

FEB 25 2000



February 24, 2000.

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
William E. Dailey facility, Manchester, Vermont (VTDEC #99-2697)

Dear Mr. Schwer:

Enclosed please find the summary report for the site investigation conducted at the above referenced site. Mr. Bob Maskiell of William E. Dailey has reviewed the report and requested that it be forwarded for your review.

Griffin is recommending that the William E. Dailey facility be removed from the VTDEC Active Hazardous Waste Sites List.

Please contact me if you have any questions or comments.

Sincerely,

A handwritten signature in cursive script, appearing to read "Christine Ward".

Christine Ward
Hydrogeologist

Enclosure

c.: Bob Maskiell, William E. Dailey, Inc. (w/o enclosure)
GI#129941651

**INITIAL INVESTIGATION OF
SUSPECTED SUBSURFACE PETROLEUM
CONTAMINATION**

**WILLIAM E. DAILEY FACILITY
ROUTE 7A
MANCHESTER, VERMONT**

VTDEC Site #99-2697
GI #129941651

February 18, 2000

Prepared for

William E. Dailey, Inc.
1424 Vermont Route 7A
Shaftsbury, VT 05262

Prepared by



20 Commerce Street • P.O. Box 943 • Williston, VT 05495 • 802-865-4288 • Fax 802-657-4129



Table of Contents

I. INTRODUCTION	1
II. SITE BACKGROUND	1
A. SITE HISTORY	1
B. SITE GEOLOGY	1
III. INVESTIGATIVE PROCEDURES	2
A. SOIL BORINGS / MONITORING WELL INSTALLATION.....	2
B. GROUNDWATER FLOW DIRECTION AND GRADIENT.....	3
C. GROUNDWATER SAMPLING AND ANALYSES.....	4
D. SUPPLY WELL SAMPLING AND ANALYSIS	4
E. SENSITIVE RECEPTOR SURVEY	4
IV. CONCLUSIONS.....	5
V. RECOMMENDATIONS.....	7
VI. REFERENCES	8

APPENDICES

Appendix A - Maps

- 1) Site Location Map
- 2) Site Sketch
- 3) Groundwater Contour Map - 1/28/00

Appendix B - Soil Logs and Monitoring Well Specifications

Appendix C - Liquid Level Monitoring Data

Appendix D - Groundwater Quality Data

Appendix E - Analytical Laboratory Reports



I. INTRODUCTION

This report summarizes the initial investigation of suspected subsurface petroleum contamination at the William E. Dailey Facility on Route 7A in Manchester, Vermont (see Site Location Map, Appendix A). The William E. Dailey facility is a sand/gravel pit and concrete processing plant. This work was conducted by Griffin International, Inc. (Griffin) for William E. Dailey, Inc., owner of the property.

This site investigation was requested by Chuck Schwer of the Vermont Department of Environmental Conservation (VTDEC) in a letter to Bob Maskiell of William E. Dailey, Inc., dated December 3, 1999. This work was conducted under the VTDEC Sites Management Section (SMS) Expressway Program and generally in accordance with Griffin's *Work Plan and Cost Estimate Subsurface Investigation of Suspected Petroleum Contamination*, dated December 14, 1999. Approval to participate in the Expressway program was granted by Chuck Schwer (VTDEC) on December 28, 1999.

II. SITE BACKGROUND

A. Site History

On October 13, 1999, petroleum contamination was detected at the William E. Dailey Facility during soil field screening at the routine removal of a 20,000-gallon capacity diesel underground storage tank (UST). Soil samples collected during the UST closure were screened for volatile organic compounds (VOCs) using an HNu™ systems model PI-101 photoionization detector (PID) equipped with a 10.2 eV lamp. Zones of elevated VOCs as measured with the PID were detected at and beneath the eastern end of the UST where the fuel dispenser had been located. The highest PID measurement of 75 parts per million (ppm) was recorded in a soil sample excavated from grade to approximately 5 feet below grade at the eastern end of the UST. The PID measurements from soil samples collected below the eastern end of the UST ranged from 0.2 ppm to 25 ppm. Soil samples collected from under the UST at the center and western end of the excavation had PID measurements of 0.2 ppm [2].

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 Geology

According to the Surficial Geologic Map of Vermont [3], the site is underlain by glaciofluvial outwash sediments consisting mainly of horizontally bedded gravel. Bedrock below the site is



mapped as the Winooski dolomite consisting of buff-weathered, pink, buff, and gray dolomite [4].

The surficial soil encountered during the UST closure excavation consisted primarily of sand and silt from grade to approximately 15 feet below grade, underlain by gravel to 19 feet below grade, which marked the vertical extent of the excavation [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; determination of groundwater flow direction and gradient; groundwater and supply well sample collection and analyses for petroleum related constituents; and a sensitive receptor survey.

A. Soil Borings / Monitoring Well Installation

On January 20, 2000, three monitoring wells, MW-1 through MW-3, were installed at the site utilizing hollow-stem auger drilling methods. T & K Drilling, Inc., of East Swanzey, New Hampshire, advanced the soil borings and installed the monitoring wells under the supervision of a Griffin hydrogeologist. The monitoring well locations are indicated on the Site Sketch (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 equipped with a 10.2 eV lamp. 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 southwest corner of the former UST in a presumed downgradient direction. Monitoring well MW-2 was installed approximately 30 feet southwest of the former UST in a presumed downgradient direction. Refusal was encountered at a depth of approximately seven and a half feet in two other attempts to advance a boring for monitoring well MW-2. Monitoring well MW-3 was installed near the northeast corner of the former UST in a presumed upgradient direction. Refusal was encountered at a depth of approximately twelve feet in the first location to advance a boring for monitoring well MW-3. The refusals were likely due to large cobbles or boulders.



The fourth proposed monitoring well MW-4 was not installed on January 20, 2000, due to the time expended on the three soil borings with refusal and due to the slightly deeper than expected water table requiring 30-foot wells rather than the proposed 25-foot wells. Chuck Schwer of the VTDEC was informed of this situation by Christine Ward of Griffin via a voice mail message on January 25, 2000.

Soil encountered in the borings for the monitoring wells consisted primarily of silt and silty fine sand at the surface, coarsing with depth to silty gravel with sand, underlain by silt with fine sand in the samples collected from 25 to 27 feet below grade. During drilling the water table was encountered at an approximate depth of 25 feet below grade in the three soil borings. Bedrock was not encountered to a depth of 30 feet which marked the vertical extent of the borings for monitoring wells.

No VOCs were measured with the PID at concentrations exceeding 1 ppm from the soils collected from the borings for monitoring wells MW-1, MW-2, and MW-3, except for the sample collected from 0 to 2 feet in the boring for MW-3, which had a PID measurement of 3 ppm. This soil boring is located near the eastern end of the former UST where elevated readings were measured during the UST closure, and the slightly elevated PID reading from the sample collected near the surface for MW-3 is likely residual from the soil excavated during the UST closure.

The monitoring wells were constructed with 2-inch diameter, Schedule 40 PVC well screen and riser. Each well contains a ten-foot length of 0.010-inch, factory-slotted screen, installed from 20 to 30 feet below grade. A sand pack was installed in the annular space around the well screen from the bottom of the boring to approximately one-foot above the top of the screened interval in the boreholes for the monitoring wells. An approximate one-foot thick bentonite seal was then installed above the sand pack, a second one-half foot thick bentonite seal was installed closer to the ground surface. Each well was fitted with a gripper cap, and secured with a flush mounted water-tight road box. After installation, the monitoring wells were developed by bailing.

B. Groundwater Flow Direction and Gradient

Water table elevation measurements were collected from the three on-site monitoring wells on January 28, 2000. The top of casing elevations were determined relative to the top of casing for monitoring well MW-1, 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. The depth to groundwater measured on January 28, 2000, in the three on-site monitoring wells ranged from 23.96 to 24.65 feet below the top of casing. The relative water table elevations measured on this date, suggest that groundwater flow at the site is directed generally toward the west at a hydraulic gradient on the order of 1.1%. Free phase product was not detected in the wells on January 28, 2000. Water table elevations were plotted on the Site Sketch to generate the Groundwater Contour Map presented in Appendix A. Water level data are presented in Appendix C.



C. Groundwater Sampling and Analyses

Griffin collected groundwater samples from the three on-site monitoring wells on January 28, 2000. 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, 1,3,5-trimethylbenzene (TMB) and 1,2,4-TMB, and for total petroleum hydrocarbons (TPH) by EPA Method 8015-DRO (diesel range organics). Results of the laboratory analyses for the monitoring wells are summarized in the table 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.

No compounds targeted by EPA Methods 8021B and 8015-DRO were reported at levels exceeding the sample specific detection limits for the groundwater samples collected from the three monitoring wells. The reported detection limits were below the Vermont Groundwater Enforcement Standards (VGES) for the targeted compounds. No unidentified peaks (UIPs) of petroleum compounds were reported for the groundwater samples collected from the three monitoring wells.

D. Supply Well Sampling and Analysis

The supply well for the William E. Dailey facility is located approximately 300 feet west of the former UST location. This supply well is a shallow well that was installed approximately 30 years ago [5].

Griffin collected a water sample from the supply well on January 28, 2000. The water sample was collected from a sink in the scale house. Water was purged from the piping system for approximately 1.75 hours prior to sample collection. The water sample was submitted for laboratory analysis of drinking water VOCs by EPA Method 524.2.

No compounds targeted by EPA Method 524.2 were reported at levels exceeding the sample specific detection limits for the supply well sample. The reported detection limits were at or below the EPA Maximum Contaminant Levels (MCLs) and the Vermont Health Advisory Level (VHALs) for the targeted compounds [6, 7]. No UIPs were reported for the supply well sample.

E. Sensitive Receptor Survey

A qualitative risk assessment was conducted during the drilling on January 20, 2000, and during the sampling event on January 28, 2000, to identify known and potential receptors of the very limited degree of soil contamination detected at the site. Based on this visual survey, a determination of the potential risk to identified receptors was made.



The soil and groundwater in the vicinity of the former diesel UST are potential receptors of the UST-related contamination. The risk to these sensitive receptors is considered minimal based on the non-detect measurements of VOCs with the PID from soil samples during drilling and based on the non-detect levels of VOCs reported in the groundwater samples collected at the site. Based upon available data, adsorbed contamination to the soils is limited to the direct vicinity of the eastern end of the former diesel UST.

There are no known underground utility lines in the vicinity of the former diesel UST that would serve as preferential pathways for the migration of contamination.

The William E. Dailey facility is serviced by an on-site supply well, located approximately 300 feet west from the former diesel UST. This supply well is downgradient from the former UST location with respect to the shallow groundwater flow direction. The risk of impact to the on-site supply well from the limited contamination detected during the closure of the former diesel UST is considered minimal since no VOCs were reported by laboratory analysis in the water sample collected from this well, given the distance between the supply well and the former UST location, and given the negligible source area strength.

The commercial complex south-southeast of the William E. Dailey facility is serviced by a drilled well [5]. The risk of impact to this well from the limited contamination detected during the closure of the former diesel UST is considered minimal because this supply well is in an estimated crossgradient direction from the former diesel UST with respect to the shallow surficial aquifer, given the distance between the complex and the former UST location, and given the negligible source area strength. Other buildings in the vicinity of the site reportedly are serviced by municipal water [5].

The nearest surface water is West Branch which is located approximately 1,000 feet west of the former UST, and a shallow pond approximately 500 feet south-southeast of the former UST. The risk to these surface waters posed by the limited petroleum impact in the vicinity of the former diesel UST is considered minimal based on the negligible source area strength and given the sufficient distance between the surface waters and the former diesel UST location.

IV. CONCLUSIONS

Based on the results of this investigation at the William E. Dailey facility in Manchester, Vermont, Griffin presents the following conclusions:

- 1) There was an apparent release(s) of petroleum to the subsurface in the vicinity of the former 20,000-gallon diesel UST at the site. The source of the detected petroleum contamination is likely due to spills and leaks due to usage over time. The duration and volume of product released is unknown. The source of the petroleum contamination (i.e., the UST system) was removed in October 1999.



- 2) PID measurements from soils collected during the UST closure in October 1999 indicate that adsorbed petroleum compounds existed in the soils in the immediate vicinity of the former diesel UST. The zones of elevated VOCs as measured with the PID were detected at and beneath the eastern end of the UST where the fuel dispenser had been located. With the source UST system 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) Three groundwater monitoring wells, MW-1 through MW-3, were installed under Griffin supervision at the site on January 20, 2000. No VOCs were measured with the PID at levels exceeding 1 ppm in the soil samples collected from the boring for monitoring wells MW-1, MW-2, and MW-3, except for the surface sample from MW-3 which had a PID measurement of 3 ppm. This information, along with the results of PID screening during the UST closure indicates that the extent of adsorbed contamination is limited to the direct vicinity of the eastern end of the former UST pit.
- 4) The depth to groundwater measured on January 28, 2000, in the three on-site monitoring wells ranged from approximately 23.96 to 24.65 feet below the top of casing. The shallow groundwater flow beneath the site on this date was estimated to be directed toward the west at a hydraulic gradient on the order of 1.1%.
- 5) Groundwater samples were collected from the three on-site monitoring wells on January 28, 2000. No targeted petroleum compounds were reported at levels exceeding the sample specific detection limits, which were themselves below the VGES, in the groundwater samples collected from the three monitoring wells. No UIPs were reported in the groundwater samples collected from the three on-site monitoring wells.
- 6) A water sample was collected from the on-site supply well and analyzed for drinking water VOCs by EPA Method 524.2. No VOCs were reported in the supply well water sample above the sample specific detection limits, which were themselves below the respective MCLs/VHALs for the targeted compounds.
- 7) There appear to be no significant risks to identified area sensitive receptors based on currently available data.



V. RECOMMENDATIONS

Based on the results of this site investigation, Griffin recommends that the William E. Dailey site in Manchester, 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, #2, #3, and #5.

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

See Conclusion #3, #5, #6 and #7.

- 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 #6.

Any point at or within the boundary of any Class I groundwater area: The William E. Dailey facility 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.

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

See Conclusions #3, #5, #6, and #7.



7) Site meets RCRA requirements.

Available records indicate that the William E. Dailey facility is not in violation of the Resource Conservation and Recovery Act (RCRA) as defined in 40 CFR 264. A RCRA compliance inspection was not conducted as part of this scope of work.

8) Site meets CERCLA requirements.

Available records indicate that the William E. Dailey facility is not in violation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as defined in 40 CFR 300.

Griffin recommends that the three site monitoring wells be properly abandoned according to VTDEC requirements for well closure and that the site be restored.

VI. REFERENCES

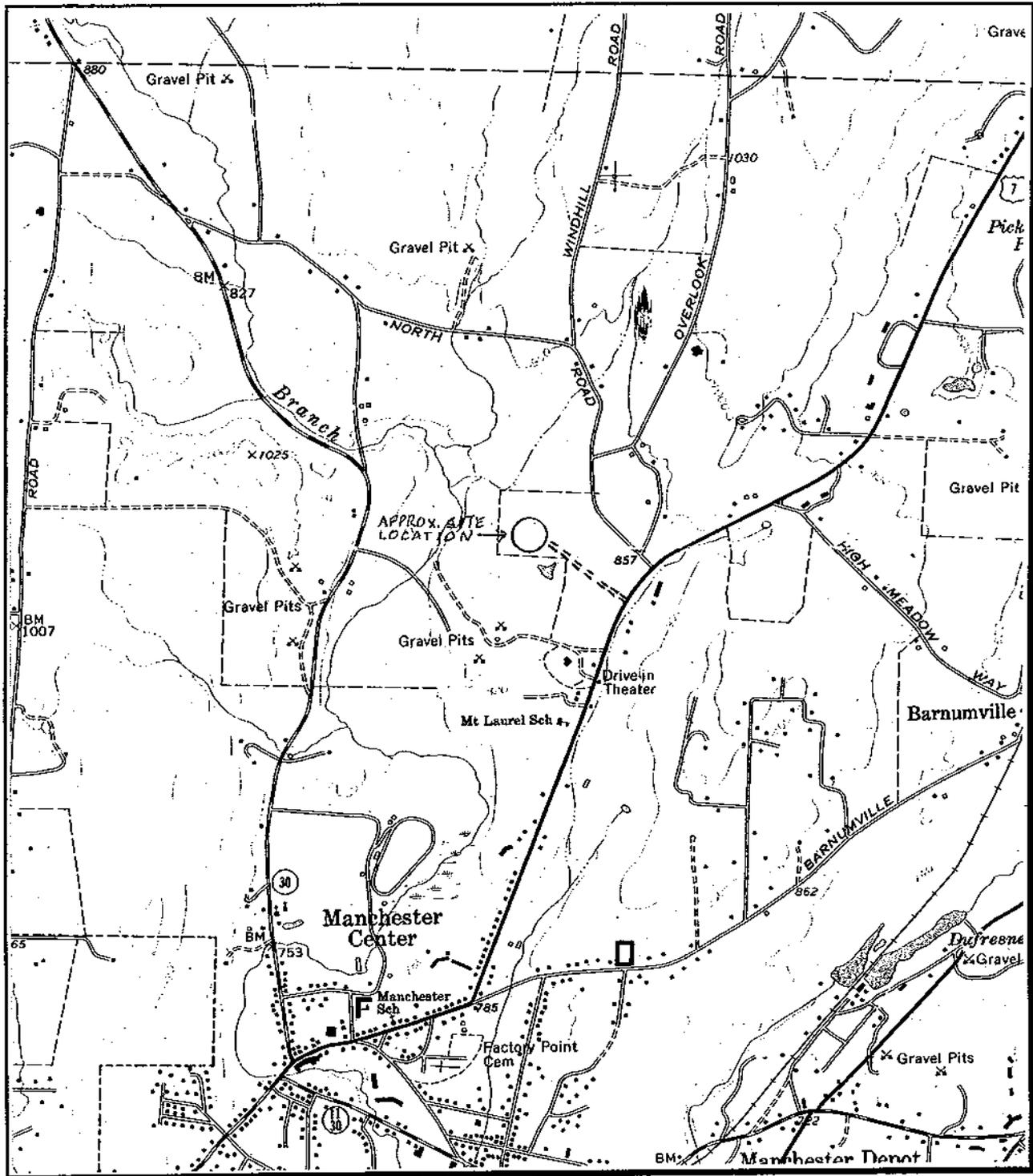
1. USGS 7.5 Minute Topographic Map, Manchester, VT, dated 1968.
2. Griffin International, October 13, 1999, *William E. Dailey, Inc. Manchester Facility UST Closure Inspection*, letter report to Ms. Sue Thayer, Vermont Department of Environmental Conservation, Waste Management Division.
3. Doll, Charles 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.
5. Bob Maskiell, William E. Dailey, Inc., January 20, 2000, personal interview.
6. State of Vermont, Agency of Natural Resources, January 20, 2000, *Chapter 12 Groundwater Protection Rule and Strategy*.
7. Vermont Department of Health, December 1998, *Drinking Water Guidance*.



Appendix A

Maps

- 1) Site Location Map**
- 2) Site Sketch**
- 3) Groundwater Contour Map - 1/28/00**



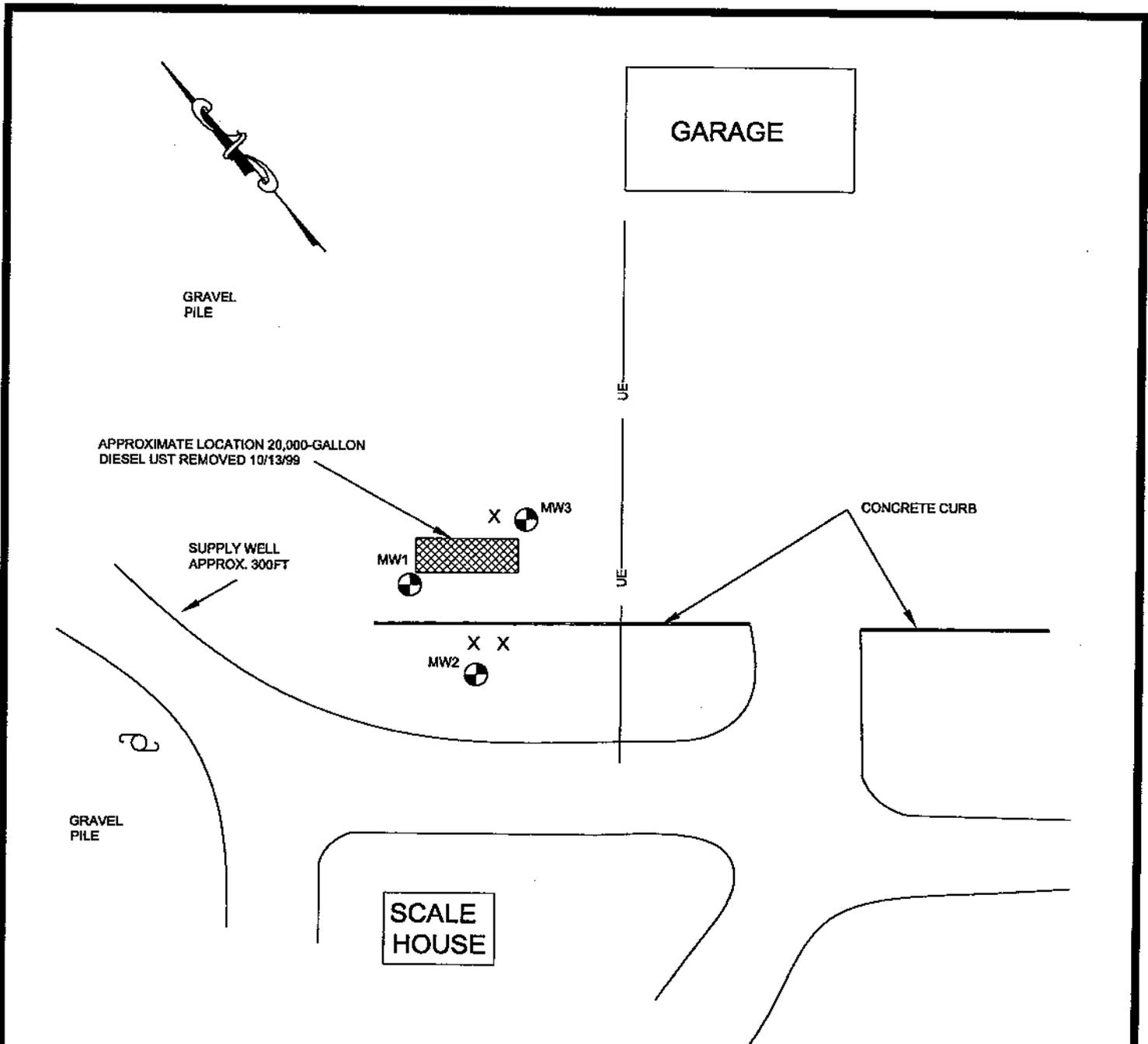
SITE LOCATION MAP - WILLIAM E. DAILEY, INC.

Manchester, Vermont

Source: USGS 7.5 minute Manchester-VT quadrangle, dated 1968.

Scale: 1:24,000





LEGEND

-  MONITORING WELL
-  SOIL BORING - REFUSAL ENCOUNTERED
-  UTILITY POLE
-  UNDERGROUND ELECTRIC LINE

SOURCE: MONITORING WELLS SURVEYED BY GRIFFIN ON 1/20/00
 JOB #: 129941651 VTDEC SITE #: 99-2897



WILLIAM E. DAILEY

MANCHESTER, VERMONT

SITE SKETCH

DATE: 2/14/00	DWG.#: 1	SCALE: 1"= 40'	DRN.: MP	APP.: CW
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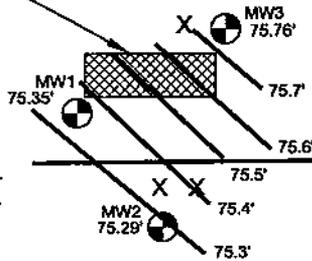
GARAGE

GRAVEL PILE

APPROXIMATE LOCATION 20,000-GALLON DIESEL UST REMOVED 10/13/99

SUPPLY WELL APPROX. 300FT

CONCRETE CURB



APPROXIMATE DIRECTION OF GROUNDWATER FLOW

GRAVEL PILE

SCALE HOUSE

LEGEND

- MW2 75.29' MONITORING WELL WITH GROUNDWATER LEVEL ELEVATION (FT)
- X SOIL BORING - REFUSAL ENCOUNTERED
- UTILITY POLE
- UNDERGROUND ELECTRIC LINE
- 75.4' GROUNDWATER ELEVATION CONTOUR (FT) (DASHED WHERE INFERRED)

GROUNDWATER ELEVATIONS DETERMINED RELATIVE TO THE TOP-OF-CASING OF MW1, WHICH WAS ARBITRARILY SET AT 100'

SOURCE: MONITORING WELLS SURVEYED BY GRIFFIN ON 1/20/00
JOB #: 129841851 VTDEC SITE #: 89-2697



WILLIAM E. DAILEY

MANCHESTER, VERMONT

GROUNDWATER CONTOUR MAP

MEASURED 1/28/00

DATE: 2/15/00

DWG #: 2

SCALE: 1" = 40'

DRN.: MP

APP.: CW



Appendix B

Soil Boring and Monitoring Well Specifications

BORING LOG AND WELL CONSTRUCTION DIAGRAM

Well No: MW-1



**WILLIAM E. DAILEY FACILITY
MANCHESTER, VERMONT**

Griffin Project #: 129941651	Date Installed: 1/20/00
Drilled by: T&K Drilling	Drilling Method: 4.25" HSA
Driller: Steve Legere	Boring Diameter: 6.5"
Supervised by: Chris Ward	Development Method: Bailing
Logged by: Chris Ward	Screened Length: 10 Ft.

Depth (Feet)	Well Construction	Pen/Rec (')	Interval (')	Soil Characteristics	Letter Symbol	Graphic Symbol
		Blow Counts	PID (ppm)	Gravel Surface		
Grade = 0						
1.0	auger cuttings	0 - 2	0 - 2	SILT (ML). 95% silt, 5% fine sand. Brown, dry.	ML	
2.0						
3.0						
4.0						
5.0						
6.0		2/1.2'	5 - 7	Gravelly SILT (ML). 70% silt, 25% fine gravel, 5% sand. Brown, dry.	ML	
7.0		5-8-8-16	0.1 ppm			
8.0						
9.0						
10.0						
11.0		1/0.8'	10 - 11	Silty GRAVEL with sand (GM). 40% gravel, 40% silt, 20% sand. Brown, dry.	GM	
12.0		33-128	0.1 ppm			
13.0						
14.0						
15.0						
16.0		2/1'	15 - 17	Silty GRAVEL with sand (GM). 50% fine to coarse gravel, 25% sand, 25% silt. Gray-brown, dry to moist.	GM	
17.0		7-12-20-18	0 ppm			
18.0						
19.0						
20.0						
21.0		2/1.1'	20 - 22	Well graded GRAVEL with silt and sand (GW-GM). 75% fine to coarse gravel, 15% sand, 10% silt. Gray-brown, moist.	GW-GM	
22.0		22-44-27-65	0.1 ppm			
23.0						
24.0						
25.0						
26.0		2/1'	25 - 27	SILT with fine sand (ML). 85% silt, 15% fine sand. Brown, wet.	ML	
27.0		18-8-6-18	0 ppm			
28.0						
29.0						
30.0				End of Exploration at 30'		

Legend

- Road Box with Bolt Down Cover, Set in Cement.
- Existing Surface.
- Bentonite Seal Placed in Annulus.
- Grade #1 Silica Sand Pack Placed in Annulus.
- Drill Cuttings Placed in Annulus.

- Locking Plug.
- 1.5" ID, Schedule 40 PVC Riser.
- 1.5" ID, Schedule 40 PVC, 0.010"-Slotted Well Screen
- Plug Point
- Approximate Water Level During Drilling
- Static Water Level

BORING LOG AND WELL CONSTRUCTION DIAGRAM

Well No: MW-2



**WILLIAM E. DAILEY FACILITY
MANCHESTER, VERMONT**

Griffin Project #: 129941651	Date Installed: 1/20/00
Drilled by: T&K Drilling	Drilling Method: 4.25" HSA
Driller: Steve Legere	Boring Diameter: 6.5"
Supervised by: Chris Ward	Development Method: Bailing
Logged by: Chris Ward	Screened Length: 10 FT.

Grade = 0	Well Construction	Pen/Rec (')	Interval (')	Soil Characteristics	Letter Symbol	Graphic Symbol
		Blow Counts	PID (ppm)	Gravel Surface		
1.0		auger	0 - 2	SILT (ML). 90% silt, 5% fine sand, 5% gravel.	ML	
2.0		cuttings	0.4 ppm	Brown, dry.		
3.0						
4.0						
5.0						
6.0			5 - 7	No sample collected		
7.0						
8.0						
9.0						
10.0						
11.0		2'/0.7'	10 - 12	Silty GRAVEL with sand (GM). 40% gravel, 45% silt,	GM	
12.0		13-9-8-4	0.1 ppm	15% sand. Brown, dry to moist.		
13.0						
14.0						
15.0						
16.0		2'/1'	15 - 17	Silty GRAVEL with sand (GM). 50% fine gravel,	GM	
17.0		7-16-20-100/5"	0.2 ppm	30% sand, 20% silt. Gray-brown, moist.		
18.0						
19.0						
20.0						
21.0		0.5'/0.2'	20 - 20.5	Silty SAND with gravel (SM). 40% sand, 30% silt,	SM	
22.0		66-100/0"	0.6 ppm	30% fine gravel. Gray-brown, moist.		
23.0						
24.0						
25.0						
26.0		2'/1'	25 - 27	SILT with fine sand (ML). 85% silt, 15% fine sand.	ML	
27.0		3-5-7-7	0.5 ppm	Brown, wet.		
28.0						
29.0						
30.0				End of Exploration at 30'		

Legend

<ul style="list-style-type: none"> Road Box with Bolt Down Cover, Set in Cement. Existing Surface. Bentonite Seal Placed in Annulus. Grade #1 Silica Sand Pack Placed in Annulus. Drill Cuttings Placed in Annulus. 	<ul style="list-style-type: none"> Locking Plug. 1.5" ID, Schedule 40 PVC Riser. 1.5" ID, Schedule 40 PVC, 0.010"-Slotted Well Screen Plug Point Approximate Water Level During Drilling Static Water Level
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BORING LOG AND WELL CONSTRUCTION DIAGRAM

Well No: MW-3



**WILLIAM E. DAILEY FACILITY
MANCHESTER, VERMONT**

Griffin Project #: 129941651	Date Installed: 1/20/00
Drilled by: T&K Drilling	Drilling Method: 4.25" HSA
Driller: Steve Legere	Boring Diameter: 6.5"
Supervised by: Chris Ward	Development Method: Bailing
Logged by: Chris Ward	Screened Length: 10 Ft.

Grade = 0	Well Construction	Pen/Rec (')	Interval (')	Soil Characteristics	Letter Symbol	Graphic Symbol	
		Blow Counts	PID (ppm)	Gravel Surface			
1.0		auger	0 - 2	Silty FINE SAND (SM). 50% fine sand, 40% silt, 10% gravel. Brown, dry.	SM		
2.0		cuttings	3 ppm				
3.0							
4.0							
5.0							
6.0			2'/1.7'	5 - 7	Silty FINE SAND (SM). 50% fine sand, 45% silt, 5% gravel. Brown, dry.	SM	
7.0			3-4-6-11	0.2 ppm			
8.0							
9.0							
10.0							
11.0			1.5'/0.8'	10 - 11.5	Silty GRAVEL with sand (GM). 40% gravel, 40% silt, 20% sand. Gray-brown, dry to moist.	GM	
12.0			26-53-100/5.5"	0.1 ppm			
13.0							
14.0							
15.0							
16.0			2'/0'	15 - 17	No Recovery		
17.0			28-31-19-21				
18.0							
19.0							
20.0							
21.0			2'/1.2'	20 - 22	Silty SAND with gravel (SM). 50% sand, 25% silt, 25% fine gravel. Gray-brown, dry.	SM	
22.0			72-33-37-35	0 ppm			
23.0							
24.0							
25.0							
26.0			2'/1.9'	25 - 27	Fine sandy SILT (ML). 60% silt, 40% fine sand. Brown, wet.	ML	
27.0			3-3-8-8	0 ppm			
28.0							
29.0							
30.0					End of Exploration at 30'		
31.0							
32.0							
33.0							
34.0							

Legend

- | | |
|---|---|
| <ul style="list-style-type: none"> Road Box with Bolt Down Cover, Set in Cement. Existing Surface. Bentonite Seal Placed in Annulus. Grade #1 Silica Sand Pack Placed in Annulus. Drill Cuttings Placed in Annulus. | <ul style="list-style-type: none"> Locking Plug. 1.5" ID, Schedule 40 PVC Riser. 1.5" ID, Schedule 40 PVC, 0.010"-Slotted Well Screen Plug Point Approximate Water Level During Drilling Static Water Level |
|---|---|



Appendix C

Liquid Level Monitoring Data

Griffin International, Inc.

LIQUID LEVEL MONITORING DATA

William E. Dailey, Inc.
Route 7A
Manchester, VT

1/28/00

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	30.0	100.00	-	24.65	-	-	-	-	75.35
MW-2	30.0	99.25	-	23.96	-	-	-	-	75.29
MW-3	30.0	99.95	-	24.19	-	-	-	-	75.76

All Values Reported in Feet

btoc - Below Top of Casing

Top-of-casing elevations surveyed January 20, 2000 by Griffin.

Elevations determined relative to the top of MW-1, which was arbitrarily set at 100'



Appendix D

Groundwater Quality Data

<i>Sample Location:</i>	MW-1	MW-2	MW-3	Supply Well	
<i>Sample Date:</i>	1/28/00	1/28/00	1/28/00	1/28/00	
<i>Analytical Method:</i>	8021B	8021B	8021B	524.2	VGES (ppb)
PARAMETER					
Benzene	ND(1)	ND(1)	ND(1)	ND(0.5)	5.
Toluene	ND(1)	ND(1)	ND(1)	ND(0.5)	1,000.
Ethylbenzene	ND(1)	ND(1)	ND(1)	ND(0.5)	700.
Xylenes	ND(1)	ND(1)	ND(1)	ND(1)	10,000.
Total BTEX	ND	ND	ND	ND	-
MTBE	ND(10)	ND(10)	ND(10)	ND(1)	40.
1,3,5-Trimethylbenzene	ND(1)	ND(1)	ND(1)	ND(0.5)	4.
1,2,4-Trimethylbenzene	ND(1)	ND(1)	ND(1)	ND(0.5)	5.
Naphthalene	ND(1)	ND(1)	ND(1)	ND(1)	20.
Total Targeted VOCs	ND	ND	ND	ND	-

<i>Analytical Method:</i>	8015-DRO	8015-DRO	8015-DRO		(ppm)
TPH (mg/L)	ND(0.40)	ND(0.40)	ND(0.40)		

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

For the Supply Well, only the compounds targeted by EPA Method 8021B are presented in this table.

ND(1) - None Detected above Detection Limit (Detection Limit)

TBQ(1) - Trace Below Quantitation Limit (Quantitation Limit)

Detections are **bolded**.

Blank cell - not analyzed

VGES - Vermont Groundwater Enforcement Standard; VTDEC Groundwater Protection Rule and Strategy, 11/15/1997

> 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: Daily Facility
REPORT DATE: February 10, 2000
DATE SAMPLED: January 28, 2000

ORDER ID: 5835
REF.#: 150,137 - 150,141

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.

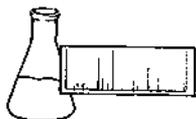
Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

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

DATE RECEIVED: January 31, 2000

PROJECT NAME: Daily Facility

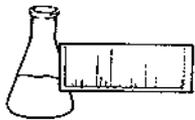
REPORT DATE: February 10, 2000

CLIENT PROJ. #: 129941651

ORDER ID: 5835

Ref. #:	150,137	150,138	150,139	150,140	150,141
Site:	Trip Blank	MW 1	Duplicate	MW 2	MW 3
Date Sampled:	1/28/00	1/28/00	1/28/00	1/28/00	1/28/00
Time Sampled:	9:10	13:23	13:23	14:09	13:31
Sampler:	JR	JR	JR	JR	JR
Date Analyzed:	2/8/00	2/8/00	2/9/00	2/8/00	2/9/00
UIP Count:	0	0	0	0	0
Dil. Factor (%):	100	100	100	100	100
Surr % Rec. (%):	94	86	90	91	84
Parameter	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

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

LABORATORY REPORT

CLIENT: Griffin International
PROJECT: Daily Facility/#129941651
REPORT DATE: February 10, 2000

ORDER ID: 5835
DATE RECEIVED: January 31, 2000

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.

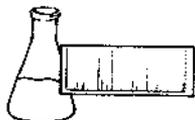
Blank contamination was not observed at levels affecting the analytical results.

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: Griffin International
PROJECT: Daily Facility/#129941651
REPORT DATE: February 14, 2000

ORDER ID: 5835
DATE RECEIVED: January 31, 2000

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

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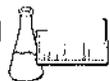
LABORATORY REPORT

EPA 524.2

CLIENT: Griffin International
PROJECT: Daily Facility/#129941651
SITE: SW-1
DATE RECEIVED: January 31, 2000
REPORT DATE: February 14, 2000
ANALYSIS DATE: February 8, 2000

ORDER ID: 5835
REFERENCE NUMBER: 150142
DATE SAMPLED: January 28, 2000
TIME SAMPLED: 1:55 PM
SAMPLER: JR
ANALYST: 725

<u>Parameter</u>	<u>Result</u> <u>ug/L</u>	<u>Parameter</u>	<u>Result</u> <u>ug/L</u>
Benzene	< 0.5	Hexachlorobutadiene	< 0.5
Bromobenzene	< 0.5	Isopropylbenzene	< 0.5
Bromochloromethane	< 0.5	4-Isopropyltoluene	< 0.5
Bromomethane	< 0.5	MTBE	< 1.0
n-Butylbenzene	< 0.5	Naphthalene	< 1.0
sec-Butylbenzene	< 0.5	n-Propylbenzene	< 0.5
tert-Butylbenzene	< 0.5	Styrene	< 0.5
Carbon tetrachloride	< 0.5	1,1,1,2-Tetrachloroethane	< 0.5
Chlorobenzene	< 0.5	1,1,2,2-Tetrachloroethane	< 1.0
Chloroethane	< 0.5	Tetrachloroethene	< 0.5
Chloromethane	< 0.5	Toluene	< 0.5
4-Chlorotoluene	< 1.0	1,2,3-Trichlorobenzene	< 0.5
2-Chlorotoluene	< 1.0	1,2,4-Trichlorobenzene	< 0.5
Dibromomethane	< 1.0	1,1,1-Trichloroethane	< 0.5
1,2-Dichlorobenzene	< 0.5	1,1,2-Trichloroethane	< 0.5
1,3-Dichlorobenzene	< 0.5	Trichloroethene	< 0.5
1,4-Dichlorobenzene	< 0.5	Trichlorofluoromethane	< 1.0
Dichlorodifluoromethane	< 0.5	1,2,3-Trichloropropane	< 0.5
1,1-Dichloroethane	< 0.5	1,2,4-Trimethylbenzene	< 0.5
1,2-Dichloroethane	< 0.5	1,3,5-Trimethylbenzene	< 0.5
1,1-Dichloroethene	< 0.5	Vinyl Chloride	< 0.5
cis-1,2-Dichloroethene	< 0.5	Xylenes, Total	< 1.0
trans-1,2-Dichloroethene	< 0.5	Bromodichloromethane	< 0.5
Dichloromethane	< 1.0	Bromoform	< 0.5
1,2-Dichloropropane	< 0.5	Chloroform	< 0.5
1,3-Dichloropropane	< 0.5	Dibromochloromethane	< 0.5
2,2-Dichloropropane	< 0.5	Total Trihalomethanes	< 0.5
1,1-Dichloropropene	< 0.5	Surrogate 1	97.0%
cis-1,3-Dichloropropene	< 0.5	Surrogate 2	88.0%
trans-1,3-Dichloropropene	< 0.5	UIP's	0.
Ethylbenzene	< 0.5		



ENDYNE, INC.

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

CHAIN-OF-CUSTODY-RECORD

35501

JOB# 129941651

Project Name: <u>WILLIAM E. DAILY FACILITY</u> <u>MANCHESTER VT.</u>		Reporting Address: <u>GRIFFIN</u>		Billing Address: <u>GRIFFIN</u>	
Endyne Order ID: (Lab Use Only)	-0 -1 -S	Company: Contact Name/Phone #: <u>GRIFFIN CW</u>		Sampler Name: Phone #: <u>J. ROCKLIN</u>	

Ref # (Lab Use Only)	Sample Identification	Matrix	GRAB	COMP	Date/Time	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
	TRIP BLANK	H ₂ O	✓		11/28/00 0910	2	40ml		8021B	HCL	
	MW-1				1323	2			8021B		
	MW-1				1323	1			8015 DRO		
	DUPLICATE MW-1				1323	2			8021B		
	MW-2				1409	2			8021B		
	MW-2				1409	1			8015 DRO		
	MW-3				1331	2			8021B		
	MW-3	↓	↓	↓	1331	1	↓		8015 DRO	↓	
	SW	↓	↓	↓	1355	2	↓		524.2	↓	

Relinquished by: <u>[Signature]</u>	Date/Time: <u>1/28/01</u>	Received by: <u>[Signature]</u>	Date/Time: <u>1/31 10:45 AM</u>	Received by:	Date/Time:
-------------------------------------	---------------------------	---------------------------------	---------------------------------	--------------	------------

New York State Project: Yes No Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Sulfate	21	1664 TPH/FOG	26	8270 PAH
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	8015 GRO	27	PP13 Metals
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	8015 DRO	28	RCRA8 Metals
4	Nitrite N	9	BOD	14	Turbidity	19	8021B	24	8260/8260B	29	524.2
5	Nitrate N	10	Alkalinity	15	Conductivity	20	8010/8020	25	8270 B/N or Acid	30	
31	Metals (As Is, Total, Diss.) Ag, Al, As, B, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Si, Sr, Ti, Tl, V, Zn										
32	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)					33					
34	Other										