

APR 1 2002

# MARIN

ENVIRONMENTAL

SCIENTISTS  
ENGINEERS  
GIS SPECIALISTS

9 August 1999

Mr. Robert Langlads  
Troy Town School District  
78 Titus Road  
North Troy, VT 05859

1700 HEGEMAN AVENUE  
COLCHESTER VT 05446  
1.802.655.0011  
1.800.520.6065  
FAX 1.802.655.6076

Re: *Initial Site Investigation,  
Troy School, North Troy, VT (VT DEC Site # 98-2476)*

116 CONSUMER SQUARE  
SUITE 174

Dear Mr. Langlads:

Marin Environmental, Inc. (**Marin**) has conducted an initial site investigation (ISI) at the Troy School following the discovery of subsurface petroleum contamination observed during removal and replacement of two in-service #2 fuel oil underground storage tanks (USTs). The investigation was performed in accordance with **Marin's** Work Plan for the site dated 14 December 1998, which was approved by the Vermont Department of Environmental Conservation (VT DEC) on 7 January 1999.

PLATTSBURGH NY 12901  
1.518.566.8297  
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## Summary of Findings and Recommendations

Based on the findings of the analytical test results, **Marin** recommends that no further subsurface investigation is needed on site. The test results indicate that the residual petroleum contamination has not significantly impacted ground water. No sensitive receptors (Troy School Building and Missisquoi River) appear to be at risk. The site and all surrounding buildings are served by a municipal water supply and sewer system.

7 ISLAND DOCK ROAD  
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Photoionization detector (PID) readings of the approximate 70-cubic yard soil stockpile, located at a baseball park owned by Troy Elementary School, ranged from 3.2 to 7.8 parts per million (ppm), and averaged 5.17 ppm. The stockpile was polyencapsulated with 6 mil plastic and enclosed with snow fencing. The soil stockpile should be screened and inspected on a semi-annual basis. Once PID readings have decreased to below one ppm, permission should be sought from the VT DEC to thin-spread the soils in accordance with the VT DEC guidelines. The next inspection of the soil stockpile should be conducted in April 2000.

600 CHARLTON STREET  
SOUTHBRIDGE MA 01550  
1.508.764.8755  
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114 SOUTH STATE STREET  
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### **Site Background**

The Troy Elementary School is located off of Vermont Route 105 (Main Street) in North Troy, Vermont (Figure 1). The school occupies a one-story building and has no basement.

Evidence of a petroleum release at the site was discovered on 27 July 1998, during the closure and removal of two fuel oil USTs. UST #1 was a 10,000-gallon, single-walled steel tank and was located approximately 24 feet north of the school. UST # 2 was a 5,000-gallon, single-walled steel tank located immediately north of the school. The tanks were reportedly installed in 1978. Both tanks and associated piping were found to be in excellent to good condition with minor surface rust and scaling. UST #2 was closed in-place to avoid possible structural damage to the northwest corner of the school.

Photoionization detector readings, reported in ppm ranged from 0.0 ppm to 212 ppm at UST #1; and 28.2 ppm to 36.0 ppm at UST #2. A thin layer of free product was observed on perched ground water in the excavation at UST #1 which appeared to be from overfills. Ground water was observed perched in small clay lenses throughout the tank excavation. No bedrock was encountered in the excavations to a depth of approximately 12 feet below ground surface (bgs). Soils consisted of fine silty brown sand with clay and few pebbles and cobbles.

Approximately 70 cubic yards of contaminated soil could not be backfilled in the former excavation due to a larger replacement tank installation. Following VT DEC approval, these soils were transported off-site to an abandoned baseball park owned by Troy Elementary School along Dominion Avenue in North Troy.

### **Scope of Work**

The following scope of work was performed to complete the initial site investigation:

- supervision of the installation of four monitoring wells at the former UST location;
- laboratory analysis of ground-water samples for volatile petroleum compounds by EPA Method 8021B, and for Total Petroleum Hydrocarbons (TPH) by EPA Method 8015 diesel range organics (DRO), to confirm the field-screening results;
- screening of indoor air in the adjacent building and surrounding manholes with a PID to evaluate whether vapor-phase petroleum compounds in the soil are entering into the building; and
- preparation of this summary report, which details the work performed, quantitatively assesses risks, provides conclusions, and offers recommendations for further action.

### **Monitoring Well Installation**

On 23 February 1999, monitoring wells MW-1 through MW-4 were installed at the site. The locations of the wells are illustrated on the Site Plan (Figure 2). MW-1 is located topographically crossgradient of the former tank locations and extends to a depth of approximately 26.5 feet bgs. MW-4 is located topographically downgradient of the former tank locations and extends to a depth of approximately 19 feet bgs. MW-2 and MW-3 are located adjacent the UST location and extend to depths of approximately 25 feet and 22 feet bgs, respectively.

In general, fine silty brown sand with clay and few pebbles and cobbles were encountered beneath the site. No PID readings of above background levels were observed on soil samples collected during the advancement of the soil borings prior to the installation of the monitoring wells. Ground water was encountered between depths of approximately 10 feet to 20 feet bgs.

The monitoring wells were installed by M&W Soils Engineering of Charleston, New Hampshire, under the supervision of **Marin** personnel. The soil borings were advanced with hollow-stem augers, with split-spoon sampling every five feet. Split-spoon samples were descriptively logged and screened for the possible presence of volatile organic compounds (VOCs) with a Photovac Model 2020 PID equipped with a 10.6 eV lamp. The PID was calibrated on site prior to screening with 100 ppm isobutylene span gas, referenced to benzene.

The four on-site monitoring wells were constructed with two-inch-diameter, polyvinylchloride (PVC) with 0.010-inch slots. The tops of the screen sections were set between 4 to 4.5 feet above the ground-water level. Sections of solid PVC were added to bring the tops of the well casings to approximately 0.5 feet bgs. Clean silica #1 filter sand was placed in the borehole annulus around each well to 12 inches above the slotted interval. A granular bentonite seal, approximately 1.0 feet thick, was set above the sand pack and the remainder of the annular space was backfilled with native material. Each completed monitoring well was protected by a flush-mounted steel roadbox cemented into place. Each well casing was topped with a water-tight compression cap.

To remove fine-grained sediment, the monitoring wells were developed immediately after installation using a peristaltic pump. Development water was discharged directly to the ground surface in the vicinity of each well. On 1 March 1999, the monitoring wells were surveyed relative to existing site features, with an azimuth accuracy of  $\pm 1.0$  feet, and an elevation accuracy of  $\pm 0.01$  feet. Monitoring-well construction details are included on the soil-boring and well-construction logs in Appendix B.

### **Ground-Water Elevation Calculations and Flow Direction**

Based on the limited hydrogeologic data collected at the site to date, ground water in the unconfined surficial aquifer at the site appears to flow in a northerly direction, with an average horizontal hydraulic gradient of approximately five percent. Shallow ground-water flow beneath the site may be influenced by the attitude of the underlying bedrock. The vertical ground-water

flow components at the site, and the hydraulic relationship between the shallow unconfined aquifer and the bedrock aquifer, are currently unknown.

Fluid levels were measured in the on-site monitoring wells on 1 March 1999. Depths to water ranged from 7.25 feet (MW-4) to 10.09 feet (MW-2) below top-of-casing. Static water-table elevations were computed for each monitoring well by subtracting the measured depth-to-water readings from the surveyed top-of-casing elevations, which are relative to an arbitrary site datum of 100.00 feet. Water-level measurements and elevation calculations for 1 March 1999 are presented in Table 1; Figure 3 is the Water-Table Contour Map prepared using these data (Appendix A).

### **Laboratory Analytical Results**

Low levels of volatile petroleum compounds were detected in MW-1, MW-3, and MW-4. Toluene was detected at a concentration of 1.1 microgram per liter ( $\mu\text{g/L}$ ) at MW-1 and trace levels below 1  $\mu\text{g/L}$  at MW-3 and MW-4. Xylenes and 1,2,4 trimethyl benzene were also detected in the sample from MW-1 at concentrations of 1.0  $\mu\text{g/L}$  and trace levels below 1  $\mu\text{g/L}$ , respectively. TPH was not detected in any of the samples. Analytical results are included in Table 2, and on the Contaminant-Distribution Map on Figure 4. Laboratory report forms are included in Appendix C.

Water-quality samples were collected on 1 March 1999 from the four on-site monitoring wells. Monitoring wells were purged and then sampled using dedicated bailers and dropline. Purge water was discharged directly to the ground in the vicinity of each well. Trip blank and duplicate samples were collected to ensure that adequate quality assurance/quality control (QA/QC) standards were maintained. All field procedures were conducted in accordance with **Marin** standard protocols.

All samples were transported under chain-of-custody in an ice-filled cooler to Endyne, Inc. of Williston, Vermont. The samples were submitted for laboratory analysis of VOCs by EPA Method 8021B and TPH by EPA Method 8015 (DRO).

Analytical results from the QA/QC samples indicate that adequate QA/QC was maintained during sample collection and analysis. None of the VOCs were detected in the trip blank. Analytical results for the blind field duplicate sample collected from MW-3 were within approximately one percent of the original sample results. Table 2 also includes a summary of the QA/QC analytical results.

### **Soil Stockpile Monitoring**

PID readings on samples collected from the soil stockpile ranged from 3.2 to 7.8 ppm, and averaged 5.17 ppm. Figure 5 presents the PID readings and sample locations from this event. The stockpile was polyencapsulated with 6 mil plastic and enclosed with snow fencing.

On 5 August 1999, **Marin** collected nine samples from depths of three to four feet in the 70-cubic yard soil stockpile. Each sample was placed into a polyethylene bag, which was sealed, agitated, and allowed to equilibrate prior to headspace screening. PID readings were measured using a PE Photovac Model 2020 PID, which was calibrated with isobutylene to a benzene reference.

### **Sensitive Receptor Survey and Risk Assessment**

**Marin** conducted a survey to identify potential sensitive receptors in the vicinity of the Troy School, and assessed the risks posed by the subsurface contamination to these receptors. The findings of this work are summarized as follows:

- The Troy School Building is located approximately nine feet to the south of UST #2. The building has no basement in the vicinity of the tank. On 1 March 1999, **Marin** personnel screened indoor air of the building with a PID. No PID readings above background levels were detected.
- The Missisquoi River flows in a southerly direction approximately 500 feet east of the site. Based on the extended distance from the UST location to the river, and the fact that petroleum contamination does not appear to extend down to the water table, the Missisquoi River is not considered likely to be impacted.
- The site and all surrounding buildings are served by a municipal water supply and sewer system.
- No preferential pathways for contaminant migration (such as curtain drains, drainage swales, storm drains or other underground utilities) were identified.

### **Conclusions**

Our conclusions are as follows:

- The residual petroleum contamination adjacent to the UST location appears to be limited to a vertical zone around the former USTs, and does not appear to have significantly impacted ground water. PID readings on soil samples collected from the borings during monitoring well installation were at background levels. Petroleum compounds detected in the laboratory analysis of the ground-water samples were not reported at concentrations above appropriate Vermont Groundwater Enforcement Standard levels.
- The natural processes of biodegradation, adsorption, dilution and dispersion are likely to be sufficient to reduce the residual soil contamination to acceptable levels and prevent any future impact to any identified sensitive receptors.
- No sensitive receptors appear to be at risk from the residual petroleum soil contamination. No elevated PID readings were measured in the adjacent building. The site and all nearby

properties are served by public water systems, and no preferential migration pathways (such as curtain drains, drainage swales, storm drains or other underground utilities) to the nearby Missisquoi River have been identified.

### **Recommendations**

The on-site soil stockpile should be monitored semi-annually with a PID, and the integrity of the stockpile cover maintained. When PID readings have decreased to below one ppm, permission should be sought from the VT DEC to thin-spread the soils in accordance with VT DEC guidelines. The next inspection of the soil stockpile should be conducted in February 1999.

Marin has appreciated the opportunity to assist you on this issue. Please call me if you have any questions. Upon receiving your approval, I will forward a copy of this report to the VT DEC.

Sincerely,

**Marin Environmental, Inc.**

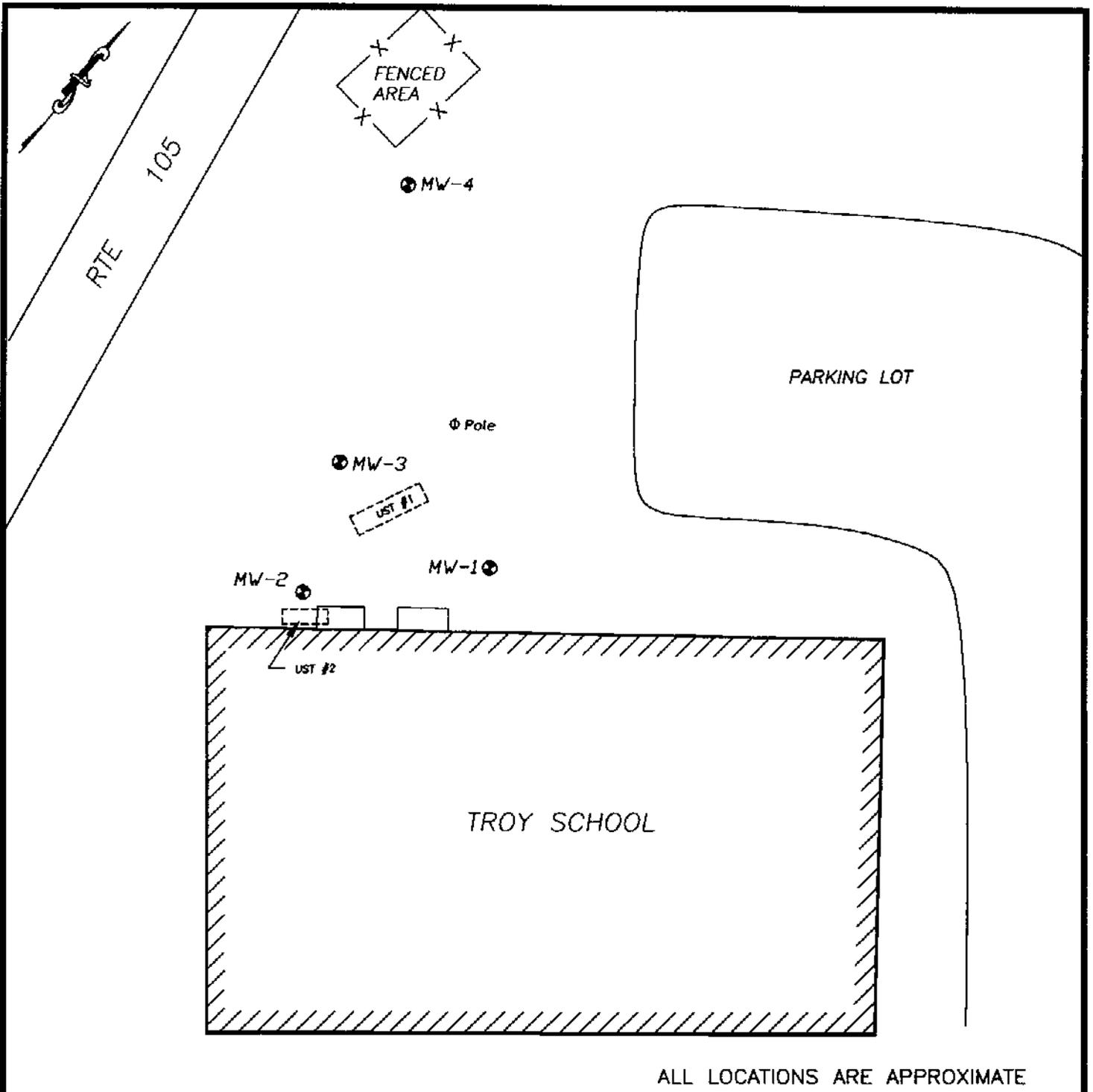


Kim Lockard  
Environmental Scientist

Ref:98126r01.doc

**APPENDIX A**  
**FIGURES & TABLES**





ALL LOCATIONS ARE APPROXIMATE

**LEGEND**

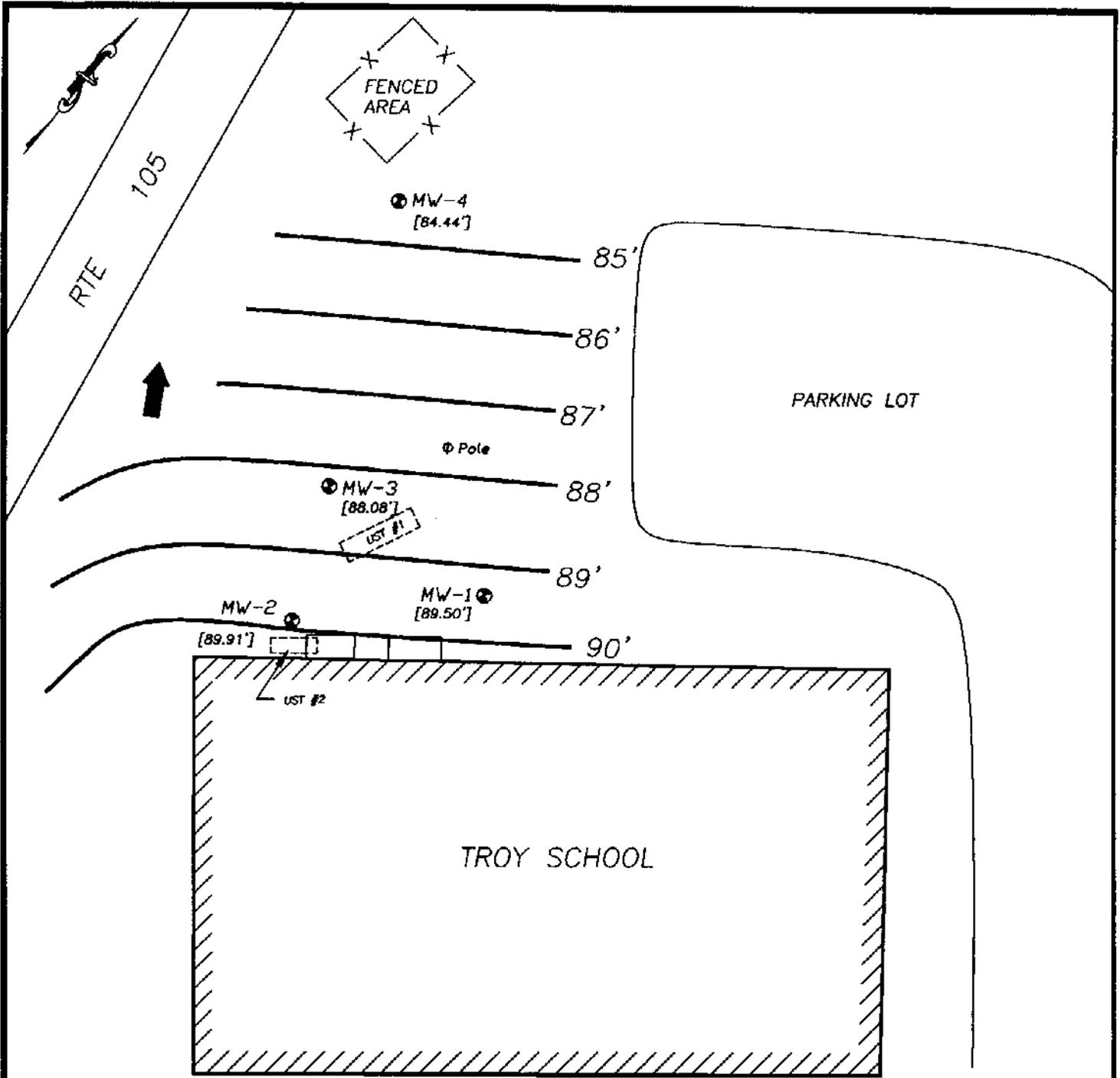
MW-2  MONITORING WELL

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FIGURE 2.  
**SITE PLAN**  
WITH MONITORING WELL LOCATIONS

TROY SCHOOL  
N. TROY, VT

DRAWN BY: MJB	DATE: 05/06/99	SCALE: 1" = 40'
APPROVED BY: ATH	FILE No.: 98126R01	



ALL LOCATIONS ARE APPROXIMATE

**LEGEND**

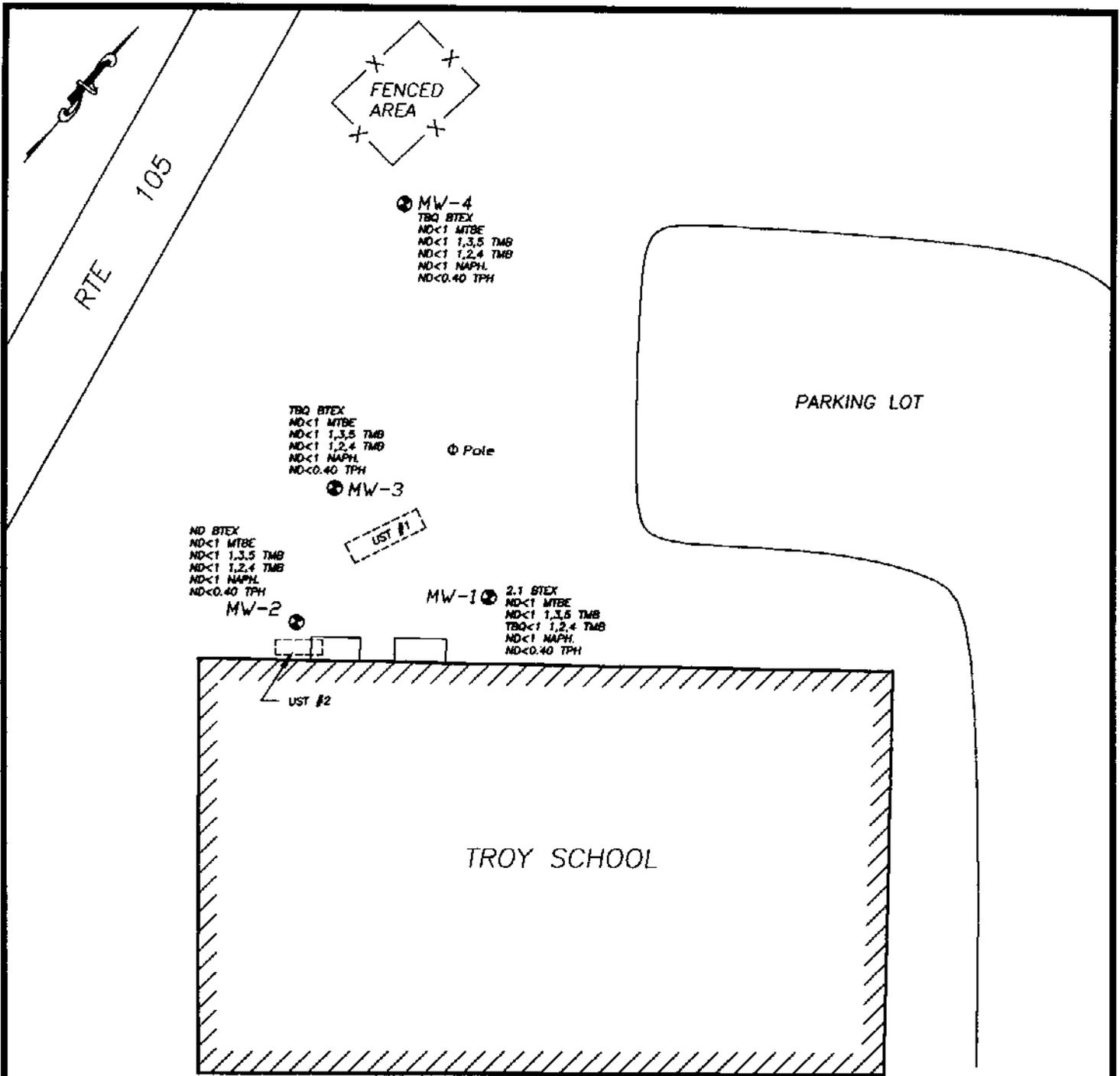
- MW-2 ⊕ MONITORING WELL
- [88.08'] GROUND WATER ELEVATION (ft)
- 88' — GROUND WATER ELEVATION CONTOUR (ft)
- ➔ INFERRED GROUND WATER FLOW DIRECTION

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**FIGURE 3.**  
**GROUND WATER CONTOUR MAP**  
Monitoring Date: 1 March 1999

**TROY SCHOOL**  
**N. TROY, VT**

DRAWN BY: MJB	DATE: 05/06/99	SCALE: 1" = 40'
APPROVED BY: ATH	FILE No.: 98126R01	



ALL LOCATIONS ARE APPROXIMATE

**LEGEND**

MW-2	MONITORING WELL
TBO	TRACE BELOW QUANTITATION LIMIT
ND	NONE DETECTED
ND<1 BTEX	TOTAL BTEX CONCENTRATION, ( $\mu\text{g/L}$ )
ND<1 MTBE	MTBE CONCENTRATION, ( $\mu\text{g/L}$ )
ND<1 1,3,5 TMB	1,3,5 TRIMETHYL BENZENE CONCENTRATION, ( $\mu\text{g/L}$ )
ND<1 1,2,4 TMB	1,2,4 TRIMETHYL BENZENE CONCENTRATION, ( $\mu\text{g/L}$ )
ND<1 NAPH.	NAPHTHALENE CONCENTRATION, ( $\mu\text{g/L}$ )
ND<1 TPH	TPH CONCENTRATION, ( $\text{mg/L}$ )

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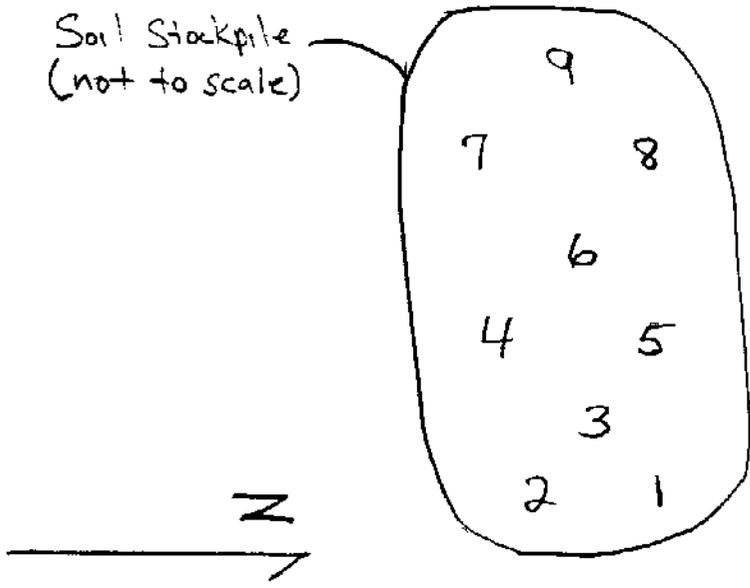
**FIGURE 4.**  
**CONTAMINANT DISTRIBUTION MAP**  
Monitoring Date: 1 March 1999

**TROY SCHOOL**  
**N. TROY, VT**

DRAWN BY: MJB	DATE: 05/06/99	SCALE: 1" = 40'
APPROVED BY: ATH	FILE No.: 98126R01	

<b>SUBJECT:</b> FIGURE 5 Troy School! PID Readings and Sample Locations	<b>DATE</b> 7/9	<b>PREPARED BY</b> KL	<b>CHECKED BY</b>	<b>DATE</b>	<b>PROJECT NO.</b>
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Monitoring Date : 5 August 1999



<u>Location</u>	<u>Depth (feet)</u>	<u>PID Reading (parts per million)</u>
1	3.0	5.6
2	4.0	5.4
3	3.0	7.8
4	3.5	3.9
5	4.0	4.1
6	3.5	6.3
7	3.5	3.5
8	4.0	4.8
9	3.5	5.8
Average		5.17

**TABLE 1**  
**GROUND-WATER ELEVATION CALCULATIONS**

**Troy Town School District**  
**North Troy, Vermont**

**Monitoring Date: 1 March 1999**

Well I.D.	Top of Casing Elevation	Depth to Water	Water Table Elevation
MW-1	98.22	8.72	89.50
MW-2	100.00	10.09	89.91
MW-3	98.16	10.08	88.08
MW-4	91.69	7.25	84.44

All values reported in feet relative to arbitrary site datum of 100.00 feet.

**TABLE 2  
LABORATORY ANALYTICAL RESULTS  
(Petroleum Hydrocarbons)**

Troy Town School District  
North Troy, Vermont

Monitoring Date: 1 March 1999

Sample Location	MTBE	Benzene	Toluene	Ethylbenzene	Total Xylenes	1,3,5 TMB	1,2,4 TMB	Napthalene	Total VOCs	TPH
MW-1	<1	<1	1.1	<1	1	<1	TBQ <1	<1	2.1	<0.40
MW-2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40
MW-3	<1	<1	TBQ <1	<1	<1	<1	<1	<1	<1	<0.40
MW-4	<1	<1	TBQ <1	<1	<1	<1	<1	<1	<1	<0.40
VGES	40	5	1,000	700	10,000	4	5	20	--	--
QA/QC										
Duplicate (MW-3)	<1	<1	TBQ <1	<1	<1	<1	<1	<1	<1	<0.40
Trip Blank	<1	<1	<1	<1	<1	<1	<1	<1	<1	NS
VGES	40	5	1,000	700	10,000	4	5	20	--	--

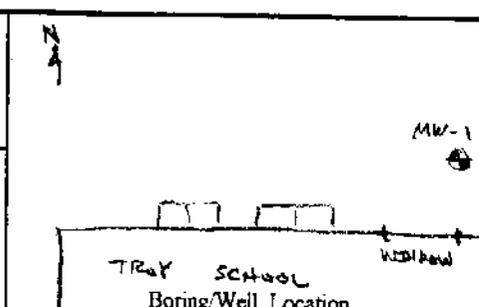
Notes: All concentrations reported in ug/L, except TPH which is mg/l  
 TBQ = Trace Below Quantitation  
 VGES = Vermont Groundwater Enforcement Standard

**APPENDIX B**  
**SOIL BORING/MONITORING WELL DETAILS**

Marin Environmental, Inc.

SITE NAME: Troy School  
 LOCATION: NORTH TROY  
 JOB NO. 980126  
 DATE: 2/23/99

BORING NO: MW-1  
 TOTAL DEPTH: 26.5 FT BGS  
 DEPTH TO WATER: 20 FT BGS



DRILLING METHOD  
HSA

FIELD SUPERVISOR: A. HOAK  
J. DEMERSE

BORING DIAMETER

CONTRACTOR: M&W Soils

DRILLERS: MIKE HITCHCOCK

Depth	SN	BLOW COUNTS PER 6"					Rec.	SAMPLE DESCRIPTION/COMMENTS	WELL DETAIL		PID (ppm)
		0-6	6-12	12-18	18-24	24-30					
5'		1	2								0.0
10'		5	3								0.0
15'		2	1								0.0
20'		2	4								0.0
25'		2	2								0.0
30'											
35'											
40'											

		BLOW COUNT		MATERIALS USED		SIZE/TYPE	QUANTITY
AND	33-50%	0-4	VERY LOSE	WELL SCREEN		2" PVC	10'
SOME	20-33%	4-10	LOOSE	SLOT SIZE		0.010	
LITTLE	10-20%	10-30	MEDIUM	RISER		2" PVC	16.5'
TRACE	0-10%	30-50	DENSE	GRADED SAND		26.5 - 14' BGS	
		> 50	VERY DENSE	BENTONITE PELLETS		14 - 13' BGS	
				BENTONITE GROUT			

Marin Environmental, Inc.

SITE NAME: Troy School LOCATION: North Troy JOB NO. 940126 DATE: 2/23/99			BORING NO: MW-2 TOTAL DEPTH: 25' DEPTH TO WATER:			<p style="text-align: center;">MW-2 ● WINDOWS TROY SCHOOL Boring/Well Location</p>				
DRILLING METHOD HSA			FIELD SUPERVISOR: A Hook							
BORING DIAMETER			CONTRACTOR: M+W Soils							
DRILLERS: Mike Hitchcock										
Depth	SN	BLOW COUNTS PER 6"					Rec.	SAMPLE DESCRIPTION/COMMENTS	WELL DETAIL	PID (ppm)
		0-6	6-12	12-18	18-24	24-30				
5'		3	4				12"	Brown fine to medium sand with trace clay, stiff		0.0
10'		1	2				22"	Brown-gray clay with little silt, fine sand interbeds. moist		0.0
15'		8	9				22"	Brown-gray very fine sand and silt coarsened down to gray medium sand very moist trace mottling		0.0
20'		14	16					Brown to grey medium sand and gravel, pebbles upto 3/4", wet		
25'										
30'										
35'										
40'										
		BLOW COUNT			MATERIALS USED		SIZE/TYPE		QUANTITY	
AND	33-50%	0-4	VERY LOSE		WELL SCREEN		2" PVC		10"	
SOME	20-33%	4-10	LOOSE		SLOT SIZE		0.010			
LITTLE	10-20%	10-30	MEDIUM		RISER		2" PVC			
TRACE	0-10%	30-50	DENSE		GRADED SAND		25-12 FT			
		> 50	VERY DENSE		BENTONITE PELLETS		12-10 FT			
					BENTONITE GROUT					

Marin Environmental, Inc.

SITE NAME: Troy School  
 LOCATION: North Troy  
 JOB NO. 980126  
 DATE: 2/23/99

BORING NO: MW-3  
 TOTAL DEPTH: 22  
 DEPTH TO WATER:

NT  
 MW-3

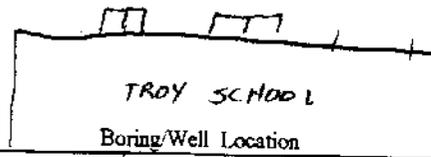
DRILLING METHOD  
 HSA

FIELD SUPERVISOR: A. Hook  
 S. Kothorse

BORING DIAMETER

CONTRACTOR: M&W Soils

DRILLERS: Mike Hitchcock



Depth	SN	BLOW COUNTS PER 6"					Rec.	SAMPLE DESCRIPTION/COMMENTS	WELL DETAIL	PID (ppm)
		0	6	12	18	24				
5'		6	7				22"	Brown fine to medium sand with trace clays, stiff		0.0
10'		3	4				18"	Dark grey, trace fine sand, silt and clay angular fragments, moist		0.0
15'		1	1				10"	Dark grey, mostly silt little clay, angular fragments, moist		0.0
20'		8	11				12"	Brown to dark grey gravel with some silt pebble size 1" - 1/4" dia, Trace iron staining wet		0.0
25'										
30'										
35'										
40'										

		BLOW COUNT	MATERIALS USED	SIZE/TYPE	QUANTITY
AND	33-50%	0-4	VERY LOSE	WELL SCREEN	2" PVC 10 FT
SOME	20-33%	4-10	LOOSE	SLOT SIZE	0.010
LITTLE	10-20%	10-30	MEDIUM	RISER	2" PVC 12 FT
TRACE	0-10%	30-50	DENSE	GRADED SAND	22-10 FT BBS
		> 50	VERY DENSE	BENTONITE PELLETS	10-8 FT BBS
			BENTONITE GROUT		

Marin Environmental, Inc.

SITE NAME: <i>Troy School</i>		BORING NO: <i>MW-4</i>		
LOCATION: <i>North Troy</i>		TOTAL DEPTH: <i>19' BGS</i>		
JOB NO: <i>980126</i>		DEPTH TO WATER: <i>10' BGS</i>		
DATE: <i>2/23/99</i>		FIELD SUPERVISOR: <i>A. Hoak</i> <i>S. DeMerse</i>		
DRILLING METHOD <i>HSA</i>		CONTRACTOR: <i>M &amp; W Soils</i>		
BORING DIAMETER:		DRILLERS: <i>Mike Hitchcock</i>		

Depth	SN	BLOW COUNTS PER 6"					Rec.	SAMPLE DESCRIPTION/COMMENTS	WELL DETAIL	PID (ppm)
		0	6	12	18	24				
5'		3	4						0.0	
				8	4	8"	BROWN MEDIUM SAND, DRY, WOOD STUCK IN SPLIT SPOON.			
10'		3	8						0.0	
				23	8	8"	BLACK MEDIUM SAND AND WOOD, VERT WET			
15'		12	7							
		7	8	21	20	0"	NO SAMPLE, WATER IN SPOON - BLACK			
				9	8	24"	DARK GREY SILT AND CLAY, WET AND STICKY, SOME ORGANIC MATTER MIXED IN		0.0	
20'										
25'										
30'										
35'										
40'										

		BLOW COUNT		MATERIALS USED	SIZE/TYPE	QUANTITY
AND	33-50%	0-4	VERY LOSE	WELL SCREEN	2" PVC	10 FT
SOME	20-33%	4-10	LOOSE	SLOT SIZE	0.010	
LITTLE	10-20%	10-30	MEDIUM	RISER	2" PVC	7 FT
TRACE	0-10%	30-50	DENSE	GRADED SAND	17-5 FT BGS	
		> 50	VERY DENSE	BENTONITE PELLETS	5-3 FT BGS	
				BENTONITE GROUT		

**APPENDIX C**  
**LABORATORY REPORTS**



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

REPORT OF LABORATORY ANALYSIS

CLIENT: Marin Environmental  
PROJECT NAME: Troy School/#VT980126  
REPORT DATE: March 9, 1999  
DATE SAMPLED: March 1, 1999

ORDER ID: 1524  
REF.#: 135,277 - 135,282

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

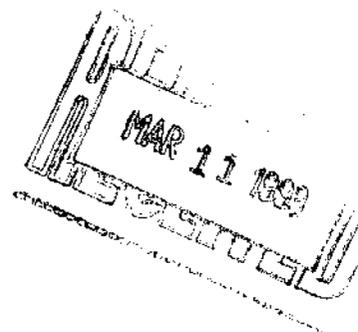
Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.  
Laboratory Director

enclosures





**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

**EPA METHOD 8021B--PURGEABLE AROMATICS**

CLIENT: Marin Environmental

DATE RECEIVED: March 5, 1999

PROJECT NAME: Troy School/#VT980126

REPORT DATE: March 9, 1999

CLIENT PROJ. #: VT980126

ORDER ID: 1524

Ref. #:	135,277	135,278	135,279	135,280	135,281
Site:	Trip Blank	Duplicate	MW-1	MW-2	MW-3
Date Sampled:	3/1/99	3/1/99	3/1/99	3/1/99	3/1/99
Time Sampled:	10:50	NI	1:30	1:45	2:10
Sampler:	J. Bierly				
Date Analyzed:	3/8/99	3/9/99	3/8/99	3/8/99	3/8/99
UIP Count:	0	0	9	0	0
Dil. Factor (%):	100	100	100	100	100
Surr % Rec. (%):	91	85	94	94	94
Parameter	Conc. (ug/L)				
MTBE	<1	<1	<1	<1	<1
Benzene	<1	<1	<1	<1	<1
Toluene	<1	TBQ <1	1.1	<1	TBQ <1
Ethylbenzene	<1	<1	<1	<1	<1
Xylenes	<1	<1	1.0	<1	<1
1,3,5 Trimethyl Benzene	<1	<1	<1	<1	<1
1,2,4 Trimethyl Benzene	<1	<1	TBQ <1	<1	<1
Naphthalene	<1	<1	<1	<1	<1

Ref. #:	135,282				
Site:	MW-4				
Date Sampled:	3/1/99				
Time Sampled:	2:00				
Sampler:	J. Bierly				
Date Analyzed:	3/8/99				
UIP Count:	4				
Dil. Factor (%):	100				
Surr % Rec. (%):	91				
Parameter	Conc. (ug/L)				
MTBE	<1				
Benzene	<1				
Toluene	TBQ <1				
Ethylbenzene	<1				
Xylenes	<1				
1,3,5 Trimethyl Benzene	<1				
1,2,4 Trimethyl Benzene	<1				
Naphthalene	<1				

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated

**CHAIN-OF-CUSTODY RECORD**

31076

2-DRL

11 980126

Project Name: <u>Troy School</u> Site Location: <u>N. Troy, VT</u>	Reporting Address: <u>1700 Heenan Ave</u> <u>Colchester VT 05446</u>	Billing Address: <u>Same</u>
Endyne Project Number: <u>1524</u>	Company: <u>Moran Env</u> Contact Name/Phone #: <u>FJ Hunk</u>	Sampler Name: <u>Tusan Biel</u> Phone #:

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
135277	top blank	H <sub>2</sub> O	X		3/1 1050	2	40 ml VOA		30	HCl	
135278	duplicate				—	3			30/31		
135279	MW-1				1330	4			30/31		
135280	MW-2				1345	4			30/31		
135281	MW-3				1410	4			30/31		
135282	MW-4				1400	4			30/31		

Relinquished by: Signature <u>[Signature]</u>	Received by: Signature <u>[Signature]</u>	Date/Time <u>3/5/99</u>	<u>1302</u>
Relinquished by: Signature	Received by: Signature	Date/Time	

New York State Project: Yes \_\_\_ No \_\_\_

**Requested Analyses**

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD <sub>5</sub>	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify): <u>80210</u>										

(31) analyzed by 8015 DRO



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
Williston, Vermont 05495  
(802) 879-4333  
FAX 879-7103

LABORATORY REPORT

CLIENT: Marin Environmental  
PROJECT: Troy School/#VT980126  
REPORT DATE: March 22, 1999

ORDER ID: 1524  
DATE RECEIVED: March 5, 1999

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Different groups of analyses may be reported under separate cover.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

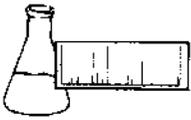
Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits, unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.  
Laboratory Director

enclosures



**LABORATORY REPORT**CLIENT: Marin Environmental  
PROJECT: Troy School/#VT980126  
REPORT DATE: March 22, 1999ORDER ID: 1524  
DATE RECEIVED: March 5, 1999  
SAMPLER: JB  
ANALYST: 820

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**Ref. Number: 135278**      **Site: Duplicate**      **Date Sampled: March 1, 1999**      **Time: NI**

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>	<u>Analysis Date</u>
TPH 8015 DRO	< 0.40	mg/L	SW 8015B	3/19/99

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**Ref. Number: 135279**      **Site: MW-1**      **Date Sampled: March 1, 1999**      **Time: 1:30 PM**

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>	<u>Analysis Date</u>
TPH 8015 DRO	< 0.40	mg/L	SW 8015B	3/19/99

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**Ref. Number: 135280**      **Site: MW-2**      **Date Sampled: March 1, 1999**      **Time: 1:45 PM**

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>	<u>Analysis Date</u>
TPH 8015 DRO	< 0.40	mg/L	SW 8015B	3/19/99

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**Ref. Number: 135281**      **Site: MW-3**      **Date Sampled: March 1, 1999**      **Time: 2:10 PM**

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>	<u>Analysis Date</u>
TPH 8015 DRO	< 0.40	mg/L	SW 8015B	3/19/99

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**Ref. Number: 135282**      **Site: MW-4**      **Date Sampled: March 1, 1999**      **Time: 2:00 PM**

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>	<u>Analysis Date</u>
TPH 8015 DRO	< 0.40	mg/L	SW 8015B	3/19/99

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**CHAIN-OF-CUSTODY RECORD**

31076  
2-DRL

VT 980126

Project Name: Troy School Site Location: N. Troy, VT	Reporting Address: 1700 Hegeon Ave Colchester VT 05446	Billing Address: Same
Endyne Project Number: 1524	Company: Marin Env Contact Name/Phone #: A. Houck	Sampler Name: Jason B. Kelly Phone #:

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
135277	trip blank	H <sub>2</sub> O	X		3/1 12:50	2	430ml Vorb		30	HCl	
135278	duplicate					3			30/31		
135279	MW-1				13:30	4			30/31		
135280	MW-2				13:45	4			30/31		
135281	MW-3				14:10	4			30/31		
135282	MW-4				14:00	4			30/31		
/											

Relinquished by: Signature <i>[Signature]</i>	Received by: Signature <i>Ray Brumard</i>	Date/Time 3/5/99 1302
Relinquished by: Signature	Received by: Signature <i>Aaron Houck</i>	Date/Time 3/5/99 1:59 pm

New York State Project: Yes  No

**Requested Analyses**

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD <sub>5</sub>	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										

30 Other (Specify): 8021b (31) TPH by 8015 DRO