



JUL 15 1992

P.O. Box 339
Randolph, Vermont 05060-0339
(802) 728-3376
(802) 728-4930 (FAX)

R-12726P
July 9, 1992

Mr. John Delemarre
Vermont Law School
P.O. Box 96 - Chelsea Street
South Royalton, Vermont 05068

**SUBJECT: Monitoring Well Installation and Sampling
Former Grease Pit Area**

Dear Mr. Delemarre:

We have completed the project work at the Vermont Law School site as outlined in our original scope of service dated April 22, 1992 and present the results in the following paragraphs. The work consisted of the following tasks:

1. Installation and sampling of one monitoring well located downgradient from the former grease pit location. Split spoon samples were collected every 5 feet of boring depth and screened with a photoionization detector for volatile organic compounds.
2. Completion of one round of groundwater sampling and analysis using EPA Methods 8240 (for volatile organic compounds) and 418.1 (for total petroleum hydrocarbons).
3. Identification of potential groundwater receptors within a one mile radius of the former grease pit area.

PROJECT BACKGROUND

The former grease pit was located beneath a floor drain of a former gasoline station which was demolished by the Vermont Law School to facilitate construction of a parking lot access road (refer to a copy of a subdivision plat prepared by Lawrence E. Swanson for general orientation). Jet-Line, Inc. was contracted to remove any contaminated soils associated with the grease pit. This was accomplished by hand excavating an area approximately 3 feet by 6 feet and 1 foot in depth; this represented the limits of the visible contamination. A soil sample taken from the base of the excavation was submitted to the Vermont Hazardous Materials Management Division (HMMD) Sites Management Section (SMS). The analysis indicated a residual contamination level of 4500 ppm of total petroleum hydrocarbons (heavier oil compounds). Based on these results, the HMMD-SMS issued a letter requiring additional sampling to verify that the area groundwater had not been impacted by the former grease pit.

Mr. John Delemare
Vermont Law School
July 9, 1992
Page 2

FINDINGS

Monitoring Well Installation:

One groundwater monitoring well was installed at the subject site on May 29, 1992 by Green Mountain Boring of Barre, Vermont. The well was located in the apparent downgradient direction from the former grease pit (see discussion of Hydrogeology below) and is shown on the site plan referenced above (Figure 1). The boring was drilled to a depth of 18 feet where refusal was encountered, apparently on bedrock. The subsurface materials consisted of medium dense silty fine sand with some gravel. Groundwater was encountered at about 13 feet below the ground surface. Screening of the soil samples obtained during the boring revealed no organic vapor levels above the background reading of the photoionization detector (0.2 ppm). The monitoring well was set at 17 feet below ground and included 10 feet of screened well section, as indicated on the boring log attached to this letter report.

Sampling and Analysis:

The monitoring well was sampled by SCITEST, Inc. on June 5, 1992 and analyzed utilizing EPA Methods 8240 for volatile organic compounds (VOC's) and 418.1 for total petroleum hydrocarbons (the heavier components). As indicated on the enclosed laboratory report, the sample contained no VOC's and contained 42 ppm total hydrocarbons.

Hydrogeology:

Based on the topography of the general vicinity, and the location of the White River in relation to the subject site, the groundwater flow direction at the former grease pit area is probably to the north toward the river which also likely serves as the local base level for the area groundwater. The subsurface materials, as disclosed by the monitoring well boring log, indicate that the groundwater table aquifer at this location likely consists of the silty sand deposits (alluvium or till) overlying bedrock. The hydraulic conductivity in this material may range from 0.1 to 1.0 feet per day or more. Due to the topographic position of the site (i.e., in a valley bottom) the flow gradients within the bedrock aquifer (underlying the silty sand deposits) is likely in an upward direction.

**DuBois
& King**^{INC.}

Potential Groundwater and Surface Water Receptors:

- **Drinking Water Sources**

South Royalton has a municipal drinking water system supplied by bedrock wells located about 1/2 mile south of the subject site and several hundred feet higher in elevation on the hillside above the I-89 highway. There are no documented private wells in the vicinity of the former grease pit area. Refer to the attached mapping of private and public drinking water sources in the immediate area.

- **Surface Water Bodies**

The water body nearest to the site is the White River located about 300 feet to the north. The river bank downgradient from the site, which consisted of sandy alluvium overlying bedrock, was inspected for evidence of petroleum contamination (e.g., sheens and slicks). There was no visible evidence of contamination found.

CONCLUSIONS

It is our opinion that the evidence presented above suggests that there is very little likelihood that the area groundwater receptors have been threatened by the former existence of the subject grease pit. We base this opinion on the following facts and observations:

1. South Royalton has a municipal drinking water system supplied by bedrock wells located about 1/2 mile upgradient from the subject site and there are no nearby private drinking water wells.
2. There was no visual evidence of petroleum contamination along the bank of the White River downgradient from the subject site.
3. The majority of the contaminated soil has been previously removed from the site and only lower levels of residual contamination remain in the underlying soils.

Mr. John Delemare
Vermont Law School
July 9, 1992
Page 4

It is our further opinion that since the source of the contamination has been removed from the ground, the relatively low levels of total petroleum hydrocarbons (in the absence of volatile organic compounds) suggests that the residual groundwater contamination as a result of the former grease pit installation is not a significant threat to the environment. We recommend that the monitoring well that was installed during this project be maintained on the Vermont Law School property, but that no further groundwater testing be completed.

We are enclosing two originals of this letter report so that you can review and submit one copy to the HMMD-SMS section documenting the work that you have recently completed at the site in response to their earlier directions. We appreciate the opportunity to be of service to the Vermont Law School and apologize for the delay in completing the groundwater monitoring well installation. It was more difficult that we anticipated scheduling a driller for the time period we were working in. If you have any questions on the report, please feel free to contact us.

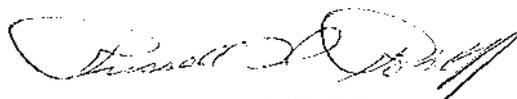
Very truly yours,

DuBois & KING, INC,



Robert L. Nelson, P.G.
Senior Hydrogeologist

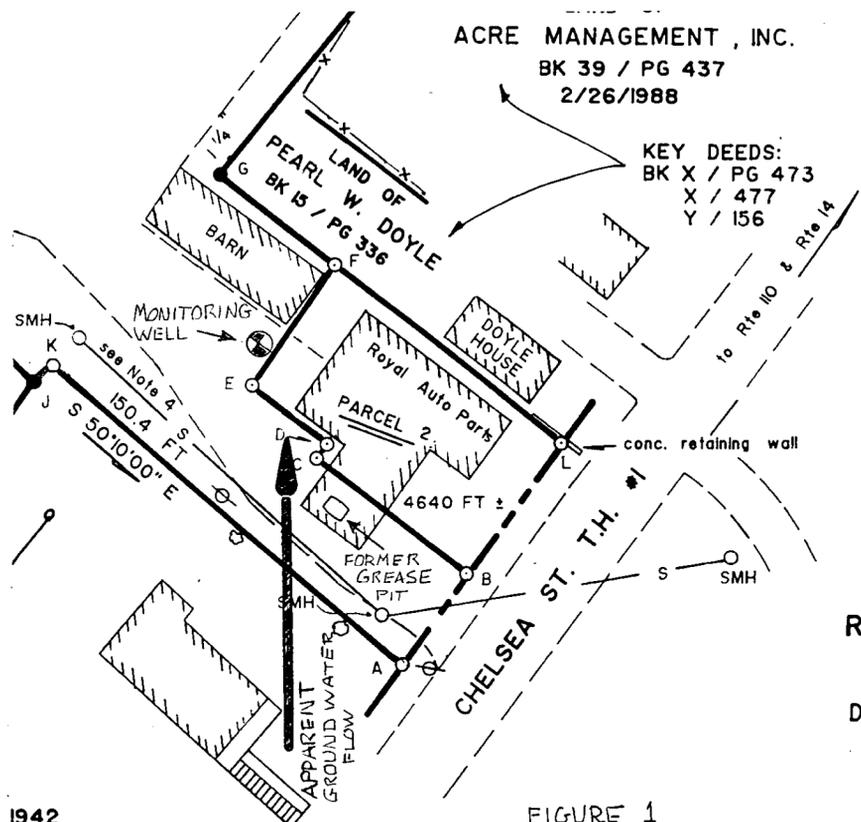
Reviewed by:



Russell W. Rohloff, P.E.
Project Manager

Enclosures

**DuBois
& King** inc.



ACRE MANAGEMENT, INC.
BK 39 / PG 437
2/26/1988

KEY DEEDS:
BK X / PG 473
X / 477
Y / 156

A SUBDIVISION OF THE LAND OF
ROBERT AND DEBORAH MCSHINSKY
ROYALTON, VERMONT
DEED REFERENCE: BOOK 32 / PAGE 17
5 / 20 / 1983

FIGURE 1

1942
5

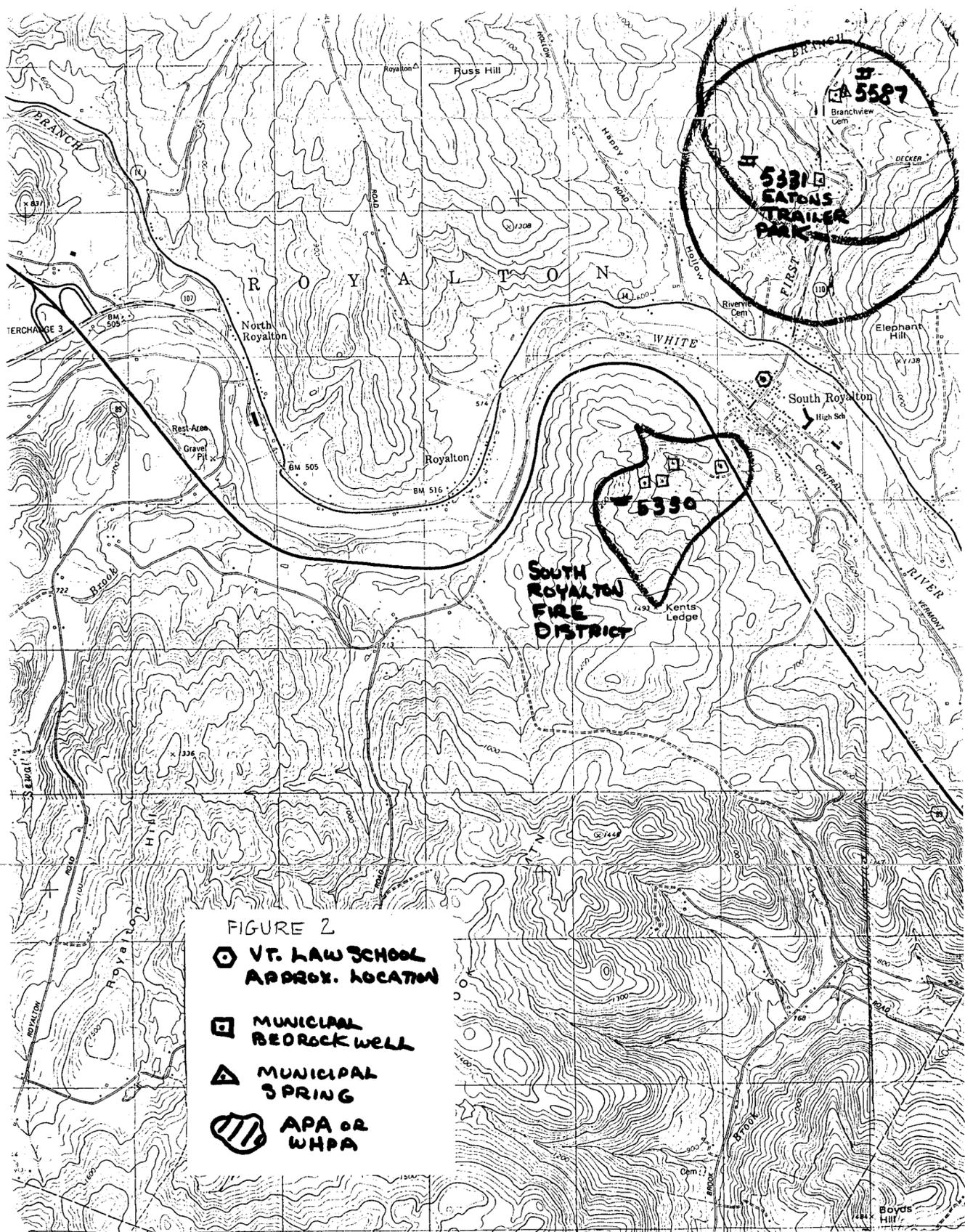
PROJECT #91003-A

BK 2 / PG 89

LAWRENCE E. SWANSON, L.S.
SHARON, VERMONT

DATE: APRIL, 1991 SURVEY: LES, RAS DRAWN: LES

based on and is constant with
record, physical evidence found in
and information provided by
John Engroff



SCALE 1" = 2000'

Green Mountain Boring Co., Inc.

R. D. 2 - BARRE, VERMONT 05641

SHEET 1 OF 1
 DATE 5/29/92
 HOLE NO. 4
 LINE & STA. _____
 OFFSET _____

TO DuBois and King ADDRESS Randolph, VT
 PROJECT NAME Vt. Law School LOCATION South Royalton, VT
 REPORT SENT TO DuBois and King PROJ. NO. _____
 SAMPLES SENT TO DuBois and King OUR JOB NO. 92-70

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR.	SURFACE ELEV.
At <u>13'</u> at <u>1/4</u> Hours	Type	AUGERS	SPLIT SPOON		DATE STARTED <u>5/29/92</u>
At _____ at _____ Hours	Size I. D.	<u>4.25"</u>	<u>1 3/8"</u>		DATE COMPL. _____
	Hammer Wt.		<u>140#</u>		BORING FOREMAN <u>Bernasconi</u>
	Hammer Fall		<u>30'</u>		INSPECTOR <u>Bob Nelson</u>
					SOILS ENGR. _____

LOCATION OF BORING: 10' from corner of barn

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler			Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE		
				From 0-6	To 6-12	To 12-18				No.	Pen	Rec
		<u>0'-2'</u>	<u>Dry</u>	<u>7</u>	<u>7</u>	<u>6</u>	<u>Damp</u>		<u>Hard packed brown fine sand into a black colored sand</u>	<u>1</u>	<u>24"</u>	<u>15</u>
		<u>5'-7'</u>	<u>Dry</u>	<u>7</u>	<u>5</u>	<u>5</u>	<u>Damp</u>		<u>Fine brown silty sand</u>	<u>2</u>	<u>24"</u>	<u>12</u>
		<u>10'-12'</u>	<u>Dry</u>	<u>4</u>	<u>4</u>	<u>5</u>	<u>Dry</u>		<u>Fine medium coarse sand with medium stones</u>	<u>3</u>	<u>24"</u>	<u>6"</u>
		<u>15'-17'</u>	<u>Dry</u>	<u>13</u>	<u>19</u>	<u>25</u>	<u>Wet</u>	<u>14'</u>	<u>Fine hard packed sand with medium stones</u>	<u>4</u>	<u>24"</u>	<u>18"</u>
				<u>29</u>					<u>Drilled to 18'</u> <u>Hit prss. bedrock</u> <u>Set well at 17'</u>			
									<u>Materials Used:</u> <u>3 bags of #2 sand</u> <u>1 bag benseal</u> <u>10' screen</u> <u>1 bottom cap</u> <u>7' riser</u> <u>1/2 bag cement</u> <u>1 top wing nut cap</u> <u>1 protective cover</u>			

GROUND SURFACE TO <u>18'</u>	USED <u>4.25" AUGERS:</u>	THEN <u>Set well</u>	140 lb. Wt. x 30" fall an 2" O. D. Sampler	SUMMARY:
Sample Type	Proportions Used	Cohesionless Density	Cohesive Consistency	Earth Boring
D=Dry C=Cored W=Washed	trace 0 to 10%	0-10 Loose	0-4 Soft 30 + Hard	Rock Coring
UP=Undisturbed Piston	little 10 to 20%	10-30 Med. Dense	4-8 M/Stiff	Samples
TP=Test Pit A=Auger V=Vane Test	some 20 to 35%	30-50 Dense	8-15 Stiff	
UT=Undisturbed Thinwall	and 35 to 50%	50 + Very Dense	15-30 V.Stiff	

HOLE NO. 4

LABORATORY REPORT

CLIENT NAME: DuBois & King, Inc.
 ADDRESS: P.O. Box 339
 Randolph, VT 05060
 SITE LOCATION: Vermont Law School
 ATTENTION: Russ Rohloff

LABORATORY NO.: 2-0877A
 PROJECT NO.: 80439
 DATE OF SAMPLE: 6/5/92
 DATE OF ANALYSIS: 6/9/92
 DATE OF REPORT: 6/23/92

VOLATILE ORGANIC DATA FOR WATER SAMPLE
 RESULTS IN MICROGRAMS/LITER(ppb)

PARAMETER	FIELD	MONITORING	TRIP	PRACTICAL
	BLANK	WELL	BLANK	QUANTITATION LIMIT
Chloromethane	BPQL	BPQL	BPQL	10
Bromomethane	BPQL	BPQL	BPQL	10
Vinyl Chloride	BPQL	BPQL	BPQL	10
Chloroethane	BPQL	BPQL	BPQL	10
Methylene Chloride	BPQL	BPQL	BPQL	10
Acetone	BPQL	BPQL	BPQL	20
Trichlorofluoromethane	BPQL	BPQL	BPQL	10
Carbon Disulfide	BPQL	BPQL	BPQL	10
1,1-Dichloroethene	BPQL	BPQL	BPQL	5
1,1-Dichloroethane	BPQL	BPQL	BPQL	5
1,2-Dichloroethene(Total)	BPQL	BPQL	BPQL	5
Chloroform	BPQL	BPQL	BPQL	5
1,2-Dichloroethane	BPQL	BPQL	BPQL	5
2-Butanone (MEK)	BPQL	BPQL	BPQL	20
1,1,1-Trichloroethane	BPQL	BPQL	BPQL	5
Carbon Tetrachloride	BPQL	BPQL	BPQL	5
Vinyl Acetate	BPQL	BPQL	BPQL	20
Bromodichloromethane	BPQL	BPQL	BPQL	5
1,2-Dichloropropane	BPQL	BPQL	BPQL	5
c-1,3-Dichloropropene	BPQL	BPQL	BPQL	5
Trichloroethene	BPQL	BPQL	BPQL	5
Dibromochloromethane	BPQL	BPQL	BPQL	5
1,1,2-Trichloroethane	BPQL	BPQL	BPQL	5
Benzene	BPQL	BPQL	BPQL	5
t-1,3-Dichloropropene	BPQL	BPQL	BPQL	5
2-Chloroethylvinylether	BPQL	BPQL	BPQL	20
Bromoform	BPQL	BPQL	BPQL	5
4-Methyl-2-Pentanone (MIBK)	BPQL	BPQL	BPQL	20
2-Hexanone	BPQL	BPQL	BPQL	20
Tetrachloroethene	BPQL	BPQL	BPQL	5
1,1,2,2-Tetrachloroethane	BPQL	BPQL	BPQL	5
Toluene	BPQL	BPQL	BPQL	5
Chlorobenzene	BPQL	BPQL	BPQL	5
Ethylbenzene	BPQL	BPQL	BPQL	5
Styrene	BPQL	BPQL	BPQL	10
m-Xylene	BPQL	BPQL	BPQL	10
o,p-Xylene	BPQL	BPQL	BPQL	10
1,3-Dichlorobenzene	BPQL	BPQL	BPQL	10
1,2-Dichlorobenzene	BPQL	BPQL	BPQL	10
1,4-Dichlorobenzene	BPQL	BPQL	BPQL	10

EPA Method 8240, SW 846, 3rd Ed., Nov 1986
 BPQL = Below Practical Quantitation Limit.



LABORATORY REPORT

CLIENT NAME: DuBois & King, Inc. LABORATORY NO.: 2-0877A
ADDRESS: P.O. Box 339 PROJECT NO.: 80439
Randolph, VT 05060 DATE OF SAMPLE: 6/5/92
SITE LOCATION: Vermont Law School DATE OF RECEIPT: 6/5/92
ATTENTION: Russ Rohloff DATE OF REPORT: 6/23/92

TOTAL PETROLEUM HYDROCARBONS (418.1)
RESULTS

<u>LOCATION</u>	<u>CONCENTRATION</u>	<u>DETECTION LIMIT</u>
Monitoring Well	42 ppm	1 ppm

Respectfully submitted,

SCITEST, INC.

Roderick J. Lamothe
Roderick J. Lamothe
Laboratory Director

RJL/ps
page 2 of 2