

Wagner, Heindel, and Noyes, Inc.

- Consulting Hydrogeologists
- Engineers
- Environmental Scientists

P.O. Box 1629 Burlington, Vermont 05402-1629

FAX: 802-658-0820
802-860-1014

July 12, 1994

Mr. George Ambrose
Principal
Otter Valley Union High School
RR 1, Box 1115
Brandon, VT 05733

Dear Mr. Ambrose:

Enclosed please find a copy of the Site Investigation Report for the leaking underground storage tank at the Otter Valley Union High School, Brandon, Vermont. A final bill will follow under separate cover. We have forwarded a copy of the report to the State office for Lynda Wedderspoon's review.

Please do not hesitate to contact us if you have any additional questions or concerns. Thank you for this opportunity to be of service to you.

Sincerely,

Christine A. Massey
Geologist

CAM/ral

Enclosure

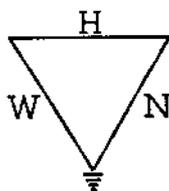
cc: Ms. Lynda Wedderspoon, Sites Management Section

[L-AMBROSE/CAM 5-8-94]

HAZARDOUS MATERIALS
MANAGEMENT DIVISION

JUL 14 10 32 AM '94

JUL 14 1994



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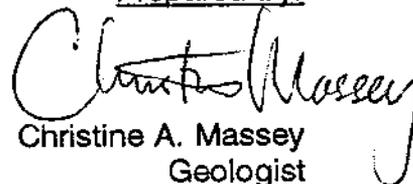
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**OTTER VALLEY UNION HIGH SCHOOL
BRANDON, VERMONT**

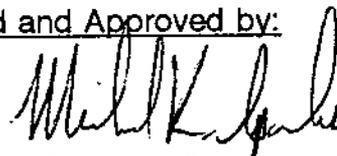
SITE INVESTIGATION REPORT

Prepared for:
Mr. George Ambrose, Principal

Prepared by:


Christine A. Massey
Geologist

Reviewed and Approved by:


Michael K. Sparks
Hydrogeologist

July 12, 1994

**OTTER VALLEY UNION HIGH SCHOOL
BRANDON, VERMONT**

SITE INVESTIGATION REPORT

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APPENDIX 1:

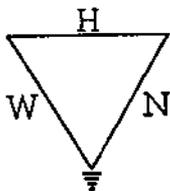
Site Location Map
USGS Topographic Map
Soil Survey and Descriptions

APPENDIX 2:

Soils Log
Driller's Log
Soil Vapor Survey Results
Water Quality Analyses

MAP POCKET:

Groundwater and Contaminant Distribution Map



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OTTER VALLEY UNION HIGH SCHOOL BRANDON, VERMONT

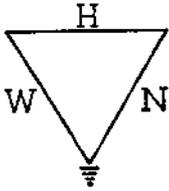
SITE INVESTIGATION REPORT

EXECUTIVE SUMMARY

- On December 14, 1992, a 10,000 gallon and a 12,000 gallon gasoline underground storage tanks were removed from Otter Valley Union High School property in Brandon, Vermont. Contamination was noted in the soils and groundwater at the excavation site. The Sites Management Section (SMS) requested that further site characterization be performed by an environmental consultant to determine the full degree and extent of contamination at the site.
- Wagner, Heindel, and Noyes (WH&N) performed a soil vapor survey and installed four monitoring wells on December 21-22, 1993, in order to examine the extent of subsurface contamination. An estimated 3,000 cubic yards of subsurface soils on the property exceed Vermont State Soils Guidelines for soils left in place. The contamination is predominantly downgradient of the tank-pull location. In consideration of the fact that the contaminant source has been eliminated and no residential receptors lie downgradient, we recommend the soils be left in place to allow the contamination to attenuate through natural processes.
- On April 12, 1994, groundwater was sampled by the SMS and analyzed for volatile organic compounds on April 15, 1994 by the Department of Environmental Conservation (DEC) laboratory. EPA method 8240 analyses revealed that Groundwater Standards for benzene and total xylenes were exceeded in groundwater downgradient from the tank-pull site.

Although contamination exceeds State Standards, we submit that remediation is not warranted at this time because there are no known sensitive receptors in the immediate vicinity of the release site. However, in light of the observation of free product in the tank excavation, elevated BTEX levels in groundwater, and limited surface water sampling, we recommend monitoring of groundwater and surface waters (stream) conditions for at least two years or until the Groundwater Standards are met. The SMS has suggested a six month monitoring frequency. WH&N submits that quarterly monitoring would be more appropriate for the first year (to fully determine the degree to which seasonal water table fluctuations influence water quality conditions at the site).

- Onsite drinking water sampled on February 4, 1994 appears not to be contaminated. We recommend resampling the school's tapwater in six months to one year, to verify the lack of petroleum contamination.



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OTTER VALLEY UNION HIGH SCHOOL BRANDON, VERMONT

SITE INVESTIGATION REPORT

1.0 INTRODUCTION

On December 21 - 22, 1993, Wagner, Heindel & Noyes (WH&N) was retained by the Otter Valley Union High School to assess the degree and extent of contamination associated with a leaking underground storage tank. The school is working with the Vermont State Petroleum Cleanup Fund. Field activities on the site were coordinated through the Sites Management Section (SMS) of the State of Vermont's Hazardous Materials Management Division, and individual field tasks were split between the SMS and WH&N.

After contamination was noted during the removal of two underground storage tanks on the subject site, WH&N performed a soil gas survey and installed four monitoring wells. Subsequent sampling of surface and groundwaters were performed by the SMS, who will continue to monitor the site in the future.

Both soils and groundwater from the subject site were found to contain elevated levels of BTEX compounds which exceed Vermont State standards.

2.0 SITE LOCATION AND HISTORY

The Otter Valley Union High School is located on Route 7, approximately four miles south of Brandon, Vermont. Site location maps are located in Appendix 1, pages 1 - 2. The Otter Valley Union High School property lies on the west side of Route 7 and is bordered on the north side by an unnamed brook and agricultural fields. Wooded areas surround other sides of the subject property, including a wooded area to the east across Route 7.

Two gasoline underground storage tanks were removed from the subject site on December 14, 1992. Mr. Marc Coleman from the State of Vermont performed the tank-pull assessment and filed the tank-pull report. Both tanks stored gasoline (1 x 10,000 gallons and 1 x 12,000 gallons) and were removed because they were no longer in use. Both tanks appeared rusted. Free product was encountered during the tank-pull, indicating that at least one of the tanks was perforated. Approximately 10 cubic yards of contaminated soil was backfilled into the tank removal site. Both soil and groundwater were contaminated by leaking gasoline. It is likely that the nearby unnamed brook was also impacted by gasoline contamination.

Three additional underground storage tanks exist on the subject site. One 10,000 gallon diesel tank supplies fuel for local school buses. In addition, two heating oil tanks (1 x 10,000 gallons and 1 x 1,400 gallons) supply fuel for the school building itself.

On December 21 - 22, 1993, WH&N performed a soil vapor survey and installed four monitoring wells on the site. The location of the soil borings monitored in the soil vapor survey and the locations of the four monitoring wells are located on the Groundwater Contour Map in the attached map pocket. Soils logs and the results of the soil vapor survey are included in Appendix 2, pages 1-18, and are discussed in Section 4.0.

The high school uses a local spring as a water source. This spring is located in an unidentified location across Route 7 to the east. Water is stored in a large onsite underground storage tank and fed directly into the school. Overflow from this water storage tank flows underground through a pipe and discharges into a channel on the northern property boundary, creating the unnamed brook which flows generally westerly along the northern property border.

As noted on the Groundwater Contour Map (map pocket), all five underground storage tanks are located on the northern side of the school. The two pulled gasoline tanks and the 10,000 gallon diesel tank are located at the edge of the property, near the unnamed brook. The tanks are buried near a steep 15 foot bank above the brook. This location may allow contamination from the onsite tanks to intercept the local surface waters fairly easily.

During the December 1993 visit, an apparent seep below the tank-pull site showed evidence of blackened soil and leaves, indicating that surface water receptors had likely been affected. Residential and/or human receptors are not located in the immediate downgradient area. The unnamed brook flows westerly into a wooded area and

coalesces with other small streams into a lowland swamp before draining into the north-flowing Otter Creek.

On February 4, 1994, a tap water sample was collected from the Otter Valley Union High School by the SMS. A trip blank was included in this sampling round. Additional water samples were obtained from the four monitoring wells and the local surface water (brook) on April 12, 1994. Water quality results are presented in Appendix 2, pages 19-25, and are discussed in Section 4.0.

During the April 1994 visit, Mr. Marc Roy of the SMS noted an intermittent petroleum odor in the ravine below the tank pull site, but was not able to locate a source. A contaminant-bearing seep may have been obscured by dense vegetation and rubble.

3.0 SITE GEOLOGY AND HYDROLOGY

The subject site is located in a north-south trending valley (see USGS Topographic Map in Appendix 1, page 2), which parallels the subsurface bedrock. The underlying bedrock, Dunham Dolomite, is relatively soft and forms the local valley. It is bordered by the more resistant Cheshire Quartzite to the east and the Monkton Quartzite to the west.

Surficial materials on the subject site consist of stratified sands and silts with some gravels. These materials are likely reworked glacial sediments, laid down by streams and rivers. Variable amounts of fill material have been graded into most areas of the property in order to create a building foundation, a parking lot, and areas for the buried underground storage tanks. According to the 1994 preliminary soil survey for Rutland County, Vermont, the soils are altered or disturbed and used for building sites or landfills (Appendix 1, pages 3-5).

Based on soil borings drilled in December 1993, the water table was found to lie between 12.3 and 14.2 feet below ground surface (BGS). The spring 1994 water levels were slightly elevated. The following table summarizes the groundwater levels at the subject site:

WATER TABLE LEVELS: (FEET BELOW GROUND SURFACE)

	December 21-22, 1993	May 20, 1994	June 24, 1994
MW-1	12.40	10.70	11.25
MW-2	12.30	11.50	11.39
MW-3	14.20	13.03	13.16
MW-4	13.60	12.65	12.83

The June 1994 levels are depicted on the Groundwater Contour Map (map pocket). The elevation of the water table is roughly concurrent with the surface water in the unnamed brook. The water table slopes to the west with a gradient of 4.4% west of the tank-pull site and 1.5% between the tank-pull site and the water storage tank to the east. The water table contouring indicates that monitoring wells MW-3 and MW-4 are well positioned to intercept contaminants migrating from the tank site.

A spring located across Route 7 is tapped for the school's water resource. As a result, the swale crossing Route 7 is rather dry. The overflow from the storage tank located onsite at the school refeeds this swale to form the unnamed brook. Apparent groundwater seeps along the brook bank feed into the surface waters.

The steep bank on the northern school property boundary has likely altered the natural surface flow by diverting surface runoff away from the unnamed brook back to the south towards the high school. Stormwater runoff collects in a catch basin next to the high school and drains to the west via underground drainage pipes.

4.0 SOIL AND WATER QUALITY

4.1 Initial Screening

The initial soil vapor screening of the tank site was performed by SMS Inspector Mr. Marc Coleman during the underground storage tank removal. Peak soil contamination was monitored with a photoionization detector (PID) to be 150 parts per million (ppm), with an average PID reading of > 20 ppm. Approximately 10 cubic yards of contaminated soils, which exceed Vermont State guidelines for clean soils, were backfilled. During this initial investigation, it was also noted that

contamination, in the form of heavy sheens and small (0.5 mm) globules of free product, was found at the groundwater table (approximately 14 feet BGS).

4.2 Soil Vapor Survey

A soil vapor survey was performed concurrently with the installation of four monitoring wells on the site. Six soil borings were drilled in addition to the four monitoring well borings, to screen the subsurface soils for elevated levels of volatile organic compounds. An HNu PI-101 Photoionization Detector (PID) equipped with a 10.2 eV lamp and calibrated to benzene equivalence, and a Century OVA 128 Flame Ionization Detector (FID) were used to make field measurements. Soil vapor borings are labeled A - F, as noted on the Groundwater Contour Map (Appendix 1).

Elevated PID readings were measured in the subsurface soils of Monitoring Well #1 (MW-1) (38 ppm), MW-4 (140 ppm), Soil Vapor Boring D (SV-D) (160 ppm), and SV-E (130 ppm). Slightly elevated PID readings were found in the subsurface soils of SV-B (16 ppm). Elevated FID readings were found in SV-C (40 ppm), SV-D (> 1000 ppm), SV-E (> 1000 ppm), MW-3 (33 ppm), and MW-4 (> 1000 ppm). A complete listing of PID and FID readings is located in Appendix 2, pages 17 - 18. Soil contamination appears to be concentrated at or near the watertable.

In summary, the soils monitored in SV-D, SV-E, MW-1, and MW-4 exceed Vermont State Guidelines for contaminated soils. On the basis of the area that these wells define, we estimate that a total of 2778 cubic yards of subsurface soil (300' x 50' x 5') exceed State guidelines. Because the source of subsurface contamination has been eliminated (removal of leaking underground storage tank), no free phase product has been detected in groundwater, and no residential receptors are immediately downgradient, we submit that active remediation of the site is not warranted at this time. Periodic water quality monitoring is recommended to determine if natural processes will attenuate the contamination before it migrates off the property or impact any potential receptors.

4.3 Water Quality

Two rounds of water samples were collected from the Otter Valley Union High School site. On April 12, 1994, water samples were collected from the four

monitoring wells on the subject site. At the same time, a surface water sample was collected from the unnamed brook. Earlier, a tapwater sample was collected from inside the school on February 4, 1994. A trip blank was included in the February water sampling procedure. Monitoring Well #1 (MW-1) is located upgradient from the tank-pull site (see Groundwater Contour Map in map pocket). MW-2 is located between the tank-pull site and a direct line towards the school (the only human receptor nearby). MW-2 is also upgradient of the existing 10,000-gallon underground storage tank used for heating oil. Both MW-1 and MW-2 showed no elevated volatile organic compounds, as noted in the laboratory reports located in Appendix 2, pages 19 - 25.

MW-3 and MW-4 were placed downgradient of the tank-pull site in order to determine the extent of subsurface contamination. MW-3 showed elevated levels of methyl-tert-butyl ether (MTBE) (25 parts per billion (ppb)), benzene (67 ppb), toluene (28 ppb), ethyl benzene (40 ppb), and xylenes (61 ppb). The total BTEX compounds were measured at 196 ppb. The total volatile hydrocarbons measured were estimated to be 3,560 ppb. The benzene levels at this location exceed the Vermont State Groundwater Standard of 5 ppb. The levels of toluene, ethyl benzene and xylenes are well below the Vermont State groundwater standards. Although a groundwater standard for MTBE does not exist, the Vermont Health Advisory level for MTBE is 40 ppb. The levels in MW-3 (25 ppb) are below that standard. MW-3 is 140 feet downgradient from the tank-pull site, indicating that substantial contaminant transport has occurred.

MW-4 is located immediately downgradient from the tank-pull site. Laboratory analyses of water samples from MW-4 indicate elevated levels of benzene (45 ppb), toluene (505 ppb), ethyl benzene (70 ppb), and xylenes (460 ppb). The total BTEX compounds were measured at 1080 ppb. The total measured volatile hydrocarbons were estimated to be 5860 ppb. The contaminant levels in this water exceed the Groundwater Standard for benzene (5 ppb) and also exceed the Groundwater Standard for total xylenes (400 ppb). Total BTEX concentrations at MW-4 are approximately five times greater than MW-3, as might be expected from a relatively recent contaminant release in a sandy media.

A surface water sample collected from the brook directly north of the tank-pull site below MW-4 showed no elevated levels of volatile organic compounds. The surface water is fed from an overflow pipe, draining the water storage tank for the Otter Valley Union High School. The sampling location (noted on the

Groundwater Contour map) is likely upgradient from the flow of contaminants away from the tank-pull site and would therefore likely not contain elevated levels of volatile organic compounds. Further characterization of the contaminant impact on the surface waters (brook) of the site is recommended.

The inside tap water at the Otter Valley High School was also sampled and showed no elevated levels of volatile organic compounds. The tap water is essentially the same water that feeds the surface brook.

The February 4, 1994 trip blank water sample showed no elevated volatile organic compounds. However, a trip blank was not analyzed when the four monitoring wells and the stream were sampled on April 12, 1994.

In summary, the drinking water supply to the Otter Valley Union High School appears to be uncontaminated. The impact to surface water receptors is not well characterized. The groundwater downgradient of the tank-pull site is contaminated with BTEX compounds, as well as MTBE, both common constituents of gasoline. Benzene and total xylenes Groundwater Standards have been exceeded. We recommend periodic monitoring of the water quality to determine if volatile organic concentrations are naturally diminishing over time.

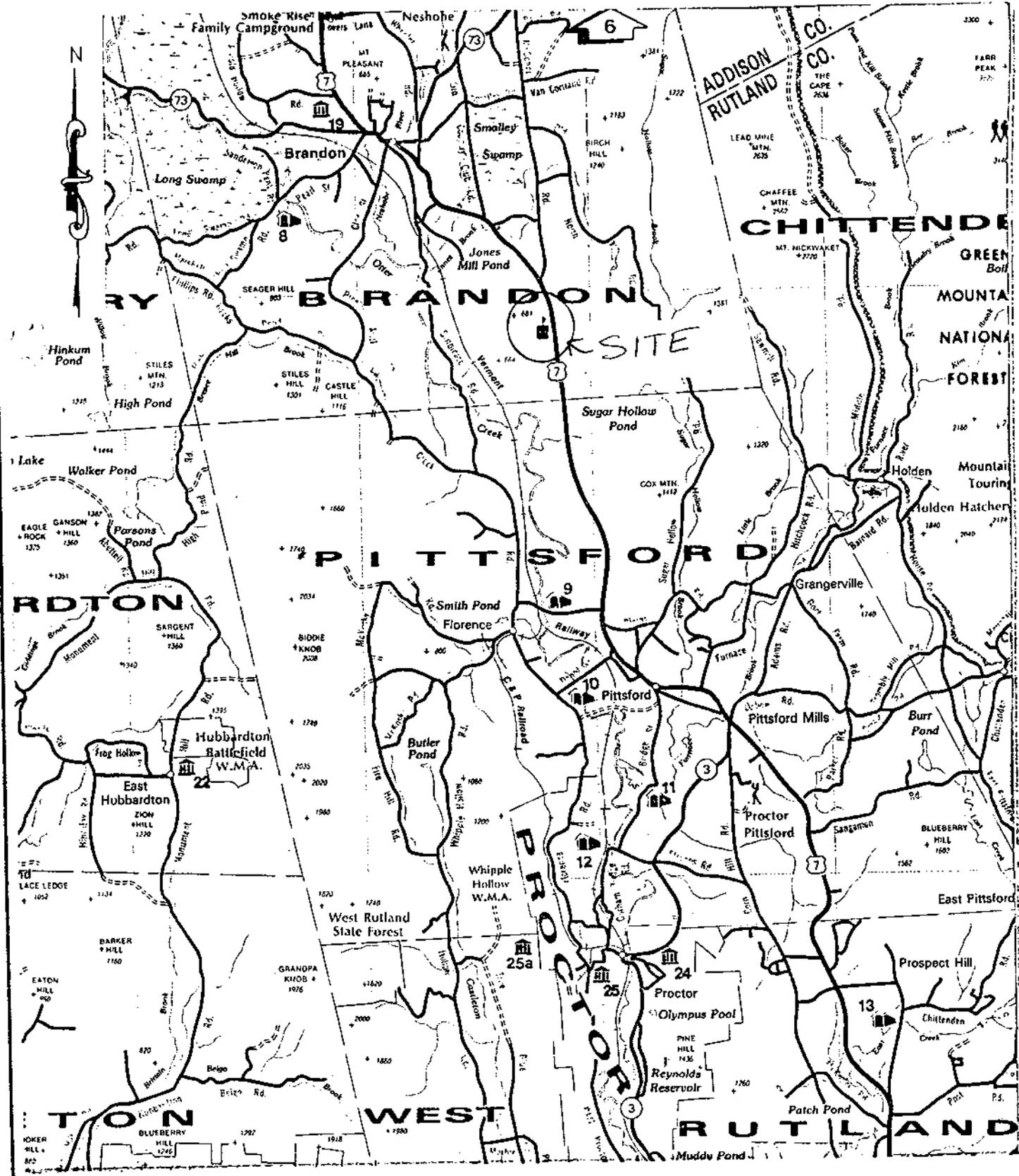
5.0 CONCLUSIONS AND RECOMMENDATIONS

The following environmental concerns have been identified on the Otter Valley Union High School property based on, 1) preliminary screening during the tank-pull of two gasoline underground storage tanks, 2) the subsequent soil vapor survey and monitoring well installations, and 3) water quality analyses.

- Approximately 3000 cubic yards of subsurface soils, located near or at the water table, exceed Vermont State standards for soils left in place. Although soil contamination exceeds state guidelines, remediation is not deemed necessary at this time, given the fact that the contamination source has been eliminated and no potential receptors lie downgradient. Active remediation may be necessary if it appears that the contamination migrates off site or if the contamination is found to present an exposure hazard.

-
- Vermont State Groundwater Standards have been exceeded for benzene and total xylenes in groundwater near the tank-pull site. We recommend continued monitoring of groundwater contaminant levels, to ensure that natural degradation processes are occurring. This monitoring should also include sampling the adjacent brook, downgradient from the tank-pull site. The Sites Managements Sections (SMS) has suggested a six-month monitoring interval for the Otter Valley Union High School Site. A quarterly monitoring program may be more appropriate for the first year in order to fully understand how water quality is affected by seasonal water table fluctuations.
 - Onsite drinking water appears not to be contaminated. We recommend resampling the school's tapwater in six months to one year, to verify the lack of petroleum contamination.

[RPT-OTTER/CAM 05-06-94]



1 0 1 2 3 4 MILES



Wagner, Heindel, and Noyes

CONSULTING SCIENTISTS AND ENGINEERS

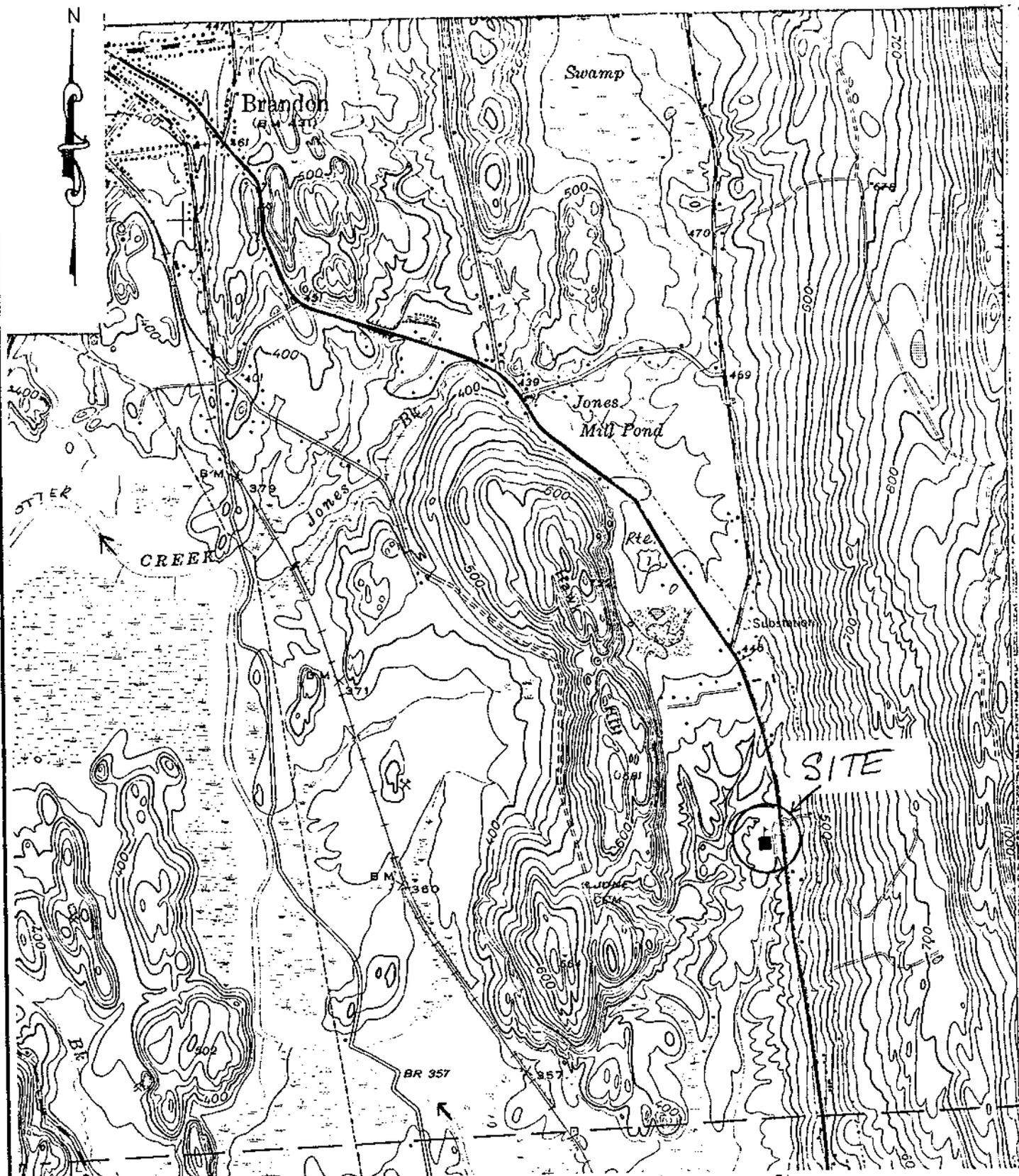
- Hydrogeology • Ecology •
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BURLINGTON, VERMONT

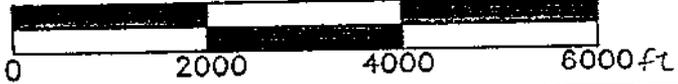
*Other Valley Union High School
Brandon, VT*

Site Location Map

DATE: 6/94 SCALE: see above DRN: CAM APPD: JEN



contour interval = 20 ft



QUAD: BRANDON, VT

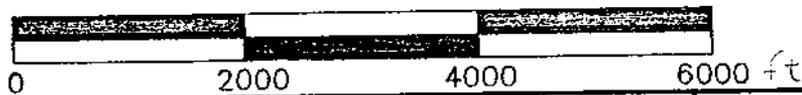
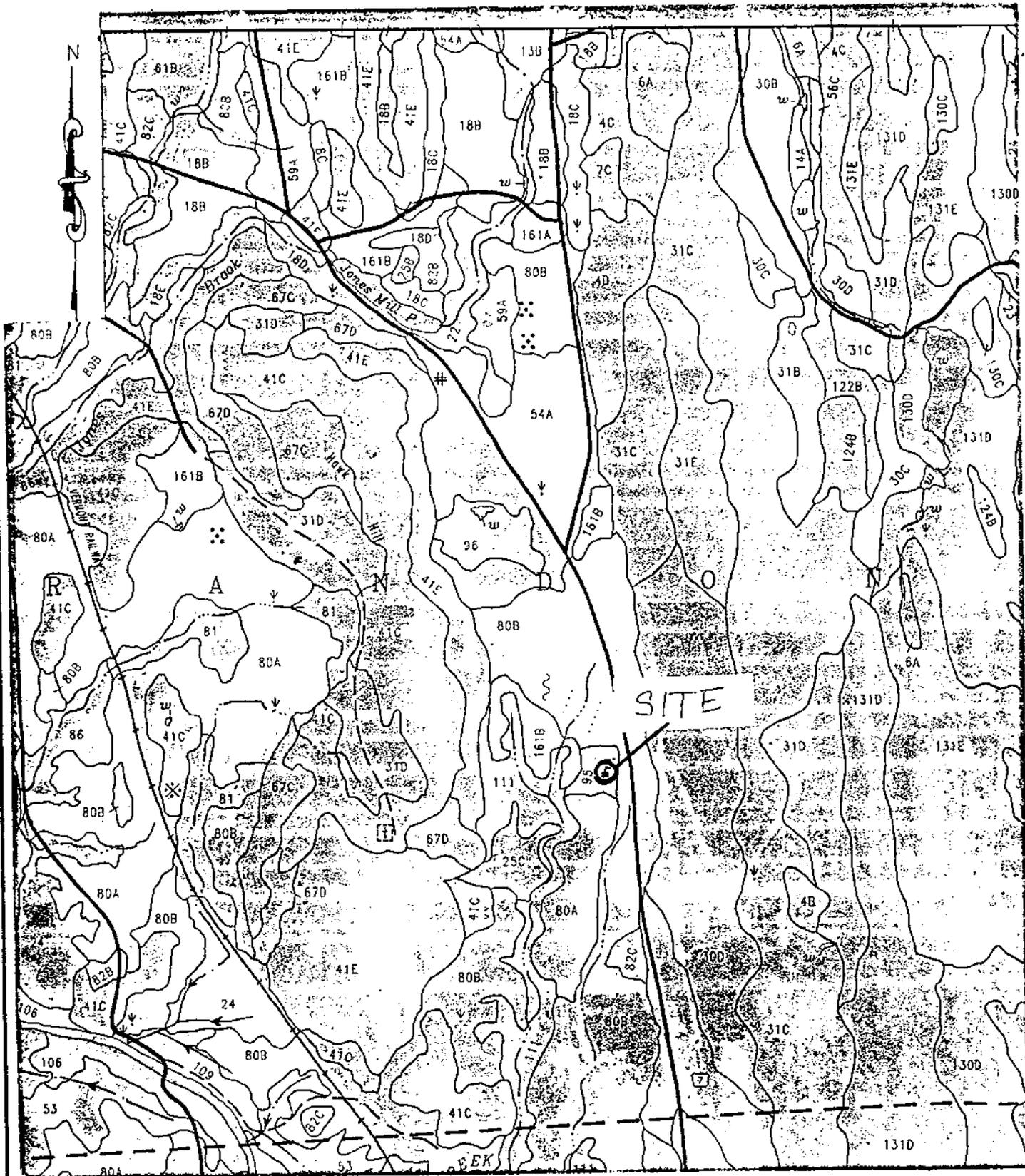


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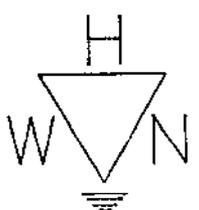
Otter Valley Union High School
 Brandon, VT

USGS TOPOGRAPHIC MAP

DATE: 6/94	SCALE: 1:24000	DRN: CAM	APPD: JEN
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COUNTY: RUTLAND VT



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TRICK VALLEY
 BRANDON, VERMONT

SOIL CONSERVATION SERVICE
 SOILS MAP

DATE: 7/92 SCALE: 1:20000 DRN: APPD:

This map unit consists of nearly level to steep soils that have been disturbed as in parking lots or interstate highways. In some locations the original surface and subsurface layers and some substratum have been removed, exposing loamy material. In other locations the original soil has been covered with loamy fill material. These soils are well drained to somewhat poorly drained. Typically units range from 3 to 100 acres.

A broad level of classification is used for the soils in this mapping unit, because these soils are so obscured or altered that identification at the series level is not feasible. This allows for a broad range of important properties.

Inclusions make up less than 5 percent of this map unit.

Most locations of this unit are used for landfills and building sites. On-site investigation is necessary to determine the hazards and degree of limitations for specific uses.

NY0170

SOIL INTERPRETATIONS RECORD

KINGSBURY SERIES

MLRA(S): 142, 144A, 140

REV. KAW, 3-58

AERIC DCHRAQUALPS, VERY-FINE, ILLITIC, MESIC

THE KINGSBURY SERIES CONSISTS OF DEEP, SOMEWHAT POORLY DRAINED SOILS ON LAKE PLAINS. THEY FORMED IN LAKE-LAID OR ESTUARINE SEDIMENTS. TYPICALLY THESE SOILS HAVE A VERY DARK GRAYISH BROWN SILTY CLAY SURFACE LAYER 8 INCHES THICK OVER 2 INCHES OF MOTTLED GRAYISH BROWN SILTY CLAY. THE MOTTLED SUBSOIL FROM 8 TO 28 INCHES IS DARK GRAYISH BROWN CLAY. THE MOTTLED SUBSTRATUM FROM 28 TO 60 INCHES IS DARK GRAYISH BROWN CLAY. SLOPES RANGE FROM 0 TO 8 PERCENT.

ESTIMATED SOIL PROPERTIES (A)											
DEPTH (IN.)	USDA TEXTURE	UNIFIED	AASHTO	FRACT. > 3 IN (PCT)	PERCENT OF MATERIAL LESS THAN 3" PASSING SIEVE NO.				LIQUID LIMIT	PLASTICITY INDEX	
					4	10	40	200			
0-8	SIC, SICL, C	ML, MH	A-7	0	100	100	90-100	80-95	40-55	11-20	
0-8	SIL, CL	ML, MH	A-7	0	100	100	90-100	80-95	40-55	11-20	
8-28	C	MH, CH	A-7	0	100	100	90-100	80-100	50-65	21-35	
28-60	C	MH, CH	A-7	0	100	100	90-100	80-100	50-65	21-35	

DEPTH (IN.)	CLAY (PCT)	MOIST BULK DENSITY (G/CM ³)	PERMEABILITY (IN/HR)	AVAILABLE WATER CAPACITY (IN/IN)	SOIL REACTION (PH)	SALINITY (MMHOS/CM)	SHRINK-SWELL POTENTIAL	EROSION FACTORS	WIND EROD. GROUP	ORGANIC MATTER (PCT)	CORROSION		
											STEEL	CONCRETE	
0-8	27-50	1.35-1.55	0.08-0.2	0.12-0.22	5.1-7.8	-	MODERATE	.49	3	-	3-8	HIGH	MODERATE
0-8	28-27	1.35-1.55	0.08-0.2	0.22-0.24	5.1-7.8	-	MODERATE	.49	3	-	3-8	HIGH	MODERATE
8-28	80-90	1.40-1.75	<0.08	0.12-0.13	5.1-7.8	-	HIGH	.28	-	-	-	-	-
28-60	80-90	1.40-1.60	<0.08	0.12-0.14	7.9-8.4	-	HIGH	.28	-	-	-	-	-

FLOODING			HIGH WATER TABLE			CEMENTED PAV.		BEDROCK		SUBSIDENCE		HYD. GRP.	POTENTIAL FROST ACTION
FREQUENCY	DURATION	MONTHS	DEPTH (FT)	KIND	MONTHS	DEPTH (IN)	HARDNESS	DEPTH (IN)	HARDNESS	INIT. (IN)	TOTAL (IN)		
NONE			0-5	PERCHED	DEC-MAY	-	-	>60	-	-	-	D	HIGH

SANITARY FACILITIES (B)		CONSTRUCTION WATER (AL) (B)	
SEPTIC TANK ABSORPTION FIELDS	SEVERE-WETNESS, PERCS SLOWLY	ROADFILL	POOR-LOW STRENGTH, WETNESS, SHRINK-SWELL
SEWAGE LAGOON AREAS	0-2%: SLIGHT 2-7%: MODERATE-SLOPE 7%: SEVERE-SLOPE	SAND	IMPROBABLE-EXCESS FINES
SANITARY LANDFILL (TRENCH)	SEVERE-WETNESS, TOO CLAYEY	GRAVEL	IMPROBABLE-EXCESS FINES
SANITARY LANDFILL (AREA)	SEVERE-WETNESS	TOPSOIL	POOR-TOO CLAYEY, WETNESS
DAILY COVER FOR LANDFILL	POOR-TOO CLAYEY, HARD TO PACK, WETNESS	WATER MANAGEMENT (B)	
		POND RESERVOIR AREA	0-3%: SLIGHT 3-6%: MODERATE-SLOPE
SHALLOW EXCAVATIONS	SEVERE-WETNESS	EMBANKMENTS DIKES AND LEVERS	SEVERE-HARD TO PACK, WETNESS
DWELLINGS WITHOUT BASEMENTS	SEVERE-WETNESS, SHRINK-SWELL	EXCAVATED PONDS AQUIFER FED	SEVERE-NO WATER
DWELLINGS WITH BASEMENTS	SEVERE-WETNESS, SHRINK-SWELL	DRAINAGE	0-3%: PERCS SLOWLY, FROST ACTION 3%: PERCS SLOWLY, FROST ACTION, SLOPE
SMALL COMMERCIAL BUILDINGS	SEVERE-WETNESS, SHRINK-SWELL	IRRIGATION	SIL, SICL, CL: WETNESS, PERCS SLOWLY SIC, C: WETNESS, SLOW INTAKE, PERCS SLOWLY
LOCAL ROADS AND STREETS	SEVERE-LOW STRENGTH, WETNESS, FROST ACTION	TERRACES AND DIVERSIONS	ERODES EASILY, WETNESS, PERCS SLOWLY
LAWNS, LANDSCAPING AND GOLF FAIRWAYS	SIL, SICL, CL: SEVERE-WETNESS SIC, C: SEVERE-WETNESS, TOO CLAYEY	GRASSED WATERWAYS	WETNESS, ERODES EASILY, PERCS SLOWLY

REGIONAL INTERPRETATIONS

OTTER VALLEY UNION HIGH SCHOOL
Brandon, Vermont

SOIL LOG

May 20, 1994

Page 1

Soil borings and monitoring well installation occurred on December 21-22, 1993.

Inspector: Christine Massey, WH&N
Driller: Soils Engineering, Charlestown, New Hampshire
Drill Rig: Bombardier

Monitoring Well #1 (MW-1)
Installed December 21, 1993

**Location: Upgradient from underground storage tanks toward Route 7 and
downgradient from the school's water supply and water storage tank.**

0 - 1.5' surface sample	Light brown silt with some fine sands and clays
1.5' - 5.0'	Silty fine sands with some clay
5.0' - 10.0'	Brown fine sands with fewer fines; brown clayey sands at 10.0' on auger tip
10.0' - 12.0' split-spoon sample	Fine to medium sands; stratified; moist; clay lens at 10.0'; 0.1' of coarse sand near 12.0'
10.0' - 15.0'	Same material as above, with a gravel layer at 13.5';
15.0' - 17.0' split-spoon sample	Medium stratified sands; wet
17.0' - 20.0'	Medium to coarse stratified sands

Monitoring well installation:

- Screen: 10' section of 0.020" slotted screen, fabric wrapped; 10.4' - 20.4' below ground surface (bgs)
- Sand pack: 8.5' - 20.4' bgs
- Bentonite: 6.5' - 8.5' bgs
- Native fill: 0' - 6.5' bgs
- Water table: 12.4' bgs
- Well guard: Flush-mounted curb box cemented in
- Top of casing: 0.4' bgs

OTTER VALLEY UNION HIGH SCHOOL
Brandon, Vermont

SOIL LOG

May 20, 1994

Page 2

Monitoring Well #2 (MW-2)

Installed on December 22, 1993

Location: Southwest of existing underground fuel oil tank, across the parking lot from the leaking underground storage tanks that were removed. MW-2 is located upgradient of the leaky tank site.

0 - 5.0'	Fine to medium sands
5.0' - 7.0' split-spoon sample	Fine to medium stratified sands
8.0'	Gravel layer
9.5' - 11.5' split-spoon sample	Medium sands
11.5' - 13.5' split-spoon sample	Medium to coarse sands; water table near 12.5'; coarser material below 12.5'
13.5' - 19.0'	Similar sand material

Monitoring well installation:

- Screen: 10' section of 0.020" slotted screen, fabric wrapped; 8.5' - 18.5' bgs
- Sand pack: 6.8' - 18.5' bgs
- Bentonite: 5.2' - 6.8' bgs
- Native fill: 0' - 5.2' bgs
- Water table: 12.3' bgs
- Well guard: Flush-mounted well guard cemented in
- Top of casing: 0.3' bgs

OTTER VALLEY UNION HIGH SCHOOL
Brandon, Vermont

SOIL LOG

May 20, 1994

Page 3

Monitoring Well #3 (MW-3)
Installed on December 22, 1993
Location: Downgradient of leaking UST site,
behind the bus parking lot along the steep bank

0 - 4.5'	Silty fine sands with some clay
4.5' - 6.5' split-spoon sample	Silty fine sands
6.5' - 10.0'	Stratified silty fine sands
10.0' - 12.0' split-spoon sample	Fine to medium sand
12.0' - 14.0' split-spoon sample	Medium to coarse sands; slight old gasoline odor
14.0' - 19.0'	Similar sandy material

Monitoring well installation:

- Screen: 10' section of 0.020" slotted screen, fabric wrapped; 9.0' - 19.0' bgs
- Sand pack: 7.0' - 19.0' bgs
- Bentonite: 5.5' - 7.0' bgs
- Native fill: 0' - 5.5' bgs
- Water table: 14.2' bgs
- Well guard: 3' stickup on well guard
- Top of casing: 2.84' stickup

OTTER VALLEY UNION HIGH SCHOOL
Brandon, Vermont

SOIL LOG

May 20, 1994

Page 4

Monitoring Well #4 (MW-4)

Installed on December 22, 1993

Location: Immediately adjacent to the downgradient side of the leaky tank site

0 - 2.0' surface sample	Sandy fill material
2.0' - 5.0'	Fine to medium sands with some silt
5.0' - 7.0' split-spoon sample	Silty fine sands
7.0' - 10.0'	Fine sands
10.0' - 12.0' split-spoon sample	Fine to medium sands
12.0' - 14.0' split-spoon sample	Fine to medium sands; slight gasoline odor
14.0' - 16.0' split-spoon sample	Medium sands with a blackened 1" layer at 15.0'; gasoline odor

Monitoring well installation:

- Screen: 10' section of 0.020" slotted screen, fabric wrapped; 10.9' - 20.9' bgs
- Sand pack: 8.0' - 20.9' bgs
- Bentonite: 6.0' - 8.0' bgs
- Native fill: 0' - 6.0' bgs
- Water table: 13.6' bgs
- Well guard: 2.8' stickup on well guard
- Top of casing: 2.67' stickup

Soil Boring A (SB-A)

Location: Upgradient of leaky tank site on the northwest corner of the school's garage in a grassy median next to the driveway

0 - 1.0' surface sample	Silty sands with gravel; 0 - 0.5' bgs was frozen ground; most likely fill material
1.0' - 2.0'	Loose sands
2.0' - 5.0'	Similar materials
5.0' - 7.0' split-spoon sample	Medium to coarse sands with a layer of very fine silty sands at 5.0' - 5.5'
7.0' - 10.0'	Medium to coarse sands; water table at 9.7'
10.0' - 12.0' split-spoon sample	Medium to coarse sands

OTTER VALLEY UNION HIGH SCHOOL
Brandon, Vermont

SOIL LOG

May 20, 1994

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Soil Boring B (SB-B)

Location: Immediately west of existing underground storage tank for heating oil, near monitoring well #2 in a slightly downgradient position; located upgradient from leaky tank site

0 - 2.0' surface sample	Sand and gravel fill materials
2.0' - 5.0'	Reddish sand
5.0' - 7.0' split-spoon sample	Fine to medium sands; moist; several brown/black mottled areas in the section
7.0' - 9.0' split-spoon sample	Fine sands; moist; 7.0' - 7.5' Medium to coarse sands; relatively dry 7.5' - 9.0'
9.0' - 11.0' split-spoon sample	Fine to coarse stratified sands
11.0' - 13.0'	Coarse sands; wet; water table at 12.5'
13.0' - 15.0' split-spoon sample	Fine sands from 13.0' - 13.5'; Medium to coarse sands 13.5' - 15.0'

Soil Boring C (SB-C)

Location: Downgradient of leaky tank site, near monitoring well #3, behind bus parking lot, near the streambank

0 - 2.0' surface sample	Brown fine sands with some silt layers
0.5' - 6.5' split-spoon sample	Similar soil materials
9.5' - 11.5' split-spoon sample	Similar materials
11.5' - 13.5' split-spoon sample	Similar materials; water table at 13.0'

Soil Boring D (SB-D)

Location: Downgradient from leaky tank site between monitoring well #3 and the tank site, located in the gravel parking area north of the school, approximately 35' from the streambank

0 - 2.0' surface sample	Brown silty fine sand
5.0' - 7.0' split-spoon sample	Similar material
9.5' - 11.5' split-spoon sample	Similar silty sands; slight gasoline odor
11.5' - 13.5' split-spoon sample	Same material; slight gasoline odor at 11.5'; water table at 12.7'; blackened soils at water table

**OTTER VALLEY UNION HIGH SCHOOL
Brandon, Vermont**

SOIL LOG

May 20, 1994

Page 6

Soil Boring E (SB-E)

**Location: Downgradient of leaky tank site,
along streambank below monitoring well #4**

0 - 2.0' surface sample	Brown silty fine sand, fill material
5.0' - 7.0' split-spoon sample	Brown silty fine sands with some roots
9.5' - 11.5' split-spoon sample	Brown silty fine sands with light brown silts from 9.0' - 10.0'; old ground surface at 9.0' bgs
11.5' - 13.5' split-spoon sample	Brown silty fine sands from 11.5' - 12.5' Gray silty fine sands from 12.5' - 13.5'; drillers noted septic odor; odor permeated through sample bag
13.5' - 15.5' split-spoon sample	Gray fine to medium sands; gasoline odor; strong odor permeated through sample bag; water table at 13.5'; blackish petroleum product was identified at water table.

Soil Boring F (SB-F)

**Location: Upgradient from the leaking tank site
and also upgradient from monitoring well #1; immediately
downgradient from the drinking water storage tank used for the school**

0 - 1.5' surface sample	Silty clay with light brown very fine sands
4.5' - 6.5' split-spoon sample	Clayey silts with very fine sands from 4.5' - 6.0'; medium sands from 6.0' - 6.5'
9.5' - 11.5' split-spoon sample	Sands from 9.5' - 10.5'; wet; 0.25' silt lens at 10.5'; dry sands from 10.5' - 11.5'; potential perched water table at 9.5'
11.5' - 13.5' split-spoon sample	Medium to coarse sands; moist to dry from 11.5' - 12.5'; wet from 12.5' - 13.5'; water table at 12.5' bgs
13.5' - 15.5' split-spoon sample	Dark stratified fine, medium, and coarse sands; coarse pebbles at 14.5'

[SL-OTTER/CAM 5-6-84]

Soils Engineering Inc.

Main St. Charlestown, NH 03603

TO WAGNER, HEINDEL & NOYES ADDRESS BURLINGTON, VT
 PROJECT NAME OTTER VALLEY UNION H.S. LOCATION BRANDON, VT
 REPORT SENT TO CHRISTINE MASSEY PROJ. NO. _____
 SAMPLE SENT TO RET. BY WAGNER, HEINDEL & NOYES OUR JOB NO. 5926-93

SHEET 1 OF 1
 DATE 12/21/93
 HOLE NO. MW-1
 LINE & STA. _____
 OFFSET _____

GROUND WATER OBSERVATIONS		Type	CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT <u>13'</u> AT * _____ HOURS			HSA	SS		DATE STARTED <u>12/21/93</u>
*WELL COMPLETION		Size I. D.	<u>4 1/4"</u>	<u>1 1/2"</u>		DATE COMPL. <u>12/21/93</u>
AT _____ AT _____ HOURS		Hammer Wt.		<u>140*</u>	BIT	BORING FORMAN <u>M.D. & R.H.</u>
		Hammer Fall		<u>30"</u>		INSPECTOR <u>C. MASSEY</u>
						SOILS ENGR.

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness. Drilling time, seams and ect	SAMPLE		
				0-6	6-12	12-18				NO	PEN	REC
5'		0' - 2'	SS	1	4		MOIST	5'	MED. DENSE LIGHT BROWN FINE SAND AND SILT	1	24"	18"
				6	6							
10'		10' - 12'	SS *	6	8		WET	13'6"	MED. DENSE LIGHT BROWN FINE SILTY SAND WITH THIN LAYERS OF SILT	2	24"	18"
				13	15							
15'		15' - 17'	SS	12	15		WET	18'6"	DENSE BROWN FINE SAND	3	24"	24"
				20	23							
20'								20'	GREY BROWN SILT			
									INSTALLED 2" PYC WELL AT 20' SLOTTED FROM 10'-20' FILTER SAND TO 8'6" BENTONITE SEAL FROM 7'6"-8'6"			
									MATERIALS USED: 150# OF SAND 40# OF CEMENT MIX			

GROUND SURFACE TO 20'

USED HSA CASING THEN _____

Sample Type
 D-Dry C-Cored W-Washed
 UP-Unfinished Piston
 TP-Test Pit A-Auger V-Vane Test
 UT-Undisturbed Thinwall

Proportions Used
 trace 0 to 10%
 little 10 to 20%
 some 20 to 35%
 and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
 Cohesionless Density
 0-10 Loose
 10-30 Med. Dense
 30-50 Dense
 50+ Very Dense
 Cohesive Consistency
 0-4 Soft 30 + Hard
 4-8 M/Stiff
 8-15 Stiff
 15-30 V-Stiff

summary
 EARTH BORING 20'
 ROCK CORING _____
 SAMPLES 3
 HOLE NO. MW-1

Soils Engineering Inc.

Main St. Charlestown, NH 03603

SHEET 1 OF 1
 DATE 12/22/93
 HOLE NO. MW-2
 LINE & STA.
 OFFSET

TO WAGNER, HEINDEL & NOYES ADDRESS BURLINGTON, VT
 PROJECT NAME OTTER VALLEY UNION H.S. LOCATION BRANDON, VT
 REPORT SENT TO CHRISTINE MASSEY PROJ. NO.
 SAMPLE SENT TO RET. BY WAGNER, HEINDEL & NOYES OUR JOB NO. 5926-93

GROUND WATER OBSERVATIONS		Type	CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT 12'4"	AT * _____ HOURS		HSA	SS		DATE STARTED 12/22/93
*WELL COMPLETION		Size I. D.	4 1/4"	1 1/2"		DATE COMPL. 12/22/93
AT _____	AT _____ HOURS	Hammer Wt.		140#	BIT	BORING FORMAN M.D. & R.H.
		Hammer Fall		30"		INSPECTOR C. MASSEY
						SOILS ENGR.

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, Drilling time, seams and ect	SAMPLE		
				From 0-6	6-12	To 12-18				NO.	PEN	REC
5'		5' - 7'	SS	1	3			5'6"	LOOSE BROWN SILT AND SAND FILL	1	24"	24"
				6	6			8'	MED. DENSE LIGHT BROWN LAYERS OF SILT AND SILTY FINE SAND TRACES OF GRAVEL AT 8'			
10'		9'6" - 11'6"	SS #	8	8				MED. DENSE BROWN FINE TO MED. FINE SAND	2	24"	16"
		11'6" - 13'6"	SS	8	7					3	24"	24"
15'				7	8				SAME MATERIAL			
								19'	SAME MATERIAL			
20'									INSTALLED 2" PVC MONITORING WELL AT 19' SLOTTED FROM 9'-19' FILTER SAND TO 6'10" BENTONITE SEAL FROM 5'2"-6'10"			
									MATERIALS USED: 175# OF SAND 40# OF CEMENT MIX			

GROUND SURFACE TO 19' USED HSA CASING THEN

Sample Type	Proportions Used	140 lb. wt. x 30"-fall an 2" O.D. Sampler	summary
D-Dry C-Cored W-Washed	trace 0 to 10%	Cohesionless Density	EARTH BORING 19'
UP-Unfinished Piston	little 10 to 20%	0-10 Loose	ROCK CORING
TP-Test Pit A-Augur V-Vane Test	some 20 to 35%	10-30 Med. Dense	SAMPLES 3
UT-Undisturbed Thinwall	and 35 to 50%	30-50 Dense	HOLE NO. MW-2
		50+ Very Dense	
		Cohesive Consistency	
		0-4 Soft 30+ Hard	
		4-8 M/Stiff	
		8-15 Stiff	
		15-30 V-Stiff	

Soils Engineering Inc.

Main St. Charlestown, NH 03603

SHEET 1 OF 1
 DATE 12/22/93
 HOLE NO. MW-3
 LINE & STA.
 OFFSET

TO WAGNER, HEINDEL & NOYES ADDRESS BURLINGTON, VT
 PROJECT NAME OTTER VALLEY UNION H.S. LOCATION BRANDON, VT
 REPORT SENT TO CHRISTINE MASSEY PROJ. NO.
 SAMPLE SENT TO RET. BY WAGNER, HEINDEL & NOYES OUR JOB NO. 5926-93

GROUND WATER OBSERVATIONS		Type	CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT 14'2"	AT 3 HOURS		HSA	SS		DATE STARTED 12/22/93
		Size I. D.	4 1/4"	1 1/2"		DATE COMPL. 12/22/93
		Hammer Wt.		140#	BIT	BORING FORMAN M.D. & R.H.
AT	AT HOURS	Hammer Fall		30"		INSPECTOR C. MASSEY
						SOILS ENGR.

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness. Drilling time, seams and ect.	SAMPLE		
				From 0-6	6-12	To 12-18				NO.	PEN	REC
5'		4'6" - 6'6"	SS	2	4			LOOSE DARK BROWN SILT, CLAY AND FINE SAND				
				5	5			OLD GROUND	1	24"	24"	
								SILTY FINE SAND				
10'		10' - 12'	SS	3	6			MED. DENSE BROWN FINE SAND				
				8	7				2	24"	24"	
		12' - 14'	SS	7	6			BROWN FINE SAND AND LAYERS OF SILT AND SAND	3	24"	20"	
15'				7	7							
								MED. DENSE GREYISH BROWN FINE TO MED. FINE SAND - SLIGHT ODOR OF OLD GAS				
20'												
								INSTALLED 2" PVC MONITORING WELL AT 19'				
								SLOTTED FROM 9'-19' FILTER SAND TO 7' BENTONITE SEAL FROM 5'6"-7'				
								MATERIALS USED: 25# OF BENTONITE CHIPS 175# OF SAND 40# OF CEMENT MIX				

GROUND SURFACE TO 19'

USED HSA CASING THEN

Sample Type	Proportions Used	140 lb. wt. x 30" - fall an 2" O.D. Sampler	summary
0-Dry C-Cored W-Washed	trace 0 to 10%	Cohesionless Density	EARTH BORING 19'
UP-Unfinished Piston	little 10 to 20%	0-10 Loose	ROCK CORING
TP-Test Pit A-Auger V-Vane Test	some 20 to 35%	10-30 Med. Dense	SAMPLES 3
UT-Undisturbed Thinwall	and 35 to 50%	30-50 Dense	HOLE NO. MW-3
		50+ Very Dense	
		Cohesive Consistency	
		0-4 Soft 30 + Hard	
		4-8 M/Stiff	
		8-15 Stiff	
		15-30 V-Stiff	

Soils Engineering Inc.

Main St. Charlestown, NH 03603

SHEET 1 OF 1
 DATE 12/22/93
 HOLE NO. MW-4
 LINE & STA.
 OFFSET

TO WAGNER, HEINDEL & NOYES ADDRESS BURLINGTON, VT
 PROJECT NAME OTTER VALLEY UNION H.S. LOCATION BRANDON, VT
 REPORT SENT TO CHRISTINE MASSEY PROJ. NO.
 SAMPLE SENT TO RET. BY WAGNER, HEINDEL & NOYES OUR JOB NO. 5926-93

GROUND WATER OBSERVATIONS		Type HSA SS	CASING HSA	SAMPLER SS	CORE BAR	SURFACE ELEV.
AT 13'6"	AT 1 HOURS					DATE STARTED 12/22/93
AT _____ AT _____ HOURS		Size I. D. 4 1/4"	1 1/2"			DATE COMPL. 12/22/93
		Hammer Wt.	140#		BIT	BORING FORMAN M.D. & R.H.
		Hammer Fall	30"			INSPECTOR C. MASSEY
						SOILS ENGR.

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 5" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness. Drilling time, seams and ect.	SAMPLE		
				From 0-6	6-12	To 12-18				NO	PEN	REC
5'		0' - 2'	SS	4	6				1	24"	20"	
				4	4			BROWN SAND AND SILT - TRACES OF ROOTS AND OTHER ORGANICS (FILL)				
		5' - 7'	SS	8	10				2	24"	24"	
				11	8							
10'		10' - 12'	SS	6	8				3	24"	24"	
				8	8							
		12' - 14'	SS	7	8			MED. DENSE BROWN FINE TO MED. FINE SAND - OCCASIONAL SILT LAYER	4	24"	18"	
				9	9							
15'		14' - 16'	SS	8	7				5	24"	18"	
				6	7			1" BLACK STAINED LAYER AT 15' (GAS ODOR)				
20'												
								INSTALLED 2" PVC WELL AT 20'11" SLOTTED FROM 10'11"-20'11" FILTER SAND TO 8' BENTONITE SEAL FROM 6'-8'				
								MATERIALS USED: 25# OF BENTONITE CHIPS 175# OF SAND 40# OF CEMENT MIX				

GROUND SURFACE TO 20'

USED HSA CASING THEN

Sample Type
 D-Dry C-Cored W-Washed
 UP-Unfinished Piston
 TP-Test Pit A-Auger V-Vane Test
 UT-Undisturbed Thinwall

Proportions Used
 trace 0 to 10%
 little 10 to 20%
 some 20 to 35%
 and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
 Cohesionless Density
 0-10 Loose
 10-30 Med. Dense
 30-50 Dense
 50+ Very Dense
 Cohesive Consistency
 0-4 Soft
 4-8 M/Stiff
 8-15 Stiff
 15-30 V-Stiff

summary
 EARTH BORING 20'
 ROCK CORING
 SAMPLES 5
 HOLE NO. MW-4

Soils Engineering Inc.

Main St. Charlestown, NH 03603

TO WAGNER, HEINDEL & NOYES ADDRESS BURLINGTON, VT
 PROJECT NAME OTTER VALLEY UNION H.S. LOCATION BRANDON, VT
 REPORT SENT TO CHRISTINE MASSEY PROJ. NO. _____
 SAMPLE SENT TO RET BY WAGNER, HEINDEL & NOYES OUR JOB NO. 5926-93

SHEET 1 OF 1
 DATE 12/21/93
 HOLE NO. SV-A
 LINE & STA. _____
 OFFSET _____

GROUND WATER OBSERVATIONS		Type	CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT <u>9'8"</u>	AT <u>IMMEDIATELY</u> HOURS		FA	SS		DATE STARTED <u>12/21/93</u>
		Size I. D.		<u>1 1/2"</u>		DATE COMPL. <u>12/21/93</u>
		Hammer Wt.		<u>140#</u>	BIT	BORING FORMAN <u>M.D. & R.H.</u>
AT _____ AT _____ HOURS		Hammer Fall		<u>30"</u>		INSPECTOR <u>C. MASSEY</u>
						SOILS ENGR. _____

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, Drilling time, seams and ect.	SAMPLE			
				From 0-6	6-12	To 12-18				NO	PEN	REC	
		0' - 2'	SS	7	4			8"	FROZEN DARK BROWN LOAMY TOPSOIL	1	24"	12"	
				6	8								
5'		5' - 7'	SS	7	9			5'6"	MED. DENSE LIGHT BROWN SANDY SILTS	2	24"	18"	
				9	12								
10'		10' - 12'	SS	6	9			12'	MED. DENSE BROWN FINE SAND - TRACES OF GRAVELS	3	24"	24"	
				12	14								
15'													

GROUND SURFACE TO 12' USED FA CASING THEN DROVE SS 24"

<p>Sample Type</p> <p>D-Dry C-Cored W-Washed</p> <p>UP-Unfinished Piston</p> <p>TP-Test Pit A-Auger V-Vane Test</p> <p>UT-Undisturbed Thinwall</p>	<p>Proportions Used</p> <p>trace 0 to 10%</p> <p>little 10 to 20%</p> <p>some 20 to 35%</p> <p>and 35 to 50%</p>	<p>140 lb. wt. x 30"-fall an 2" O.D. Sampler</p> <p>Cohesionless Density</p> <p>0-10 Loose</p> <p>10-30 Med. Dense</p> <p>30-50 Dense</p> <p>50+ Very Dense</p>	<p>Cohesive Consistency</p> <p>0-4 Soft 30 + Hard</p> <p>4-8 M/Stiff</p> <p>8-15 Stiff</p> <p>15-30 V-Stiff</p>	<p>summary</p> <p>EARTH BORING <u>12'</u></p> <p>ROCK CORING _____</p> <p>SAMPLES <u>3</u></p> <p>HOLE NO. <u>SV-A</u></p>
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Soils Engineering Inc.

Main St. Charlestown, NH 03603

TO WAGNER, HEINDEL & NOYES ADDRESS BURLINGTON, VT
 PROJECT NAME OTTER VALLEY UNION H.S. LOCATION BRANDON, VT
 REPORT SENT TO CHRISTINE MASSEY PROJ. NO. _____
 SAMPLE SENT TO RET. BY WAGNER, HEINDEL & NOYES OUR JOB NO. 5926-93

SHEET 1 OF 1
 DATE 12/21/93
 HOLE NO. SV-B
 LINE & STA. _____
 OFFSET _____

GROUND WATER OBSERVATIONS		Type FA SS	CASING 1 1/2"	SAMPLER 140#	CORE BAR BIT	SURFACE ELEV.	
AT <u>12:5</u> "	AT _____ HOURS					DATE STARTED <u>12/21/93</u>	DATE COMPL. <u>12/21/93</u>
AT _____	AT _____ HOURS	Hammer Wt. _____	Hammer Fall _____	BORING FORMAN <u>M.D. & R.H.</u>		INSPECTOR <u>C. MASSEY</u>	
						SOILS ENGR. _____	

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION <small>Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, Drilling time, seams and ect.</small>	SAMPLE		
				From 0-6	6-12	To 12-18				NO	PEN	REC
5'		0' - 2'	SS	5	5			6"	SILTY TOPSOIL	1	24"	12"
				5	8				MED. DENSE BROWN MED. FINE SAND - FILL			
		5' - 7'	SS	2	4			4"		2	24"	24"
		7' - 9'	SS	6	6			7"	LOOSE LAYERS OF SILT AND FINE SAND	3	24"	18"
		9' - 11'	SS	7	9				MED. DENSE BROWN FINE SAND	4	24"	17"
10'		11' - 13'	SS	9	11				LAYER OF SILTY FINE SAND FROM 9'6" - 10'6"	5	24"	24"
				11	13			13'	BROWN FINE SAND			
15'												

GROUND SURFACE TO 13'

USED FA _____ CASING THEN DROVE SS 24"

Sample Type
 D-Dry C-Cored W-Washed
 UP-Unfinished Piston
 TP-Test Pit A-Auger V-Vane Test
 UT-Undisturbed Thinwall

Proportions Used
 trace 0 to 10%
 little 10 to 20%
 some 20 to 35%
 and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
 Cohesionless Density
 0-10 Loose
 10-30 Med. Dense
 30-50 Dense
 50+ Very Dense
 Cohesive Consistency
 0-4 Soft 30 + Hard
 4-8 M/Stiff
 8-15 Stiff
 15-30 V-Stiff

summary
 EARTH BORING 13'
 ROCK CORING _____
 SAMPLES 5
 HOLE NO. SV-B

Soils Engineering Inc.

Main St. Charlestown, NH 03603

SHEET 1 OF 1
 DATE 12/21/93
 HOLE NO. SV-C
 LINE & STA.
 OFFSET

13

TO WAGNER, HEINDEL & NOYES ADDRESS BURLINGTON, VT
 PROJECT NAME OTTER VALLEY UNION H.S. LOCATION BRANDON, VT
 REPORT SENT TO CHRISTINE MASSEY PROJ. NO.
 SAMPLE SENT TO RET. BY WAGNER, HEINDEL & NOYES OUR JOB NO. 5926-93

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT 13'	AT _____ HOURS	Type	FA	SS	DATE STARTED 12/21/93
		Size I. D.		1 1/2"	DATE COMPL. 12/21/93
		Hammer Wt.		140*	BORING FORMAN M.D. & R.H.
		Hammer Fall		30"	INSPECTOR C. MASSEY
					SOILS ENGR.

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, drilling time, seams and etc.	SAMPLE		
				From 0-6	6-12	To 12-18				NO.	PEN	REC
5'		0' - 2'	SS	3	2			1'	SILTY TOPSOIL	1	24"	24"
				4	3				BROWN FINE SAND WITH OCCASIONAL THIN SILT LAYER			
		4'6" - 6'6"	SS	6	6				MED. DENSE BROWN FINE SAND SANDY SILT LAYER FROM 5' - 6'	2	24"	24"
				5	5							
10'		9'6" - 11'6"	SS	7	9				BROWN FINE SAND	3	24"	15"
				10	12							
		11' - 13'6"	SS	11	9			13'6"		4	24"	24"
				8	9							
15'												

GROUND SURFACE TO 13'6"

USED FA CASING THEN DROVE SS 24"

Sample Type
 D-Dry C-Cored W-Washed
 UP-Unfinished Piston
 TP-Test Pit A-Auger V-Vane Test
 UT-Undisturbed Thinwall

Proportions Used
 trace 0 to 10%
 little 10 to 20%
 some 20 to 35%
 and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
 Cohesionless Density
 0-10 Loose
 10-30 Med. Dense
 30-50 Dense
 50+ Very Dense
 Cohesive Consistency
 0-4 Soft 30+ Hard
 4-8 M/Stiff
 8-15 Stiff
 15-30 V-stiff

summary
 EARTH BORING 13'6"
 ROCK CORING
 SAMPLES 4
 HOLE NO. SV-C

Soils Engineering Inc.

Main St. Charlestown, NH 03603

TO WAGNER, HEINDEL & NOYES ADDRESS BURLINGTON, VT
 PROJECT NAME OTTER VALLEY UNION H.S. LOCATION BRANDON, VT
 REPORT SENT TO CHRISTINE MASSEY PROJ. NO. _____
 SAMPLE SENT TO RET. BY WAGNER, HEINDEL & NOYES OUR JOB NO. 5926-93

SHEET 1 OF 1
 DATE 12/21/93
 HOLE NO. SV-D
 LINE & STA. _____
 OFFSET _____

GROUND WATER OBSERVATIONS		Type	CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT <u>12'8"</u>	AT _____ HOURS		FA	SS		DATE STARTED <u>12/21/93</u>
AT _____	AT _____ HOURS	Size I. D.		<u>1 1/2"</u>		DATE COMPL. <u>12/21/93</u>
		Hammer Wt.		<u>140*</u>	BIT	BORING FORMAN <u>M.D. & R.H.</u>
		Hammer Fall		<u>30"</u>		INSPECTOR <u>C. MASSEY</u>
						SOILS ENGR. _____

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond, hardness Drilling time, seams and ect	SAMPLE		
				From 0-6	6-12	To 12-18				NO	PEN	REC
		0' - 2'	SS	5	8			1'	BROWN SILTY FINE SAND	1	24"	24"
				8	8							
5'		5' - 7'	SS	3	5			8' +/-	MED. DENSE LAYERS OF FINE SAND AND SILT (FILL)	2	24"	24"
				5	5							
10'		9'6" - 11'6"	SS	7	8			8' +/-	MED. DENSE OLIVE BROWN LAYER OF SILT AND SAND FROM 9'6" - 10'6" SLIGHT ODOR OF GAS AT 11'6" BROWN FINE SAND	3	24"	24"
		11' - 13'6"	SS	6	7					4	24"	24"
				7	7			13'6"	STRONG ODOR OF GAS AT 13'6"			

GROUND SURFACE TO 13'6"

USED FA CASING THEN DROVE SS 24"

Sample Type
 D-Dry C-Cored W-Washed
 UP-Unfinished Piston
 TP-Test Pit A-Auger V-Vane Test
 UT-Undisturbed Thinwall

Proportions Used
 trace 0 to 10%
 little 10 to 20%
 some 20 to 35%
 and 35 to 50%

140 lb. wt. x 30"-fall an 2" O.D. Sampler
 Cohesionless Density
 0-10 Loose
 10-30 Med. Dense
 30-50 Dense
 50+ Very Dense
 Cohesive Consistency
 0-4 Soft 30 + Hard
 4-8 M/Stiff
 8-15 Stiff
 15-30 V-Stiff

summary
 EARTH BORING 13'6"
 ROCK CORING _____
 SAMPLES 4
 HOLE NO. SV-D

Soils Engineering Inc.

Main St. Charlestown, NH 03603

TO WAGNER, HEINDEL & NOYES ADDRESS BURLINGTON, VT
 PROJECT NAME OTTER VALLEY UNION H.S. LOCATION BRANDON, VT
 REPORT SENT TO CHRISTINE MASSEY PROJ. NO. _____
 SAMPLE SENT TO RET. BY WAGNER, HEINDEL & NOYES OUR JOB NO. 5926-93

SHEET 1 OF 1
 DATE 12/21/93
 HOLE NO. SV-E
 LINE & STA. _____
 OFFSET _____

GROUND WATER OBSERVATIONS		Type Size I. D. Hammer Wt. Hammer Fall	CASING	SAMPLER	CORE BAR	SURFACE ELEV.
AT <u>13'6"</u>	AT _____ HOURS		FA	SS		DATE STARTED <u>12/21/93</u>
AT _____	AT _____ HOURS				DATE COMPL. <u>12/21/93</u>	
				BIT	BORING FORMAN <u>M.D. & R.H.</u>	
					INSPECTOR <u>C. MASSEY</u>	
					SOILS ENGR. _____	

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness, Drilling time, seams and ect.	SAMPLE		
				From 0-5	6-12	To 12-18				NO.	PEN	REC
5'		0' - 2'	SS	1	1				1	24"	18"	
				1	1			LOOSE BROWN FINE SAND WITH WOOD (FILL)				
		4'6" - 6'6"	SS	2	3			BROWN FINE SANDS AND SILT (FILL)	2	24"	20"	
				5	7			ROOTS (FILL)				
10'		9'6" - 11'6"	SS	5	6			9' OLD GROUND	3	24"	24"	
				6	7			10' MED. DENSE LIGHT BROWN SILTS				
		11' - 13'6"	SS	8	9			BROWN FINE SAND	4	24"	24"	
				9	8			BROWN SILTY FINE SAND FROM 11'6"-12'6"				
15'		13'6" - 15'6"	SS	3	5			15'6" GREY SILTY FINE SAND FROM 12'6"-13'6" (SEPTIC ODOR)	5	24"	18"	
				3	4			GREY MED. FINE SAND FROM 13'6"-15'6" (STRONG GAS ODOR)				

GROUND SURFACE TO 15'6" USED FA CASING THEN DROVE SS 24"

140 lb. wt. x 30"-fall an 2" O.D. Sampler

Sample Type	Proportions Used	Cohesionless Density	Cohensive Consistency	summary
D-Dry C-Cored W-Washed	trace 0 to 10%	0-10 Loose	0-4 Soft 30 + Hard	EARTH BORING <u>15'6"</u>
UP-Unfinished Piston	little 10 to 20%	10-30 Med. Dense	4-8 M/Stiff	ROCK CORING _____
TP-Test Pit A-Augur V-Vane Test	some 20 to 35%	30-50 Dense	8-15 Stiff	SAMPLES <u>5</u>
UT-Undisturbed Thinwall	and 35 to 50%	50+ Very Dense	15-30 V-Stiff	HOLE NO. <u>SV-E</u>

Soils Engineering Inc.

Main St. Charlestown, NH 03603

TO WAGNER, HEINDEL & NOYES ADDRESS BURLINGTON, VT
 PROJECT NAME OTTER VALLEY UNION H.S. LOCATION BRANDON, VT
 REPORT SENT TO CHRISTINE MASSEY PROJ. NO. _____
 SAMPLE SENT TO RET. BY WAGNER, HEINDEL & NOYES OUR JOB NO. 5926-93

SHEET 1 OF 1
 DATE 12/22/93
 HOLE NO. SV-F
 LINE & STA. _____
 OFFSET _____

GROUND WATER OBSERVATIONS		CASING		SAMPLER		CORE BAR		SURFACE ELEV.	
AT <u>12:6</u>	AT <u>IMMEDIATELY</u>	HOURS	Type	<u>FA</u>	<u>SS</u>			DATE STARTED	<u>12/22/93</u>
			Size I. D.		<u>1 1/2"</u>			DATE COMPL.	<u>12/22/93</u>
			Hammer Wt.		<u>140#</u>	<u>8 BIT</u>		BORING FORMAN	<u>M.D. & R.H.</u>
AT _____	AT _____	HOURS	Hammer Fall		<u>30'</u>			INSPECTOR	<u>C. MASSEY</u>
								SOILS ENGR.	

LOCATION OF BORING

Depth	CASING BLOWS PER FOOT	SAMPLE DEPTHS FROM-TO	TYPE OF SAMPLE	Blows per 6" on sampler			MOISTURE DENSITY OF CONSTANT	STRATA CHANGE ELEV.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, cond., hardness. Drilling time, seams and ect.	SAMPLE		
				From 0-6	6-12	To 12-18				NO	PEN	REC
5'		0' - 2'	SS	3	7			3"	SOD	1	24"	15"
				6	8							
		4'6" - 6'6"	SS	8	8			5'	MED. DENSE BROWN CLAYEY SILTS	2	24"	20"
10'				11	8							
		9'6" - 11'6"	SS	3	3				GREYISH BROWN FINE SAND.			
		11'6" - 13'6"	SS	8	6				MED. DENSE SAME MATERIAL WITH 4" SILT LAYER AT 10'6"	3	24"	24"
15'				11	12					4	24"	24"
		13'6" - 15'6"	SS	10	11			15'6"	SAME MATERIAL	5	24"	24"
				14	15							
20'												

GROUND SURFACE TO 15'6" USED FA CASING THEN DROVE SS 24"

Sample Type D-Dry C-Cored W-Washed UP-Unfinished Piston TP-Test Pit A-Auger V-Vane Test UT-Undisturbed Thinwall	Proportions Used trace 0 to 10% little 10 to 20% some 20 to 35% and 35 to 50%	140 lb. wt. x 30"-fall an 2" O.D. Sampler Cohesionless Density 0-10 Loose 10-30 Med. Dense 30-50 Dense 50+ Very Dense		Cohesive Consistency 0-4 Soft 30 + Hard 4-8 M/Stiff 8-15 Stiff 15-30 V-Stiff		Summary EARTH BORING <u>15'6"</u> ROCK CORING _____ SAMPLES <u>5</u> HOLE NO. <u>SV-F</u>
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OTTER VALLEY UNION HIGH SCHOOL, BRANDON, VT
 MONITORING WELL INSTALLATION, DEC. 21-22, 1993

SOIL VAPOR PID/FID LOG C.A.MASSEY/WH&N
 PID=Photo Ionization Detector, HNU with 10.2 eV lamp; FID=Flame Ionization Detector

SOIL VAPOR BORING #	SAMPLE INTERVAL (FEET)	PID READING (PPM)	PID BACKGROUND (PPM)	FID READING (PPM)	FID BACKGROUND (PPM)
Monitoring Well #1	0-2	0.5	0.4	4.3	3.6
	10-12	0.7	0.4	5.5	3.6
	15-17	38	0.4	9.3	3.6
A	0-1	3	0.4	5	3.6
	5-7	0.7	0.4	5.2	3.2
	10-12	2	0.4	9.2	3.4
B	0-2	0.6	0.4	5.2	3
	5-7	2	0.4	5.5	3
	7-9	8	0.4	5.8	3
	9-11	8	0.4	5.6	2.9
	11-13	16	0.4	6	3
	13-15	13	0.4	8	2.9
C	0-2	1.2 to neg.	0.4	6.8	2.9
	4.5-6.5	2	0.4	7.2	2.9
	9.5-11.5	1.6	0.4	7.8	2.9
	11.5-13.5	5	0.4	40	2.9
D	0-2	2.4	0.4	7.3	3.2
	5-7	2	0.4	7.2	3.2
	9.5-11.5	84	0.4	290	2.9
	11.5-13.5	160	0.4	>1000	3.1
E	0-2	1.6	0.4	6.7	3.5
	5-7	1.6	0.4	6.5	2.9
	9.5-11.5	1.8	0.4	6.5	3
	11.5-13.5	40	0.4	340	3
	13.5-15.5	130	0.4	>1000	5
Monitoring Well #2	5-7	1.0 to neg.	0.4	6.8	3.4
	9.5-11.5	1.2	0.4	5.2	3.3
	11.5-13.5	1.3	0.4	6.8	3.3
Monitoring Well #3	4.5-6.5	1	0.4	7.4	3.2
	10-12	1.4 to neg.	0.4	7.9	3.3
	12-14	4.8	0.4	33	3.2

OTTER VALLEY UNION HIGH SCHOOL, BRANDON, VT
MONITORING WELL INSTALLATION, DEC. 21-22, 1993

SOIL VAPOR PID/FID LOG C.A.MASSEY/WH&N
PID=Photo Ionization Detector, HNU with 10.2 eV lamp; FID=Flame Ionization Detector

SOIL VAPOR BORING #	SAMPLE INTERVAL (FEET)	PID READING (PPM)	PID BACKGROUND (PPM)	FID READING (PPM)	FID BACKGROUND (PPM)
Monitoring Well #4	0-2	1.8	0.4	9	3.6
	5-7	1.6	0.4	7.5	3.5
	10-12	17	0.4	89	3.6
	12-14	11	0.4	66	3.6
	14-16	140	0.4	>1000	3.6
F	0-2	1.4	0.4	2.5	2.4
	4.5-6.5	2.2	0.4	5.2	2.4
	9.5-11.5	2	0.4	4	2.4
	11.5-13.5	2.2	0.4	5.8	2.1
	13.5-15.5	2.2 to neg.	0.4	10	1.5

4/26/94

Department of Environmental Conservation Laboratory
Method 8240 - Volatile Organics in Water

GJD

Lab Id: 6933 Report To: m.roy
Location: mw 1

Phone: 241-3888 Date Collected: 4/12/94
Program: 41 1344 Chain of Custody? No

Notes:

Date Analyzed: 4/15/94 Over hold? No Dilution factor: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Vinyl chloride	10	N.D.				
Chloromethane	10	N.D.				
Bromomethane	10	N.D.				
Chloroethane	10	N.D.				
Trichlorofluoromethane	10	N.D.				
Acetone	100	N.D.				
1,1-Dichloroethene	5	N.D.				
Carbon disulfide	100	N.D.				
Methylene chloride	5	N.D.				
Methyl-t-butylether (MTBE)	10	N.D.				
1,2-Dichloroethene	5	N.D.				
1,1-Dichloroethane	5	N.D.				
Vinyl acetate	50	N.D.				
2-Butanone	100	N.D.				
Chloroform	5	N.D.				
1,1,1-Trichloroethane	5	N.D.				
Carbon tetrachloride	5	N.D.				
Benzene	5	N.D.				
1,2-Dichloroethane	5	N.D.				
Trichloroethene	5	N.D.				
1,2-Dichloropropane	5	N.D.				
Bromodichloromethane	5	N.D.				
4-Methyl-2-pentanone	50	N.D.				
cis-1,2-Dichloropropene	5	N.D.				
Toluene	5	N.D.				
trans-1,3-Dichloropropene	5	N.D.				
1,1,2-Trichloroethane	5	N.D.				
2-Hexanone	50	N.D.				
Tetrachloroethene	5	N.D.				
Dibromochloromethane	5	N.D.				
Chlorobenzene	5	N.D.				
Ethylbenzene	5	N.D.				
Xylenes	5	N.D.				
Styrene	5	N.D.				
Bromoform	5	N.D.				
1,1,2,2-Tetrachloroethane	5	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

1,2-Dichloroethane-D4	92%	D8-Toluene	94%	4-Bromofluorobenzene	96%
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Notes: Capillary column used with EPA approval.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

APR 29 1994 20

4/26/94

Department of Environmental Conservation Laboratory
Method 8240 - Volatile Organics in Water

GJD

Lab Id: 6934 Report To: m.roy
Location: mw 2

Phone: 241-3888 Date Collected: 4/12/94
Program: 41 1344 Chain of Custody? No

Notes:

Date Analyzed: 4/15/94 Over hold? No Dilution factor: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Vinyl chloride	10	N.D.				
Chloromethane	10	N.D.				
Bromomethane	10	N.D.				
Chloroethane	10	N.D.				
Trichlorofluoromethane	10	N.D.				
Acetone	100	N.D.				
1,1-Dichloroethene	5	N.D.				
Carbon disulfide	100	N.D.				
Methylene chloride	5	N.D.				
Methyl-t-butylether (MTBE)	10	N.D.				
1,2-Dichloroethene	5	N.D.				
1,1-Dichloroethane	5	N.D.				
Vinyl acetate	50	N.D.				
2-Butanone	100	N.D.				
Chloroform	5	N.D.				
1,1,1-Trichloroethane	5	N.D.				
Carbon tetrachloride	5	N.D.				
Benzene	5	N.D.				
1,2-Dichloroethane	5	N.D.				
Trichloroethene	5	N.D.				
1,2-Dichloropropane	5	N.D.				
Bromodichloromethane	5	N.D.				
4-Methyl-2-pentanone	50	N.D.				
cis-1,2-Dichloropropene	5	N.D.				
Toluene	5	N.D.				
trans-1,3-Dichloropropene	5	N.D.				
1,1,2-Trichloroethane	5	N.D.				
2-Hexanone	50	N.D.				
Tetrachloroethene	5	N.D.				
Dibromochloromethane	5	N.D.				
Chlorobenzene	5	N.D.				
Ethylbenzene	5	N.D.				
Xylenes	5	N.D.				
Styrene	5	N.D.				
Bromoform	5	N.D.				
1,1,2,2-Tetrachloroethane	5	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

1,2-Dichloroethane-D4	92%	D8-Toluene	94%	4-Bromofluorobenzene	96%
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Notes: Capillary column used with EPA approval.

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4/26/94

Department of Environmental Conservation Laboratory
Method 8240 - Volatile Organics in Water

GJD

Lab Id: 6935 Report To: m.roy
Location: mw 3

Phone: 241-3888 Date Collected: 4/12/94
Program: 41 1344 Chain of Custody? No

Notes:

Date Analyzed: 4/15/94 Over hold? No Dilution factor: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Vinyl chloride	10	N.D.				
Chloromethane	10	N.D.				
Bromomethane	10	N.D.				
Chloroethane	10	N.D.				
Trichlorofluoromethane	10	N.D.				
Acetone	100	N.D.				
1,1-Dichloroethene	5	N.D.				
Carbon disulfide	100	N.D.				
Methylene chloride	5	N.D.				
Methyl-t-butylether (MTBE)	10	25				
1,2-Dichloroethene	5	N.D.				
1,1-Dichloroethane	5	N.D.				
Vinyl acetate	50	N.D.				
2-Butanone	100	N.D.				
Chloroform	5	N.D.				
1,1,1-Trichloroethane	5	N.D.				
Carbon tetrachloride	5	N.D.				
Benzene	5	67				
1,2-Dichloroethane	5	N.D.				
Trichloroethene	5	N.D.				
1,2-Dichloropropane	5	N.D.				
Bromodichloromethane	5	N.D.				
4-Methyl-2-pentanone	50	N.D.				
cis-1,2-Dichloropropene	5	N.D.				
Toluene	5	28				
trans-1,3-Dichloropropene	5	N.D.				
1,1,2-Trichloroethane	5	N.D.				
2-Hexanone	50	N.D.				
Tetrachloroethene	5	N.D.				
Dibromochloromethane	5	N.D.				
Chlorobenzene	5	N.D.				
Ethylbenzene	5	40				
Xylenes	5	61				
Styrene	5	N.D.				
Bromoform	5	N.D.				
1,1,2,2-Tetrachloroethane	5	N.D.				
Total Volatile Hydrocarbons	100	3560	E			

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

1,2-Dichloroethane-D4 90% D8-Toluene 94% 4-Bromofluorobenzene . 94%

Notes: Capillary column used with EPA approval.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

APR 29 1994

4/26/94

Department of Environmental Conservation Laboratory
Method 8240 - Volatile Organics in Water

GJD 22

Lab Id: 6936 Report To: m.roy
Location: mw 4

Phone: 241-3888 Date Collected: 4/12/94
Program: 41 1344 Chain of Custody? No

Notes:

Date Analyzed: 4/21/94 Over hold? No Dilution factor: 5

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Vinyl chloride	50	N.D.				
Chloromethane	50	N.D.				
Bromomethane	50	N.D.				
Chloroethane	50	N.D.				
Trichlorofluoromethane	50	N.D.				
Acetone	500	N.D.				
1,1-Dichloroethene	25	N.D.				
Carbon disulfide	500	N.D.				
Methylene chloride	25	N.D.				
Methyl-t-butylether (MTBE)	50	N.D.				
1,2-Dichloroethene	25	N.D.				
1,1-Dichloroethane	25	N.D.				
Vinyl acetate	250	N.D.				
2-Butanone	500	N.D.				
Chloroform	25	N.D.				
1,1,1-Trichloroethane	25	N.D.				
Carbon tetrachloride	25	N.D.				
Benzene	25	45				
1,2-Dichloroethane	25	N.D.				
Trichloroethene	25	N.D.				
1,2-Dichloropropane	25	N.D.				
Bromodichloromethane	25	N.D.				
4-Methyl-2-pentanone	250	N.D.				
cis-1,2-Dichloropropene	25	N.D.				
Toluene	25	505				
trans-1,3-Dichloropropene	25	N.D.				
1,1,2-Trichloroethane	25	N.D.				
2-Hexanone	250	N.D.				
Tetrachloroethene	25	N.D.				
Dibromochloromethane	25	N.D.				
Chlorobenzene	25	N.D.				
Ethylbenzene	25	70				
Xylenes	25	460				
Styrene	25	N.D.				
Bromoform	25	N.D.				
1,1,2,2-Tetrachloroethane	25	N.D.				
Total Volatile Hydrocarbons	500	5860	E			

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

1,2-Dichloroethane-D4	96%	D8-Toluene	92%	4-Bromofluorobenzene .	100%
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Notes: Capillary column used with EPA approval.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

APR 29 1994

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4/26/94

Department of Environmental Conservation Laboratory
Method 8240 - Volatile Organics in Water

GJD

Lab Id: 6937
Location: SW

Report To: m.roy

Phone: 241-3888
Program: 41 1344

Date Collected: 4/12/94

Chain of Custody? No

Notes:

Date Analyzed: 4/21/94 Over hold? No Dilution factor: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Vinyl chloride	10	N.D.				
Chloromethane	10	N.D.				
Bromomethane	10	N.D.				
Chloroethane	10	N.D.				
Trichlorofluoromethane	10	N.D.				
Acetone	100	N.D.				
1,1-Dichloroethene	5	N.D.				
Carbon disulfide	100	N.D.				
Methylene chloride	5	N.D.				
Methyl-t-butylether (MTBE)	10	N.D.				
1,2-Dichloroethene	5	N.D.				
1,1-Dichloroethane	5	N.D.				
Vinyl acetate	50	N.D.				
2-Butanone	100	N.D.				
Chloroform	5	N.D.				
1,1,1-Trichloroethane	5	N.D.				
Carbon tetrachloride	5	N.D.				
Benzene	5	N.D.				
1,2-Dichloroethane	5	N.D.				
Trichloroethene	5	N.D.				
1,2-Dichloropropane	5	N.D.				
Bromodichloromethane	5	N.D.				
4-Methyl-2-pentanone	50	N.D.				
cis-1,2-Dichloropropene	5	N.D.				
Toluene	5	N.D.				
trans-1,3-Dichloropropene	5	N.D.				
1,1,2-Trichloroethane	5	N.D.				
2-Hexanone	50	N.D.				
Tetrachloroethene	5	N.D.				
Dibromochloromethane	5	N.D.				
Chlorobenzene	5	N.D.				
Ethylbenzene	5	N.D.				
Xylenes	5	N.D.				
Styrene	5	N.D.				
Bromoform	5	N.D.				
1,1,2,2-Tetrachloroethane	5	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

-1,2-Dichloroethane-D4 92% D8-Toluene 98% 4-Bromofluorobenzene . 98%

Notes: Capillary column used with EPA approval.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

2/24/94

Department of Environmental Conservation Laboratory
Method 8240 - Volatile Organics in Water

24
SRL

Lab Id: 6555 Report To: M.ROY
Location: BRANDON TAP

Phone: 241-3888 Date Collected: 2/04/94
Program: 41 1344 Chain of Custody? No

Notes:

Date Analyzed: 2/09/94 Over hold? No Dilution factor: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Vinyl chloride	10	N.D.				
Chloromethane	10	N.D.				
Bromomethane	10	N.D.				
Chloroethane	10	N.D.				
Trichlorofluoromethane	10	N.D.				
Acetone	100	N.D.				
1,1-Dichloroethene	5	N.D.				
Carbon disulfide	100	N.D.				
Methylene chloride	5	N.D.				
Methyl-t-butylether (MTBE)	10	N.D.				
1,2-Dichloroethene	5	N.D.				
1,1-Dichloroethane	5	N.D.				
Vinyl acetate	50	N.D.				
2-Butanone	100	N.D.				
Chloroform	5	N.D.				
1,1,1-Trichloroethane	5	N.D.				
Carbon tetrachloride	5	N.D.				
Benzene	5	N.D.				
1,2-Dichloroethane	5	N.D.				
Trichloroethene	5	N.D.				
1,2-Dichloropropane	5	N.D.				
Bromodichloromethane	5	N.D.				
4-Methyl-2-pentanone	50	N.D.				
cis-1,2-Dichloropropene	5	N.D.				
Toluene	5	N.D.				
trans-1,3-Dichloropropene	5	N.D.				
1,1,2-Trichloroethane	5	N.D.				
2-Hexanone	50	N.D.				
Tetrachloroethene	5	N.D.				
Dibromochloromethane	5	N.D.				
Chlorobenzene	5	N.D.				
Ethylbenzene	5	N.D.				
Xylenes	5	N.D.				
Styrene	5	N.D.				
Bromoform	5	N.D.				
1,1,2,2-Tetrachloroethane	5	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

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HAZARDOUS MATERIALS
MANAGEMENT DIVISION

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

1,2-Dichloroethane-D4 102% D8-Toluene 106% 4-Bromofluorobenzene . 102%

Notes: Capillary column used with EPA approval.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

2/24/94

Department of Environmental Conservation Laboratory
Method 8240 - Volatile Organics in Water

25

SRL

Lab Id: 6554 Report To: M.ROY
Location: BRANDON TB

Phone: 241-3888 Date Collected: 2/04/94
Program: 41 1344 Chain of Custody? No

Notes:

Date Analyzed: 2/09/94 Over hold? No Dilution factor: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Vinyl chloride	10	N.D.				
Chloromethane	10	N.D.				
Bromomethane	10	N.D.				
Chloroethane	10	N.D.				
Trichlorofluoromethane	10	N.D.				
Acetone	100	N.D.				
1,1-Dichloroethene	5	N.D.				
Carbon disulfide	100	N.D.				
Methylene chloride	5	N.D.				
Methyl-t-butylether (MTBE)	10	N.D.				
1,2-Dichloroethene	5	N.D.				
1,1-Dichloroethane	5	N.D.				
Vinyl acetate	50	N.D.				
2-Butanone	100	N.D.				
Chloroform	5	N.D.				
1,1,1-Trichloroethane	5	N.D.				
Carbon tetrachloride	5	N.D.				
Benzene	5	N.D.				
1,2-Dichloroethane	5	N.D.				
Trichloroethene	5	N.D.				
1,2-Dichloropropane	5	N.D.				
Bromodichloromethane	5	N.D.				
4-Methyl-2-pentanone	50	N.D.				
cis-1,2-Dichloropropene	5	N.D.				
Toluene	5	N.D.				
trans-1,3-Dichloropropene	5	N.D.				
1,1,2-Trichloroethane	5	N.D.				
2-Hexanone	50	N.D.				
Tetrachloroethene	5	N.D.				
Dibromochloromethane	5	N.D.				
Chlorobenzene	5	N.D.				
Ethylbenzene	5	N.D.				
Xylenes	5	N.D.				
Styrene	5	N.D.				
Bromoform	5	N.D.				
1,1,2,2-Tetrachloroethane	5	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

HAZARDOUS MATERIALS
MANAGEMENT DIVISION

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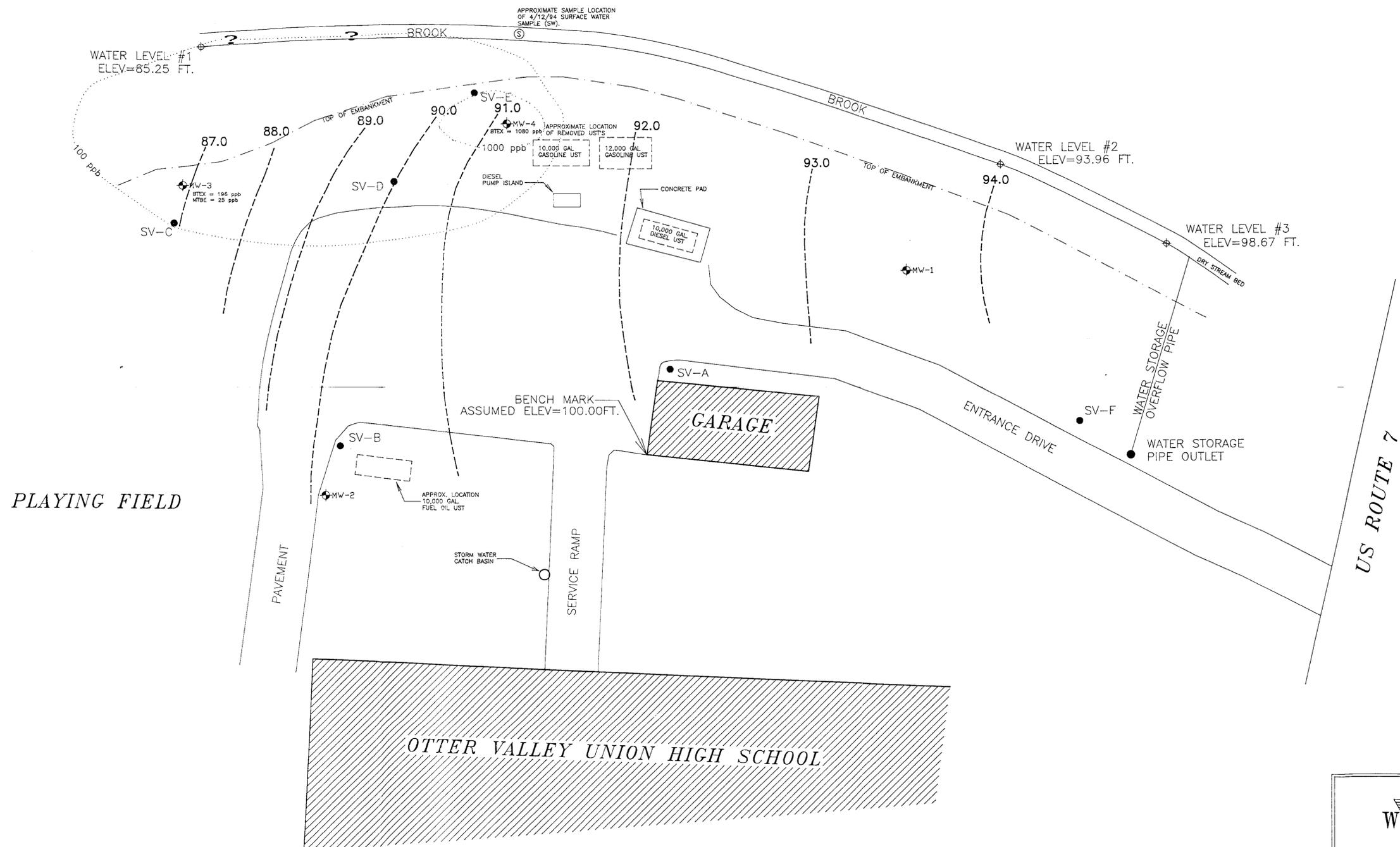
Surrogate Percent Recoveries (S=Surrogate recovery out of range)

1,2-Dichloroethane-D4 98% D8-Toluene 104% 4-Bromofluorobenzene . 102%

Notes: Capillary column used with EPA approval.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

AGRICULTURAL FIELD



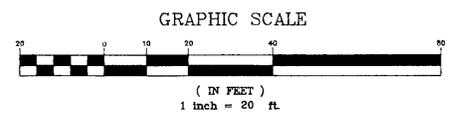
WATER TABLE RESULTS TAKEN 6/24/94

WELL #	T.O.C. ELEV.(FT.)	WATER LEVEL B.T.O.C.(FT.)	WATER TABLE ELEV.(FT.)
MW-1	104.42	10.85	93.57
MW-2	101.35	11.09	90.26
MW-3	102.88	16.00	86.88
MW-4	106.82	15.50	91.32

LEGEND

- MW-1 MONITORING WELL LOCATION
- SV-F SOIL VAPOR BORING (APPROXIMATE LOCATION)
- GROUNDWATER CONTOUR(FT)
- BTEX CONTOUR (ppb)

NOTES
1. SURVEYED BY D.REGAN & C.MASSEY 6/24/94.



<p>Wagner, Heindel, and Noyes, Inc. CONSULTING SCIENTISTS AND ENGINEERS • Hydrogeology • Ecology • • Environmental Engineering • BURLINGTON, VERMONT</p>	<p>OTTER VALLEY UNION HIGH SCHOOL</p>	
	<p>BRANDON,</p>	<p>VERMONT</p>
<p>GROUNDWATER AND CONTAMINANT DISTRIBUTION MAP</p>		
<p>Revisions:</p>		
<p>PROJECT: 93865</p>	<p>DATE: 7/08/94</p>	<p>SCALE: 1"=20'</p>
<p>DRN: MRL</p>	<p>APPD: JEN</p>	