



January 30, 1995

RECEIVED
STATE OF VERMONT
JAN 31 10 17 AM '95

Mr. Richard Spiese
Acting Supervisor
Sites Management Section
Vermont Department of
Environmental Conservation
103 South Main Street
Waterbury, Vermont 05676

RE: McCullough's Quik Stop - Site Investigation Report (VDEC Site #94-
1716)
18

Dear Mr. Spiese:

A subsurface soil boring investigation was conducted on December 19 and 20, 1994 at the McCullough's Quik Stop (MQS) site located on Route 107 in Royalton, Vermont. The investigation was conducted in response to the recent discovery of subsurface petroleum contamination during the excavation and removal of several underground storage tanks (USTs), and your November 16, 1994 letter requesting additional site investigations. On December 6, 1994 we provided you with a brief work plan and site investigation expressway notification.

The actual subsurface investigation commenced on December 19, 1994. A total of four soil borings (B-1, 2, 3, and 4) were drilled, and limited petroleum related soil contamination was detected in two of the borings (B-2 and B-4). Soil petroleum contamination levels as assayed with a photoionization detector (PID) revealed minor soil contamination to a depth of 12 feet in B-2, and greater soil contamination levels in B-4 to a depth of about 20 feet. In both borings, soil contamination declined to background levels at depths less than 15 feet and 35 feet, respectively. As expected, no shallow ground water table was encountered in any of the borings, however a thin layer of moist to wet soils was found atop a dense glacial till confining unit at depths ranging from about 25 feet to 35 feet below grade. No ground water monitoring wells were installed.

Three soil samples collected at different depths in B-4 showed low levels of BTEX and TPH contaminants at a depth of 7'-9', and no detectable levels at 17.5'-19.5' and 35'-36'. Three ground water samples obtained from nearby drilled bedrock wells contained no detectable levels of BTEX and MTBE. The approximately 50 cubic yards of petroleum contaminated soils have been appropriately stocked and polyencapsulated in the nearby gravel pit. The stockpile will be fully evaluated in the spring in order to determine the ultimate disposition. The minor extent of soil contamination found in the soil borings, lack of vapor levels in the MQS store and apartment, and lack of petroleum

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related contamination in the three drilled bedrock wells sampled suggests that, with the exception of the stockpiled soils, no further remedial investigations or actions are necessary at this site.

Enclosed for your information and use in reviewing this summary report and our recommendations are the following:

Figure 1,	General Location Map;
Figure 2,	Detailed Site Map;
Appendix A,	LAG Detailed Soil Boring Logs;
Appendix B,	TSDB Soil Boring Logs;
Appendix C,	B-4 Soil Boring Laboratory Report; and
Appendix D,	Water Quality Reports from Nearby Bedrock Wells

The general location of the MQS site in Royalton is shown on a USGS topographic map presented as **Figure 1**. Also shown immediately to the east is Northeast Hydraulics (NH), a hydraulics repair shop. The Vermont State Police "Troop E" Barracks (VSPB) abuts the Northeast Hydraulics property to the east. All three properties are located on the south side of Route 107, at an elevation of 630 to 640 feet above mean sea level (MSL). The major ground water discharge zone for the region, the White River, is located 1,100 feet south of the site at an elevation of 490 feet MSL and flows east to the Connecticut River.

A detailed site map is presented as **Figure 2**. The MQS store building, NH shop building, petroleum underground storage tanks (USTs), pump island, approximate locations of UST electrical and delivery piping, septic tanks and leachfield, drilled bedrock water supply wells, former UST and pump island locations, and the four soil borings (B-1, 2, 3, and 4) are shown on **Figure 2**. The VSPB building, drilled bedrock well, and 2,000 gallon gasoline UST are not shown on **Figure 2**, but are located immediately east of the NH shop building and property. Approximately 50 cubic yards of stockpiled and polyencapsulated petroleum contaminated soils excavated during the recent UST removals are located 300 feet due west of the MQS drilled bedrock well in a semi-active gravel pit on McCullough's property. The four soil borings drilled by Tri State Drilling and Boring, Inc. (TSDB) were located at known or suspected areas of soils petroleum contamination (B-2 and B-4), or in areas downgradient of known soils contamination (B-1 and B-3). The three drilled bedrock water supplies that were sampled for petroleum related contamination include the MQS well (400 feet deep) located 105 feet west of the store, the NH well located 58 feet east of the shop, and the VSPB well (shared with the Vermont Agency of Transportation Garage) located approximately 400 feet east-southeast of the MQS store.



Lincoln Applied Geology, Inc.
Environmental Consultants

RD # 1 Box 710 • Bristol, Vermont 05443 • (802) 453-4384 • FAX (802) 453-5399

Presently there are four petroleum USTs located at the MQS site that were registered and installed in the fall of 1994. These include an 8,000 gallon super no lead gasoline UST, an 8,000 gallon mid-grade gasoline UST, a 10,000 gallon regular gasoline UST, and a 10,000 gallon UST that contains 8,000 gallons of diesel and 2,000 gallons of kerosene in two separate compartments. These USTs are located at the former location of a 4,000 gallon gasoline UST and a former 4,000 gallon kerosene UST. Both of the former USTs were excavated and removed by Bradford Oil Company (BOC) on October 18, 1994. Evaluation of the two USTs and the surrounding soils by BOC revealed that the USTs were in good condition and contained an average of 0-5 parts per million (ppm) of volatile organic compounds (VOCs) as detected by a photoionization detector (PID) with a 10.2 eV lamp. The highest PID readings obtained were 300 and 240 ppm on the north side of the store in the area of a former pump island as shown on Figure 2. These elevated PID readings were found at depths of 3 feet and 5 feet below grade, respectively.

In association w/ replacement USTs

Soil boring B-1 is located about 40 feet south of the former and present USTs at the west side of the store, and soil boring B-4 is located on the north side of the store at the location of the former pump island.

Three additional petroleum USTs were excavated and removed by BOC on November 23, 1994. These included a former 4,000 gallon super gasoline UST and a former 7,000 gallon regular gasoline UST that were located on the east side of the MQS store, and a 20,000 gallon diesel UST that was located about 150 feet west of the MQS store as shown on Figure 2. Both gasoline USTs were described by BOC as being in fair condition, and the diesel UST was in good condition. No diesel related soil contamination was found in the vicinity of the diesel UST, however low levels of gasoline related soil contamination (5 ppm average) were found at the northern end of the gasoline USTs. The highest soil PID level was 110 ppm at a depth of 2 feet below the gasoline USTs.

not in association w/ replacement USTs

Soil boring B-2 is located on the east side of the store at the former location of the gasoline USTs. Soil boring B-3 is located 50 feet south of the rear of the store, and was placed here since it is located in a downgradient position from the former pump island, former USTs, and confirmed locations of soil contamination.

Surficial unconsolidated sediments and soils at the site are identified on the Surficial Geologic Map of Vermont (1970) as glaciolacustrine littoral sediment that is predominantly sand. This is underlain by glacial till which overlies the bedrock surface. Bedrock is identified on the Centennial Geologic Map of Vermont (1961) as the Lower Devonian age Barton River member of the Waits River formation, an interbedded siliceous crystalline limestone and phyllite. Depth to bedrock beneath the site is expected to be greater than 100 feet.

$\frac{15}{32} \cdot 100 = 46.875$



Soil borings B-1, B-2, B-3, and B-4 were drilled by TSDB on December 19 and 20, 1994. The LAG Detailed Well Logs are included as **Appendix A**, and the TSDB boring logs are included as **Appendix B**. [REDACTED] located west of the MQS store encountered unconsolidated glaciolacustrine littoral sediments consisting of dry, fine sand and silt with lesser amounts of fine to medium gravel from the surface to a depth of about 25.5 feet. Dry, dark grey, dense glacial till soils are present from 25.5 feet to the bottom of the boring (refusal) at 31 feet. The only evidence of seasonal ground water was a single [REDACTED] [REDACTED] glacial till soils. This suggests that only [REDACTED] exists, and that the lower glacial till forms an effective confining layer to the downward vertical migration of fluids through the overlying unconsolidated silts, sands, and gravels. No PID levels above background (BG = 0.6 ppm) were detected in any of the six soil samples obtained, indicating that soil contamination related to the former gasoline and kerosene USTs was of a very limited extent. No ground water monitor well was installed.

Soil boring [REDACTED] located east of the MQS store encountered the same dry, unconsolidated glaciolacustrine littoral sediments from the surface to a depth of about 34 feet. Dry, olive grey to dark grey, [REDACTED] to the bottom of the boring at 42 feet. A [REDACTED] indicating the existence of a very thin perched ground water table directly at the top of the less permeable and dense glacial till. Soil sample PID levels of 10.6 ppm and 0.2 ppm, and 'old gas' odors were obtained from depths of 5 to 7 feet and 10 to 12 feet, respectively. Six soil samples obtained from depths of 15 to 42 feet had BG (0.6 ppm) PID levels, suggesting that the magnitude and extent of gasoline related soil contamination from the former gasoline USTs was very limited. No ground water monitor well was installed.

[REDACTED] located south of the MQS store also encountered similar dry, unconsolidated glaciolacustrine littoral sediments from the surface to a depth of about 25 feet. Dry, olive grey to grey, dense [REDACTED] is present [REDACTED] to the bottom of the boring at 41 feet. A soil [REDACTED], again indicating the occasional existence of a very thin perched ground water table at the top of the less permeable and dense glacial till. Soil sample PID levels of BG (0.0 ppm) were obtained from the six soil samples, suggesting that upgradient soil contamination is of limited extent and has not migrated toward the south to the vicinity of B-3. No ground water monitor well was installed.

[REDACTED] located north of the MQS store at the former pump island encountered asphalt pavement and a thin layer of sand and gravel fill to a depth of about 3 feet. Below the fill is [REDACTED] glaciolacustrine littoral sediments [REDACTED]. Strong 'old gas' odors were noticeable from soil samples obtained immediately below the asphalt pavement to a depth of 11 feet, and increasingly fainter 'old gas' odors

Mr. Richard Spiese
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On December 19, 1994 the petroleum contaminated soils stockpiled on the adjoining gravel pit property were found to be properly polyencapsulated. The total volume is estimated to be about 50 cubic yards. These soils will be temporarily uncovered in the spring so that contamination levels may be evaluated using a PID. A few samples may also be collected for BTEX, MTBE and TPH analysis. After the PID and laboratory data has been received and evaluated, a long-term plan for soils treatment and/or disposal will be prepared and submitted for your approval. We do anticipate that following the biological breakdown that occurs within a polyencapsulated stockpile, the soils will be able to be thinspread within the gravel pit area.

not necessary

when?

after soils removed in Spring

A [redacted] was [redacted] and apartment on December 19, 1994. [redacted], and there was no evidence of gasoline or other petroleum odors. Historically, there have been no complaints of odors in either of these two potential receptors. The limited soil contamination documented during the UST removals and subsequent soil borings, and the lack of a shallow ground water table indicates a minimal contaminant impact to soils, and a non-existent impact to ground water and interior business and living spaces. The native soils have attenuated the petroleum contamination, and have prevented it from migrating. Natural biodegradation of the contaminants is likely occurring as chromatographic patterns generated during the soils analyses provided evidence of low molecular weight breakdown products. With the exception of evaluating the stockpiled soils and determining their ultimate disposition, we recommend that no further remedial investigation or actions are necessary at the McCullough's Quik Stop site.

The stockpiled soils will be evaluated when they are thawed in the spring, and report the findings and recommendations to you. Until then, please feel free to call me or John Amadon, Project Manager, at 802-453-4384 with any questions or comments that you may have.

Sincerely,

William D. Norland

William D. Norland
Hydrogeologist

Enclosures

cc: Dan McCullough
Bill Sellinger



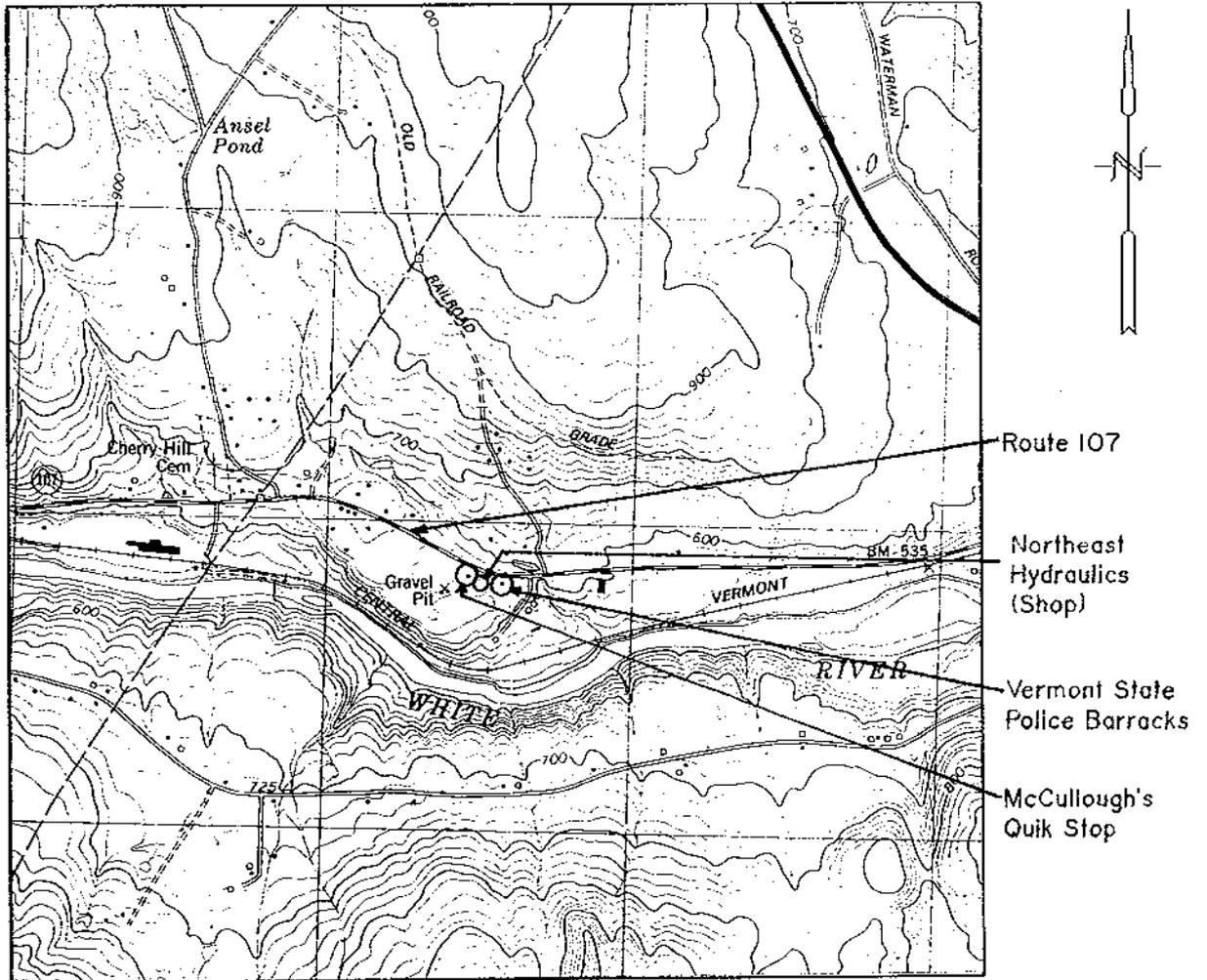
Lincoln Applied Geology, Inc.
Environmental Consultants

RD # 1 Box 710 • Bristol, Vermont 05443 • (802) 453-4384 • FAX (802) 453-5399

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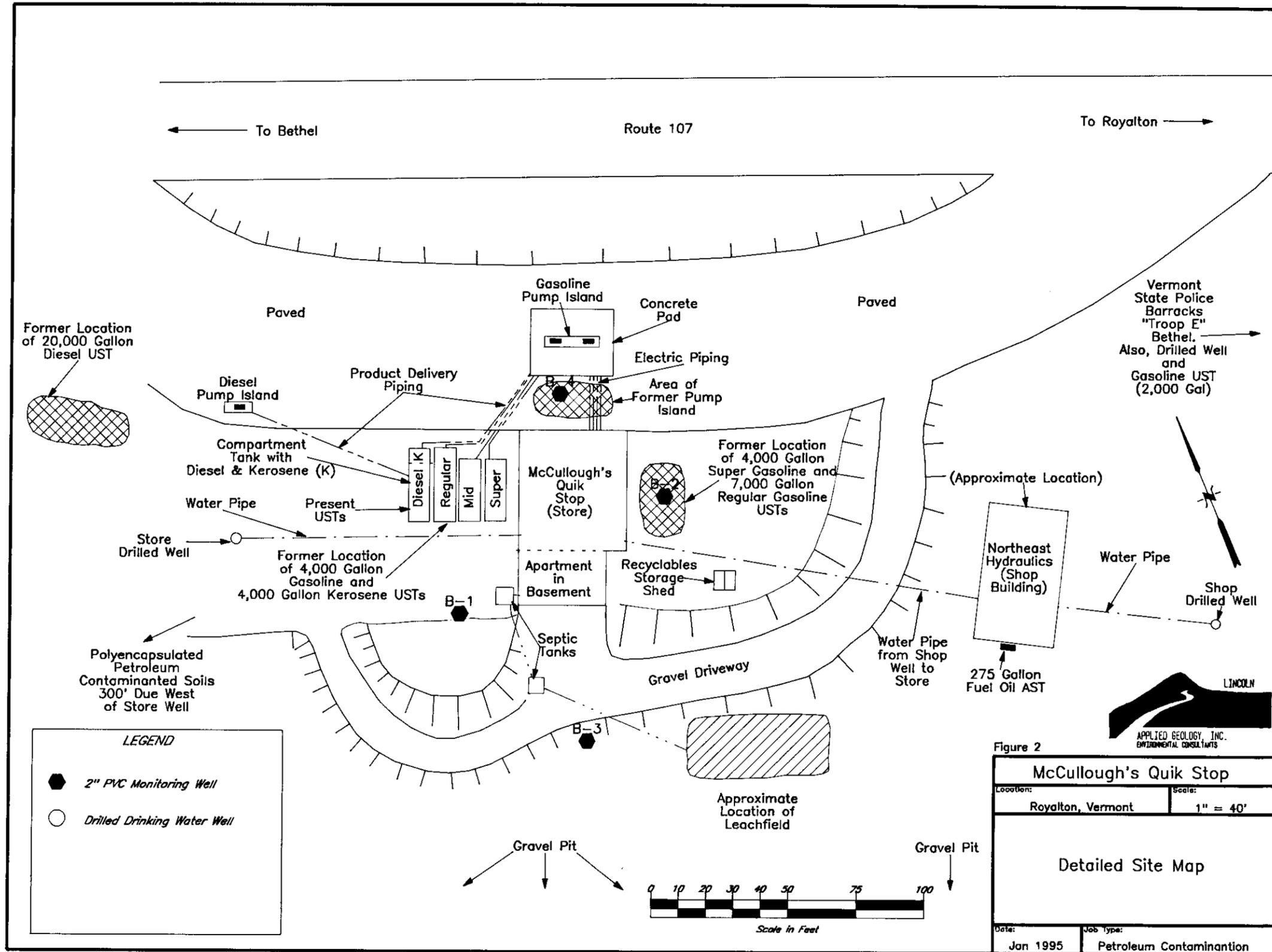
Figure 1

McCullough's Quik Stop
South Royalton, VT
GENERAL LOCATION MAP



Source: U.S.G.S. 7.5 Min
Topo Series
So. Royalton, VT Quad.

Scale: 1:24,000



Former Location of 20,000 Gallon Diesel UST

LEGEND

● 2" PVC Monitoring Well

○ Drilled Drinking Water Well

Figure 2
McCullough's Quik Stop
 Location: Royalton, Vermont Scale: 1" = 40'
Detailed Site Map
 Date: Jan 1995 Job Type: Petroleum Contamination



Appendix A
LAG Boring Logs

SOIL BORING LOG

BORING: B-1 (Elevation = 98.75')
 LOCATION: McCulloughs Quik Stop, near southwest corner of store building.
 DRILLER: Tri-State Drilling and Boring, Inc.
 HYDROGEOLOGIST: Bill Norland, Lincoln Applied Geology, Inc.
 DATE: December 19, 1994

Soils Description: (BG = Background [0.6], SL = Saturated Lamp [>500], ppm = Parts Per Million)

<u>Depth</u>	<u>Description</u>	<u>PID (ppm)</u>
0' - 3'	Silty fine sand; some fine gravel (changed at 3').	
5' - 7'	Dry, tan brown; <u>fine sand and medium gravel</u> ; little medium to coarse sand; silt.	BG
10' - 12'	Dry, olive grey to green, <u>silt and very fine sand</u> ; little medium gravel; trace fine sand. Glaciolacustrine.	BG
15' - 17'	7" - Dry, tan, <u>fine sand and fine gravel</u> ; little medium to coarse sand; trace medium gravel. 6" - Dry, brown, <u>very fine sand and silt</u> ; some fine to medium gravel; trace fine to medium sand. 3" - Dry, tan, same as 7" unit above.	BG
20' - 22'	Dry, tan, <u>very fine sand and silt</u> . ~1/16 - 1/8" laminations.	BG
25' - 25.5'	Split spoon bouncing on rock. Moist, dark grey, <u>silt and fine sand</u> ; some fine gravel (mica schist, angular fragments). Glacial till.	BG
25.5' - 26.5'	Very tough drilling. Glacial till/Gravel horizon.	
30' - 31'	Dry, dark grey, <u>silt and very fine sand</u> ; little fine to coarse gravel (angular to subrounded). Looks like dense glacial till	BG
	Bottom of boring at 31' depth. Refusal at 31' on dense rock/soils. No well installed, boring backfilled.	

Construction:

Bottom of Boring: 31'

SOIL BORING LOG

BORING: B-2 (Elevation = 98.86')
LOCATION: McCullough's Quik Stop, east side of store.
DRILLER: Tri-State Drilling and Boring, Inc.
HYDROGEOLOGIST: Bill Norland, Lincoln Applied Geology, Inc.
DATE: December 19, 1994

Soils Description: (BG = Background [0.6], SL = Saturated Lamp [>500], ppm = Parts Per Million)

<u>Depth</u>	<u>Description</u>	<u>PID (ppm)</u>
0'	Dry, brown, <u>fine sand and fine to medium gravel</u> .	
5' - 7'	Dry, brown, <u>fine sand and fine to medium gravel</u> ; little medium sand and silt. (Old gas odor).	10.6
10' - 12'	Dry, brown, <u>fine to medium sand</u> ; some fine to medium gravel; trace coarse sand. (Faint old gas odor).	0.2
15' - 17'	2" - Dry, brown, <u>fine sand and silt</u> ; little fine gravel. 11" - Dry, tan, <u>fine to medium sand</u> ; some fine to coarse gravel; trace coarse sand. (No gas odor).	BG
20' - 22'	Dry, tan, <u>fine to medium sand</u> ; some fine to coarse gravel; little coarse sand.	BG
25' - 27'	Dry, tan, <u>fine to medium sand</u> ; little fine to medium gravel; trace coarse sand.	BG
30' - 32'	No sample to keep - wet, brown tan, <u>fine sand and silt</u> .	BG
35' - 36'	Dry, olive grey to dark grey, <u>silt and very fine sand</u> ; some fine to coarse gravel (mica schist rock); trace fine sand. (Very dense glacial till).	BG
40' - 42'	Dry, medium to dark grey, <u>silt and very fine sand</u> ; some fine to coarse gravel; trace fine to medium sand. (Dense glacial till)	BG
	No Well installed - Backfill to grade.	

Construction:

Bottom of Boring: 42'

SOIL BORING LOG

BORING: B-3 (Elevation = 90.94')
LOCATION: McCullough's Quik Stop, south (behind) store building.
DRILLER: Tri-State Drilling and Boring, Inc.
HYDROGEOLOGIST: Bill Norland, Lincoln Applied Geology, Inc.
DATE: December 19 and 20, 1994

Soils Description: (BG = Background [0.0], SL = Saturated Lamp [>500], ppm = Parts Per Million)

<u>Depth</u>	<u>Description</u>	<u>PID (ppm)</u>
0'		
5' - 7'	Dry, brown, <u>fine sand and silt</u> ; some fine to medium gravel; trace medium sand.	BG
10' - 12'	Dry, brown, <u>fine to medium sand</u> ; little fine to medium gravel; trace coarse sand.	BG
15' - 17'	Dry, tan, <u>fine to medium sand</u> ; some coarse sand; trace fine to medium gravel.	BG
20' - 22'	9" - Dry, tan, <u>fine to medium sand</u> ; some coarse sand; trace fine to medium gravel. 4" - Dry, brown, <u>silt and very fine sand</u> . 3" - Dry, tan, <u>fine sand</u> ; some medium sand. Hard drilling at 24.5'	BG
25' - 27'	7" - Moist, olive grey to dark grey, <u>silt and very fine sand</u> ; some medium to coarse gravel (mica schist); trace medium to coarse sand. Glacial till. 7" - Dry, (same as above, glacial till). Harder drilling at 27.5'	BG
30' - 32'	Pushed rock - no sample (glacial till - very dense).	
35' - 37'	Dry, grey, <u>silt and very fine sand</u> ; little fine to coarse mica schist gravel; trace medium sand. Possibly not till, but a dense glaciolacustrine silt deposit.	BG
40' - 41'	Dry, grey, (same as above) Bottom of boring - no water, no well installed. Backfill to grade with auger cuttings.	

Construction:

Bottom of Boring: 41'

SOIL BORING LOG

BORING: ██████████ (Elevation = 100.00')
 LOCATION: McCullough's Quik Stop, in front (north) of store building.
 DRILLER: Tri-State Drilling and Boring, Inc.
 HYDROGEOLOGIST: Bill Norland, Lincoln Applied Geology, Inc.
 DATE: December 20, 1994

Soils Description: (BG = Background [0.0], SL = Saturated Lamp [>500], ppm = Parts Per Million)

Depth	Description	PID (ppm)
0' - 0.5'	Asphalt pavement.	
1.5'	Sand and gravel fill. ██████████	18.2
5' - 7'	3" - Dry, tan, <u>silt and very fine sand</u> . 13" - Moist, olive green and grey, <u>silt</u> ; some very fine sand; trace clay (laminations). ██████████	196 at 5' 15.4 at 7'
7' - 9'	2" - Dry, tan, <u>silt and very fine sand</u> . 6" - Moist olive green, <u>silt</u> ; some very fine sand; trace clay. 5" - same as 2" above 5" - same as 6" above. Strong old gas odor.	1200 at 7.5' ██████ at 8.0' 480 at 9.0'
9' - 11'	4" - Dry, tan, <u>silt and very fine sand</u> . 13" - Moist , olive green, <u>silt</u> ; some very fine sand; trace clay. 2" - same as 4" above. Strong old gas odor.	418 at 9.2' 28 at 9.5' 11.8 at 10' 362 at 11'
13' - 15'	Moist, olive green, <u>silt</u> ; some very fine sand; trace clay.	18.6 at 13.5' 7.8 at 14' 21.2 at 15'
17'	Harder drilling - sand and gravel.	
17.5' - 19.5'	Dry, brown to buff, <u>medium to coarse sand</u> ; some fine to coarse gravel; little fine sand.	10.3 at 18' 7.6 at 18.5' 1.0 at 19.5'
23' - 25'	(Pushed stone) Dry, brown, <u>medium to coarse sand</u> ; some fine to coarse gravel; little fine sand.	2.8
25' - 27'	11" - Dry, tan and brown, <u>medium to coarse sand</u> ; some fine to coarse gravel; little fine sand. No petroleum odor. 1" - Moist, grey, <u>fine to medium sand</u> ; some fine to medium gravel; little silt. Start of till ?	0.3
30' - 31.5'	Dry, grey, <u>silt and very fine sand</u> ; some fine to coarse gravel; trace medium to coarse sand. Glacial till. Dense.	0.3
35' - 36'	Dry, grey, same as above - Glacial till.	BG
	No well installed. Bentonite seal (12") 23' - 35', then backfill to surface. Concrete cap.	

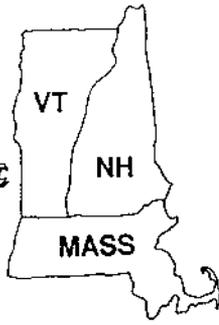
Construction:

Bottom of Boring: 36'

Appendix B

Boring Logs

Tri State
Drilling &
Boring
Inc.



- monitor wells
- soil borings
- shallow wells

office 802-467-3123
fax 802-467-8540

RFD #2, Box 113, West Burke, Vermont 05871

December 21, 1994

DEC 23 1994

Lincoln Applied Geology
Attn: Mr. Bill Norland
RD 2, Box 710
Bristol, VT 05443

RE: McCullough's Quick Stop, Royalton, VT

Dear Mr. Norland:

Enclosed herewith please find the soil probe logs for the above referenced project.

Tri State will be invoicing this project after the first of the year.

I would like to thank you for the opportunity to accommodate you on this project. Should you need any further assistance, please feel free to contact me.

Sincerely,

Neal S. Faulkner
Vice President
NSF/jal

SOIL PROBE LOG

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 B-1
 McCullough's Quick Stop
 Royalton, VT

TRI STATE
 DRILLING & BORING, INC.
 RFD #2, Box 113 West Burke, VT 05671
 (802) 467-3123

		SAMPLER	SOIL
		Continuous	Saturated
TYPE	_____	_____	Wet
SIZE	_____	_____	Moist
HAMMER	_____	_____	Damp
FALL	_____	_____	Slightly Damp

DATE STARTED: 12/19/94

DATE COMPLETED: 12/19/94

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

0-3.5'						0-3.5' Brown damp silty fine to coarse sand, fine gravel.
3.5-18'						3.5-18' Brown damp fine to coarse sand, fine gravel.
18-25'						18-25' Gray damp fine sand.
25-31'						25-31' Gray damp silt, fine to coarse sand, rock fragments, till.
31-31.0'						Bottom 31.0'.
						No well.

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Project: McCullough's Quick Stop
 Job Location: Royalton, VT
 Engineer: Lincoln Applied Geology
 Bristol, VT
 Inspector: Bill Norland

Driller: Ray Gilfillan
 Helper: Sean Hogan
 Materials: None.

SOIL PROBE LOG

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 B-2
 McCullough's Quick Stop
 Royalton, VT

TRI STATE
 DRILLING & BORING, INC.
 RFD #2, Box 113 West Burke, VT 05871
 (802) 467-3123

		SAMPLER	SOIL
		Continuous	Saturated
TYPE	_____	_____	Wet
SIZE	_____	_____	Moist
HAMMER	_____	_____	Damp
FALL	_____	_____	Slightly Damp

DATE STARTED: 12/19/94

DATE COMPLETED: 12/19/94

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

..5-7'	..2	.3	.4	..4	0.5'	0-18'	Brown damp silty fine to coarse sand, fine gravel.
.10-12'	..5	.4	.3	..9	0.6'		
.15-17'	..7	.5	.5	..5	1.1'		
.....		
.20-22'	..5	.8	.7	..6	0.9'	18-24'	Brown damp fine to coarse sand, fine gravel.
.....		
.25-27'	..3	.3	.4	.47	1.1'	24-30'	Gray damp medium coarse sand.
.....		
.30-32'	..3	.5	.7	..7	0.1'	30-42'	Gray moist silty fine to coarse sand, fine gravel, weathered rock, till.
.35-36'	..40	.70	..	..	0.1'		
.40-42'	..28	.41	.46	.53	1.5'		
.....		
.....	.....	.....	.....	.....	.....		Bottom 42.0'.
.....	.....	.....	.....	.....	.....		No well.
.....		
.....		
.....		
.....		
.....		

Project: McCullough's Quick Stop
 Job Location: Royalton, VT
 Engineer: Lincoln Applied Geology
 Bristol, VT
 Inspector: Bill Norland

Driller: Ray Gilfillan
 Helper: Sean Hogan
 Materials: None.

SOIL PROBE LOG

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B-3

McCullough's Quick Stop
Royalton, VT

TRI STATE
DRILLING & BORING, INC.
RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

		SAMPLER	SOIL
		Continuous	Saturated
TYPE	_____		Wet
SIZE	_____		Moist
HAMMER	_____		Damp
FALL	_____		Slightly Damp

DATE STARTED: 12/19/94

DATE COMPLETED: 12/19/94

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

0-5'	3	3	1	3	0.3'
5-10'	4	4	4	2	0.8'
10-15'	5	5	7	7	1.1'
15-20'	19	15	13	15	1.3'
20-25'	9	7	12	38	1.2'
25-30'	33	47	55	78	0.0'
30-35'	50	50	50	50	1.5'
35-40'	50	75			1.0'

0-14' Brown damp silty fine to coarse sand, fine gravel.
14-24.5' Gray damp medium coarse sand, layers of silt.
24.5-41' Gray damp silty fine to coarse sand, fine gravel, rock fragments, till.
Bottom 41.0'.
No well.

Project: McCullough's Quick Stop
Job Location: Royalton, VT
Engineer: Lincoln Applied Geology
Bristol, VT
Inspector: Bill Norland

Driller: Ray Gilfillan
Helper: Sean Hogan
Materials: None.

SOIL PROBE LOG

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B-4

McCullough's Quick Stop
Royalton, VT

TRI STATE
DRILLING & BORING, INC.
RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

		SAMPLER	SOIL
TYPE	_____	Continuous	Saturated
SIZE	_____		Wet
HAMMER	_____		Moist
FALL	_____		Damp
			Slightly Damp

DATE STARTED: 12/20/94

DATE COMPLETED: 12/20/94

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

0-0.3'						0-0.3' Asphalt.
0.3-5'						0.3-5' Brown damp fine to coarse sand, fine gravel, fill.
5-7'	5	4	4	8	1.4	5-7' Brown damp silt.
7-9'	4	6	7	5	1.4	7-13' Brown gray damp silt and fine sand layers.
9-11'	4	4	5	5	1.6	
13-15'	4	5	5	5	1.5	13-17' Brown moist silt.
17.5-19.5'	11	13	10	8	0.8	17-26' Brown damp coarse to fine sand, fine gravel.
23-25'	7	9	11	11	0.2	
25-27'	5	6	7	10	1.0	26-36' Gray damp silt and fine to coarse sand, fine gravel, till.
30-31.5'	6	14	75		1.1	
35-36'	27	40			1.0	
						Bottom 36.0'.
						No well.

Hole plug 36' to 23' below GS. Backfill 23' to 1' below GS. Cement 1' to GS.

Project: McCullough's Quick Stop
Job Location: Royalton, VT
Engineer: Lincoln Applied Geology
Bristol, VT
Inspector: Bill Norland

Driller: Ray Gilfillan
Helper: Sean Hogan
Materials: 4 bags hole plug.

Appendix C

December 1994
Soil Analytical Results



LABORATORY ANALYSIS

CLIENT NAME:	Lincoln Applied Geology	REF #:	10390
ADDRESS:	RD#1 Box 710 Bristol, VT 05443	PROJECT NO.:	not given
SAMPLE LOCATION:	McCullough's Quick Stop	DATE OF SAMPLE:	12/21/94
SAMPLER:	Bill Norland	DATE OF RECEIPT:	12/22/94
		DATE OF ANALYSIS:	1/4,1/5/95
ATTENTION:	John Amadon/Bill Norland	DATE OF REPORT:	1/6/95

Pertaining to the analyses of specimens submitted under the accompanying chain of custody form, please note the following:

- Soil samples submitted for VOC analysis were not preserved.
- Specimens were processed and examined according to the procedures outlined in the specified method.
- Holding times were honored.
- Instruments were appropriately tuned and calibrations were checked with the frequencies required in the specified method.
- Blank contamination was not observed at levels interfering with the analytical results.
- Continuing calibration standards were monitored at intervals indicated in the specified method. The resulting analytical precision and accuracy were determined to be within method QA/QC acceptance limits.
- The efficiency of analyte recovery for individual samples was monitored by the addition of surrogate analytes to all samples, standards, and blanks. Surrogate recoveries were found to be within laboratory QA/QC acceptance limits, unless noted otherwise.

Reviewed by:

Brendan McMahon, Ph.D.
Director, Chemical Services



LABORATORY REPORT

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

CLIENT NAME:	Lincoln Applied Geology	PROJECT CODE:	not given
PROJECT NAME:	McCullough's Quick Stop	REF.#:	10,390
REPORT DATE:	January 6, 1995	STATION:	3-4 (7'-9') P10
DATE SAMPLED:	December 21, 1994	TIME SAMPLED:	17:30 100-100
DATE RECEIVED:	December 22, 1994	SAMPLER:	Bill Norland
ANALYSIS DATE:	January 4, 1995	SAMPLE TYPE:	Soil - 79% dry wt.
		EXTRACTION:	Methanol

PARAMETER	Concentration (mg/Kg dry wt)	Concentration (mg/Kg dry wt)
Benzene	0.1 0.1	BPQL
Toluene	1.3 20	28.7
Ethylbenzene	1.3 18.9	18.9
Xylenes	3.9 110	110
MTBE	6.5 BPQL	BPQL

Surrogate % Recovery: 102%

GC	100 mg/Kg	GC
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BPQL = Below Practical Quantitation Limit (PQL).



LABORATORY REPORT

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

CLIENT NAME:	Lincoln Applied Geology	PROJECT CODE:	not given
PROJECT NAME:	McCullough's Quick Stop	REF.#:	10,390
REPORT DATE:	January 6, 1995	STATION:	XXXXXXXXXX) 1,0-10.5 L-1077
DATE SAMPLED:	December 21, 1994	TIME SAMPLED:	17:40
DATE RECEIVED:	December 22, 1994	SAMPLER:	Bill Norland
ANALYSIS DATE:	January 5, 1995	SAMPLE TYPE:	Soil - 95% dry wt.
		EXTRACTION:	Methanol

PARAMETER	PQL (µg/Kg dry wt) ^{ZOX} <u>VGES</u>	Concentration (µg/Kg dry wt)
Benzene	21	BPQL
Toluene	21	BPQL
Ethylbenzene	21	BPQL
Xylenes	63	BPQL
MTBE	105	BPQL

Surrogate % Recovery: 101%

TPH-GC	2 mg/Kg	BPQL
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BPQL = Below Practical Quantitation Limit (PQL).



LABORATORY REPORT

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

CLIENT NAME:	Lincoln Applied Geology	PROJECT CODE:	not given
PROJECT NAME:	McCullough's Quick Stop	REF.#:	10,390
REPORT DATE:	January 6, 1995	STATION:	Redacted
DATE SAMPLED:	December 21, 1994	TIME SAMPLED:	17:50
DATE RECEIVED:	December 22, 1994	SAMPLER:	Bill Norland
ANALYSIS DATE:	January 5, 1995	SAMPLE TYPE:	Soil - 85% dry wt.
		EXTRACTION:	Methanol

PARAMETER	PQL (µg/Kg dry wt)	Concentration (µg/Kg dry wt)
Benzene	24	BPQL
Toluene	24	BPQL
Ethylbenzene	24	BPQL
Xylenes	72	BPQL
MTBE	120	BPQL

Surrogate % Recovery: 101%

TPH-GC	2 mg/Kg	BPQL
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BPQL = Below Practical Quantitation Limit (PQL).

Appendix D

January 1995
Water Quality Results



LABORATORY ANALYSIS

CLIENT NAME:	Lincoln Applied Geology	REF #:	10502
ADDRESS:	RD#1 Box 710 Bristol, VT 05443	PROJECT NO.:	not given
SAMPLE LOCATION:	McCullough's	DATE OF SAMPLE:	1/16/95
SAMPLER:	James Robideau	DATE OF RECEIPT:	1/16/95
		DATE OF ANALYSIS:	1/19, 1/20/95
ATTENTION:	John Amadon/Bill Norland	DATE OF REPORT:	1/25/95

Pertaining to the analyses of specimens submitted under the accompanying chain of custody form, please note the following:

- Water samples submitted for VOC analysis were preserved with HCl. The trip blank was prepared by the client from reagent water supplied by the laboratory.
- Specimens were processed and examined according to the procedures outlined in the specified method.
- Holding times were honored.
- Instruments were appropriately tuned and calibrations were checked with the frequencies required in the specified method.
- Blank contamination was not observed at levels interfering with the analytical results.
- Continuing calibration standards were monitored at intervals indicated in the specified method. The resulting analytical precision and accuracy were determined to be within method QA/QC acceptance limits.
- The efficiency of analyte recovery for individual samples was monitored by the addition of surrogate analytes to all samples, standards, and blanks. Surrogate recoveries were found to be within laboratory QA/QC acceptance limits, unless noted otherwise.

Reviewed by:

Brendan McMahon, Ph.D.
Director, Chemical Services

JAN 30 1995

APPLIED GEOLOGY



LABORATORY REPORT

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

CLIENT NAME:	Lincoln Applied Geology	PROJECT CODE:	not given
PROJECT NAME:	McCullough's	MAV REF.#:	10,502
REPORT DATE:	January 25, 1995	STATION:	McCullough's Quick Stop
DATE SAMPLED:	January 16, 1995	TIME SAMPLED:	09:40
DATE RECEIVED:	January 16, 1995	SAMPLER:	James Robideau
ANALYSIS DATE:	January 19, 1994	SAMPLE TYPE:	Water

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	BPQL
Toluene	1	BPQL
Ethylbenzene	1	BPQL
Xylenes	3	BPQL
MTBE	5	BPQL

Surrogate % Recovery: 99%

JAN

BPQL = Below Practical Quantitation Limit (PQL)



LABORATORY REPORT

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

CLIENT NAME:	Lincoln Applied Geology	PROJECT CODE:	not given
PROJECT NAME:	McCullough's	MAV REF.#:	10,502
REPORT DATE:	January 25, 1995	STATION:	Northeast Hydraulics
DATE SAMPLED:	January 16, 1995	TIME SAMPLED:	09:49
DATE RECEIVED:	January 16, 1995	SAMPLER:	James Robideau
ANALYSIS DATE:	January 20, 1994	SAMPLE TYPE:	Water

PARAMETER	PQL ($\mu\text{g/L}$)	Conc. ($\mu\text{g/L}$)
Benzene	1	BPQL
Toluene	1	BPQL
Ethylbenzene	1	BPQL
Xylenes	3	BPQL
MTBE	5	BPQL

Surrogate % Recovery: 103%

BPQL = Below Practical Quantitation Limit (PQL)

JAN 30 1995



LABORATORY REPORT

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

CLIENT NAME:	Lincoln Applied Geology	PROJECT CODE:	not given
PROJECT NAME:	McCullough's	MAV REF.#:	10,502
REPORT DATE:	January 25, 1995	STATION:	Vermont State Police
DATE SAMPLED:	January 16, 1995	TIME SAMPLED:	09:54
DATE RECEIVED:	January 16, 1995	SAMPLER:	James Robideau
ANALYSIS DATE:	January 20, 1994	SAMPLE TYPE:	Water

PARAMETER	PQL (µg/L)	Conc. (µg/L)
Benzene	1	BPQL
Toluene	1	BPQL
Ethylbenzene	1	BPQL
Xylenes	3	BPQL
MTBE	5	BPQL

Surrogate % Recovery: 101%

BPQL = Below Practical Quantitation Limit (PQL)

JAN 30 1995



LABORATORY REPORT

GC/MS METHOD - BTEX (BENZENE, TOLUENE, ETHYLBENZENE, XYLENES) + MTBE

CLIENT NAME:	Lincoln Applied Geology	PROJECT CODE:	not given
PROJECT NAME:	McCullough's	MAV REF.#:	10,502
REPORT DATE:	January 25, 1995	STATION:	Trip Blank
DATE SAMPLED:	January 16, 1995	TIME SAMPLED:	08:00
DATE RECEIVED:	January 16, 1995	SAMPLER:	James Robideau
ANALYSIS DATE:	January 19, 1994	SAMPLE TYPE:	Water

PARAMETER	PQL ($\mu\text{g/L}$)	Conc. ($\mu\text{g/L}$)
Benzene	1	BPQL
Toluene	1	BPQL
Ethylbenzene	1	BPQL
Xylenes	3	BPQL
MTBE	5	BPQL

Surrogate % Recovery: 97%

BPQL = Below Practical Quantitation Limit (PQL)

JAN 20 1995

James Robideau

