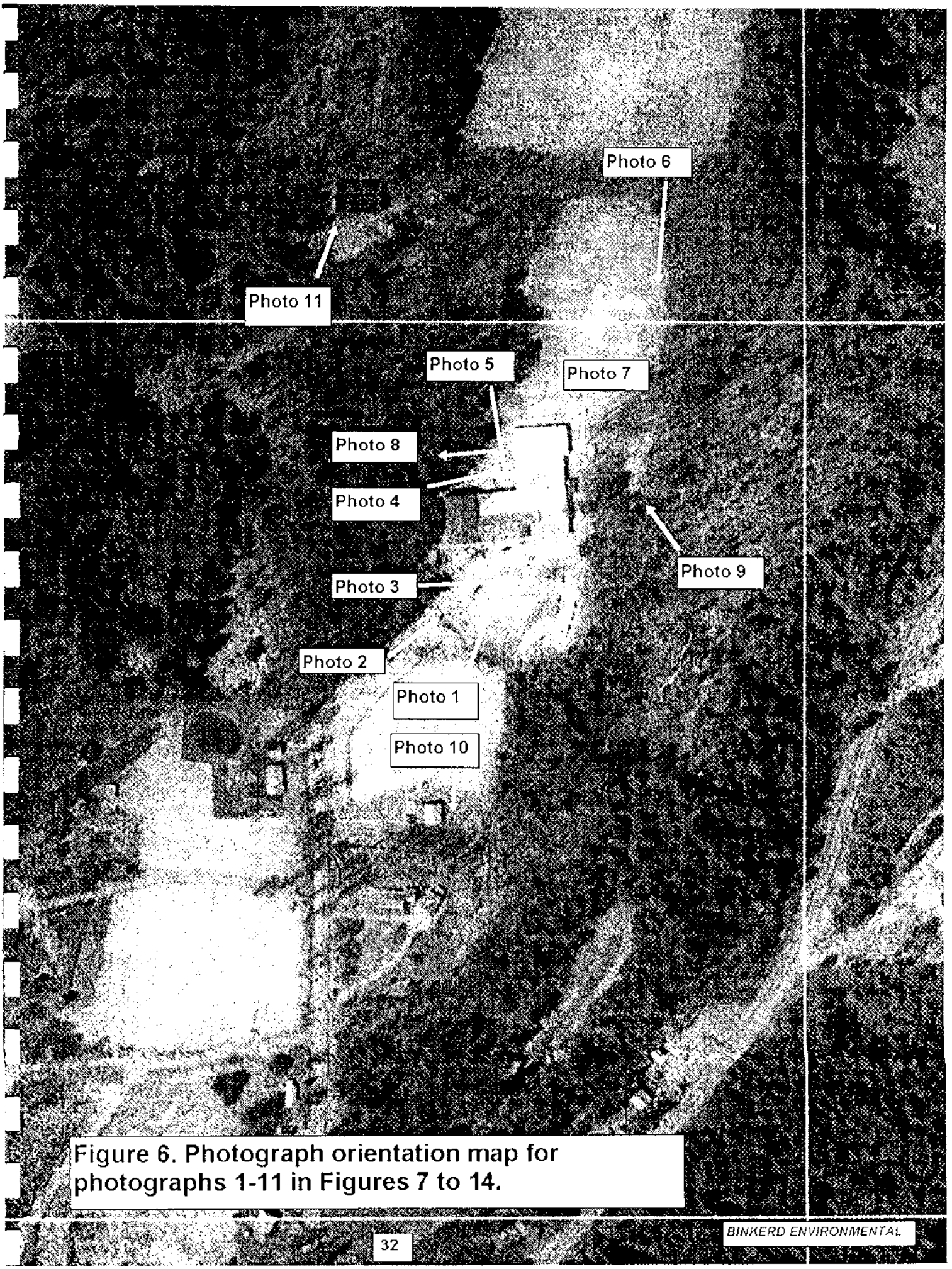


Figure 6. Photograph orientation map for photographs 1-11 in Figures 7 to 14.

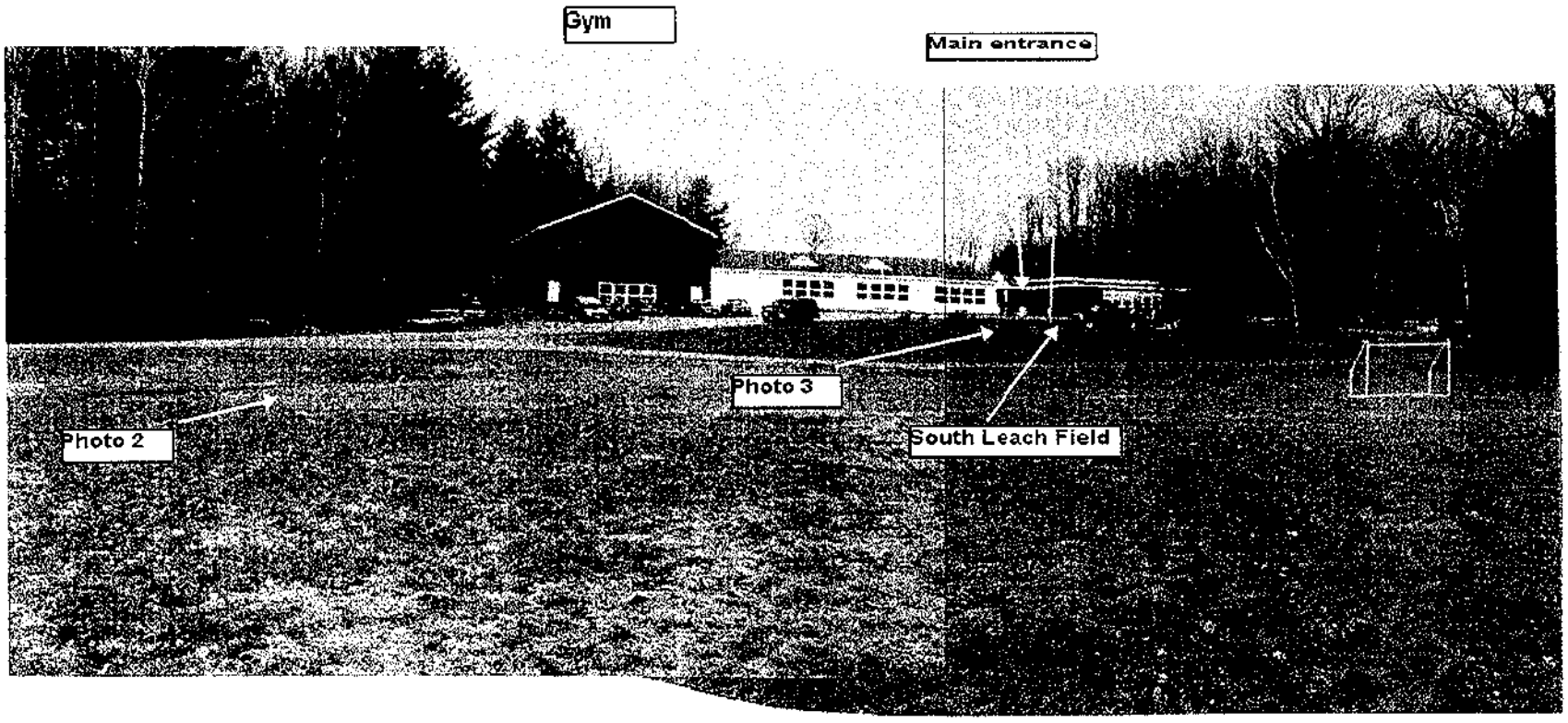
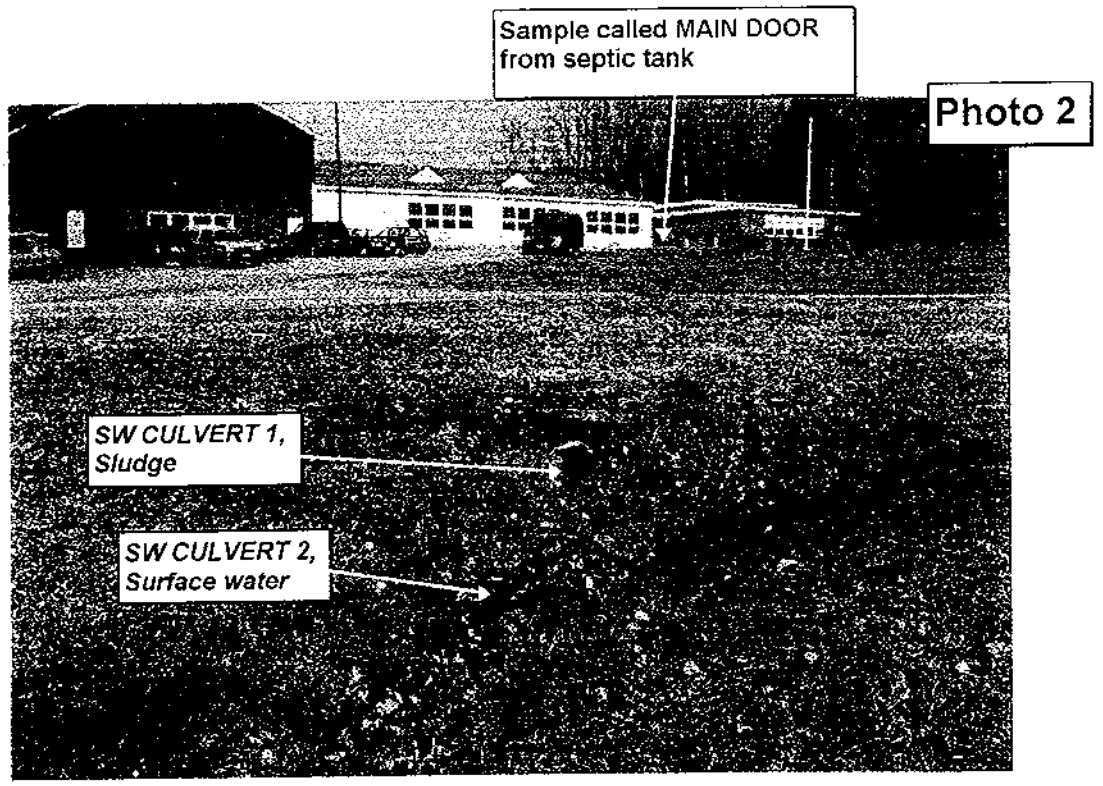


Figure 7. View of Guilford Central School looking north from Town Hall.



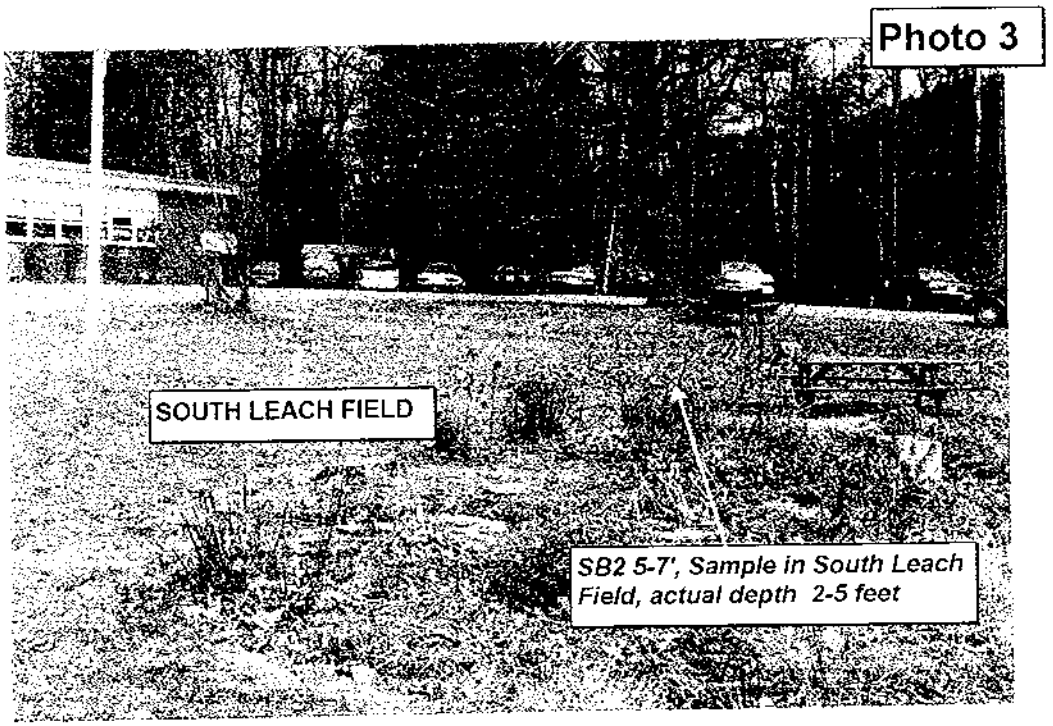


Figure 8. View of SOUTH LEACH FIELD and sample locations.

Figure 9. View of west side of Guilford Central School looking toward boiler room door and location of water supply well.

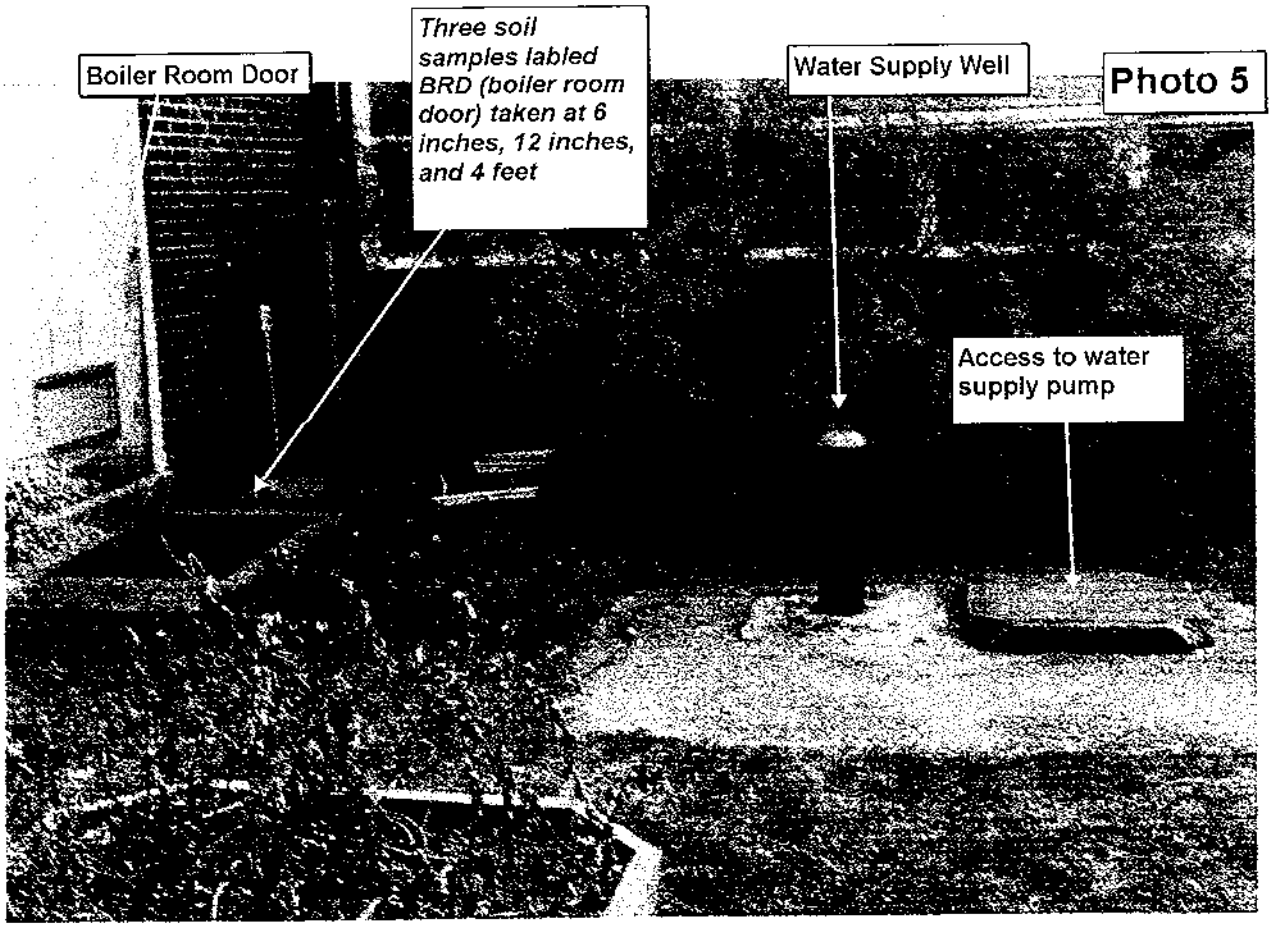


Figure 10.Close-up view of west side of Guilford Central School looking toward boiler room door and location of water supply well.

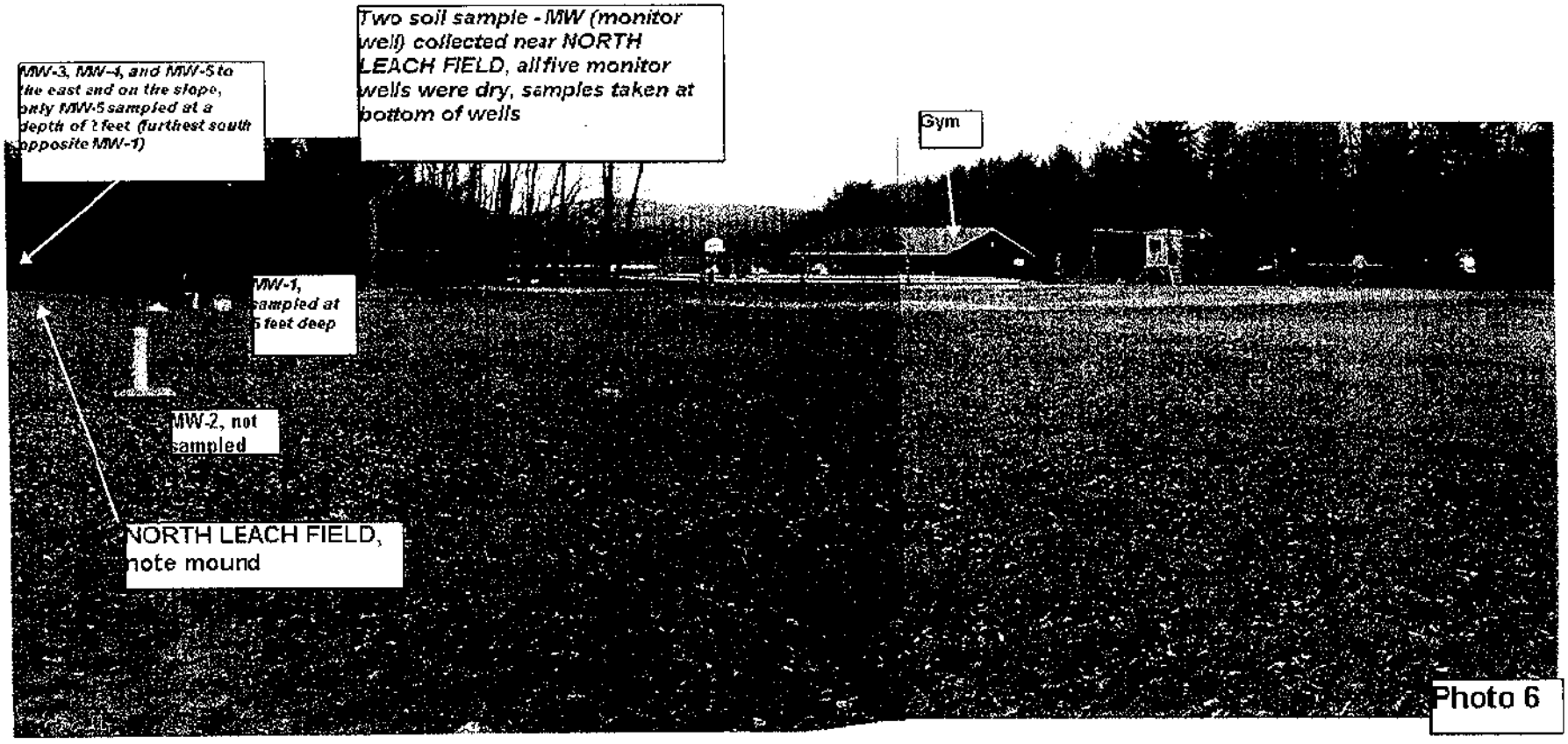


Figure 11. View of north side of Guilford Central School looking at NORTH LEACH FIELD, baseball field and playing area to the right.

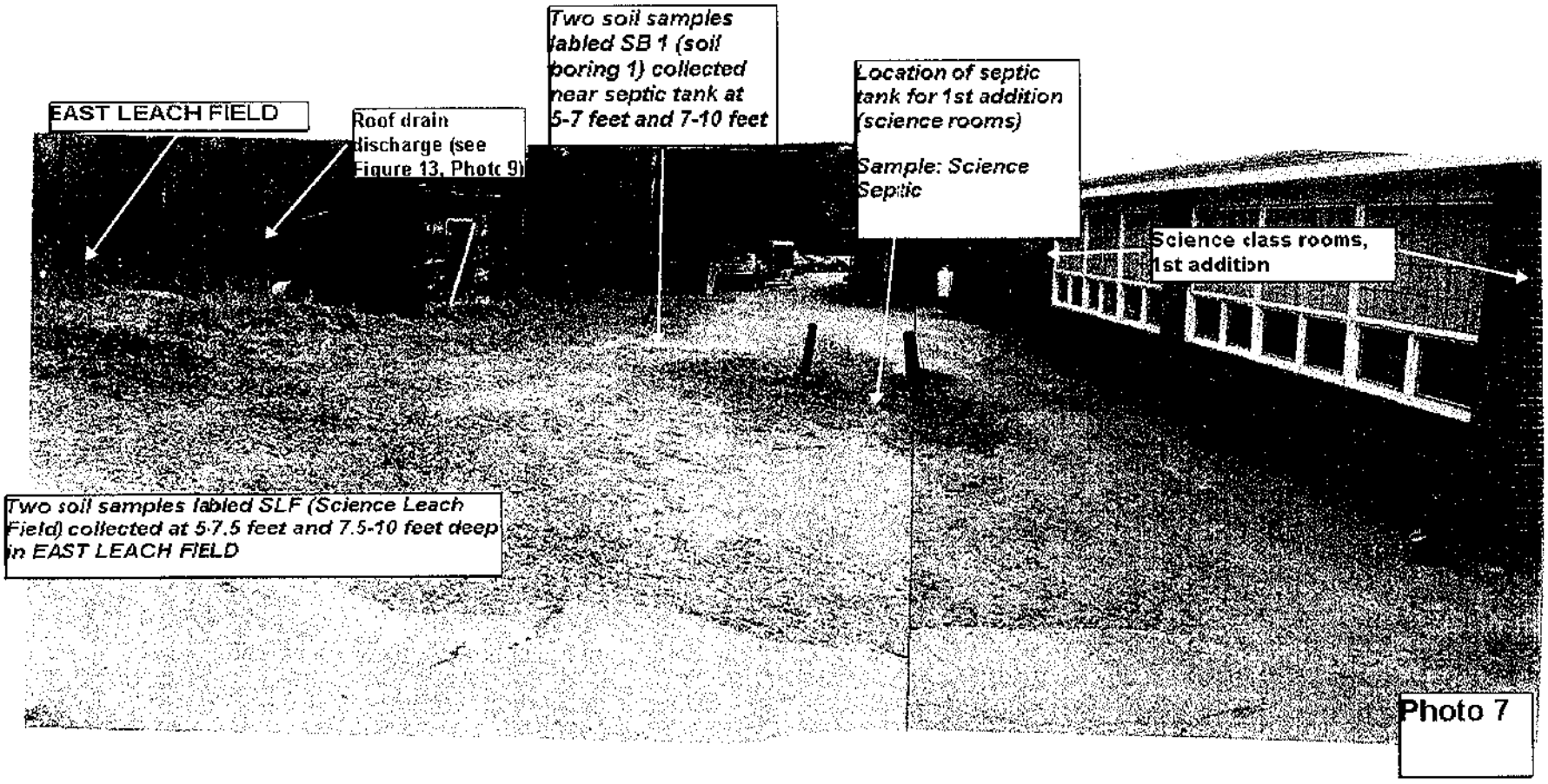
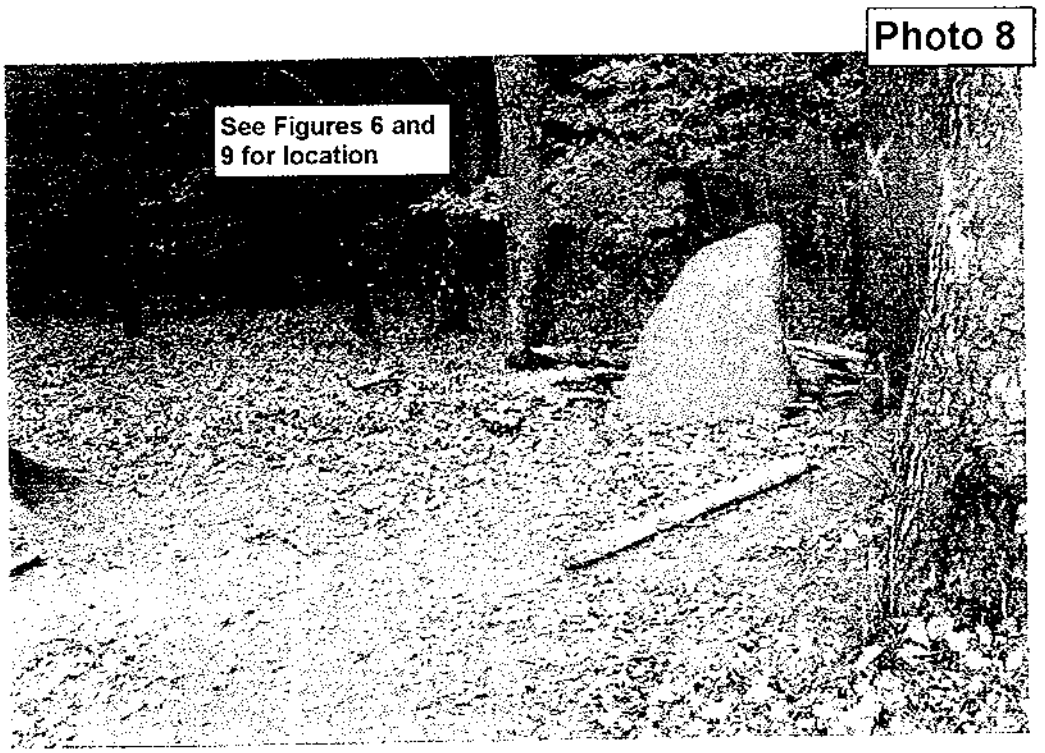


Figure 12. View of east side of Guilford Central School, EAST LEACH FIELD to the left.



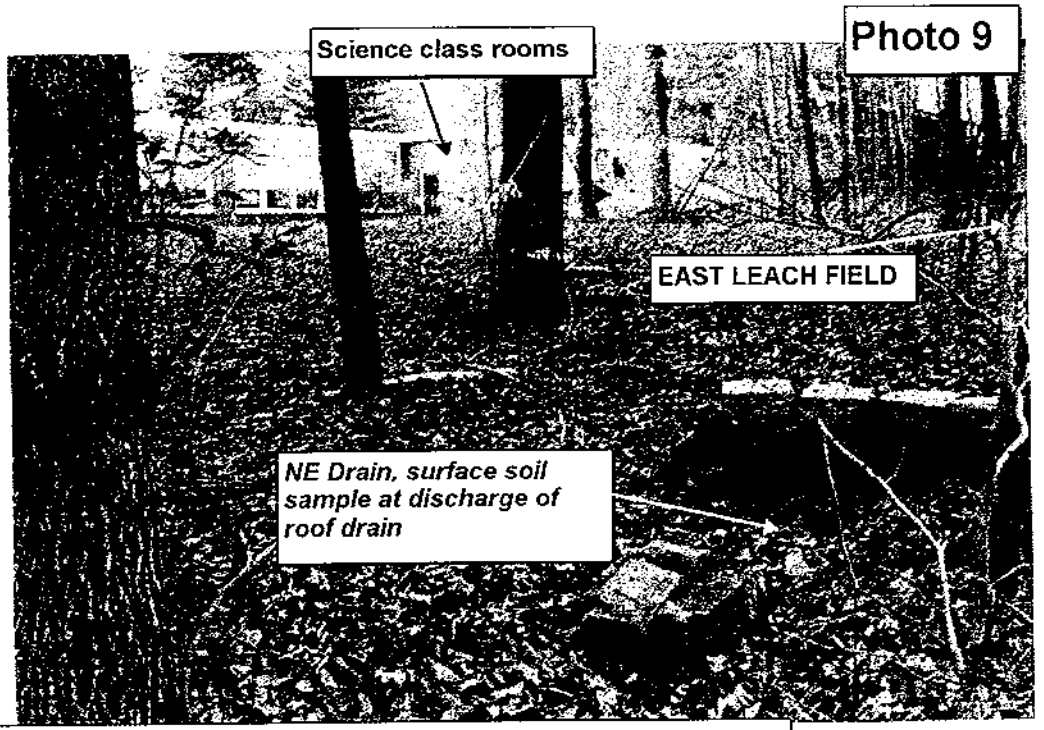


Figure 13. View of rock outcrop on west side of school and roof drain on east side of school.

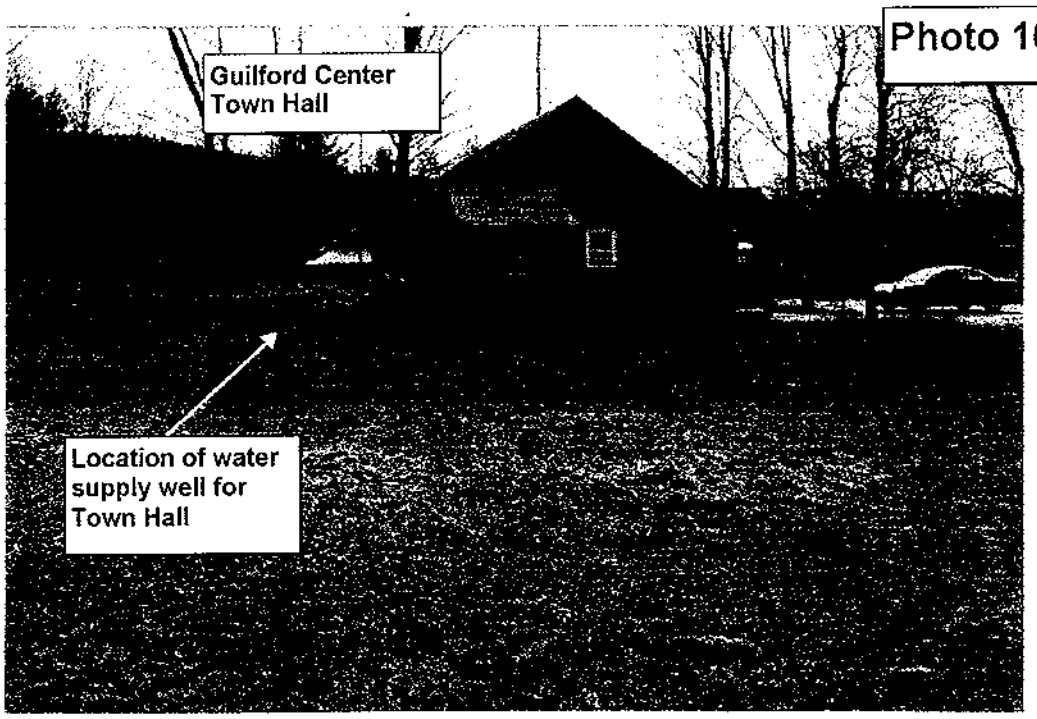


Figure 14. View of Guilford Center Town Hall and Town Garage.

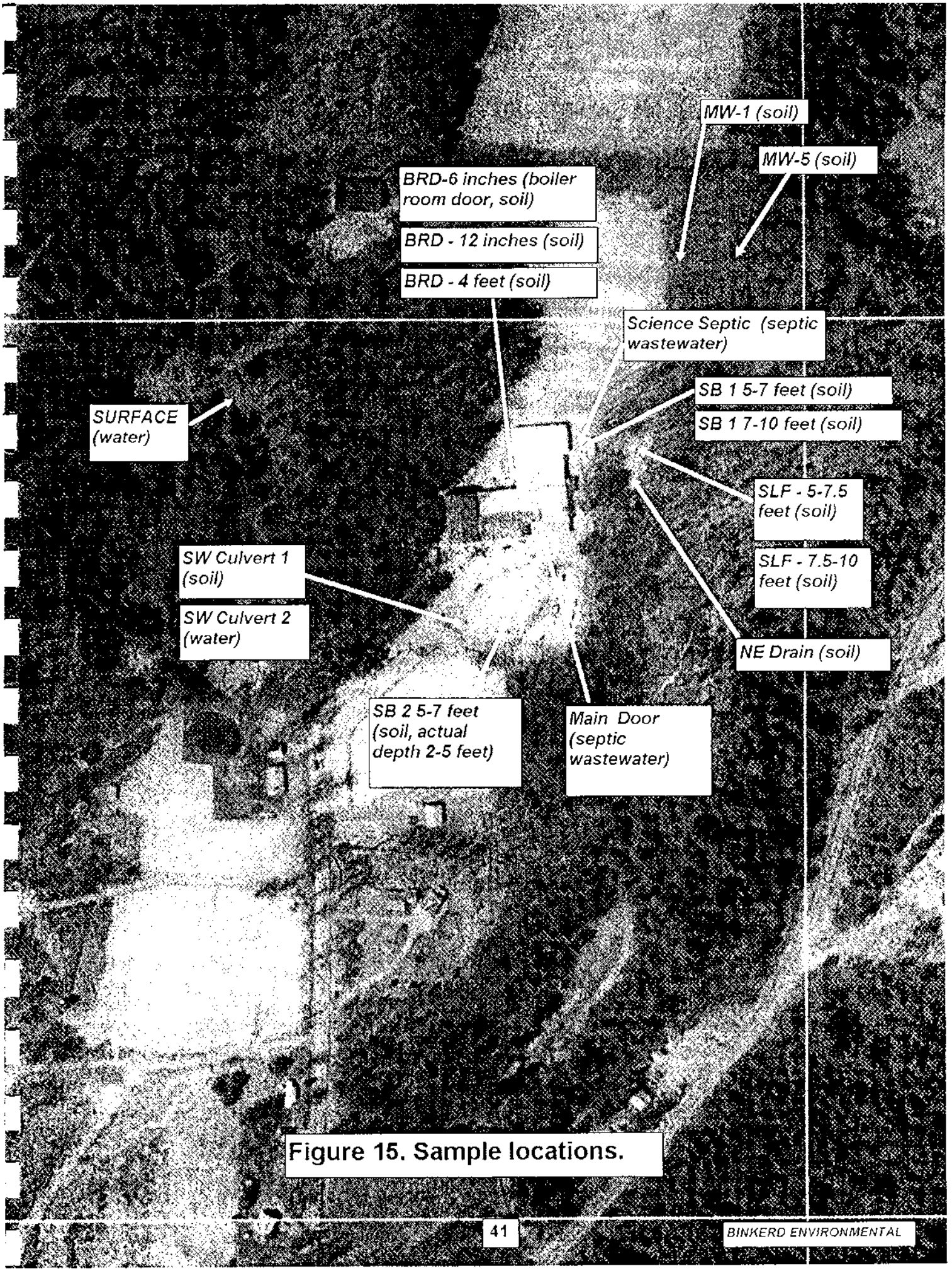


Figure 15. Sample locations.

APPENDIX A

ANALYTICAL CHEMISTRY RESULTS

Inchcape Testing Services
Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

75 Green Mountain Drive
South Burlington, VT 05403

Analytical Report

VT Dept of Envir Conservation
103 South Main Street
West Building
Waterbury, VT 05671-0404

Attention : Roger Binkerd

Date : 11/15/96
ETR Number : 62474
Project No.: 96068
No. Samples: 11
Arrived : 11/06/96

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater.
All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
318170	MW1:11/05/96 @1245(Soil)	
8010	Halogenated Volatiles	C
318171	MW5:11/05/96 @1230(Soil)	
8010	Halogenated Volatiles	C
318172	SWCULVERT1:11/05/96 @1330(Sludge)	
8010	Halogenated Volatiles	C
318173	SWCULVERT2:11/05/96 @1350(Water)	
8010	Halogenated Volatiles	C
318174	NEDRAIN:11/05/96 @1400(Soil)	
8010	Halogenated Volatiles	C
318175	MAIN DOOR:11/05/96 @1410(Water)	
8010	Halogenated Volatiles	C
318176	SB1 5-7':11/05/96 @1445(Soil)	
8010	Halogenated Volatiles	C
318177	SB1 7-10':11/05/96 @1500(Soil)	
8010	Halogenated Volatiles	C

Comments/Notes

C = Procedure/analysis completed

< Cont. Next Page >

Inchcape Testing Services
Environmental Laboratories

55 South Park Drive
Colchester, VT 05446

75 Green Mountain Drive
South Burlington, VT 05403

Analytical Report

VT Dept of Envir Conservation
103 South Main Street
West Building
Waterbury, VT 05671-0404

Attention : Roger Binkerd

Date : 11/15/96
ETR Number : 62474
Project No.: 96068
No. Samples: 11
Arrived : 11/06/96

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater.
All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
318178	SB2 5-7':11/05/96 @1600(Soil)	
8010	Halogenated Volatiles	C
318179	SURFACE:11/05/96 @1615(Water)	
8010	Halogenated Volatiles	C
318180	Trip Blank:11/04/96 @1400(Water)	
8010	Halogenated Volatiles	C

Comments/Notes

C = Procedure/analysis completed

< Last Page > Submitted By : Karen R. Clinger Aquatec Inc.

ITS Environmental
Laboratories

55 South Park Drive
Colchester, VT 05446

Analytical Report

Agency of Natural Resources
Dept.of Env. Conservation
103 So. Main Street
Waterbury, VT 05671-0404

Date : 01/08/97
ETR Number : 63082
Project No.: 96068
No. Samples: 6
Arrived : 12/13/96

Standard analyses were performed in accordance with Methods for Analysis of Water and Wastes, EPA-600/4/79-020, Test Methods for Evaluating Solid Waste, SW-846, or Standard Methods for the Examination of Water and Wastewater.
All results are in mg/l unless otherwise noted.

Lab No./ Method No.	Sample Description/ Parameter	Result
321477	Science Septic:12/13/96 @1030(Water)	
	8010 Halogenated Volatiles	C
321478	SLF-5-7.5:12/13/96 @1115(Soil)	
	8010 Halogenated Volatiles	C
321479	SLF-7.5-10:12/13/96 @1130(Soil)	
	8010 Halogenated Volatiles	C
321480	BRD-6 Inches:12/13/96 @1215(Soil)	
	8260 Analysis, Vol. Organics	C
321481	BRD-12 Inches:12/13/96 @1220(Soil)	
	8260 Analysis, Vol. Organics	C
321482	BRD-4 Feet:12/13/96 @1230(Soil)	
	8260 Analysis, Vol. Organics	C

Comments/Notes

C = Procedure/analysis completed

< Last Page > Submitted By : Karen R. Chapin Aquatec Inc.

Inchcape Testing Services
Environmental Laboratories

55 South Park Drive
Colchester, VT 05446
Tel. 802-655-1203
Fax. 802-655-1248

The following Qualifiers may be used when reporting any Organic Parameters analyzed by Gas Chromatography (GC) or High Pressure Liquid Chromatography (HPLC). Any additional qualifiers used in the reports will be described in the case narrative. These flags are based on the EPA Contract Laboratory Program statement of work.

GC/HPLC Qualifiers

U - Indicates compound was analyzed for but not detected above the reporting limit.

J - Indicates an estimated value. This flag is used when the result is less than the reporting limit, but ≥ 1/2 reporting limit.

P - This flag is used for a pesticide/Aroclor target analyte when there is greater than 25.0% difference for detected concentrations between the two analytical columns. The lower of the two values is reported on the Form I and flagged with a "P".

C - This flag applies to pesticide results where the identification has been confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated method blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. Only the samples get a "B" flag. The method blank does not.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. This flag alerts data users that any discrepancies between the concentrations reported for the dilutions may be due to dilution of the sample or extract. It additionally indicates that spike recoveries may have been diluted below quantifiable levels.

E - This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis. If one or more compounds have a response greater than the upper level of calibration range, the extract shall be diluted and re-analyzed.

X,Y,Z -Laboratory defined flags. These flags must be fully described, and such description attached to the Sample Data Summary Package and the case Narrative. Begin by using "X" and go on to "Y" and "Z" as necessary. These flags may also be used to combine several flags, as needed.

ITS Environmental
Laboratories

55 South Park Drive
Colchester, VT 05446

75 Green Mountain Drive
South Burlington, VT 05403

Analytical Report

Date: 18 November 1996
Inchcape Lab No.: 318180
ETR No.: 62474 Project No.: 96068
Sample Received On: 11/06/96 Analyzed On: 11/12/96
Sample Identification: VTDEC, water sample labeled Trip Blank, 11/04/96 at 1400 hours.

Volatile Organic Compounds in ug/l
EPA Method 8010

bromodichloromethane	0.5 U	1,2-dichloropropane	0.5 U
bromoform	0.5 U	cis-1,3-dichloropropene	0.5 U
bromomethane	0.5 U	trans-1,3-dichloropropene	0.5 U
carbon tetrachloride	0.5 U	Freon 113	0.5 U
chlorobenzene	0.5 U	methylene chloride	1.0
chloroethane	0.5 U	1,1,2,2-tetrachloroethane	0.5 U
chloroform	0.5 U	tetrachloroethene	0.5 U
chloromethane	0.5 U	1,1,1-trichloroethane	0.5 U
dibromochloromethane	0.5 U	1,1,2-trichloroethane	0.5 U
1,2-dichlorobenzene	0.5 U	trichloroethene	0.5 U
1,3-dichlorobenzene	0.5 U	trichlorofluoromethane	0.5 U
1,4-dichlorobenzene	0.5 U	vinyl chloride	0.5 U
dichlorodifluoromethane	0.5 U		
1,1-dichloroethane	0.5 U		
1,2-dichloroethane	0.5 U		
1,1-dichloroethene	0.5 U		
cis-1,2-dichloroethene	0.5 U		
trans-1,2-dichloroethene	0.5 U		

Summary of Surrogate Recovery

	% Rec
1-chloro-3-fluorobenzene	102
1-bromo-3-chloropropane	105

Key to the letters used to qualify the results of the analysis:

U - The compound was analyzed for but not detected at or above the method specified reported limit.

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Analytical Report

Date: 18 November 1996
Inchcape Lab No.: 318170
ETR No.: 62474 Project No.: 96068
Sample Received On: 11/06/96 Analyzed On: 11/12/96
Sample Identification: VTDEC, soil sample labeled MW1, 11/05/96 at 1245 hours.

Volatile Organic Compounds in ug/kg dry weight
EPA Method 8010

bromodichloromethane	0.5 U
bromoform	0.5 U
bromomethane	0.5 U
carbon tetrachloride	0.5 U
chlorobenzene	0.5 U
chloroethane	0.5 U
chloroform	0.5 U
chloromethane	0.5 U
dibromochloromethane	0.5 U
1,2-dichlorobenzene	0.5 U
1,3-dichlorobenzene	0.5 U
1,4-dichlorobenzene	0.5 U
dichlorodifluoromethane	0.5 U
1,1-dichloroethane	0.5 U
1,2-dichloroethane	0.5 U
1,1-dichloroethene	0.5 U
cis-1,2-dichloroethene	0.5 U
trans-1,2-dichloroethene	0.5 U
1,2-dichloropropane	0.5 U
cis-1,3-dichloropropene	0.5 U
trans-1,3-dichloropropene	0.5 U
Freon 113	0.5 U
methylene chloride	2.9
1,1,2,2-tetrachloroethane	0.5 U
tetrachloroethene	0.5 U
1,1,1-trichloroethane	0.5 U
1,1,2-trichloroethane	0.5 U
trichloroethene	0.5 U
trichlorofluoromethane	0.5 U
vinyl chloride	0.5 U

Percent solid = 91

Summary of Surrogate Recovery

	% Rec
1-chloro-3-fluorobenzene	97
1-bromo-3-chloropropane	107

Key to the letters used to qualify the results of the analysis:

U - The compound was analyzed for but not detected at or above the method specified reported limit.

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75 Green Mountain Drive
South Burlington, VT 05403

Analytical Report

Date: 18 November 1996
Inchcape Lab No.: 318171
ETR No.: 62474 Project No.: 96068
Sample Received On: 11/06/96 Analyzed On: 11/12/96
Sample Identification: VTDEC, soil sample labeled MW5, 11/05/96 at 1230 hours.

Volatile Organic Compounds in ug/kg dry weight
EPA Method 8010

bromodichloromethane	0.6 U
bromoform	0.6 U
bromomethane	0.6 U
carbon tetrachloride	0.6 U
chlorobenzene	0.6 U
chloroethane	0.6 U
chloroform	0.6 U
chloromethane	0.6 U
dibromochloromethane	0.6 U
1,2-dichlorobenzene	0.6 U
1,3-dichlorobenzene	0.6 U
1,4-dichlorobenzene	0.6 U
dichlorodifluoromethane	0.6 U
1,1-dichloroethane	0.6 U
1,2-dichloroethane	0.6 U
1,1-dichloroethene	0.6 U
cis-1,2-dichloroethene	0.6 U
trans-1,2-dichloroethene	0.6 U
1,2-dichloropropane	0.6 U
cis-1,3-dichloropropene	0.6 U
trans-1,3-dichloropropene	0.6 U
Freon 113	0.6 U
methylene chloride	3.0
1,1,2,2-tetrachloroethane	0.6 U
tetrachloroethene	0.6 U
1,1,1-trichloroethane	0.6 U
1,1,2-trichloroethane	0.6 U
trichloroethene	0.6 U
trichlorofluoromethane	0.6 U
vinyl chloride	0.6 U

Percent solid = 87

Summary of Surrogate Recovery

	% Rec
1-chloro-3-fluorobenzene	108
1-bromo-3-chloropropane	114

Key to the letters used to qualify the results of the analysis:

U - The compound was analyzed for but not detected at or above the method specified reported limit.

This form replaces one previously submitted.

FORM 1
8010-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SCIENCE SEPTIC

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) WATER Lab Sample ID: 321477

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 18DEC960841-I071

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. _____ Date Analyzed: 12/19/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	0.50	U
74-87-3	Chloromethane	0.50	U
75-01-4	Vinyl Chloride	0.50	U
74-83-9	Bromomethane	0.50	U
75-00-3	Chloroethane	0.50	U
75-69-4	Trichlorofluoromethane	0.50	U
76-13-1	Freon-113	0.50	U
75-35-4	1,1-Dichloroethene	0.50	U
75-09-2	Methylene Chloride	0.50	U
156-60-5	trans-1,2-Dichloroethene	0.50	U
75-34-3	1,1-Dichloroethane	0.50	U
156-59-2	cis-1,2-dichloroethene	0.50	U
67-66-3	Chloroform	0.50	U
71-55-6	1,1,1-Trichloroethane	0.50	U
56-23-5	Carbon tetrachloride	0.50	U
107-06-2	1,2-Dichloroethane	0.50	U
79-01-6	Trichloroethene	0.50	U
78-87-5	1,2-Dichloropropane	0.50	U
75-27-4	Bromodichloromethane	0.50	U
10061-01-5	cis-1,3-Dichloropropene	0.50	U
10061-02-6	trans-1,3-Dichloropropene	0.50	U
79-00-5	1,1,2-Trichloroethane	0.50	U
127-18-4	Tetrachloroethene	0.50	U
124-48-1	Dibromochloromethane	0.50	U
108-90-7	Chlorobenzene	0.50	U
75-25-2	Bromoform	0.50	U
79-34-5	1,1,2,2-Tetrachloroethane	0.50	U
541-73-1	1,3-Dichlorobenzene	0.50	U
106-46-7	1,4-Dichlorobenzene	0.50	U
95-50-1	1,2-Dichlorobenzene	0.50	U

FORM 1
8010-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SLF-5-7.5

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321478

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 23DEC960104-I011

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. 13 Date Analyzed: 12/23/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	0.57	U
74-87-3	Chloromethane	0.57	U
75-01-4	Vinyl Chloride	0.57	U
74-83-9	Bromomethane	0.57	U
75-00-3	Chloroethane	0.57	U
75-69-4	Trichlorofluoromethane	0.57	U
76-13-1	Freon-113	0.57	U
75-35-4	1,1-Dichloroethene	0.57	U
75-09-2	Methylene Chloride	0.57	U
156-60-5	trans-1,2-Dichloroethene	0.57	U
75-34-3	1,1-Dichloroethane	0.57	U
156-59-2	cis-1,2-dichloroethene	0.57	U
67-66-3	Chloroform	0.57	U
71-55-6	1,1,1-Trichloroethane	0.57	U
56-23-5	Carbon tetrachloride	0.57	U
107-06-2	1,2-Dichloroethane	0.57	U
79-01-6	Trichloroethene	0.57	U
78-87-5	1,2-Dichloropropane	0.57	U
75-27-4	Bromodichloromethane	0.57	U
10061-01-5	cis-1,3-Dichloropropene	0.57	U
10061-02-6	trans-1,3-Dichloropropene	0.57	U
79-00-5	1,1,2-Trichloroethane	0.57	U
127-18-4	Tetrachloroethene	0.57	U
124-48-1	Dibromochloromethane	0.57	U
108-90-7	Chlorobenzene	0.57	U
75-25-2	Bromoform	0.57	U
79-34-5	1,1,2,2-Tetrachloroethane	0.57	U
541-73-1	1,3-Dichlorobenzene	0.57	U
106-46-7	1,4-Dichlorobenzene	0.57	U
95-50-1	1,2-Dichlorobenzene	0.57	U

FORM 1
8010-VOA ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

SLF-7.5-10

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321479

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 23DEC960104-I021

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. 10 Date Analyzed: 12/23/96

GC Column: DB-VRX ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(ml) Soil Aliquot Volume: _____(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	0.56	U
74-87-3	Chloromethane	0.56	U
75-01-4	Vinyl Chloride	0.56	U
74-83-9	Bromomethane	0.56	U
75-00-3	Chloroethane	0.56	U
75-69-4	Trichlorofluoromethane	0.56	U
76-13-1	Freon-113	0.56	U
75-35-4	1,1-Dichloroethene	0.56	U
75-09-2	Methylene Chloride	0.56	U
156-60-5	trans-1,2-Dichloroethene	0.56	U
75-34-3	1,1-Dichloroethane	0.56	U
156-59-2	cis-1,2-dichloroethene	0.56	U
67-66-3	Chloroform	0.62	
71-55-6	1,1,1-Trichloroethane	0.56	U
56-23-5	Carbon tetrachloride	0.56	U
107-06-2	1,2-Dichloroethane	0.56	U
79-01-6	Trichloroethene	0.56	U
78-87-5	1,2-Dichloropropane	0.56	U
75-27-4	Bromodichloromethane	0.56	U
10061-01-5	cis-1,3-Dichloropropene	0.56	U
10061-02-6	trans-1,3-Dichloropropene	0.56	U
79-00-5	1,1,2-Trichloroethane	0.56	U
127-18-4	Tetrachloroethene	0.56	U
124-48-1	Dibromochloromethane	0.56	U
108-90-7	Chlorobenzene	0.56	U
75-25-2	Bromoform	0.56	U
79-34-5	1,1,2,2-Tetrachloroethane	0.56	U
541-73-1	1,3-Dichlorobenzene	0.56	U
106-46-7	1,4-Dichlorobenzene	0.56	U
95-50-1	1,2-Dichlorobenzene	0.56	U

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Analytical Report

Date: 18 November 1996
Inchcape Lab No.: 318176
ETR No.: 62474 Project No.: 96068
Sample Received On: 11/06/96 Analyzed On: 11/12/96
Sample Identification: VTDEC, soil sample labeled SB1 5-7', 11/05/96 at 1445 hours.

Volatile Organic Compounds in ug/kg dry weight
EPA Method 8010

bromodichloromethane	0.6 U
bromoform	0.6 U
bromomethane	0.6 U
carbon tetrachloride	0.6 U
chlorobenzene	0.6 U
chloroethane	0.6 U
chloroform	0.6 U
chloromethane	0.6 U
dibromochloromethane	0.6 U
1,2-dichlorobenzene	0.6 U
1,3-dichlorobenzene	0.6 U
1,4-dichlorobenzene	0.6 U
dichlorodifluoromethane	0.6 U
1,1-dichloroethane	0.6 U
1,2-dichloroethane	0.6 U
1,1-dichloroethene	0.6 U
cis-1,2-dichloroethene	0.6 U
trans-1,2-dichloroethene	0.6 U
1,2-dichloropropane	0.6 U
cis-1,3-dichloropropene	0.6 U
trans-1,3-dichloropropene	0.6 U
Freon 113	0.6 U
methylene chloride	2.2
1,1,2,2-tetrachloroethane	0.6 U
tetrachloroethene	0.6 U
1,1,1-trichloroethane	0.6 U
1,1,2-trichloroethane	0.6 U
trichloroethene	0.6 U
trichlorofluoromethane	0.6 U
vinyl chloride	0.6 U

Percent solid = 88

Summary of Surrogate Recovery

	% Rec
1-chloro-3-fluorobenzene	106
1-bromo-3-chloropropane	118

Key to the letters used to qualify the results of the analysis:

U - The compound was analyzed for but not detected at or above the method specified reported limit.

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Analytical Report

Date: 18 November 1996
Inchcape Lab No.: 318177R1
ETR No.: 62474 Project No.: 96068
Sample Received On: 11/06/96 Analyzed On: 11/14/96
Sample Identification: Reanalysis of VTDEC, soil sample labeled SB1 7-10', 11/05/96 at 1500 hours.

Volatile Organic Compounds in ug/kg dry weight
EPA Method 8010

bromodichloromethane	0.5 U
bromoform	0.5 U
bromomethane	0.5 U
carbon tetrachloride	0.5 U
chlorobenzene	0.5 U
chloroethane	0.5 U
chloroform	0.5 U
chloromethane	0.5 U
dibromochloromethane	0.5 U
1,2-dichlorobenzene	0.5 U
1,3-dichlorobenzene	0.5 U
1,4-dichlorobenzene	0.5 U
dichlorodifluoromethane	0.5 U
1,1-dichloroethane	0.5 U
1,2-dichloroethane	0.5 U
1,1-dichloroethene	0.5 U
cis-1,2-dichloroethene	0.5 U
trans-1,2-dichloroethene	0.5 U
1,2-dichloropropane	0.5 U
cis-1,3-dichloropropene	0.5 U
trans-1,3-dichloropropene	0.5 U
Freon 113	0.5 U
methylene chloride	0.5 U
1,1,2,2-tetrachloroethane	0.5 U
tetrachloroethene	0.5 U
1,1,1-trichloroethane	0.5 U
1,1,2-trichloroethane	0.5 U
trichloroethene	0.5 U
trichlorofluoromethane	0.5 U
vinyl chloride	0.5 U

Percent solid = 91

Summary of Surrogate Recovery

	% Rec
1-chloro-3-fluorobenzene	92
1-bromo-3-chloropropane	109

Key to the letters used to qualify the results of the analysis:

U - The compound was analyzed for but not detected at or above the method specified reported limit.

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Analytical Report

Date: 18 November 1996
Inchcape Lab No.: 318174
ETR No.: 62474 Project No.: 96068
Sample Received On: 11/06/96 Analyzed On: 11/12/96
Sample Identification: VTDEC, soil sample labeled NEDRAIN, 11/05/96 at 1400 hours.

Volatile Organic Compounds in ug/kg dry weight
EPA Method 8010

bromodichloromethane	0.7 U
bromoform	0.7 U
bromomethane	0.7 U
carbon tetrachloride	0.7 U
chlorobenzene	0.7 U
chloroethane	0.7 U
chloroform	0.7 U
chloromethane	0.7 U
dibromochloromethane	0.7 U
1,2-dichlorobenzene	0.7 U
1,3-dichlorobenzene	0.7 U
1,4-dichlorobenzene	0.7 U
dichlorodifluoromethane	0.7 U
1,1-dichloroethane	0.7 U
1,2-dichloroethane	0.7 U
1,1-dichloroethene	0.7 U
cis-1,2-dichloroethene	0.7 U
trans-1,2-dichloroethene	0.7 U
1,2-dichloropropane	0.7 U
cis-1,3-dichloropropene	0.7 U
trans-1,3-dichloropropene	0.7 U
Freon 113	0.7 U
methylene chloride	3.8
1,1,2,2-tetrachloroethane	0.7 U
tetrachloroethene	0.7 U
1,1,1-trichloroethane	0.7 U
1,1,2-trichloroethane	0.7 U
trichloroethene	0.7 U
trichlorofluoromethane	0.7 U
vinyl chloride	0.7 U

Percent solid = 72

Summary of Surrogate Recovery

	% Rec
1-chloro-3-fluorobenzene	76
1-bromo-3-chloropropane	52*

Key to the letters used to qualify the results of the analysis:

U - The compound was analyzed for but not detected at or above the method specified reported limit.

* = Outside of QC limits (70-120%)

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Analytical Report

Date: 18 November 1996
Inchcape Lab No.: 318174R1
ETR No.: 62474 Project No.: 96068
Sample Received On: 11/06/96 Analyzed On: 11/14/96
Sample Identification: Reanalysis of VTDEC, soil sample labeled NEDRAIN, 11/05/96 at 1400 hours.

Volatile Organic Compounds in ug/kg dry weight
EPA Method 8010

bromodichloromethane	0.7 U
bromoform	0.7 U
bromomethane	0.7 U
carbon tetrachloride	0.7 U
chlorobenzene	0.7 U
chloroethane	0.7 U
chloroform	0.7 U
chloromethane	0.7 U
dibromochloromethane	0.7 U
1,2-dichlorobenzene	0.7 U
1,3-dichlorobenzene	0.7 U
1,4-dichlorobenzene	0.7 U
dichlorodifluoromethane	3.5
1,1-dichloroethane	0.7 U
1,2-dichloroethane	0.7 U
1,1-dichloroethene	0.7 U
cis-1,2-dichloroethene	0.7 U
trans-1,2-dichloroethene	0.7 U
1,2-dichloropropane	0.7 U
cis-1,3-dichloropropene	0.7 U
trans-1,3-dichloropropene	0.7 U
Freon 113	0.7 U
methylene chloride	0.7 U
1,1,2,2-tetrachloroethane	0.7 U
tetrachloroethene	0.7 U
1,1,1-trichloroethane	0.7 U
1,1,2-trichloroethane	0.7 U
trichloroethene	0.7 U
trichlorofluoromethane	0.7 U
vinyl chloride	0.7 U

Percent solid = 72

Summary of Surrogate Recovery

	% Rec
1-chloro-3-fluorobenzene	78
1-bromo-3-chloropropane	42*

Key to the letters used to qualify the results of the analysis:

U - The compound was analyzed for but not detected at or above the method specified reported limit.

* = Outside of QC limits (70-120%)

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Analytical Report

Date: 18 November 1996
Inchcape Lab No.: 318175
ETR No.: 62474 Project No.: 96068
Sample Received On: 11/06/96 Analyzed On: 11/12/96
Sample Identification: VTDEC, water sample labeled MAIN DOOR, 11/05/96 at 1410 hours.

Volatile Organic Compounds in ug/l
EPA Method 8010

bromodichloromethane	0.5 U
bromoform	0.5 U
bromomethane	0.5 U
carbon tetrachloride	0.5 U
chlorobenzene	0.5 U
chloroethane	0.5 U
chloroform	2.3
chloromethane	0.5 U
dibromochloromethane	0.5 U
1,2-dichlorobenzene	0.5 U
1,3-dichlorobenzene	0.5 U
1,4-dichlorobenzene	0.5 U
dichlorodifluoromethane	0.5 U
1,1-dichloroethane	0.5 U
1,2-dichloroethane	0.5 U
1,1-dichloroethene	0.5 U
cis-1,2-dichloroethene	0.5 U
trans-1,2-dichloroethene	0.5 U
1,2-dichloropropane	0.5 U
cis-1,3-dichloropropene	0.5 U
trans-1,3-dichloropropene	0.5 U
Freon 113	0.5 U
methylene chloride	0.5 U
1,1,2,2-tetrachloroethane	0.5 U
tetrachloroethene	0.5 U
1,1,1-trichloroethane	0.5 U
1,1,2-trichloroethane	0.5 U
trichloroethene	0.5 U
trichlorofluoromethane	0.5 U
vinyl chloride	0.5 U

Summary of Surrogate Recovery

	% Rec
1-chloro-3-fluorobenzene	66 *
1-bromo-3-chloropropane	No recovery of BCP, insufficient sample to re analyze.

Outside QC limits (70-120%)

Key to the letters used to qualify the results of the analysis:

U - The compound was analyzed for but not detected at or above the method specified reported limit.

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Analytical Report

Date: 18 November 1996
Inchcape Lab No.: 318178R1
ETR No.: 62474 Project No.: 96068
Sample Received On: 11/06/96 Analyzed On: 11/14/96
Sample Identification: Reanalysis of VTDEC, soil sample labeled SB2 5-7', 11/05/96 at 1600 hours.

Volatile Organic Compounds in ug/kg dry weight
EPA Method 8010

bromodichloromethane	0.5 U	1,2-dichloropropane	0.5 U
bromoform	0.5 U	cis-1,3-dichloropropene	0.5 U
bromomethane	0.5 U	trans-1,3-dichloropropene	0.5 U
carbon tetrachloride	0.5 U	Freon 113	0.5 U
chlorobenzene	0.5 U	methylene chloride	0.5 U
chloroethane	0.5 U	1,1,2,2-tetrachloroethane	0.5 U
chloroform	0.5 U	tetrachloroethene	0.5 U
chloromethane	0.5 U	1,1,1-trichloroethane	0.5 U
dibromochloromethane	0.5 U	1,1,2-trichloroethane	0.5 U
1,2-dichlorobenzene	0.5 U	trichloroethene	0.5 U
1,3-dichlorobenzene	0.5 U	trichlorofluoromethane	0.5 U
1,4-dichlorobenzene	0.5 U	vinyl chloride	0.5 U
dichlorodifluoromethane	0.5 U		
1,1-dichloroethane	0.5 U		
1,2-dichloroethane	0.5 U		
1,1-dichloroethene	0.5 U		
cis-1,2-dichloroethene	0.5 U		
trans-1,2-dichloroethene	0.5 U		

Percent solid = 91

Summary of Surrogate Recovery

	% Rec
1-chloro-3-fluorobenzene	94
1-bromo-3-chloropropane	114

Key to the letters used to qualify the results of the analysis:

U - The compound was analyzed for but not detected at or above the method specified reported limit.

ITS Environmental
Laboratories

55 South Park Drive
Colchester, VT 05446

75 Green Mountain Drive
South Burlington, VT 05403

Analytical Report

Date: 18 November 1996
Inchcape Lab No.: 318172R1
ETR No.: 62474 Project No.: 96068
Sample Received On: 11/06/96 Analyzed On: 11/14/96
Sample Identification: Reanalysis of VTDEC, sludge sample labeled SWCULVERT1, 11/05/96 at 1330 hours.

Volatile Organic Compounds in ug/kg dry weight
EPA Method 8010

bromodichloromethane	1.0 U
bromoform	1.0 U
bromomethane	1.0 U
carbon tetrachloride	1.0 U
chlorobenzene	1.0 U
chloroethane	1.0 U
chloroform	1.0 U
chloromethane	1.0 U
dibromochloromethane	1.0 U
1,2-dichlorobenzene	1.0 U
1,3-dichlorobenzene	1.0 U
1,4-dichlorobenzene	1.0 U
dichlorodifluoromethane	1.0 U
1,1-dichloroethane	1.0 U
1,2-dichloroethane	1.0 U
1,1-dichloroethene	1.0 U
cis-1,2-dichloroethene	1.0 U
trans-1,2-dichloroethene	1.0 U
1,2-dichloropropane	1.0 U
cis-1,3-dichloropropene	1.0 U
trans-1,3-dichloropropene	1.0 U
Freon 113	1.0 U
methylene chloride	1.0 U
1,1,2,2-tetrachloroethane	1.0 U
tetrachloroethene	1.0 U
1,1,1-trichloroethane	1.0 U
1,1,2-trichloroethane	1.0 U
trichloroethene	1.0 U
trichlorofluoromethane	1.0 U
vinyl chloride	1.0 U

Percent solid = 51

Summary of Surrogate Recovery

	% Rec
1-chloro-3-fluorobenzene	74
1-bromo-3-chloropropane	53*

Key to the letters used to qualify the results of the analysis:

U - The compound was analyzed for but not detected at or above the method specified reported limit.

* = Outside of QC limits (70-120%)

ITS Environmental
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Analytical Report

Date: 18 November 1996
Inchcape Lab No.: 318173
ETR No.: 62474 Project No.: 96068
Sample Received On: 11/06/96 Analyzed On: 11/12/96
Sample Identification: VTDEC, water sample labeled SWCULVERT2, 11/05/96 at 1350 hours.

Volatile Organic Compounds in ug/l
EPA Method 8010

bromodichloromethane	0.5 U
bromoform	0.5 U
bromomethane	0.5 U
carbon tetrachloride	0.5 U
chlorobenzene	0.5 U
chloroethane	0.5 U
chloroform	0.5 U
chloromethane	0.5 U
dibromochloromethane	0.5 U
1,2-dichlorobenzene	0.5 U
1,3-dichlorobenzene	0.5 U
1,4-dichlorobenzene	0.5 U
dichlorodifluoromethane	0.5 U
1,1-dichloroethane	0.5 U
1,2-dichloroethane	0.5 U
1,1-dichloroethene	0.5 U
cis-1,2-dichloroethene	0.5 U
trans-1,2-dichloroethene	0.5 U
1,2-dichloropropane	0.5 U
cis-1,3-dichloropropene	0.5 U
trans-1,3-dichloropropene	0.5 U
Freon 113	0.5 U
methylene chloride	0.5 U
1,1,2,2-tetrachloroethane	0.5 U
tetrachloroethene	0.5 U
1,1,1-trichloroethane	0.5 U
1,1,2-trichloroethane	0.5 U
trichloroethene	0.5 U
trichlorofluoromethane	0.5 U
vinyl chloride	0.5 U

Summary of Surrogate Recovery

	% Rec
1-chloro-3-fluorobenzene	87
1-bromo-3-chloropropane	90

Key to the letters used to qualify the results of the analysis:

U - The compound was analyzed for but not detected at or above the method specified reported limit.

ITS Environmental
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55 South Park Drive
Colchester, VT 05446

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South Burlington, VT 05403

Analytical Report

Date: 18 November 1996
Inchcape Lab No.: 318179
ETR No.: 62474 Project No.: 96068
Sample Received On: 11/06/96 Analyzed On: 11/12/96
Sample Identification: VTDEC, water sample labeled SURFACE, 11/05/96 at 1615 hours.

Volatile Organic Compounds in ug/l
EPA Method 8010

bromodichloromethane	0.5 U
bromoform	0.5 U
bromomethane	0.5 U
carbon tetrachloride	0.5 U
chlorobenzene	0.5 U
chloroethane	0.5 U
chloroform	0.5 U
chloromethane	0.5 U
dibromochloromethane	0.5 U
1,2-dichlorobenzene	0.5 U
1,3-dichlorobenzene	0.5 U
1,4-dichlorobenzene	0.5 U
dichlorodifluoromethane	0.5 U
1,1-dichloroethane	0.5 U
1,2-dichloroethane	0.5 U
1,1-dichloroethene	0.5 U
cis-1,2-dichloroethene	0.5 U
trans-1,2-dichloroethene	0.5 U
1,2-dichloropropane	0.5 U
cis-1,3-dichloropropene	0.5 U
trans-1,3-dichloropropene	0.5 U
Freon 113	0.5 U
methylene chloride	0.5 U
1,1,2,2-tetrachloroethane	0.5 U
tetrachloroethene	0.5 U
1,1,1-trichloroethane	0.5 U
1,1,2-trichloroethane	0.5 U
trichloroethene	0.5 U
trichlorofluoromethane	0.5 U
vinyl chloride	0.5 U

Summary of Surrogate Recovery

	% Rec
1-chloro-3-fluorobenzene	109
1-bromo-3-chloropropane	102

Key to the letters used to qualify the results of the analysis:

U - The compound was analyzed for but not detected at or above the method specified reported limit.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BRD-6 INCHES

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321480

Sample wt/vol: 1.0 (g/mL) G Lab File ID: O321480DV

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. 31 Date Analyzed: 12/27/96

GC Column: CAP ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	36	U
74-87-3	Chloromethane	36	U
75-01-4	Vinyl Chloride	36	U
74-83-9	Bromomethane	36	U
75-00-3	Chloroethane	36	U
75-69-4	Trichlorofluoromethane	36	U
67-64-1	Acrolein	72	U
76-13-1	Freon TF	36	U
75-35-4	1,1-Dichloroethene	36	U
67-64-1	Acetone	61	J
74-88-4	Methyl Iodide	72	U
75-15-0	Carbon Disulfide	36	U
107-05-1	Allyl Chloride	72	U
75-09-2	Methylene Chloride	36	U
107-13-1	Acrylonitrile	72	U
156-60-5	trans-1,2-Dichloroethene	36	U
540-59-0	1,2-Dichloroethene (total)	36	U
1634-04-4	Methyl-t-Butyl Ether	36	U
75-34-3	1,1-Dichloroethane	36	U
108-05-4	Vinyl Acetate	72	U
126-99-8	Chloroprene	72	U
156-59-2	cis-1,2-Dichloroethene	36	U
78-93-3	2-Butanone	72	U
107-12-0	Propionitrile	72	U
126-98-7	Methacrylonitrile	36	U
74-97-5	Bromochloromethane	36	U
109-99-9	Tetrahydrofuran	1800	U
67-66-3	Chloroform	36	U
71-55-6	1,1,1-Trichloroethane	36	U
56-23-5	Carbon Tetrachloride	36	U
78-83-1	Isobutyl Alcohol	1800	U
71-43-2	Benzene	36	U
107-06-2	1,2-Dichloroethane	36	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BRD-6 INCHES

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321480

Sample wt/vol: 1.0 (g/mL) G Lab File ID: O321480DV

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. 31 Date Analyzed: 12/27/96

GC Column: CAP ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
79-01-6	Trichloroethene	36	U
78-87-5	1,2-Dichloropropane	36	U
80-62-6	Methyl Methacrylate	36	U
74-95-3	Dibromomethane	36	U
123-91-1	1,4-Dioxane	1800	U
75-27-4	Bromodichloromethane	36	U
110-75-8	2-Chloroethyl Vinyl Ether	72	U
10061-01-5	cis-1,3-Dichloropropene	36	U
108-10-1	4-Methyl-2-pentanone	72	U
108-88-3	Toluene	36	U
10061-02-6	trans-1,3-Dichloropropene	36	U
97-63-2	Ethyl Methacrylate	72	U
79-00-5	1,1,2-Trichloroethane	36	U
127-18-4	Tetrachloroethene	36	U
591-78-6	2-Hexanone	72	U
124-48-1	Dibromochloromethane	36	U
106-93-4	1,2-Dibromoethane	36	U
108-90-7	Chlorobenzene	36	U
630-20-6	1,1,1,2-Tetrachloroethane	36	U
100-41-4	Ethylbenzene	36	U
1330-20-7	Xylene (total)	36	U
100-42-5	Styrene	36	U
75-25-2	Bromoform	36	U
98-82-8	Isopropylbenzene	36	U
1476-11-5	cis-1,4-Dichloro-2-butene	36	U
79-34-5	1,1,2,2-Tetrachloroethane	36	U
96-18-4	1,2,3-Trichloropropane	36	U
110-57-6	trans-1,4-Dichloro-2-butene	36	U
541-73-1	1,3-Dichlorobenzene	36	U
106-46-7	1,4-Dichlorobenzene	36	U
95-50-1	1,2-Dichlorobenzene	36	U
96-12-8	1,2-Dibromo-3-Chloropropane	72	U
120-82-1	1,2,4-Trichlorobenzene	36	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BRD-6 INCHES

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321480

Sample wt/vol: 1.0 (g/mL) G Lab File ID: O321480DV

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. 31 Date Analyzed: 12/27/96

GC Column: CAP ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
87-68-3	Hexachlorobutadiene	36	U
91-20-3	Naphthalene	36	U

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

BRD-6 INCHES

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321480

Sample wt/vol: 1.0 (g/mL) G Lab File ID: O321480DV

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. 31 Date Analyzed: 12/27/96

GC Column: CAP ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 20 CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN ALKYLCYCLOHEXANE	15.69	1300	J
2.		UNKNOWN ALIPHATIC COMPOUND	16.12	1400	J
3.		UNKNOWN ALKANE	16.40	1400	J
4.		UNKNOWN ALKANE	16.61	2800	J
5.		UNKNOWN ALIPHATIC COMPOUND	17.22	1000	J
6.		UNKNOWN ALKYLCYCLOHEXANE	17.60	1100	J
7.		UNKNOWN AROMATIC COMPOUND	17.94	440	J
8.		UNKNOWN ALKANE	18.08	340	J
9.		UNKNOWN ALKANE W/UNKNOWN	18.45	560	JZ
10.		UNKNOWN ALIPHATIC COMPOUND	18.97	560	J
11.		UNKNOWN ALKANE W/UNKNOWN	19.42	330	JZ
12.		UNKNOWN C3-ALKYLBENZENE	19.50	360	J
13.		UNKNOWN ALKANE	19.68	670	J
14.		UNKNOWN C4-ALKYLBENZENE	19.92	680	J
15.		UNKNOWNS	20.08	930	JZ
16.		UNKNOWN AROMATIC COMPOUND	20.23	790	J
17.		UNKNOWN C4-ALKYLBENZENE	20.30	710	J
18.		UNKNOWN C4-ALKYLBENZENE	20.41	440	J
19.		UNKNOWN C4-ALKYLBENZENE	20.77	940	J
20.		UNKNOWN AROMATIC COMPOUNDS	20.96	340	JZ
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

BRD-6INCHESRE

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321480R1

Sample wt/vol: 1.0 (g/mL) G Lab File ID: O321480D2V

Level: (low/med) LOW Date Received: 12/24/97

% Moisture: not dec. 31 Date Analyzed: 01/06/97

GC Column: CAP ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.		UNKNOWN ALKYLCYCLOHEXANE	15.02	2000	J
2.		UNKNOWN ALKYLCYCLOHEXANE	15.73	7000	J
3.		UNKNOWN ALIPHATIC COMPOUND	15.95	1900	J
4.		UNKNOWN ALKYLCYCLOHEXANE	16.18	9400	J
5.		UNKNOWN ALIPHATIC COMPOUND	16.32	1700	J
6.		UNKNOWN ALKANE	16.51	9400	J
7.		UNKNOWN ALKANE	16.66	3700	J
8.		UNKNOWN	16.92	11000	J
9.		UNKNOWN ALKANE	17.03	1900	J
10.		UNKNOWN ALKYLCYCLOHEXANE	17.69	36000	J
11.		UNKNOWN ALKYLCYCLOHEXANE	18.04	6600	J
12.		UNKNOWN ALKANE	18.23	5200	J
13.		UNKNOWN ALKYLCYCLOHEXANE	18.56	11000	J
14.		UNKNOWN ALKYLCYCLOHEXANE	18.68	5400	J
15.	91-17-8	NAPHTHALENE, DECAHYDRO- W/C4	19.35	23000	NJZ
16.		UNKNOWN C3-ALKYLBENZENE W/AL	19.56	3300	JZ
17.		UNKNOWN AROMATICS	19.95	4100	J
18.	493-01-6	NAPHTHALENE, DECAHYDRO-, CIS	20.03	2500	NJ
19.		UNKNOWN	20.14	4400	J
20.		UNKNOWN	20.29	2700	J
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BRD-12INCHES

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321481

Sample wt/vol: 5.0 (g/mL) G Lab File ID: O321481V

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. 16 Date Analyzed: 12/26/96

GC Column: CAP ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	U
74-87-3	Chloromethane	6	U
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	6	U
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
67-64-1	Acrolein	12	U
76-13-1	Freon TF	6	U
75-35-4	1,1-Dichloroethene	6	U
67-64-1	Acetone	12	U
74-88-4	Methyl Iodide	12	U
75-15-0	Carbon Disulfide	6	U
107-05-1	Allyl Chloride	12	U
75-09-2	Methylene Chloride	6	U
107-13-1	Acrylonitrile	12	U
156-60-5	trans-1,2-Dichloroethene	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
1634-04-4	Methyl-t-Butyl Ether	6	U
75-34-3	1,1-Dichloroethane	6	U
108-05-4	Vinyl Acetate	12	U
126-99-8	Chloroprene	12	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-Butanone	12	U
107-12-0	Propionitrile	12	U
126-98-7	Methacrylonitrile	6	U
74-97-5	Bromochloromethane	6	U
109-99-9	Tetrahydrofuran	300	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
78-83-1	Isobutyl Alcohol	300	U
71-43-2	Benzene	6	U
107-06-2	1,2-Dichloroethane	6	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BRD-12INCHES

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321481

Sample wt/vol: 5.0 (g/mL) G Lab File ID: O321481V

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. 16 Date Analyzed: 12/26/96

GC Column: CAP ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
79-01-6	Trichloroethene	6	U
78-87-5	1,2-Dichloropropane	6	U
80-62-6	Methyl Methacrylate	6	U
74-95-3	Dibromomethane	6	U
123-91-1	1,4-Dioxane	300	U
75-27-4	Bromodichloromethane	6	U
110-75-8	2-Chloroethyl Vinyl Ether	12	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	12	U
108-88-3	Toluene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
97-63-2	Ethyl Methacrylate	12	U
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	6	U
591-78-6	2-Hexanone	12	U
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	U
108-90-7	Chlorobenzene	6	U
630-20-6	1,1,1,2-Tetrachloroethane	6	U
100-41-4	Ethylbenzene	6	U
1330-20-7	Xylene (total)	6	U
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropylbenzene	6	U
1476-11-5	cis-1,4-Dichloro-2-butene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
96-18-4	1,2,3-Trichloropropane	6	U
110-57-6	trans-1,4-Dichloro-2-butene	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-Chloropropane	12	U
120-82-1	1,2,4-Trichlorobenzene	6	U

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

BRD-12INCHES

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321481

Sample wt/vol: 5.0 (g/mL) G Lab File ID: O321481V

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. 16 Date Analyzed: 12/26/96

GC Column: CAP ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
87-68-3	Hexachlorobutadiene	6	U
91-20-3	Naphthalene	6	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BRD-4FEET

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321482

Sample wt/vol: 5.0 (g/mL) G Lab File ID: O321482V

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. 15 Date Analyzed: 12/26/96

GC Column: CAP ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	U
74-87-3	Chloromethane	6	U
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	6	U
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
67-64-1	Acrolein	12	U
76-13-1	Freon TF	6	U
75-35-4	1,1-Dichloroethene	6	U
67-64-1	Acetone	12	U
74-88-4	Methyl Iodide	12	U
75-15-0	Carbon Disulfide	6	U
107-05-1	Allyl Chloride	12	U
75-09-2	Methylene Chloride	0.8	J
107-13-1	Acrylonitrile	12	U
156-60-5	trans-1,2-Dichloroethene	6	U
540-59-0	1,2-Dichloroethene (total)	6	U
1634-04-4	Methyl-t-Butyl Ether	6	U
75-34-3	1,1-Dichloroethane	6	U
108-05-4	Vinyl Acetate	12	U
126-99-8	Chloroprene	12	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-Butanone	12	U
107-12-0	Propionitrile	12	U
126-98-7	Methacrylonitrile	6	U
74-97-5	Bromochloromethane	6	U
109-99-9	Tetrahydrofuran	290	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
56-23-5	Carbon Tetrachloride	6	U
78-83-1	Isobutyl Alcohol	290	U
71-43-2	Benzene	6	U
107-06-2	1,2-Dichloroethane	6	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BRD-4FEET

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321482

Sample wt/vol: 5.0 (g/mL) G Lab File ID: O321482V

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. 15 Date Analyzed: 12/26/96

GC Column: CAP ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
79-01-6	Trichloroethene	6	U
78-87-5	1,2-Dichloropropane	6	U
80-62-6	Methyl Methacrylate	6	U
74-95-3	Dibromomethane	6	U
123-91-1	1,4-Dioxane	290	U
75-27-4	Bromodichloromethane	6	U
110-75-8	2-Chloroethyl Vinyl Ether	12	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	12	U
108-88-3	Toluene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
97-63-2	Ethyl Methacrylate	12	U
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	6	U
591-78-6	2-Hexanone	1	J
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	U
108-90-7	Chlorobenzene	6	U
630-20-6	1,1,1,2-Tetrachloroethane	6	U
100-41-4	Ethylbenzene	6	U
1330-20-7	Xylene (total)	6	U
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropylbenzene	6	U
1476-11-5	cis-1,4-Dichloro-2-butene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
96-18-4	1,2,3-Trichloropropane	6	U
110-57-6	trans-1,4-Dichloro-2-butene	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-Chloropropane	12	U
120-82-1	1,2,4-Trichlorobenzene	6	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BRD-4FEET

Lab Name: INCHCAPE ENVIRONMENTAL Contract: 96068

Lab Code: INCHVT Case No.: 96068 SAS No.: SDG No.: 63082

Matrix: (soil/water) SOIL Lab Sample ID: 321482

Sample wt/vol: 5.0 (g/mL) G Lab File ID: O321482V

Level: (low/med) LOW Date Received: 12/13/96

% Moisture: not dec. 15 Date Analyzed: 12/26/96

GC Column: CAP ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
87-68-3	Hexachlorobutadiene	6	U
91-20-3	Naphthalene	5	J