GRIFFIN INTERNATIONAL INC

Nov 25 10 14 AM '98

November 23, 1998

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

RE: Initial Investigation of Suspected Subsurface Petroleum Contamination
Dr. Wolfe, 316 Dewey Street, Bennington, Vermont (VTDEC Site #98-2348)

Dear Mr. Schwer:

Enclosed please find the summary report for the site investigation conducted at Dr. Wolfe's office/ residence at 316 Dewey Street in Bennington, Vermont. I am recommending that this site be considered for closure and removed from the VTDEC Active Hazardous Waste Sites List.

This site in involved in a property transfer, so an expedited review would be greatly appreciated.

Please contact me if you have any questions or comments.

Sincerely,

Christine Ward
Hydrogeologist

Enclosure

c.: Dr. William Wolfe (w/o enclosure)
GI#89841341

P.O. Box 943 • Williston, VT 05495 • Phone/Fax 802-865-4288
59 Clinton Street • Plattsburgh, NY 12901 • 518-562-4666 • Fax 518-561-6832

INITIAL INVESTIGATION OF SUSPECTED SUBSURFACE PETROLEUM CONTAMINATION

316 DEWEY STREET BENNINGTON, VERMONT

(VTDEC SITE #98-2348)
GI #89841341

November 1998

Prepared for

Dr. William Wolfe
P.O. Box 557
Bennington, VT 05201

Prepared by

P.O. Box 943
Williston, Vermont 05495
(802) 865-4288

TABLE OF CONTENTS

I. INTRODUCTION

This report summarizes the initial investigation of suspected subsurface petroleum contamination at Dr. Wolfe's office/ residence (the Site) at 316 Dewey Street in Bennington, Vermont (see Site Location Map, Appendix A). This work was requested by Mr. Chuck Schwer of the Vermont Department of Environmental Conservation (VTDEC) in a letter to Dr. William Wolfe dated May 7, 1998. This work was performed in accordance with the August 19, 1998, *Work Plan and Cost Estimate for an Initial Subsurface Investigation* prepared by Griffin. The work plan was approved by Mr. Schwer (VTDEC) in a letter to Dr. Wolfe dated September 9, 1998, with the addition that a surface water sample be collected from the stream below the curtain drain discharge point.

II. SITE BACKGROUND

A. Site History

On February 18, 1998, petroleum contamination was detected at the Site during soil field screening at the routine removal of a 550-gallon No. 2 fuel oil underground storage tank (UST). The UST was observed to be in fair condition with signs of severe pitting and one small hole [2]. Soil samples collected during the UST closure were screened for volatile organic compounds (VOCs) using an HNu™ systems Model HW-101 portable photoionization detector (PID). Soils collected from the excavation of the UST had VOC readings up to 140 parts per million (ppm). For reference, the VTDEC generally considers soil VOC readings greater than 10 ppm as measured with a PID to be the guideline level for further investigation at sites where these has been a No. 2 fuel oil UST.

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 Site is located on the southwest side of Bennington, on the east side of Dewey Street. West of the Site, on the opposite side of Dewey Street, is United Community Services of Bennington County, Inc. To the northwest of the Site, also on the opposite side of Dewey Street, is Putnam Health (Hospital). There is a private residence on the property to the north of the Site. The Site is bounded to the east by an unnamed northerly flowing stream that eventually discharges into the Walloomsac River. South of the Site is a

dental office. The surface topography across the Site slopes down toward the north and toward the east. Bedrock outcroppings were observed west of the Site, on the opposite side of Dewey Street.

There is a one-story brick-exterior building with a walk-in basement on the subject property. The basement is constructed of concrete poured walls and concrete slab floor. There are two sumps in the basement. The building covers approximately 1,750 square feet. There is a gravel drive and parking area north and east of the building. Grass lawns and landscaping comprise the remainder of the ground cover, except near the stream which is surrounded by scrub brush and small trees. There is a foundation curtain drain that discharges through a perforated PVC pipe from the northeast corner of the building to the small unnamed stream on the east side of the property.

The area is served by municipal water and sewer systems.

C. Site Geology

According to the Surficial Geologic Map of Vermont [3], the Site is underlain by glacial till. Bedrock below the Site is mapped as the Clarendon Springs Dolomite member of the Gorge formation, consisting fairly uniform, massive, smooth, weathered gray dolomite characterized by numerous geodes and knots of white quartz [4].

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; determination of groundwater flow direction and gradient; groundwater and surface water sample collection and analyses for petroleum related constituents; and a sensitive receptor survey.

A. Monitoring Well Installation

Four shallow monitoring wells, MW-1 through MW-4, were installed on October 1, 1998, by T&K Drilling, Inc., under the direct supervision of a Griffin hydrogeologist. The soil borings for the monitoring wells were advanced with a truck mounted 4 1/4" hollow stem auger. The monitoring well locations are indicated on the Site Map (Appendix A).

During borehole advancement, a two-foot split spoon sampler was advanced ahead of the augers every five feet. Undisturbed soil samples, collected from the borings with the split

spoon sampler, were logged by the supervising hydrogeologist and screened for the presence of VOCs using an HNu™ systems Model HW-101 PID. Prior to screening, the PID was calibrated with isobutylene referenced to benzene. Soils were screened using the Griffin Jar/Polyethylene Bag Headspace Screening Protocol, which conforms to state and industry standards. Soil characteristics and contaminant concentrations were recorded by the hydrogeologist in detailed well logs which are presented in Appendix B.

Monitoring well MW-1 was installed near the curtain drain, approximately 60 feet northeast of the former UST, in a presumed downgradient direction. Monitoring well MW-2 was installed approximately 40 feet north-northeast of the former UST, in a presumed downgradient direction. Monitoring well MW-3 was installed near the small stream, approximately 95 feet east of the former UST, in a presumed downgradient direction. Monitoring well MW-4 was installed in the source area of the former UST.

Soil encountered in the boring for MW-1 consisted primarily of brown sand with little silt, little clay, and trace fine gravel, from grade to approximately 7 feet below grade. The sample collected from 10 feet to 11 feet below grade consisted primarily of brown sand and clay with trace amounts of fine gravel. Refusal was encountered in the boring for MW-1 with the split-spoon sampler at 11 feet below grade. During drilling, the water table was encountered at a depth of 4 feet below grade; prior to leaving the Site on October 1, 1998, the water table was measured at a depth of 1.25 feet below grade.

Soil encountered in the boring for MW-2 consisted primarily of brown silt with some fine sand from grade to approximately 3 feet below grade. From 3 feet to 11.25 feet below grade, the soil consisted primarily of dense gray-brown fine sand and silt with trace clay and fine gravel. Refusal was encountered in the boring for MW-2 with the split-spoon sampler at 11.25 feet below grade. The water table was not established in MW-2 on the day of the drilling, likely due to the very dense soils.

Soil encountered in the boring for MW-3 consisted primarily of gravel and silt with some sand and little clay. The water table was measured in MW-3 at a depth of 2.15 feet below grade.

Soil encountered in the boring for MW-4 consisted primarily of brown silt and fine sand from grade to approximately 2 feet below grade. The split-spoon sample collected from 5 feet to 7 feet below grade consisted of gray-brown silt and clay with some gravel. The soils from grade to approximately 8 feet below grade in the boring for MW-4 were excavated and backfilled during the UST removal in February. The soil sample collected from 10 feet to 12 feet below grade consisted primarily of dense silt and fine gravel. A soil sample was not recovered from 15 feet to 17 feet below grade. The water table was not established in MW-4 on the day of the drilling, likely due to the very dense soils.

No VOCs were detected with the PID (i.e. readings were below 1 ppm) from the soils collected from the borings for the four monitoring wells, except for the sample collected

from 5 to 7 feet below grade in the boring for MW-4 which had a reading of 30 ppm. This sample was collected in the zone of backfilled material from the UST closure. No olfactory or visual indications of petroleum were noted from the soil samples, except for the above mentioned sample in the boring for MW-4 which had a very slight fuel oil odor.

Each of the new monitoring wells was constructed in a similar fashion, with two-inch diameter, Schedule 40 PVC well screen and riser. Monitoring wells MW-1, MW-2, and MW-3 contain a seven-foot length of 0.010-inch, factory-slotted screen; these wells are screen from 3 to 10 feet below grade. Monitoring well MW-4 contains a ten-foot length of 0.010-inch, factory-slotted screen from 5 to 15 feet below grade. A sand pack was installed in the annular space around the well screen from the bottom of the boring to one-half foot to two feet above the top of the screened interval in each borehole. An approximate one-foot thick bentonite surface seal was then installed above the sand pack. Each well was fitted with a gripper cap, and secured with a water-tight road box. The road box on each well is flush-mounted, set in concrete, and suitable for vehicular traffic. Monitoring wells MW-1 and MW-3 were developed by bailing immediately after installation. Monitoring wells MW-2 and MW-4 were dry and therefore not developed on the day of drilling.

B. Groundwater Flow Direction and Gradient

Water table elevation measurements were collected from the four on-site monitoring wells on October 8, 1998. 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. Water level data are presented in Appendix C. No free phase product was detected in the wells on October 8, 1998. Water table elevations were plotted on the Site map to generate the Groundwater Contour Map figure presented in Appendix A.

The relative water table elevations measured on October 8, 1998, suggest that groundwater flow at the Site is directed generally toward the north-northeast at a hydraulic gradient of approximately 6.7%.

Based on this flow direction, monitoring well MW-2 is located in a downgradient direction from the former UST location. Monitoring wells MW-1 and MW-3 are located in a downgradient to crossgradient direction from the former UST location.

C. Groundwater and Surface Water Sampling and Analyses

Griffin collected groundwater samples from the four on-site monitoring wells and a surface water sample from the stream on October 8, 1998. The water samples were analyzed by Endyne, Inc. of Williston, Vermont, by EPA Method 8021B for the presence of benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tertiary butyl ether (MTBE), naphthalene, and the alkylbenzenes: 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene. In addition, the samples were analyzed by modified EPA Method 8100 for Total Petroleum Hydrocarbons (TPH).

Results of the laboratory analyses for the monitoring wells and the stream are summarized in Appendix D. The laboratory analysis report is contained in Appendix E. Analytical results of the trip blank and duplicate samples indicate that adequate quality assurance and control were maintained during sample collection and analysis.

Toluene was detected in the groundwater samples collected from monitoring wells, MW-2 and MW-4, at a low concentration of 1.1 parts per billion (ppb) and at 1.3 ppb, respectively. The Vermont Groundwater Enforcement Standard (VGES) for toluene is 1,000 ppb.

The groundwater samples collected from monitoring wells MW-1 and MW-3, and the surface water sample collected from the stream, had no detectable levels of petroleum compounds.

No TPHs were detected above sample-specific detection limits in the groundwater samples collected from the four monitoring wells or from the surface water sample collected from the stream.

D. Sensitive Receptor Survey

A qualitative risk assessment was conducted to identify known and potential receptors of the limited contamination detected at the Site. A visual survey was conducted during the UST removal inspection on February 19, 1998, as well as during the monitoring well installation on October 1, 1998. Based on these observations, a determination of the potential risk to identified receptors was made.

The soil and groundwater in the vicinity of the former UST are potential receptors of the UST-related contamination. The risk to these sensitive receptors is considered minimal based on the low to non-detect concentrations of VOCs with the PID from soil samples during drilling and based on the very low to non-detect levels of VOCs and TPHs measured in the groundwater samples collected at the Site.

The nearest surface water is the unnamed brook located approximately 140 feet east of the former UST. The brook was inspected for signs of petroleum contamination on October 1, 1998. No indications of petroleum contamination impact such as stressed vegetation, stained soil, or sheens were observed along the length of the brook in the direct vicinity of the site. The risk to the brook posed by the limited petroleum impact in the vicinity of the former UST is considered minimal based on the negligible source area strength and based on the non-detect levels of VOCs and TPHs measured in the surface water sample collected below the curtain drain discharge point.

The area surrounding the Site is served by municipal water supplies.

The air space of the basement adjacent to the former 550-gallon UST and the two basement sumps were screened for the presence of VOCs using a PID on October 1, 1998. No VOCs were detected. The risk to the indoor air posed by the limited petroleum impact in the vicinity of the former UST is considered minimal based on the negligible source area strength and based on the non-detection of VOCs in the basement with the PID.

IV. CONCLUSIONS

Based on the results of this investigation at Dr. Wolfe's office/ residence, Griffin presents the following conclusions:

1) The source of petroleum contamination detected in soils at the Site was the former 550-gallon No. 2 fuel oil UST at the property. The contamination may have resulted from seepage from the pitting in the UST occurring over a period of time. The volume of product released is unknown. The source of the petroleum contamination (i.e., the UST system) was removed in February of 1998.

2) VOC readings of soils collected during the UST closure in February of 1998 indicate that adsorbed petroleum compounds existed in the soils in the immediate vicinity of the former UST. With the source UST eliminated, it is expected that adsorbed petroleum compound concentrations will decrease over time with the progressive action of natural mitigative processes including biodegradation, volatilization, and diffusion.

3) Four groundwater monitoring wells, MW-1 through MW-4, were installed by Griffin at the Site on October 1, 1998. VOCs were not detected by field screening methods in soil samples collected from the borings for the monitoring wells, except for the soil sample collected from 5 feet to 7 feet below grade in MW-4 which is located in the source area of the former UST. These results indicate that adsorbed contamination is limited to the direct vicinity of the former UST pit.

4) The depth to groundwater measured on October 8, 1998, in the four site monitoring wells ranged from approximately 1 to 6 feet below grade. The shallow groundwater flow beneath the Site on this date was estimated to be directed toward the north-northeast at a hydraulic gradient of approximately 6.7%.

5) Groundwater samples were collected from the four site monitoring wells on October 8, 1998. Very low concentrations of toluene, below the VGES, were detected in the groundwater samples collected from source area monitoring well MW-4 (1.3 ppb) and downgradient monitoring well MW-2 (1.1 ppb). No other VOCs or TPHs were detected by laboratory analysis in the groundwater samples. Detection limits in the analyses were well below the VGES.

6) A surface water sample was collected from the small stream below the discharge point of the foundation curtain drain. No VOCs or TPHs were detected by laboratory analysis in the stream water sample. Detection limits in the analyses were well below the VGES. No indications of petroleum contamination impact such as stressed vegetation, stained soil, or sheens were observed along the length of the brook in the direct vicinity of the site on October 1, 1998.

7) The area surrounding the Site is served by municipal water supplies.

8) The air space of the basement adjacent to the former 550-gallon UST and the basement sumps were screened for the presence of VOCs using a PID during the monitoring well installation on October 1, 1998. No VOCs were detected

9) There appear to be no significant potential risks to identified sensitive receptors based on currently available data.

V. RECOMMENDATIONS

Based on the results of this site investigation, Griffin recommends that Dr. Wolfe's site in Bennington, Vermont be considered for closure and be removed from the VTDEC Active Hazardous Waste Sites List. This recommendation is offered based upon achievement of the following closure criteria, as per the VTDEC Site Management Activity Completed (SMAC) Checklist (dated December 1, 1997):

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

   See Conclusions #1, #2, #3 and #5.

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

   See Conclusions #1 and #5.

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

   See Conclusion #3 and #5.

4) Groundwater enforcement standards are met at the following compliance points:

   Any point of present use of groundwater as a source of potable water: See Conclusions #5 and #7.

   Any point at or within the boundary of any Class I groundwater area: Dr. Wolfe's office/ residence on 316 Dewey Street is not within a Class I groundwater area.

   Any point at the boundary of the property on which the contaminant source is located: See Conclusion #5 and #6.

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

   See Conclusion #3 and #8.

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

See Conclusions #5, #6, #7, #8, and #9.

7) Site meets RCRA requirements.

Available records indicate that Dr. Wolfe's office/ residence on 316 Dewey Street 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 Dr. Wolfe's office/ residence on 316 Dewey Street is not in violation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as defined in 40 CFR 300.

In addition, Griffin recommends that the four site monitoring wells be properly abandoned according to VTDEC requirements for well closure.

REFERENCES

1. USGS 7.5 Minute Topographic Maps, Pownal, VT and Bennington, VT, dated 1954.

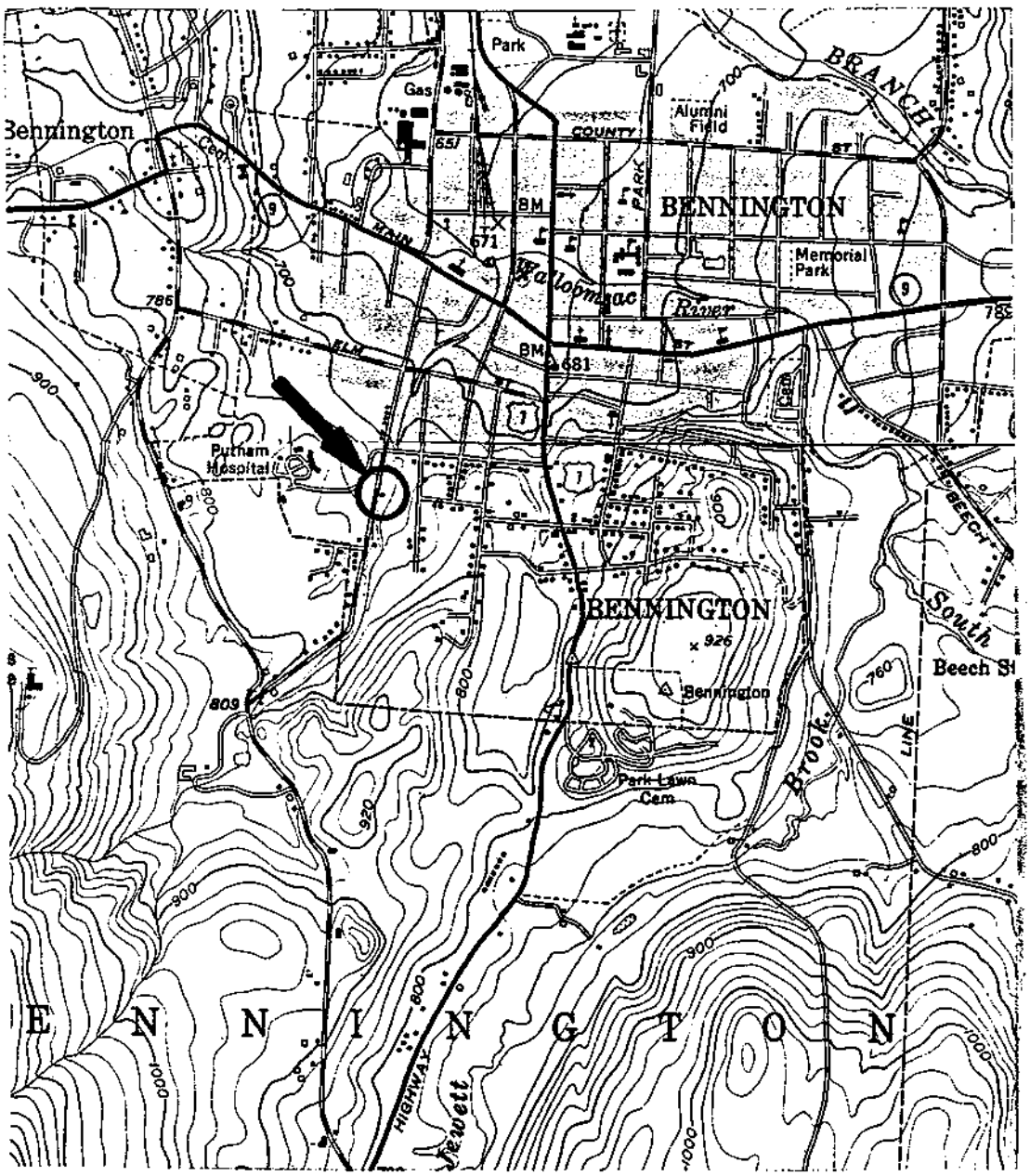
2. Griffin International, February 24, 1998, *UST Closure Inspection, Dr. Wolfe Residence, 316 Dewey Street, Bennington, Vermont,* letter report to Ms. Sue Thayer, State of Vermont, Department of Environmental Conservation.

3. Doll, Charles G., ed., 1970, *Surficial Geologic Map of Vermont*, Vermont Geological Survey.

4. Doll, Charles G., ed., 1961, *Centennial Geologic Map of Vermont*, Vermont Geological Survey.

APPENDIX A

Site Location Map
Site Sketch
Groundwater Contour Map
Contaminant Concentration Map



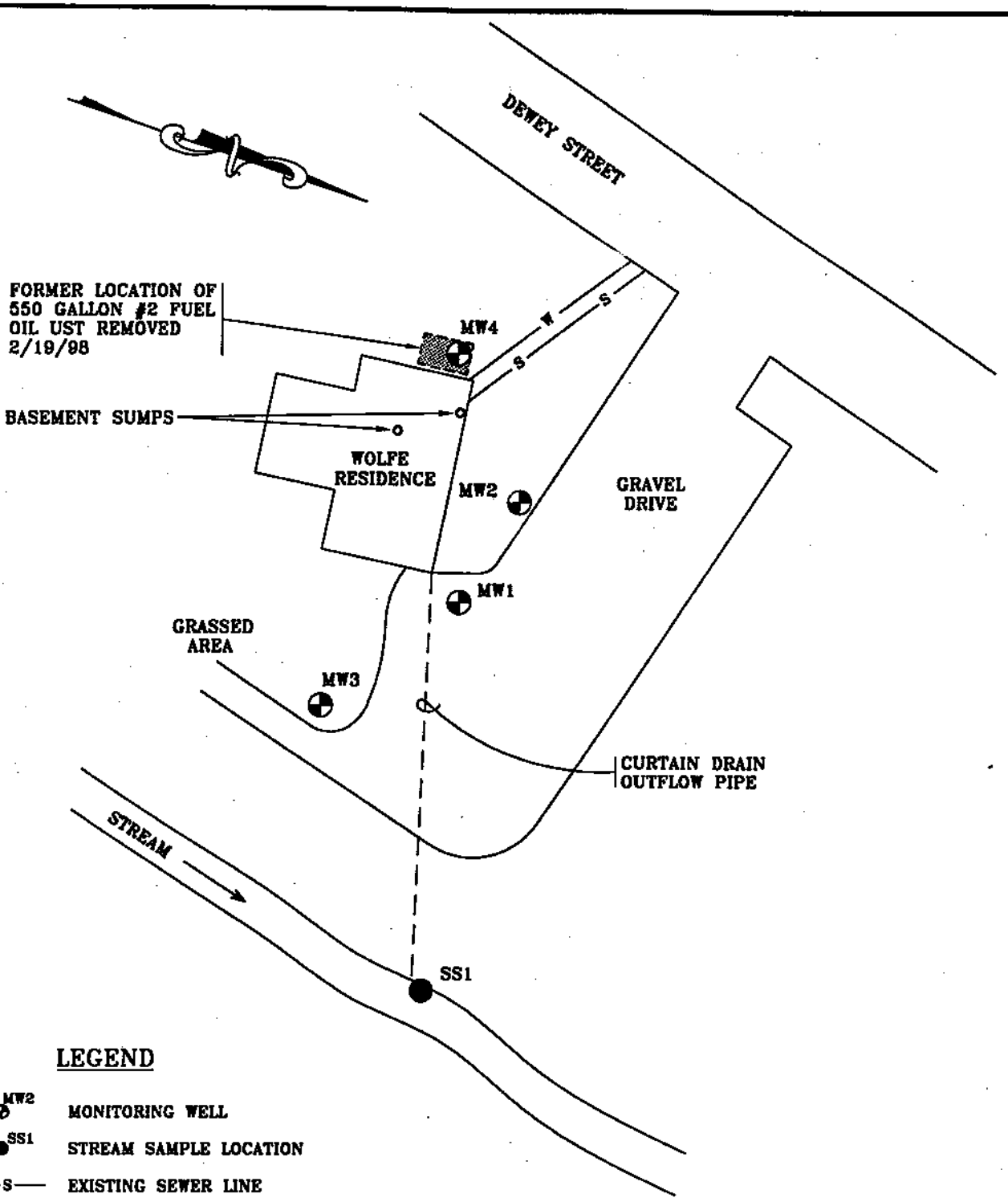
JOB #: 89841341
SOURCE: USGS– POWNAL AND BENNINGTON, VERMONT QUADRANGLES

GRIFFIN INTERNATIONAL INC

DR. WILLIAM WOLFE
316 DEWEY STREET
BENNINGTON, VERMONT

SITE LOCATION MAP

DATE: 10/21/98	DWG.#:1	SCALE: 1:24000	DRN.:SB	APP.:CW



LEGEND

- MW2 — MONITORING WELL
- SS1 — STREAM SAMPLE LOCATION
- —S— EXISTING SEWER LINE
- —W— EXISTING WATER LINE

JOB #: 89841341

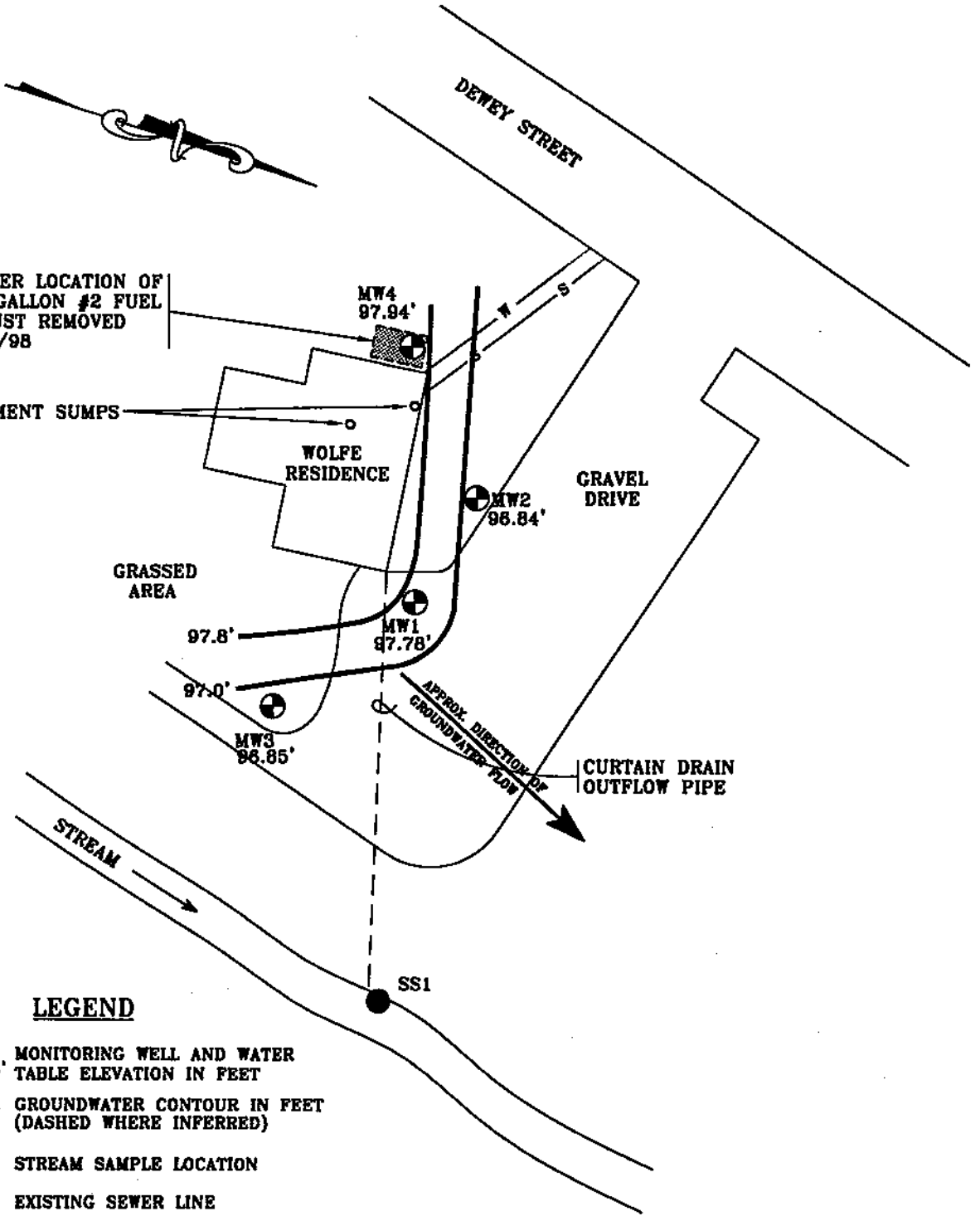
NOTE: MONITORING WELL AND STREAM LOCATIONS SURVEYED RELATIVE TO BUILDING BY GRIFFIN INTERNATIONAL ON 10/1/98

GRIFFIN INTERNATIONAL INC

DR. WILLIAM WOLFE
316 DEWEY STREET
BENNINGTON, VERMONT

SITE SKETCH

DATE: 11/4/98	DWG.#:2	SCALE: 1"=40'	DRN.:SB	APP.:CW



LEGEND

- MW2 96.84' — MONITORING WELL AND WATER TABLE ELEVATION IN FEET
- 97.0' — GROUNDWATER CONTOUR IN FEET (DASHED WHERE INFERRED)
- SS1 — STREAM SAMPLE LOCATION
- —S— EXISTING SEWER LINE
- —W— EXISTING WATER LINE

JOB #: 89841341

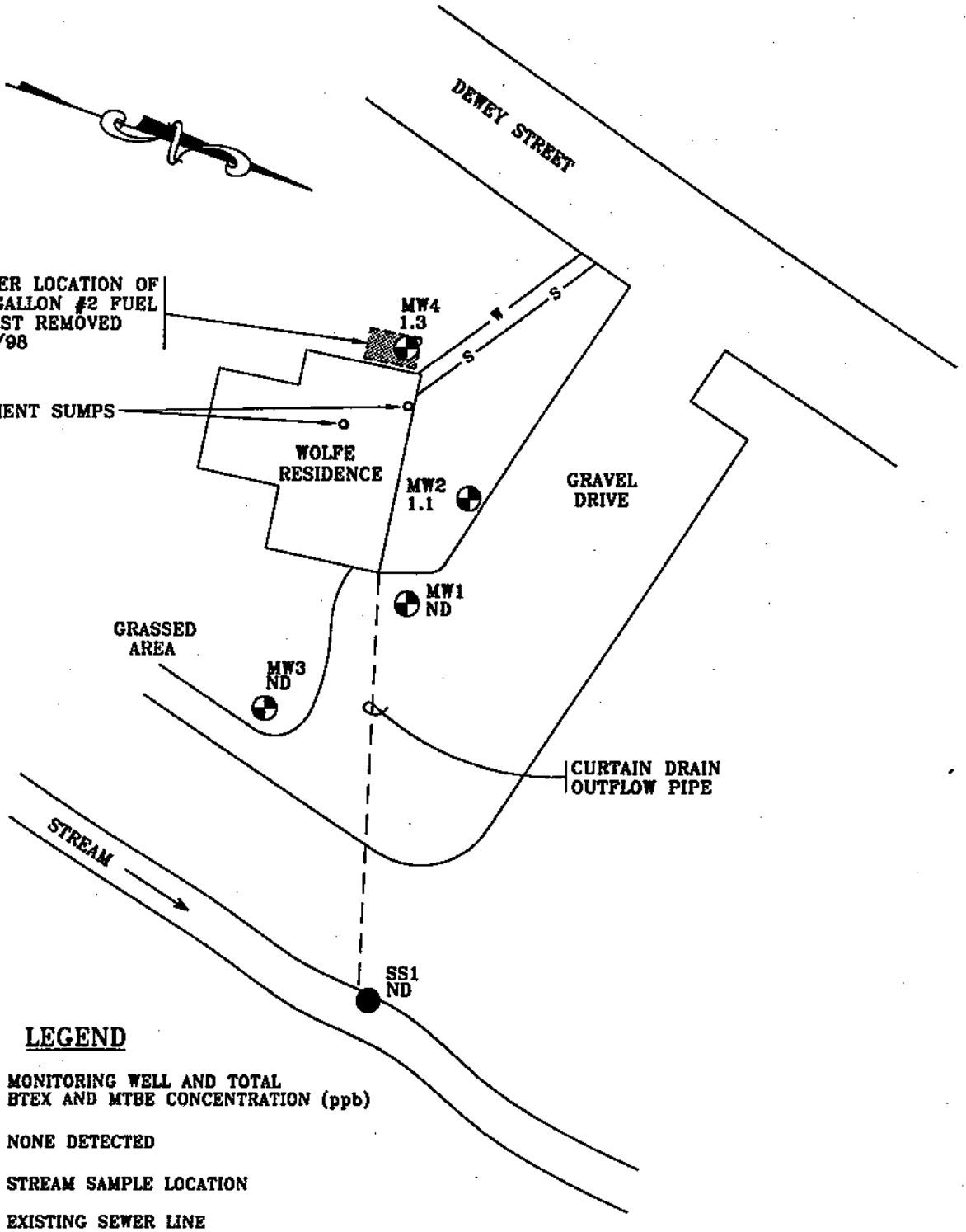
NOTE: MONITORING WELL AND STREAM LOCATIONS SURVEYED RELATIVE TO BUILDING BY GRIFFIN INTERNATIONAL ON 10/1/98

GRIFFIN INTERNATIONAL INC

DR. WILLIAM WOLFE
316 DEWEY STREET
BENNINGTON, VERMONT

GROUNDWATER CONTOUR MAP
MEASUREMENT DATE: 10/8/98

DATE: 11/4/98	DWG.#:3	SCALE: 1"=40'	DRN.:SB	APP.:CW



LEGEND

MW2 1.1	MONITORING WELL AND TOTAL BTEX AND MTBE CONCENTRATION (ppb)
ND	NONE DETECTED
SS1	STREAM SAMPLE LOCATION
—S—	EXISTING SEWER LINE
—W—	EXISTING WATER LINE

JOB #: 89841341

NOTE: MONITORING WELL AND STREAM LOCATIONS SURVEYED RELATIVE TO BUILDING BY GRIFFIN INTERNATIONAL ON 10/1/98

GRIFFIN INTERNATIONAL INC

DR. WILLIAM WOLFE
316 DEWEY STREET
BENNINGTON, VERMONT

CONTAMINANT CONCENTRATION MAP
SAMPLE DATE: 10/8/98

DATE: 11/4/98	DWG.#:4	SCALE: 1"=40'	DRN.:SB	APP.:CW

APPENDIX B

Soil Logs and Monitoring Well Specifications

PROJECT DR. WILLIAM WOLFE 316 DEWEY STREET

OCATION BENNINGTON, VERMONT

DATE DRILLED 10/1/98 TOTAL DEPTH OF HOLE 11.0'

IAMETER 4.25"

SCREEN DIA. 2" LENGTH 7.0' SLOT SIZE 0.010"

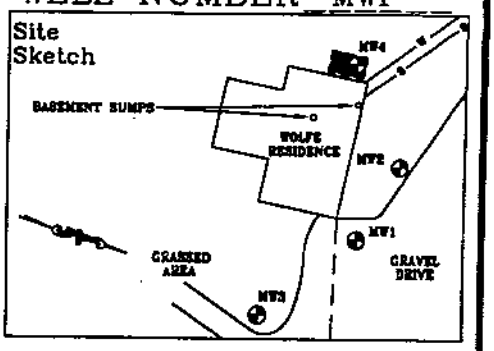
ASING DIA. 2" LENGTH 2.65' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING METHOD HSA

RILLER ALAN LOG BY C. WARD

WELL NUMBER MW1

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		NATIVE BACKFILL	0'–2' 0.1 ppm	1.25' WATER TABLE ▼	1
2		BENTONITE			2
3		WELL RISER			3
4					4
5		SAND PACK			5
6			5'–7' 15/10/14/11 0.2 ppm	Brown, fine to medium SAND, little silt, little clay, trace fine gravel, saturated.	6
7		WELL SCREEN			7
8					8
9		BOTTOM CAP			9
10			10'–11' 14/100–5" 0.2 PPM	Brown SAND and CLAY, trace fine gravel. Bottom 1" of sample: Brown fine to medium GRAVEL and CLAY with thin layers of orange oxidation–weathered bedrock.	10
11		UNDISTURBED NATIVE SOIL			11
12				BASE OF WELL AT 10' END OF EXPLORATION AT 11'	12
13					13
14					14
15					15
16					16
17					17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT DR. WILLIAM WOLFE 316 DEWEY STREET

LOCATION BENNINGTON, VERMONT

DATE DRILLED 10/1/98 TOTAL DEPTH OF HOLE 11.25'

DIAMETER 4.25"

SCREEN DIA. 2" LENGTH 7.0' SLOT SIZE 0.010"

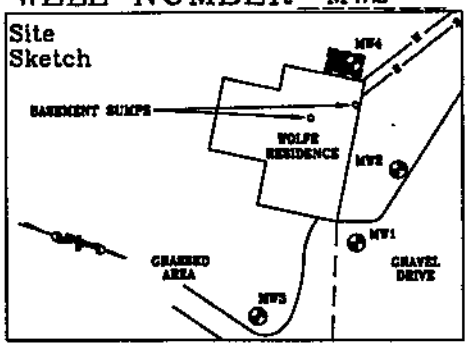
CASING DIA. 2" LENGTH 2.65' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING METHOD HSA

DRILLER ALAN 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 LOCKING WELL CAP CONCRETE			0
1		NATIVE BACKFILL	0'-2' 0.2 ppm	Brown SILT, some fine sand, little clay.	1
2		BENTONITE			2
3		WELL RISER			3
4					4
5		SAND PACK			5
6			5'-7' 8/14/15/17 0.1 ppm	Gray/brown, fine SAND and SILT, little clay, trace fine gravel.	6
7		WELL SCREEN			7
8					8
9		BOTTOM CAP			9
10			10'-11.25' 17/38/50-3" 0.1 ppm	Gray/brown, fine to medium SAND and SILT, some fine to medium gravel, trace clay, very dense, moist.	10
11		UNDISTURBED NATIVE SOIL			11
12				BASE OF WELL AT 10' END OF EXPLORATION AT 11.25'	12
13					13
14					14
15					15
16					16
17					17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT DR. WILLIAM WOLFE 316 DEWEY STREET

LOCATION BENNINGTON, VERMONT

DATE DRILLED 10/1/98 TOTAL DEPTH OF HOLE 12.0'

DIAMETER 4.25"

SCREEN DIA. 2" LENGTH 7.0' SLOT SIZE 0.010"

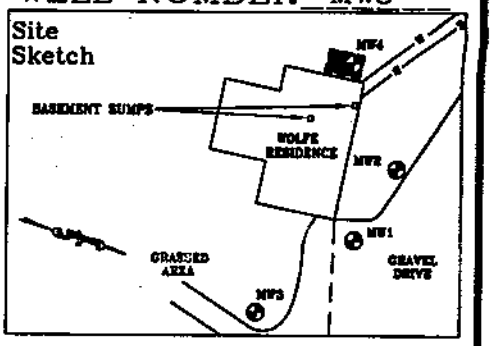
CASING DIA. 2" LENGTH 2.6' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING METHOD HSA

DRILLER ALAN LOG BY C. WARD

WELL NUMBER MW3

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		NATIVE BACKFILL	0'–2' 0.2 ppm	Brown SILT and SAND, some fine gravel.	1
2		BENTONITE		2.15' WATER TABLE	2
3		WELL RISER			3
4					4
5		SAND PACK			5
6			5'–7' 8/13/18/20 0.1 ppm	Brown, fine to medium GRAVEL and SILT, some fine sand, little clay, wet.	6
7		WELL SCREEN			7
8					8
9		BOTTOM CAP			9
10			10'–12' 16/28/24/25 0.1 ppm	Brown, fine to medium GRAVEL and SILT, some fine sand, little clay, saturated.	10
11					11
12		UNDISTURBED NATIVE SOIL		BASE OF WELL AT 10' END OF EXPLORATION AT 12'	12
13					13
14					14
15					15
16					16
17					17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

PROJECT DR. WILLIAM WOLFE 316 DEWEY STREET

LOCATION BENNINGTON, VERMONT

DATE DRILLED 10/1/98 TOTAL DEPTH OF HOLE 17.0'

DIAMETER 4.25"

SCREEN DIA. 2" LENGTH 10.0' SLOT SIZE 0.010"

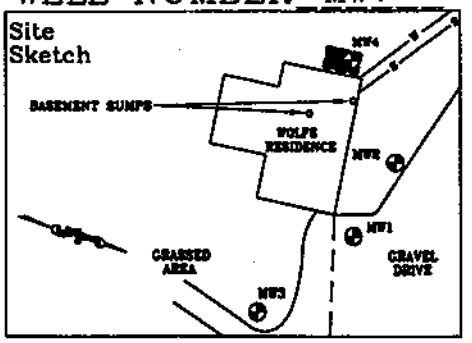
CASING DIA. 2" LENGTH 4.7' TYPE sch 40 pvc

DRILLING CO. T&K DRILLING METHOD HSA

DRILLER ALAN 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		ROAD BOX LOCKING WELL CAP CONCRETE			0
1			0'–2' 0 ppm	Brown SILT and fine SAND, trace gravel.	1
2		NATIVE BACKFILL BENTONITE			2
3					3
4		WELL RISER			4
5				Gray/brown SILT and CLAY, some fine gravel, little sand, moist to wet.	5
6			5'–7' 1/1/2/8 30 ppm		6
7					7
8		SAND PACK			8
9					9
10			10'–12' 7/14/22/16 0.2 ppm	Brown SILT and fine GRAVEL, little fine sand, (till), dense, wet.	10
11					11
12		WELL SCREEN			12
13					13
14		BOTTOM CAP			14
15				No recovery.	15
16			15'–17' 32/35/47/39		16
17		UNDISTURBED NATIVE SOIL		BASE OF WELL AT 15' END OF EXPLORATION AT 17'	17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

APPENDIX C

Liquid Level Monitoring Data

LIQUID LEVEL MONITORING DATA

DR. WILLIAM WOLFE
316 DEWEY STREET
BENNINGTON, VERMONT

10/8/98

Well I.D.	Well Depth bgs	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	10.00	98.60	-	0.82	-	-	-	-	97.78
MW-2	10.00	100.00	-	3.16	-	-	-	-	96.84
MW-3	10.00	98.94	-	2.09	-	-	-	-	96.85
MW-4	15.00	103.97	-	6.03	-	-	-	-	97.94

All Values Reported in Feet

btoc - Below Top of Casing

bgs - Below Ground Surface

Elevations determined relative to top of casing of MW-2, which was arbitrarily set at 100'

Top of Casing Elevations surveyed by Griffin on 10/1/98

APPENDIX D

Water Quality Data

WATER QUALITY DATA

DR. WILLIAM WOLFE
316 DEWEY STREET
BENNINGTION, VERMONT

Sample Location	MW-1	MW-2	MW-3	MW-4	STREAM	VGES
Sample Date:	10/8/98	10/8/98	10/8/98	10/8/98	10/8/98	
Analytical Method:	8021B	8021B	8021B	8021B	8021B	
PARAMETER						(ppb)
Benzene	ND>1	ND>1	ND>1	ND>1	ND>1	5.
Toluene	ND>1	**1.1**	ND>1	**1.3**	ND>1	1,000.
Ethylbenzene	ND>1	ND>1	ND>1	ND>1	ND>1	700.
Xylenes	ND>1	ND>1	ND>1	ND>1	ND>1	10,000.
Total BTEX	ND	**1.1**	ND	**1.3**	ND	-
MTBE	ND>10	ND>10	ND>10	ND>10	ND>10	40.
1,3,5-Trimethyl Benzene	ND>1	ND>1	ND>1	ND>1	ND>1	4.
1,2,4-Trimethyl Benzene	ND>1	ND>1	ND>1	ND>1	ND>1	5.
Naphthalene	ND>1	ND>1	ND>1	ND>1	ND>1	20.
Total VOCs	ND	**1.1**	ND	**1.3**	ND	-

Analytical Method:	8100M	8100M	8100M	8100M	8100M	(ppm)
TPH	ND>0.4	ND>0.4	ND>0.4	ND>0.4	ND>0.4	1,000.

All Values Reported in ug/L (ppb), except TPH in mg/L (ppm)

ND>1 - None Detected above Detection Limit

TBQ<1 - Trace Below Quantitation Limit

Detections are bolded.

Blank cell - not analyzed

VGES - Vermont Groundwater Enforcement Standard >VGES

APPENDIX E

Analytical Laboratory Report

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: Dr. Wolfe Residence
REPORT DATE: October 16, 1998
DATE SAMPLED: October 8, 1998

PROJECT CODE: GIDR1079
REF.#: 128,645 - 128,651

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: Griffin International
PROJECT NAME: Dr. Wolfe Residence
CLIENT PROJ. #: 89841341

DATE RECEIVED: October 9, 1998
REPORT DATE: October 16, 1998
PROJECT CODE: GIDR1079

Ref. #:	128,645	128,646	128,647	128,648	128,649
Site:	Trip Blank	MW3	MW1	Duplicate	Stream
Date Sampled:	10/8/98	10/8/98	10/8/98	10/8/98	10/8/98
Time Sampled:	7:25	11:19	11:46	11:46	12:12
Sampler:	D. Tourangeau	D. Tourangeau	D. Tourangeau	D. Tourangeau	D. Tourangeau
Date Analyzed:	10/15/98	10/15/98	10/15/98	10/15/98	10/15/98
UIP Count:	0	0	0	0	0
Dil. Factor (%):	100	100	100	100	100
Surr % Rec. (%):	91	91	92	85	98
Parameter	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)
MTBE	<10	<10	<10	<10	<10
Benzene	<1	<1	<1	<1	<1
Toluene	<1	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1	<1	<1
Xylenes	<1	<1	<1	<1	<1
1,3,5 Trimethyl Benzene	<1	<1	<1	<1	<1
1,2,4 Trimethyl Benzene	<1	<1	<1	<1	<1
Naphthalene	<1	<1	<1	<1	<1

Ref. #:	128,650	128,651			
Site:	MW4	MW2			
Date Sampled:	10/8/98	10/8/98			
Time Sampled:	12:22	12:30			
Sampler:	D. Tourangeau	D. Tourangeau			
Date Analyzed:	10/15/98	10/15/98			
UIP Count:	0	0			
Dil. Factor (%):	100	100			
Surr % Rec. (%):	93	91			
Parameter	Conc. (ug/L)	Conc. (ug/L)			
MTBE	<10	<10			
Benzene	<1	<1			
Toluene	1.3	1.1			
Ethylbenzene	<1	<1			
Xylenes	<1	<1			
1,3,5 Trimethyl Benzene	<1	<1			
1,2,4 Trimethyl Benzene	<1	<1			
Naphthalene	<1	<1			

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

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: Dr.Wolfe Residence/#89841341
DATE REPORTED: October 23, 1998
DATE SAMPLED: October 8, 1998

PROJECT CODE: GIDR1080
REF. #: 128,652 - 128,656

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 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.

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

LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8100

DATE: October 23, 1998
CLIENT: Griffin International
PROJECT: Dr.Wolfe Residence/#89841341
PROJECT CODE: GIDR1080
COLLECTED BY: Don Tourangeau
DATE SAMPLED: October 8, 1998
DATE RECEIVED: October 9, 1998

Reference #	Sample ID	Concentration (mg/L)[1]
128,652	MW#3; 11:19	ND[2]
128,653	MW#1; 11:46	ND
128,654	Stream; 12:12	ND
128,655	MW#4; 12:22	ND
128,656	MW#2; 12:30	ND

Notes:

1 Value quantitated based on the response of #2 Fuel Oil. Method detection limit is 0.4 mg/L.
2 None Detected

ENDYNE, INC.

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

29313

CHAIN-OF-CUSTODY RECORD

Project Name: [illegible]	Reporting Address: GRIFFIN	Billing Address: GRIFFIN
Site Location: [illegible]		
Endyne Project Number:	Company:	Sampler Name: [illegible]
	Contact Name/Phone #: CHRIS WARD	Phone #:

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
	TRIP BLANK	H_2O			07:25	2	VOA		8021B	HCl	
	MW #3				11:19						
	MW #1				11:46						
	DUPLICATE				11:46						
	STANDARD				12:12						
	MW #4				12:22						
	MW #2				12:30						
	MW #3				11:19				30		
	MW #1				11:46						
	STANDARD				12:12						
	MW #4				12:22						
	MW #2				12:30						

Relinquished by: Signature	Received by: Signature	Date/Time 10-9-98 10:00
Relinquished by: Signature	Received by: Signature	Date/Time 10/9/98 10:13

New York State Project: Yes ___ No X

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): TPH BY 8100 MODIFIED										