

Phase (check one)		Type (check one)	
X	Initial Site Investigation		Work Scope
	Corrective Action Feasibility Investigation	X	Technical Report
	Corrective Action Plan		PCF Reimbursement Request
	Corrective Action Summary Report		General Correspondence
	Operations & Monitoring Report		

HYDROGEOLOGIC SUBSURFACE INVESTIGATION

Ross's Auto Repair, Inc.
Route 104
Fairfax, Vermont
40° 5'00" North, 73°1'10" West

KSKGeoS™ Project #: 98021
Vermont DEC Site #: Not Yet Assigned
UST Facility ID #: 8492236

99-2695

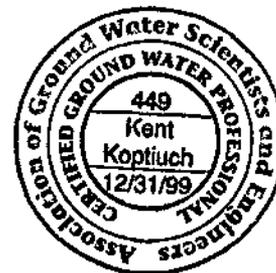
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EXECUTIVE SUMMARY
HYDROGEOLOGIC SUBSURFACE SITE INVESTIGATION
ROSS'S AUTO REPAIR INC.

KENT S. KOPTIUCH, Inc. (KSKGeoS™), under the authorization of Mr. Carl Ruprecht and the, conducted a Phase II subsurface hydrogeologic investigation of Ross's Auto Repair Station located on Route 104 (Main Street), Fairfax, Vermont.

- KSKGeoS™ completed the installation, development, and sampling of five (5) groundwater monitoring wells. A water sample from each well, except MW-2 was analyzed under EPA method 8021b for BTEX and MTBE (purgeable aromatics). All wells were also sampled and analyzed by EPA modified Method 8015 (TPH). *Why not MW-2?*
- Groundwater exhibits a south-southwesterly flow direction across the site. Gradient is approximately 2.9%. The rate of groundwater travel through the aquifer is calculated to be 9.35×10^3 gpd/ft².
- Separate-phase petroleum hydrocarbon products were observed during the soil boring, and well installation of MW-2. No other soil boring or monitoring well sampling event yielded the presence of free phase petroleum liquid. Laboratory analysis and chromatograph interpretation of a grab sample taken during the soil boring for MW-2 indicates a TPH concentration of 3,000 mg/L comprised primarily of weathered kerosene and used motor with the remaining ten-percent of composition unidentifiable.
- Soils screened by PID from core-barrel samples obtained during boring activities revealed levels of volatile organic compounds (VOCs) ranging from non-detect to 32 ppm.
- Laboratory chemical analytical results of the groundwater samples secured from four of five wells monitoring wells revealed total BTEX concentrations ranging from <1.0 µg/L through >179.0 µg/L. Groundwater from MW-3 contained naphthalene and 1,2,4-trimethylbenzene concentrations above the Vermont DEC Groundwater Enforcement Standards; benzene concentration in this well was a trace below the quantitation limit of 20 µg/L, and likely exceeds the VT GES limit of 5.0 µg/L for this constituent. MTBE concentrations also exceeded VT GES at monitoring wells MW-3 and MW-4.
- The site is supplied water via the Town of Fairfax Water System. There are no known potable water supply wells within ¼-mile radius of the site.
- In addition to soil and groundwater beneath the site, other potential receptors of contamination identified during this investigation, listed in order of decreasing risk, include; a limited surface water and wetland area located directly behind the site; two utility conduit trenches identified with municipal water lines (along the north boundary of the site parallel with Route 104) and the municipal sewer main (located just beyond the southern boundary of the site); the basement of a residence located to the east of the site, although cross and somewhat up-gradient of the plume, and; surface waters of the nearby Lamoille River located approximately 2,600-feet east and southeast of the site.
- Based upon the findings of this investigation KSKGeoS™ recommends the installation of up to three additional monitoring wells proposed to be located to the east and south of the site to better define the extent of dissolved and/or liquid-phase hydrocarbon impact.
- The existing soil pile, remnant from the UST closure event of October 1999, requires additional PID monitoring to ascertain its current VOC concentrations. The pile is currently encapsulated in polyethylene upon the Jamie Ross property in Westford, Vermont.

*four?
see map*

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- 1 Boring and Well Completion Logs
- 2 Laboratory Chemical Analytical Results – November 23, 1999 Groundwater Sampling Event

1.0 INTRODUCTION

1.1 Authorization and Site Description

On November 15, 1999, KENT S. KOPTIUCH, Inc. Geo-Environmental Services (KSKGeoS™) was authorized by S.B. Collins Inc. to conduct a phase II subsurface hydrogeologic investigation of Ross's Auto Service Station located on Main Street (State Route 104) in Fairfax, Vermont. This property is referred to as Ross's Auto (*the Site*). KSKGeoS™ investigation was performed following the closure and removal of two (2) 4,000 gallon gasoline USTs completed on October 12, 1999.

The site is located on the south side of Route 104 approximately ¼-mile west-northwest of the Lamoyille River. The area is comprised of agricultural land uses with an even blend of residential land use and also includes some limited commercial land use, including the site. Figure 1 is a *Site Location Map* depicting the facility's relative geographic location and its topographic setting. The site is currently occupied by Ross's Auto Service Station, operated by Mr. Clifford Ross of Fairfax. The lot size is approximately 0.25 of an acre and is rectangular in shape. The site includes a single-story building with a poured slab floor and footing. The repair shop building is divided into two sections, consisting of five-bays, some with floor lifts, and a smaller front section consisting of a customer reception area and desk/counter space. Currently, there are two (2) 4,000 gallon gasoline USTs and two (2) 275 gallon above-ground waste oil tanks at the site. The gasoline USTs were installed in late October 1999.

This investigation was initiated following the closure by removal of two (2) gasoline USTs completed in early October 1999, to address concerns of confirmed groundwater and/or soils impact at the site by petroleum hydrocarbons associated with this former UST system.

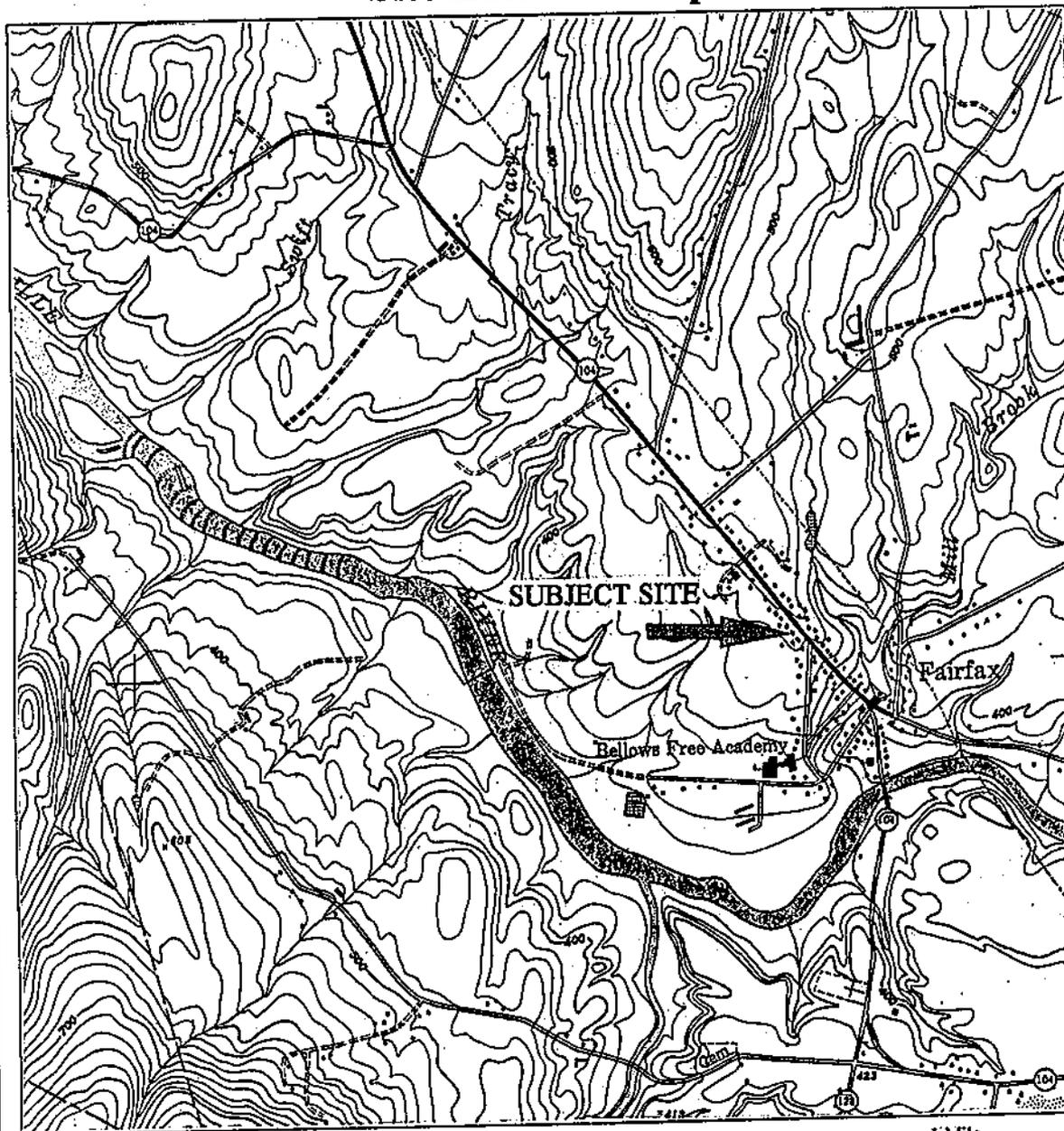
1.2 Historical Background

According to Mr. Ross, this site has been operating as an automobile repair facility since 1934; prior to this, the site was a restaurant. Mr. Ross purchased the site was in 1983. Prior to this time it is likely that there was at least one gasoline UST (unknown size) located beneath the northwest quarter of the site. This is suspected, based upon field observations completed during excavation procedures conducted on October 13, 1999 for installation of the newest USTs, and according to interviews conducted with knowledgeable persons familiar with the site's history. The excavation of this new pit resulted in the accumulation of approximately 100 cubic yards of gasoline-impacted soils that were transported to the Jamie Ross Property in Westford Vermont. During excavation procedures for this new pit on October 13, 1999, soils screened by PID contained VOCs ranging from 0.2 ppm to 128 ppm.

Beginning in the spring of 1998, and concluding in the fall of 1998, the garage building associated with this site was replaced with a steel-framed structure set upon a poured concrete slab. During this time, the former mechanic lifts were removed.

In 1985, two 4,000 gallon gasoline USTs were installed side by side in ground along the eastern side of the property. These tanks were pumped of bulk fuel and taken out of service on December 23, 1998, in accordance with Vermont DEC UST regulations, since these tank would not meet upgrade standards in time. On October 12, 1999 these UST were closed by removal. The assessment conducted by KSKGeoS™ on this date revealed soils at and below the groundwater interface associated with the tank pit bottom to be impacted with VOCs at levels above VT ANR DEC guidelines of 20 ppm by PID.

Figure 1
Site Location Map

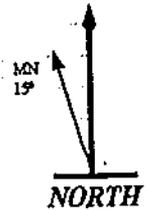


1 1/4 0 1 Mile

0 2,000 4,000 6,000 8,000 Feet

SCALE: 1" = 2,000 Feet

SOURCE:
Milton Quadrangle, Vermont 7.5 Minute Series (Topographic) U.S.G.S. Reston, VA 1987



Based upon the degree of contamination identified in the October 1999 UST closure assessment, a phase II hydrogeologic investigation was initiated by KSKGeoS™ on November 23, 1999.

1.3 Goals

KSKGeoS™ developed this investigation to meet the following goals:

- To assess the current environmental conditions in the overburden soils and in the unconsolidated groundwater aquifer by defining the extent and concentrations (if any) of separate-phase and/or dissolved-phase petroleum hydrocarbon product plume(s).
- To identify and evaluate impacts (if any) to identified potential receptors in the vicinity of the site, and;
- To identify a potential remedial action program and/or future monitoring program suitable to address identified impacts (if any) revealed through the course of this investigation.

1.4 Scope of Work

KSKGeoS™'s scope of work on this site included the completion of the following tasks:

- Modification of a previously prepared (October, 1999) site-specific health and safety plan (HASP) in accord with OSHA 29 CFR 1910.120, to include tasks associated with drilling, well installations and other tasks involved with this phase of site investigation.
- Field identification and/or up-dated evaluation of potential receptors proximal to the site, including but not limited to: potable water supply sources, surface waterbodies and waterways, sensitive environmental areas, basement and crawlspace air quality in on-site and adjacent buildings, and possible preferential subsurface migratory pathways.
- Completion, with professional oversight, of five (5) soil borings by hydraulic probe methodology; each of these borings was finished as a 1½ -inch diameter groundwater monitoring well (MW-1 - MW-5).
- Core barrel sampling of the overburden soils during soil boring activities. All samples were screened for VOCs, using bagged, head-space methodology, with an H-Nu PI-101, 10.2 electron-volt (eV) lamp, photoionization detector (PID).
- Survey of groundwater monitoring well locations and elevations to an assumed datum. Elevational accuracy is $\pm 0.01'$; spatial accuracy is $\pm 1.0'$.
- Gauging of groundwater elevations of all wells in the monitoring well network.
- Sampling of groundwater from wells MW-1, MW-2, MW-3, MW-4, and MW-5, under chain-of-custody protocol.
- Laboratory chemical analyses of groundwater well samples for benzene, toluene, ethylbenzene, and total xylenes (BTEX); methyl tert-butyl ether (MTBE); 1,3,5-trimethylbenzene; 1,2,4 trimethylbenzene; and naphthalene by EPA method 8021b.
- Laboratory chemical analyses of groundwater well samples for total petroleum hydrocarbons (TPH) by EPA modified Method 8015.
- Data evaluation and interpretation.
- Summary report preparation including all investigative results, documentation, interpretation, and findings and recommendations.

Figure 2 is a site map showing property layout, with groundwater monitoring well locations, groundwater contours, and contaminant isoconcentrations with tabled contaminant concentrations based upon field and laboratory data from the November 23, 1999 sampling event.

2.0 INVESTIGATIVE METHODOLOGY

2.1 Soil Boring & Groundwater Monitoring Well Installation

Boring and well installations at the site were completed on November 23, 1999. All monitoring well locations were selected by KSKGeoS™ supervising scientist John Roman. Monitoring well locations were sited to best represent the overburden and groundwater conditions on a site-wide basis. Soil borings and wells were completed by Adams Engineering of Underhill, Vermont under the direct supervision of Mr. Roman.

The wells are constructed of 1½" diameter, flush-threaded, PVC screening and casing. Screening is factory slotted to 0.010' (an equivalent of 0.010 -feet of opening per running foot of screen). The screened interval for each well was determined by the supervising scientist to extend at least five (5) feet above and five (5) feet below the groundwater table, where possible, to allow for seasonal fluctuations.

The annulus of each borehole was then filter-packed with washed, # 0 Morie sand to a depth at least one (1) foot above the top of the screened interval. A one (1) foot (or greater) hydrated bentonite seal was placed above the filter-pack. The remainder of the annular space was then back-filled with clean cuttings from each borehole. The top of each well casing was secured with a gripper-type cap. All six (6) wells were completed with flush-mounted, steel manholes set in concrete pads. Boring and well completion logs are included as Attachment 1.

Upon completion each monitoring well was developed utilizing a peristaltic pump on November 23, 1999. Well top-of-casing elevations were surveyed in on November 23, 1999 by Mr. Roman and Mr. Adams to an assumed datum of 100.00 -feet. The top of the concrete slab on the southeast corner of the pump island was used as a benchmark.

2.2 Soil Sampling and Field Analysis

57
Soil boring samples were secured with a two-inch by five-foot (2"x 5.0') core-barreled sampler, advanced with the aid of a truck-mounted hydraulic probe. The core-barrel and probe rods were decontaminated after each sample was collected with a high pressure steam cleaner, and a double-wash with liquinox-clean water solution and clean water rinse. The core-barrel was lined with a clean length of 4-mil polyethylene prior to sample procurement.

All samples were classified by the supervising ground water scientist using the Unified Soil Classification System. Each soil sample was screened for the presence of VOCs by PID using bagged, head-space methodology. The PID employed was an H-Nu PI-101 with a 10.2 eV lamp. The unit was calibrated on-site for benzene in calibration gas equivalents (CGEs) of 100% isobutylene at 70 parts per million (ppm).

2.3 Groundwater Monitoring, Sampling, and Analysis

Approximately one hour following installation, an optical interface probe, capable of determining groundwater and separate-phase hydrocarbon petroleum product presence and thickness to within 0.01', was utilized to profile the elevations and the VOC characteristics of the overburden aquifer within each well. Table 1 is a summary of groundwater elevations for the November 23, 1999 gauging event.

Water volumes were then calculated for each of the five (5) wells to be sampled, and the equivalent of three (3) well volumes were purged, by peristaltic pump, prior to sampling. Groundwater samples were then secured from each well under chain-of-custody protocol.

A dedicated length of polypropylene sampling hose was used for each well to purge and sample groundwater. Therefore, a field blank to evaluate sampling equipment or decontamination effectiveness was not necessary. All samples were packed on ice and hand-delivered to Endyne,

Inc. Laboratory Services (Endyne) in Williston, Vermont the following morning – November 24, 1999. **Table 2** is a summary of the laboratory chemical analytical results for ground water samples obtained on November 23, 1999. The actual laboratory chemical analytical report prepared by Endyne is included as **Attachment 2**. Samples were analyzed by EPA Method 8021b for benzene, toluene, ethylbenzene, and total xylene constituents (BTEX); 1,2,4 Tri-methylbenzene; 1,3,5 Tri-methylbenzene; Naphthalene; and MTBE. These water samples were also laboratory analyzed by Endyne in accordance with EPA modified method 8015 for TPH concentration at each well.

SUMMARY TABLE 1: GROUNDWATER ELEVATIONS (in feet) – November 23, 1999						
WELL	GRADE	TOP-OF-CASING	SCREENED INTERVAL	DEPTH-TO-BOTTOM (BG)	DEPTH-TO-WATER	WATER ELEVATION
MW-1	99.25	99.05	84.25 – 94.25'	15.00	3.79	95.26
MW-2	97.64	97.29	85.64 – 95.64'	12.00	6.00	91.29
MW-3	98.09	97.85	85.09 – 95.89'	13.00	4.53	93.32
MW-4	97.95	97.63	85.45 – 95.45'	12.50	5.84	92.11
MW-5	99.31	99.07	86.31 – 96.31'	13.00	3.34	95.97

Table 1 Notes:

- 1) Benchmark: Top of concrete slab for pump island – southeast corner.

2.4 Potential Receptor Survey

A physical survey was conducted to identify potential receptors, including surface waterbodies, potable water sources, neighboring or on-site basements and/or crawl-spaces, sensitive environmental areas, and likely routes of subsurface conductance.

In addition, a review of the VT DEC's *Vermont Hazardous Sites List* was completed to identify any known spill sites in close proximity to the study area.

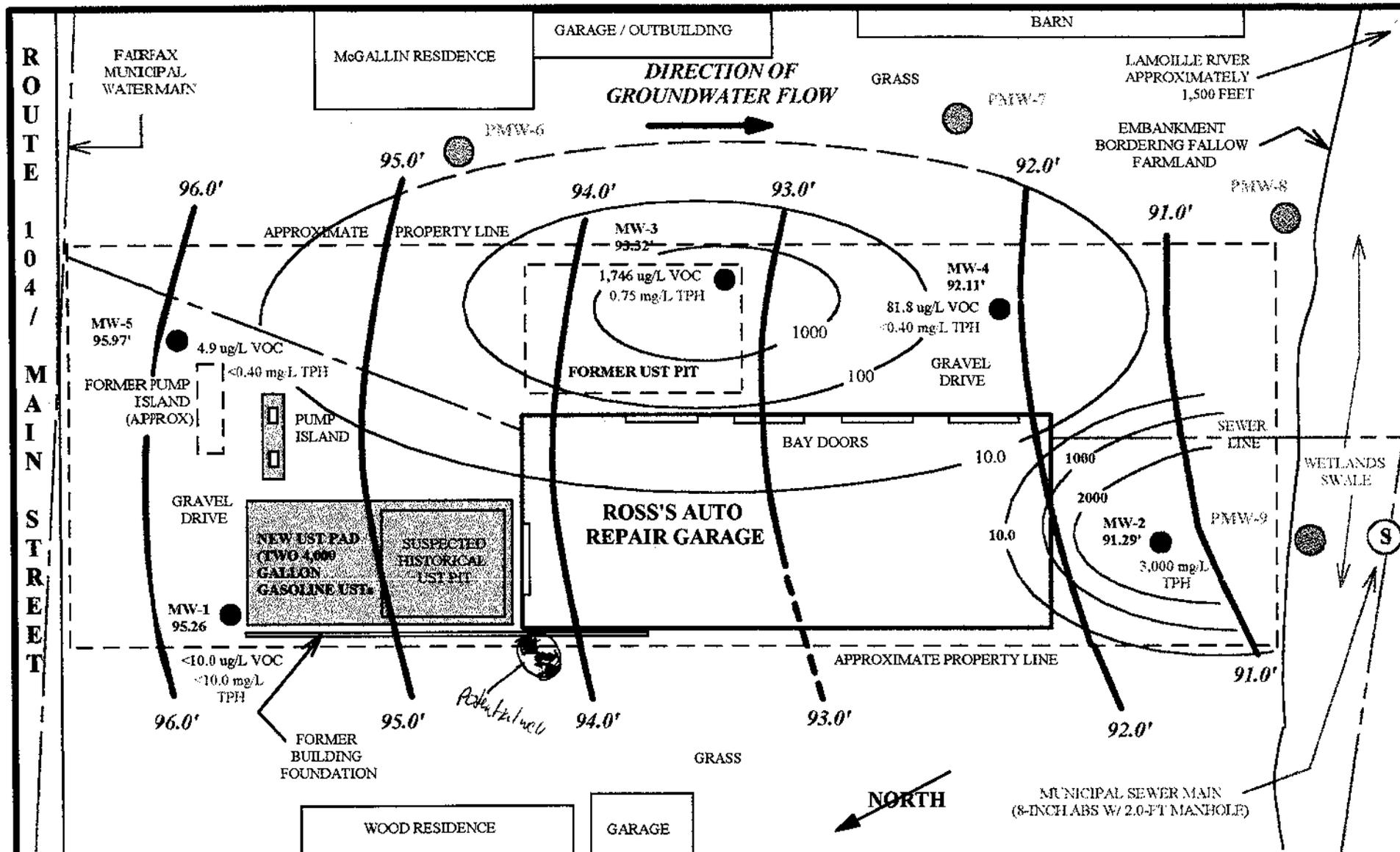
3.0 RESULTS

3.1 Geologic, Overburden Lithologic, Geomorphologic, and Hydrogeologic Summary

The site is located in Fairfax Vermont, within the Green Mountain geomorphic subdivision in the Lamoille River drainage basin. The site is situated approximately 460-feet above mean sea level on a terrace of the foothills associated with the Green Mountain anticlinorium structure. Site topography is relatively level, and appears to consist of some degree of fill to meet the grade of Route 104 (Main Street), particularly at the rear of the site which is approximately 5.0-feet higher in grade than the adjoining fallow field along its southwestern boundary. Surficial drainage at the site generally has a south-southwesterly gradient of less 1%. Overall regional surficial drainage is to the south-southwest toward the Lamoille River approximately 2,000 feet from the site.

neg account for suspected dry well.
 (see MW-2 log)

According to the Geology for Environmental Planning in the Milton-St. Albans Region, Vermont, the site is situated upon lacustrine and marine clays and silts comprised of bottom sediments of the former Champlain Sea associated with the last Great Ice Age. Near the site, there is also mapped the occurrence of recent stream alluvium associated with the modern day erosional processes of the Lamoille River. Observaton of the excavated materials at the site, and inspection of the side walls of the tank pit in October 1999, as well as observation of soils in core



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PROJECT DETAIL	
PROJECT:	SBC / ROSS'S AUTO
PROJECT No:	98021
DEC SPILL #:	NOT ASSIGNED
LOCATION:	FAIFAX, VERMONT
CUSTOMER:	S.B. COLLINS, INC.
SAMPLE DATE:	NOVEMBER 23, 1999
DRAWN BY:	ROMAN
SCALE:	1" = 20'

ANALYTE	CONCENTRATIONS BY WELL IN ug/L				
	MW-1	MW-2	MW-3	MW-4	MW-5
BENZENE	<1.0	N/A	TBQ <20	<1	<1
TOLUENE	<1.0	N/A	<20	<1	<1
ETHYLBENZENE	<1.0	N/A	56	<1	<1
XYLENES	<1.0	N/A	123	<1	3.2
MTBE	<10.0	N/A	1,490	81.8	<10
1,2,4 TRIMETHYLBENZENE	<1.0	N/A	50.2	<1	1.7
1,3,5 TRIMETHYLBENZENE	<1.0	N/A	<20	<1	<1
NAPHTHALENE	<1.0	N/A	27	<5	TBQ <1
TPH (in ppm)	<0.40	3,000	0.75	<0.40	<0.40

samples obtained during this investigation suggests that both of these formations are present beneath the site, with the lacustrine silt appearing as the dominant lithology.

Bedrock beneath the site is mapped as pre-Cambrian, Fairfield Pond Formation consisting of green, fine-grained, chloritic phyllites that are considered transitional to Pinnacle rift clastics associated with the Cambrian Cheshire Formation located beneath it. Based upon a composite stratigraphic column done of the West Georgia Vermont Area (Dorsey, et al, 1983), this formation is estimated to be 100-feet thick. Bedrock was not encountered during the October UST closure excavations, or during the monitoring well installations completed on November 23, 1999.

Groundwater was noted at between 3.5-feet and 6.5-feet bg during well installations. Soils encountered included primarily sand and gravel through the initial 5.0-foot bg, over silt with variably graded sand through approximately 10-foot bg, and silt with varying degree of clay below 10-foot bg. The exception to this general profile was found at MW-3, located adjacent, if not within the south-eastern edge of the former tank pit; the profile existed primarily as sand with silts encountered at 10-foot bg. During the installation of MW-2, located behind the garage we encountered a void in the subsurface of unknown thickness during the advancement of the second core-barrel for this borehole (5.0-foot to 10.0-foot bg). The limited soil extracted from this sample consisted of weathered and blackened (with petroleum sheen) drainage stone, suggesting the presence of an abandoned dry-well or leach field. A subsequent sample taken from the 10.0-foot to 15.0-foot bg sequence for MW-2 yielded silt, transitioning to clay at 14.0-foot bg with no indication of petroleum staining.

Soil grab samples from MW-1, located off of the north corner of the new UST pad, and also nearest the suspected former location of a gasoline UST in front of the garage, yielded VOCs by PID ranging from 0.4 ppm to 0.8 ppm. Core barrel soil samples obtained for MW-2 located behind the garage building, and set into a suspected abandoned dry well or leach field, yielded PID headspace readings ranging from non-detect to 16.8 ppm, with higher levels occurring at or just the groundwater interface (between 5.5-feet to 10.0-foot bg). Soil samples obtained during the advancement for MW-3, located within or directly along-side the south-western side of the former tank pit for USTs removed in October 1999, produced PID readings of between 0.8 ppm and 32 ppm, with the highest level intercepted below the groundwater interface at approximately 8.0-foot bg. Soils screened during the advancement for MW-4, situated within the southern, rear quarter of the property, yielded PID readings ranging to 1.2 ppm. These were associated with soil at between 5.0-foot and 6.0-foot bg which revealed a black band of apparent waste-oil impacted soil (5.83-feet to 6.49 feet), at and just below the groundwater interface. MW-5 was installed in the northeast quarter of the site to evaluate soil and groundwater conditions near the location of the previous gas pump island. Soils obtained during this boring did not yield PID readings above background.

3.2 Specific Hydrogeological Characteristics

Groundwater beneath the site was gauged at an average depth of 4.86 -feet BG on the November 23, 1999 sampling date. Groundwater flow direction is to the south-southwest across the site with an approximate gradient of 2.9%. An approximate rate-of-travel (V_a) in the overburden aquifer was calculated through the application of Darcy's Law utilizing typical constants for horizontal hydraulic conductivity (K_H) and porosity (n) of the observed aquifer matrix (Driscoll, 1986):

$$V_a = \{[K_H (h_1-h_2)] \div L\} \div n$$

where (h_1-h_2) is the difference in hydraulic head, and L is the distance along the flowpath for which the difference in hydraulic head is measured. When all known and assumed aquifer characteristics are entered into the above equation, the resulting rate-of-travel from MW-5 to MW-4 on November 23, 1999 is:

$$V_a = \{[10 \text{ gpd/ft}^2 (95.97' - 92.11')] \div 118'\} \div 35\% = 9.35 \times 10^3 \text{ gpd/ft}^2$$

Table 1 is the groundwater elevation data calculated from the gauging of the monitoring well network on November 23, 1999. Figure 2 depicts groundwater contours of the overburden aquifer based upon this data.

3.3 Groundwater Laboratory Chemical Analytical Results

Actual laboratory chemical analytical results for all analytes are included as Attachment 2 of this report. Table 2 summarizes the results of these analyses. Samples were secured from five (5) monitoring wells.

- Samples obtained from monitoring wells MW-1, MW-3, MW-4 and MW-5 were laboratory analyzed by EPA Method 8021. The groundwater sample obtained from MW-1 did not yield any VOCs above an MDL of 1.0 µg/L, nor the presence of MTBE above an MDL of 10.0 µg/L. Groundwater from MW-3 yielded a total BTEX concentration of 179 µg/L, an MTBE concentration of 1,490 µg/L, and a total VOC concentration of 1,746 µg/L. The laboratory analysis for MW-3 yielded a trace of benzene below quantitation limits (TBQ) of 20 µg/L. Groundwater from MW-4 did not yield the presence of BTEX constituents, tri-methyl benzene or naphthalene above MDLs of 1.0 µg/L, however this sample did yield a MTBE concentration of 81.8 µg/L. Groundwater obtained from MW-5 yielded a total BTEX concentration of 3.2 µg/L (xylenes only), while MTBE was below the MDL of 10 µg/L. Total VOCs were 4.9 µg/L for MW-5.

Why no 8021b?

MW-2?

WELL	MTBE µg/L	Benzene µg/L	Toluene µg/L	Ethyl- benzene µg/L	Xylenes µg/L	Total BTEX µg/L	1,3,5 Tri- Methylbenzene µg/L	1,2,4 Tri- Methylbenzene µg/L	Naphthalene µg/L	TPH mg/L
MW-1	<10.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.40
MW-2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,000*
MW-3	1,490.	TBQ <20.0	<20.0	56.0	123.	>179.0	<20.0	50.2	27.0	0.75
MW-4	81.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<0.40
MW-5	<10.	<1.0	<1.0	<1.0	3.2	3.2	<1.0	1.7	TBQ <1.0	<0.40

Table 2 Notes:

- 1) Volatiles, including naphthalene, analyzed by EPA Method 8021B.
- 2) Total Petroleum Hydrocarbons (TPH) analyzed by modified EPA Method 8015.
- 3) * MW-2 sample - Interpretation of GC/FID Chromatograph indicates groundwater contains weathered/old kerosene and motor oil
- 4) Concentrations in bold type represent levels that exceed Vermont GES Enforcement Standards.
- 5) N/A - MW-2 not analyzed for volatiles due to the presence of free-phase petroleum within sample.

- Ground water samples obtained from all site monitoring wells were laboratory analyzed by modified EPA Method 8015 for total petroleum hydrocarbons. The results of these analyses showed MW-1, MW-4 and MW-5 to be below an MDL of 0.40 mg/L. MW-2 yielded a TPH concentration of 3,000 mg/L, while MW-3 yielded a TPH concentration of 0.75 mg/L. Additionally, the sample for MW-2 also underwent chromatographic interpretation in an attempt to identify the hydrocarbon specie(s) that comprised the sample. According to Endyne, interpretation of this sample's chromatograph fingerprint revealed weathered kerosene and used motor oil, as well as other unidentified peaks comprising less than 10% of the total petroleum hydrocarbon value. Included with Attachment 2 is a copy of the actual

chromatograph result for this sample as well as copies of standards for kerosene, fuel oil, used motor oil, and general hydrocarbon-chain window chromatographs.

- Field blank samples were not obtained for this sampling round as dedicated length of polypropylene sampling tubing were used at each monitoring well being sampled via peristaltic pump.

3.4 Potential Environmental Concerns

3.4.1 Site Specific Concerns

Ross's Auto Repair Service Station is an automobile repair shop, and gasoline filling station. The facility was observed to be well-kept and orderly. In general, the limited presence of cleaning fluids, lubricants, and/or other fluids maintained for the operation were found to be properly stored and containerized. However, on November 23, 1999 while completing a site walkover for this investigation, one 250-gallon AST and 2 (two) accompanying 55-gallon drums filled with waste oil were observed situated outside, behind the rear of the facility. These storage drums and AST appeared sound and no spillage or soil staining was observed. According to Mr. Ross the waste oil is staged in this location temporarily to be used in the facility's permitted waste oil burner unit utilized to heat the garage. A secondary source of heat is produced by a propane fired ceiling-mounted heating unit; the propane for this unit is located adjacent the southeast corner of the building. Four (4) other drums containing antifreeze were observed stored along the south exterior end-wall of the garage building. The antifreeze is also in temporary storage awaiting processing by Hytech Recyclers of Middlebury, Vermont. According to Mr. Ross, a concrete storage pad with elevated side-walls for secondary containment is planned for installation behind the garage during the spring/summer of 2000. This will be used for short-term storage of these fluids prior to their use/re-use.

on impervious
surface
w/ weather
striking
cover

The facility does not contain floor drains. However the former building, present through the Fall of 1998, did have a floor drain located in the front (north) end of the building. This fed to the sewer and was approved by the Town of Fairfax, according to Mr. Ross. The current hydraulic lifts utilized at the facility are self-contained units that do not breach the slab floor they are situated on. The previous garage also utilized self-contained units that did breach the floor; according to Mr. Ross, upon their removal in the fall of 1998, these lift columns were found to be sound without leakage.

3.4.2 Surrounding Land Uses

The site is located on the south side of Route 104 (Main Street). The area is comprised of agricultural land uses with an even blend of residential land use and limited commercial land use.

- North (across Route 104) Residential Dwelling and Fairfax Historical Society.
- East Residential Property owned by Dave & Tammy McGallin
- South Fallow Agricultural (behind the site)
- West Residential Property owned by Sue & Mack Wood.

3.4.3 Site Utilities

This site currently receives its water supply from Fairfax Municipal Water Supply through a one-inch copper line that enters the building in the front, northwest corner of the building. This pipe is buried between 4.0 and 5.0-feet bg according to the Fairfax DOPW. The primary water main, running nearly parallel with Route 104, and beneath the front (northern) property boundary, is constructed of 2-inch PVC buried approximately 5.0-feet bg in a trench approximately 24-inches in circumference. A new 8-inch iron main was recently installed adjacent and within the same trench as the 2-inch PVC line. This newer iron line was to be activated shortly upon its complete installation along Main Street.

The site is also serviced by an 8-inch PVC sewer main that is situated approximately 7.0-feet bg and runs east southeasterly adjacent to the rear boundary of the site. The site is connected to the main by a 4-inch PVC line leading from the southeast corner of the garage building where the bathroom and wash basin sink are located. Please refer to Figure 2 that depicts the approximate location of these underground services.

3.4.4 Potable Water Sources - 1 Mile Radius of Site

The site and surrounding residences are supplied potable water through the Town of Fairfax Water Systems. According to Mr. Randy Devine, Public and Water Works Director for the Town of Fairfax, there are no known public or private water wells within a ¼-mile radius of the site.

3.4.5 Other Identified Sensitive Receptors - 1 Mile Radius of Site

Sensitive receptors within a one-mile radius of the site, include soils and groundwater, as well as the Lamoille River, which is situated approximately 2000-feet south and southeast of the site. A residential dwelling located approximately 50-feet northeast of the former tank pit was observed to have a basement, that may also be considered a potential receptor, however this dwelling is cross, and slightly up-gradient of apparent groundwater flow. The underground utilities already described also represent potential receptors of subsurface impacts identified during this study. According to Mr. Peter Pochop of Green Mountain Engineering, who has overseen test borings for the installation of the new water main, no subsurface impact was observed during boreholes placed in front of the site and along the water main corridor in the Spring of 1998. Further, no discernable impact was noted more recently during excavation procedures for the installation of the new water main completed within the last two months following this phase of investigation.

McCallister residence
Basement
No concern
crossed flow
LE when 1998
no impact

On November 24, 1999, a PID was utilized to test for potential hydrocarbon impact with the 24-inch manway of the town sewer line located behind the site. The PID did not yield any response. Observation of this manway did not reveal the presence of discernable oil or petroleum odor or staining. Also noted in the proximity of the sewer manway, and in the immediate area just below the rear embankment (fill) of the facility were wetland species of cattail reed and swale grass, as well as perched surface water, pooled amongst these flora. These plant species did not appear to be stressed, although seasonal dormancy for many of such species is nearing. No discernable petroleum sheen or odor was noted on the ponded waters of this limited wetland area.

3.4.6 Hazardous Sites Review / Identification

A review of the Vermont WMD *Hazardous Sites List* identified one (1) site within one (1)- mile of the study site. This one identified site is referred to as Nan's Mobil. It is located approximately ¼-mile west-northwest of the site on the opposite side of Route 104. Based upon the location of Nan's Mobil in relation to the Lamoille River, as well as the consideration of the duration of time since the inception of the release associated with Nan's Mobil, it appears there is little risk of contamination originating from Nan's Mobil that would affect the subsurface beneath Ross's Auto. Two other Vermont WMD Hazardous Sites were noted, and are located between 1.25 and 3.0-miles from Ross's Auto, and likely not at risk of impacting or influencing subsurface conditions at the study site. The list of identified hazardous sites is as follows:

Site#	ID	Location	Town	Action	
1)	931467	Nan's Mobil	Route 104	Fairfax	LUST / Annual GW monitoring
2)	951836	Minors Country Store	Route 104	Fairfax	LUST / Semi-Annual GW monitor
3)	951874	R.L. Vallee - Fairfield Spill	Route 104A	Fairfax	Source Removed/Investigate On-going

4.0 FINDINGS

KENT S. KOPTIUCH, Inc. Geo-Environmental Services' phase II subsurface investigation at Ross's Auto Service Station property, located on Main Street (Route 104) in Fairfax, Vermont yielded the following results and findings:

- The overburden aquifer is comprised primarily of fine silt-sand and silt-clay matrices and some coarser materials associated with lacustrine formations of the former Champlain Sea basin. Coarser sand and gravel material encountered immediately below grade surface is likely associated with fill operations and site development; the rear of the site appears to have been raised between four and five feet and is now relatively level with the grade of Route 104. The groundwater table was noted at depths ranging from 3.0 -feet to 6.0 -feet below grade at the time of this investigation.
- Groundwater flow conditions in the overburden aquifer exhibit a south south-southwesterly flow direction across the site. Gradient is approximately 2.9 % with a rate-of-travel through the overburden aquifer of approximately 9.35×10^{-3} gpd/ft².
- Laboratory chemical analytical results of the groundwater samples secured from five (5) monitoring wells yielded total BTEX concentrations ranging from <1.0 µg/L through >179.0 µg/L. MW-3, located adjacent and along the edge of the former tank pit was found to contain groundwater with benzene, naphthalene, and 1,2,4-trimethylbenzene concentrations that are above Vermont GES. MTBE concentrations also exceeded Vermont GES at monitoring wells MW-3 and MW-4. TPH concentrations of 0.75 mg/L were detected in groundwater obtained from MW-3. TPH concentrations in groundwater obtained from MW-2 were 3,000 mg/L with supplemental petroleum species identification yielding weathered or old kerosene and motor oil.
- During advancement of soil probes for MW-2 behind the garage building, a medium of apparent leach stone with blackened groundwater and petroleum sheen was encountered at between 5.0 to 10.0-feet bg. During the advancement of MW-4, located approximately 50-feet east of MW-2, a band of blackened soil, with odor of motor/waste oil was encountered within the core barrel sample from 5.83-feet and 6.49-feet bg.
- Soils screened during the installation of MW-3 installed adjacent to, and at the edge of the former tank pit yielded concentrations ranging to 32.0 ppm by PID in soils beneath the groundwater interface.
- At the time of this investigation, the site and surrounding residences are supplied water from the Town of Fairfax through a primary main constructed of two-inch PVC. The installation of a new 8-inch iron water main was on-going along Route 104 at the time of this investigation and will soon be activated as the primary main, while the 2-inch line is to be abandoned. A one-inch copper water line enters Ross's Auto in the front northeast corner of the building. All water lines are situated between 4.0-feet and 6.0-feet bg and are potentially submerged in groundwater at least part of the year. The town's gravity feed, 8-inch sewer main is situated behind the site running south-southeasterly. The site's septic connects to the main behind the station, originating from the southeast rear corner of the garage.
- In addition to soil and groundwater beneath the site, other nearby potential receptors of the contamination identified during this investigation include; the water and sewer corridors previously described, the basement of the adjacent residence to the east, a limited wetland area with surface waters located directly adjacent the rear boundary of the site.
- One hazardous site referred to as Nan's Mobil is located approximately ¼-mile northeast of the site, also on Route 104. However, based the proximity of the Lamoille River and the current low/no risk monitoring program on-going at Nan's, it does not appear to pose a significant risk to the subsurface beneath Ross's Auto.
- A soil pile of approximately 100 cubic yards is stockpiled at the Jamie Ross Property in

Westford, Vermont. This soil, impacted by adsorbed gasoline hydrocarbons, was generated during excavation of soil for the installation of a new UST system at Ross's Auto in mid October, 1999.

5.0 RECOMMENDATIONS

Based upon the findings of this subsurface investigation, KSKGeoS™ offers the following recommendations regarding future monitoring and/or remedial options for the Ross's Auto Service Station property:

- The extent of groundwater contamination to the south and east, in the apparent direction of groundwater flow has not been fully characterized. A minimum of four (4) additional monitoring wells located along the eastern boundary of the site, and upon the abutting fallow farmland, are necessary to evaluate the extent of subsurface migration of both a dissolved gasoline hydrocarbon plume and weathered waste oil / kerosene source existent behind the garage building. These additional monitoring points will also serve to determine the risk of contaminant impact to environmentally sensitive areas and/or potential receptors identified in this investigation, that reside down or cross gradient of the site. Proposed well locations are noted on Figure 2. *also read well adjacent to the oldest garage wst*
- Additional investigation of an apparent dry-well / leach field behind the main facility is necessary to ascertain its possible role as a source and conduit to further dispersion of contamination(s). Future monitoring and investigation of the sewer main and associated structures, as potential receptors of the contaminant plume, are necessary to better evaluate potential human health risks that may be present as a result of this utility's proximity to the plume. ✓
- After the installation of the proposed additional wells, likely to be installed by hand-auger due to site conditions, an additional groundwater sampling round should be completed incorporating all site monitoring wells including MW-2, with groundwater samples laboratory analyzed by EPA Method 8021b to determine the current degree of contamination. *get 8260 + lead*
- The stockpiled soil pile, remnant from the excavation for the new tank systems, should be monitored by PID to determine the current VOC impact (if any) remaining in this soil. The pile should be monitored a minimum of twice a year at representative depths within the pile. The next monitoring event for this soil pile is proposed to occur in the late spring of 2000 after spring thaw has concluded. ✓
- A supplemental investigation and groundwater quality report on these findings should be completed by a qualified groundwater professional to track petroleum hydrocarbon impact, including all field and laboratory results, with interpretations regarding ground water conditions, contaminant levels and potential risks, concluding with recommendations regarding the need for any additional remedial and or monitoring action.

6.0 LIMITATIONS

This report is based upon limited physical investigation of the site and vicinity, samples from a fixed number of groundwater monitoring wells and sampling points, laboratory chemical analyses, and research of materials and files available at the time of the investigation. The findings presented in this report are based only on the observations drawn during this investigation, and upon data provided by others. This report presents a description of the subsurface conditions, in the overburden lithology at each sampling and/or well location, that were prevalent at the time of KSKGeoS™ investigation.

Subsurface conditions can vary significantly over time, particularly with respect to groundwater elevations and groundwater and soil quality. Findings and recommendations presented in this document are applicable only to the facts and conditions described at the time of this investigation. In performing its professional services, KSKGeoS™ employs the degree of care

and skill exercised under similar circumstances by members of the environmental profession practicing in the same or similar locality under similar conditions. The standard of care shall be judged exclusively as of the time these services are rendered, and not according to later standards. KSKGeoS™ makes no express or implied warranty beyond its conformance to this standard. KSKGeoS™ shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed for the preparation of this document. KSKGeoS™ believes that all information contained in this document is factual, but no guarantee is made or implied.

7.0 REFERENCES

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- Driscoll, Fletcher G., Ph.D., **Groundwater and Wells, 2nd ed.**, Johnson Division, St. Paul, MN., 1986.
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- Stewart, David P., **Geology for Environmental Planning in the Milton-St. Albans Region, Vermont**, Environmental Geology No. 5, Vermont Geological Survey, Water Resources Department, Montpelier, Vermont, 1974.
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- United States Geological Survey, **Milton Quadrangle, Vermont 7.5 Minute Series (Topographic)**, U.S.G.S Reston, VA., 1987.
- Waste Management Division, **Third Quarter 1999 Update, Vermont Hazardous Sites List**, Vermont Agency of Natural Resources, Department of Environmental Conservation, Waterbury, VT October 12, 1999

Attachment 1

Soil Boring and Well Completion Logs



KENT S. KOPTUCH, INC.
 Geo-Environmental Services
 164 OSGOOD HILL • ESSEX, VERMONT 05452
 TELE/FAX (802) 878-1620

WELL LOG MW-1
 INSTALLED: November 23, 1999
 LOGGED BY: JOHN C. ROMAN

PROJECT # 98021	DRILLING COMPANY	DRILL RIG:	SAMPLING METHOD:
SBC/FAIRFAX - ROSS'S AUTO	ADAMS ENGINEERING	Truck-Mounted Hydroprobe	5" X 2.375" ID NQ Sampler

 BENTONITE WELL SEAL
  NATIVE BACKFILL
  #0 MORIE SAND PACK
 CASING: 1.5" DIAM., FLUSH-THREADED PVC
 CONCRETE SURFACE SEAL
 SCREEN: 1.5" DIAM., FLUSH-THREADED, 0.10" SLOT PVC

DEPTH (ft)	CONSTRUCTION	SAMPLE #	BLOWS/ft	RECOVERY	VOCs in ppm	SOILS/LITHOLOGY	COMMENTS
0.0							GRADE @ 99.25'
							TOC @ 99.05'
0.0 - 1.16'		SB-1	N/A	1.5'	0.8	MOIST, BROWN SAND W/ FN TO MED GRAVEL	
1.16' - 1.50'					0.4	SLIGHTLY MOIST GRAY SILT & CRS SAND FRAGMENTS	
5.0' - 6.25'		SB-2	N/A	5.0'	0.0	MOIST TO V MOIST, MAUVE SILT, PLASTIC SLIGHTLY FIRM.	
6.25' - 7.66'					0.0	MOIST TO SATURATED, OLIVE SILT W/ VP SAND, TRC CLAY	WT @ 6.5' BG
7.66' - 10.0'					0.0	WET, TAN & OLIVE SILT W/ SOME CLAY; DENSE	
10.0' - 12.08'		SB-3	N/A	4.16'	0.4	SATURATED TO WET OLIVE SILT-CLAY	
12.08' - 14.16'					0.4	V. MOIST TO WET BROWN TO OLIVE CLAY	
15.0'							EOB 15.0'; SET WELL @ 15.0'



KENT S. KOPTUCH, INC.
 Geo-Environmental Services
 164 OSGOOD HILL • ESSEX, VERMONT 05452
 TELE/FAX (802) 878-1620

WELL LOG MW-3
 INSTALLED: NOVEMBER 23, 1999
 LOGGED BY: JOHN C. ROMAN

PROJECT # 98021

DRILLING COMPANY

DRILL RIG:

SAMPLING METHOD:

SBC/FAIRFAX- ROSS'S AUTO

ADAMS ENGINEERING

Truck-Mounted Hydroprobe

5' X 2.375" ID NQ Sampler

BENTONITE WELL SEAL
 CONCRETE SURFACE SEAL

NATIVE BACKFILL

#0 MORIE SAND PACK

CASING: 1.5" DIAM, FLUSH-THREADED PVC
 SCREEN: 1.5" DIAM, FLUSH-THREADED, 0.10" SLOT PVC

DEPTH (ft)	CONSTRUCTION	SAMPLE #	BLOWS/ft	RECOVERY	VOCs in ppm	SOILS/LITHOLOGY	COMMENTS
0.0							GRADE @ 98.09'
							TOC @ 97.85'
0.0		SB-01	N/A	2.33	1.2	MOIST, GRAVEL W/ SILT-SAND (COMPACTED FILL),	0.0' - 1.0'
1.0					1.6	MOIST, OLIVE SILT & FN TOI CRS SAND, SOME FN GRAVEL	1.0' - 1.83'
2.0					1.8	MOIST BROWN SAND & FN ROUNDED GRAVEL	1.83' - 2.33'
5.0		SB-02	N/A	3.58	1.2	SATURATED BROWN TO OLIVE FN SAND W/ SILT & FN GRAVEL.	5.0' - 5.83'
6.0					2.8	WET OLIVE-GREY FN SAND W/ SILT, SOME CRS SAND, FN GRAVEL AND LITTLE COBBLE.	5.83' - 7.99'
8.0					32.0	V. MOIST TO WET OLIVE SAND, CRS SAND, TRC SILT	7.99' - 8.24'
10.0		SB-3	N/A	2.00	2.6	SATURATED, BROWN FN TO CRS SAND, TRACE SILT	10.0' - 11.0'
11.0					1.4	SATURATED VF SAND WITH SOME SILT	11.0' - 11.16'
11.6					0.8	WET OLIVE SILT W/ VF SAND	11.16' - 11.75'
12.0					0.4	MOIST BROWN SILT, TRACE FN SAND	11.75' - 12.0'
13.0							EOB @ 13.0'
							SET WELL @ 13.0'

WT @ 3.5' BG



KENT S. KOPTHUCH, INC.
 Geo-Environmental Services
 164 OSGOOD HILL - ESSEX, VERMONT 05452
 TELE/FAX (802) 878-1620

WELL LOG MW-4
 INSTALLED: November 23, 1999
 LOGGED BY: JOHN C. ROMAN

PROJECT # 98021	DRILLING COMPANY	DRILL RIG:	SAMPLING METHOD:
SBC/FAIRFAX-ROSS'S AUTO	ADAMS ENGINEERING	Truck-Mounted Hydroprobe	5" X 2.375" ID NQ Sampler

BENTONITE WELL SEAL
 NATIVE BACKFILL
 #0 MORIE SAND PACK
 CASING: 1.5" DIAM, FLUSH-THREADED PVC
 CONCRETE SURFACE SEAL
 SCREEN: 1.5" DIAM, FLUSH-THREADED, 0.10" SLOT PVC

DEPTH (ft)	CONSTRUCTION	SAMPLE #	BLOWS/ft	RECOVERY	VOCs in ppm	SOILS/LITHOLOGY	COMMENTS
0.0							GRADE @ 97.95'
							TOC @ 97.63'
-0.0		SB-01	N/A	2.5	0.6	MOIST BROWN SAND AND FINE PEA STONE (FILL)	0.0' - 1.33'
-1.0					0.0	DRY LIGHT BROWN SAND FN GRAVEL	1.33' - 1.66'
-2.0					0.8	MOIST, DRK BROWN MED-CRS SAND, FN GRAVEL, MOTTLED	1.66' - 2.5'
-3.0							
-4.0							
-5.0		SB-02	N/A	3.33	± 1.0	MOIST, BROWN, MED & CRS SAND W/ SILT, FN GRAVEL	5.0' - 5.83'
-6.0					1.2	WET BLACK & TAN FN SAND W/ SILT (OIL STAINED?)	5.83' - 6.49'
-7.0					0.0	MOIST OLIVE SILT-CLAY	6.49' - 7.32'
-8.0					0.0	S. MOIST TAN & OLIVE MARBLED CLAY-SILT	7.32' - 8.33'
-9.0							
-10.0		SB-3	N/A	5.0	0.0	MOIST TO S. MOIST RED-BROWN & TAN MARBLED CLAY	10.0' - 15.0'
-11.0							
-12.0							
-13.0							SET-WELL @ -12.5'
-14.0							
-15.0							EOB @ 15.0'
-16.0							

WT @ 5.75 BG



KENT S. KOPTUCH, INC.
 Geo-Environmental Services
 164 OSGOOD HILL • ESSEX, VERMONT 05452
 TELE/FAX (802) 878-1620

WELL LOG MW-5
 INSTALLED: November 23, 1999
 LOGGED BY: JOHN C. ROMAN

PROJECT # 98021	DRILLING COMPANY	DRILL RIG:	SAMPLING METHOD:
SBC/FAIRFAX- ROSS'S AUTO	ADAMS-ENGINEERING	Truck-Mounted Hydroprobe	5' X 2.375" ID NQ Sampler

BENTONITE WELL SEAL
 NATIVE BACKFILL
 #0 MORIE SAND PACK
 CASING: 1.5" DIAM, FLUSH-THREADED PVC
 CONCRETE SURFACE SEAL
 SCREEN: 1.5" DIAM, FLUSH-THREADED, 0.10' SLOT PVC

DEPTH (ft)	CONSTRUCTION	SAMPLE #	BLOWS/ft	RECOVERY	VOCs in ppm	SOILS/LITHOLOGY	COMMENTS
0.0							GRADE @ 99.31'
							TOC @ 99.07'
0.00' - 1.16'		SB-1	N/A	3.0	0.0	DRY, FN TO CRS SAND & FN GRAVEL (FILL)	
1.16' - 2.76'					0.0	MOIST, OLIVE FN TO MED SAND W/ SILT, FEW GRAVEL	
2.76' - 3.00'					0.0	V. MOIST FINE SAND W/ SILT	
5.00' - 6.16'		SB-02	N/A	5.0+	0.0	WET TO SATURATED GRAY & TAN SILT	
6.16' - 6.66'					0.0	WET, BROWN SAND, SOME SILT	▼ WT @ 5.3' BG
6.66' - 7.99'					0.0	MOIST, TAN AND OLIVE SILT W/ SOME CLAY	
7.99' - 10.0'					0.0	S. MOIST OLIVE & TAN CLAY-SILT & CLAY	
10.0' - 11.25'		SB-03	N/A	3.0	0.0	SATURATED TAN SILT, SOME CRS TO FN SAND	
11.25' - 13.0'					0.0	MOIST, RED-BROWN CLAY	
13.0'							EOB @ 13.0'
							SET WELL @ 13.0'

Attachment 2

**Laboratory Chemical Analytical Results:
November 23, 1999 Groundwater Sampling Event**



ENDYNE, INC.

Laboratory Services

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

LABORATORY REPORT

CLIENT: KSK GeoEnvironmental Services, Inc.

ORDER ID: 5080

PROJECT: SBC/Ross Auto Repair

DATE RECEIVED: November 24, 1999

REPORT DATE: December 10, 1999

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Different groups of analyses may be reported under separate cover.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

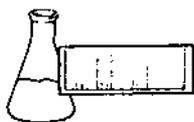
Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits, unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures



ENDYNE, INC.

Laboratory Services

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

EPA METHOD 8021B--PURGEABLE AROMATICS

CLIENT: KSK GeoEnvironmental Services, Inc.

DATE RECEIVED: November 24, 1999

PROJECT NAME: SBC/Ross Auto Repair

REPORT DATE: December 3, 1999

CLIENT PROJ. #: NI

ORDER ID: 5080

Ref. #:	147,978	147,980	147,981	147,982	
Site:	MW-1	MW-3	MW-4	MW-5	
Date Sampled:	11/23/99	11/23/99	11/23/99	11/23/99	
Time Sampled:	10:00	1:45	15:45	16:30	
Sampler:	JR	JR	JR	JR	
Date Analyzed:	12/1/99	12/2/99	12/1/99	12/1/99	
UIP Count:	0	>10	>10	>10	
Dil. Factor (%):	100	5	100	100	
Surr % Rec. (%):	90	91	86	81	
Parameter	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	Conc. (ug/L)	
MTBE	<10	1,490.	81.8	<10	
Benzene	<1	TBQ <20	<1	<1	
Toluene	<1	<20	<1	<1	
Ethylbenzene	<1	56.0	<1	<1	
Xylenes	<1	123.	<1	3.2	
1,3,5 Trimethyl Benzene	<1	<20	<1	<1	
1,2,4 Trimethyl Benzene	<1	50.2	<1	1.7	
Naphthalene	<1	27.0	<1	TBQ <1	

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated

2099

CHAIN-OF-CUSTODY RECORD

33722

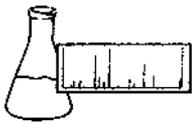
Project Name: <i>SBC/Ross's Auto Repair</i> Site Location: <i>FAIRFAX VT</i>	Reporting Address: <i>KSK GEOS</i> <i>164 Osgood Hill Essex VT</i>	Billing Address: <i>SBC COLLINS</i> <i>ST ALBANS VT</i>
Endyne Project Number: <i>5080</i>	Company: <i>KSK GEOS</i> Contact Name/Phone #: <i>J ROMAN</i>	Sampler Name: <i>JOHN ROMAN</i> Phone #: <i>802 878-1620</i>

Lab #	Sample Location	Matrix	G R A B	C O M P	Date/Time	Sample Containers		Field Results/Remarks	Analysis Required	Sample Preservation	Rush
						No.	Type/Size				
147977	MW-1	GW	X		11/23/97 10 AM	1	40ML		8021B	HCL	
147978	MW-1	GW	X		10 AM	1	40ML		MOD 8015	HCL	
147979	MW-2**	GW	X		10:40	1	8020	GW IN OLD DRYWELL WASTE OIL?	TPH PRO 2015	+ID	
147980	MW-3	GW	X		1:45	1	40ML		8021B	HCL	
147980	MW-3	GW	X		1:45	1	40ML		MOD 8015	HCL	
147981	MW-4	GW	X		3:45	1	40ML		8021B	HCL	
147981	MW-4	GW	X		3:45	1	40ML		MOD 8015	HCL	
147982	MW-5	GW	X		4:30	1	40ML		8021B	HCL	
147982	MW-5	GW	X		4:30	1	40ML		MOD 8015	HCL	

Relinquished by: Signature <i>John C. Roman</i>	Received by: Signature <i>[Signature]</i>	Date/Time <i>11/24/99 10:30am</i>
Relinquished by: Signature	Received by: Signature	Date/Time

New York State Project: Yes No X Requested Analyses *TAKEN FROM MACRO CORE MAYBE 1-2 STONES ALSO DO 20*

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD ₅	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										



ENDYNE, INC.

Laboratory Services

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

LABORATORY REPORT

CLIENT: KSK GeoEnvironmental Services, Inc.
PROJECT: SBC/Ross Auto Repair
DATE REVISED: December 23, 1999

ORDER ID: 5080
DATE RECEIVED: November 24, 1999

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Different groups of analyses may be reported under separate cover.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

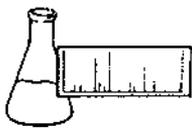
Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits, unless otherwise noted.

Asterisk in results column indicates sample contained degraded kerosene and motor oil and some other unknown hydrocarbons constituting less than 10% of the total petroleum hydrocarbon value.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

enclosures



LABORATORY REPORT

CLIENT: KSK GeoEnvironmental Services, Inc.
PROJECT: SBC/Ross Auto Repair
REPORT DATE: December 23, 1999

ORDER ID: 5080
DATE RECEIVED: November 24, 1999
SAMPLER: JR
ANALYST: 128

Ref. Number: 147978 Site: MW-1 Date Sampled: November 23, 1999 Time: 10:00 AM

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>	<u>Analysis Date</u>
TPH 8015 DRO	< 0.40	mg/L	SW 8015B	12/7/99

Ref. Number: 147979 Site: MW-2 Date Sampled: November 23, 1999 Time: 10:40 AM

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>	<u>Analysis Date</u>
Fuel ID	Kerosene/Motor Oil *	n/a	SW 8015B	12/22/99
TPH 8015 DRO	3,000.	mg/L	SW 8015B	12/7/99

Ref. Number: 147980 Site: MW-3 Date Sampled: November 23, 1999 Time: 1:45 PM

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>	<u>Analysis Date</u>
TPH 8015 DRO	0.75	mg/L	SW 8015B	12/7/99

Ref. Number: 147981 Site: MW-4 Date Sampled: November 23, 1999 Time: 3:45 PM

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>	<u>Analysis Date</u>
TPH 8015 DRO	< 0.40	mg/L	SW 8015B	12/7/99

Ref. Number: 147982 Site: MW-5 Date Sampled: November 23, 1999 Time: 4:30 PM

<u>Parameter</u>	<u>Result</u>	<u>Unit</u>	<u>Method</u>	<u>Analysis Date</u>
TPH 8015 DRO	< 0.40	mg/L	SW 8015B	12/7/99

Fuel ID
147979-1-0
du
0-30 mi

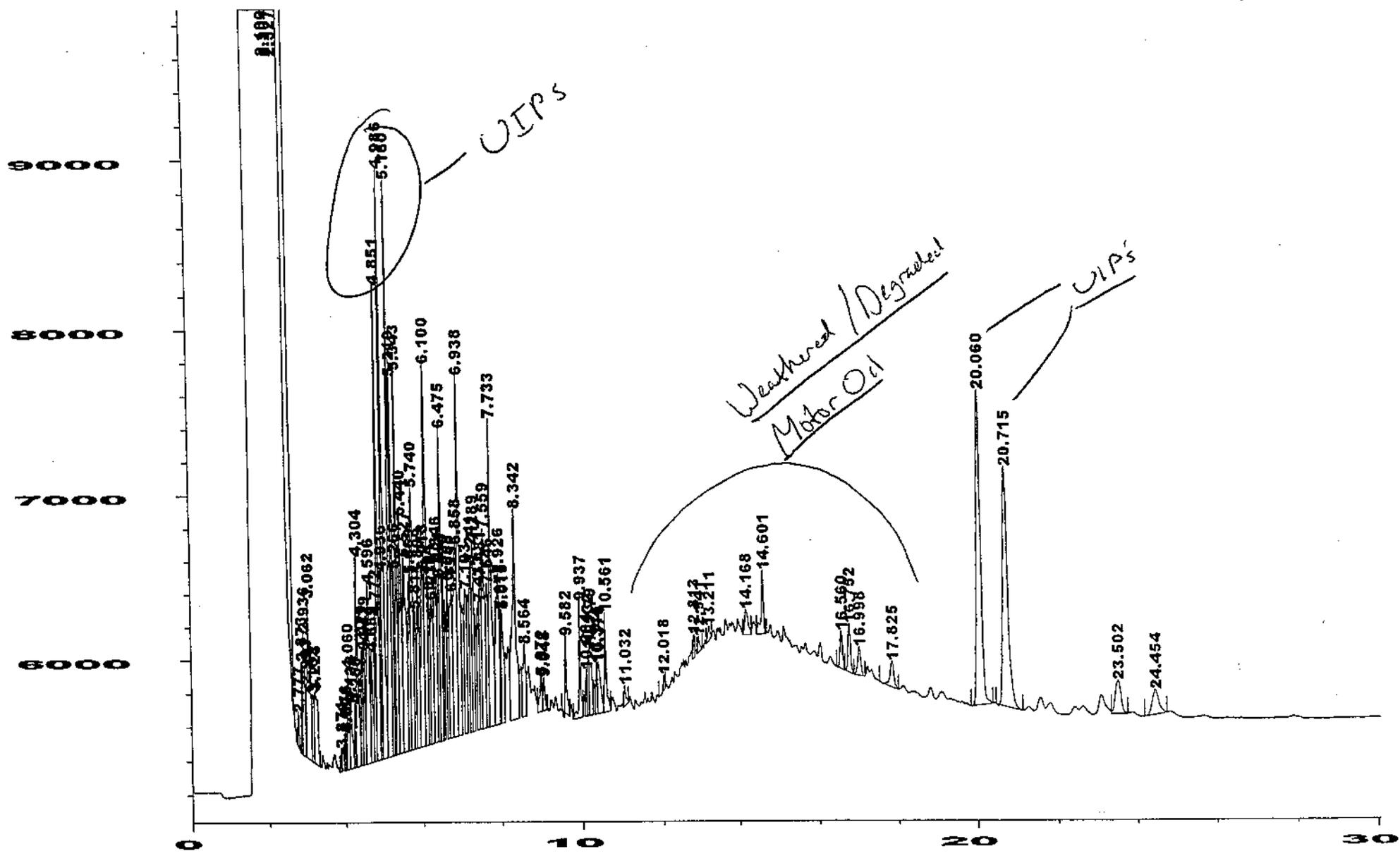


Fig. 1 is C:\HPCHEM\1\DATA\FID\12229906.D

Fuel ID
147979 1-20 drl
0-20 min

Order ID
5080

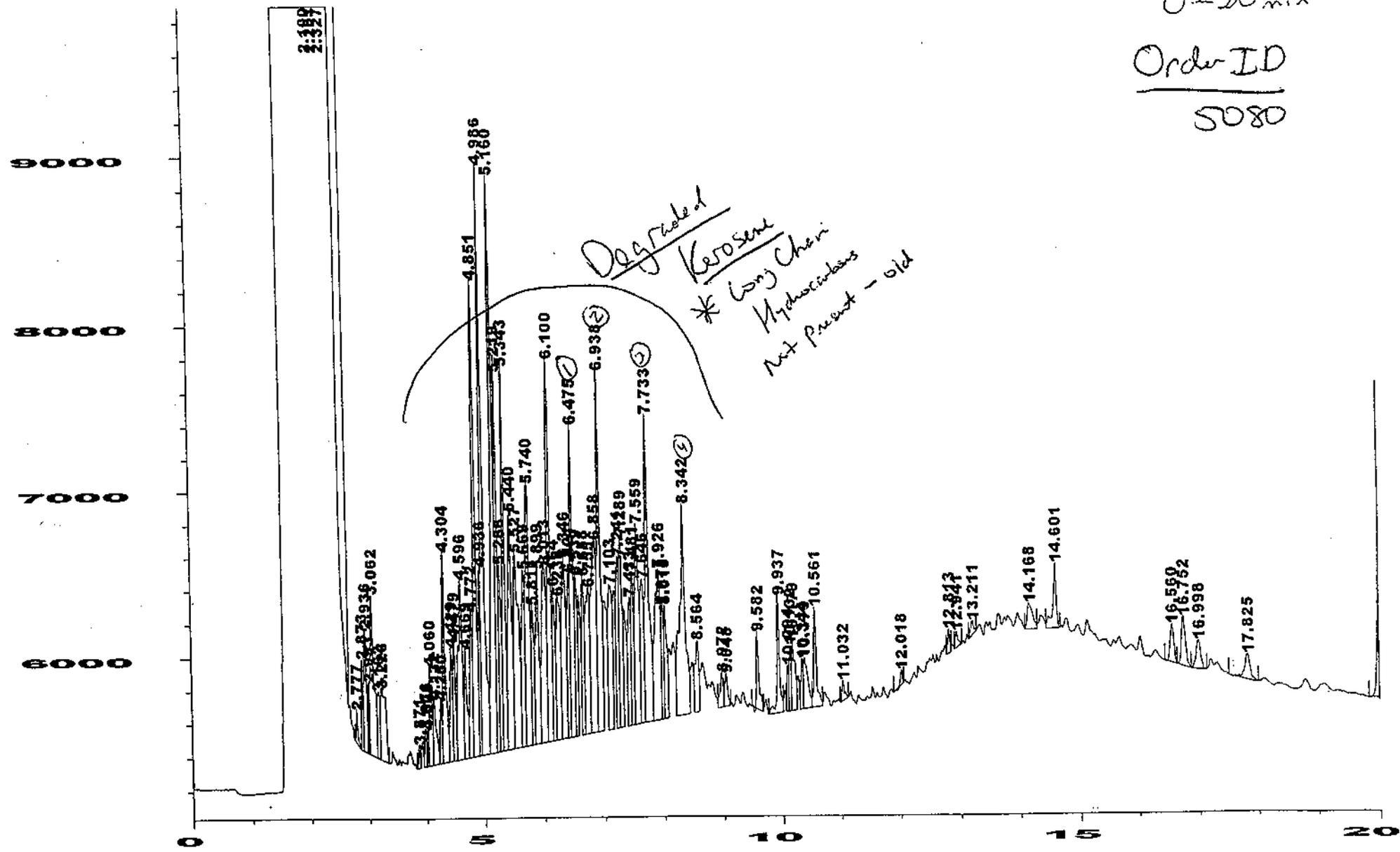


Fig. 1 in C:\HPCHEM\1\DATA\FID\12229906.D

Kerosene
9.3.99
12.22.99
Db

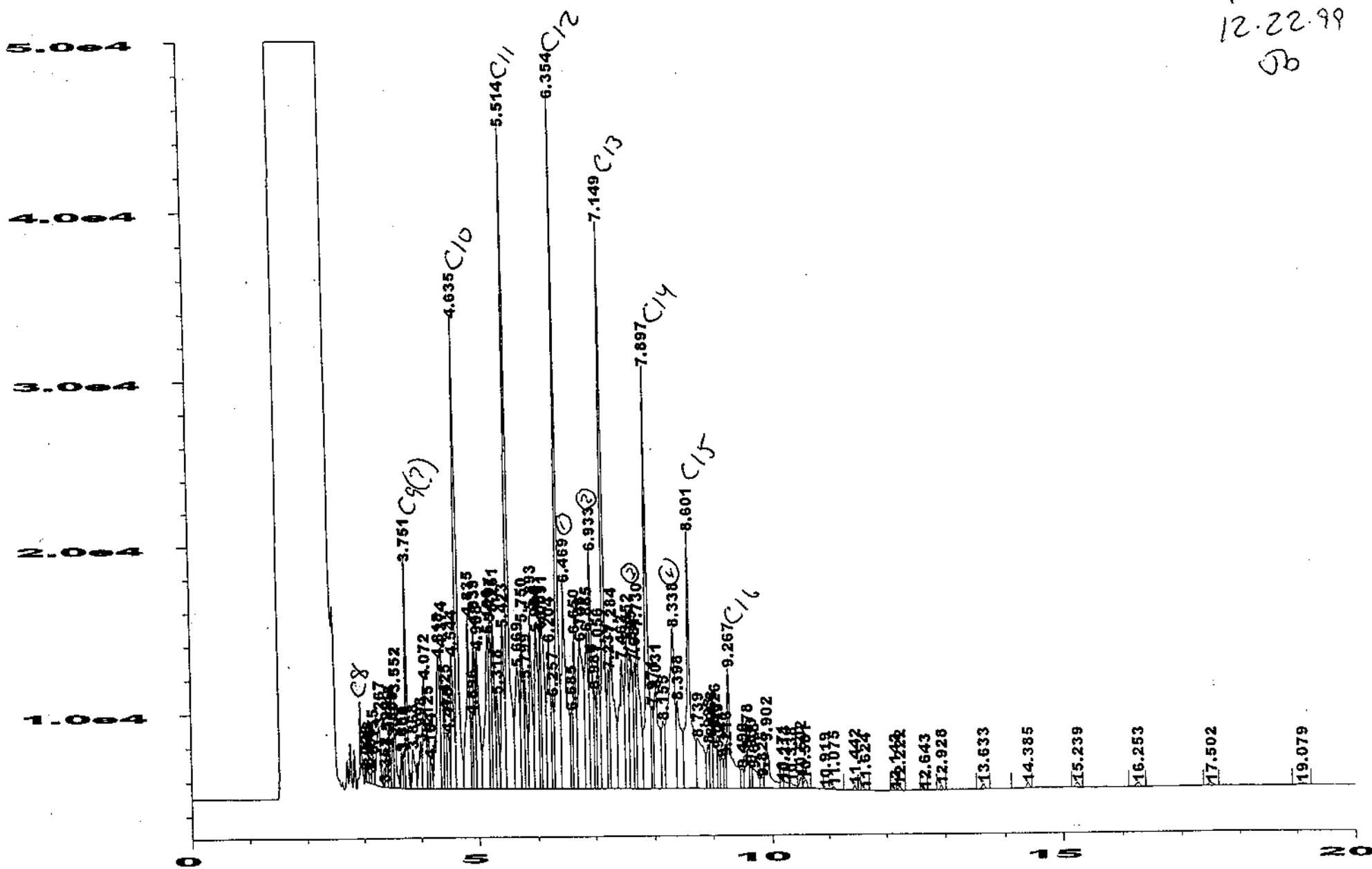


Fig. 1 is C:\HPCHEM\1\DATA\FID\122229902.D

Used Motor Oil
8.18 99
12.22 99
Jo

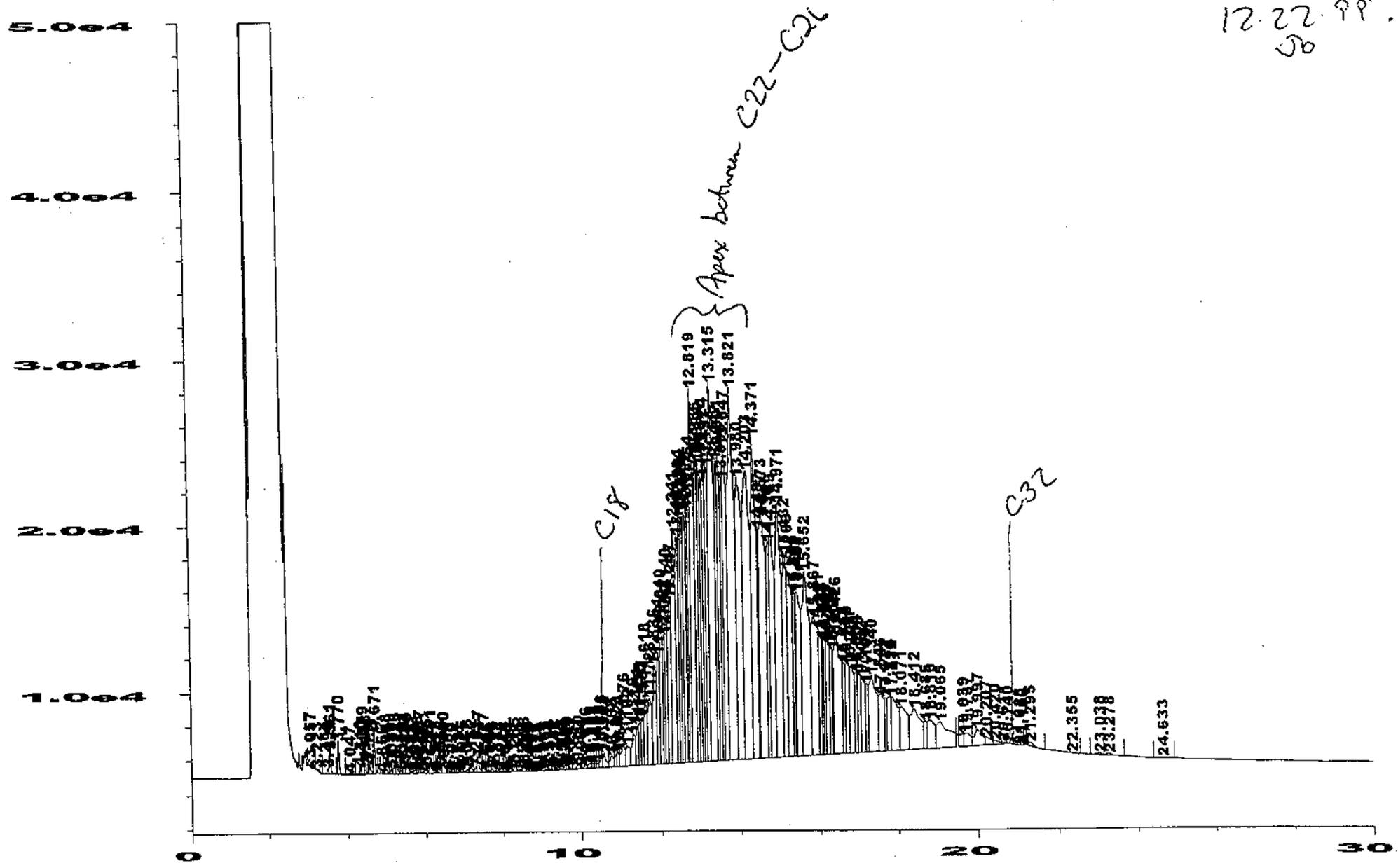


Fig. 1 in C:\HPCHEM\1\DATA\FID\12229903.D

Hydrocarbon Windex

11-11-99

12-22-99

5b

C8-C34

0-30 min

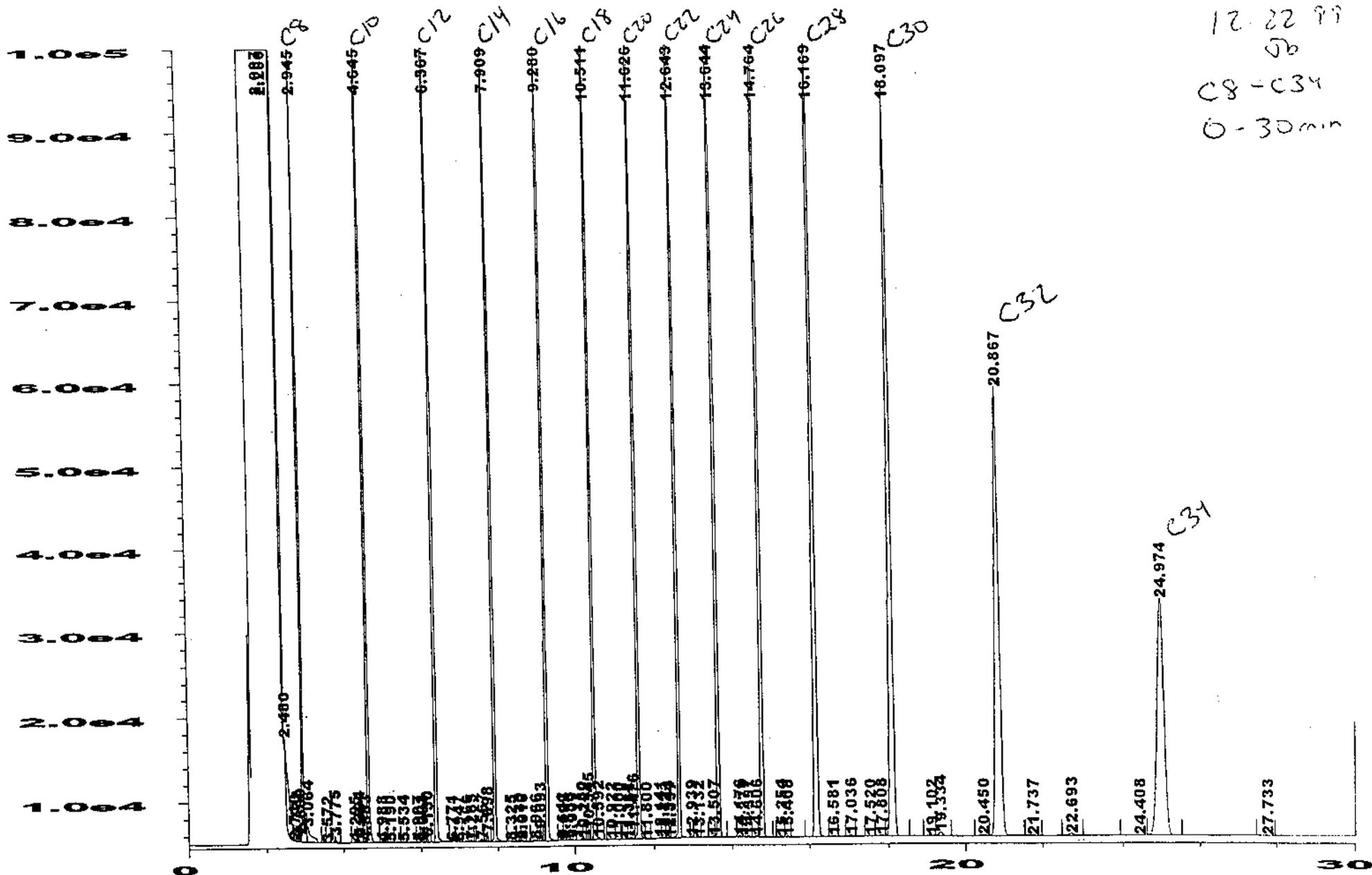


Fig. 1 is C:\HP\CHEM1\DATA\FID\12229904.D

11/24/00
C8-C30
12-22-99
98

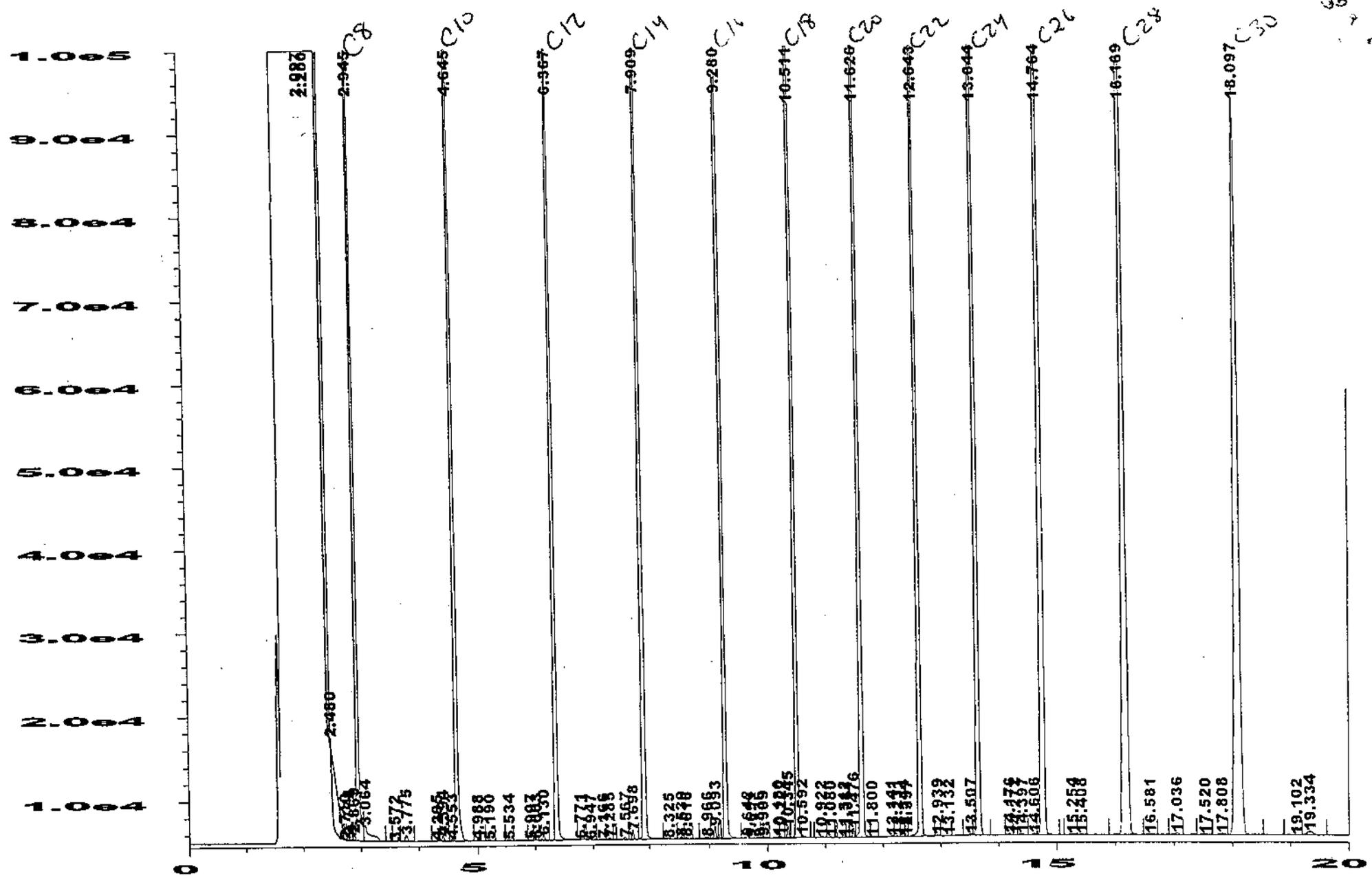


Fig. 1 is C:\HPCHEM\DATA\FID\IN\N9904.D