

Dodge Cars

Dodge

Dodge Trucks

HANDY DODGE-TOYOTA

39 SOUTH MAIN STREET

ST. ALBANS, VT 05478

802-527-7512

1-800- 698-5143

JAN 27 1994



Jan. 26, 1994

Mr. Chuck Schwer, Supervisor
SITES Management Section
Dept of Environmental Conservation
103 So. Main St/West Office
Waterbury, Vermont 05671-0404

RE: Hydrogeologic Investigation Report
On Site #93-1470

Dear Chuck;

Enclosed is a copy of the report on the hydrogeologic investigation at our site. If possible, we would like to have you perform a site visit so that we can review the report and site, and discuss what further activities the SMS might deem necessary.

Sincerely,

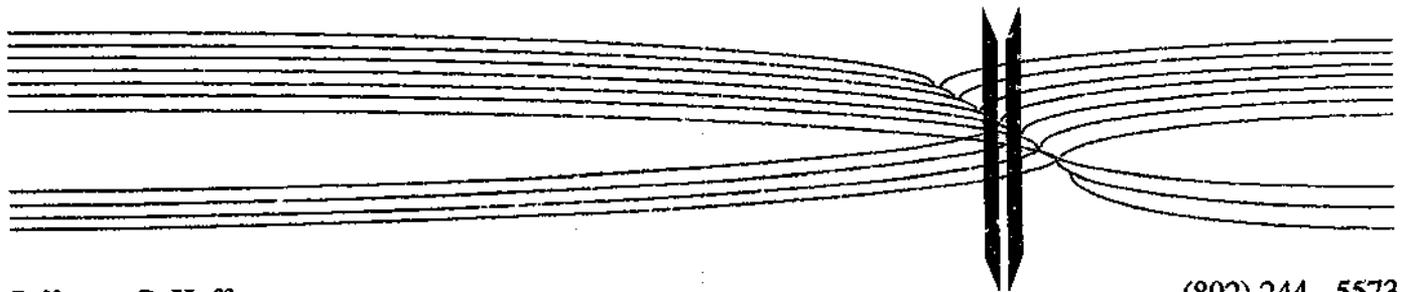
A handwritten signature in cursive script, appearing to read "Daniel S. Luneau".

Daniel S. Luneau
General Manager

JAN 27 1994

REPORT ON HYDROGEOLOGIC INVESTIGATION
HANDY DODGE/TOYOTA
ST. ALBANS, VERMONT

JANUARY, 1994



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Consulting Hydrogeologist

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JAN 27 1994

**Hydrogeologic Investigation
Handy Dodge/Toyota, St. Albans, Vermont**

January, 1994

Prepared For:

Handy Dodge/Toyota
St. Albans, Vermont

Prepared By:

Jefferson P. Hoffer
Consulting Hydrogeologist
Waterbury, Vermont

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1.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Two out-of-service USTs were excavated and removed from the property of the Handy Dodge/Toyota car dealership on September 27, 1993. Elevated PID readings were measured in soils surrounding the tanks, indicating that historical releases of petroleum had occurred. A hydrogeologic investigation was performed to assess the nature and extent of contamination. Five groundwater monitoring wells were installed and sampled for BTEX and MTBE. Groundwater occurs at depths of one to three feet and flows from east to west under a hydraulic gradient of 0.05 to 0.075 ft/ft, within a shallow saturated zone consisting of weathered till and fill materials underlain by a dense glacial till. Hydraulic conductivity values range from 1.2×10^{-4} cm/sec for a well completed in sandy backfill to a range of 2.9×10^{-6} to 3.9×10^{-5} cm/sec for four wells screened in fill and weathered till. Groundwater sampling shows a contaminant plume migrating downgradient from the former tank locations. The distribution of contamination found during this investigation suggests that releases occurred from the tank(s) before they were taken out of service nearly 20 years ago. The downgradient and lateral extent of groundwater contamination has not been defined.

MTBE ?

A limited amount of free-phase petroleum exists in the subsurface at the site as evidenced by sheens in purge waters and in water/soil mixtures from cuttings. The extent of vapor migration is uncertain, although no elevated PID readings were detected in a storm water catch basin nor in a basement hydraulically downgradient of the site.

Based on the existing data, there does not appear to be an immediate threat to potential receptors. Dissolved-phase contamination in groundwater, free-phase petroleum, and/or petroleum vapors may have reached buried utilities along South Main Street and migrated along these potential conduits for preferential flow.

It is recommended that the downgradient extent of groundwater contamination be further investigated. Additional subsurface investigation at the site is complicated due to the presence of numerous buried utilities and the high-traffic location on Main Street. The numerous buried utilities downgradient of the site may complicate investigation efforts in that these utilities may provide pathways for preferential groundwater flow, which may

result in a non-uniform distribution of contamination. There are also many other potential sources of contamination in the vicinity, including numerous historical filling stations and USTs. It is recommended that a utility map be prepared to guide future subsurface investigations at the site. Once this map is developed, a scope of work for additional investigation should be prepared.

Additional subsurface investigations at the site may benefit from the use of less-intrusive techniques such as the GeoProbe™ or HydroPunch™ technologies, as opposed to standard monitoring well installation techniques. The extent of vapor migration and groundwater contamination could be more efficiently delineated by utilizing this approach to collect soil, soil-gas, and groundwater samples.

It is also recommended that Handy proceed with the re-paving of the site as soon as possible in order to minimize infiltration at the site.

2.0 BACKGROUND AND SITE DESCRIPTION

2.1 Background

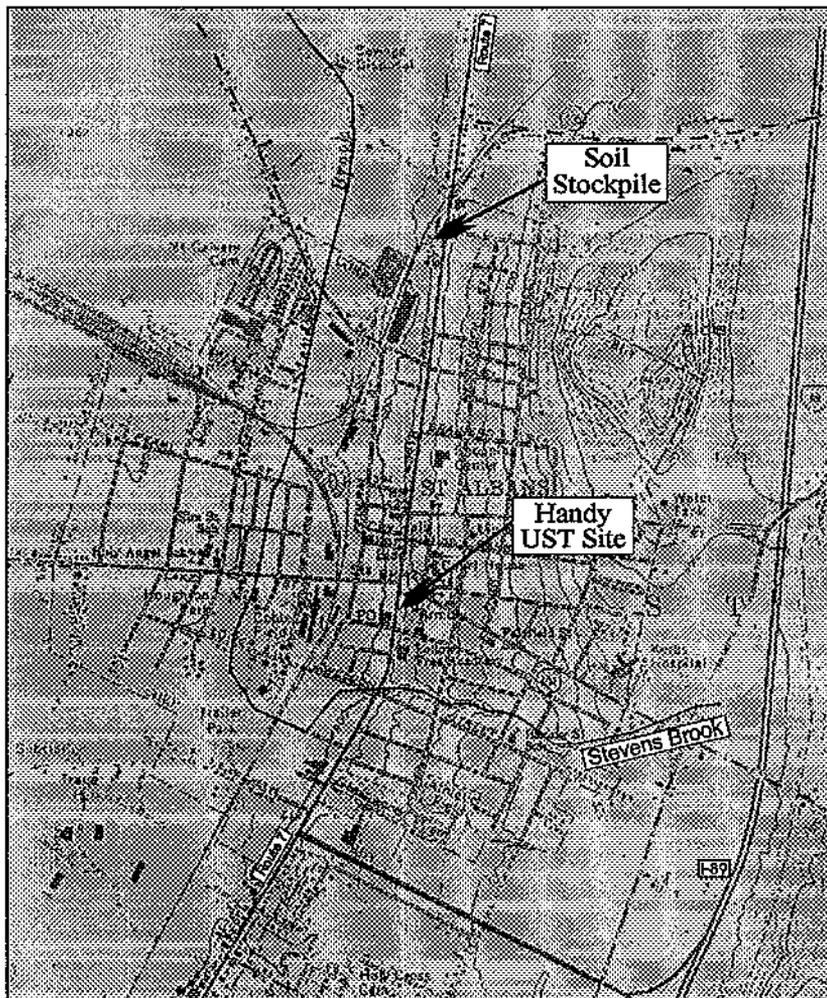
The Handy Dodge/Toyota car dealership (site) is located at 39 South Main Street, St. Albans, Vermont. Figure 1 presents a site location map. Two underground storage tanks (USTs) were excavated and removed from the site on September 27, 1993. The two USTs (one 3000-gallon, one 4000-gallon) were utilized for gasoline storage by a service station which ceased operations at the site in 1974. The last recorded delivery to these tanks was in October, 1974. Handy began operating at the site in 1976 and never used the tanks.

The USTs were excavated and removed from the site by Pollution Solutions of Vermont, Inc (PSOV). Observations during the tank removals are summarized in a letter from PSOV to the Vermont Department of Environmental Conservation, and State tank pull forms. The 4000-gallon tank was reported to have a "3-4 inch opening", although Handy manager Dan Luneau and the backhoe operator claim this opening was made by the backhoe as the tank was being removed. Soils removed during the excavation exhibited photoionization detector (PID) readings exceeding 2500 parts per million (ppm). Groundwater was reported at a depth of eight feet. The Sites Management Section (SMS), in a letter dated October 12, 1993, requested that Handy retain a consultant to determine the nature and extent of contamination at the site.

A workplan for site investigation, dated October 27, 1993, was prepared on behalf of Handy and submitted to the SMS. The workplan provided a scope of work for a hydrogeologic investigation and also for the screening of soils removed during the UST pulls. Copies of the workplan and all correspondence are provided in Appendix A.

2.2 Site Description

The site is located in downtown St. Albans, and is bounded by South Main Street on the west, and Fairfield Street to the north. The Vermont National Guard Armory is located immediately east of the site. A building just south of the site is owned by the Northwest Medical Center. A vacant building (most recently a sub shop) is situated on the southwest corner on the property. Figure 2 presents a site vicinity map, which includes the locations of nine past and present (Miller's Gulf) fuel stops which operated in the immediate vicinity.



Basemap: USGS Topographic Quad,
St. Albans, VT

2000 feet

FIGURE 1
Site location map, Handy Dodge/Toyota,
39 South Main Street, St. Albans, Vermont.

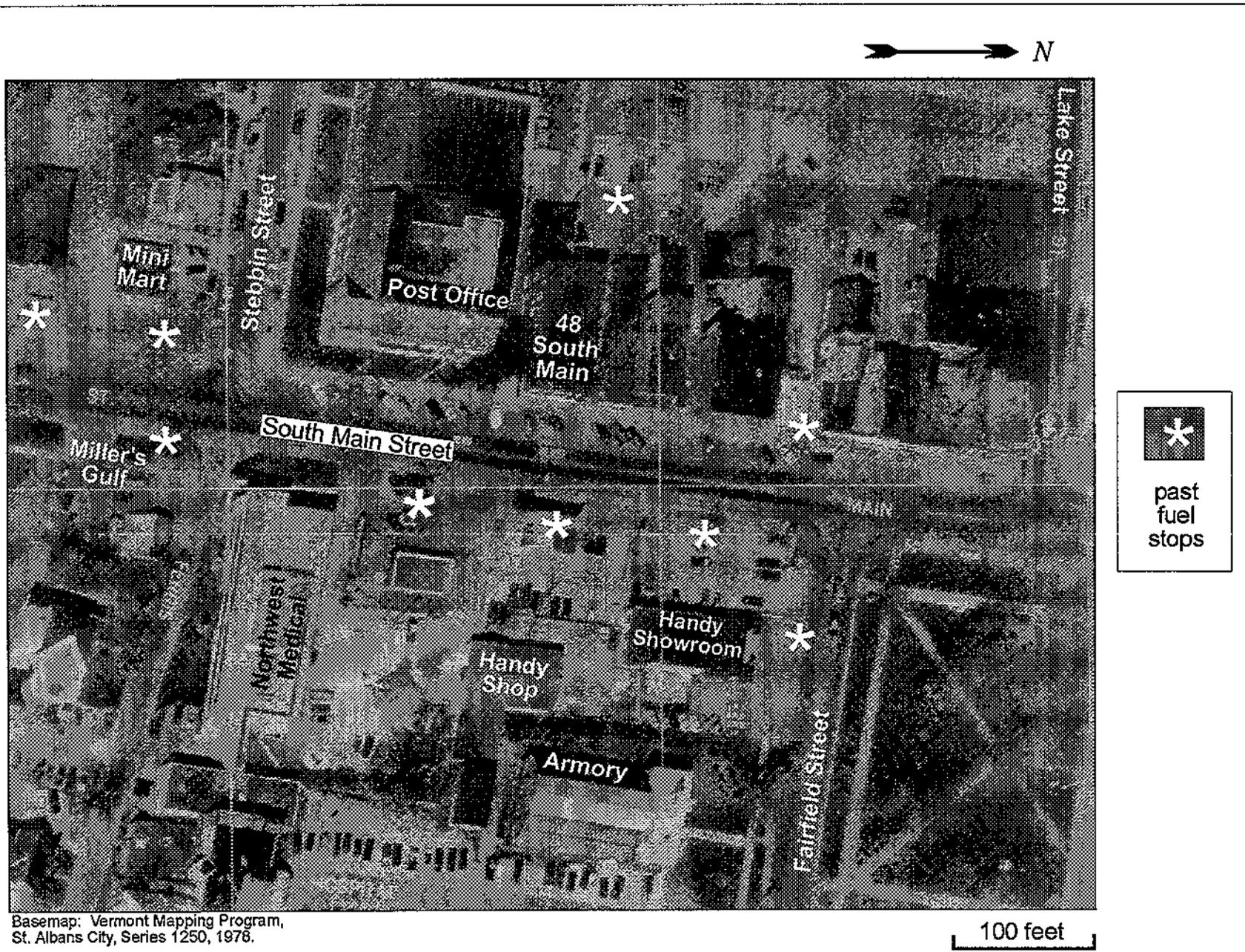


FIGURE 2
Site vicinity map, Handy Dodge/Toyota, St. Albans, Vermont.

All nearby residences and commercial facilities are served by municipal sewer and water. Buried utilities along Main Street include water, wastewater, stormwater, natural gas, and telephone lines. A north/south drain crosses Fairfield Street at its intersection with Main Street. A storm water catch basin is located immediately west of the former tank area, on the eastern edge of Main Street. All of the Handy site is covered by either buildings or pavement, with the exception of the area between the buildings and Main Street, where asphalt and concrete was removed one week prior to the tank removals. Handy intends to re-pave this area in the Spring of 1994. Roof runoff from the showroom and office roofs are directed to the drain which crosses Fairfield Street, and roof runoff from the shop area is directed into the sanitary sewer.

The surface topography in the vicinity slopes toward the west. Surface elevation at the site is approximately 420 feet above mean sea level. According to the Surficial Geologic Map of Vermont (Doll, 1970), the site is underlain by glacial till. As presented by Stewart's (1974) generalized bedrock map, underlying bedrock is shale. The nearest surface water feature is Stevens Brook, which is located south and west of the site as shown on Figure 1.

A site investigation and remedial effort was performed at Miller's Gulf, which is located a few hundred feet south of the site. This investigation was prompted by the discovery of petroleum vapors in a telephone utility manhole located directly in front of Miller's Gulf. Logs of monitoring wells drilled at the Gulf site indicate medium sand and fill materials underlain by a weathered glacial till. The till was found at depths ranging from five to seven feet. Depths to water in monitoring wells at the site range from one to seven feet. Groundwater at the Gulf site flows from east to west, under a hydraulic gradient of 0.089 ft/ft (Lincoln Applied Geology, 1989).

3.0 FIELD INVESTIGATION PROCEDURES

3.1 Monitoring Well Installation

Five groundwater monitoring wells were installed on November 23, 1993. Drilling services were provided by Tri-State Drilling & Boring of West Burke, Vermont. Well locations were selected to determine the horizontal extent of groundwater contamination at the site. Groundwater flow direction was inferred to be east to west across the site, based on data from investigations at Miller's Gulf. Monitoring well MW-1 was installed at an upgradient location. Monitoring well MW-2 was sited immediately downgradient from the former tanks.

Borings were advanced using 4.25" ID hollow-stem augers. Split-spoon soil samples were collected to observe soil conditions and to screen samples for contamination with a photoionization detector (PID). Both split-spoon samples and cuttings returned on the auger flights were visually examined and described in the field. Soil samples from the split spoons were placed into glass jars for headspace analysis using a PID. The PID was also utilized to detect zones of contamination during auger advancement, and for health and safety monitoring.

The monitoring wells were constructed with five-foot sections of factory-slotted PVC screen (0.020-inch) and PVC riser. Wells were constructed so that a few feet of screen remained above the water table to enable the detection of floating petroleum, and to account for water-table fluctuations. After installation of MW-2, the water level in this well rose above the top of the screen. As a result, an additional well (MW-5) was installed downgradient from this well. The well screens were backfilled with a coarse sand as the augers were retracted. The sandpack was extended at least 0.5 feet above the top of the screen. A layer of granular bentonite was placed on top of the sandpack. Protective manhole covers were cemented into place around each well. The wells were developed by bailing and surging. After surging, the wells were bailed to dryness, and water-level recovery measurements were taken to assess the hydraulic conductivity of the saturated materials.

Land surveyor Steven Brooks of St. Albans, Vermont, was contracted to provide a site basemap and elevations of the monitoring wells. Elevations were obtained at each well for ground surface and the top of the 2-inch PVC riser. Elevations were measured relative to 100.00 feet assigned to a benchmark. A site map showing well locations is provided on Figure 3.

3.2 Groundwater Sampling and Analysis

The five monitoring wells were sampled on December 2, 1993. Prior to sampling, well headspace (PID), water level, and free-product measurements were taken in each well. The monitoring wells were bailed of at least three well volumes prior to sampling. Samples were collected using a Teflon™ bailer. Samples were transferred from the bailer to laboratory-supplied 40 mL vials containing HCL, using a bottom-emptying stopcock to minimize sample agitation. Samples were labeled and placed into a cooler with ice. Sampling equipment was decontaminated between each well using an Alconox™ scrub/tap water rinse/methanol rinse/distilled water rinse. All purge water generated during sampling was containerized on site in a 55-gallon drum. ←

Sampling proceeded from "clean" to "dirty" based on observations during well installation and well headspace PID readings prior to sampling. Quality assurance/quality control samples included a trip blank supplied by the laboratory, a field/equipment blank, and a blind duplicate. The trip blank was transported to the site, handled the same as the other samples, and returned to the laboratory for analysis. The duplicate sample was collected at well MW-5 and was labeled MW-A. A field/equipment blank was prepared using laboratory-supplied analyte-free water to gauge the effectiveness of the decontamination procedure and possible sample exposure to air-borne contaminants.

The groundwater sampling event was documented on a field data sheet and a laboratory chain-of-custody. Samples were hand-delivered to Scitest Laboratory Services, Randolph, Vermont, and analyzed for methyl-tert-butyl-ether (MTBE) and benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA SW-846 Method 8020. The field data sheet, analytical reports, and chain-of-custody are included in Appendix B.



FIGURE 3
 Site map showing monitoring well locations and former tank locations,
 Handy Dodge/Toyota, St. Albans, Vermont.

3.3 PID Measurements

A Photovac MicroTIP HL-2000 photoionization detector, equipped with a 10.6 eV bulb, was utilized to monitor for the presence of volatile organic vapors during field investigations. The PID was utilized during drilling to screen for contamination and to perform headspace analyses on soil samples. Measurements of well headspaces were also taken during water-level measurements and groundwater sampling events. The PID was also used to survey a basement located directly across Main Street from the site, and a storm water catch basin located in front of the site. Prior to each days use, the PID was calibrated with an isobutylene standard, following the manufacturer's operating procedures.

4.0 RESULTS

4.1 Hydrogeologic Setting

Surficial Geology

Split-spoon samples and cuttings were generally silts and fine sands, with increasing density and rock-fragment content with depth. One exception to this profile was encountered at MW-2, which was apparently drilled through the backfill (sand) of the former tanks. A dense, gray, unweathered glacial till was encountered in all boreholes at depths ranging from six to eight feet. The materials overlying the unweathered till include fill materials and weathered (oxidized) till. Soil mottling and moisture contents indicated saturation from about two to four feet below grade. Soil samples collected from the underlying till were dry or slightly moist. Additional observations are included on the soil boring/monitoring well logs provided in Appendix C.

The stratigraphy encountered during monitoring well drilling is consistent with the mapped surficial geology of the area, which is glacial till (Doll, 1970). This stratigraphy is also consistent with subsurface conditions encountered during well installations at Miller's Gulf.

Groundwater Elevation and Flow Direction

Site groundwater levels were measured on November 29, 1993 during well development/slug testing, and during the December 2, 1993 sampling event. Groundwater elevations are summarized on Table 1 and vary somewhat between the two measurements periods. A period of heavy rain preceded the November 29 measurements. On both occasions, no free-product accumulations were detected in any of the wells.

Figure 4 presents a site groundwater map for December 2, 1993. Groundwater elevations mimic the surface topography of the vicinity, which slopes west. Groundwater flows from east to west across the site, under a gradient of 0.05 to 0.075 ft/ft. Horizontal flow within the weathered till and fill likely predominates. The dense, unweathered till found at depths ranging from six to eight feet likely acts as a nearly-impermeable base. Soil samples collected from the unweathered till were dry or slightly moist, indicative of either unsaturated conditions or extremely low porosity.

TABLE 1
Groundwater elevations, Handy Dodge/Toyota, St. Albans, Vermont.

Well ID	Elevation of Ground Surface (feet)	Top of Screen Elevation (feet)	Elevation of Top of Casing (feet)	11/29/93		12/2/93		
				Depth to Water from TOC (feet)	Groundwater Elevation (feet)	PID* Reading (ppm)	Depth to Water from TOC (feet)	Groundwater Elevation (feet)
MW-1	100.19	96.2	99.99	1.67	98.32	0.6	2.00	97.99
MW-2	99.26	96.3	98.99	0.94	98.05	54.6	1.90	97.09
MW-3	98.41	96.4	98.11	3.33	94.78	309	3.32	94.79
MW-4	98.26	95.3	98.05	3.05	95.00	204	3.34	94.71
MW-5	99.14	98.1	98.99	2.30	96.69	1915	3.08	95.91

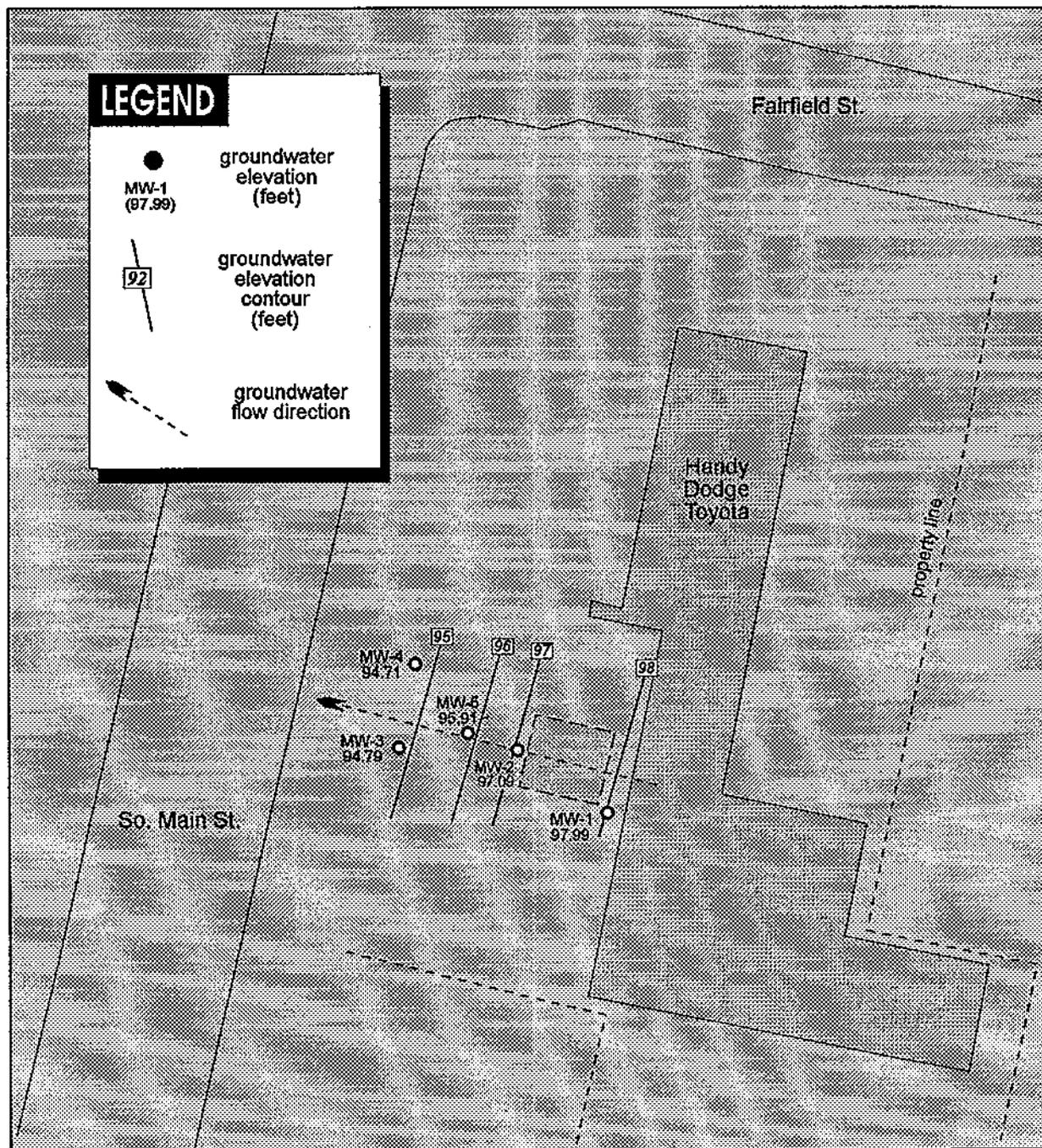
NOTES:

11/29/93 measurements followed a period of heavy rain.

TOC - top of casing

Benchmark - Bolt on Sign Base North of MW-4, Elev. = 100.00 feet

* PID readings taken with MicroTIP HL-2000, 10.6 eV bulb, calibrated to isobutylene, (maximum reading during 1-minute interval with slip cap attached to well).



Elevations relative to on-site benchmark of 100.00 feet

FIGURE 4
Groundwater contour map, December 2, 1993,
Handy Dodge/Toyota, St. Albans, Vermont.

Prior to the removal of the tanks, the area surrounding the tanks was covered with asphalt and concrete. The asphalt and concrete was removed from vicinity of the tanks about one week prior to the excavation. As a result, precipitation occurring after this date (mid-September, 1993) infiltrated into the subsurface. During the tank removals, depth to groundwater was reported as eight feet. In addition, observations during the well installations suggested depths of two to four feet to water, somewhat lower than the measured values shown on Table 1. As a result, the groundwater elevations measured during this investigation may not represent conditions prior to the tank removals.

Hydraulic Conductivity

Water-level recoveries measured after well development provide a measure of the hydraulic conductivity of the saturated materials. Figure 5 presents the recovery data for the five wells. Analysis of this data using the Bouwer & Rice method (Bouwer, 1989) yields the following hydraulic conductivity values.

<u>WELL</u>	<u>K (ft/day)</u>	<u>K (cm/sec)</u>
MW-1	9.3×10^{-2}	3.3×10^{-5}
MW-2	3.5×10^{-1}	1.2×10^{-4}
MW-3	8.2×10^{-3}	2.9×10^{-6}
MW-4	1.1×10^{-1}	3.9×10^{-5}
MW-5	1.6×10^{-2}	5.8×10^{-6}

The hydraulic conductivity value for MW-2 is within published values for fine sands and silty sands, consistent with the fact that this well is apparently screened within the sandy material used to backfill the tank excavations or as bedding during the original tank installations. Values for the other wells range from 2.9×10^{-6} to 3.9×10^{-5} cm/sec, within published ranges for low-permeability materials such as silt and glacial till.

4.2 Groundwater Sampling Results

Groundwater sampling results are summarized on Table 2. Elevated concentrations of BTEX constituents were found in all wells except the upgradient well MW-1. The highest concentrations occur in the two wells furthest from the former tank locations, MW-3 and MW-4. Toluene, ethylbenzene, and xylenes were detected in all monitoring

Handy Dodge/Toyota

- ○ ○ ○ ○ MW-1
- □ □ □ □ MW-2
- △ △ △ △ △ MW-3
- ◇ ◇ ◇ ◇ ◇ MW-4
- ★ ★ ★ ★ ★ MW-5

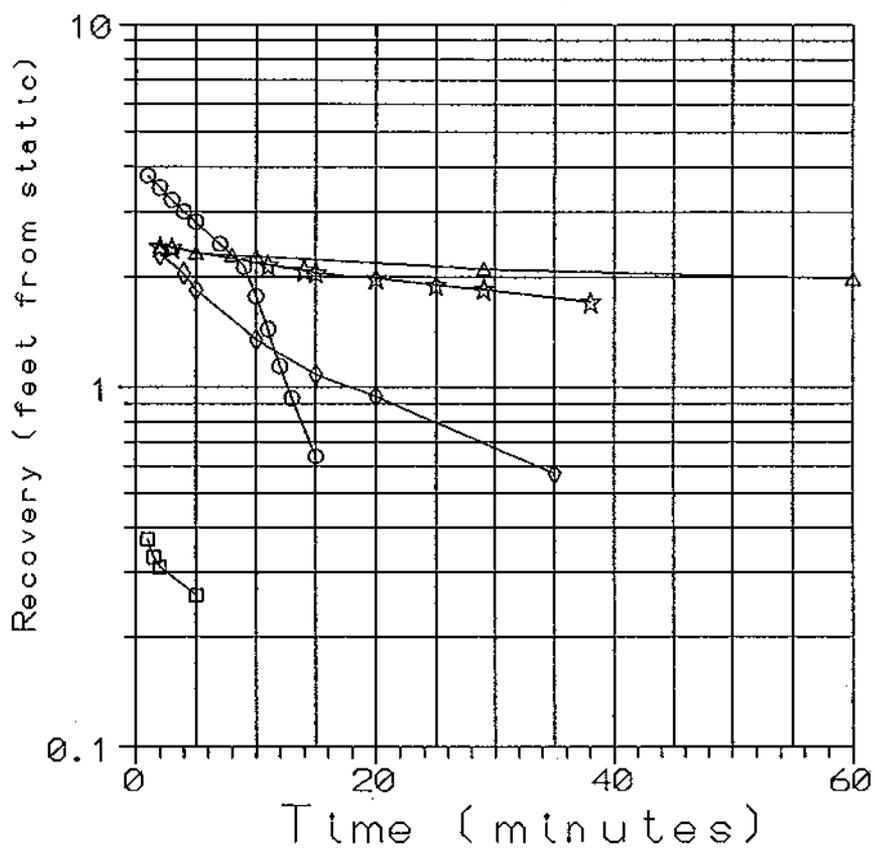


Figure 5
Water-level recovery measurements,
Handy Dodge/Toyota, St. Albans, Vermont.

TABLE 2
Groundwater sampling results, Handy Dodge/Toyota, St. Albans, Vermont.

2-Dec-93 Results in µg/L					
WELL ID	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
Trip Blank	<1	<1	<1	<1	<1
MW-1	<1	<1	<1	<1	<1
MW-2	<100	340	410	3,070	<100
MW-3	630	830	1,500	10,030	<100
MW-4	1,220	2,710	1,980	9,460	850
MW-5	<100	1,650	1,080	5,200	<100
MW-5 Field Duplicate	<100	1,700	1,080	5,080	<100
Field Blank	<1	<1	<1	<1	<1

NOTES:

<1 = below a practical quantitation limit of 1

wells downgradient of the former tank area, with xylenes consistently showing the highest concentrations in each well. Benzene was detected only in MW-3 and MW-4, and MTBE was detected only in MW-4. Isoconcentration maps for each BTEX constituent and MTBE are provided on Figures 6 - 10.

The sampling results define a contaminant plume migrating downgradient from the former tank area. The plume configuration suggests that releases occurred prior to when the tanks were taken out of service in 1976.

4.3 PID Measurements

PID measurements of soil headspace samples collected during well installation are summarized on Table 3. The highest readings were detected in samples collected just below the water table in MW-3 and MW-4. PID readings decrease with depth at each location, suggesting that the vertical migration into the underlying till is limited.

Well headspace measurements taken during prior to collecting groundwater samples are given on Table 1. These values correspond with soil headspace measurements taken during well installations, with the exception of MW-5, which displayed the highest well headspace measurement during sampling.

On December 10, 1993, the storm water catch basin located on South Main Street immediately in front of the site was screened with the PID. A reading of 0.3 ppm was detected in the catch basin. The basement of 48 South Main Street, which is located across Main street from the site, was also screened on December 10, 1993. PID readings in the basement were 0.5 ppm higher than ambient air outside.

4.4 Free Product

While no free-product accumulations were found in site monitoring wells, purge waters from MW-2 and MW-4 displayed sheens. In addition, soil cuttings from MW-2 contained black staining. When the black-stained soils were mixed with water, a sheen formed and exhibited a PID reading of 500 ppm. These observations indicate that while

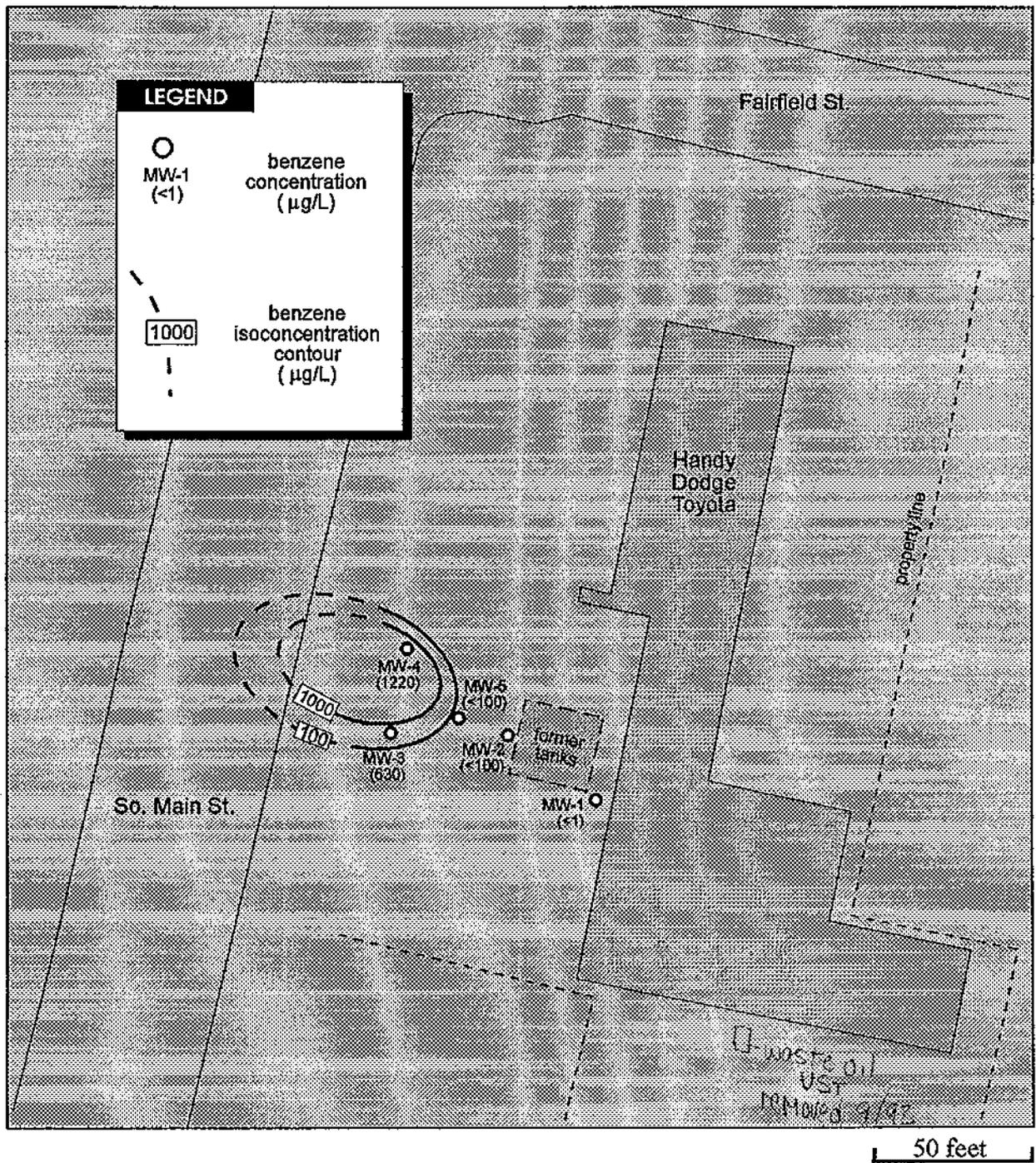


FIGURE 6
Benzene isoconcentration map, December 2, 1993,
Handy Dodge/Toyota, St. Albans, Vermont.

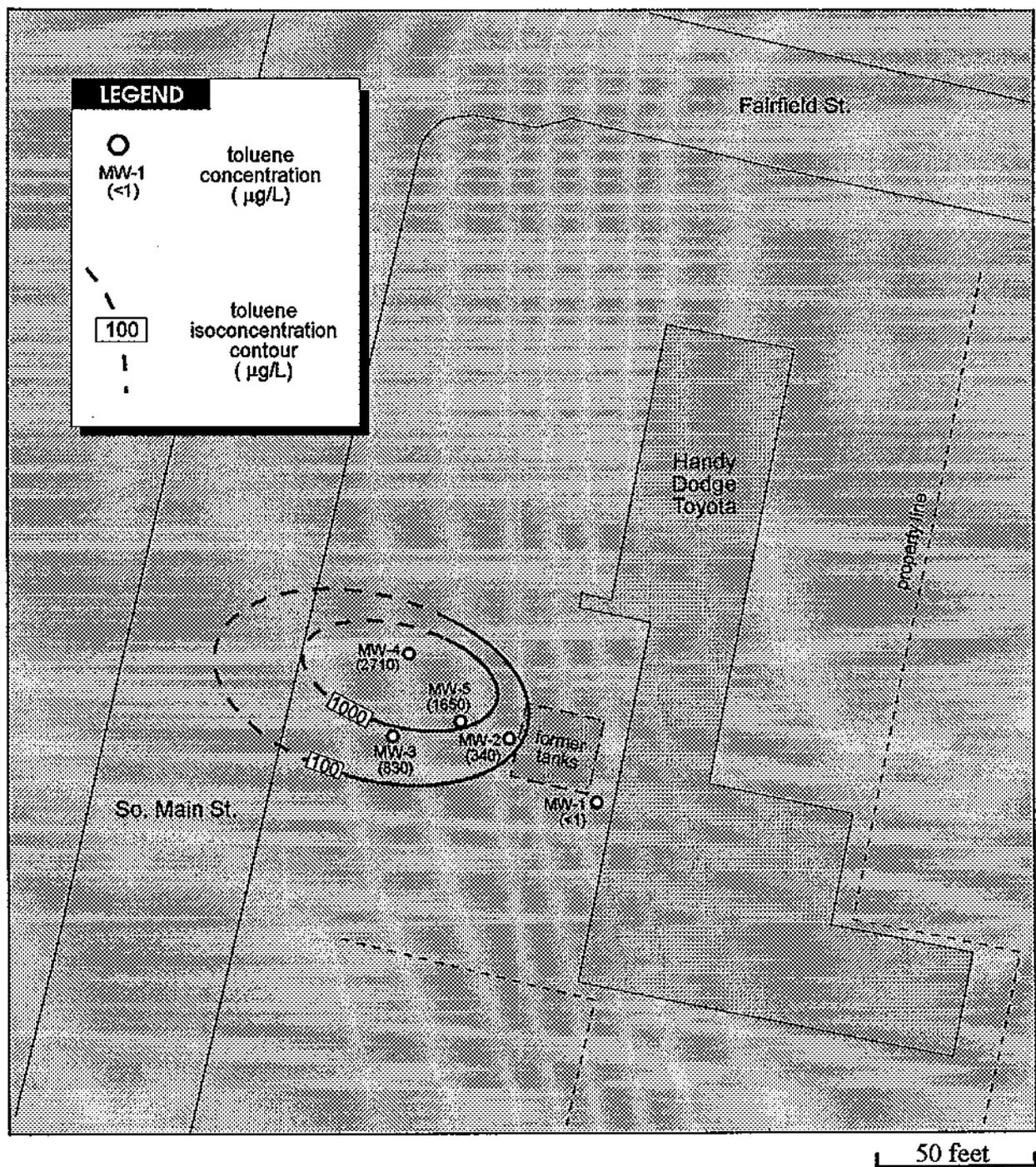


FIGURE 7
 Toluene isoconcentration map, December 2, 1993,
 Handy Dodge/Toyota, St. Albans, Vermont.

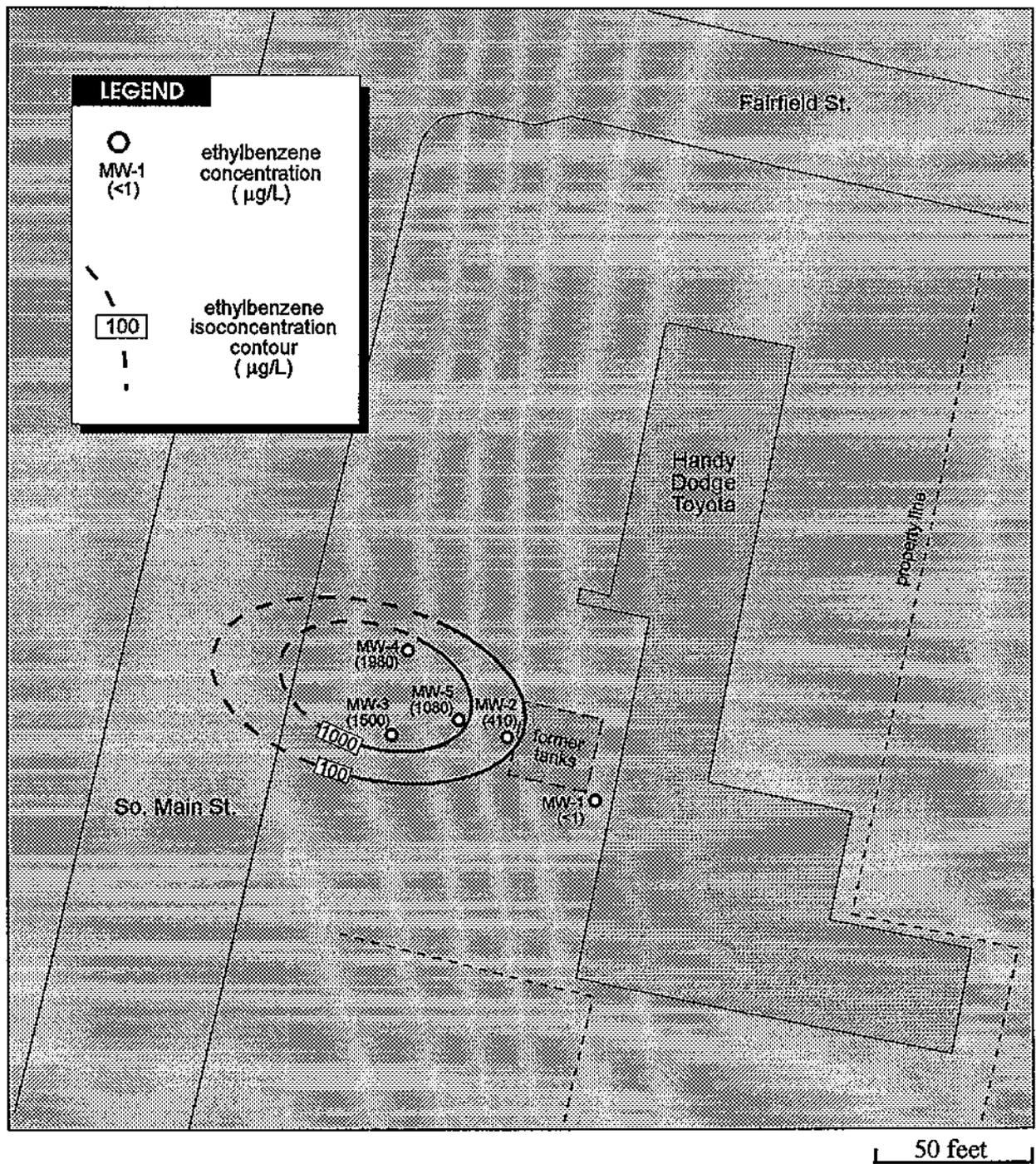


FIGURE 8
Ethylbenzene isoconcentration map, December 2, 1993,
Handy Dodge/Toyota, St. Albans, Vermont.

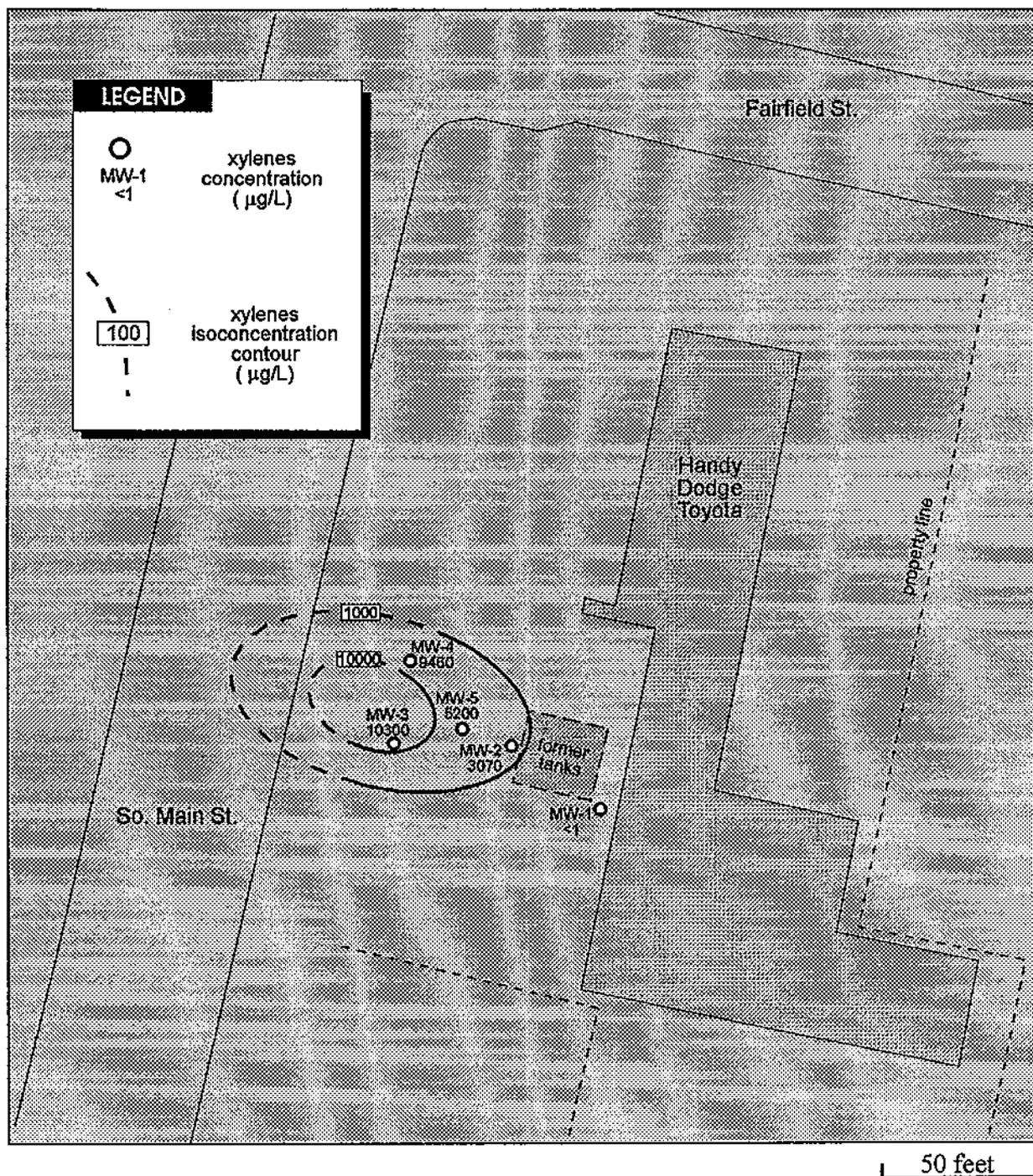


FIGURE 9
 Xylenes isoconcentration map, December 2, 1993,
 Handy Dodge/Toyota, St. Albans, Vermont.

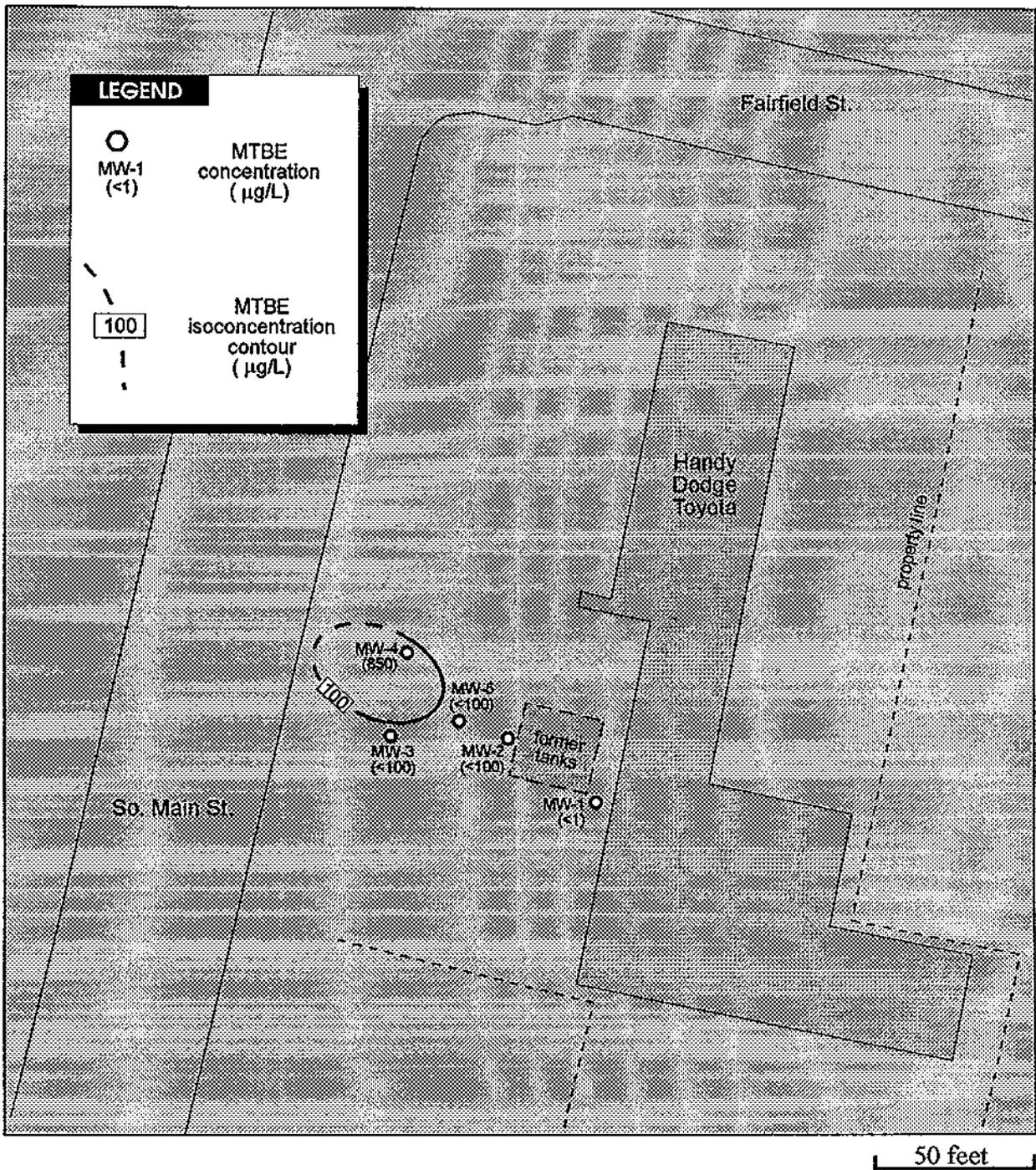


FIGURE 10
 MTBE isoconcentration map, December 2, 1993,
 Handy Dodge/Toyota, St. Albans, Vermont.

TABLE 3
PID headspace results for split-spoon samples collected during well installation,
Handy Dodge/Toyota, St. Albans, Vermont.

MW-1		MW-2		MW-3		MW-4		MW-5	
Depth (ft)	PID (ppm)								
2.5-4.5	0.2	2.5-4.5	23	2.5-4.5	845	2.5-4.5	75	5-6	88
4.5-6.5	0.3	5-7	41.4	4-6	1490	4-6	1008	6-6.5	18.8
8-10	0.2	8-9	6	6-8	5.5	6-8	314		
				7-8	13	8-9	49.5		

no measurable accumulations of free-phase product has been found in the monitoring wells, some free-phase product remains as residual saturation in site soils. It should be pointed out that prior to removal of the tanks, the area surrounding the tanks was covered with pavement and cement surfaces, allowing for little or no infiltration.

5.0 DISCUSSION OF RESULTS

5.1 Source and Extent of Contamination

During the tank excavations, elevated PID readings were detected in surrounding and underlying soils. Groundwater sampling results define a contaminant plume migrating downgradient from the former tank area. The distribution of contamination found during this investigation suggests that releases occurred from the tank(s) before they were taken out of service nearly 20 years ago. The downgradient and lateral extent of groundwater contamination has not been defined.

Although no attempt was made to determine the vertical distribution of contaminated groundwater, it is likely that contamination is limited to a shallow zone of groundwater occurring within weathered till and fill materials. Given the low permeability nature of the underlying till, as well as a decrease in soil sample headspace readings with depth, Horizontal flow within the weathered till and flow likely predominates.

A limited amount of free-phase petroleum exists in the subsurface at the site as evidenced by sheens in purge waters and in water/soil mixtures from cuttings. The extent of vapor migration is uncertain, although no elevated PID readings were detected in storm water catch basin nor in a basement hydraulically downgradient of the site.

5.2 Potential Receptors

The nearest surface water feature downgradient from the site contaminant plume is Stevens Brook, which is located 2000 feet downgradient from the site. Based on the low-permeability of the saturated materials at the site, and distance involved, it is unlikely that site contamination will impact Stevens Brook.

The State's water-well inventory database for St. Albans was reviewed to identify nearby water wells. As shown on Figure 10, the nearest well is located over 2000 feet south of the site. The existing data indicates that contamination at the site is limited to a shallow groundwater zone perched on a low-permeability till. Given this hydrogeologic setting,

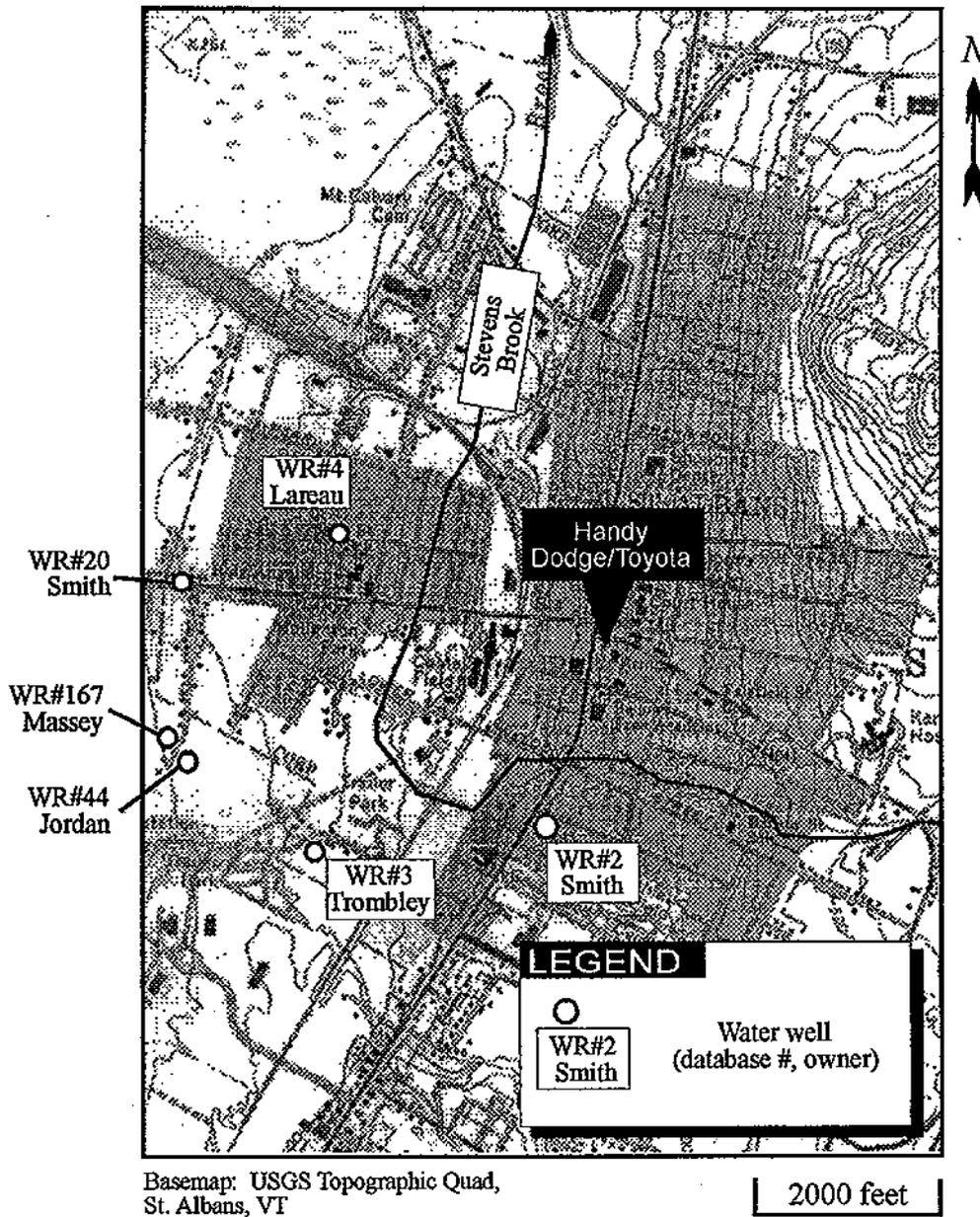


FIGURE 11
 Water-supply wells in the vicinity,
 Handy Dodge/Toyota, St. Albans, Vermont.

and distances from water wells, it is extremely unlikely that site contaminants could reach the identified water wells.

Vapor migration through the unsaturated zone, especially along subsurface utilities, is a possible contaminant migration route at the site. No elevated readings were detected in basement directly across South Main Street from the site, and no elevated readings were detected in a storm water catch basin downgradient from the former tank locations. Neither the Handy buildings nor the vacant building just south of the former tank area have basements.

Based on the existing data, there does not appear to be an immediate threat to potential receptors. However, the downgradient extent of dissolved-phase contamination has not be delineated. Both dissolved-phase contamination in groundwater and petroleum vapors may have reached buried utilities along South Main Street and migrated along these potential conduits for preferential flow.

5.3 Conclusions and Recommendations

Historical releases of gasoline from USTs recently excavated from the Handy site have impacted site soils and groundwater. Groundwater sampling defines a contaminant plume migrating downgradient from the former tank locations, within a shallow saturated zone consisting of weathered till and fill materials underlain by a dense glacial till.

The distribution of contamination found during this investigation suggests that releases occurred from the tank(s) before they were taken out of service nearly 20 years ago. The downgradient and lateral extent of groundwater contamination has not been defined.

A limited amount of free-phase petroleum exists in the subsurface at the site as evidenced by sheens in purge waters and in water/soil mixtures from cuttings. The extent of vapor migration is uncertain, although no elevated PID readings were detected in storm water catch basin nor in a basement hydraulically downgradient of the site.

Based on the existing data, there does not appear to be an immediate threat to potential receptors. Dissolved-phase contamination in groundwater, free-phase petroleum, and/or petroleum vapors may have reached buried utilities along South Main Street and migrated along these potential conduits for preferential flow.

It is recommended that the downgradient extent of groundwater contamination be further investigated. Additional subsurface investigation at the site is complicated due to the presence of numerous buried utilities and the high-traffic location on Main Street. The numerous buried utilities downgradient of the site may complicate investigation efforts in that these utilities may provide pathways for preferential groundwater flow, which may result in a non-uniform distribution of contamination. There are also many other potential sources of contamination in the vicinity, including numerous historical filling stations and USTs. It is recommended that a utility map be prepared to guide future subsurface investigations at the site. Once this map is developed, a scope of work for additional investigation should be prepared.

Additional subsurface investigations at the site may benefit from the use of less-intrusive techniques such as the GeoProbe™ or HydroPunch™ technologies, as opposed to standard monitoring well installation techniques. The extent of vapor migration and groundwater contamination could be more efficiently delineated by utilizing this approach to collect soil, soil-gas, and groundwater samples.

It is also recommended that Handy proceed with the re-paving of the site as soon as possible in order to minimize infiltration at the site.

REFERENCES

- Bouwer, H., 1989, *The Bouwer and Rice Slug Test - An Update*, Groundwater, Vol. 27, No. 3, pp. 304-309.
- Doll, C.G. (Ed.), 1970, *Surficial Geologic Map of Vermont*, State of Vermont.
- Lincoln Applied Geology, 1989, Various letters and reports on file with the Hazardous Materials Management Division in Waterbury, Vermont.
- Stewart, D.P., 1974, *Geology for Environmental Planning in the Milton-St. Albans Region, Vermont*. Environmental Geology No. 5, Vermont Geological Survey, Water Resources Department, Montpelier, Vermont.

APPENDIX A:
Workplan for Site Investigation and Relevant Correspondence



State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
Natural Resources Conservation Council

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
Hazardous Materials Management Division
103 South Main Street/West Office
Waterbury, Vermont 05671-0404
(802) 241-3888
FAX (802) 244-5141

244-8302

October 12, 1993

Dan Luneau
Handy's Dodge/Toyota
39 South Main Street
St. Albans, VT 05478

RE: Petroleum contamination at Handy's Dodge/Toyota in St. Albans
(Site #93-1470)

Dear Mr. Luneau:

The Sites Management Section (SMS) has received a report outlining the subsurface assessment for the above referenced site, conducted by Michael Fontaine of Pollution Solutions on September 27, 1993. This report summarizes the degree and extent of contamination encountered during the assessment. The tanks pulled were gasoline, underground storage tank (USTs); one 4,000 gallons and the other 3,000 gallons. Both tanks were reportedly in good condition, however the 4,000 gallon UST had a 3-4 inch hole in it.

During the tank pull, soils screened in all locations beneath the tank bed had peak concentrations of greater than 2,500 ppm (the maximum detection level of this instrument) as measured by a photoionization detector (PID). Groundwater was encountered at the bottom of the excavation at a depth of eight feet below ground surface. No free product was observed during the excavation. Petroleum contaminated soils which were stockpiled during the tank pull were moved offsite after receiving approval from the VT Department of Environmental Conservation and the city of St. Albans. An estimated 30 cubic yards of petroleum contaminated soils was polyencapsulated at 290 North Main Street in St. Albans. Soils remaining within the excavation contain high levels of petroleum contamination and the SMS also believes that groundwater has been impacted.

Based on the above information, the SMS has determined that some additional work is necessary at the site in order to determine the severity of contamination present. Therefore, the SMS is requesting that Handy's Dodge/Toyota retain the services of a qualified environmental consultant to perform the following:

1. Determine the degree and extent of contamination to groundwater. Since soils were found to contain evidence of contamination at the water table, a sufficient number of monitoring wells should be installed in locations which will adequately define the severity of contamination at the site. Soil borings should be screened with a PID at five foot intervals to further define the degree and extent of contamination to soils. All groundwater samples taken should be analyzed

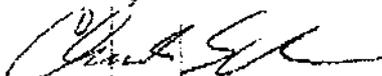
for BTEX and MTBE compounds using EPA Methods 8020.

2. Perform an assessment of the site to determine the potential for sensitive receptors to be impacted by the contamination. This should include basements of adjacent buildings, nearby surface water, and any public or private drinking water wells which are located within the vicinity of the site. If any water supplies appear at risk from this contamination, they should be sampled and analyzed using EPA 8020.
3. Develop a plan to treat and/or monitor the 30 cubic yards of stockpiled soils located at 290 North Main Street. The soils must be located in an area such that they have a low potential to impact nearby receptors. They must also be properly encapsulated in plastic. If the soils are to be moved offsite, the SMS or UST Program must grant permission prior to their transport.
4. Determine the need for a long term treatment and/or monitoring plan which addresses the contamination present at the site. The need for such a plan should be based on the results of the above investigations.
5. Submit to the SMS a summary report which outlines the work performed as well as providing conclusions and recommendations. Included should be detailed well logs, analytical data, site map, area map which shows the location of the stockpiled soils, and a groundwater contour map.

Please have your consultant submit a preliminary work plan and cost estimate within fifteen days of our receipt of this letter so that it may be approved prior to the initiation of onsite work. Enclosed please find a list of consultants who perform this type of work in the area as well as the brochure "Selecting Your UST Cleanup Contractor", which will help you in choosing an environmental consultant.

The underground storage tanks at Handy's Dodge/Toyota are covered by the Petroleum Cleanup Fund as set forth in 10 V.S.A. Section 1941. An owner or permittee of an underground storage tank, who is not in significant violation of his or her permit, is eligible for reimbursement from the fund. The owner or permittee must pay for the removal or repair of the failed tank and for the first \$10,000 of the cleanup; after that the fund will reimburse the tank owner or permittee for additional cleanup costs up to \$1 million. The fund does not pay for cleanup costs which are covered by insurance or for cleanup work that is not pre-approved by the Agency. Please refer to the attached guidance document titled, "Reimbursement Package for the Petroleum Cleanup Fund" for further information on this program. Additionally, the Secretary of the Agency of Natural Resources reserves the right to seek cost recovery of fund monies spent at the Handy Dodge/Toyota site if the Secretary concludes that Handy's Dodge/Toyota is in significant violation of the Vermont Underground Storage Tank Regulations and the Underground Storage Tank statute (10 V.S.A., Chapter 59). If you have any questions, please feel free to call.

Sincerely,


Chuck Schwer, Supervisor
Sites Management Section

cc: St. Albans Board of Alderpersons
DEC Regional Office

October 27, 1993

2 copies sent

WORKPLAN FOR SITE INVESTIGATION
HANDY DODGE/TOYOTA
39 SOUTH MAIN STREET
ST ALBANS, VERMONT
October 27, 1993

PURPOSE

This workplan has been prepared to investigate the degree and extent of petroleum contamination resulting from two underground storage tanks (USTs) recently excavated at the Handy Dodge/Toyota in St. Albans, Vermont. The site investigation will include a subsurface investigation near the former tank locations at 39 South Main Street, and an evaluation of contamination within soils excavated during the tank removals which are presently stockpiled at 260 North Main Street. The UST site and stockpile locations are shown on Figure 1.

The technical requirements for this investigation were presented in an October 12, 1993 letter to Dan Luneau from Chuck Schwer, Supervisor of the Sites Management Section, Vermont Agency of Natural Resources (State).

UST REMOVALS

Two USTs (one 3000-gallon, one 4000-gallon, both gasoline) were excavated and removed from the Handy Dodge/Toyota property at 39 South Main Street on September 27, 1993. The tank removals and initial site assessment were performed by Pollution Solutions of Vermont, Inc. (PSOV), and are summarized on the attached State tank pull forms and letter to the State from PSOV. The PSOV letter reports that the 4000-gallon tank had a 3-4 inch opening and was leaking. The tank pull form indicates 150 gallons of waste pumpage. Photo-ionization detector (PID) readings for soil removed from the excavation and from below the tank beds were 2500 ppm. Groundwater was encountered at depth of approximately eight feet. Excavated soils were transported to 260 North Main Street and encapsulated.

BACKGROUND INFORMATION

According to Mr. Luneau, the two on-site tanks were utilized by a gasoline station between 1960 and 1974. The last recorded delivery of fuel to these tanks was in October, 1974. Handy Dodge/Toyota began operations at the site in 1976, and never used the tanks.

A number of past and present gasoline stations exist in the immediate vicinity. A site investigation and remedial effort was performed at Joe Miller's Gulf Station, which is located a few hundred feet south of Handy Dodge/Toyota. The Hazardous Materials Management Division's file on this site contains consultant's reports regarding hydrogeologic investigations performed at the site. Subsurface materials encountered during monitoring well installations at the site included medium sands and fill materials, underlain by a weathered glacial till. The till was found at depths ranging from five to seven feet, and depth to groundwater at the site ranges from one to seven feet across the site. Groundwater at the site flows from east to west, under a hydraulic gradient in the range of 0.089 ft/ft.

SCOPE OF WORK - Soil Stockpile Screening

Approximately 30 cubic yards of soil was excavated during the UST removals, and is presently stockpiled at 260 North Main Street. In order to evaluate soil treatment/disposal options, a soil screening program will be implemented to measure contaminant concentrations within the stockpiled soils. Soil contaminant concentrations will be screened using a PID.

Figure 2 presents a diagram of the soil stockpile and a proposed sampling grid. Proposed sampling depths are as follows; 0 to 6 inches, 12 to 18 inches, and 24 to 36 inches. Soil samples will be collected with a hand-driven auger and placed into plastic bags or glass jars. Headspace readings will be measured after all samples have been collected and equilibrated to room temperature. A Photovac Microtip HL-2000, equipped with a 10.6 eV bulb and calibrated with an isobutylene standard, will be used to measure sample headspaces. The maximum reading for each sample will be recorded.

SCOPE OF WORK - Hydrogeologic Investigation

A hydrogeologic investigation will be implemented to define site hydrogeologic characteristics (stratigraphy, permeability, flow direction, and flow rate) and to define the degree of contamination. Four groundwater monitoring wells will be installed and sampled at the site. A general site characterization will also be performed to identify potential receptors such as water-supply wells, surface waters, and buildings/residences. The following work items will be performed.

- General site characterization - Information on the site environmental setting will be collected from such sources as USGS topographic maps, SCS maps, geologic and hydrologic reports, and the Water Supply Division's water-well inventory database. Surface waters and other relevant hydrologic features in the vicinity will also be identified.

A site location map will be prepared using a 1:24,000 USGS topographic map as a base (see Figure 1). A site vicinity map will be prepared using a 1:5,000 orthophoto or enlarged USGS topographic map to highlight local relevant features. A site map at a scale of 1 inch = 50 feet (or less) will be used to display monitoring well locations, groundwater elevation contours and flow directions, and contaminant distribution.

- Groundwater monitoring well installation. - Four soil borings/monitoring wells are proposed at the site. Proposed locations are presented on Figure 3, and are based on expected groundwater flow directions. Well #1 is sited in the inferred upgradient direction. Well #2 is sited directly downgradient (within 10 feet) of the former tank locations. Wells #3 and #4 are located approximately 30 feet from the former tanks in the expected downgradient direction. The proposed well configuration is designed to allow measurement of the water table, and to obtain groundwater samples downgradient of the former tanks.

Boreholes will be advanced using hollow-stem augers. Split-spoon samples will be collected every five feet. Split-spoon samples and cuttings returned on the auger flights will be visually inspected and described according to USDA soil classifications. Soil samples will be collected from the split-spoons and field-screened using a PID to qualitatively assess soil contamination. Soil samples will be collected from the split spoons and placed into plastic bags or glass jars, in preparation for field screening with the PID.

Boreholes will be advanced approximately five feet below the water table. Wells will be constructed with 10 feet of two-inch factory-slotted (10 or 20-slot), flush-thread, PVC well screen. The well screen will be positioned so that approximately five feet of screen is below the water table. 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 to at least one foot above the top of the screen. The remaining annular space will be sealed with bentonite. 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. All development waters will be collected and placed into 55-gallon drums at the site.

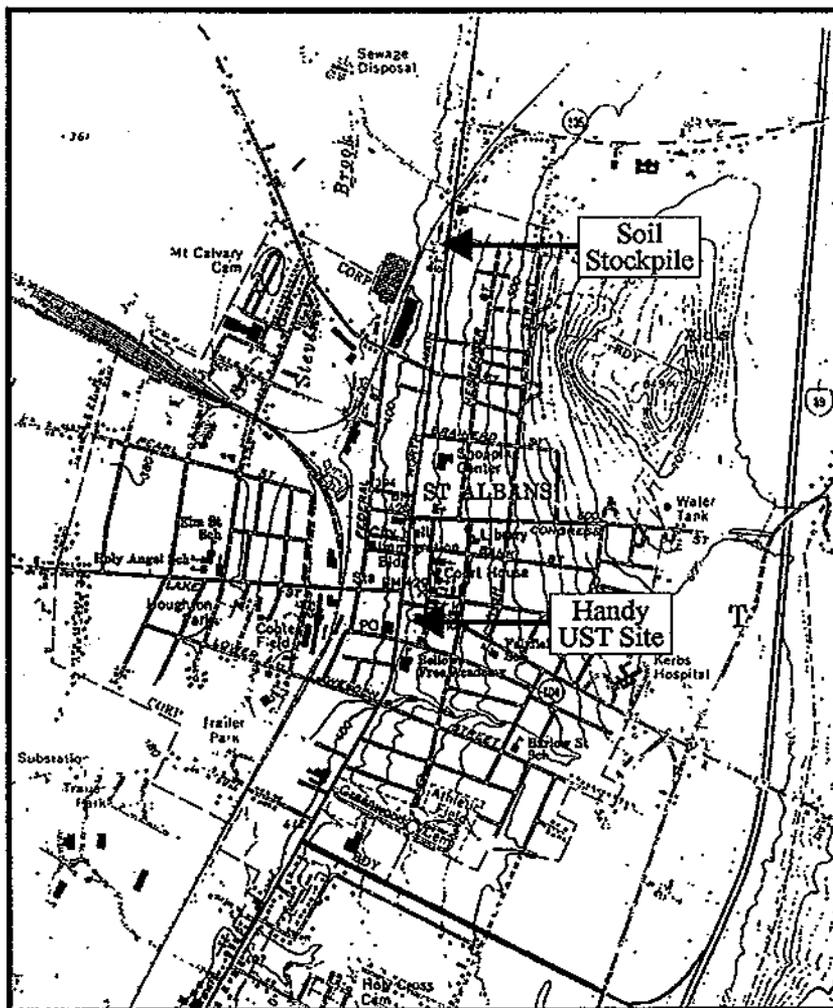
During the well drilling and installation activities, the PID will be utilized to monitor for the presence of organic vapors. The vapor monitoring will be used to detect zones of contamination, and also to monitor worker air-space for health and safety concerns.

- Slug testing. Slug testing will be performed on the monitoring wells to measure the hydraulic conductivity of the saturated materials screened by the monitoring wells.
- Groundwater elevation surveys - A site survey will be performed to provide a basemap showing well locations and physical structures at the site. Monitoring well elevations will be surveyed to allow calculation of groundwater elevations. 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. Two water-level surveys will be performed. The initial survey will occur a few days after the installation/development of the monitoring wells. A second round of water-level measurements will be taken at the time of groundwater sampling. Groundwater elevation maps will be prepared for both water-level surveys.
- Groundwater sampling. One round of groundwater sampling will be performed. Samples will be collected from each of the four monitoring wells. The monitoring wells will be purged of three well volumes (or until dry) by bailing or pumping. Samples will be collected using a Teflon™ bailer equipped with a bottom-emptying stopcock to minimize sample agitation. All sampling equipment will be

decontaminated between sampling points with an Alconox™ scrub/tap water rinse/methanol rinse/deionized water rinse. Quality assurance/quality control samples will include a trip blank, a field/equipment blank, and a blind duplicate. The trip blank will be provided by the laboratory and will be transported to the site, handled the same as other samples, and returned to the laboratory for analysis. The field/equipment blank will be prepared by pouring deionized water through the teflon sampling bailer, 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 ice. The samples will be transported to a laboratory and analyzed for BTEX compounds using SW-846 8020. A laboratory chain-of-custody form will be utilized to document the sampling event. All field measurements and observations will be recorded on a sampling data sheet.

- Health & Safety - A Health & Safety Plan will be prepared for work performed at the site.
- 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, and potential receptors. Groundwater flow directions and estimates of groundwater flow rates will be presented. The report will include logs, tables, vicinity and site maps, contour maps, cross-sections, and other figures, as appropriate. The report will also provide recommendations concerning subsequent investigations or remediation efforts which may be deemed necessary at the site. The results of the soil stockpile screening will also be presented and evaluated in the report.
- Project Schedule - The anticipated project schedule/duration is shown on Table 1.
- Project Costs - The estimated project cost is as follows.

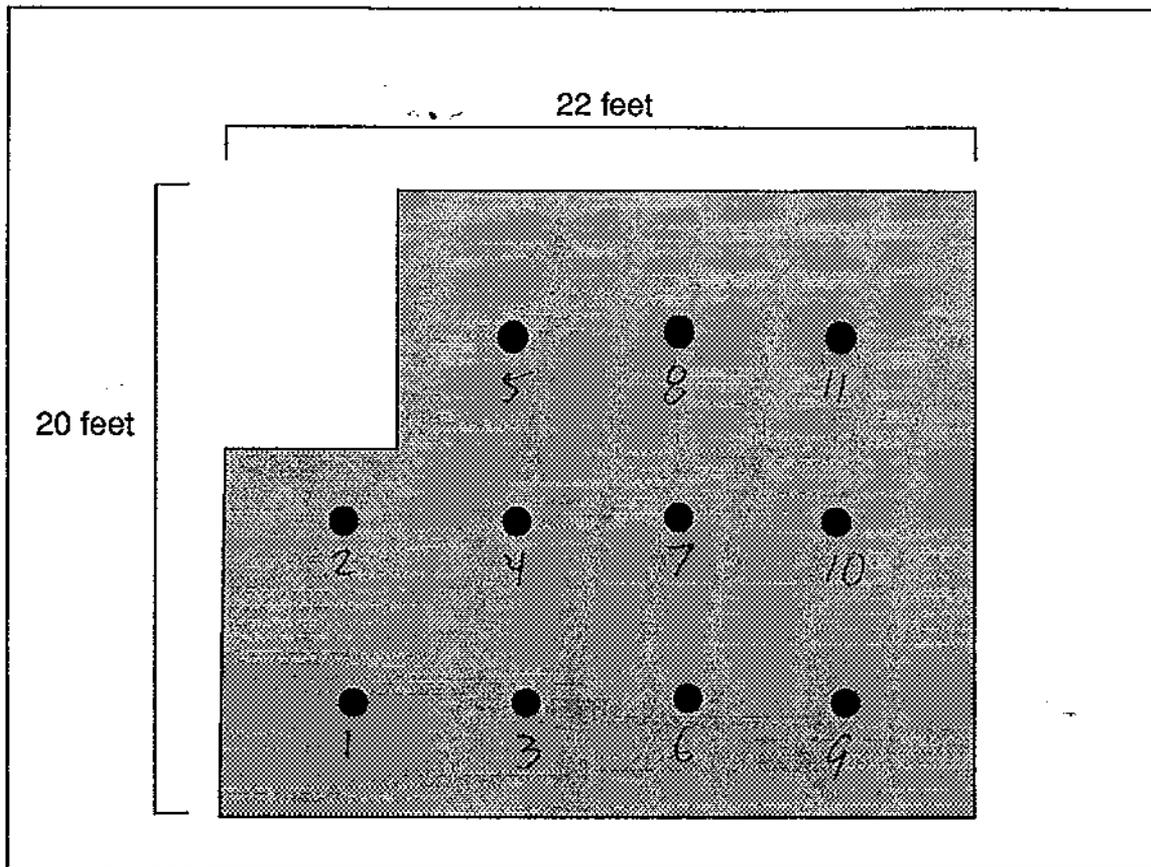
Hydrogeologic Consultant	\$2,844
Soil Boring Contractor	\$2,200
Surveyor	\$450
Laboratory	\$455
TOTAL	\$5,949



Basemap: USGS Topographic Quad,
St. Albans, VT

2000 feet

FIGURE 1
Site Location Map, Handy Dodge/Toyota,
St. Albans, Vermont.

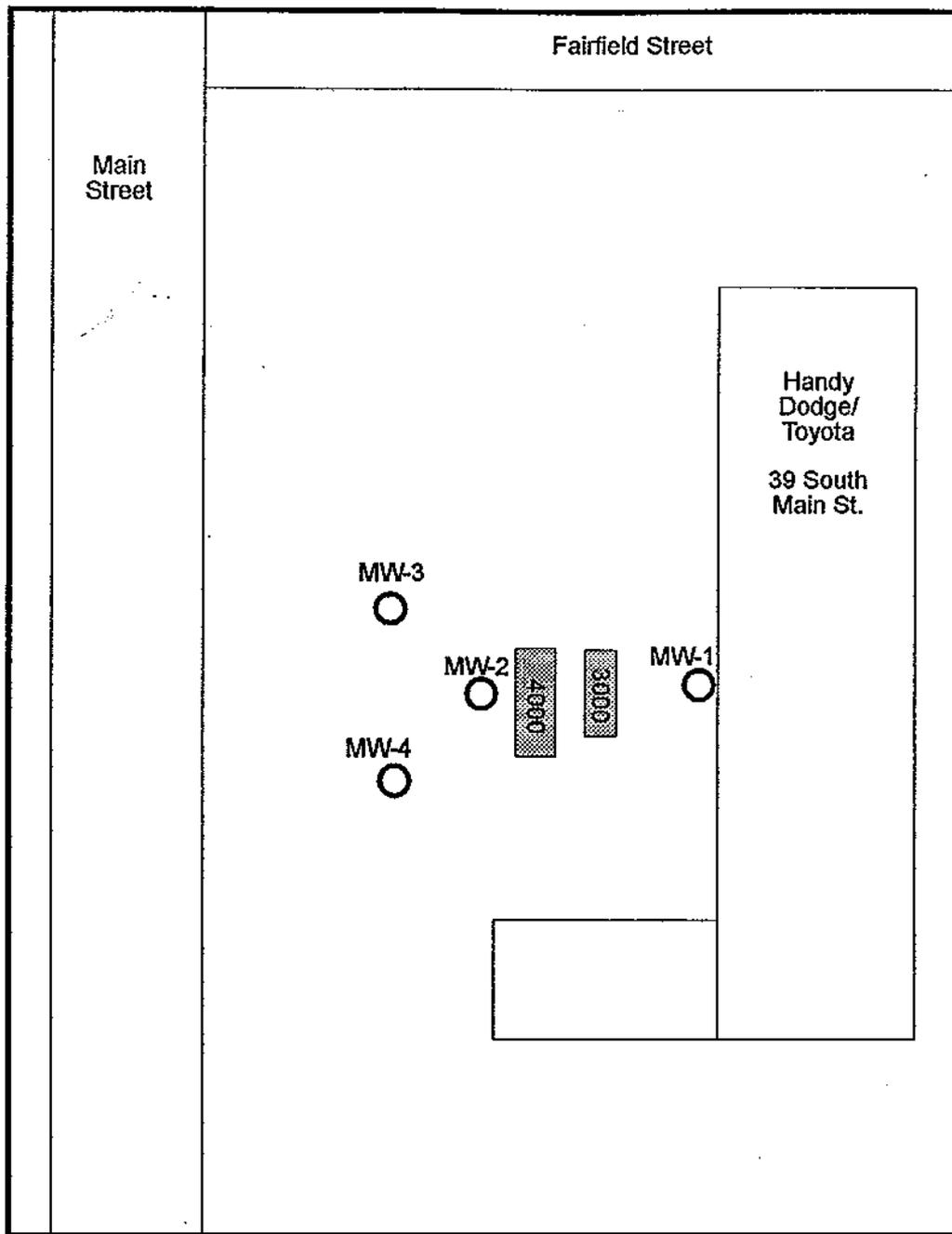


● *proposed sampling location*

proposed sampling intervals:

- 0-6" A
- 12-18" B
- 24-36" C

FIGURE 2
Soil stockpile configuration and proposed sampling locations,
Handy Dodge/Toyota, St. Albans, Vermont.



NOT TO SCALE

FIGURE 3
Site Diagram Showing Proposed Monitoring Wells,
Handy Dodge/Toyota, St. Albans, Vermont.

TABLE 1

Workplan implementation schedule/duration,
Handy Dodge/Toyota, St. Albans, Vermont.

	Time in Weeks (After Authorization to Proceed)								
	1	2	3	4	5	6	7	8	9
<u>Soil Stockpile Screening</u>									
<u>Monitoring Well Installation</u>									
<u>Groundwater Sampling</u>									
<u>Laboratory Analyses</u>									
<u>Report</u>									



**POLLUTION
SOLUTIONS**
OF VERMONT
INCORPORATED

VT Dept Environmental Conservation
103 South Main Street
Waterbury, VT 05671-0404

~~877-6543~~
241-3888
Mark Coleman

Ref: Handy Dodge Toyota
39 South Main St.
St. Albans, VT 05481

On 9/27/93 PSOV removed two gasoline tanks from the above property. One(1), 3000 gallon and one (1) 4000 gallon. The 4000 gallon tank was leaking there was a 3-4 inch opening on the south end in a corner seam. All the soil removed from excavation was stock piled. P.I.D. reading was over 2500 ppm. Several samples were drawn from below tank bed's, and all read over 2500 on P.I.D. The hole was back filled with clean fill. After the tanks were removed the hole slowly started to fill with ground water approximately 8 feet. Stock pile soil was moved to another site owned by owner: 260 north main street St. Albans. I drove to the site prior to moving the soil and check to ensure that the site met criteria for stock piling. Once I inspected the site, I spoke with Chuck Swayer and discussed the site with him. He then authorized the moving of the soils, soil stock piles on poly and covered with poly. Once covered it was fenced in using orange snow fence. This site is certainly a problem site and needs further investigation. Also enclosed is a copy of the letters of approval for stock piling from the city manager.

If you have any questions please feel free to call me at POLLUTION SOLUTIONS OF VT., INC. any time. 802-860-1200.

Sincerely,

Michael Fontaine
Remediation Manager

ma (I called) 10 93
Maura (she called) 9:37 10-5-93
said she posed mife to give message!

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
UNDERGROUND STORAGE TANK PROGRAM
TANK PULL FORM

TODAY'S DATE: 9/27/93

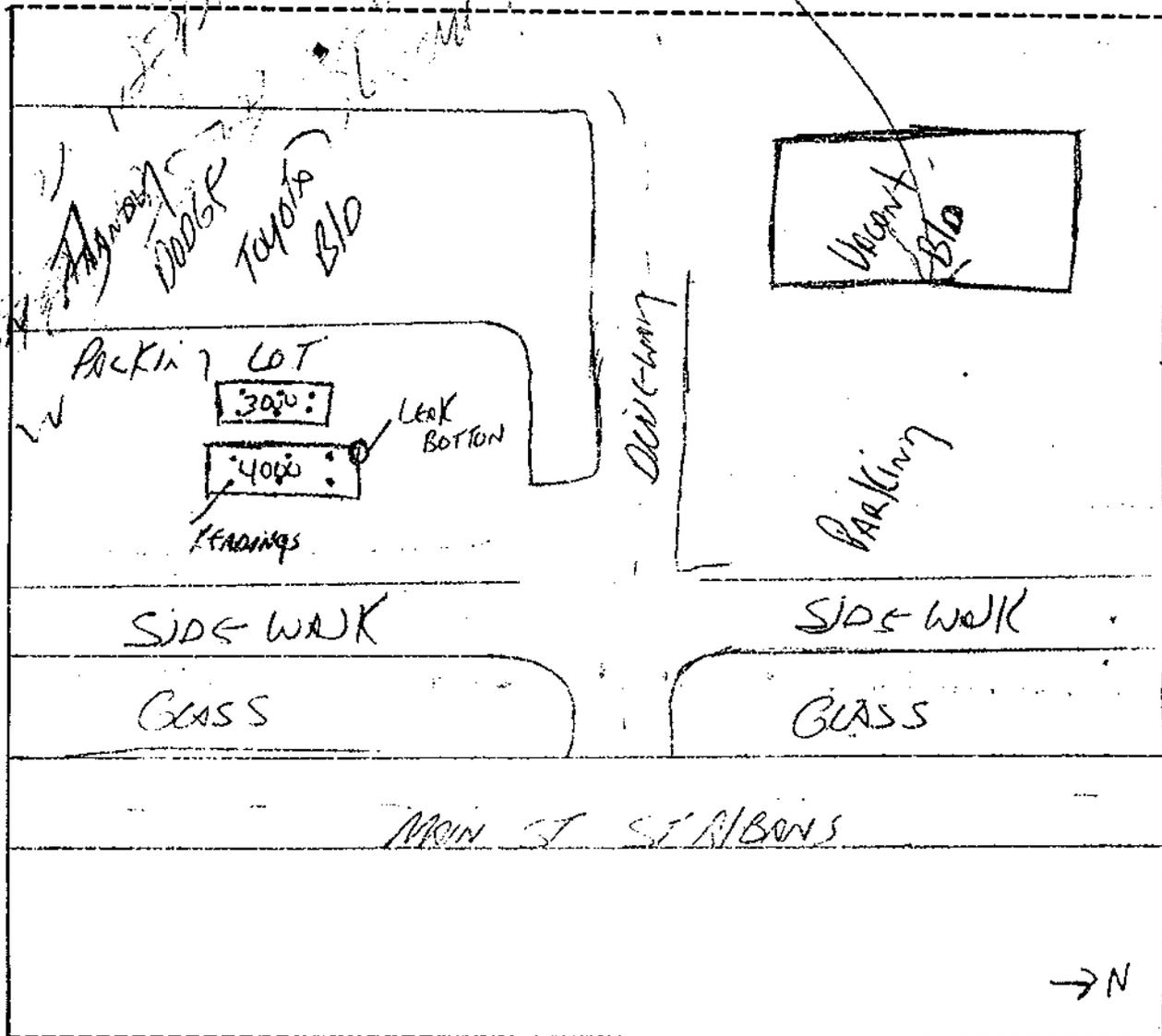
INSPECTOR: MIKE DOWLING

DATE OF REMOVAL: 9/27/93

BUSINESS NAME: POLLUTIONS SOLUTIONS
OF VERMONT

SITE DIAGRAM

Show location of all tanks and distance to permanent structures, sample points, areas of contamination and any pertinent site information. Indicate North arrow and major street names or route number.



VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
 UNDERGROUND STORAGE TANK PROGRAM
 103 SOUTH MAIN STREET
 WATERBURY, VERMONT 05671-0404
 (802) 244-8702

Date of Removal: _____ Date of Assessment: 9/27/93
 Person & Company Doing Assessment: MKE CONTINENTAL
 Telephone Number: 802-865-1000
 Business Name Where Tank(s) Located: HANDY COOLERS TOYOTA
 Number of Employees: 12
 Street Address & Town/City: 39 SO MAIN ST ST ALBANS VERMONT
 Owner of Tank(s): _____
 Address: SAME Contact Person: DAN CONEY
 Town/City: _____ Phone Number: 802-527-7512
 UST Facility ID Number: NONE

Tank #	Product	Size	Condition
1	<u>GASOLINE</u>	<u>3000</u>	<u>GOOD</u>
2	<u>GASOLINE</u>	<u>4000</u>	<u>GOOD EXCEPT FOR 1 HOLE</u>
3			
4			

Reason for Tank Removal (check one): abandoned routine replacement
 tank or piping leaking liability
 Replacement Tank(s)? yes no Number of Replacement Tanks: 0
 DEC UST Permit(s) Obtained? yes no
 DEC-Permitted Tank(s) Still On-Site? yes no Number of Tanks: _____
 Out of Service Tank(s) On-Site? yes no Number of Tanks: _____
 Heating Oil Tank(s) On-Site? yes no No. of Tanks: _____ Size(s): _____

Any Waste Pumpage? yes no Estimated Volume: 150 Gallons
 Transported By: Permitted Solvent Co. of VT

Size of Excavation (ft²): 20x40 Depth: 8" Soil Type: GRAVEL SAND
 Concentrations Detected with PID: Peak = _____ Average = OVER 2500
 Type of PID: NUCEN TRAC 1000
 Number of Readings (please put locations on attached drawing): 10
 Calibration Info. (date, time, type of gas): 9/27/93

Free Phase Product Encountered? yes no Approx. Amount: _____
 Cont. Soils Stockpiled? yes no Amount (yd³): 30 yds
 Cont. Soils Backfilled? yes no Amount (yd³): _____

Groundwater Encountered? yes no Depth to Groundwater: 8 FT
 Monitoring Wells Installed? yes no Number: _____ Screen Depth: _____

On-Site Drinking Well? yes no (if yes: rock gravel spring)
 Public Water Supply Well(s) Within 1/4 Mile? yes no
 Distance to nearest: 10 MWPS
 Private Water Supply Well(s) Within 1/4 Mile? yes no How Many? _____

Samples Collected for Laboratory Analysis? yes no How Many? _____
 [check all that apply: soil groundwater drinking water]

Receptors Affected (check all that apply):
 soil residential; # of houses/people: _____
 groundwater surface water; name/type of water body: _____

Signature of Owner or Authorized Representative: [Signature]
 Date: 9/27/93
 Signature of Person Performing Site Assessment: [Signature]
 Date: 9/27/93

*** ATTACH OBSERVATIONS, CONCLUSIONS, AND DRAWING ON A SEPARATE PAGE ***



State of Vermont

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
Hazardous Materials Management Division
103 South Main Street/West Office
Waterbury, Vermont 05671-0404
(802) 241-3888
FAX (802) 244-5141

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
Natural Resources Conservation Council
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

November 8, 1993

Dan Luneau
Handy Dodge/Toyota
39 South Main Street
St. Albans, VT 05478

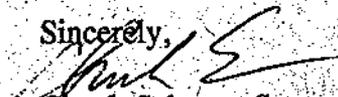
RE: Petroleum contamination at Handy's Dodge/Toyota in St. Albans.
(Site #93-1470)

Dear Mr. Luneau:

The Sites Management Section (SMS) has reviewed the workplan for subsurface investigation proposed by Jefferson P. Hoffer on October 27, 1993. The SMS approves the workplan and requests that onsite work be initiated as soon as possible.

Please keep the SMS informed of work scheduled to be performed at the site, as well as forwarding sampling and analytical results as they become available. If you have any questions, please feel free to call.

Sincerely,


Chuck Schwer, Supervisor
Sites Management Section

cc: Jefferson P. Hoffer, Consulting Hydrogeologist

jasonf/wp50/931470

December 7, 1993

Chuck Schwer, Supervisor
Sites Management Section
Department of Environmental Conservation
103 South Main Street/West Office
Waterbury, VT 05671-0404

Re: Contaminated Soil, Handy Dodge/Toyota, St. Albans, Vermont

Dear Mr. Schwer:

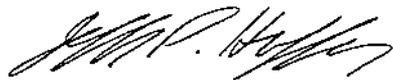
In accordance with the workplan dated October 27, 1993, I recently completed a PID screening of the Handy Dodge/Toyota soil stockpile located at 260 North Main Street, St. Albans. The sample locations are shown on the enclosed Figure 1, and results are given on Table 1. For comparison purposes, headspace readings were measured with a MicroTIP and an HNU. Figure 2 presents a graph of MicroTIP verses HNU readings.

Although the MicroTIP results were lower than the >2500 ppm average reported during the tank removals, the average MicroTIP reading was 760 ppm (180 ppm for the HNU). We have obtained a price quote from Environmental Products & Services (EP&S) to handle the removal and disposal of the soil. EP&S intends to dispose of the soil at an out-of-state asphalt facility. A copy of EP&S's cost estimate is enclosed. Please let us know if you approve of this approach.

With regard to the site investigation at 39 South Main Street, groundwater samples were recently collected (December 2, 1993) from five monitoring wells at the site. We will forward a copy of the analytical results to you as soon as we receive them.

Please contact myself at 244 - 5573 or Dan Luneau at 527 - 7512 if you have any questions.

Sincerely,

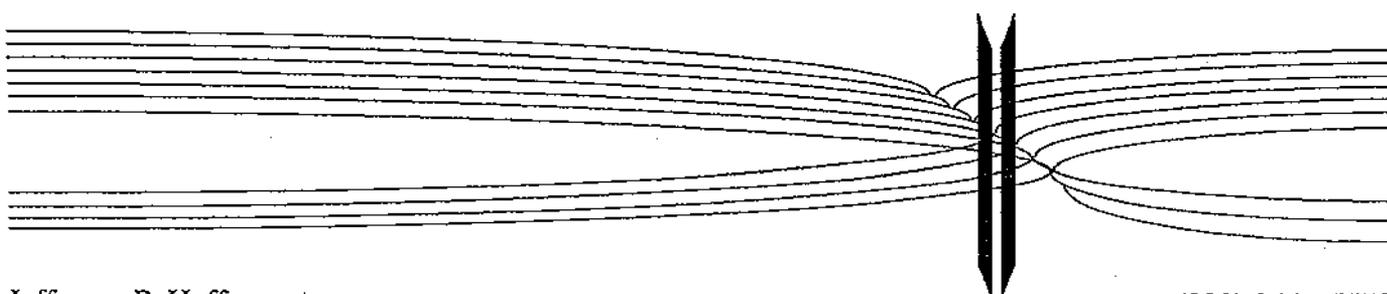


Jefferson P. Hoffer
Consulting Hydrogeologist

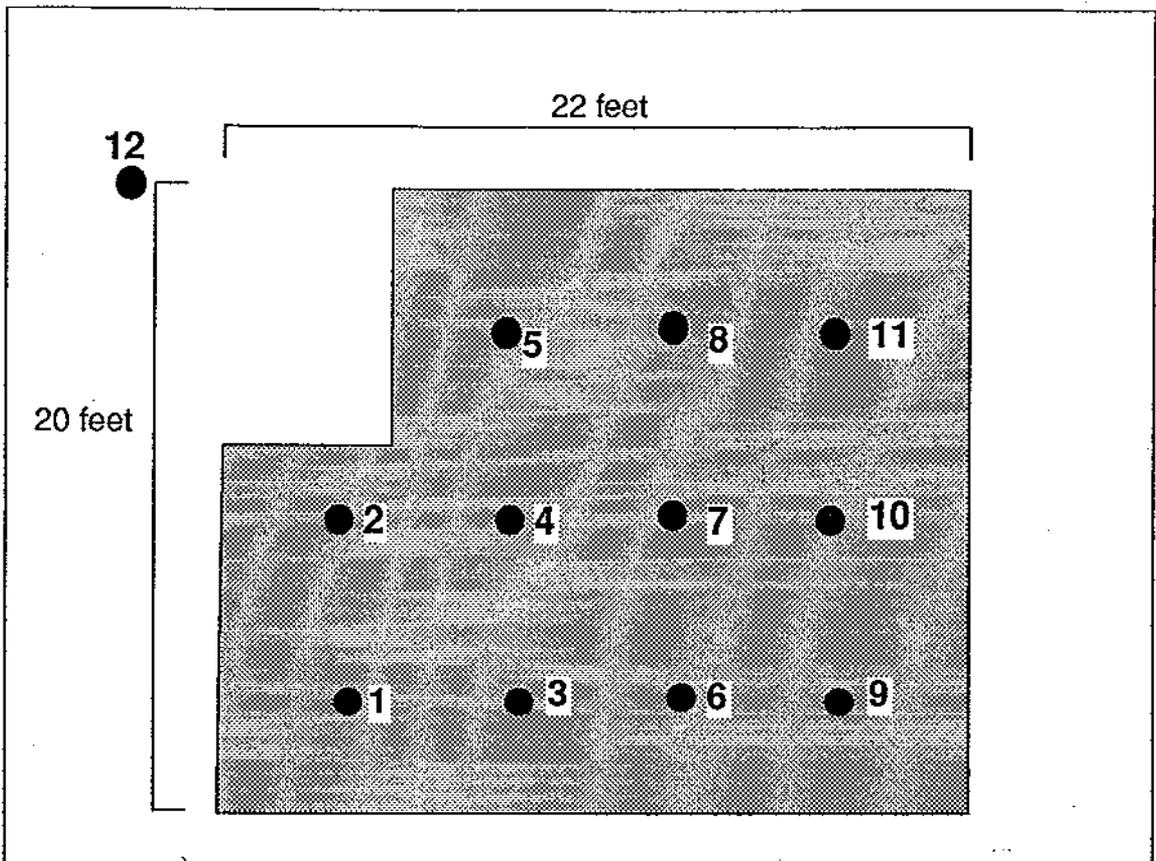
enc.

cc: Dan Luneau, Handy Dodge/Toyota

Jefferson P. Hoffer
Consulting Hydrogeologist



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



● 1 *sampling location
and boring number*

sample depths:
 A 0-6"
 B 12-18"
 C 24-32"

FIGURE 1
 Soil stockpile configuration and soil sampling locations,
 Handy Dodge/Toyota, St. Albans, Vermont.

TABLE 1
Soil Stockpile Headspace Readings,
Handy/Dodge Toyota, St. Albans, Vermont.

Boring Number	Thickness of Stockpile (feet)	Depth Interval	MicroTIP (ppm)	HNU (ppm)
1	3	A	43.9	26
		B	146	64
		C	521	170
2	3	A	74.2	32
		B	563	180
		C	534	175
3	3	A	129	55
		B	212	132
		C	156	98
4	3	A	133	72
		B	717	220
		C	444	156
5	4	A	90.1	45
		B	767	200
		C	726	300
6	6	A	175	105
		B	1478	300
		C	1871	300
7	4	A	243	102
		B	594	200
		C	357	124
8	4	A	379	120
		B	680	280
		C	2002	280
9	4	A	1767	320
		B	2207	280
		C	2169	220
10	4	A	296	136
		B	1486	300
		C	1277	260
11	4	A	280	118
		B	1335	310
		C	1271	270
12*	-	A	3.3	1

NOTES:

MicroTIP HL-2000 with 10.6 eV bulb

HNU, 10.2 eV bulb

Depth Intervals:

A = 0 to 6", B = 12 to 18", C = 24 to 32"

* Boring #12 located on native soil 20 feet from stockpile

Headspace Readings, Gasoline-Contaminated Soil Handy Dodge/Toyota

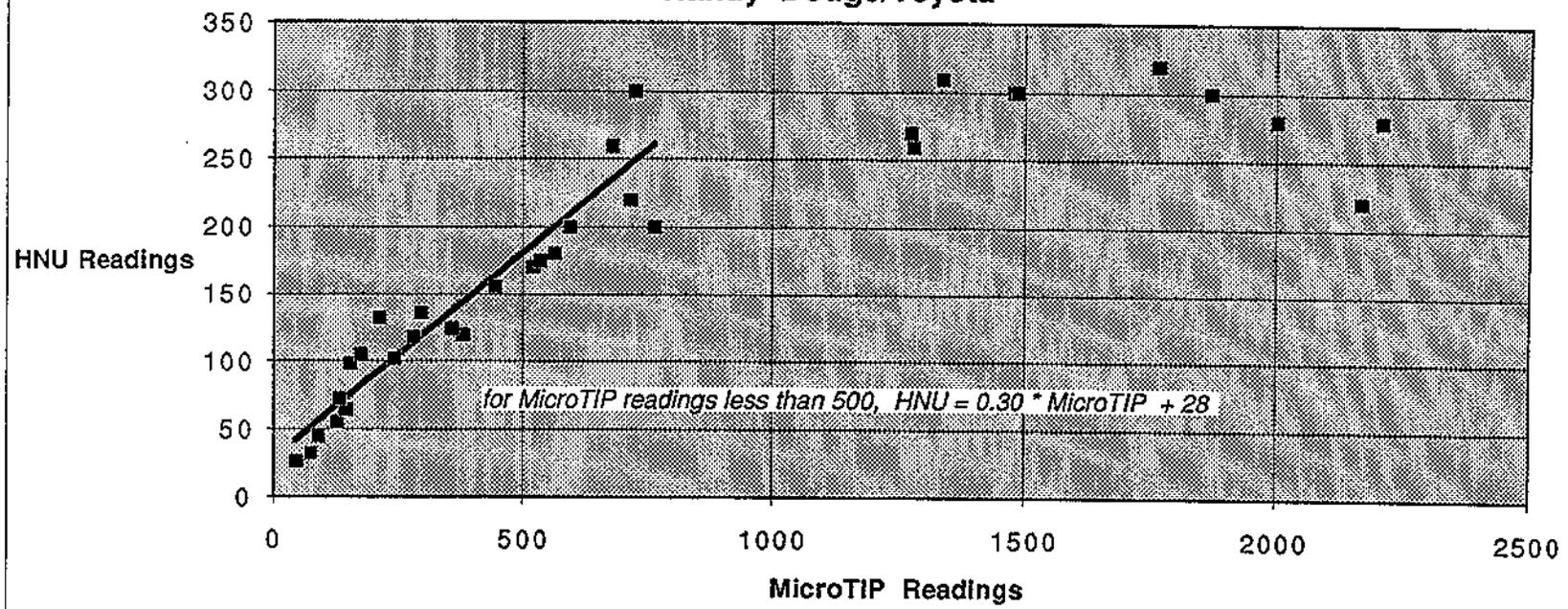


FIGURE 2
Comparison of MicroTIP versus HNU Headspace Readings,
Handy Dodge/Toyota Soil Stockpile, St. Albans, Vermont.

Environmental

PRODUCTS & SERVICES, INC.

2 Flynn Avenue
Burlington, VT 05401
(802) 862-1212
FAX (802) 860-7445

(800) THE-TANK

Port of Albany
Albany, NY 12202
(518) 465-4000
FAX (518) 465-5722

December 6, 1993

Jeff Hoffer
Handy Dodge/Toyota
39 South Main Street
St. Albans, VT 05478

Dear Jeff,

Environmental Products & Services, Inc. is pleased to present the following quotation for services to be performed at your St. Albans, Vermont site.

Environmental Products & Services, Inc. will provide all labor, materials and equipment necessary to perform the following scope of work:

SCOPE OF WORK

Disposal of gasoline contaminated soil stock pile (approx 30 yards) to an Asphalt Batch Incineration Facility. The stock pile to be removed is located in St. Albans, Vermont. Work includes:

- A. Disposal
- B. Transportation
- C. Loading
- D. Paperwork
- E. Lab Analysis

PROJECT COST

Disposal and Transportation Costs:	\$65.00 per ton (minimum 15 tons per load)
Loading and Paperwork Costs:	\$300.00
Lab Analysis Costs for Asphalt Batch Incineration	\$1,350.00/sample

Jeff Hoffer
December 6, 1993
Page 2

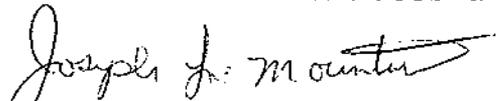
Above costs are based on the following items:

1. All pricing based on Asphalt Batch Incineration Facility approval.
2. Free and easy access for personnel and equipment.
3. A customer representative must be present for the signing of all shipping documents. Environmental Products & Services, Inc. will assist in the completion of these forms.
4. Work will conform to all local, state, and federal regulations.

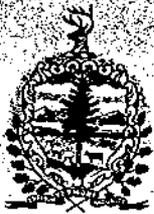
If you have any questions or require additional information, please contact me at (802) 862-1212, FAX (802) 860-7445.

Very truly yours,

ENVIRONMENTAL PRODUCTS & SERVICES



Joseph LaMountain, Project Coordinator
Vermont Office



State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
Natural Resources Conservation Council
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
Hazardous Materials Management Division
103 South Main Street / West Building
Waterbury, Vermont 05671-0404
802-241-3888
FAX 802-244-5141

December 21, 1993

Mr. Jeff Hoffer
Consulting Hydrogeologist
P.O. Box 428
Waterbury, VT 05676

RE: Petroleum contaminated soils located at 260 North Main Street, St. Albans, originating from Handy Dodge/Toyota in St. Albans (Site #93-1470)

Dear Mr. Hoffer:

The Sites Management Section (SMS) has received the information on the soil screening of the 30 cubic yards of petroleum contaminated soil originating from the above referenced site.

In light of the excessive costs of disposing the soil at an Asphalt Batch Incinerating Facility, up to \$5,000.00, versus the costs of polyencapsulation until the soils are non-detect, the SMS does not approve of asphalt batching of the 30 cubic yards of soils.

Please feel free to call with any questions or concerns.

Sincerely,

E. Matt Germon, Environmental Engineer
Sites Management Section

cc: Dan Luneau, Handy Dodge/Toyota

mg/1470soils>poly

**APPENDIX B:
Groundwater Sampling Results**

GROUNDWATER SAMPLING DATA SHEET

PROJECT LOCATION: Handy Dodge/Toyota St. Albans, VT
 DATE: 12/2/93

SAMPLE METHOD: Teflon Bailor
 SAMPLERS: J. Hoffer

WELL ID	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	WATER COLUMN (ft)	Gals/Foot			Sample Time	Sample Type	Chain-of-Custody		Remarks
				(2" = 0.163)	(4" = 0.653)	(6" = 1.469)			3 Well Volumes (gals)	Total Purged (gals)	
Trip								Trip	TB-1	Lab	
MW-1	2.00	9.0	7.0	1.14	3.42	3.5	10:01	Sample	MW-1	0900	(1)
MW-3	3.32	7.0	3.68	0.6	1.8	1.8	10:10	Sample	MW-3	0930	(1)
MW-5	3.08	6.0	2.92	0.5	1.5	1.6	10:25	Sample	MW-5	1000	(1)
MW-5	"	"	"	"	"	"	"	Duplicate	MW-A	0945	(1)
MW-2	1.90	8.0	6.10	0.97	3.0	3.0	10:35	Sample	MW-2	1030	(2)
MW-4	3.34	8.0	4.66	0.75	2.25	2.25	10:45	Sample	MW-4	1045	(3)
Field							11:01	Field	FB-1	1115	

* REMARKS (1) Purge Water Light gray + silty
 (2) Purge Water Black + silty, slight sheen
 (3) Purge Water gray + silty, slight sheen

Sample Subsets: A=Refrigerate, N=HNO₃ preserved, S=H₂SO₄ preserved, H=NaOH preserved,
 P= H₃PO₄ & CuSO₄, V= VOC vials, G= 1 L Glass, O= Other, B=Bacteria bottle.



SAMPLE NO: 3-2222
 CLIENT NAME: Hardy Dodge/Torpta (Don Lunew)
 ADDRESS: 39 South Main St.
St Albans VT 05478

LOGIN: KK
 PROJECT NO: _____
 DATE RECEIVED: 12/2/93
 TIME RECEIVED: 2:15 AM/PM

Results to: Jeff Hoffer

Sample #	Date Sampled	Time Sampled	Matrix	Client ID	Preserv Check	Analysis	Holding Time Expires	Sign
FB-1			W	Trip Blank	#	8020 BTEX/MTBE		
MW-1	12/2/93	0900		MW-1	HL			
MW-3		0930		MW-3				
MW-5		1000		MW-5				
MW-A		0945		MW-A				
MW-2		1030		MW-2				
MW-4		1045		MW-4				
FB-1		1115		FB-1	ed			

Comments: 12/2/93 1400

[Signature]

Reviewed by: _____
 Date: _____

LABORATORY REPORT

CLIENT NAME:	Jeff Hoffer	LABORATORY NO.:	3-2222
	P.O. Box 428		
ADDRESS:	Waterbury, VT 05676	PROJECT NO.:	70249
		DATE OF SAMPLE:	12/2/93
SAMPLE LOCATION:	Handy Dodge/Toyota	DATE OF RECEIPT:	12/2/93
	39 So. Main Street	DATE OF ANALYSIS:	12/7-8/93
	St. Albans, VT 05478		
ATTENTION:	Dan Luneau	DATE OF REPORT:	12/16/93

RESULTS

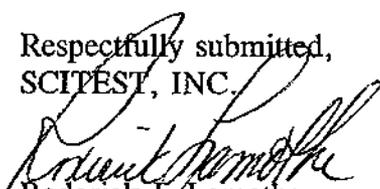
(Expressed as micrograms per liter [ug/L] ppb)

<u>PARAMETER</u>	<u>MW-1</u>	<u>MW-2</u>	<u>MW-3</u>	<u>MW-4</u>	<u>MW-5</u>
Methyl Tertiary Butyl Ether	BPQL	< 100	< 100	850	< 100
Benzene	BPQL	< 100	630	1220	< 100
Toluene	BPQL	340	830	2710	1650
Ethylbenzene	BPQL	410	1500	1980	1080
Total Xylenes	BPQL	3070	10030	9460	5200
Chlorobenzene	BPQL	< 100	< 100	< 100	< 100
1,2-Dichlorobenzene	BPQL	< 100	< 100	< 100	< 100
1,3-Dichlorobenzene	BPQL	< 100	< 100	< 100	< 100
1,4-Dichlorobenzene	BPQL	< 100	< 100	< 100	< 100
Surrogate % Recovery	97%	99%	92%	90%	92%

EPA Method 8020

BPQL = Below Practical Quantitation Limit, 1 ppb.

Respectfully submitted,
SCITEST, INC.


Roderick J. Lamothe
Laboratory Director

RJL/mh

Page 1 of 2

LABORATORY REPORT

CLIENT NAME:	Jeff Hoffer	LABORATORY NO.:	3-2222
	P.O. Box 428		
ADDRESS:	Waterbury, VT 05676	PROJECT NO.:	70249
		DATE OF SAMPLE:	12/2/93
SAMPLE LOCATION:	Handy Dodge/Toyota	DATE OF RECEIPT:	12/2/93
	39 So. Main Street	DATE OF ANALYSIS:	12/7-8/93
	St. Albans, VT 05478		
TTENTION:	Dan Luneau	DATE OF REPORT:	12/16/93

RESULTS

(Expressed as micrograms per liter (ug/L) ppb)

<u>PARAMETER</u>	<u>MW-A</u>	<u>Trip Blank</u>	<u>Field Blank</u>
Methyl Tertiary Butyl Ether	< 100	BPQL	BPQL
Benzene	< 100	BPQL	BPQL
oluene	1700	BPQL	BPQL
Ethylbenzene	1080	BPQL	BPQL
total Xylenes	5080	BPQL	BPQL
chlorobenzene	< 100	BPQL	BPQL
1,2-Dichlorobenzene	< 100	BPQL	BPQL
1,3-Dichlorobenzene	< 100	BPQL	BPQL
1,4-Dichlorobenzene	< 100	BPQL	BPQL
Surrogate % Recovery	86%	97%	94%

EPA Method 8020

BPQL = Below Practical Quantitation Limit; 1 ppb.

**APPENDIX C:
Monitoring Well Logs**

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

Well/Boring ID: MW-1

Project Name: Handy Dodge/Toyota	WELL CONSTRUCTION
Site: 39 South Main St., St. Albans, VT	Total Depth Drilled: 9' BGS
Project Number: 13-01	Screen Type/Interval: 2" PVC, 20-slot from 4 to 9' BGS
Driller: Tri-State Drilling & Boring/Ed Westover	Sandpack Type/Interval: f/c sand, 3.5 - 9' BGS
Drilling Method: 4.25" ID HSA	Riser Type/Interval: 2" PVC from 0-4' BGS
Geologist: J. Hoffer	Seal Type/Interval: Benseal granular bentonite, 3 - 3.5' BGS
Sampling Method: 2" split spoon	Water Level/Date/Time: 2.00' BTOC, 12/2/93
Date/Time Started: 11/23/93	Elevation of Top of PVC: 99.99' relative to on-site benchmark
Date/Time Completed: 11/23/93	Well Development: Bailer
Weather: 40 degrees, overcast, slight wind	
Surface Conditions: gravel	

Split-Spoon Depth (feet)	Sample Blows (per 6")	Sample Recovery (feet)	Sample Description (color, texture, etc.)	PID* Reading (ppm)
2.5 - 4.5	2/4/3/12	1.0	0.75' dark gray/black silt with some clay, 15-25% rock fragments, moist, (fill)	0.2
			0.25' orangish-brown silt, some clay, some fine sand, moist, (fill)	0.2
4.5 - 6.5	12/32/31/43	1.5	dense, light yellow silt loam, 15-25% rock fragments (unsorted), mottled, moist, (fill?)	0.3
8 - 10	43/59/77/69	1.5	0.5' yellow-brown silt, moist	0.2
			1.0' dense, gray silt and fine sand, 15-25% rock fragments (unsorted), dry, (till)	0.2

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

- 0 - 1.0' gravelly sub-base
- 1.0 - 8.5' dense, yellow silt with fine sand and rock fragments (weathered till/fill?), moist
- 8.5' dense, gray till, dry
- cuttings balled up at about 7', augers were wet when pulled out

NOTES:

* Peak Headspace Reading, Photovac MicroTIP HL-2000

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-2

Project Name: Handy Dodge/Toyota	WELL CONSTRUCTION
Site: 39 South Main St., St. Albans, VT	Total Depth Drilled: 8' BGS
Project Number: 13-01	Screen Type/Interval: 2" PVC, 20-slot from 3 to 8' BGS
Driller: Tri-State Drilling & Boring/Ed Westover	Sandpack Type/Interval: f/c sand, 2 - 8' BGS
Drilling Method: 4.25" ID HSA	Riser Type/Interval: 2" PVC from 0 -3' BGS
Geologist: J. Hoffer	Seal Type/Interval: Benseal granular bentonite, 1.5 - 2.0' BGS
Sampling Method: 2" split spoon	Water Level/Date/Time: 1.90' BTOC, 12/2/93
Date/Time Started: 11/23/93	Elevation of Top of PVC: 98.99', relative to on-site benchmark
Date/Time Completed: 11/23/93	Well Development: Bailer
Weather: 40 degrees, overcast, slight wind	
Surface Conditions: gravel	

Split-Spoon Depth (feet)	Sample Blows (per 6")	Sample Recovery (feet)	Sample Description (color, texture, etc.)	PID* Reading (ppm)
2.5 - 4.5	1/0/1/0	0.5	wet brown f/m sand, (backfill sand)	23
			tip of spoon, as above with black staining	
5 - 7'	1/1/7/0	0.2	wet brown f/m sand, (backfill sand)	41.4
8 - 10	29/50	0.8	dense, gray silt with fine sand, 15-25% rock fragments, some rounded, dry, (till)	6

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

0 - 1.0' gravelly sub-base

1.0 - 8' brown f/m sand, (backfill sand), saturated below 2.5'

8' dense, gray till, dry

when removed the augers were coated with sand with black staining,

(headspace = 500 ppm), when mixed with water, sheen appeared

NOTES:

* Peak Headspace Reading, Photovac MicroTIP HL-2000

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-3

Project Name: Handy Dodge/Toyota	WELL CONSTRUCTION
Site: 39 South Main St., St. Albans, VT	Total Depth Drilled: 7' BGS
Project Number: 13-01	Screen Type/Interval: 2" PVC, 20-slot from 2 - 7' BGS
Driller: Tri-State Drilling & Boring/Ed Westover	Sandpack Type/Interval: f/c sand, 1.5 to 7' BGS
Drilling Method: 4.25" ID HSA	Riser Type/Interval: 2" PVC from 0-2' BGS
Geologist: J. Hoffer	Seal Type/Interval: Holeplug bentonite gravel, 1 - 1.5' BGS
Sampling Method: 2" split spoon	Water Level/Date/Time: 3.32' BTOC, 12/2/93
Date/Time Started: 11/23/93	Elevation of Top of PVC: 98.11', relative to on-site benchmark
Date/Time Completed: 11/23/93	Well Development: Bailer
Weather: 40 degrees, overcast, slight wind	
Surface Conditions: gravel	

Split-Spoon Depth (feet)	Sample Blows (per 6")	Sample Recovery (feet)	Sample Description (color, texture, etc.)	PID* Reading (ppm)
2.5 - 4.5	3/4/9/9	1.3	olive-gray silt, some fine sand, 15% rock fragments, moist, mottled in last 6", petro odor	845
4 - 6'	1/0/3/4	1.5	olive-gray silt, some fine sand, <15% rock fragments, soft, wet, petro odor	1490
6 - 8'	5/13/50-4"	1.0	as above but more dense, moist bottom 0.1' is gray	5.5
7 - 9'	29/50-4"	0.5	dense, light brown fine sand and silt, moist on top, dry on bottom (till)	13

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

0 - 1.0' gravelly sub-base

1.0 - 7' soft, olive-gray silt and fine sand, wet below 4.5',

7' dense, till, dry

NOTES:

* Peak Headspace Reading, Photovac MicroTIP HL-2000

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-4

Project Name: Handy Dodge/Toyota	WELL CONSTRUCTION
Site: 39 South Main St., St. Albans, VT	Total Depth Drilled: 8' BGS
Project Number: 13-01	Screen Type/Interval: 2" PVC, 20-slot from 3 to 8' BGS
Driller: Tri-State Drilling & Boring/Ed Westover	Sandpack Type/Interval: f/c sand, 2 - 8' BGS
Drilling Method: 4.25" ID HSA	Riser Type/Interval: 2" PVC from 0-3' BGS
Geologist: J. Hoffer	Seal Type/Interval: Holeplug bentonite gravel, 1 - 2' BGS
Sampling Method: 2" split spoon	Water Level/Date/Time: 3.34' BTOC, 12/2/93
Date/Time Started: 11/23/93	Elevation of Top of PVC: 98.05', relative to on-site benchmark
Date/Time Completed: 11/23/93	Well Development: Bailer
Weather: 40 degrees, overcast, slight wind	
Surface Conditions: gravel	

Split-Spoon Depth (feet)	Sample Blows (per 6")	Sample Recovery (feet)	Sample Description (color, texture, etc.)	PID* Reading (ppm)
2.5 - 4.5	6/6/7/6	0.1	gray silt, some fine sand, mottled, petro odor	75
4 - 6	3/4/5/3	1.0	0.5' light brown fine sand and silt, mottled, moist	
			0.5' grayish-green silt with f/m sand, wet	1008
6 - 8	3/17/50-1"	0.5	greenish-gray fine sand and silt, wet, 15% rock fragments	314
8 - 10	39/50-2"	0.5	dense, olive-gray silt and fine sand, 15-25% rock fragments, (till)	49.5

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

0 - 1.0' gravelly sub-base

1.0 - 7.5' fine sand and silt, wet from 5'

7.5' dense, olive-gray till, dry

hard drilling horizon at 7.5'

NOTES:

* Peak Headspace Reading, Photovac MicroTIP HL-2000

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-5

Project Name: Handy Dodge/Toyota	WELL CONSTRUCTION
Site: 39 South Main St., St. Albans, VT	Total Depth Drilled: 6' BGS
Project Number: 13-01	Screen Type/Interval: 2" PVC, 20-slot from 1 to 6' BGS
Driller: Tri-State Drilling & Boring/Ed Westover	Sandpack Type/Interval: f/c sand, 0.5 - 6' BGS
Drilling Method: 4.25" ID HSA	Riser Type/Interval: 2" PVC from 0-1' BGS
Geologist: J. Hoffer	Seal Type/Interval: cement pad at surface
Sampling Method: 2" split spoon	Water Level: 3.08' BTOC, 12/2/93
Date/Time Started: 11/23/93	Elevation of Top of PVC: 98.99', relative to on-site benchmark
Date/Time Completed: 11/23/93	Well Development: Bailer
Weather: 40 degrees, overcast, slight wind	
Surface Conditions: gravel	

Split-Spoon Depth (feet)	Sample Blows (per 6")	Sample Recovery (feet)	Sample Description (color, texture, etc.)	PID* Reading (ppm)
5 - 7	16/23/50-5"	1.0	0.5' greenish-gray silty fine sand, 15-25% rock fragments, moist	88
			0.5' greenish-gray silty fine sand, 15-25% rock fragments, dense, dry	18.8

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

- 0 - 1.0' gravelly sub-base
- 1.0 - 6' silty sand, wet at 4'
- 6' dense, greenish-gray till, dry

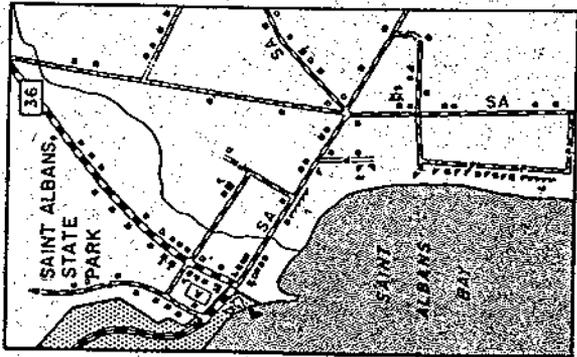
NOTES:

* Peak Headspace Reading, Photovac MicroTIP HL-2000

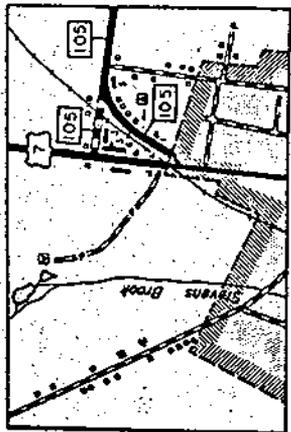
BGS - Below Ground Surface, BTOC - Below Top of Casing, f - fine, m - medium, c - coarse

APPENDIX D:
Water Well Logs

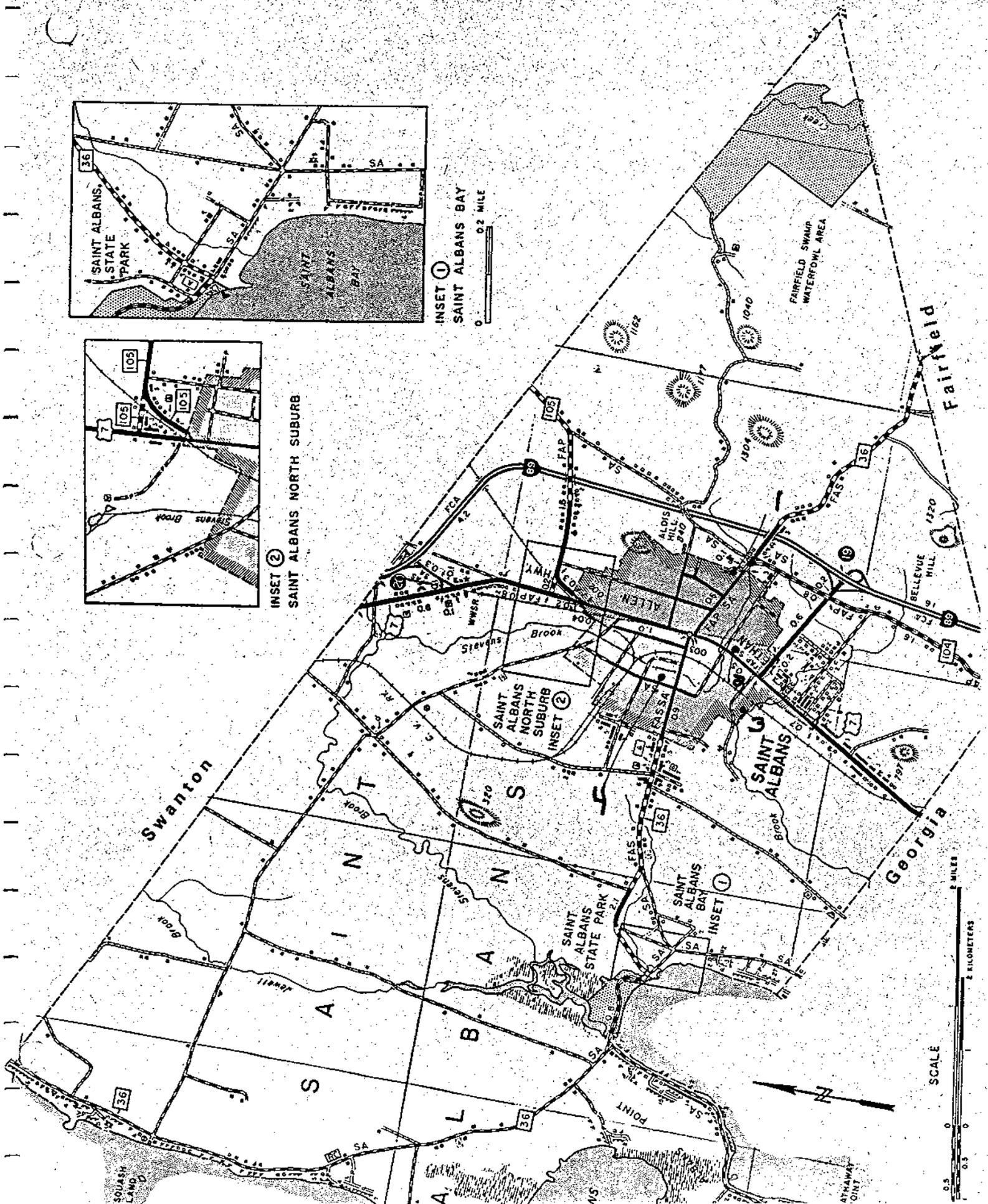
MAP SOURCE: VERMONT AGENCY OF TRANSPORTATION



INSET 1
SAINT ALBANS BAY
0 0.2 MILE



INSET 2
SAINT ALBANS NORTH SUBURB



WELL NO. / TAG NO.

53-66-89

(For Driller's Use)

This report must be completed and submitted to the Department of Environmental Conservation 103 South Main Street (ION), Waterbury, Vt. 05676 no later than 60 days after completion of the well.

State of Vermont
Dept. of Environmental Conservation
103 South Main Street (ION)
Waterbury, Vt. 05676
WELL COMPLETION REPORT

DEPARTMENT USE ONLY

E.C. 4 U.S.G.S.
Field Location Map area 1102
Latitude _____ Elev. _____
Longitude _____ Topo. _____
Scale: 62,500 25,000 24,000
Data in Town Files

JAN 19 1990
Location map attached to WCR

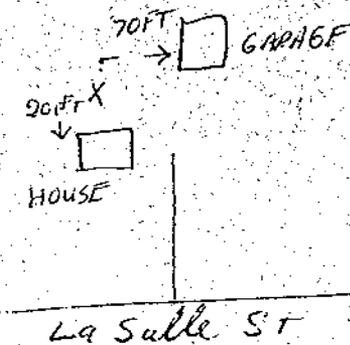
- WELL OWNER ALBERT LORRAIN RD 3 Pearl St St. Albans
OR
WELL PURCHASER _____
Name _____ Permanent Mailing Address _____
- LOCATION OF WELL: TOWN ST. ALBANS CITY SUBDIVISION La Salle St LOT NO. _____
- DATE WELL WAS COMPLETED 6/22/89
- PROPOSED USE OF WELL: Domestic, Other _____
- REASON FOR DRILLING WELL: New Supply, Replace Existing Supply, Deepen Existing Well, Test or Exploration,
 Provide Additional Supply, Other _____
- DRILLING EQUIPMENT: Auger Tool, Rotary with A-P, Other _____
- TYPE OF WELL: Open Hole in Bedrock, Open End Casing, Screened or Slotted; Other _____
- TOTAL DEPTH OF WELL: 175 feet below land surface.
- CASING FINISH: Above ground, Finished, Above ground, Unfinished, Buried, In Pit, Removed, None used, Other _____
- CASING DETAILS: Total length 46'5" ft. Length below L.S. 45' ft. Dia. 6 in. Material Steel Wt. 19 lb./ft.
- LINER OR INNER CASING DETAILS: Length used _____ ft. Diameter _____ in. Material _____ Weight _____ lb./ft.
- METHOD OF SEALING CASING TO BEDROCK: Drive Shoe, Grout - type _____, Drilled _____ in. hole _____ ft. in Bedrock
 Other _____
- SCREEN DETAILS: Make and Type _____, Material _____, Length _____ ft., Diameter _____ in.,
Slot Size _____, Depth to top of screen in feet below land surface _____ ft., Gravel pack if used: Gravel Size or Type _____
- YIELD TEST: Bailed, Pumped, Compressed Air, for 1/2 Hours at 30 Gallons per minute
Measured by Bucket, Orifice pipe, Wier, Meter Permanent Airline installed
- STATIC WATER LEVEL: _____ feet below land surface, Date or Time measured _____, Overflows at _____ G.P.M.
- WATER ANALYSIS: Has the water been analyzed? Yes No, if Yes, Where _____
- SPECIAL NOTES: _____

18. WELL LOG

Depth from Land Surface		Water Bearing	Formation Description	Sketch
Feet	Feet			
Ground Surface	37		Sand	
	37		BEDROCK gray	
	128		Tan Rock	
	128		GRAY	
	129		Tan Rock	
	163			
	163			
	175			

19. SITE MAP

Show permanent structures such as buildings, septic tanks, and/or other land marks and indicate not less than two distances to the well. Indicate local street name and subdivision lot number.



20. TESTED YIELD

If the yield was tested at different depths during drilling, list below.

Feet	Gallons Per Minute
175	30

WELL DRILLED BY: EDWARD SKOMBERG

DOING BUSINESS AS: GREEN MT WELL CO.
Company or Business Name

REPORT FILED BY: Michael A. Hodgett
Authorized Signature

DATE OF REPORT: 9/20/89 WELL DRILLERS LIC. NO. 53

WELL NUMBER

585

(For Driller's Use)

State of Vermont
DEPARTMENT OF WATER RESOURCES
WELL COMPLETION REPORT

1102

OCT 22 1979

DO NOT FILL IN

3

(This report must be completed and submitted to the Department of Water Resources, State Office Building, Montpelier, Vermont 05602, no later than 60 days after completion of well. Complete or line out all blanks.)

WELL OWNER: Michael Trumbley Name R.D. #2, Rt. 7, St. Albans, Vt. Mailing Address

TOWN IN WHICH WELL IS LOCATED: St. Albans (Please locate well on a large scale map to accompany this report. Maps are available on request.)

DATE WELL WAS COMPLETED: 9/12/79

PROPOSED USE OF WELL: Domestic Agricultural Business Establishment
 Municipal Industrial Other (Specify)

DRILLING EQUIPMENT: Cable Tool Rotary Air Percussion
 Other (Specify)

TOTAL DEPTH OF WELL: 163 ft STATIC WATER 54 ft
CASING DETAILS: Length 104 ft. Diameter 6 in. Material steel

SCREEN DETAILS: Make — Material — Length — ft.
Diameter — in. Slot Size —

METHOD OF SEALING CASING TO SCREEN OR BEDROCK: 4 ft sleeve + bentonite

FINAL YIELD TEST: Bailed, or Pumped, or Compressed Air
1 Hours at 15 gallons per minute
Water level during yield test 160 ft

WELL LOG
Depth From
Ground Surface

Give description of formations penetrated, such as: peat, silt, sand, gravel, clay, hardpan, shale, limestone, granite, etc. Include size of gravel (diameter) and sand (fine, medium, coarse, color of material, structure (loose, packed, cemented, hard). For example: Surface to 27 ft. fine, packed, yellow sand 27 ft. to 134 ft. gray granite.

Surface to 10 ft. hard brown clay
10 to 99 ft. hard clay interspersed with small & large stones
99 to 163 ft. gray, soft shale
to ft.

YIELD TEST DATA IN G.P.M.
If yield was tested at different depths during drilling, List Below

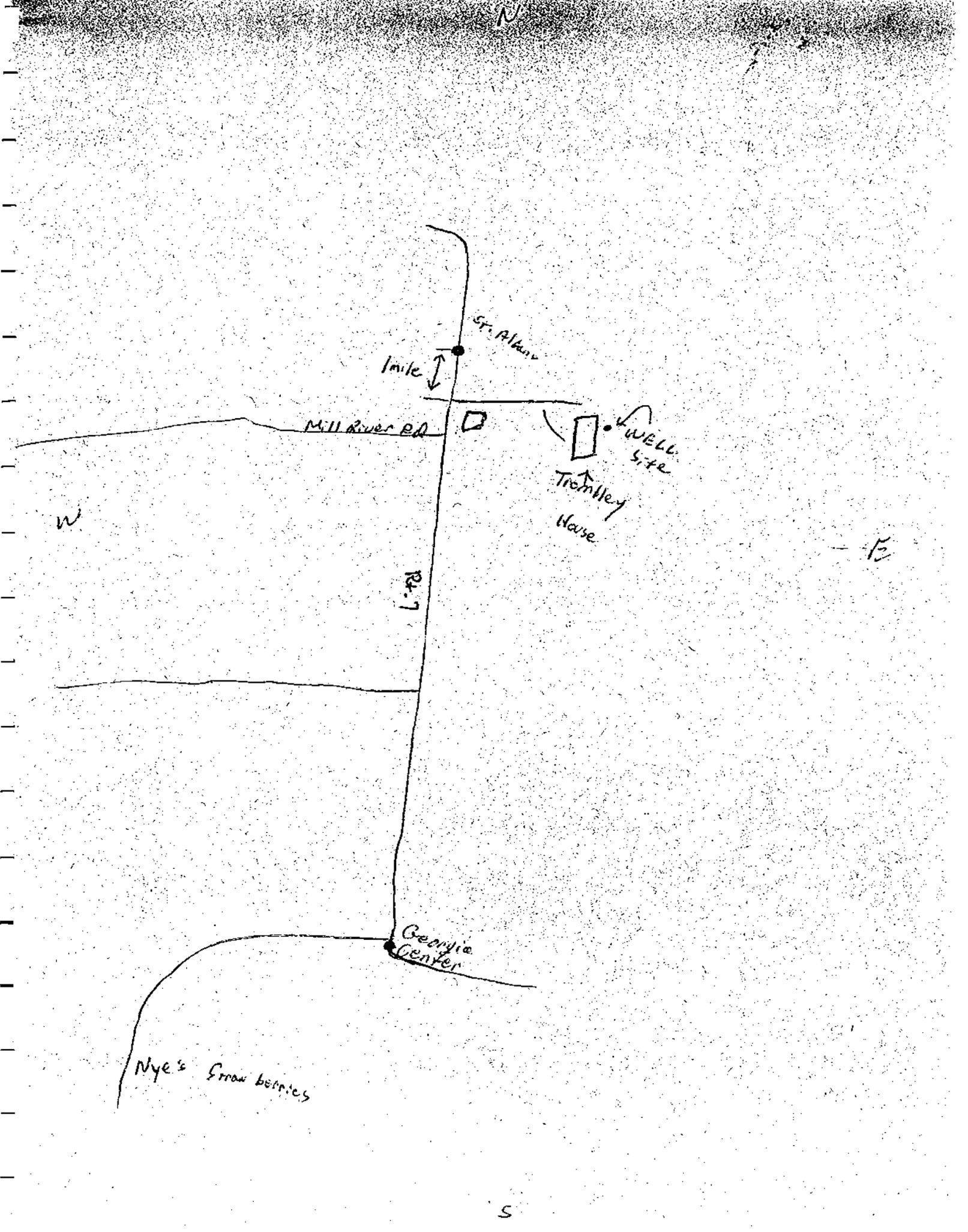
G.P.M. @	ft.	G.P.M. @	ft.
G.P.M. @	ft.	G.P.M. @	ft.

WATER ANALYSIS: Has water been analyzed? Yes No If Yes, Where
Include Analysis

DRILLED BY: Dennis Chretien Signature

DOING BUSINESS AS: Chretien Drilling Co. Company

DATE OF REPORT: 9/12/79 WELL DRILLERS LICENSE NO. 36



12-83

(For Driller's Use)

This report must be completed and submitted to the Department of Water Resources and Environmental Engineering, State Office Building, Montpelier, Vermont 05602, no later than 60 days after completion of the well.

DEPARTMENT OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING

WELL COMPLETION REPORT

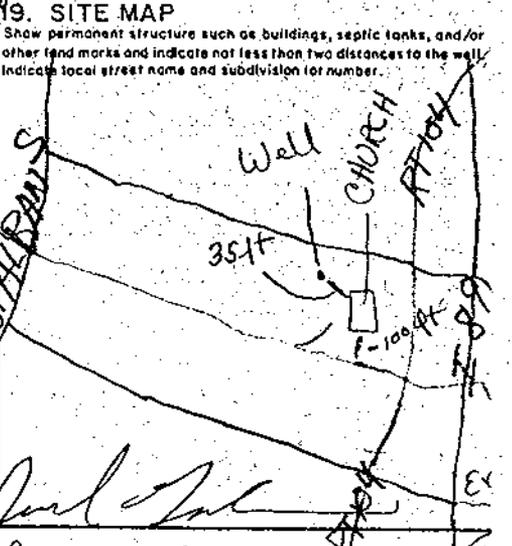
MAY 11 1983

Location map attached to WCR

W.R. U.S.G.S. Field Location Map area 11D5 Latitude Elev. Longitude Topo. Scale: 62,500, 25,000, 24,000 Data in Town Files

- 1. WELL OWNER Church of Nazarene St. Albans Vermont 05478 OR WELL PURCHASER Bruce King Jr. Sheldon Vermont 05483 2. LOCATION OF WELL: TOWN St. Albans SUBDIVISION LOT NO. 3. DATE WELL WAS COMPLETED 4/29/83 4. PROPOSED USE OF WELL: Domestic, Other Church 5. REASON FOR DRILLING WELL: New Supply, Replace Existing Supply, Deepen Existing Well, Test or Exploration, Provide Additional Supply, Other 6. DRILLING EQUIPMENT: Cable Tool, Rotary with A-P, Other 7. TYPE OF WELL: Open Hole in Bedrock, Open End Casing, Screened or Slotted, Other 8. TOTAL DEPTH OF WELL: 200 feet below land surface. 9. CASING FINISH: Above ground, Finished, Above ground, Unfinished, Buried, In Pit, Removed, None used, Other 10. CASING DETAILS: Total length 80 ft. Length below L.S. 78 1/2 ft. Dia. 6 in. Material Steel Wt. 17 lb./ft. 11. LINER OR INNER CASING DETAILS: Length used ft. Diameter in. Material Weight lb./ft. 12. METHOD OF SEALING CASING TO BEDROCK: Drive Shoe, Grout-type, Drilled 8 3/4 in. hole ft. in Bedrock Other Drive Shoe grout 13. SCREEN DETAILS: Make and Type, Material, Length ft., Diameter, Slot Size, Depth to top of screen in feet below land surface ft., Gravel pack if used: Gravel Size or Type 14. YIELD TEST: Bailed, Pumped, Compressed Air, for 1 Hours at 62 Gallons per minute Measured by Bucket, Orifice pipe, Wier, Meter Permanent Airline Instal 15. STATIC WATER LEVEL: 20 feet below land surface, Date or Time measured 4/29/83, Overflows at G.P.M. 16. WATER ANALYSIS: Has the water been analyzed? Yes No, if Yes, Where 17. SPECIAL NOTES: Church has Town Sewerage 18. WELL LOG 19. SITE MAP Show permanent structure such as buildings, septic tanks, and/or other land marks and indicate not less than two distances to the well. Indicate local street name and subdivision or number.

Table with 5 columns: Depth from Land Surface (Feet), Water Bearing, Formation Description, and Sketch. Rows include: Top soil (105-170 grey rock 62 gpm), clay (170-184 white + brown rock), boulder (184-200 grey rock), clay, gravel, clay, grey ledge, white rock (100-105 2 gpm).



20. TESTED YIELD. If the yield was tested at different depths during drilling, list below. Table with 2 columns: Feet, Gallons Per Minute. Rows: 105 (2), 184 (62).

WELL DRILLED BY: [Signature] DOING BUSINESS AS: Harselin Artesian Wells Company or Business Name REPORT FILED BY: Ted Haddock Authorized Signature DATE OF REPORT: 4/30/83 WELL DRILLERS LIC. NO. 174

2390

(For Driller's Use)

This report must be completed and submitted to the Department of Water Resources and Environmental Engineering, State Office Building, Montpelier, Vermont 05602, no later than 90 days after completion of the well.

MAY 11 1982

State of Vermont DEPARTMENT OF WATER RESOURCES AND ENVIRONMENTAL ENGINEERING WELL COMPLETION REPORT

W.R. 2 U.S.G.S. Field Location Map area 1102 Latitude Elev. Longitude Topo Scale: 62,500, 25,000, 24,000 Data in Town Files 1.1

Location map attached to WCR

1. WELL OWNER Larry Smith Name Permanent Mailing Address RFO 3 Fairfax St. Albans, Vt.

WELL PURCHASER Name Permanent Mailing Address

2. LOCATION OF WELL: TOWN Same SUBDIVISION LOT NO.

3. DATE WELL WAS COMPLETED 2/10/82

4. PROPOSED USE OF WELL: Domestic Other

5. REASON FOR DRILLING WELL: New Supply, Replace Existing Supply, Deepen Existing Well, Test or Exploration, Provide Additional Supply, Other

6. DRILLING EQUIPMENT: Cable Tool, Rotary with A-P, Other

7. TYPE OF WELL: Open Hole in Bedrock, Open End Casing, Screened or Slotted, Other

8. TOTAL DEPTH OF WELL: 315 feet below land surface.

9. CASING FINISH: Above ground, Finished, Above ground, Unfinished, Buried, In Pit, Removed, None used, Other

10. CASING DETAILS: Total length 82 ft. Length below L.S. 80 ft. Dia. 6 in. Material Steel Wt. lb./ft.

11. LINER OR INNER CASING DETAILS: Length used ft. Diameter in. Material Weight lb./ft.

12. METHOD OF SEALING CASING TO BEDROCK: Drive Shoe, Grout-type, Drilled in hole ft. in Bedrock, Other

13. SCREEN DETAILS: Make and Type, Material, Length ft., Diameter in., Slot Size, Depth to top of screen in feet below land surface ft., Gravel pack if used: Gravel Size or Type

14. YIELD TEST: Boiled, Pumped, Compressed Air, for 1 Hour at 5 Gallons per minute Measured by: Bucket, Orifice pipe, Wier, Meter, Permanent Airline installed

15. STATIC WATER LEVEL: feet below land surface, Date or Time measured, Overflows at G.P.M.

16. WATER ANALYSIS: Has the water been analyzed? Yes No, If Yes, Where

17. SPECIAL NOTES:

18. WELL LOG

Table with columns: Depth from Land Surface (Feet), Water Bearing, Formation Description, Sketch. Handwritten entries: 81 Ground Surface, 81 315 Gray shale Bedrock.

19. SITE MAP: Show permanent structure such as buildings, septic tanks, and/or other land marks and indicate not less than two distances to the well. Indicate local street name and subdivision lot number.

20. TESTED YIELD: If the yield was tested at different depths during drilling, list below.

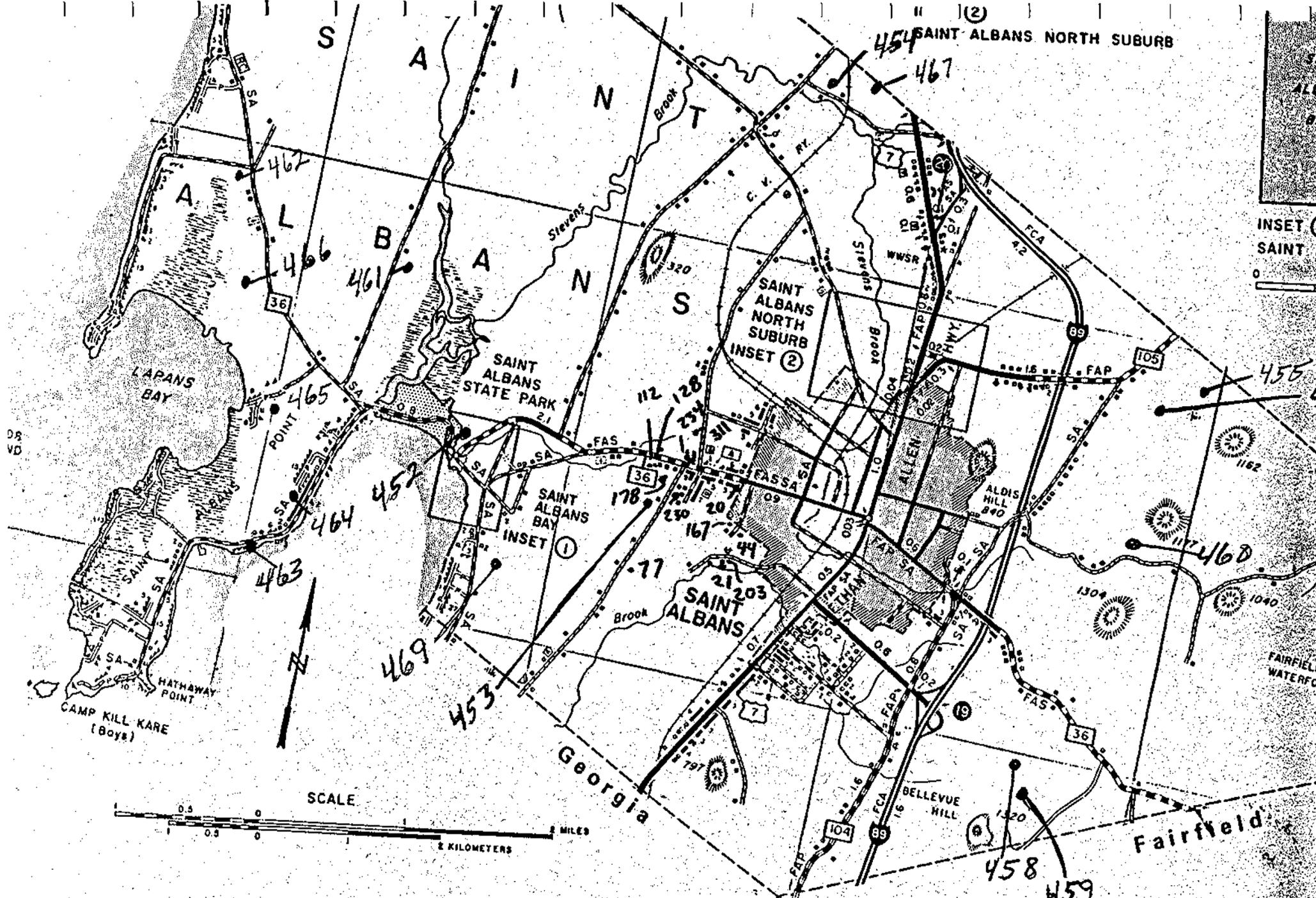
Table with columns: Feet, Gallons Per Minute.

WELL DRILLED BY: H. A. Maronch

DOING BUSINESS AS: H. A. Maronch Corp. Company or Business Name

REPORT FILED BY: [Signature] Authorized Signature

DATE OF REPORT: 2/19/82 WELL DRILLERS LIC. NO. 8



St. Albans Town

598

1102

(For Driller's Use)

State of Vermont DEPARTMENT OF WATER RESOURCES WELL COMPLETION REPORT

(This report must be completed and submitted to the Department of Water Resources, State Office Building, Montpelier, Vermont 05602, no later than 60 days after completion of well. Complete or line out all blanks.)

JAN 28 1980

DO NOT FILL IN 167

WELL OWNER: Kenneth Masse, Huntington St. St Albans, Vt. Name: Masse, Huntington St. St Albans, Vt. Mailing Address

TOWN IN WHICH WELL IS LOCATED: St Albans

(Please locate well on a large scale map to accompany this report. Maps are available on request.)

DATE WELL WAS COMPLETED: October 9, 1979

PROPOSED USE OF WELL: [X] Domestic [] Agricultural [] Business Establishment [] Municipal [] Industrial [] Other (Specify)

DRILLING EQUIPMENT: [] Cable Tool [X] Rotary [X] Air Percussion [] Other (Specify)

TOTAL DEPTH OF WELL: 323 ft. STATIC WATER: 20 ft. CASING DETAILS: Length 65 ft. Diameter 6 in. Material steel Weight 19 lb./ft.

SCREEN DETAILS: Make Material Length ft. Diameter in. Slot Size

METHOD OF SEALING CASING TO SCREEN OR BEDROCK: fine foot sleeve

FINAL YIELD TEST: [] Bailed, or [] Pumped, or [X] Compressed Air 1 Hours at 3 gallons per minute Water level during yield test 320 ft.

WELL LOG Depth From Ground Surface

Give description of formations penetrated, such as: peat, silt, sand, gravel, clay, hardpan, shale, limestone, granite, etc. Include size of gravel (diameter) and sand (fine, medium, coarse, color of material, structure (loose, packed, cemented, hard). For example: Surface to 27 ft. fine, packed, yellow sand; 27 ft. to 134 ft. gray granite.

Surface to 59 ft. clay & stones 59 to 323 ft. shale

YIELD TEST DATA IN G.P.M. If yield was tested at different depths during drilling, List Below

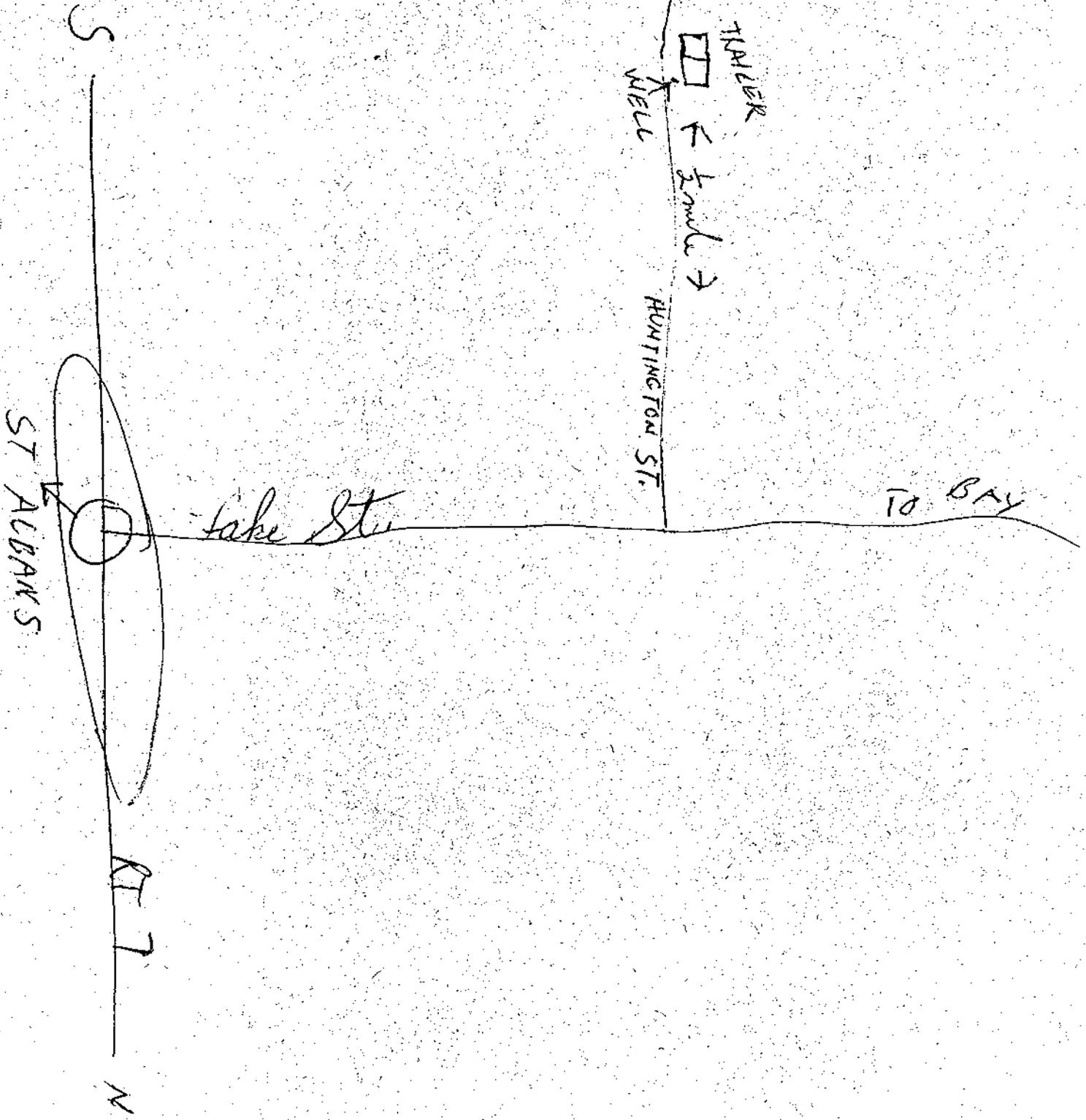
Table with 4 columns: G.P.M. @, ft., G.P.M. @, ft.

WATER ANALYSIS: Has water been analyzed? [] Yes [] No If Yes, Where Include Analysis

DRILLED BY: Mark Chevalier Signature

DOING BUSINESS AS: Chevalier Drilling Co. Company

DATE OF REPORT: Oct 9, 1979 WELL DRILLERS LICENSE NO. 36



State of Vermont
DEPARTMENT OF WATER RESOURCES

Form WR-51

WELL COMPLETION REPORT

No. 44

(This report must be completed and submitted to the Department of Water Resources, State Office Building, Montpelier, Vermont 05602, no later than 60 days after completion of well.)

Do not fill in
State Well No. 994819
Other No. 730601

WELL OWNER: Andrew Jordan Bronson Ad. St. Albans, Vt.
Name Mailing Address

WELL DRILLER: Chevalier Drilling Co Highgate Springs, Vt.
Name Mailing Address

PROPOSED USE OR USES (Check):

- Domestic
- Agricultural
- Business Establishment
- Municipal
- Industrial
- Other (Specify use)

CASING DETAILS (Inside)	YIELD TEST	WATER LEVEL (From land surface) (if possible)	SCREEN DETAILS
Length: 16 Feet	<input type="checkbox"/> Bailed or <input type="checkbox"/> Pumped or <input checked="" type="checkbox"/> Compressed Air 1 Hours 15 GPM	Static: 6 Feet	Make: ✓
Diameter: 6 Inches		During Yield Test: 162 Feet	
Kind: steel	Yield: 15 GPM	DRILLING EQUIPMENT	
Weight: 19 lbs/p/ft		<input type="checkbox"/> Cable Tool	Slot Size
<input checked="" type="checkbox"/> New <input type="checkbox"/> Used		<input type="checkbox"/> Rotary	Length: Ft.
		<input checked="" type="checkbox"/> Air Percussion	Diameter: in.
		<input type="checkbox"/> Other (specify)	

TOTAL DEPTH OF WELL 162 FEET TOWN WELL IS LOCATED IN: St. Albans Vt.
(Make sketch of well location on reverse side of sheet)

WELL LOG

Depth From Ground Surface	Give description of formations penetrated, such as: peat, silt, sand, gravel, clay, hard pan, shale, limestone, granite, etc. Include size of gravel (diameter) and sand (fine, medium, coarse) color of material, structure (loose, packed, cemented, hard). For example: 0 ft. to 27 ft. fine, packed, yellow sand; 27 ft. to 134 ft. gray granite.
0 ft. to 6 ft.	clay
6 ft. to 162 ft.	limestone
ft. to ft.	
ft. to ft.	
ft. to ft.	

YIELD TEST DATA IN G.P.M.
If yield was tested at different depth during drilling, List Below

ft.	G.P.M.
ft.	G.P.M.
ft.	G.P.M.

Has sample of well water been analyzed?

Where was sample analyzed?
(Include analysis of sample if analyzed by other than Department of Water Resources.)

Date Well was Completed July 21, 1969

Date of Report July 24, 1969

Water Well Driller's License No. 36

Well Driller Roger E. Chevalier (signature)

01-001-020

1102

State of Vermont
DEPARTMENT OF WATER RESOURCES

Form WR-59

WELL COMPLETION REPORT

This report must be completed and submitted to
Department of Water Resources, State Office
Building, Montpelier, Vermont 05602, no later than
10 days after completion of well.

Do not fill in
State Well No. 44 48 39
Other No. 73 06 10

WELL OWNER Noel Smith Name Lake St. St. Albans, Vt. Mailing Address

WELL DRILLER Chevalier Drilling Co. Name Highgate Springs, Vt. Mailing Address

PROPOSED USE OR USES (Check):

- Domestic
 - Agricultural
 - Business Establishment
 - Municipal
 - Industrial
- Other (Specify use)

CASTING DETAILS (Inside)	YIELD TEST	WATER LEVEL (From land surface) (if possible)	SCREEN DETAILS
Length: <u>78</u> Feet	<input type="checkbox"/> Bailed or <input type="checkbox"/> Pumped or <input checked="" type="checkbox"/> Compressed Air	Static: <u>18</u> Feet	Make: <u>-</u>
Diameter: <u>6</u> Inches		During Yield Test: <u>256</u> Feet	Material: _____
Material: <u>steel</u>	Yield: <u>15</u> GPM	DRILLING EQUIPMENT	
Weight: <u>19</u> lbs/p/ft		<input type="checkbox"/> Cable Tool	Slot Size
<input checked="" type="checkbox"/> New <input type="checkbox"/> Used		<input type="checkbox"/> Rotary	Length: _____ Ft.
		<input type="checkbox"/> Air Percussion	Diameter: _____ in.
		<input type="checkbox"/> Other (specify)	

TOTAL DEPTH OF WELL 257 FEET TOWN WELL IS LOCATED IN: St. Albans, Vt.
(Make sketch of well location on reverse side of sheet)

WELL LOG

Depth From Ground Surface	Give description of formations penetrated, such as: peat, silt, sand, gravel, clay, hardpan, shale, limestone, granite, etc. Include size of gravel (diameter) and sand (fine, medium, coarse) color of material, structure (loose, packed, cemented, hard). For example: 0 ft. to 27 ft. fine, packed, yellow sand; 27 ft. to 134 ft. gray granite.
<u>0</u> ft. to <u>54</u> ft.	<u>Clay & stones</u>
<u>54</u> ft. to <u>78</u> ft.	<u>soft shale</u>
<u>78</u> ft. to <u>257</u> ft.	<u>shale rock</u>
ft. to ft.	
ft. to ft.	

YIELD TEST DATA IN G.P.M.
If yield was tested at different depth during drilling, List Below

ft.	G.P.M.
ft.	G.P.M.
ft.	G.P.M.

Has sample of well water been analyzed?

Where was sample analyzed?
(Include analysis of sample if analyzed by other than Department of Water Resources.)

Well was Completed April 24, 1968 Date of Report April 28, 1968
Water Well Driller's License No. 36 Well Driller Roger C. Chevalier
(signature)