

OCT 20 1992



19 October 1992

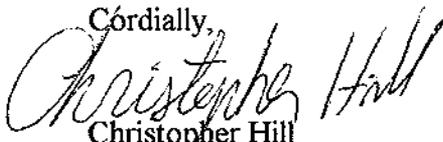
Mr. Charles B. Schwer
Agency of Natural Resources
Department of Environmental Conservation
Hazardous Materials Management Division
103 South Main Street/West Building
Waterbury, Vermont 05671-0405

RE: Limited Site Subsurface Investigation. Burlington Schools Maintenance Building, 287
Shelburne Road, Burlington, Vermont. VTDEC Site #92-1264

Dear Mr. Schwer:

Please find enclosed our summary letter report on the Limited Site Subsurface Investigation at the above referenced site. If you have any questions about the report, please call.

Cordially,


Christopher Hill
Hydrogeologist

Enclosure



12 October 1992

Mr. William S. Duncan
Director
Burlington Public Schools
Physical Plant Division
287 Shelburne Road
Burlington, Vermont 05401

RE: Limited Site Subsurface Investigation. Burlington Schools Maintenance Building, 287
Shelburne Road, Burlington, Vermont. VTDEC Site #92-1264

Dear Mr. Duncan:

This letter summarizes the results of work conducted by Griffin International, Inc. (Griffin) at the above referenced site in response to the Vermont Department of Environmental Conservation (VTDEC) letter to the Burlington Public Schools Department dated 23 July 1992. This limited site assessment has been conducted due to the discovery of small amounts of residual petroleum contamination in the subsurface during the removal of five petroleum underground storage tanks (USTs) on 2 July 1992.

Existing Monitoring Wells

After removal of the USTs, four test pits were dug at locations around the former tank locations. One monitoring well consisting of two inch diameter PVC screen and casing was placed into each of these test pits under the supervision of the VTDEC. A narrower diameter casing was used for monitoring well 2 (MW-2). These wells were installed so that samples of groundwater could be collected and analyzed for the presence of petroleum related hydrocarbons and to collect water level data with which to make a determination of groundwater flow direction. a Site Location Map, Area Map, and Site Map appear on pages A1 through A3 of the Attachment.

Groundwater Sampling and Analyses

On 4 September 1992, Griffin collected groundwater from each of the four monitoring wells except (MW-2), which was sampled on 8 September. Sample collection from MW-2 was delayed

by the narrower diameter PVC casing which required a smaller well bailer to obtain a sample. All of the groundwater samples collected were submitted to Endyne Labs, Inc. of Williston, Vermont for analyses by EPA Method 602.

The results of the lab analyses of all groundwater samples are tabulated on Page A6 of the Attachment. Lab report forms are also attached. These results indicate that no petroleum related compounds were detected in MW-1 or MW-4. Results from MW-2 indicate the presence of only very low concentrations of benzene, ethylbenzene, and xylenes, all well below the Vermont Health Advisory Levels for those compounds in drinking water. In MW-3, none of the BTEX compounds (benzene, toluene, ethylbenzene, xylenes) were detected. The MTBE (methyl tertiary butyl ether, an antiknock gasoline additive) concentration in this well was 6.5 parts per billion, and also well below the Vermont Health Advisory Level for this compound in drinking water. Vermont Health Advisory Levels are included for quick reference on page A6 of the attachment. No free phase product was detected in any monitoring wells during sample collection.

In summary, lab results indicate that no petroleum related hydrocarbons were detected at concentrations above Vermont Health Advisory Levels in groundwater in the vicinity of on-site monitoring wells. The duplicate, trip blank and equipment blank results indicate that good quality assurance and control was maintained through out the sampling and analyses process.

Given this information, it appears unlikely that any significant petroleum contamination extends outside the area bounded by these monitoring wells.

Determination of Groundwater Flow Direction and Gradient

Prior to groundwater sampling, Griffin measured the relative water table elevations in all on-site monitoring wells. Measurements were made relative to a benchmark (top of casing at MW-3), which was assigned an arbitrary elevation of 100 feet. Liquid level data is presented on page A5 of the attachment.

The water table surface was calculated using the water level measurements from each of the four monitoring wells. The resulting groundwater contour map appears on page A4. This map illustrates the northwesterly direction of groundwater flow indicated by the water level data. The water table gradient is approximately 3.8%.

Assessment of Risk to Potential Receptors

As part of the assessment of the extent of residual petroleum contamination and the risk posed to the immediate surroundings, Griffin visually inspected an adjacent drainage swale which runs north-south between the maintenance building and the adjacent Champlain School building. During this inspection, no evidence of petroleum seepage such as sheens, stressed vegetation, or petroleum odors were detected.

In addition to the visual inspection of the adjacent drainage swale, Griffin used an Hnu model PI 101 photoionization detector, or PID, to screen air in the basement of the adjacent Champlain School Building. The PID measurements were collected from along the floor and wall joints in the east end of the building's basement, closest to the former UST location, where petroleum vapors would most likely appear. Background PID readings of 2.1 parts per million (ppm) were observed outside the building. Inside the building, background readings of 1.7 ppm were observed. No elevated PID readings above background were detected.

The absence of any elevated PID readings above background indicates that this building is not being impacted by migrating petroleum vapors from the former UST pits.

All of the buildings surrounding the former UST pits are served by the Burlington Water Department. This, combined with the absence of any petroleum related compounds above Vermont Health Advisory Levels in the groundwater samples collected from the monitoring wells surrounding the former tank pits, indicates that there is little or no risk to the drinking water supply systems which serve the adjacent buildings.

Conclusions

Based on the information collected during this limited site assessment, Griffin has reached the following conclusions:

- The five underground petroleum storage tanks which were the likely source of the petroleum contamination discovered at the site, have been excavated and removed.
 - Four monitoring wells were placed in test pits surrounding the former UST locations under the supervision of the VTDEC.
 - Results from the EPA Method 602 analyses of groundwater samples collected from these monitoring wells indicates that no petroleum related compounds tested for exist in concentrations above Vermont Health Advisory Levels.
 - Groundwater occurs approximately five feet below grade and flows to the northwest at a gradient of 3.8%
 - Visual inspection of an adjacent drainage swale indicates no impact to surrounding surface waters. PID screening for hydrocarbon vapors in the basement of the adjacent Champlain School Building indicates that hydrocarbon vapors from the former UST pits are not migrating into that building.
 - Little or no risk is posed to surrounding drinking water supply systems by the residual petroleum contamination detected during UST removal.
-

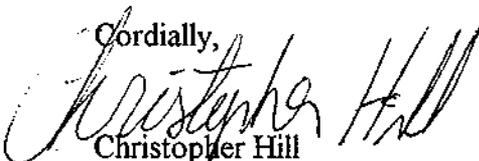
Mr. William S. Duncan
12 October 1992
Page 4

Recommendations

Based on the very low levels of groundwater contamination detected, and the apparent absence of any impact or risk to surrounding receptors, it does not appear that long term groundwater monitoring or remediation efforts are necessary at this site.

Based on the information collected during this site assessment, Griffin recommends no further actions at this site.

Griffin is pleased to have conducted this work for you. If you have any questions about any of the material presented here, please call.

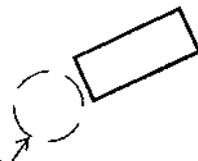
Cordially,

Christopher Hill
Hydrogeologist

Attachments

cc. Charles B. Schwer, VTDEC

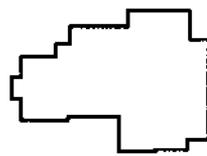
SHELBURNE ROAD

AREA OF FORMER
USTs AND
MONITORING WELLS



BURLINGTON
SCHOOLS
MAINTENANCE
BUILDING

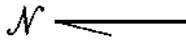
DRAINAGE SWALE



CHAMPLAIN
SCHOOL
BUILDING

PINE STREET

FLYNN AVENUE

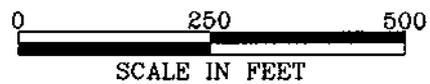


AREA MAP

BURLINGTON SCHOOLS
MAINTENANCE BUILDING
BURLINGTON, VERMONT

Griffin Project # 8924261
Map Drawn 10-9-92
ref: BSCHAREA

NOTE: All locations, approximate



SCALE IN FEET

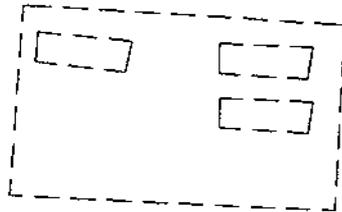
GRIFFIN INTERNATIONAL, INC.

A2

APPROXIMATE AREA
OF FORMER UST
LOCATIONS

MW2 ●

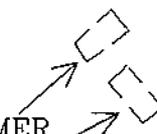
MW4 ●



MW3 ●

MW1 ●

FORMER
DIESEL
USTs



BURLINGTON
SCHOOLS
MAINTENANCE
BUILDING

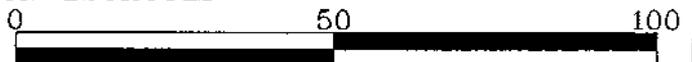


SITE MAP

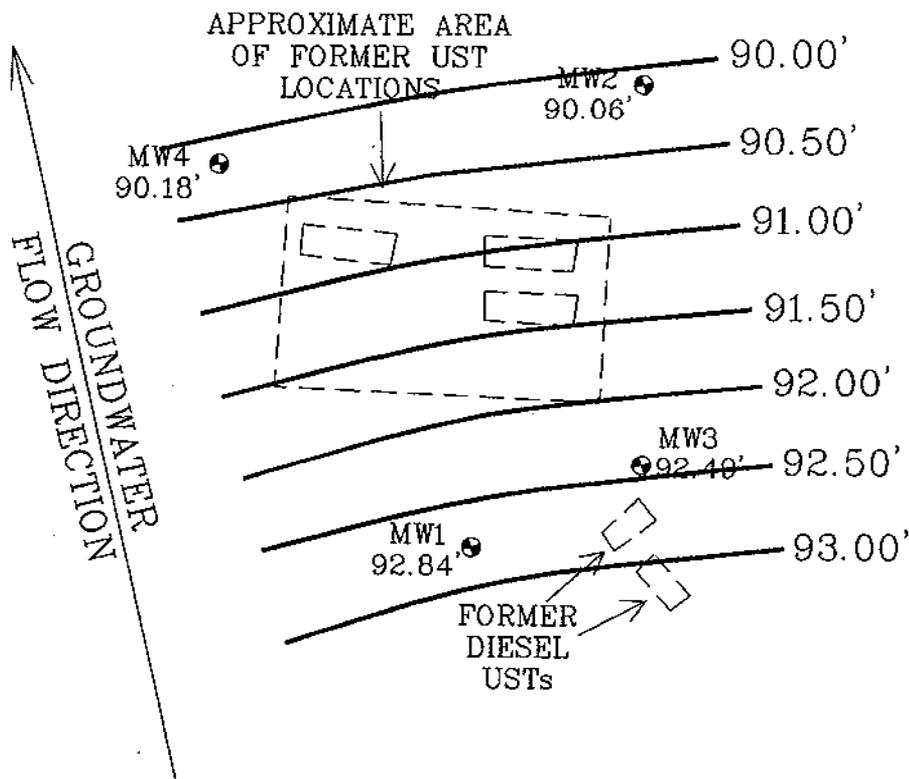
BURLINGTON SCHOOLS
MAINTENANCE BUILDING
BURLINGTON, VERMONT

MW3 ● Monitoring Well with ID

Griffin Project #8924261
Map Drawn 10-9-92
ref: BSCHOOLS



SCALE IN FEET



BURLINGTON
SCHOOLS
MAINTENANCE
BUILDING



GROUNDWATER
CONTOUR MAP
BURLINGTON SCHOOLS
MAINTENANCE BUILDING
BURLINGTON, VERMONT

MW3 Monitoring Well with ID and
91.35' Groundwater Elevation in Feet.
Griffin Project #8924261
Map Drawn 10-9-92
ref: BSCHOOLS

0 50 100

SCALE IN FEET

GRIFFIN INTERNATIONAL, INC.

A4

**Burlington Schools Maintenance Building
Liquid Level Monitoring Data
8-Sep-92**

Well I.D.	Well Depth	Top of Casing Elevation	Depth To Product	Depth To Water	Product Thickness	Specific Gravity Of Product	Hydro Equivalent	Corrected Depth To Water	Corrected Water Table Elevation
MW-1	-	97.29	-	4.45	-	-	-	-	92.84
MW-2	-	97.95	-	7.89	-	-	-	-	90.06
MW-3	-	100.00	-	7.51	-	-	-	-	92.49
MW-4	-	95.49	-	5.31	-	-	-	-	90.18

All Values Reported in Feet

AS

**Groundwater Quality Summary
Burlington Schools Maintenance Building
Burlington, Vermont**

Sampling Date: 4 September 1992

PARAMETER	Location				Vermont Health Advisory Levels
	MW-1	MW-2	MW-3	MW-4	
Benzene	ND	4.0	ND	ND	5.0*
Chlorobenzene	ND	ND	ND	ND	100**
1,2-DCB	ND	ND	ND	ND	-
1,3-DCB	ND	ND	ND	ND	-
1,4-DCB	ND	ND	ND	ND	-
Ethylbenzene	ND	2.8	ND	ND	680**
Toluene	ND	ND	ND	ND	2,420**
Xylenes	ND	8.6	ND	ND	400**
Total BTEX	ND	15.4	ND	ND	-
MTBE	ND	ND	6.5	ND	40**
BTEX+MTBE	ND	15.4	6.5	ND	-

All Values Reported in ug/L (ppb)

* - Maximum Contaminant Level ND - None Detected

** - Health Advisory Level



Laboratory Services

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

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Burl. Schools Maintenance PROJECT CODE: GIBS1068
REPORT DATE: September 21, 1992 ANALYSIS DATE: September 21, 1992
SAMPLER: Peter Murray STATION: MW-1
DATE SAMPLED: September 4, 1992 REF.#: 35,383
DATE RECEIVED: September 4, 1992 TIME SAMPLED: 14:10

<u>Parameter</u>	<u>Minimum Detection Limit</u>	<u>Concentration (ug/L)</u>
Benzene	1.	ND ¹
Chlorobenzene	2.	ND
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	ND
Toluene	1.	ND
Xylenes	1.	ND
MTBE	5.	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

RECEIVED SEP 23 1992

Reviewed by _____



Laboratory Services

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

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Burlington Schools
REPORT DATE: September 24, 1992
SAMPLER: Peter Murray
DATE SAMPLED: September 8, 1992
DATE RECEIVED: September 8, 1992

PROJECT CODE: GIBS1071
ANALYSIS DATE: September 22, 1992
STATION: Mw-2
REF.#: 35,400
TIME SAMPLED: 7:30

<u>Parameter</u>	<u>Minimum Detection Limit</u>	<u>Concentration (ug/L)</u>
Benzene	1.	4.0
Chlorobenzene	2.	ND ¹
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	2.8
Toluene	1.	ND
Xylenes	1.	8.6
MTBE	5.	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 1

NOTES:

1 None detected

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Laboratory Services

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

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Burl. Schools Maintenance PROJECT CODE: GIBS1068
REPORT DATE: September 21, 1992 ANALYSIS DATE: September 21, 1992
SAMPLER: Peter Murray STATION: MW-3
DATE SAMPLED: September 4, 1992 REF.#: 35,384
DATE RECEIVED: September 4, 1992 TIME SAMPLED: 14:49

<u>Parameter</u>	<u>Minimum Detection Limit</u>	<u>Concentration (ug/L)</u>
Benzene	1.	ND ¹
Chlorobenzene	2.	ND
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	ND
Toluene	1.	ND
Xylenes	1.	ND
MTBE	5.	6.5

NUMBER OF UNIDENTIFIED PEAKS FOUND: 20

NOTES:

1 None detected

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Laboratory Services

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

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Burl. Schools Maintenance PROJECT CODE: GIBS1068
REPORT DATE: September 21, 1992 ANALYSIS DATE: September 21, 1992
SAMPLER: Peter Murray STATION: MW-4
DATE SAMPLED: September 4, 1992 REF.#: 35,385
DATE RECEIVED: September 4, 1992 TIME SAMPLED: 15:10

<u>Parameter</u>	<u>Minimum Detection Limit</u>	<u>Concentration (ug/L)</u>
Benzene	1.	ND ¹
Chlorobenzene	2.	ND
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	ND
Toluene	1.	ND
Xylenes	1.	ND
MTBE	5.	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

RECEIVED SEP 23 1992

Reviewed by _____



Laboratory Services

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

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Burl. Schools Maintenance PROJECT CODE: GIBS1068
REPORT DATE: September 21, 1992 ANALYSIS DATE: September 21, 1992
SAMPLER: Peter Murray STATION: Trip Blank
DATE SAMPLED: September 4, 1992 REF.#: 35,382
DATE RECEIVED: September 4, 1992 TIME SAMPLED: 12:00

<u>Parameter</u>	<u>Minimum Detection Limit</u>	<u>Concentration (ug/L)</u>
Benzene	1.	ND ¹
Chlorobenzene	2.	ND
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	ND
Toluene	1.	ND
Xylenes	1.	ND
MTBE	5.	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

RECEIVED SEP 23 1992

Reviewed by _____



ENDYNE, INC.

Laboratory Services

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

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Burlington Schools
REPORT DATE: September 24, 1992
SAMPLER: Peter Murray
DATE SAMPLED: September 8, 1992
DATE RECEIVED: September 8, 1992

PROJECT CODE: GIBS1071
ANALYSIS DATE: September 22, 1992
STATION: MW-2 Duplicate
REF.#: 35,401
TIME SAMPLED: 7:30

<u>Parameter</u>	<u>Minimum Detection Limit</u>	<u>Concentration (ug/L)</u>
Benzene	1.	3.8
Chlorobenzene	2.	ND ¹
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	3.0
Toluene	1.	ND
Xylenes	1.	8.9
MTBE	5.	ND

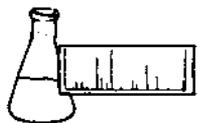
NUMBER OF UNIDENTIFIED PEAKS FOUND: 1

NOTES:

1 None detected

RECEIVED SEP 28 1992

Reviewed by _____



ENDYNE, INC.

Laboratory Services

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

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Burl. Schools Maintenance PROJECT CODE: GIBS1068
REPORT DATE: September 21, 1992 ANALYSIS DATE: September 21, 1992
SAMPLER: Peter Murray STATION: Equipment Blank
DATE SAMPLED: September 4, 1992 REF.#: 35,386
DATE RECEIVED: September 4, 1992 TIME SAMPLED: 15:25

<u>Parameter</u>	<u>Minimum Detection Limit</u>	<u>Concentration (ug/L)</u>
Benzene	1.	ND ¹
Chlorobenzene	2.	ND
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	ND
Toluene	1.	ND
Xylenes	1.	ND
MTBE	5.	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

RECEIVED SEP 23 1992

Reviewed by _____