

NOV 17 1994

November 15, 1994

Mr. Richard Spiese, Acting Supervisor
Sites Management Section
VT DEC - HMMD
103 South Main Street/West Office
Waterbury, Vermont 05671

Re: Site Investigation, Lester's General Store, St. Albans, Vermont
SMS Site #94-1558

Dear Mr. Spiese:

Enclosed is our report on the site investigation performed at Lester's General Store in St. Albans on behalf of S.B. Collins, Inc. The investigation was performed by Timothy Schmalz, Project Geologist. Feel free to call myself or Tim if you have any questions concerning the site investigation or our recommendations.

Sincerely,

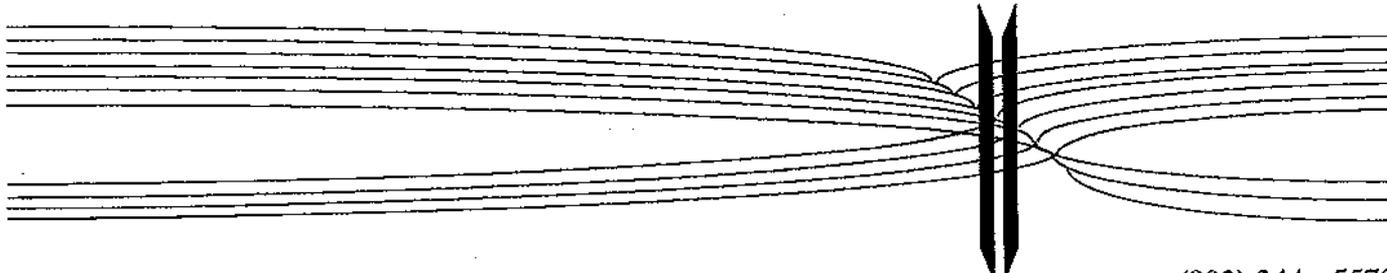


Jefferson P. Hoffer
Principal Hydrogeologist

enc.

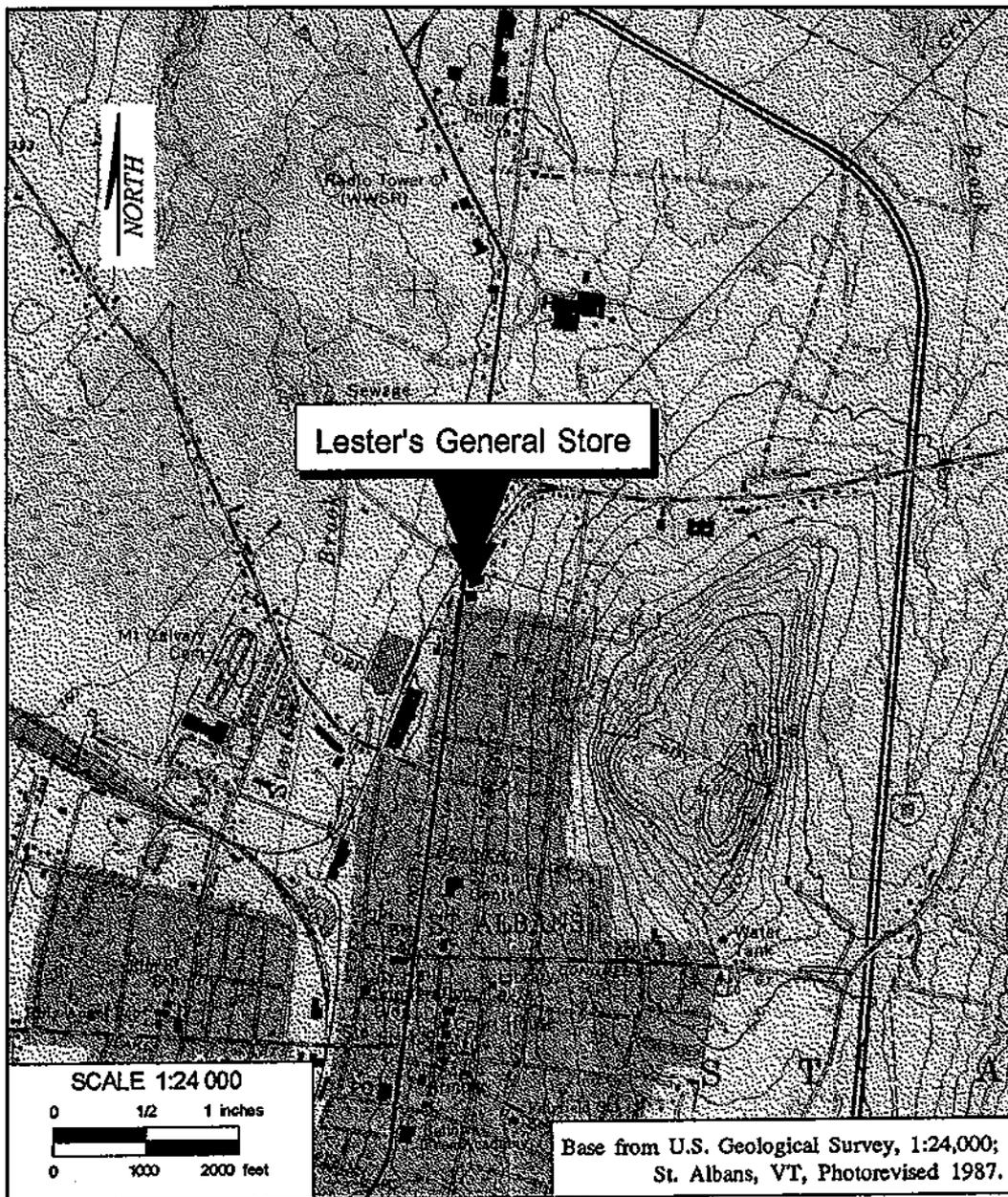
cc: Carl Ruprecht, S.B. Collins, Inc.

Jefferson P. Hoffer
Consulting Hydrogeologists



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REPORT ON UST SITE INVESTIGATION LESTER'S GENERAL STORE ST ALBANS, VERMONT November 1994



**Report on UST Site Investigation
Lester's General Store
277 North Main Street
St. Albans, Vermont**

November, 1994

SMS Site #94-1558

Site Owner:

Richard Deso
277 North Main Street
St. Albans, Vermont 05478
(802) 524 - 5107

Report Prepared For:

Carl Ruprecht, UST Manager
S.B. Collins, Inc.
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Report Prepared By:

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1.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A hydrogeologic site investigation was performed at Lester's General Store in St. Albans, Vermont, to evaluate the extent of soil and groundwater contamination associated with former underground storage tanks (USTs). The investigation included a soil-gas survey and the installation and sampling of groundwater monitoring wells, and evaluation of the extent of contamination and the risk posed to potential receptors.

A dense, unweathered till occurs at a depth of about 12 feet at the site. A thin saturated zone is perched on the unweathered till within fill materials, lacustrine sediments, and weathered till. Groundwater occurs at a depth of four to seven feet, and flows westward under a hydraulic gradient of 0.08. Groundwater sampling has defined a plume of dissolved-phase gasoline constituents migrating westward from the former UST area toward Main Street. The highest concentrations of contaminants were detected in monitoring well MW-102, ranging from 8270 µg/L for xylenes to 1310 µg/L for MTBE. Lower concentrations were detected in MW-103, which is located directly downgradient from the former UST area. The downgradient and lateral extent of contamination has not been defined.

Neither surface water nor drinking water supplies appear to be threatened by site contamination. The potential for a petroleum vapor accumulation problem in nearby structures appears to be low.

Additional site investigation efforts should be undertaken to define the extent of contamination and to monitor site contaminant levels through time.

2.0 BACKGROUND INFORMATION AND SITE SETTING

2.1 Background Information

Lester's General Store (site) is a convenience store and automotive fueling station located at 277 North Main Street in St. Albans, Vermont. Underground storage tanks (USTs) used for gasoline storage at the site were replaced in June 1994 by owner Richard Deso. The former tanks were owned and maintained by S. B. Collins, Inc (SBC) of St. Albans, Vermont. These tanks were excavated and removed on June 21, 1994. In accordance with Vermont Underground Storage Tank Regulations, an initial site assessment was performed at the time of closure to determine if a release of hazardous materials had occurred.

The initial site assessment report is summarized in the June 22, 1994 letter to Carl Ruprecht (SBC) from Jefferson P. Hoffer (see Appendix A). Observations during the tank removals indicated that soil and groundwater had been impacted by releases of gasoline. Although no free product was observed in the excavations, elevated photoionization detector (PID) readings were detected in soil and groundwater headspace samples.

Based on the initial site assessment results, a scope of work for a site investigation was prepared and submitted to the Sites Management Section (SMS). The scope of work and SMS approval letter are included in Appendix A. This report presents the results of the site investigation efforts.

2.2 Site Setting

The site is located along a commercially-developed section of North Main Street (US Route 7) in St Albans. Figure 1 presents a site location map, and Figure 2 presents a site vicinity map. A site map showing the former and present USTs, and monitoring well locations, is provided on Figure 1. The site is bordered to the south by Lakeview Terrace, to the west by North Main Street, and to the north by Vermont Publishing and Messenger, a printing and typesetting shop. The site is bordered to the east by a residential neighborhood. A small trailer park, consisting of five trailers, is situated on the eastern portion of the site property. Across Main Street from the site are additional gasoline and

service stations, light commercial enterprises (Hungerford's on Figure 2), and a used car dealership and car wash.

Topography in the vicinity of the site slopes westward towards St. Albans Bay and Lake Champlain. St. Albans Bay is located three miles southwest of the site, and the main body of Lake Champlain is approximately five miles to the west. Elevation at the site is about 420 feet above mean sea level, approximately 300 feet higher than the average Lake Champlain elevation. According to Stewart's (1974) surficial geology map, the site is underlain by lacustrine sands and gravels. The bedrock at the site has been mapped as the Moses Line Formation, a middle Ordovician calcareous shale, with occasional limestone and dolomite lenses (Doll, 1961).

Nearby surface water features are highlighted on Figure 1, and include the northward-flowing Stevens Brook, which is about 1500 west of the site. An intermittent tributary of Stevens Brook is mapped about 700 feet west of the site. A number of stormwater discharge pipes empty about 500 feet northwest of the site, on the west side of Main Street.

feet?

3.0 FIELD INVESTIGATION PROCEDURES

3.1 Soil-Gas Survey

A soil-gas survey was performed at the site to preliminarily define the extent of contamination. The procedures and results of this survey were presented in the September 22, 1994 letter to the SMS from Jefferson P. Hoffer (see Appendix A).

3.2 Monitoring Well Installation

Five leak-detection monitoring wells existed at the site prior to the UST closures. Four of these wells were destroyed during the UST closures (all except MW-5). As part of this investigation, four monitoring wells were installed (MW-101, MW-102, MW-103, and MW-104) on September 29, 1994. Well locations are shown on Figure 3. MW-101 was sited as an upgradient well. MW-104 was drilled across Main Street from the site to assess the downgradient extent of contamination. MW-102 and MW-103 were sited to assess the magnitude of contamination directly downgradient from the former USTs. MW-103 was originally sited closer to the road, however, the site owner would not allow the well to be drilled in an area that would disrupt traffic flow to the fuel pumps.

Drilling services were provided by Tri-State Drilling and Boring, of West Burke, Vermont. Soil borings were advanced using 4.25-inch hollow stem augers. Borings were advanced to the top of unweathered till, or until auger refusal. Split-spoon samples were collected at a minimum of every five feet. Soil samples were characterized using the ASTM D2488 "Standard Practice for Description and Identification of Soils (Visual Manual Procedure)". Samples from distinct soil horizons were placed into plastic zip-lock bags for PID headspace screening.

Monitoring wells were constructed using two-inch diameter PVC factory-slotted screens (10-slot) and PVC riser. The wells were screened from the base of the boring to two feet below the surface. The screened intervals were selected so that the top of the screen remained above the surface of the water table. A filter pack consisting of commercial sand (#1) was placed by gravity around the well screens. The remaining annular space was filled with a granular bentonite seal. Flush-mount protective casings were cemented in place at the surface of each well.

At the time of installation, there was not sufficient water present in the wells for development. The wells were developed by hand bailing on October 4, 1994, with the exception of MW-104, which was dry. Development efforts of the remaining wells included bailing at least five well volumes, during which time turbidity levels dropped, but the discharge did not clear up completely. Although water levels were not measured during bailing efforts, none of the wells went dry, indicating fairly good recovery rates. All development waters were contained in a 55-gallon drum at the site.

Well elevations were measured by Brooks Land Surveying of St. Albans, Vermont. The elevations were determined relative to an arbitrary on-site datum of 100.00 feet.

3.3 PID Measurements

A Photovac MicroTIP HL-2000, equipped with a 10.6 eV lamp and calibrated to respond to isobutylene, was utilized to measure soil sample and well headspaces during well installation and sampling activities. The PID was calibrated according to the manufacturer's specifications prior to commencement of each day's activities.

3.4 Groundwater Sampling and Analysis

Groundwater samples were collected from MW-101, MW-102, MW-103, and MW-5 (MW-104 was dry) on October 6, 1994. Prior to sampling, water level and PID well headspace measurements were collected from each well. The wells were purged of more than three well volumes prior to sample collection. Purge waters were contained in a 55-gallon drum at the site. Purging and sampling was accomplished using dedicated polyethylene bailers. Samples were collected into 40 mL vials and preserved with hydrochloric acid.

Quality assurance/quality control samples included a trip blank supplied by the laboratory and a blind duplicate. The trip blank was transported to the site, handled with the other samples, and returned to the laboratory for analysis. The duplicate sample was collected from MW-102 and was labeled MW-10 on the chain-of-custody. Samples were analyzed for MTBE and BTEX using EPA Method SW-846 8020 by Scitest Laboratory Services, of Randolph, Vermont. The sampling event was documented on a field data sheet and a laboratory chain-of-custody.

4.0 RESULTS

4.1 Stratigraphy

Soil observed during the well drilling efforts included soft, gray, silty sand (fill used to backfill UST excavations), brown and dark gray, soft sandy silts and silts (lacustrine deposits), dark brown and gray, moist, stiff silts and angular gravel (weathered till), and tough, dry, gray sandy silts and angular gravel (unweathered till). The lacustrine silts and sands were typically present from the surface to depths of between 5.0 to 7.0 feet. The weathered till was present to depths of between 9.0 to 11.0 feet, underlain by the dense unweathered till. Fill materials in MW-102 and MW-103 were apparent from the surface to depths of 5.0 to 7.0 feet. A layer of coarse, angular to sub-angular gravel was observed in MW-102 and MW-103 at depths ranging from eight to ten feet. Attempts to sample this interval were unsuccessful due to sampler refusal and subsequent poor recovery. Monitoring well MW-104 was drilled through coarse demolition debris and other fill materials until auger refusal at 7.2 feet.

Soil boring/monitoring well construction logs are given in Appendix B.

4.2 Soil-Gas Survey and PID Survey of Nearby Structures

The soil-gas survey results, presented in the September 23, 1994 letter to the SMS (appendix A), defined elevated PID readings in the vicinity of the former USTs and westward toward Main Street. Measurements along Main Street exceeded the instrument's maximum, indicating that soil/groundwater contamination was present at the edge of the road.

A PID basement survey had been proposed in the scope of work. No basement is present in the building housing Lester's General Store. Neither the store owner nor the employees have reported any petroleum odors in the store. The Hungerford building, located across Main Street from Lesters, is a split level with a basement level on the Main Street side of the building. Access to basements in this building was denied by the building's managers despite repeated requests. No attempts were made to screen the Vermont Publishing building since the soil-gas survey did not suggest that elevated organic vapors extended in this direction.

4.3 Groundwater Elevations and Flow Direction

Groundwater levels were measured on October 4 and 26, 1994, and are presented in Table 1. Figure 4 presents a groundwater elevation contour map for the October 26, 1994 water levels. The local groundwater gradient is from east to west, consistent with the local topography. The gradient is on the order of 0.08.

4.4 Groundwater Sampling Results

Table 2 presents the results of the groundwater analyses. The highest concentrations of MTBE and BTEX constituents were detected in MW-102, in the parts per million range. Lower concentrations were detected in MW-103, although this well is located nearer to the former USTs than MW-102. MTBE and BTEX constituents were also detected in MW-5. No contaminants were detected in MW-1. Contaminant isoconcentration maps for xylenes and MTBE are presented on Figures 5 and 6. Laboratory report sheets, the chain-of-custody, and the groundwater sampling data sheet are provided in Appendix C.

5.0 DISCUSSION OF RESULTS

5.1 Hydrogeologic Setting

Groundwater at the site occurs at depths ranging from four to seven feet, and occurs within a thin permeable zone of fill, lacustrine sandy silt and silt, and weathered till. Unweathered till was encountered at depth of about 11 feet, and appeared to be unsaturated. The underlying unweathered till apparently acts as a near-impermeable layer on which the overlying zone of saturation is perched.

Just above the unweathered till, at a depth of eight to ten feet, a gravelly zone of weathered till appeared to be the most transmissive layer at the site. This layer may be responsible for the fairly rapid recharge observed during well development and sampling, since the overlying soil layers are lower permeability silt and sandy silt. Irregularities in the surface of the unweathered till, and the presence of the gravelly zone may influence groundwater flow and contaminant migration patterns at the site.

Water, wastewater, stormwater, and other buried utilities in the vicinity may affect groundwater flow and contaminant migration at the site. A stormwater catchbasin is located on the northwest corner of the site.

5.2 Source, Degree, and Extent of Contamination

During the UST closures, the tanks were observed to be in relatively good condition, with no holes or pipe breaks noted. Elevated PID readings were noted in soil surrounding the fill pipes. As a result, releases are believed to have occurred from overflowing. Dissolved gasoline constituents present in MW-5 may have originated from the former USTs, piping and pump dispenser leakage, or from customer spillage near the pumps. As a result, it is not possible to quantify the release(s) at the site.

The highest concentrations of dissolved-phase gasoline constituents were detected in monitoring well MW-102, ranging from 8270 µg/L for xylenes to 1310 µg/L for MTBE. Lower concentrations were detected in MW-103, which is located directly downgradient from the former UST area. MW-104, which is located on the other side of Main Street, has been dry (to a depth of 7.2 feet) and therefore has not been sampled. No PID readings were noted in soil sample headspaces during installation of this well.

Groundwater levels may rise enough this Fall or next Spring to allow sample collection from MW-104, which will determine whether or not the plume extends beneath Main Street.

5.3 Potential Receptors

The nearest surface water features are small intermittent tributaries of Stevens Brook, located west of the site (see Figure 2). Because of the distance from the site, and the relatively low permeability of the saturated zone at the site, impacts to these surface waters from site contamination appears unlikely. It is possible that contaminated groundwater at the site could infiltrate the stormwater system, and therefore discharge to surface waters in the vicinity of the site. Locally, a stormwater discharge pipe was found about 500 feet northwest of the site, but it is unknown if stormwater drainage from the site flows toward this discharge.

The area is serviced by municipal water, and a review of the State's water well inventory did not identify any nearby private wells. As a result, site contamination does not appear to pose a threat to drinking water supplies.

Since no free product has been detected at the site, and site soils are fairly tight, the threat of petroleum vapor accumulation in nearby structures appears to be low. No odors have been reported by the owner or employees of Lester's. Access to the basements across Main Street from the street has been denied. Although the downgradient extent of contamination has not been defined, based on the soil conditions, there is no reason to suspect that a petroleum vapor accumulation problem exists in these basements.

Perhaps the greatest risk of exposure to site contamination is to workers involved in excavating the subsurface utilities downgradient from the former USTs.

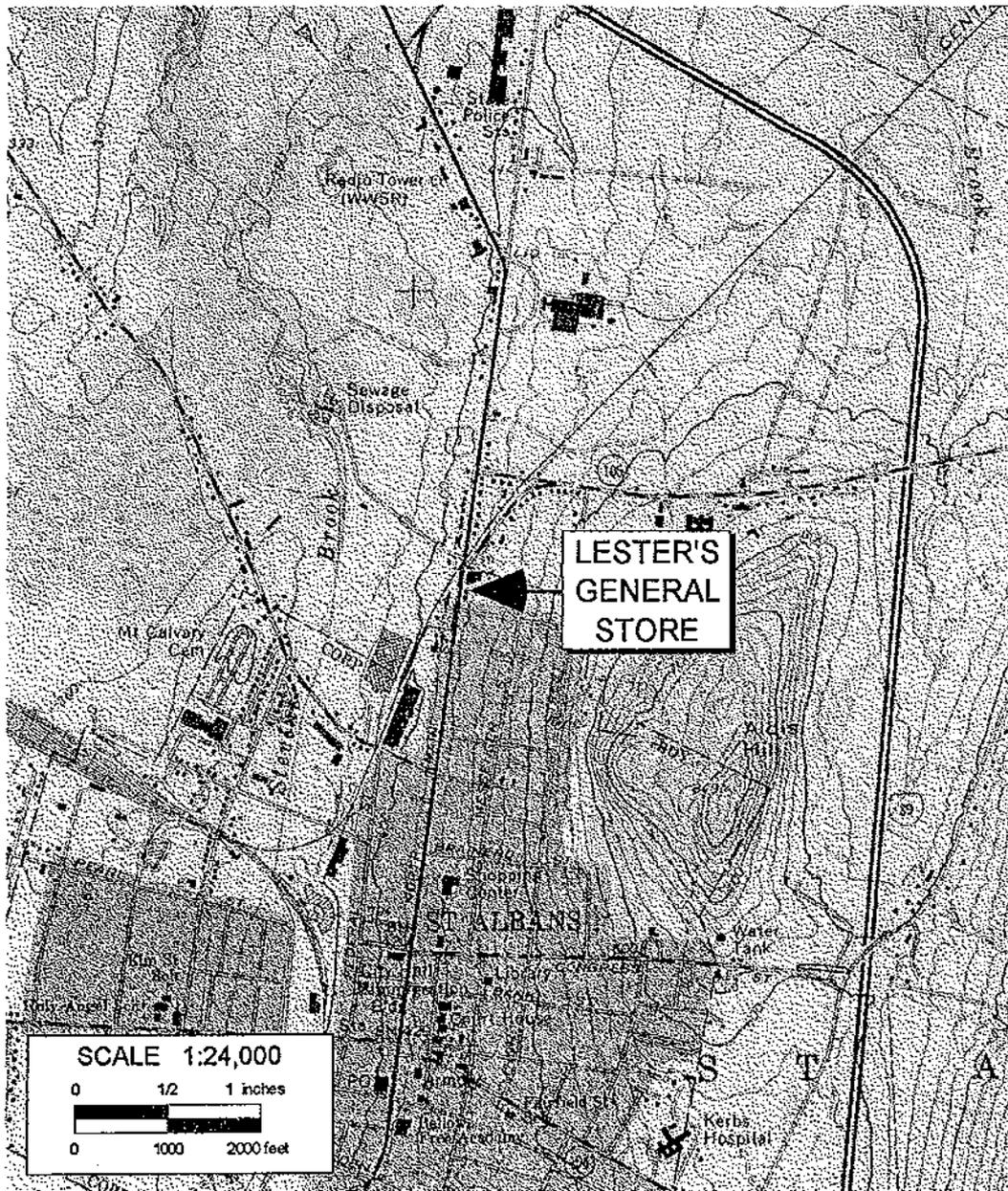
5.4 Recommendations

Figure 7 presents locations of proposed monitoring wells to further delineate the extent of groundwater contamination at the site. It is recommended that a quarterly groundwater monitoring program be initiated in December, 1994.

REFERENCES

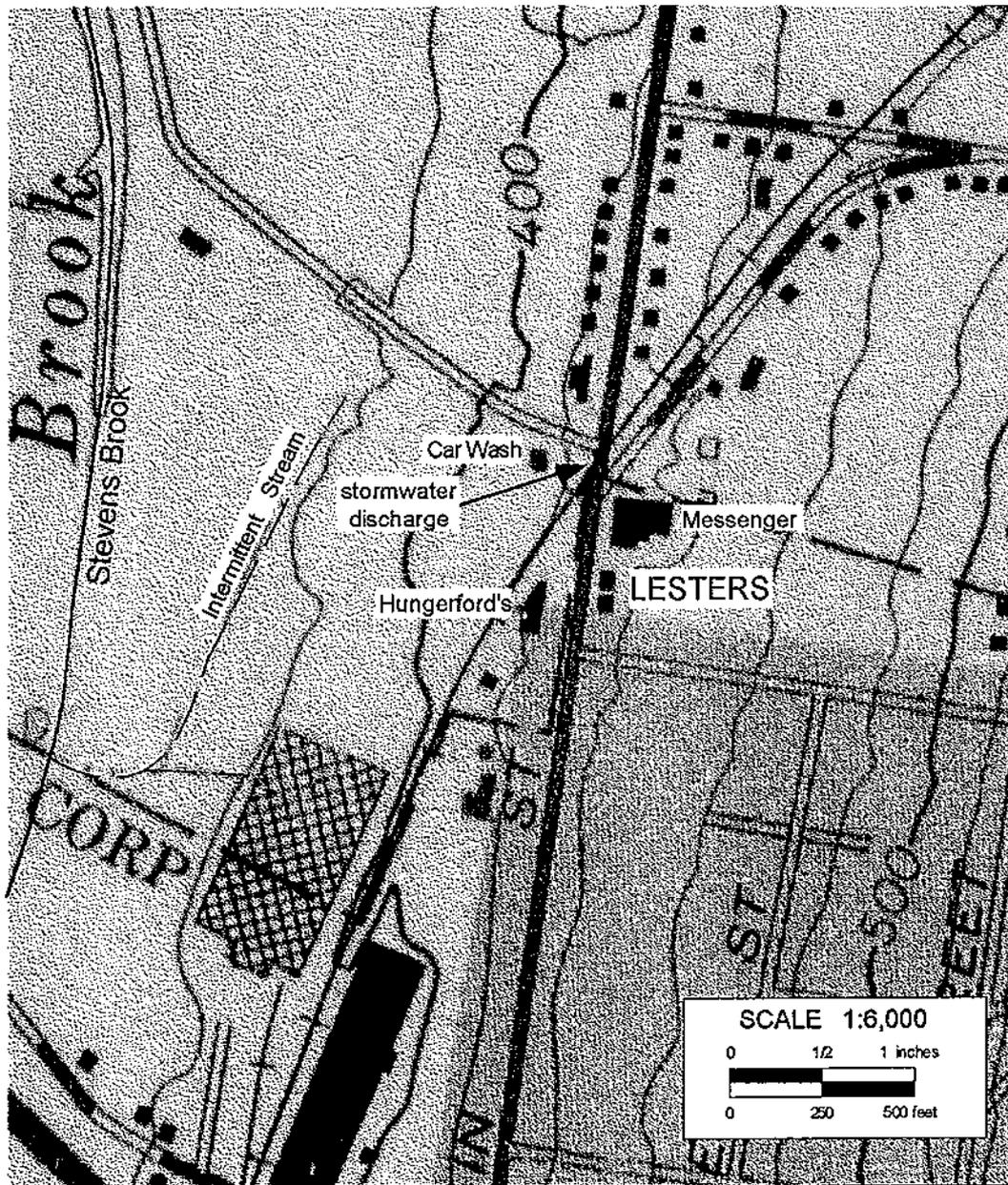
Doll, Charles G., 1961, *Centennial Geologic Map of Vermont*, Vermont Geological Survey, State of Vermont.

Stewart, D.P., 1974, *Geology for Environmental Planning in the Milton-St. Albans Region, Vermont*, Vermont Geological Survey, Water Resources Department, Environmental Geology No. 5.



Base from U.S. Geological Survey, 1:24,000;
St. Albans, VT, Photorevised 1987

FIGURE 1
Site location map, Lester's General Store,
St. Albans, Vermont (SMS Site #94-1558).



Base enlarged from U.S. Geological Survey,
1:24,000; St. Albans, VT, Photorevised 1987

FIGURE 2
Site vicinity map, Lester's General Store,
St. Albans, Vermont (SMS Site #94-1558).

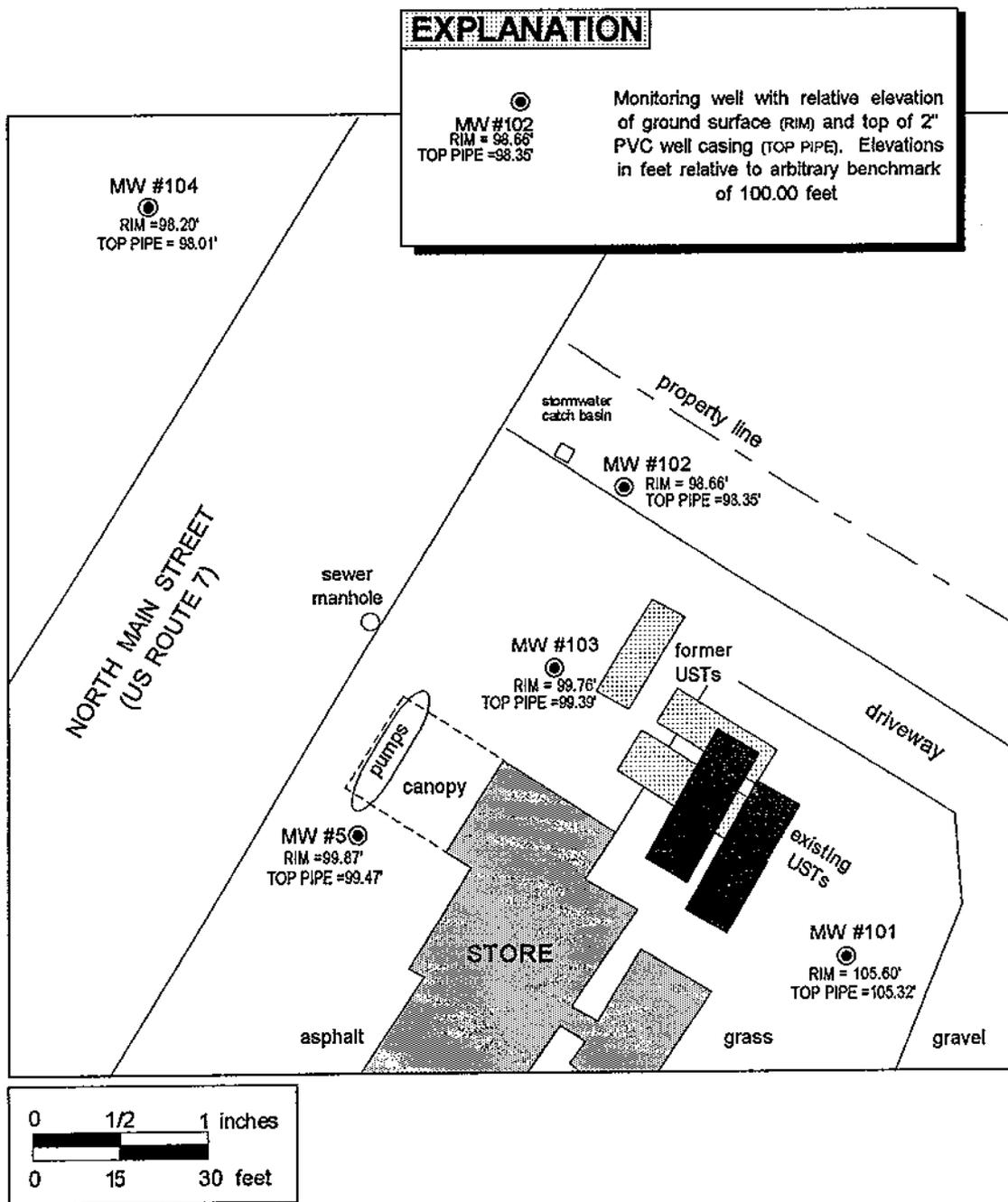


FIGURE 3
Site map illustrating past and present UST locations and monitoring well locations, Lester's General Store, St. Albans, Vermont (SMS Site #94-1558).

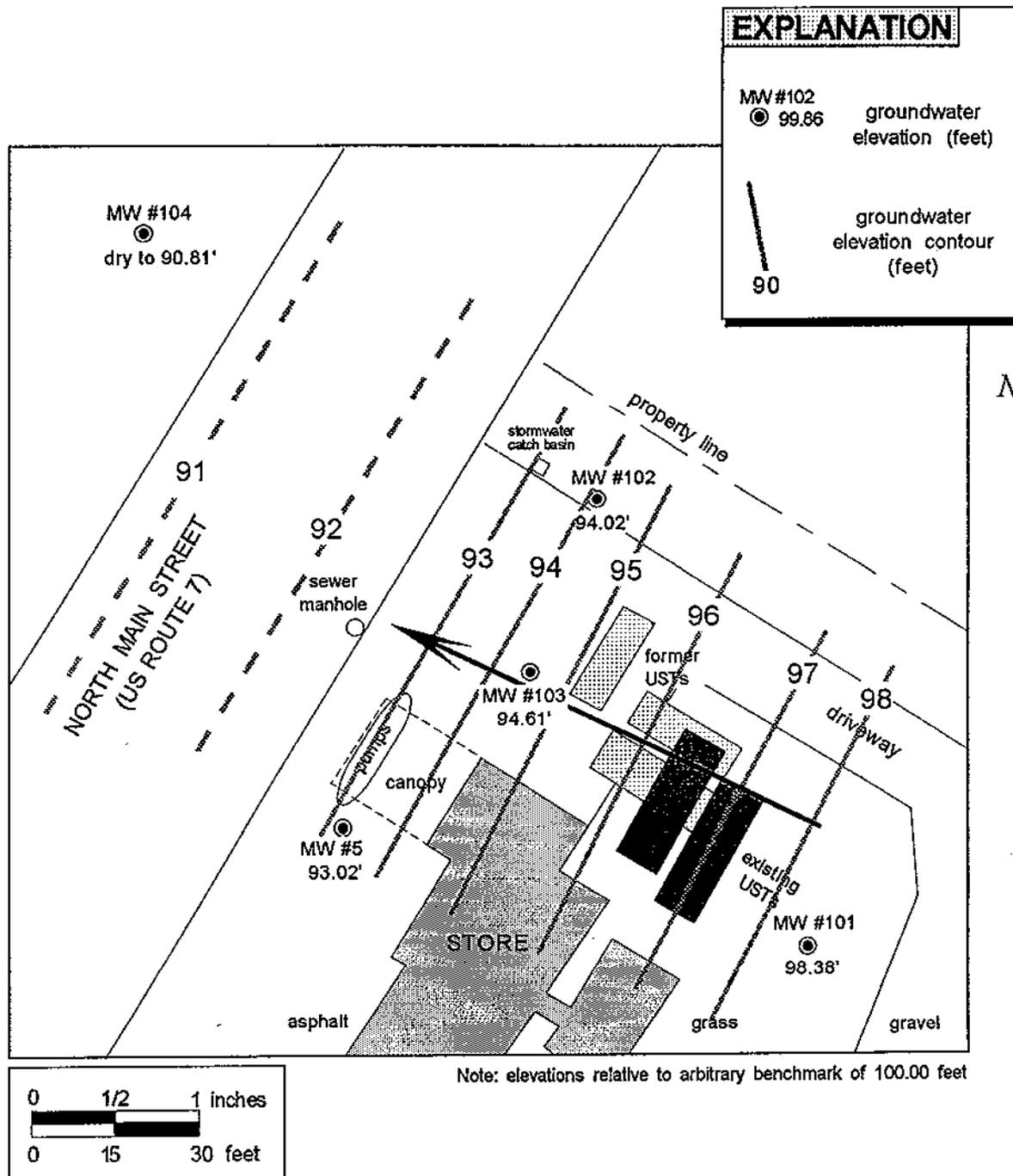


FIGURE 4
Groundwater elevation contour map for October 26, 1994,
Lester's General Store, St. Albans, Vermont
(SMS Site #94-1558).

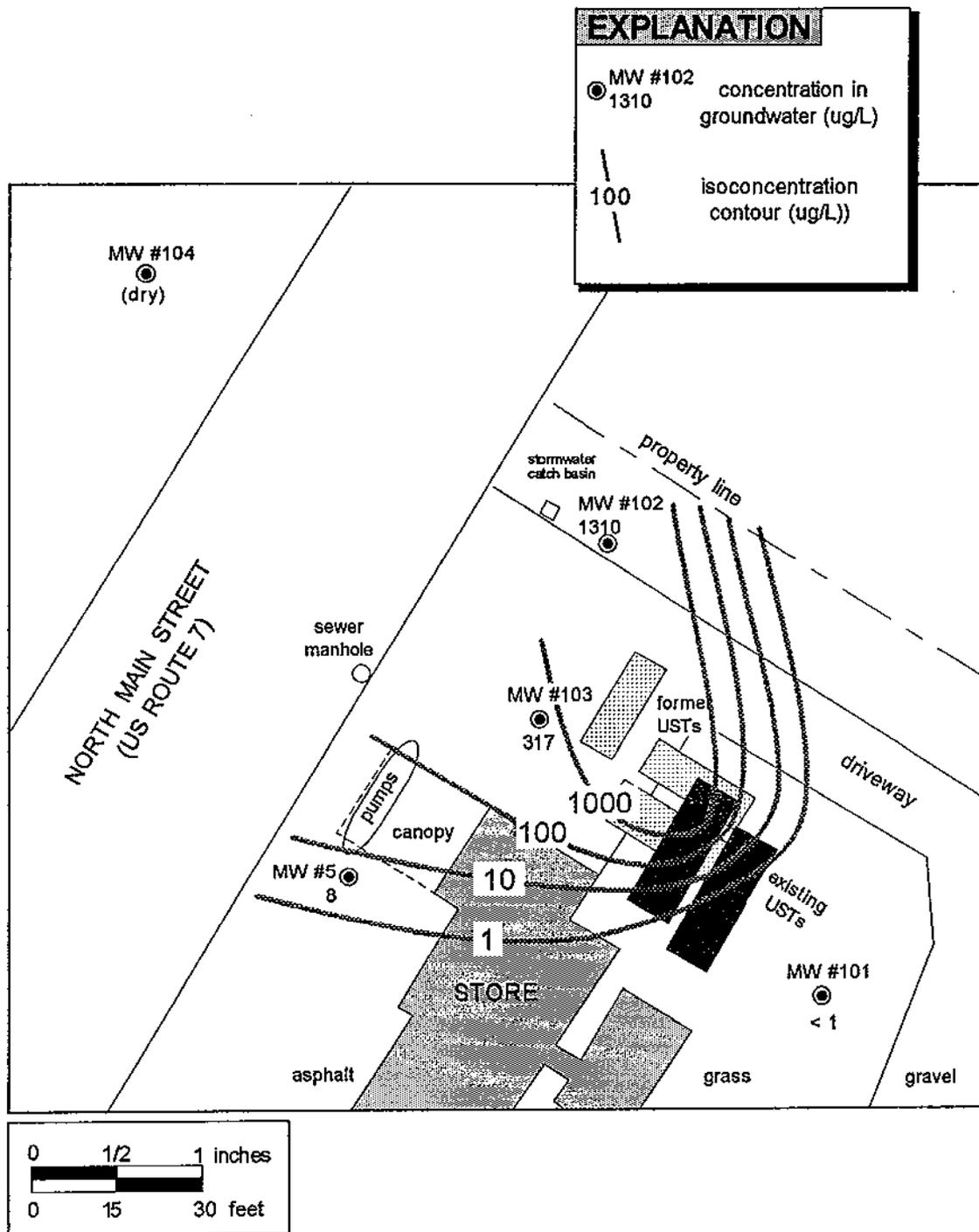


FIGURE 5
 Isoconcentration map for MTBE in groundwater, October 6, 1994,
 St. Albans, Vermont (SMS Site #94-1558).

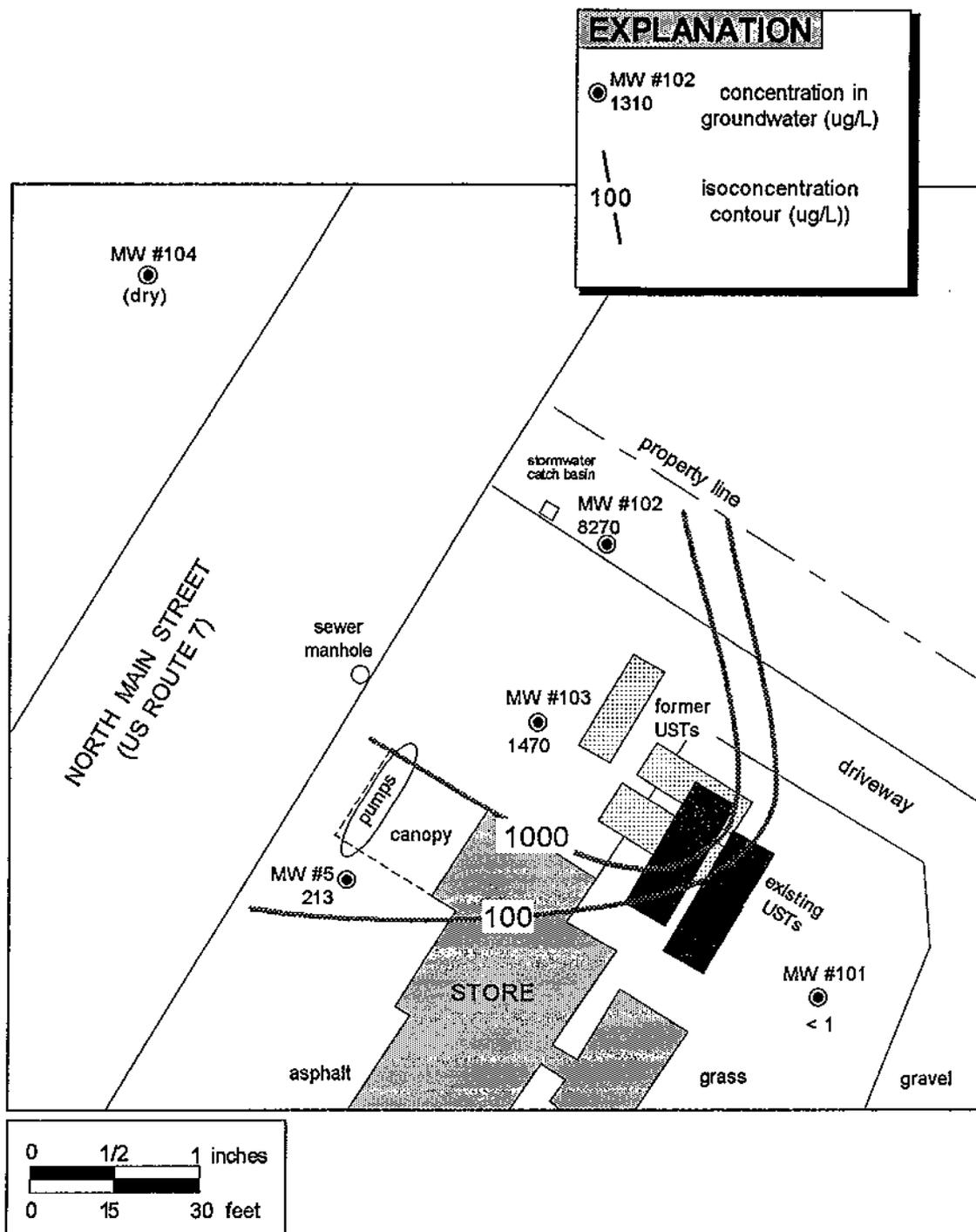


FIGURE 6
 Isoconcentration map for xylenes in groundwater, October 6, 1994,
 St. Albans, Vermont (SMS Site #94-1558).

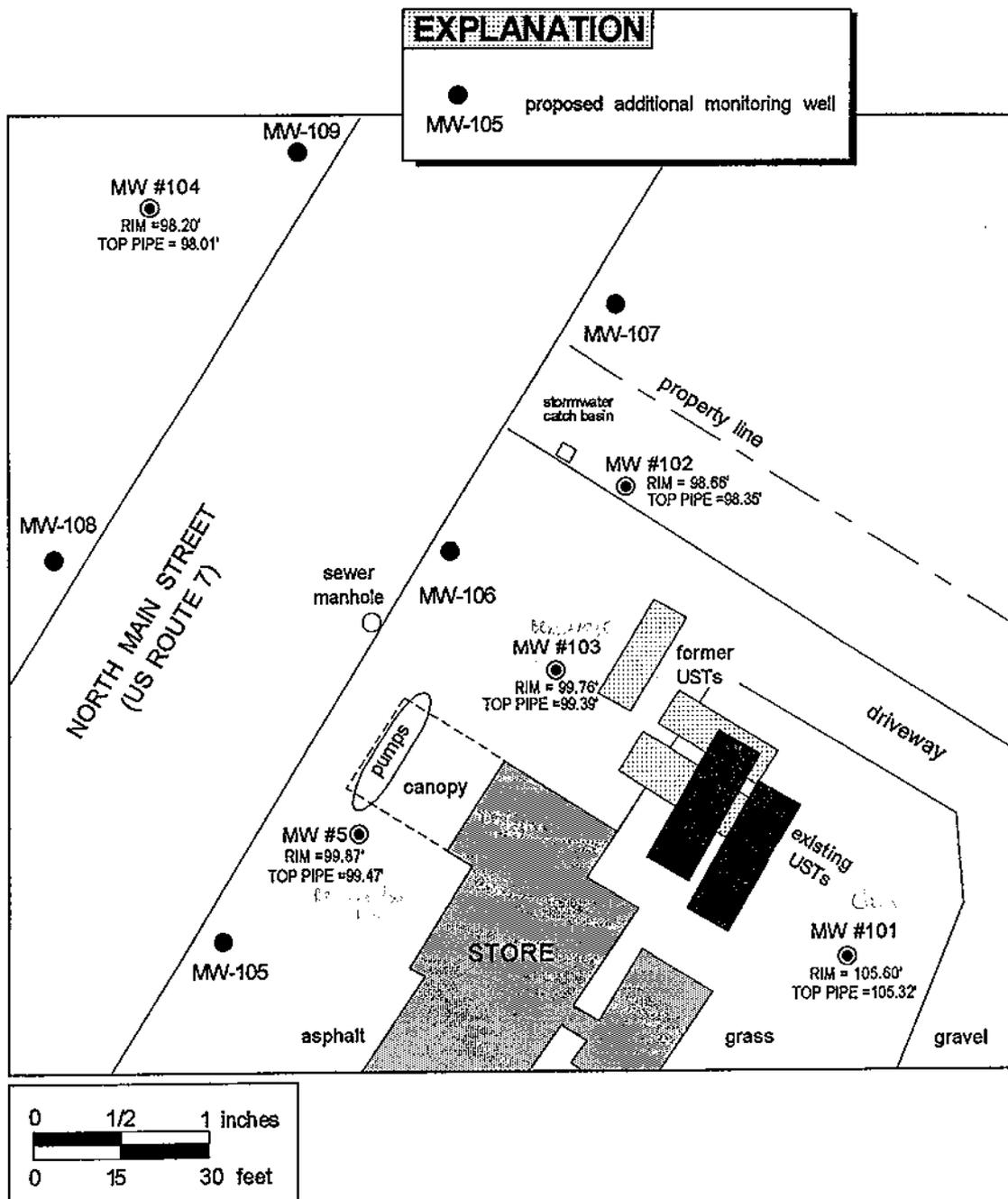


FIGURE 7
 Proposed additional monitoring well locations, Lester's General Store,
 St. Albans, Vermont (SMS Site #94-1558).

TABLE 1
Groundwater elevations, Lester's General Store, St. Albans, Vermont.

WELL ID	Elevation of Ground Surface (feet)	Elevation of TOC (feet)	October 4, 1994*			October 26, 1994	
			Well Headspace PID Reading (ppm)	Depth to Water from TOC (feet)	Groundwater Elevation (feet)	Depth to Water from TOC (feet)	Groundwater Elevation (feet)
MW-101	105.60	105.32	3.6	6.56	98.76	6.94	98.38
MW-102	98.66	98.35	261	4.17	94.18	4.33	94.02
MW-103	99.76	99.39	2261	4.57	94.82	4.78	94.61
MW-104	98.20	98.01	2.8	Dry to 7.2	<90.8	Dry to 7.2	<90.8
MW-5	99.87	99.47	2.3	6.06	93.41	6.45	93.02

NOTES:

Elevations are relative to arbitrary on-site benchmark of 100.00 feet.

* Measurements for MW-5 were obtained on October 6, 1994.

PID readings obtained with a Photovac MicroTIP HL-2000, 10.6 eV bulb, calibrated to isobutylene.

TABLE 2
 Groundwater sampling results for October 4, 1994,
 Lester's General Store, St. Albans, Vermont.

Results in $\mu\text{g/L}$					
10/4/94					
Sample/Well ID	<i>5 ppb</i> Benzene	<i>5,000 ppb</i> Toluene	<i>700 ppb</i> Ethylbenzene	<i>10,000</i> Xylenes	<i>90</i> MTBE
MW-101	<1	<1	<1	<1	<1
MW-102	1610/1250	2010/1600	1620/1090	8270/7350	1310/870
MW-103	267	291	146	1470	317
MW-5	44	45	41	213	8
Trip Blank	<1	<1	<1	<1	<1

A/OK

NOTES:

<1 - below a detection limit of 1 $\mu\text{g/L}$

1610/1250 - sample/duplicate result

TABLE 3
 Results of PID soil screening during monitoring well installation,
 Lester's General Store, St. Albans, Vermont.

MW- 101		MW- 102		MW- 103		MW- 104	
Interval (ft BGS)	PID (ppm)						
0.0-2.0	0.5	2.5-2.8	307.0	2.0-2.5	>2500	0.5-1.0	0.0
4.0-6.0	0.0	2.8-3.6	36.0	4.5-5.6	2130.0	1.0-1.8	0.0
9.0-11.0	0.1	4.5-5.4	78.8	10.0-10.9	6.9	4.5-5.4	0.0
		10.0-11.0	27.1			7.0-7.2	0.0
		11.0-11.4	2.0				

NOTES:

Depths recorded from distinct soil layers within each split spoon, highest PID headspace measurement reported.

PID readings obtained with a Photovac MicroTIP HL-2000, 10.6 eV bulb, calibrated to isobutylene.

BGS = below ground surface.

APPENDIX A:
Relevant Correspondence

June 22, 1994

Carl Ruprecht, UST Manager
S.B. Collins, Inc.
54 Lower Welden Street
St. Albans, VT 05478

Re: UST Closures, Lester's General Store, St. Albans, Vermont
(Facility ID #5245107)

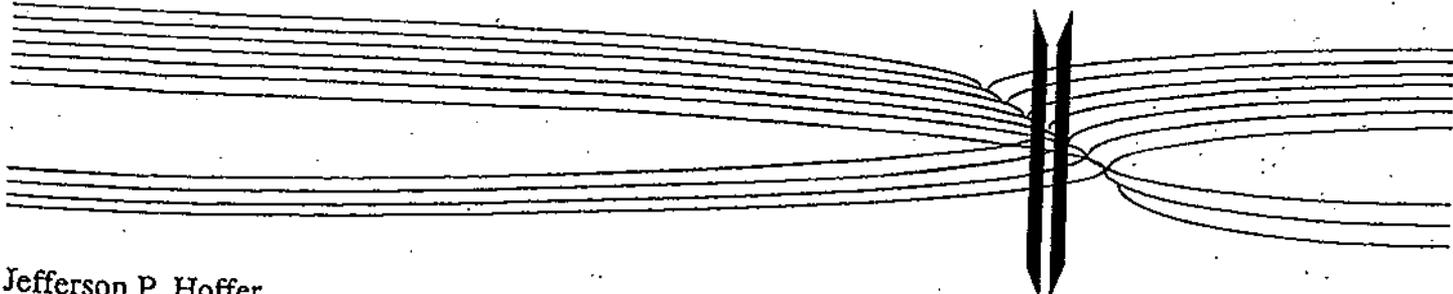
Dear Carl:

This letter summarizes the site assessment for the closure of three underground storage tanks (USTs) at Lester's General Store in St Albans. The State tank pull forms are enclosed, as well as some photographs taken during the closure. The USTs were removed on Tuesday, June 21, 1994. Excavation services were provided by Craig Cowles, and the tank cleaning and removal services were provided by MacIntyre Fuels, Inc.

The enclosed Figure 1 presents a site location map. Figure 2 presents a site sketch. The site is located in a highly-developed region along Main Street, with numerous businesses along both sides of the street. Residential neighborhoods are present east of the site, and a small trailer park (6 trailers) is situated on the eastern edge of the site. Four gasoline service stations are located just south of the site. A structure just north of the site is occupied by Vermont Publishing and Messenger. A structure across Main Street from Lester's is occupied by a number of business tenants.

A Photovac MicroTIP HL-2000 photoionization detector (PID), equipped with a 10.6 eV lamp and calibrated to isobutylene, was utilized to screen soils during the UST excavations and removals. Soil screening was performed by placing the PID tip near exposed soil. Screening was performed periodically during the tank removals, and exposed sidewalls were screened after the tanks were removed from the excavation. Reported values are of the maximum (peak) reading detected by the instrument.

Jefferson P. Hoffer
Consulting Hydrogeologist



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Prior to excavating, water-level and PID headspace determinations were taken in the five existing monitoring wells. This data is presented below.

Well ID	Diameter (inches)	Depth to Water (feet)	PID Headspace (ppm)
MW-1	4	3.25	514
MW-2	4	3.62	52.9
MW-3	4	3.62	224
MW-4	2	3.75	8.0
MW-5	2	3.45	0.5

Water samples were collected from each of the wells to monitor for free product. No free product was detected in any of the five wells, although sheens were present in MW-1, MW-2, and MW-3. Headspace determinations were taken on water samples from these three wells by placing 20 mL of water in a 40 mL vial and covering the vial with aluminum foil. The results were as follows: 2393 ppm for MW-1, 250 ppm for MW-2, and 1744 ppm for MW-3.

The two pump dispensers were removed on June 20, 1994. The soils underlying the former pumps were screened and exhibited the following PID readings: 50 ppm for the pump near MW-5, and 116 ppm for the pump near MW-4.

MW-1 was located in a small depression surrounded by the three fill pipes. Staining was observed on the concrete pads and asphalt around each fill pipe. The staining from the 4000 and 5000 gallon tank fill pipes extended to the cover of MW-1. The plastic cover on top of MW-1 contained water, and a sheen was present on the water surface.

A stormwater catchbasin is located on the northwest corner of the site, a few feet from Main Street. Water was visible in the catchbasin at a depth of about three feet below grade. A PID reading of 1.0 ppm above background was detected in the catchbasin. There was no visible sheen or free product.

TANK EXCAVATIONS

The extent of asphalt removal and the limits of the tank excavations are included on Figure 2. The site was covered with asphalt from Main Street to the small retaining wall shown in Figure 2. After removal of the fill pipe concrete pads and asphalt, the soils surrounding the three fill pipes were screened and exhibited readings in excess of 2500 ppm, which is the maximum reading of the instrument.

Prior to excavating the tanks, a small test pit was dug between the tank area and Main Street to assess soil conditions and contamination levels. The test pit exposed grayish-black silty sand with gravel and boulders, which appeared to be fill materials. This material was underlain at a depth of five feet by a dense orangish-brown silty sand containing gravel and boulders. Water seeped into the pit from about four feet, at a relatively low rate. PID readings taken from the edge of the test pit ranged from 500 to 1000 ppm. The last bucket of soil removed from the test pit, from a depth of seven feet, exhibited a maximum reading of 2100 ppm.

Tank excavations began with the 5000-gallon UST. Soil overlying this tank was a yellow sand (fine to coarse grain size), with PID readings ranging from 1900 to 2100 ppm. As excavation proceeded, it became apparent that the 5000-gallon and 4000-gallon tanks were aligned east/west, and extended eastward, beyond the small retaining wall. Soil PID readings on the western end of the tanks exceeded 2000 ppm. Soils overlying the tanks on the eastern end included a loamy sand (fine-medium grained), underlain by a dense clayey sand with >25% rock fragments (sub-rounded pebbles, gravel, and boulders). PID readings decreased to less than 10 ppm a few feet eastward of the retaining wall. Contamination appeared to be limited to soils surrounding the fill pipes, and westward, in the inferred downgradient direction.

The 5000-gallon tank was in good shape, with no holes or evidence of significant corrosion. A water line was visible on the top 1/4 of the tank. The 4000-gallon tank was also in good shape, with no holes found. The top 1/3 of the tank was covered with a rind of iron-cemented sands. Underneath this rind, there was a slight amount of corrosion, although no pitting was observed.

Soils overlying the 3000-gallon tank were backfill sands with PID readings exceeding 2500 ppm. This tank was in good shape, with no corrosion surfaces or holes visible. There was no evidence of a water line on the tank, suggesting it was fully submerged in groundwater.

After the tanks were removed, the excavation sidewalls were observed and screened with the PID. Figure 3 presents these observations. In general, high PID readings were detected in all soils west of the fill pipes of the 4000 and 5000-gallon tanks. PID readings showed a rapid decrease toward the east. Four general soil types were encountered during

the excavating.

- A gravelly silty sand (fill) underlying the paved areas of the site to a depth of four or five feet. Moderate to low permeability.
- A native loamy sand unit present on the eastern portion of the site, overlying the eastern end of the 4000 and 5000 gallon USTs, and forming a small topographic rise. High to moderate permeability.
- Sandy material which was used as backfill around the tanks and piping. High to moderate permeability.
- A weathered glacial till found at a depth of about four to five feet. Low permeability.

Groundwater seeped into the excavations from a depth of about four feet below ground surface (around the fill pipe locations and westward). Sheens were present on some of the water entering the excavations, although no free product accumulated.

POTENTIAL RECEPTORS

Based on topography, which grades gently to the west, the inferred direction of groundwater flow is westward. Stevens Brook, the nearest mapped surface water feature, is located about 1500 feet west of the site. Stormwater in the vicinity is apparently discharged to a small swale about 500 feet northwest of the site, on the other side of Main Street (see Figure 1). A number of stormwater pipes daylight at this location, and flow was observed on June 21, 1994. The flow appears to be fairly steady, indicating that shallow groundwater infiltration into the stormwater system provides a constant flow. No sheen was present on the water surface observed at this location.

The area surrounding the site is served by municipal water. As a result, contamination at the site is unlikely to impact water supplies. The potential for site contamination to reach surface water appears unlikely, unless shallow groundwater at the site enters the stormwater system which is discharged to the surface approximately 500 feet northwest of the site.

Based on the shallow depth to water and relatively low permeability of underlying soils, the potential for vapor migration and accumulation appears limited. Nearby structures include Lester's General Store, a building to the north occupied by Vermont Publishing and Messenger, and a building across the street from the site occupied by various businesses.

Numerous subsurface utilities are present in the vicinity and may allow for preferential flow of contaminated groundwater.

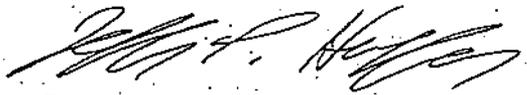
SUMMARY AND RECOMMENDATIONS

Observations during the UST closures indicate soil and groundwater have been impacted by releases of gasoline. No free product was detected, although high PID readings were observed in soil and groundwater. Based on the condition of the tanks (good), as well as observations around the fill pipes, it appears that releases at the site occurred from overfilling.

A site investigation is needed to determine the extent of contamination. I recommend performing a soil-gas survey to delineate the extent of contamination, followed by the installation of groundwater monitoring wells (at the site and across the street in the inferred downgradient location). In addition, PID screening should be performed within nearby structures (Lester's, the building north of the site, and the building across the street).

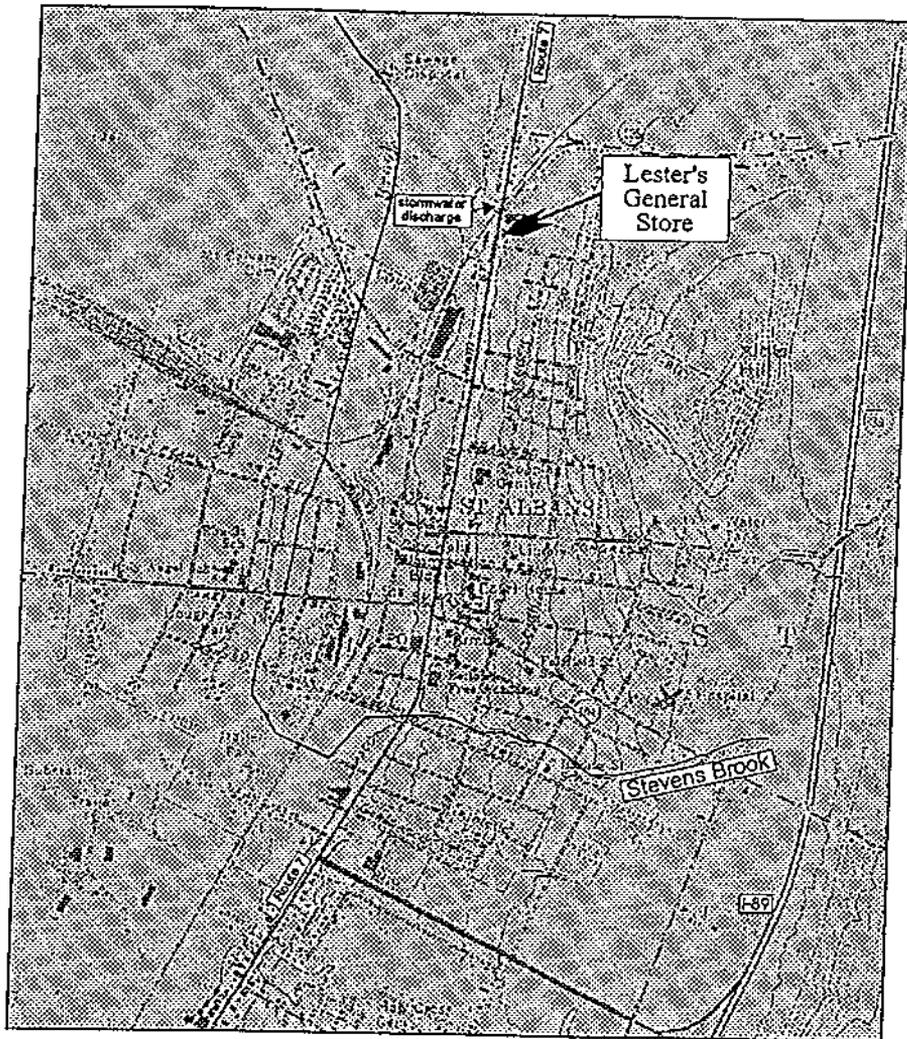
I will put together a scope of work and cost estimate for a site investigation. In the meantime, if you have any questions concerning this site assessment, please contact me.

Sincerely,



Jefferson P. Hoffer
Consulting Hydrogeologist

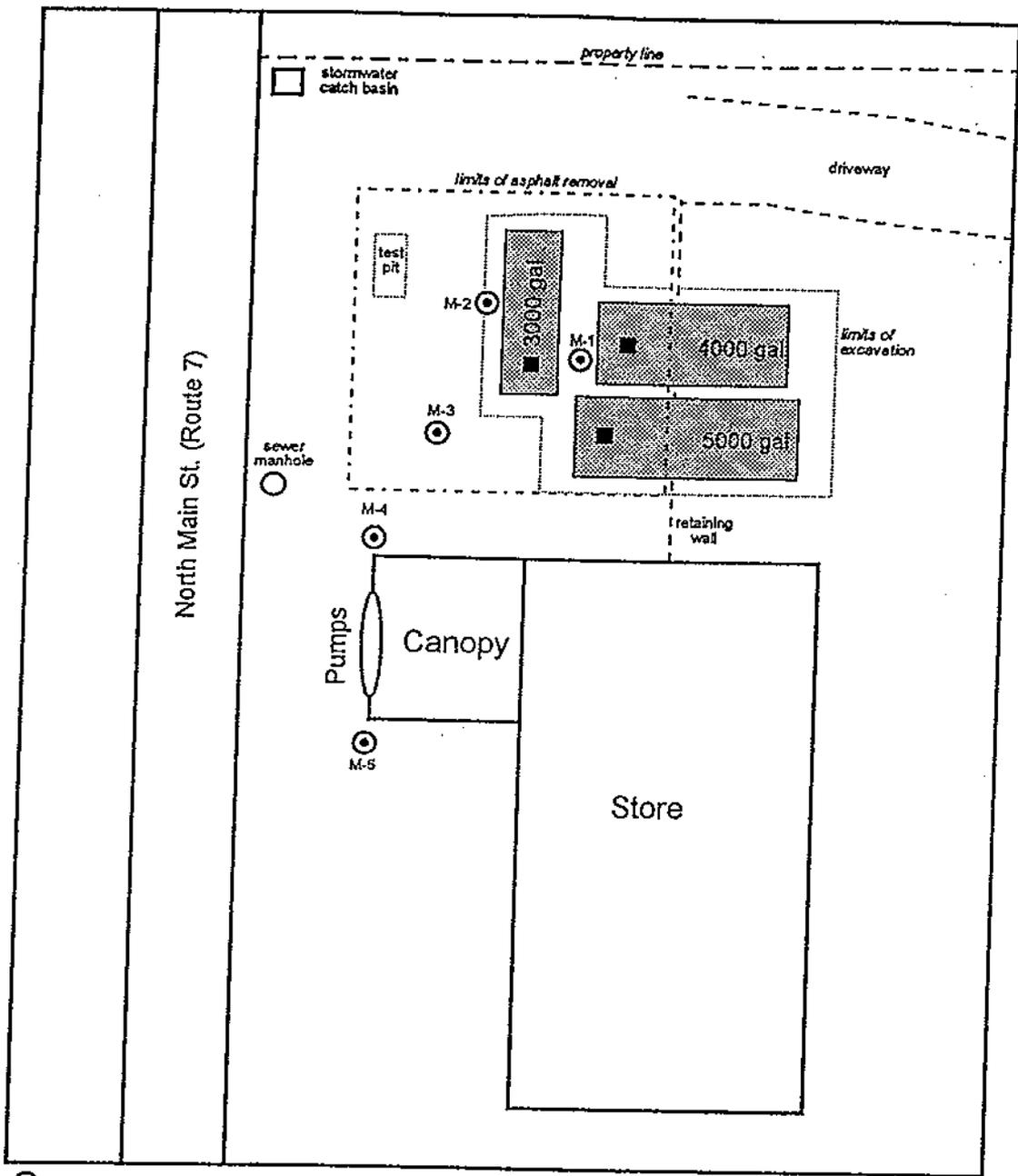
enc.



Basemap: USGS Topographic Quad,
St. Albans, VT

2000 feet

FIGURE 1
Site location map, Lester's General Store,
St. Albans, Vermont,
UST Facility ID #5275107.



⊙ Existing Monitoring Well
M-5

NOT TO SCALE

FIGURE 2
Site Diagram Showing Former Location of USTs,
Lester's General Store, St. Albans, Vermont,
UST Facility ID #5245107.

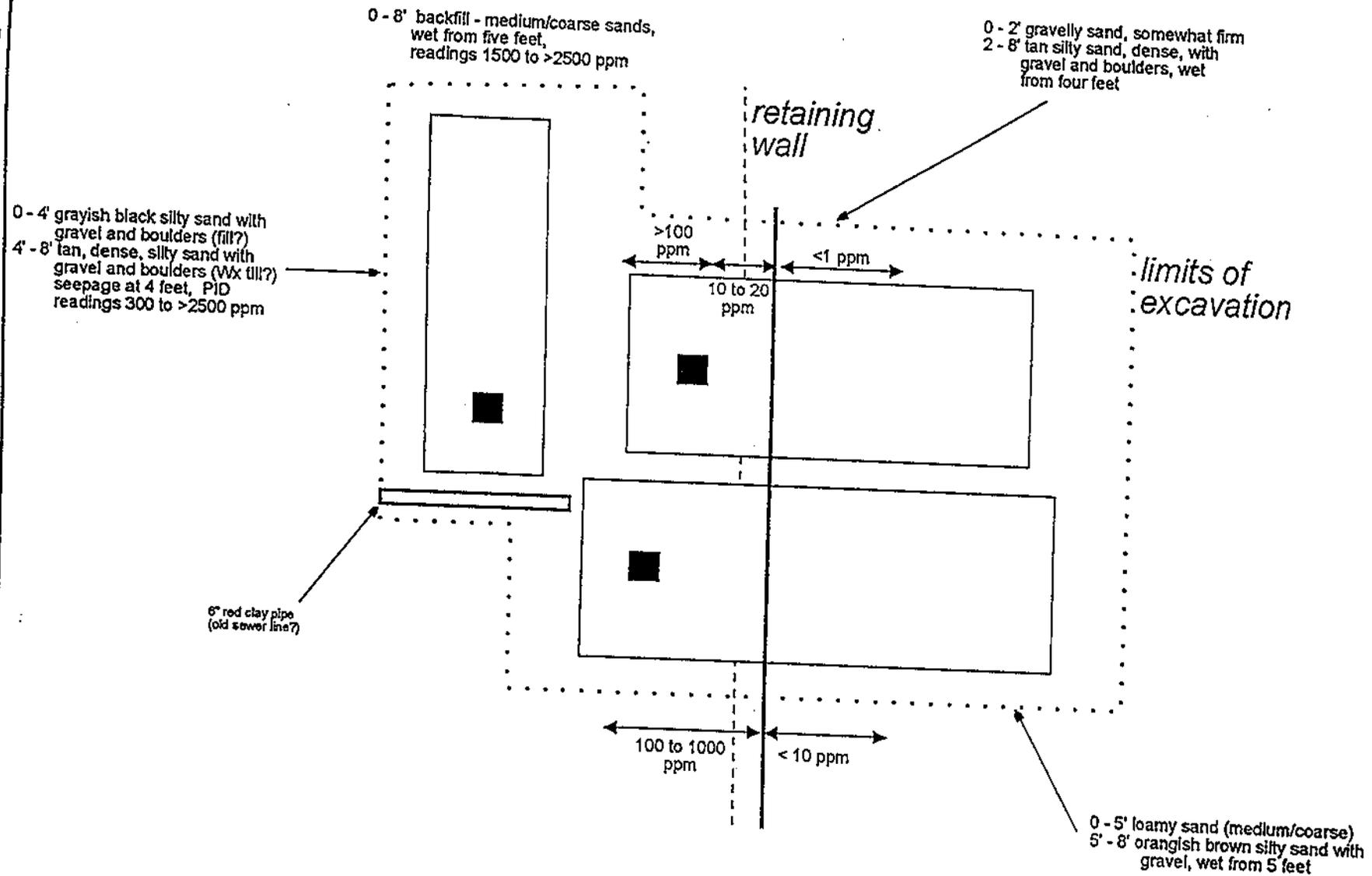


FIGURE 3
 UST excavation pit observations,
 Lester's General Store, St. Albans, Vermont,
 UST Facility ID #5245107.



State of Vermont

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Department of Environmental Conservation
Hazardous Materials Management Division
103 South Main Street/West Office
Waterbury, Vermont 05671-0404
(802) 241-3888
FAX (802) 241-3296

September 14, 1994

Jefferson P. Hoffer
Consulting Hydrogeologists
P.O. Box 428
Waterbury, VT 05676

RE: Work Plan for Lester's Service Center, St. Albans, VT
(Site #94-1558)

Dear Mr. Hoffer:

The Sites Management Section (SMS) has received and reviewed your workplan dated July 25, 1994 for subsurface investigation prepared for the Lester's Service Station site in St. Albans. The SMS approves the workplan and requests that onsite work be initiated as soon as possible.

The SMS looks forward to the completion of this work. If you have any questions, please feel free to call.

Sincerely,

Richard Spiese, Acting Supervisor
Sites Management Section

cc: Carl Ruprecht, S.B. Collins, Inc.

RS:mm/wp/941558wp

September 23, 1994

Mr. Richard Spiese, Site Coordinator
Sites Management Section
103 South Main Street/West Office
Waterbury, Vermont 05671-0404
St. Albans, VT 05478

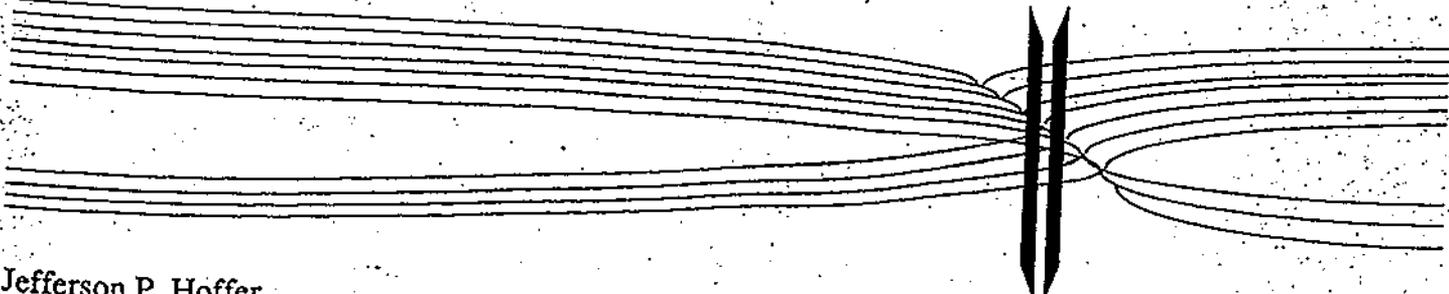
Re: Proposed Monitoring Well Locations, Lester's General Store, St. Albans, Vermont
Site #94-1558

Dear Mr. Spiese:

As part of our site investigation efforts at Lester's General Store in St. Albans, we have completed a PID soil-gas survey. Based on these results, we have modified the proposed monitoring well locations and would like to obtain your approval or comments prior to installing the wells. The soil-gas survey results and rationale for the monitoring well locations are provided below.

A photoionization detector (PID) was used to measure levels of organic vapors present in the shallow subsurface on September 22, 1994. A Photovac MicroTIP HL-2000 (10.6 eV lamp, calibrated to respond to isobutylene) was utilized. Soil-gas data was collected by driving a 3/4-inch, stainless-steel slam bar to a depth of at least two feet. The slam bar was then retracted and replaced with a two foot, stainless-steel sampling tube, which was sealed in the probe hole to prevent atmospheric air from entering. The PID sample port was connected to the sampling tube, and measurements were taken for at least one minute. The maximum reading detected was recorded for each sampling point. Figure 1 is a site map which presents the results of the PID soil-gas survey.

Jefferson P. Hoffer
Consulting Hydrogeologists



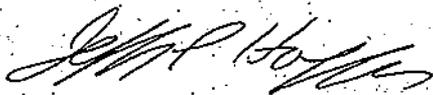
(802) 244 - 5573
P.O. Box 428, Waterbury, Vermont 05676

PID soil-gas measurements along the edge of North Main Street exceeded the instrument's maximum, suggesting that contamination has reached the roadway. Measurements along the northern perimeter of the site were generally low, with the exception of one point where the instrument's maximum was exceeded. Based on these results, it appears that contamination has spread westward, in the inferred direction of groundwater flow. Due to the presence of the roadway and subsurface utilities, it is difficult to assess the downgradient extent of contamination. Unfortunately, we were unable to obtain soil-gas points on the opposite side of North Main Street.

The proposed well locations presented in our scope of work (July 25, 1994) incorrectly included a pre-existing monitoring well MW-4. This well was apparently destroyed during the new UST installations. As a result, only one monitoring well (MW-5) exists at the site. The enclosed Figure 1 updates our proposed locations for four monitoring wells. MW-101 is located in the inferred upgradient direction. MW-102 and 103 are situated along North Main Street to assess contaminant concentrations immediately preceding the roadway. MW-104 is sited on the opposite side of North Main Street to monitor the downgradient and off-site extent of contamination.

We would like to install these wells within the next few weeks, and would appreciate your timely review of the proposed locations. If you have any questions, please call me at 244 - 5573 or Carl Ruprecht at 527 - 7512.

Sincerely,



Jefferson P. Hoffer
Principal Hydrogeologist

enc.

cc: Carl Ruprecht, S.B. Collins

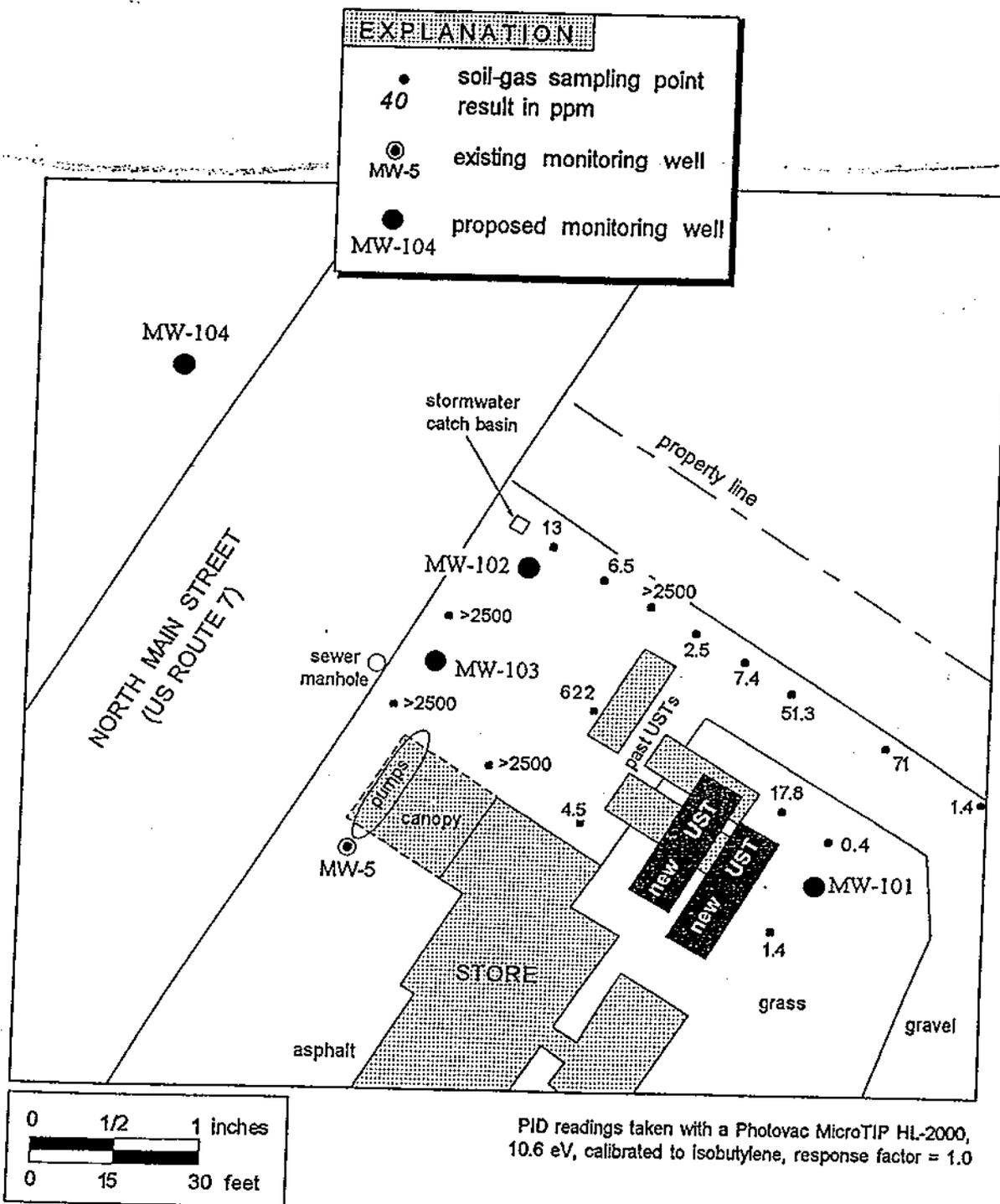


FIGURE 1
Site map with PID soil-gas survey results and proposed well locations, Lester's General Store, St. Albans, Vermont (Site #94-1558).

July 25, 1994

Mr. Carl Ruprecht, UST Manager
S.B. Collins, Inc.
54 Lower Welden Street
St. Albans, VT 05478

Re: Scope of Work for Site Investigation
Lester's General Store, St. Albans, Vermont
Facility ID #5245107

Dear Carl:

This scope of work has been prepared for a site investigation at Lester's General Store in St. Albans, Vermont. The site assessment for the June 21, 1994 closure of three underground storage tanks (USTs) at the site was presented in our June 22 letter. Elevated concentrations of organic vapors were detected in soil and groundwater during the UST closures, indicating that surrounding soil and groundwater at the site have been impacted by releases of gasoline. Based on the integrity of the removed USTs, as well as the high photoionization detector (PID) readings detected in soils around the fill pipes, it is likely that the observed impacts were due to overfilling practices over time.

A site investigation is necessary to define the degree and extent of contamination at the site. The following scope of work has been prepared in accordance with the Site's Management Section (SMS) most recent guidelines published in May, 1994. Since this site investigation is not being performed under the "expressway", this scope of work should be reviewed by the SMS prior to proceeding with the work elements.

SCOPE OF WORK

The following activities will be performed at the site in order to complete the initial site investigation requirements:

- **General Site Characterization** - The general site characterization will include information on the environmental setting and site history. Sources for this information include USGS topographic and geologic maps, SCS soil maps, geologic and hydrogeologic reports, and the DEC Water Supply Division's water

Jefferson P. Hoffer
Consulting Hydrogeologists

(802) 244 - 5573
P.O. Box 428, Waterbury, Vermont 05676

APPENDIX B:
Soil Boring/Monitoring Well Construction Logs

Wells will be constructed with 10 feet sections (or less) of 2-inch factory-slotted (10 or 20-slot), flush-thread, PVC well screen. The well screens will be positioned so that the top of the screen remains above the seasonal high water table, as judged by observations during well drilling. Flush-thread PVC riser will be extended from the screen to the ground surface. The well screens will be backfilled with an appropriately sized, commercially-sorted sand. Geologic and monitoring well construction logs will be prepared to document the stratigraphy and well construction details. After well installation, the wells will be developed by either bailing or pumping. If possible, water-level recovery measurements will be taken after development in order to assess hydraulic conductivity values for the wells. All development waters will be collected and placed into a 55-gallon drum at the site.

During the well drilling and installation activities, a PID will be utilized to monitor for the presence of organic vapors. The vapor monitoring will be used to detect zones of contamination, and also to monitor worker air-space for health and safety concerns.

Prior to drilling, DIG-SAFE will be contacted to alert subsurface utility owners of the well drilling activities. In addition, arrangements will be made with St. Albans Public Works Department to identify water, wastewater, and stormwater utilities.

Tentative monitoring well locations are shown on Figure 2. Based on the results of the soil-gas survey, we will update the proposed well locations. The proposed well locations will be submitted to the SMS for their approval.

For the purposes of this scope of work, we have utilized unit costs from Tri-State Drilling and Boring to estimate well drilling costs.

- **Groundwater Sampling** - One set of groundwater samples will be collected from all site monitoring wells. Prior to sampling, depth to water, PID well headspace, and free product (if present) thickness determinations will be made. The monitoring wells will be purged of three well volumes or until dry prior to sampling. Samples will be collected with either dedicated polyethylene bailers or a teflon bailer. The bailer(s) will be equipped with bottom emptying devices or stopcocks in order to minimize sample agitation during sample transferral from the bailer(s) to sampling vials. Any non-dedicated sampling equipment will be decontaminated between sampling points with an Alconox scub/tap water rinse/methanol rinse/deionized water rinse. Quality assurance/quality control samples will include trip blank, a field/equipment blank (if non-dedicated bailers are used), and a blind duplicate. The trip blank will be provided by the laboratory and will be transported to the site, handled with the groundwater samples and returned to the laboratory for analysis. The field/equipment blank will be prepared by pouring deionized water through the sampling apparatus, in order to determine the effectiveness of the decontamination procedure and possible sample exposure to airborne contaminants.

The samples will be properly labeled and placed into a cooler with water ice. The samples will be transported to the laboratory and analyzed for MTBE and BTEX using EPA Method 8020. A laboratory chain-of-custody and a field sampling data sheet will be utilized to document the sampling event.

For the purposes of this scope of work, we have used unit prices from Scitest Laboratory Services, Randolph, Vermont, for the analytical work.

- **Groundwater elevation surveys** - Depth to water measurements will be taken in the site monitoring wells on at least two occasions. Depth to water measurements will be converted to groundwater elevations to allow preparation of groundwater elevation contour maps depicting groundwater flow directions.
- **Site survey/basemap preparation** - A basemap at an approximate scale of 1 inch to 50 feet will be prepared for the site. The basemap will include relevant site features and monitoring well elevations (ground surface and top of casing). If possible, site elevations will be measured relative to a USGS benchmark in feet above mean sea level. If not, an on-site benchmark will be assigned an arbitrary reference elevation. In our cost estimate, we have included costs incurred from Brooks Land Surveying of St. Albans, Vermont, for surveying work performed at similar sites.
- **Report preparation** - All information collected during the investigation will be incorporated into a final report. The report will describe the environmental setting, the nature and extent of contamination found at the site, identify potential receptors, and discuss the qualitative risks posed by site contamination to the potential receptors. The report will include well logs, vicinity and site maps, tabulated groundwater elevation and analytical results, contour maps, isoconcentration maps, cross-sections, and all raw data. The report will provide recommendations concerning the need for further characterization, remedial approaches if deemed appropriate, and/or monitoring frequencies.
- **Health & Safety** - A Health & Safety Plan will be prepared for work performed at the site.

ESTIMATED COST

The costs to perform this site investigation are estimated as follows:

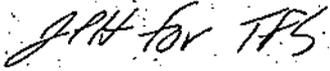
<u>Contractor</u>	<u>Cost</u>
Jefferson P. Hoffer, Consulting Hydrogeologists	\$2934.40
Tri-State Drilling & Boring	\$2200.00
Scitest Laboratory Services	\$ 495.00
Brooks Land Surveying	\$ 450.00
<hr/>	
TOTAL	\$6079.40

Please note that this cost estimate is based on the installation of four monitoring wells. If more wells are needed, the estimated project costs will be updated as appropriate. Our portion of the work will be performed on a time and materials basis with an estimated fee of \$3000. A breakdown for our portion of the work is detailed on the enclosed cost estimate sheet. Since we have assumed that S.B. Collins will be responsible for hiring the sub-contractors directly, the project cost does not include sub-contractor mark-up fees.

Our services will be provided and billed in accordance with the attached Standard Terms. S.B. Collins acknowledges having read and agreed to these rates and terms upon acceptance of this proposal. We thank you for the opportunity be of service to S.B. Collins. You can authorize the work by signing below or issuing a purchase order.

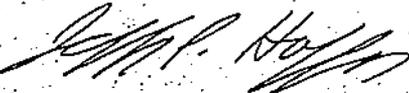
Respectfully submitted,

Accepted by:



Timothy F. Schmalz
Project Geologist

Authorized Signature

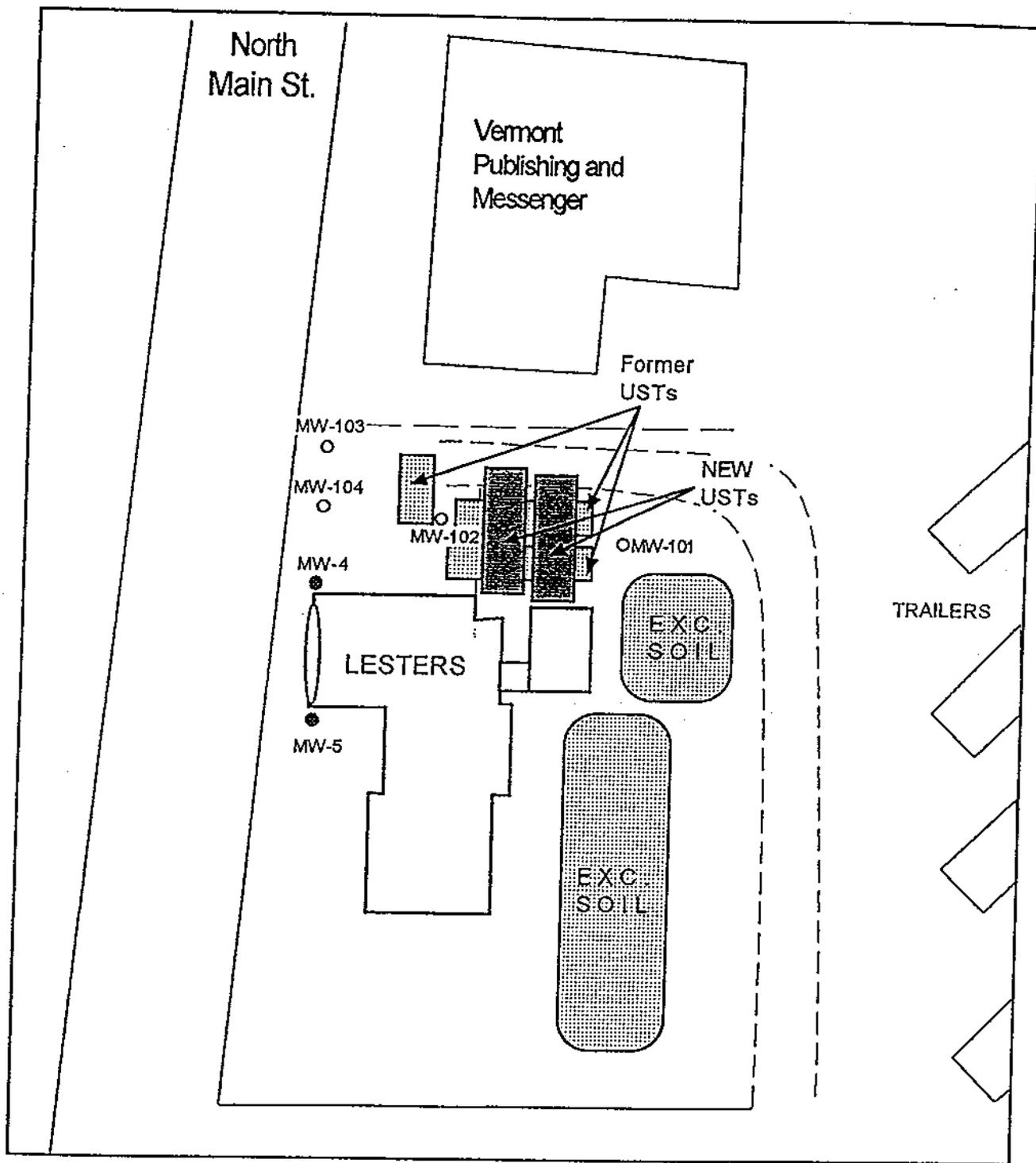


Jefferson P. Hoffer
Principal Hydrogeologist

Title

Date

Enc.



- existing monitoring well
- proposed monitoring well

NOT TO SCALE

FIGURE 2
 Site sketch with proposed monitoring well locations,
 Lester's General Store, St. Albans, Vermont.

JEFFERSON P. HOFFER
Consulting Hydrogeologists

COST ESTIMATE

S.B. Collins, Inc.

Site Investigation at Lester's General Store, St. Albans, Vermont.

LABOR

<u>ITEM</u>	<u>Staff</u>	<u>Hours</u>	<u>Rate</u>	<u>Cost</u>
Health & Safety Plan	JPH	2	\$35.00	\$70.00
Background Information Review	TFS	4	\$30.00	\$120.00
Soil-Gas Survey	JPH	6	\$35.00	\$210.00
Soil-Gas Survey	TFS	6	\$30.00	\$180.00
Monitoring Well Installation	TFS	12	\$30.00	\$360.00
Well Development/Water Levels	TFS	6	\$30.00	\$180.00
Groundwater Sampling	TFS	6	\$30.00	\$180.00
Figure Preparation	JPH	8	\$35.00	\$280.00
Report Preparation	TFS	24	\$30.00	\$720.00
Report Review	JPH	8	\$35.00	\$280.00

Sub-Total Labor **\$2,580.00**

EXPENSES

<u>ITEM</u>	<u>Quantity</u>	<u>Rate</u>	<u>Cost</u>
Mileage, 4 trips, 120 miles round trip	480	\$0.28	\$134.40
Water-level probe	1	\$10.00	\$10.00
Teflon sampling bailer	1	\$10.00	\$10.00
Soil-gas equipment	1	\$25.00	\$25.00
PID Rental (for soil-gas survey)	1	\$75.00	\$75.00
PID Rental (for well installation)	1	\$75.00	\$75.00
PID Rental (for well headspaces)	1	\$25.00	\$25.00

Sub-Total Expenses **\$354.40**

Total Jefferson P. Hoffer **\$2,934.40**

SUB-CONTRACTORS

<u>Surveyor - Brooks Land Surveying</u>	<u>Quantity</u>	<u>Rate</u>	<u>Cost</u>
Site basemap and well elevations	1	\$450.00	\$450.00

<u>Well Driller - Tri-State Drilling and Boring</u>	<u>Quantity</u>	<u>Rate</u>	<u>Cost</u>
4 wells @ \$550/well	4	\$550.00	\$2,200.00

<u>Laboratory - Scitest Laboratory Services</u>	<u>Quantity</u>	<u>Rate</u>	<u>Cost</u>
8020 analysis for BTEX/MTBE, 9 samples	9	\$55.00	\$495.00

Total Sub-Contractors **\$3,145.00**

ESTIMATED PROJECT TOTAL **\$6,079.40**



State of Vermont

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September 23, 1994

Jefferson P. Hoffer
Consulting Hydrogeologists
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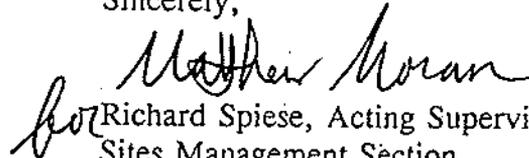
RE: Proposed Monitoring Well Locations for Lester's Service Center, St. Albans, VT
(Site #94-1558)

Dear Mr. Hoffer:

The Sites Management Section (SMS) has received and reviewed the results of the soil-gas survey and reviewed the proposed monitoring well locations. The SMS approves the proposed locations and requests that onsite work be initiated as soon as possible.

The SMS looks forward to the completion of this work. If you have any questions, please feel free to call.

Sincerely,


for Richard Spiese, Acting Supervisor
Sites Management Section

cc: Carl Ruprecht, S.B. Collins, Inc.

RS:mni/wp/941558wp2

APPENDIX B:
Soil Boring/Monitoring Well Construction Logs

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

Well/Boring ID: MW-101

Project Name: S.B. Collins/Lester's General Store	WELL CONSTRUCTION
Site: Lester's General Store, St. Albans	Total Depth Drilled: 12.0' BGS
Project Number: 04-09	Screen Type/Interval: 2" PVC, 10-slot from 12.0' to 2.0' BGS
Driller: Tri-State Drilling and Boring	Sandpack Type/Interval: #1 factory-sorted sand from 12.0' to 1.8' BGS
Drilling Method: 4.25" Hollow Stem Auger	Riser Type/Interval: 2" PVC from 2.0' to 0.0' BGS
Geologist: T. Schmalz	Seal Type/Interval: Benseal 3/8" granular bentonite, 1.8' to 1.0' BGS
Sampling Method: 2" Split Spoon	Measuring Point/Stickup: top of PVC casing, flushmount
Date/Time Started: 9/29/94, 0915	Water Level/Date/Time: 6.56', 10/4/94, 1143
Date/Time Completed: 9/29/94, 1010	Elevation of Top of PVC: 105.32'
Weather: 55°, cloudy, intermittent rain	Well Development: 5 gallons removed using 2" bailer
Surface Conditions: Slightly sloping lawn	

Sample Run Depth (feet)	Blow Count, Recovery (feet)	Sample Description *	PID Reading** (ppm)
0.0-2.0	6-8-7-7 [1.0]	0.25' Brown, SANDY SILT, soft, moist, low plasticity	
		0.75' Brown-gray SANDY SILT, slightly moist, fine-medium angular gravel, low plasticity	0.5
4.0-6.0	4-4-6-6 [1.8]	1.8' Light brown-yellow SANDY SILT WITH GRAVEL, moist fine-medium, poorly graded angular gravel, low plasticity	0.0
9.0-11.0	30-70-50/2 [1.2]	1.2' Brown-dark brown SANDY SILT WITH GRAVEL, medium-coarse, poorly graded, angular gravel, firm	0.1

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

0.0 - 0.25' sandy silt and silt topsoil

0.25 - 7.5' Brown weathered till and/or lacustrine sediments (sandy silt), some fill at 0.25-2.0'

7.5 - 9.0' Angular to subrounded gravelly layer, poorly graded gravels and silty sand,

9.0 - 12.0' Weathered till and till, very dense, dark brown and gray, coarse angular gravel and silt, becoming dryer with depth

NOTES:

* - ASTM D-2488 "Standard Practice for Description and Identification of Soils"

** Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene

BGS - Below Ground Surface, BTOC - Below Top of Casing, f - fine, m - medium, c - coarse

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

Well/Boring ID: MW-102

Project Name: S.B. Collins/Lester's General Store	WELL CONSTRUCTION
Site: Lester's General Store, St. Albans	Total Depth Drilled: 8.6' BGS
Project Number: 04-09	Screen Type/Interval: 2" PVC, 10-slot from 8.6' to 2.0' BGS
Driller: Tri-State Drilling and Boring	Sandpack Type/Interval: #1 factory-sorted sand from 8.6' to 1.8' BGS
Drilling Method: 4.25" Hollow Stem Auger	Riser Type/Interval: 2" PVC from 2.0' to 0.0' BGS
Geologist: T. Schmalz	Seal Type/Interval: Benseal 3/8" granular bentonite, 1.8' to 1.0' BGS
Sampling Method: 2" Split Spoon	Measuring Point/Stickup: top of PVC casing, flushmount
Date/Time Started: 9/29/94, 1325	Water Level/Date/Time: 4.17', 10/4/94, 1154
Date/Time Completed: 9/29/94, 1400	Elevation of Top of PVC: 98.35'
Weather: 55°, cloudy, intermittent rain	Well Development: 5 gallons removed using 2" bailer
Surface Conditions: Slightly sloping crushed stone	

Sample Run Depth (feet)	Blow Count, Recovery (feet)	Sample Description*	PID Reading** (ppm)
2.5-4.5	6-9-4-6 [1.1]	0.3' Dark gray SILTY SAND, moist (fill)	307.0
		0.8' Gray-olive SILTY SAND, moist, low plasticity, few f-m angular gravel, slightly tough	36.0
4.5-6.5	3-4-5-5 [0.9]	0.6' Same (as above)	
		0.3' Brown SILTY GRAVEL, wet, tough, angular, f-m, poorly graded gravel	78.8
10.0-12.0	7-27-77-0 [1.4]	1.0' Same (as above)	27.1
		0.4' Gray-brown SILTY SAND WITH GRAVEL, dry, hard, poorly graded f-m ang gravel (till)	2.0

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

- 0.0 - 2.8' Angular crushed stone and silty sand, driveway fill material
- 2.8' - 5.1' Brown f-m sand and silt, moist, strong petroleum odor, excavation backfill, filter fabric at 5.0-5.5'
- 5.1' - 11.0' Brown, firm, moist weathered till and/or lacustrine sediments, m-c subangular gravel interval from 7-9'
- 11.0' - 11.4' Very dense, dark gray to brown till, sand and angular, poorly graded gravel, dry.

NOTES:

- * - ASTM D-2488 "Standard Practice for Description and Identification of Soils"
- ** Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene
- BGS - Below Ground Surface, BTOC - Below Top of Casing, f - fine, m - medium, c - coarse

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

Well/Boring ID: MW-103

Project Name: S.B. Collins/Lester's General Store	WELL CONSTRUCTION
Site: Lester's General Store, St. Albans	Total Depth Drilled: 9.5' BGS
Project Number: 04-09	Screen Type/Interval: 2" PVC, 10-slot from 9.5' to 2.0' BGS
Driller: Tri-State Drilling and Boring	Sandpack Type/Interval: #1 factory-sorted sand from 9.5' to 1.8' BGS
Drilling Method: 4.25" Hollow Stem Auger	Riser Type/Interval: 2" PVC from 2.0' to 0.0' BGS
Geologist: T. Schmalz	Seal Type/Interval: Benseal 3/8" granular bentonite, 1.8' to 1.0' BGS
Sampling Method: 2" Split Spoon	Measuring Point/Stickup: top of PVC casing, flushmount
Date/Time Started: 9/29/94, 1130	Water Level/Date/Time: 4.57', 10/4/94, 1147
Date/Time Completed: 9/29/94, 1220	Elevation of Top of PVC: 99.39'
Weather: 55°, cloudy, intermittent rain	Well Development: 5 gallons removed using 2" bailer
Surface Conditions: Level crushed stone	

Sample Run Depth (feet)	Blow Count, Recovery (feet)	Sample Description *	PID Reading ** (ppm)
2.0-4.0	9-13-4-4 [0.5]	0.5' Dark brown-gray SILTY SAND WITH GRAVEL, moist, angular to subangular poorly graded gravel, fill	>2500
4.5-6.5	6-5-14-27 [1.1]	1.1' Dark gray SILTY SAND WITH GRAVEL, very moist, c, angular, poorly graded gravel (weathered till?)	2130.0
10.0-12.0	38-75/4 [0.9]	0.9' Dark brown-gray GRAVELLY SILT WITH SAND, dry, coarse, angular, poorly graded gravel, stiff, (till)	6.9

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

- 0.0 - 2.0' Angular crushed stone and silty sand, driveway fill material,
- 2.0 - 7.0' Silty sands and gravels, moist, strong petroleum odors, excavation backfill materials, filter fabric at 5.0'
- 7.0 - 9.0' Subangular to subrounded gravelly layer, poorly graded gavel and silty sand, moist to wet.
- 9.0 - 10.9' Weathered tilland till, very dense, dark brown and gray, coarse angular gravel and silt, moist, becoming dry

NOTES:

* - ASTM D-2488 "Standard Practice for Description and Identification of Soils"

** Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene

BGS - Below Ground Surface, BTOC - Below Top of Casing, f - fine, m - medium, c - coarse

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

Well/Boring ID: MW-104

Project Name: S.B. Collins/Lester's General Store	WELL CONSTRUCTION
Site: Lester's General Store, St. Albans	Total Depth Drilled: 7.2' BGS
Project Number: 04-09	Screen Type/Interval: 2" PVC, 10-slot from 7.2' to 2.0' BGS
Driller: Tri-State Drilling and Boring	Sandpack Type/Interval: #1 factory-sorted sand from 7.2' to 1.8' BGS
Drilling Method: 4.25" Hollow Stem Auger	Riser Type/Interval: 2" PVC from 2.0' to 0.0' BGS
Geologist: T. Schmalz	Seal Type/Interval: Benseal 3/8" granular bentonite, 1.8' to 1.0' BGS
Sampling Method: 2" Split Spoon	Measuring Point/Stickup: top of PVC casing, flushmount
Date/Time Started: 9/29/94, 1455	Water Level/Date/Time: dry, 10/4/94, 1156
Date/Time Completed: 9/29/94, 1600	Elevation of Top of PVC: 98.01'
Weather: 55°, cloudy, intermittent rain	Well Development: None (well dry)
Surface Conditions: Level parking lot/asphalt	

Sample Run Depth (feet)	Blow Count, Recovery (feet)	Sample Description *	PID Reading** (ppm)
0.5-2.5	7-4-4-3 [1.3]	0.5' Gray SILTY GRAVEL WITH SAND, slightly moist, angular gravel (asphalt sub-base)	0.0
		0.8' Dark brown SANDY SILT WITH GRAVEL, moist, low plasticity, angular gravel	0.0
4.5-6.5	3-1-21-11 [0.9]	0.9' Brown GRAVELLY SILT WITH SAND, moist, soft, slightly tough, low plasticity	0.0
7.2-9.2	20/0.0 [0.0]	Split-spoon and auger refusal at 7.2' BGS	0.0

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

0.0 - 1.0' Asphalt and sub-base material, (f-m angular gravel and silty sands, gray to brown, dry to slightly moist)

1.0' - 7.2' Brown to gray silts with angular gravel, slightly moist to moist, fill

7.2' Spoon and auger refusal on unidentified object

NOTES:

* - ASTM D-2488 "Standard Practice for Description and Identification of Soils"

** Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene

BGS - Below Ground Surface, BTOC - Below Top of Casing, f - fine, m - medium, c - coarse

APPENDIX C:
Groundwater Sampling Data

GROUNDWATER SAMPLING DATA SHEET

LOCATION: LESTER'S GENERAL STORE
 DATE: 10/6/1994

SAMPLE METHOD: 2" POLY BAILER
 SAMPLING TEAM: TLS

WELL ID	PID Head Space (ppm)	Depth to Water (ft)	Total Well Depth (ft)	Water Column (ft)	3 Well Volumes* (gals)	Total Purged (gals)	Sample Time	Sample Type	Chain-of-Custody		Remarks
									Number	Time	
TB-01	NA										
MW-101	3.6	6.67	12.0	5.33	2.56	2.75	1145	S	MW-101	1145	Brown, Silty
MW-5	2.3	6.06	11.3	5.24	2.52	2.50	1215	S	MW-5	1215	Dk gray, Silty
MW-102	261	4.30	8.6	4.30	2.06	2.25	1230	S	MW-102	1230	Lt. brown, Turbid
MW-102	↓	↓	↓	↓	↓	↓	↓	DP	MW-10	1330	↓
MW-103	2261	4.61	9.5	4.89	2.35	2.5	1245	S	MW-103	1245	Brown, Silty (Turbid)
MW-104 (DRY @ 1255) TOTAL DEPTH 7.2' BGS											

* (1.5" = 0.092 gals/ft, 2" = 0.16 gals/ft, 4" = 0.65 gals/ft, 6" = 1.5 gals/ft)

REMARKS WELLS SAMPLED USING DEDICATED POLYETHYLENE BAILERS

30 COLI INS INC
 OF LOWER WELDEN ST.
 ST. ALBANS, VT, 05478

DN FIN. HYDROGEOLOGICAL
 PO BOX 428
 WATERBURY, VT 05676

Scitest, Inc.
 P.O. Box 339
 Route 66 Professional Center, Randolph, VT 06060
 Phone: (802)728-6313 Fax: (802)728-6044

LABORATORY NUMBER:

Client: **Jeff Hoffer** Project # **004-009** 70249 Address: P.O. Box 428
 Contact: Phone No: Waterbury, VT 05676
 Date requested: 10/5/94 Requested by: **KLG**
 Date shipped: 10/5/94 Cooler #(s)
 Date scheduled: 10/6/94

LOGIN:

Cals Checked by:
 Date:

Report Prepared by:
 Date:

Data Tran Checked by:
 Date:

CHAIN OF CUSTODY		DATE	TIME
SAMPLED BY:	<i>[Signature]</i>	10/6/94	1:30
RELINQUISHED BY:	<i>[Signature]</i>	10/6/94	3:10p
RECVD BY SCITEST INC:			

Additional Comments:

Item Nos	Client ID or Description	Sampling Date/Time	Type Comp/Grab	Matrix	Preserve/ Label	Preserve Check	Bottle Type	Reqd. Volume	Bottles/ Sample	Parameters and Holding Times >7days
1	MW-101	10/6/94 1145	G	GW	HCl		Glass	40 mL	2	BTEX + MTBE 8020
2	MW-5	1215		GW	HCl		Glass	40 mL	2	BTEX + MTBE 8020
3	MW-102	1230		GW	HCl		Glass	40 mL	2	BTEX + MTBE 8020
4	MW-103	1245		GW	HCl		Glass	40 mL	2	BTEX + MTBE 8020*
5	MW-10	1330		GW	HCl		Glass	40 mL	2	BTEX + MTBE 8020
6	Trip Blank	(0800)	(D10)	GW	HCl		Glass	40 mL	2	BTEX + MTBE 8020

ATTN:
Jeff
Hoffer



P.O. Box 339
Randolph, Vermont 05060-0339
(802) 728-6313

LABORATORY REPORT

CLIENT: SB Collins, Inc.
ADDRESS: 54 Lower Welden St.
St. Albans, VT 05478

LABORATORY NO: 4-2619
PROJECT NO. 70249
DATE OF SAMPLE: 10/6/94
DATE OF RECEIPT: 10/6/94
DATE OF ANALYSIS: 10/6-14/94
DATE OF REPORT: 10/18/94

SITE: Lester's General Store, St. Albans, VT
ATTENTION: Carl Ruprecht

Results (Results expressed in micrograms per liter (ug/L))

PARAMETER	MW-101	MW-5	MW-102	MW-103	MW-10	Trip Blank
Methyl Tertiary Butyl Ether	BPQL	8	1310	317	870	BPQL
Benzene	BPQL	44	1610	267	1250	BPQL
Toluene	BPQL	45	2010	291	1600	BPQL
Ethylbenzene	BPQL	41	1620	148	1090	BPQL
Total Xylenes	BPQL	213	8270	1470	7350	BPQL
Chlorobenzene	BPQL	BPQL	BPQL	BPQL	< 50	BPQL
1,2-Dichlorobenzene	BPQL	BPQL	BPQL	BPQL	< 50	BPQL
1,3-Dichlorobenzene	BPQL	BPQL	BPQL	BPQL	< 50	BPQL
1,4-Dichlorobenzene	BPQL	BPQL	BPQL	BPQL	< 50	BPQL
Surrogate % Recovery	93%	108%	102%	101%	104%	94%

EPA Method 8020
BPQL = Below Practical Quantitation Limit, 1 ppb

Respectfully submitted,

SCITEST INC.
Roderick J. Lamothe
Roderick J. Lamothe
Laboratory Director