GRIFFIN INTERNATIONAL INC

March 7, 1997

Mr. Andrew Shively
Vermont ANR/DEC
Waste Management Division
103 South Main St. /West Building
Waterbury, VT 05671-0404

RE: Investigation of Subsurface Petroleum Contamination at Brownington Central School, Brownington, Vermont (VTDEC Site #96-2042)

Dear Andrew:

Enclosed please find the summary report for the site investigation conducted at Brownington Central School. Griffin is recommending that the Brownington Central School site be considered for closure and removed from the VT DEC Active Hazardous Waste Sites List.

Please contact me if you have any questions or comments.

Sincerely,

Christine Ward

Christine Ward
Hydrogeologist

Enclosure

c.: Mr. Wayne Shepard, w/o enc.
GI#12964963

MONITORING WELL INSTALLATION AND SAMPLING REPORT

BROWNINGTON CENTRAL SCHOOL
CHASE ROAD
BROWNINGTON, VERMONT

(VT DEC SITE #96-2042)
GI #12964963

February 1997

Prepared for

BROWNINGTON SCHOOL DISTRICT
RFD #2, BOX 184
ORLEANS, VERMONT 05860

Prepared by

P.O. Box 943
Williston, Vermont 05495
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I. INTRODUCTION

This report summarizes the investigation of subsurface petroleum contamination at the Brownington Central School on Chase Road in Brownington, Vermont. This work was requested by Mr. Chuck Schwer of the Vermont Department of Environmental Conservation (VTDEC) in a letter to the Brownington School District dated September 30, 1996. This work was performed in accordance with the November 21, 1996, *Preliminary Work Plan and Cost Estimate for Subsurface Investigation of Suspected Petroleum Contamination* for the site prepared by Griffin.

II. SITE BACKGROUND

A. Site History

On July 29, 1996, petroleum contamination was detected at the Brownington Central School during soil field screening at a routine removal of two No. 2 fuel oil underground storage tanks (USTs). The former USTs each had a capacity of 3,000 gallons and were constructed of single wall steel. Related piping was also removed. The USTs and the piping were 34 years old. The USTs were reported to be in poor condition and the piping was reported to be in fair condition at the time of closure. The two USTs were replaced with one 5,000 gallon No. 2 fuel oil UST.

Soil samples collected during the UST removal were screened for volatile organic compounds (VOCs) using an HNu™ systems Model PI 101 photo ionizing detector (PID). Readings of 2.6 to 150 parts per million (ppm) were detected in soils collected from the bottom of the former UST pit. Readings of 1.0 to 13 ppm were detected in soils collected from the sidewalls of the UST pit. Soils collected during further excavation of the UST pit had readings of 0.8 to 120 ppm. The tank pull report identified several holes in each of the former USTs, including one hole that appeared to have been leaking prior to removal of the tank. Groundwater was not encountered to a depth of 14 feet during the tank removal.

As a result of the petroleum contamination detected in the subsurface beneath the former UST, the VTDEC requested that additional work be conducted at the site in order to determine the extent and degree of petroleum contamination.

B. Site Description

The Brownington Central School consists of one building. The school does not have a basement (only a narrow crawl space), and there have been no reports of fuel oil odors in

the building. There are playgrounds / recreational fields to the north and east of the building. Further east, past the recreational field, the hillside has been excavated for sand and gravel. South of the building is the driveway, and beyond that are woods. To the west of the school is an embankment down to Chase Road. The grade continues down to the Brownington Branch of the Willoughby River. It is mostly wooded between Chase Road and the Brownington Branch, with a house trailer located on the east side of the river. The river is approximately 500 feet from the school.

The entire area is served by private water and septic systems. The Brownington Central School supply well is located on the west side of the school. The school's septic system is northeast of the building. The water source for the trailer is not known.

C. Site Geology

Soils in the vicinity of the UST pit during the removal inspection consisted of brown fine to medium sand with little gravel from grade to approximately 8 feet below grade. From 8 feet to the bottom of the excavation at approximately 14 feet below grade, gray silt and very fine sand with little clay was observed. According to the Surficial Geologic Map of Vermont (Ref. 1), the site is underlain by glaciolacustrine littoral sediment, predominately delta gravel. Bedrock below the site is mapped as the Gile Mountain Formation consisting of gray quartz-muscovite phyllite or schist (Ref. 2).

III. INVESTIGATIVE PROCEDURES

To further define the extent of subsurface petroleum contamination in the area of the former UST, the following investigative tasks were undertaken: soil borings; monitoring well installations; and groundwater sample collection and analyses for petroleum related constituents.

A. Monitoring Well Installation

Four monitoring wells were installed on January 20, 1997, by Tri State Drilling and Boring of West Burke, Vermont, under the direct supervision of a Griffin hydrogeologist. The wells were installed using a truck mounted 4 1/4" hollow stem auger. The soil boring logs and monitoring well as-built specifications are presented in Appendix B. The monitoring well locations are indicated on the Site Map (Appendix A).

Undisturbed soil samples, collected from the boring with a split spoon sampler, were logged by the supervising hydrogeologist and screened for the presence of volatile organic compounds (VOCs) using an HNu™ systems Model PI 101 photo ionizing

detector (PID). Prior to screening, the PID was calibrated with isobutylene with reference made to benzene. Soils were screened using the Griffin Jar/Polyethylene Bag Headspace Screening Protocol, which conforms to state and industry standards. Continuous samples from 10 feet below grade to 22 feet below grade were collected from the boring for MW-1. Only one split spoon sample was collected in the borings for MW-2, MW-3, and MW-4, from fifteen to seventeen feet below grade. This depth represents the saturated zone, close to the estimated water table at the time of the drilling.

A peak reading of 8 parts per million (ppm) was detected from the soil sample collected at 10 to 12 feet below grade in the boring for MW-1. Soil samples from 12 feet below grade to the bottom of the boring for MW-1 at 22 feet below grade, had very low (0.1 ppm) to non-detectable VOC readings. A reading of 2 ppm was detected from the soil sample collected from the boring for MW-2. No VOCs were detected from the soil samples collected from the borings for MW-3 and MW-4.

During drilling, the water table was encountered at 15 feet below grade in MW-1, at 13 feet below grade in MW-2, at 12.7 feet below grade in MW-3, and 14.1 feet below grade in MW-4. The water table was used as a guide for determining the placement of the screened interval. The wells were constructed such that the water table intersected the screen slightly above the midpoint of the screen, with the assumption that the water table on the day of drilling was probably higher than what might be observed during the summer months.

The monitoring wells are constructed of two inch diameter, 0.020" slot, PVC well screen and attached solid PVC riser. The annulus between the borehole wall and the screened section of each well was filled with sand pack to filter fine sediments in groundwater from entering the well. Approximately one and a half feet above the screened section of each well, the annulus between the borehole wall and the riser was filled with a three foot bentonite clay seal to prevent surface water from entering the borehole. The wells were protected at the surface by a flush mounted steel well head protective casing and a bolt down cover. The well head protection casings were set in cement. Well construction details are listed on the well logs in Appendix B.

The monitoring wells were developed immediately following installation by bailing.

B. Groundwater Flow Direction and Gradient

Water table elevation measurements were collected from all four monitoring wells prior to sampling on February 6, 1997. The top of casing elevations were determined relative to MW-2, which was arbitrarily set at 100 feet. The depth to water in each well was subtracted from the top of casing elevation to obtain the relative water table elevation in each well. Water level data are presented in Appendix C.

Water table elevations have been plotted and contoured to illustrate the estimated gradient and direction of groundwater flow beneath the site (see Groundwater Contour Map, Appendix A). According to these data, it appears that the on-site groundwater flow is generally to the northwest at a shallow hydraulic gradient of 0.4%. This flow direction is toward the Brownington Branch.

C. Groundwater Sampling and Analyses

Griffin collected groundwater samples at the site from MW1, MW2, MW3, and MW4 during the site visit on February 6, 1997. Groundwater samples were analyzed by Endyne, Inc. of Williston, Vermont, by EPA Method 602 for the presence of benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tertiary butyl ether (MTBE). Additionally, the samples were analyzed by modified EPA Method 8100 for total petroleum hydrocarbons (TPH) as requested by Mr. Andrew Shively (VTDEC) in a letter to Mr. Larry Chase of the Brownington School District dated December 12, 1996. Results of the laboratory analyses for the monitoring wells are summarized in Appendix D. The laboratory analysis report is also in Appendix D. Analytical results of the trip blank and duplicate samples indicate that adequate quality assurance and control were maintained during sample collection and analysis.

No petroleum compounds were detected in the groundwater samples collected from the four monitoring wells.

D. Sensitive Receptor Survey

A receptor risk assessment was conducted to identify known and potential receptors of the contamination detected at the Brownington Central School. A visual survey was conducted at the time of the UST removal inspection, as well as during the monitoring well installation. Based on these observations, a determination of the potential risk to identified receptors was conducted.

The entire area is served by private water and septic systems. The Brownington Central School supply well is located on the west side of the school. The supply well is 104 feet deep in overburden, with casing to 101.2 feet. The pump is set at a depth of 90 feet, and is approved for 30 gallons per minute. Based on the groundwater flow direction measured on February 6, 1997, the school's supply well is located cross-gradient from the UST pit. The Brownington Central School collects semi-annual water samples from the supply well and submits them to the Vermont Department of Health for analysis of VOCs by EPA Method 524.2. No VOCs have been detected in water samples collected from the school's supply well. The water supply for the trailer is not known, however it potentially is a sensitive receptor.

The nearest surface water is the Brownington Branch of the Willoughby River, located approximately 500 feet west-northwest of the school.

Since no petroleum contamination was detected in groundwater from the four monitoring wells surrounding the UST location, it appears the risk to the sensitive receptors is minimal.

IV. CONCLUSIONS

Based on the results of this sampling event, and on observations made during previous site visits, Griffin presents the following conclusions:

1) There was a release(s) of No. 2 fuel oil to the subsurface from the former UST system. The total volume of the release(s) is unknown.

2) The source of the petroleum contamination (i.e., the UST system) was removed in September 1996.

3) The groundwater flow beneath the site is estimated to be to the northeast at a shallow hydraulic gradient of 0.4%. On February 6, 1997, the depth to groundwater at the site was approximately 13 feet below grade.

4) Dissolved petroleum contamination was not detected in groundwater at the site.

5) Based on a survey of known potential sensitive receptors in the vicinity of the site, the Brownington Branch, the Brownington Central School supply well, and the water supply for the trailer are the only receptors potentially at risk. The risk to these receptors is likely minimal based on the non-detection of petroleum compounds in the groundwater samples collected from the on-site monitoring wells.

V. RECOMMENDATIONS

Based on the groundwater sample analyses and on the soil screening results during drilling, Griffin recommends that the Brownington Central School, Brownington, VT site be considered for closure and be removed from the VT DEC Active Hazardous Waste Sites List. This recommendation is offered based upon achievement of the following closure criteria, as per the VT DEC Site Management Activity Completed (SMAC) Checklist:

1) The source(s), nature, and extent of the petroleum contamination at the site has been adequately defined.

   The source of petroleum contamination detected in soils at the Brownington Central School was two former No. 2 Fuel Oil USTs at the property.

   VOC readings up to 150 ppm were detected in soils during the tank removal on July 29, 1996. VOC readings of 0 to 8 ppm were detected from the soil borings on January 20, 1997.

   No dissolved petroleum contamination was detected in groundwater samples collected from on-site monitoring wells on February 6, 1997.

2) Source(s) has been removed, remediated, or adequately contained.

   Two No. 2 Fuel Oil USTs were removed from the Brownington Central School in July 1996.

   The area surrounding the USTs is paved thus containing any residual vapors. Additionally, the paving deters the infiltration of rain water that might dissolve and transport residual adsorbed petroleum to the groundwater.

   Remaining adsorbed petroleum concentrations in the soil will continue to decrease over time with the progressive action of natural mitigative processes.

3) Levels of contaminants in soil and groundwater shall be stable, falling, or non-detectable.

   Petroleum contamination was not detected in groundwater samples collected from the four monitoring wells.

4) Groundwater enforcement standards are met on entire property.

Petroleum contamination was not detected in groundwater samples collected from the four on-site monitoring wells on February 6, 1997. Petroleum contamination has not been detected in groundwater from the Brownington Central School's supply well.

5) Soil guideline levels are met. If not, engineering or institutional controls are in place.

Very low to non-detect readings of VOCs were measured from the soil borings on January 20, 1997.

The area surrounding the USTs is contained by paving on the surface.

6) No unacceptable threat to human health or the environment exists on site.

Petroleum contamination was not detected in groundwater samples collected from the four on-site monitoring wells, or from the supply well at the Brownington Central School.

7) Site meets RCRA requirements.

Available records indicate that the Brownington Central School site is not in violation of the Resource Conservation and Recovery Act (RCRA) as defined in 40 CFR 264.

8) Site meets CERCLA requirements.

Available records indicate that the Brownington Central School site is not in violation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as defined in 40 CFR 300.

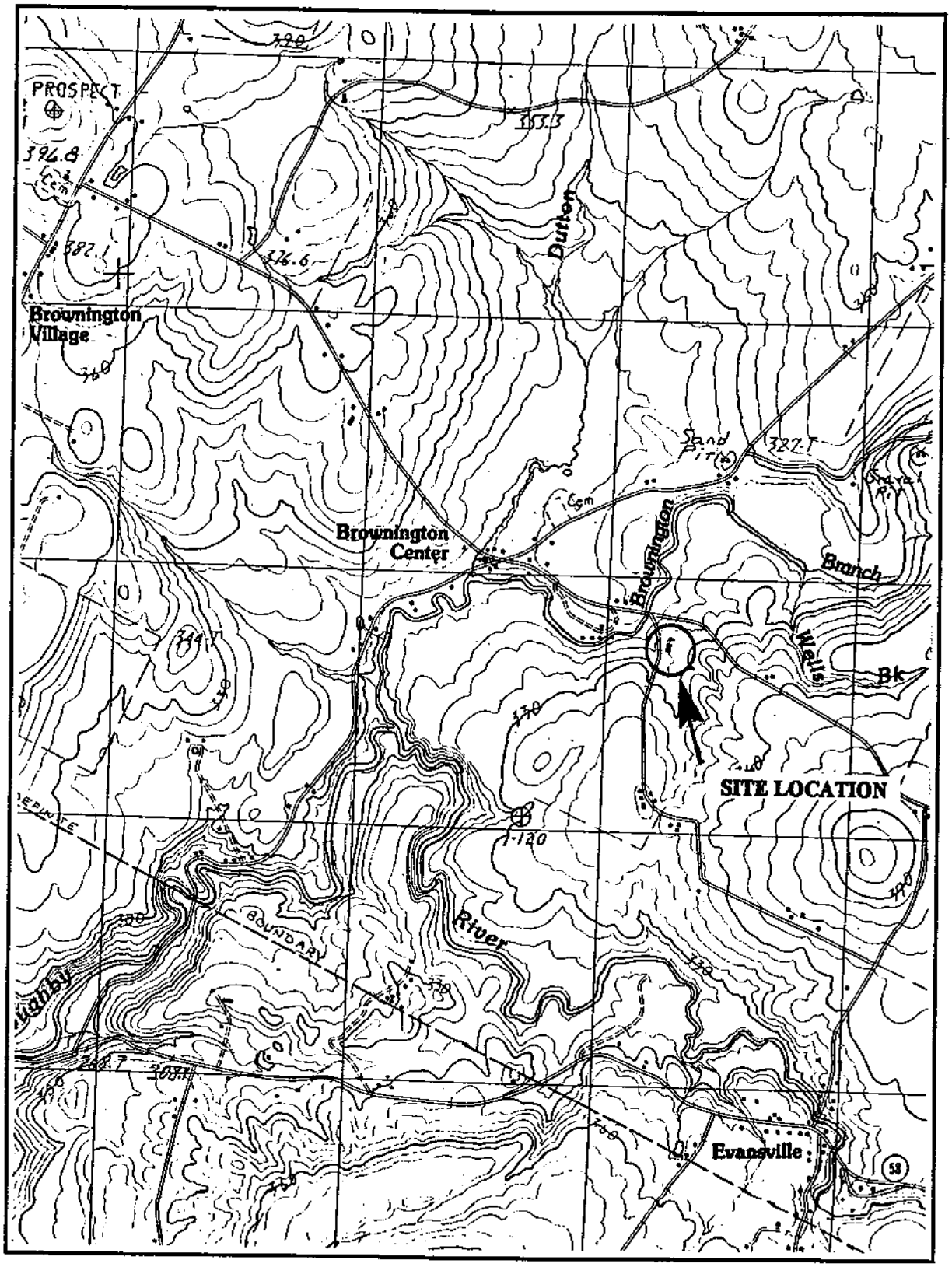
REFERENCES

1. Doll, Charles G., ed., 1970, *Surficial Geologic Map of Vermont*, State of Vermont

2. Doll, Charles G., ed., 1961, *Centennial Geologic Map of Vermont*, State of Vermont

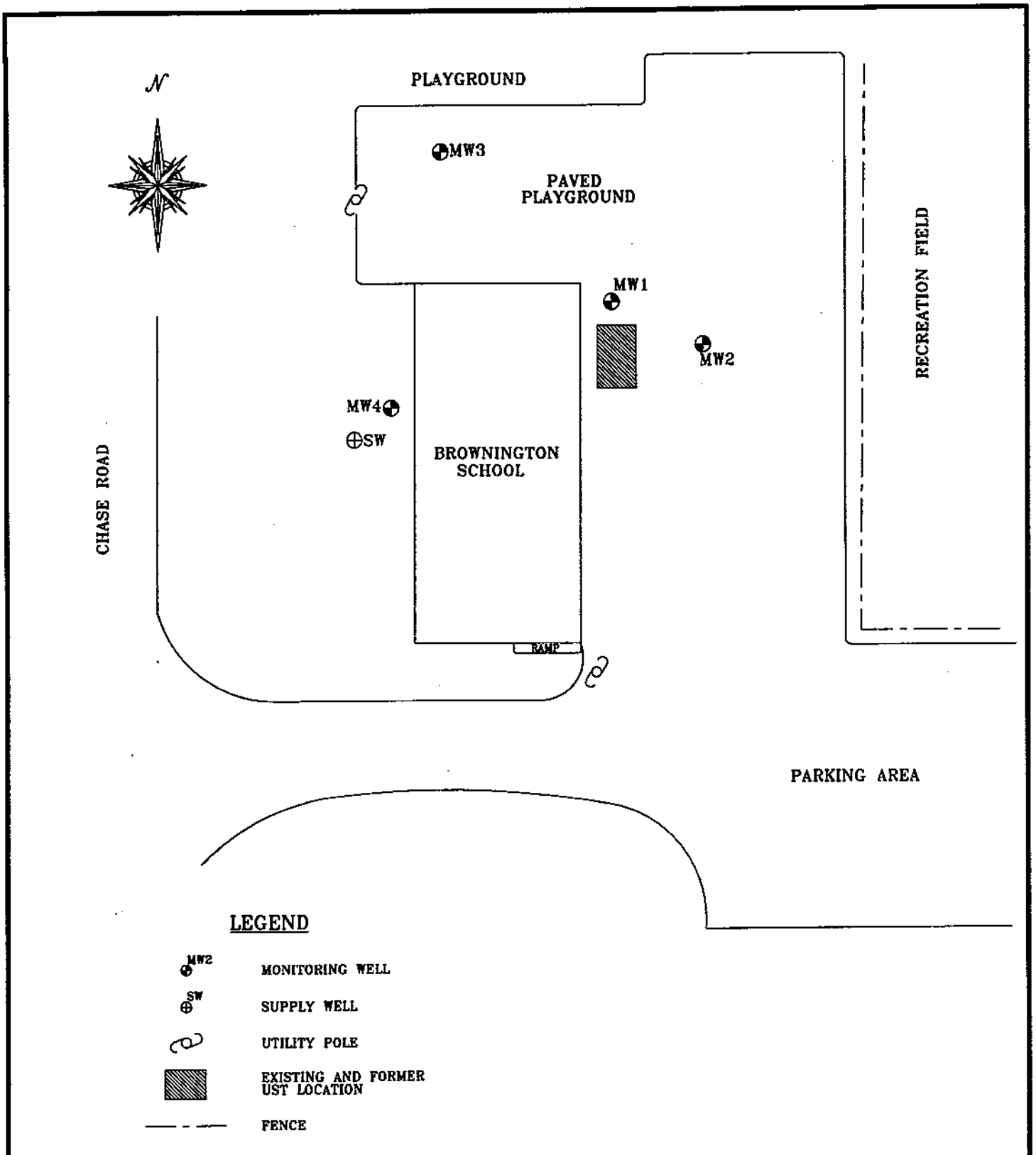
APPENDIX A

Site Location Map
Site Map
Groundwater Contour Map



SITE LOCATION MAP
Brownington Central School, Chase Road, Brownington, VT

SOURCE: U.S.G.S. - ORLEANS, VERMONT (1986)
SCALE 1:24,000



JOB #: 12964963

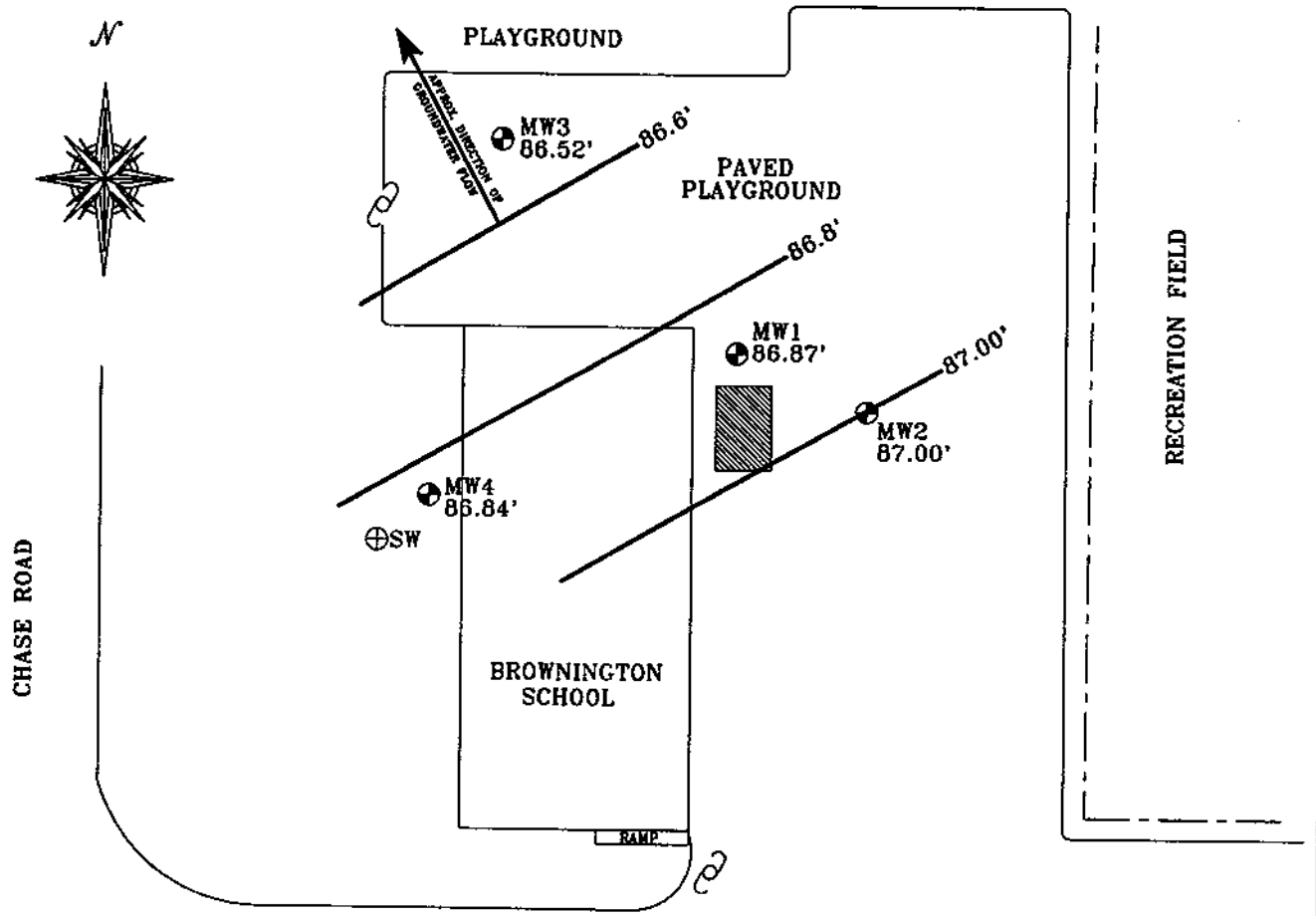
GRIFFIN INTERNATIONAL INC

BROWNINGTON CENTRAL SCHOOL

BROWNINGTON, VERMONT

SITE MAP

DATE: 2/10/97	DWG.#: 2	SCALE: 1"=50'	DRN.:SB	APP.:CW



LEGEND

MW2 87.00'	MONITORING WELL AND WATER TABLE ELEVATION IN FEET
86.6'	GROUNDWATER CONTOUR IN FEET (DASHED WHERE INFERRED)
SW	SUPPLY WELL
	UTILITY POLE
	EXISTING AND FORMER UST LOCATION
	FENCE

JOB #: 12964963
MEASUREMENT DATE: 2/6/97

GRIFFIN INTERNATIONAL INC

BROWNINGTON CENTRAL SCHOOL

BROWNINGTON, VERMONT

GROUNDWATER CONTOUR MAP

DATE: 2/10/97	DWG.#: 2	SCALE: 1"=50'	DRN.:SB	APP.:CW

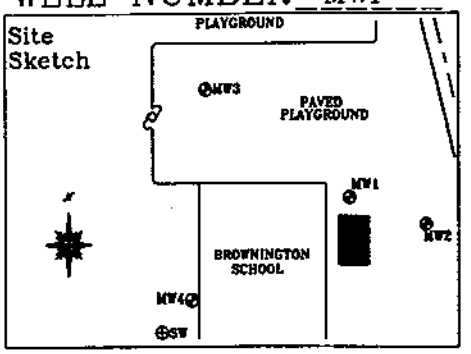
APPENDIX B

Soil Logs and Monitoring Well Specifications

WELL NUMBER MW1

PROJECT BROWNINGTON CENTRAL SCHOOL
LOCATION BROWNINGTON, VERMONT
DATE DRILLED 1/20/97 TOTAL DEPTH OF HOLE 22.0'
DIAMETER 4.25"
SCREEN DIA. 2" LENGTH 10.0' SLOT SIZE 0.020"
CASING DIA. 2" LENGTH 10.5' TYPE sch 40 pvc
DRILLING CO. TRI-STATE DRILLING METHOD HSA
DRILLER NEAL FAULKNER LOG BY C. WARD

Site Sketch



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		ROAD BOX LOCKING WELL CAP CONCRETE			0
1					1
2					2
3		NATIVE BACKFILL			3
4					4
5		WELL RISER			5
6					6
7					7
8		BENTONITE			8
9					9
10					10
11			10'–12'– 6/6/6/7 8 ppm	Brown, fine SAND and SILT, little clay.	11
12				Dark brown/black/white, coarse SAND and GRAVEL, some orange staining.	12
13		SAND PACK	12'–14'– 10/10/11/12 0 ppm	Brown/gray SAND and GRAVEL, (quartz and phyllite) moist, orange staining.	13
14				Brown/gray GRAVEL and SAND, loose, wet.	14
15			14'–16'– 5/5/6/6 0.1 ppm	15.0' WATER TABLE ▼	15
16		WELL SCREEN			16
17			16'–18'– 3/3/4/3 0.1 ppm	Brown/gray GRAVEL, some coarse sand, loose, wet, angular quartz, some mica.	17
18					18
19			18'–20'– 4/5/6/6 0 ppm	Brown/gray GRAVEL, some coarse sand, loose, wet. 1" layer of brown, fine to medium sand, orange staining and the bottom 2", white, fine to medium sand.	19
20		BOTTOM CAP			20
21			20'–22'– 5/6/20/16 0 ppm	Brown/orange/white GRAVEL, some coarse sand, loose, wet.	21
22		UNDISTURBED NATIVE SOIL			22
23				BASE OF WELL AT 21' END OF EXPLORATION AT 22'	23
24					24
25					25

PROJECT BROWNINGTON CENTRAL SCHOOL

LOCATION BROWNINGTON, VERMONT

DATE DRILLED 1/20/97 TOTAL DEPTH OF HOLE 20.0'

DIAMETER 4.25"

SCREEN DIA. 2" LENGTH 10.0' SLOT SIZE 0.020"

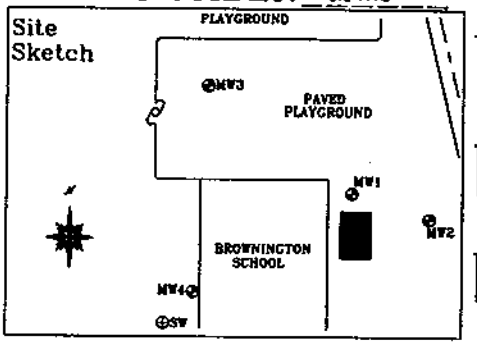
CASING DIA. 2" LENGTH 9.0' TYPE sch 40 pvc

DRILLING CO. TRI-STATE DRILLING METHOD HSA

DRILLER NEAL FAULKNER LOG BY C. WARD

WELL NUMBER MW2

Site Sketch



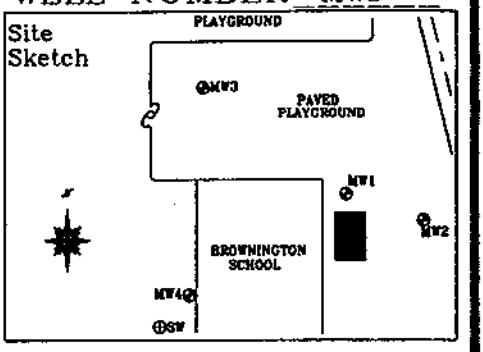
GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		ROAD BOX			0
		LOCKING WELL CAP			
1		CONCRETE			1
2		NATIVE BACKFILL			2
3					3
4		WELL RISER			4
5					5
6		BENTONITE			6
7					7
8					8
9					9
10					10
11					11
12					12
13		SAND PACK		13.0' WATER TABLE	13
14					14
15					15
16		WELL SCREEN	15'-17'- 4/5/5/6 2 ppm	Brown/gray, fine/medium/coarse GRAVEL and SAND, wet, no odor.	16
17					17
18					18
19		BOTTOM CAP			19
20				BASE OF WELL AT 19.5' END OF EXPLORATION AT 20'	20
21		UNDISTURBED NATIVE SOIL			21
22					22
23					23
24					24
25					25

WELL NUMBER MW3

PROJECT BROWNINGTON CENTRAL SCHOOL
LOCATION BROWNINGTON, VERMONT
DATE DRILLED 1/20/97 TOTAL DEPTH OF HOLE 20.0'
DIAMETER 4.25"
SCREEN DIA. 2" LENGTH 10.0' SLOT SIZE 0.020"
CASING DIA. 2" LENGTH 9.0' TYPE sch 40 pvc
DRILLING CO. TRI-STATE DRILLING METHOD HSA
DRILLER NEAL FAULKNER LOG BY C. WARD

Site Sketch



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		ROAD BOX LOCKING WELL CAP CONCRETE			0
5		NATIVE BACKFILL WELL RISER	0 ppm	Brown, medium SAND, some silt, damp, loose, fill.	5
8		BENTONITE			8
13		SAND PACK		12.7' WATER TABLE ▼	13
15				Brown, coarse SAND, some gravel, little silt, wet, then white/black (quartz and biotite) rock frags., then brown, medium SAND, some rock fragments, little silt.	15
16		WELL SCREEN	15'-17'- 18/15/16/18 0 ppm		16
17					17
19		BOTTOM CAP			19
20		UNDISTURBED NATIVE SOIL		BASE OF WELL AT 19.5' END OF EXPLORATION AT 20'	20
25					25

PROJECT BROWNINGTON CENTRAL SCHOOL

LOCATION BROWNINGTON, VERMONT

DATE DRILLED 1/20/97 TOTAL DEPTH OF HOLE 20.0'

DIAMETER 4.25"

SCREEN DIA. 2" LENGTH 10.0' SLOT SIZE 0.020"

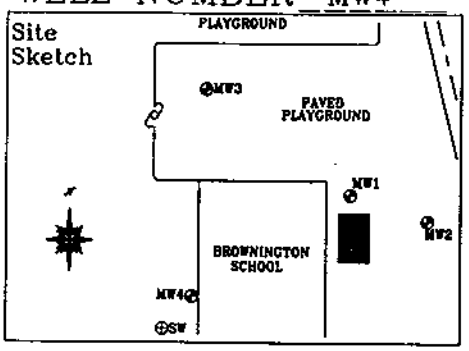
CASING DIA. 2" LENGTH 9.0' TYPE sch 40 pvc

DRILLING CO. TRI-STATE DRILLING METHOD HSA

DRILLER NEAL FAULKNER LOG BY C. WARD

WELL NUMBER MW4

Site Sketch



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0–25	ROAD BOX; LOCKING WELL CAP; CONCRETE; NATIVE BACKFILL; WELL RISER; BENTONITE; SAND PACK; WELL SCREEN; BOTTOM CAP; UNDISTURBED NATIVE SOIL		15'–17'– 3/3/4/3 0 ppm	14.1' WATER TABLE Coarse SAND, then brown, medium/fine SAND and SILT, wet. BASE OF WELL AT 19.5' END OF EXPLORATION AT 20'	0–25

APPENDIX C
Liquid Level Monitoring Data

LIQUID LEVEL MONITORING DATA

BROWNINGTON CENTRAL SCHOOL
BROWNINGTON, VERMONT

2/6/97

Well I.D.	Well Depth btoc	Top of Casing Elevation	Depth To Product btoc	Depth To Water btoc	Product Thickness	Specific Gravity Of Product	Water Equivalent	Corrected Depth To Water	Corrected Water Table Elevation
MW-1	21.0	100.52	-	13.65	-	-	-	-	86.87
MW-2	19.5	100.00	-	13.00	-	-	-	-	87.00
MW-3	19.5	98.87	-	12.35	-	-	-	-	86.52
MW-4	19.5	100.85	-	14.01	-	-	-	-	86.84

All Values Reported in Feet

Top-of-Casing Elevations Measured in Feet Relative to MW-2 set at 100.00'

btoc - Below Top of Casing

APPENDIX D

Water Quality Data

GROUNDWATER QUALITY SUMMARY

BROWNINGTON CENTRAL SCHOOL
BROWNINGTON, VERMONT

MW-1

PARAMETER	Date of Sample Collection 2/6/97				Applicable Standard (ppb)	
Benzene	ND>1				5.	a
Chlorobenzene	ND>1				100.	a
1,2-DCB	ND>1				600.	b
1,3-DCB	ND>1				600.	c
1,4-DCB	ND>1				75.	a
Ethylbenzene	ND>1				680.	d
Toluene	ND>1				1,000.	b
Xylenes	ND>1				400.	d
Total BTEX					-	
MTBE	ND>10				40.	c
BTEX+MTBE					-	
TPH (mg/L)	ND>1					

MW-2

PARAMETER	Date of Sample Collection 2/6/97				Applicable Standard (ppb)	
Benzene	ND>1				5.	a
Chlorobenzene	ND>1				100.	a
1,2-DCB	ND>1				600.	b
1,3-DCB	ND>1				600.	c
1,4-DCB	ND>1				75.	a
Ethylbenzene	ND>1				680.	d
Toluene	ND>1				1,000.	b
Xylenes	ND>1				400.	d
Total BTEX					-	
MTBE	ND>10				40.	c
BTEX+MTBE					-	
TPH (mg/L)	ND>1					

All Values Reported in ug/L (ppb) except for TPH which is reported in mg/L (ppm)
ND>1 - None Detected above Detection Limit

MCL - E.P.A. Maximum Contaminant Level
HAL - Health Advisory Level
VGES - Vermont Groundwater Enforcement Standard

a - MCL and VGES
b - MCL
c - HAL
d - VGES

GROUNDWATER QUALITY SUMMARY

BROWNINGTON CENTRAL SCHOOL
BROWNINGTON, VERMONT

MW-3

PARAMETER	Date of Sample Collection 2/6/97				Applicable Standard (ppb)	
Benzene	ND>1				5.	a
Chlorobenzene	ND>1				100.	a
1,2-DCB	ND>1				600.	b
1,3-DCB	ND>1				600.	c
1,4-DCB	ND>1				75.	a
Ethylbenzene	ND>1				680.	d
Toluene	ND>1				1,000.	b
Xylenes	ND>1				400.	d
Total BTEX					-	
MTBE	ND>10				40.	c
BTEX+MTBE					-	
TPH (mg/L)	ND>1					

MW-4

PARAMETER	Date of Sample Collection 2/6/97				Applicable Standard (ppb)	
Benzene	ND>1				5.	a
Chlorobenzene	ND>1				100.	a
1,2-DCB	ND>1				600.	b
1,3-DCB	ND>1				600.	c
1,4-DCB	ND>1				75.	a
Ethylbenzene	ND>1				680.	d
Toluene	ND>1				1,000.	b
Xylenes	ND>1				400.	d
Total BTEX					-	
MTBE	ND>10				40.	c
BTEX+MTBE					-	
TPH (mg/L)	ND>1					

All Values Reported in ug/L (ppb) except for TPH which is reported in mg/L (ppm)
ND>1 - None Detected above Detection Limit

MCL - E.P.A. Maximum Contaminant Level
HAL - Health Advisory Level
VGES - Vermont Groundwater Enforcement Standard

a - MCL and VGES
b - MCL
c - HAL
d - VGES

GROUNDWATER QUALITY SUMMARY
QA/QC SAMPLES

BROWNINGTON CENTRAL SCHOOL
BROWNINGTON, VERMONT

2/6/97

PARAMETER	Trip Blank	Equipment Blank	Duplicate of MW-2	Applicable Standard (ppb)	
Benzene	ND>1	No	ND>1	5.	a
Chlorobenzene	ND>1	Sample	ND>1	100.	a
1,2-DCB	ND>1		ND>1	600.	b
1,3-DCB	ND>1	Disposable	ND>1	600.	c
1,4-DCB	ND>1	Bailers	ND>1	75.	a
Ethylbenzene	ND>1	Used	ND>1	680.	d
Toluene	ND>1		ND>1	1,000.	b
Xylenes	ND>1		ND>1	400.	d
Total BTEX				-	
MTBE	ND>10		ND>10	40.	c
BTEX+MTBE				-	
TPH (mg/L)	ND>1		ND>1		

All Values Reported in ug/L (ppb) except for TPH which is reported in mg/L (ppm)
ND>1 - None Detected above Detection Limit

MCL - E.P.A. Maximum Contaminant Level
HAL - Health Advisory Level
VGES - Vermont Groundwater Enforcement Standard

a - MCL and VGES
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ENDYNE, INC.

Laboratory Services

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

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Brownington Central School
REPORT DATE: February 14, 1997
DATE SAMPLED: February 6, 1997

PROJECT CODE: GIBR1915
REF.#: 99,737 - 99,742

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

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EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Brownington Central School
CLIENT PROJ. #: 12964963

DATE RECEIVED: February 7, 1997
REPORT DATE: February 14, 1997
PROJECT CODE: GIBR1915

Ref. #:	99,737	99,738	99,739	99,740	99,741
Site:	Trip Blank	MW-1	MW-2	MW-3	MW-4
Date Sampled:	2/6/97	2/6/97	2/6/97	2/6/97	2/6/97
Time Sampled:	7:10	10:20	10:12	10:31	10:40
Sampler:	Higgins/Ward	Higgins/Ward	Higgins/Ward	Higgins/Ward	Higgins/Ward
Date Analyzed:	2/13/97	2/13/97	2/13/97	2/13/97	2/14/97
UIP Count:	0	0	0	0	0
Dil. Factor (%):	100	100	100	100	100
Surr % Rec. (%):	93	93	91	94	93
Parameter	**Conc. (ug/L)**	**Conc. (ug/L)**	**Conc. (ug/L)**	**Conc. (ug/L)**	**Conc. (ug/L)**
Benzene	<1	<1	<1	<1	<1
Chlorobenzene	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1	<1	<1
Toluene	<1	<1	<1	<1	<1
Xylenes	<1	<1	<1	<1	<1
MTBE	<10	<10	<10	<10	<10

Ref. #:	99,742
Site:	Duplicate
Date Sampled:	2/6/97
Time Sampled:	10:12
Sampler:	Higgins/Ward
Date Analyzed:	2/14/97
UIP Count:	0
Dil. Factor (%):	100
Surr % Rec. (%):	91
Parameter	**Conc. (ug/L)**
Benzene	<1
Chlorobenzene	<1
1,2-Dichlorobenzene	<1
1,3-Dichlorobenzene	<1
1,4-Dichlorobenzene	<1
Ethylbenzene	<1
Toluene	<1
Xylenes	<1
MTBE	<10

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

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REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Brownington Central School
DATE REPORTED: February 20, 1997
DATE SAMPLED: February 6, 1997

PROJECT CODE: GIBR1916
REF. #: 99,743 - 99,748

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated sample preservation with HCl.

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 were 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.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

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LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8100

DATE: February 20, 1997
CLIENT: Griffin International
PROJECT: Brownington Central School
PROJECT CODE: GIBR1916
COLLECTED BY: R. Higgins/C. Ward
DATE SAMPLED: February 6, 1997
DATE RECEIVED: February 7, 1997

Reference #	Sample ID	Concentration (mg/L)[1]
99,743	Trip Blank; 7:10	ND[2]
99,744	MW-1; 10:20	ND
99,745	MW-2; 10:12	ND
99,746	MW-3; 10:31	ND
99,747	MW-4; 10:40	ND
99,748	Duplicate; 10:12	ND

Notes:

1 Method detection limit is 1.0 mg/L.
2 None detected

GIBR1.1b

20595

ENDYNE, INC.

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

CHAIN-OF-CUSTODY RECORD

99,737 — 99,748 GI# 1296463

Project Name: Brownington Central School Site Location: Brownington, VT	Reporting Address: GRIFFIN	Billing Address: GRIFFIN
Endyne Project Number: GIBR1915	Company: Contact Name/Phone #: CHRIS WARD 865-4288	Sampler Name: R. Higgins, C. Ward Phone #: 802 865-4288

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
99,737	TRIP BLANK	H_2O	✓		2/6/97 7:10	4	40ml		BTEX by 602 TPH by 8100	HCl	
99,738	MW-1				10:20	4					
99,739	MW-2				10:12	4					
99,740	MW-3				10:31	4					
99,741	MW-4				10:40	4					
99,742	DUPLICATE				10:12	2					

Relinquished by: Signature Chris Ward	Received by: Signature Barbara Cox	Date/Time 2-7-97 9:30
Relinquished by: Signature Barbara Cox	Received by: Signature Tonia M. Chandler	Date/Time 2-7-97 9:45

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_5	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):										