

THE JOHNSON COMPANY, INC.

Environmental Sciences and Engineering

June 17, 1996

Mr. Bob Haslam
Waste Management Division
Vermont Department of Environmental Conservation
103 South Main Street
Waterbury, Vermont 05671-0404

Re: Findings and Recommendations, CVMC (Fisher Road) Wells
DEC Site #95-1853
JCO # 1-2267-8 (010)

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Dear Bob:

Attached please find our report of findings and recommendations concerning methyl tertiary butyl ether (MTBE) contamination of three wells serving the Central Vermont Medical Center. This report discusses the study performed and presents a recommendation for targeted surficial groundwater sampling in the vicinity of Granger Road to look for MTBE and possibly other VOCs in groundwater in this area.

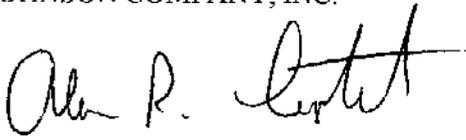
We've integrated the findings from the second phase of the investigation with the preliminary findings (March 1996) so as to present a comprehensive report of the work perform to date on this project.

We appreciate the opportunity to perform this work for the Department of Environmental Conservation and we hope that our efforts assist you in understanding and in resolving the problem. Please review this document at your earliest convenience, after which we will be happy to meet with you to further discuss it.

Sincerely,

THE JOHNSON COMPANY, INC.

By:



Alan R. Liptak
Senior Scientist

enclosures

Reviewed By: lhf, erf
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Attachment 3 Inventory of Known Water Supply Wells
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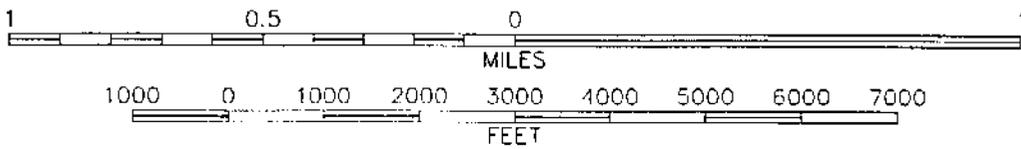
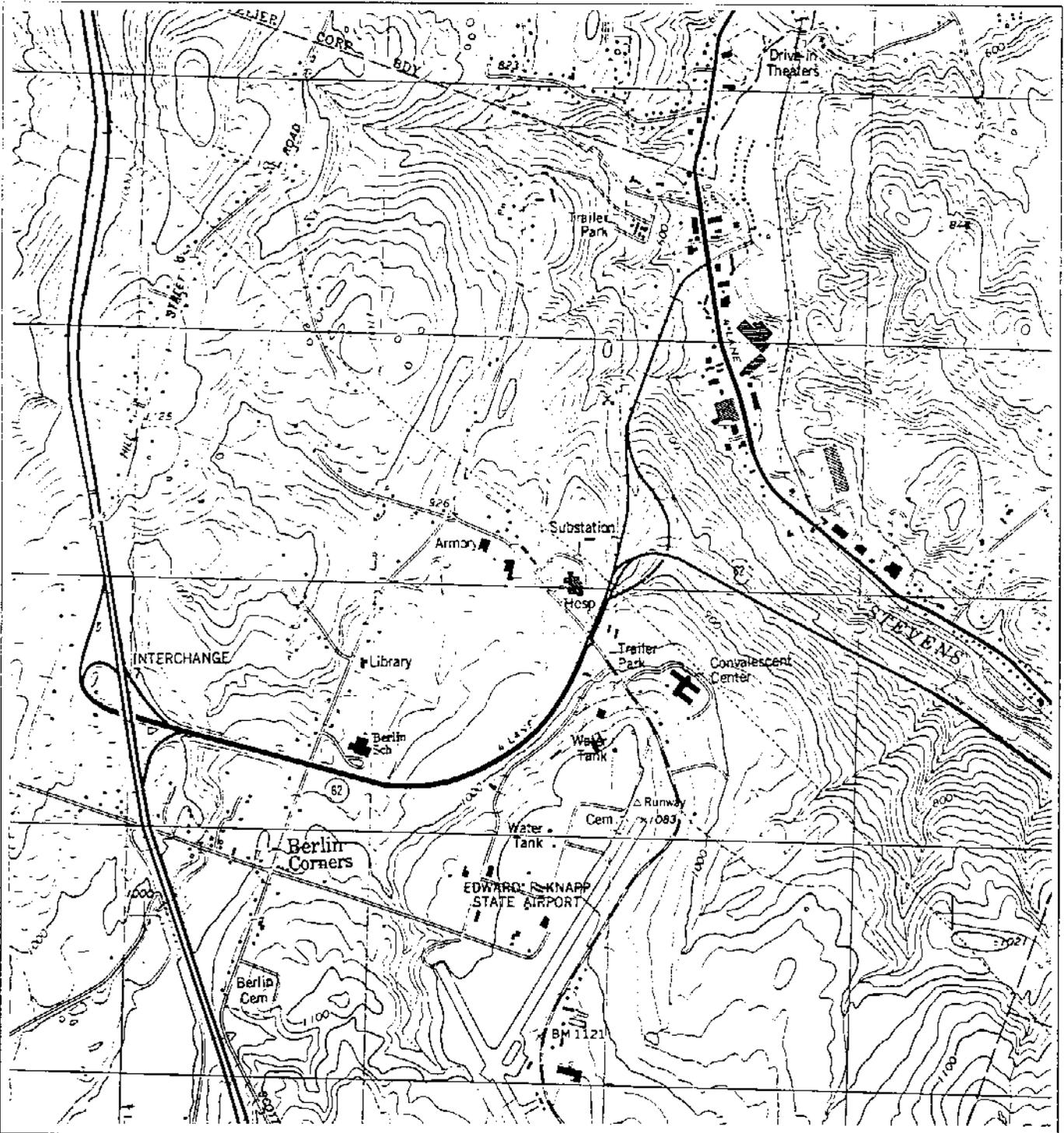
1.0 STATEMENT OF THE PROBLEM

Routine analysis of water samples collected in March 1995 from three water supply wells at the Central Vermont Medical Center (CVMC), Berlin, Vermont, indicated that the gasoline additive methyl tertiary butyl ether (MTBE) was present at low concentrations in each well. The compound MTBE has been added to gasoline as an octane-booster since the early 1980s. It is more soluble and mobile than other gasoline constituents, hence it is often, but not always, an early warning of impending gasoline contamination.

The three water supply wells at CVMC serve the industrial and potable needs of the facility. Numerous sets of water samples have been collected by CVMC since March 1995, and the analytical results for the samples indicate a variable concentration trend in the three wells. Reported concentrations of MTBE have been below the Vermont Health Advisory for drinking water of 40 parts per billion (ppb), with the exception of Well #3 on January 17, 1996 (41.2 ppb). Xylene, a major gasoline constituent, was also reported in low concentrations in water samples collected from the CVMC wells on July 11 and on December 18, 1995. A tabular summary of the reported water quality results, and a graphical presentation of the reported MTBE concentrations in the three CVMC wells through May 16, 1996 are included in Attachment 1. A site location map for CVMC is provided in Figure 1.

1.1 SCOPE OF WORK

The Johnson Company was initially retained by the Vermont Department of Environmental Conservation (DEC), Waste Management Division (WMD) on February 16, 1996 to investigate the source(s) of MTBE contamination of three wells. Additional work was subsequently requested by the WMD to further evaluate the potential sources of MTBE. Our work included a review of all available information relating to the geology, hydrogeology, and human influences on contaminant sources and contaminant mobility, and preparation of an inventory of water supply wells within the area of investigation, testing of twenty-five nearby water wells, mapping of bedrock structures and lineaments, and preparation of a bedrock groundwater map.



CONTOUR INTERVAL 20 FEET



MAP LOCATION

BASE MAP: USGS 7.5 Minute Topographic Quadrangle BARRE WEST, VT, 1978 PHOTOREVISED 1988

FIGURE 1 : Site Location Map
 C.V.M.C. Wells
 Berlin, Vermont

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All of this information was subsequently compiled on three maps which were initially included with our preliminary report. Hydrogeological information has been added to the bedrock contour map, Sheet 2 of 3, and the updated version is included with this report in Attachment 2. The maps present, in a comprehensive format, the following information:

- Potential sources of subsurface contamination including active and closed hazardous sites, permitted and closed USTs (Sheet 1 of 3).
- Bedrock groundwater surface contours and flow potential and available flow directions in the rock dictated by the fracture patterns (Sheet 2 of 3).
- Bedrock overburden thickness isopachs derived from well drillers records and from local bedrock outcrop data (Sheet 3 of 3).

These maps are helpful in visualizing the potential source(s) of MTBE contamination as well as in estimating the probability of each of the potential sources being the actual source of the MTBE.

The principal recommendation at the end of this report is to collect surficial groundwater samples from numerous selected locations within the area of investigation, to confirm or deny the potential source locations for the MTBE. We recommend that the work described in Section 4.0 of this report be performed as soon as possible.

1.2 PREVIOUS WORK

Nelson, Heindel & Noyes, Inc., of Burlington, Vermont (NHN) is currently working with CVMC on the MTBE contamination problem. As part of their work, they prepared a report of their MTBE investigation dated August 15, 1995. Part of this report described their investigation into the potential source(s) of MTBE contamination of the three CVMC wells. Based on this analysis, NHN collected samples from nearby water supply wells at the Berlin Mall, Lague residence, the Berlin School, and Wedgewood Fitness Center. No petroleum related volatile organic compounds (VOCs) were noted in these samples at concentrations above laboratory detection limits.

The Johnson Company then issued a report, "Preliminary Findings, Fisher Road Well Investigation", dated March, 1996. This report included a number of recommendations for further work aimed at locating the source(s) of MTBE in the area and including laboratory testing of up to thirty nearby drinking water supplies. Subsequently, the Vermont Waste Management Division approved the additional work, and the combined results of both phases of work are reported on in this report.

2.0 PRELIMINARY INVESTIGATION

In performing this investigation, we studied potential contamination sources and likely contaminant pathways in a land area that we believe encompasses the hydraulically upgradient area for the CVMC wells. The "area of investigation" is roughly bounded by Interstate Highway 89 and Berlin Pond to the west, Scott Hill Road to the south, Airport Road to the east and the steep northward-facing slope to the north of CVMC. The Barre-Montpelier Road (U.S. Route 302) area was not included in the area of investigation because it and its adjoining businesses are lower in elevation than the bottoms of the CVMC wells. The area to the west of Interstate 89 was not included in the area of investigation due to its rural-residential character and its apparent lack of significant sources of contamination. Following is a summary of the work performed and findings made during this study.

2.1 DELINEATION OF POTENTIAL SOURCES OF CONTAMINATION

We reviewed Johnson Company and WMD files to delineate potential sources of groundwater contamination within the area of investigation. Information pertaining to potential sources of groundwater contamination within the area of investigation were reviewed for completeness, and all of the potential sources that were discovered during the study are presented on the Potential Sources Map, Attachment 2, Sheet 1 of 3. We did not attempt to include non-registered potential sources of subsurface contamination in this study such as indoor or outdoor heating oil tanks, nor did we attempt to perform an environmental audit of the area of interest.

To our knowledge, MTBE is used as an additive only in gasoline and not in fuel oil, aviation fuel, or jet fuel. Therefore, it is unlikely that non-gasoline USTs or other identified sites are potential sources of MTBE contamination of groundwater in the area of investigation. A brief synopsis of each of the potential MTBE sources follows in alphabetic order. Further discussion of the probability of any of the identified sources being responsible for the observed groundwater contamination is contained in Section 3.0 of this report.

The known potential MTBE sources in the area of investigation consists of the following identified locations:

- A.G. Anderson: one permitted gasoline UST;
- Berlin Armory: one closed gasoline UST;
- former Central Vermont Truck Stop: two closed gasoline USTs;
- E.J. Prescott: one closed potential gasoline UST (former Texaco gasoline station);
- Fecteau Construction: one closed gasoline UST;
- Knapp State Airport: one permitted and four closed USTs used to store "gas";
- Lague Residence: one permitted gasoline UST;
- Lyons of Vermont: two closed and one permitted gasoline UST;
- Maplewood Store: three permitted gasoline USTs;
- Pike Industries (former Cooley Asphalt): three closed gasoline USTs;
- Town and Country Honda: one former gasoline UST now used to store heating oil;
- United Parcel Service: one closed gasoline UST.

The locations of each of these potential sources are indicated on Attachment 2, Sheet 1 of 3. A brief summary of file contents for each of these locations follows.

2.1.1 A.G. Anderson Co., Inc.

UST Facility ID #2290191

A.G. Anderson has three permitted USTs located near the entrance driveway off the northeast corner of the concrete plant building:

- two 4,000 gallon USTs used to store diesel fuel, installed 1971
- one 2,000 gallon UST used to store gasoline, installed 1971

No information pertaining to past or present site investigation activities was discovered during this work.

2.1.2 Berlin Armory

UST Facility ID #1038

The Berlin Armory currently has one permitted UST, a 6,200 gallon UST used to store 2/4 fuel oil. On April 16, 1990, a 1,000 gallon UST used to store gasoline was pulled at the facility. On the tank pull form, its condition was listed as "LUST". Soils excavated during the UST closure were placed back into the excavation as the personnel overseeing the closure noted no evidence of product migration. On July 29, 1991, a previous 6,000 gallon #2 fuel oil UST was pulled to allow for its replacement with the current UST. No contaminated soils were noted during this UST closure. No information pertaining to past or present site investigation activities was discovered during this work.

2.1.3 Central Vermont Truck Stop

DEC Hazardous Site #880288 (Closed)

On December 29, 1988, three USTs - one 6,000 gallon gas, one 8,000 gallon gas, and one 10,000 gallon diesel - were pulled at the Site. In a January 12, 1989 memorandum, Mr. Marc Coleman of the Vermont DEC indicated that he arrived on the Site on December 30, 1989 to oversee the removal of the three USTs only to find that the USTs were removed on the previous day. Approximately 150 cubic yards of petroleum contaminated soils which exhibited PID readings of 100 to 220 parts per million (ppm) had been excavated. The memo indicates that water samples were collected from the water supplies for A.G. Anderson, Central Vermont Truck Stop, and Blue Cross/Blue Shield buildings and "no water contaminants were found".

In January 1989, during additional investigation of the Site, additional soil was excavated until a clayey silt layer was encountered. This soil was stockpiled with the previously- excavated soils. PID readings 0.5 feet into the clayey silt ranged up to 200 ppm. On January 6, 1989, four monitoring wells were installed on the Site by Green Mountain Boring, Inc. Mr. Coleman noted some petroleum odors during the installation of two of these wells. Groundwater samples and a sample of the stockpiled soils indicated that petroleum contamination existed on the Site. MTBE concentrations in monitoring well MW-2 ranged from 3,430 ppb in February 1990 to 360 ppb in April 1990, the last groundwater sample collected at the Site. Toluene and xylenes were also reported in samples of the groundwater and of the stockpiled soils.

In a letter dated February 10, 1989 to Mr. Cecil Royea of Central Vermont Truck Stop, Mr. William Ahearn of the Vermont DEC ordered additional groundwater sampling and stockpiled soil vapor monitoring at the Site. In a letter dated May 7, 1990 to Mr. Peter Boyd of New England Research, Inc., Mr. Chuck Schwer indicated that groundwater sampling performed at the Site (from May 1989 to April 1990) indicated petroleum contaminated groundwater exists in the vicinity of monitoring well MW-2 with a general downward trend in concentrations, and had not migrated downgradient or off the Site. Mr. Schwer also indicated that the Anderson well has not been affected by the contamination and the Central Vermont Hospital wells "...do not appear to be threatened by the contamination". The letter indicated that the DEC would close the Site once the stockpiled soils have been properly handled. In an August 15, 1990 letter to Mr. Schwer, Mr. Boyd indicated that, on August 13, 1990, the stockpiled soils (for which PID readings had become non-detect) were spread on the Site and cow manure and grass seed were spread over the soil. The Site was closed via a August 21, 1990 letter prepared by Mr. Schwer.

The most recent correspondence is a January 20, 1992 letter from Dubois & King, Inc. to Mr. Schwer indicating that they had coordinated the removal of hazardous materials abandoned by the previous owner. These included a drum of tank bottoms from the UST closures, two uncovered five-gallon buckets containing petroleum products which, due to precipitation, had overflowed. A 100 to 150 square foot area of a petroleum spill had resulted. PID readings of the soils in this area were 1 to 2 ppm. The visibly contaminated soils were excavated from the Site to a depth of 10-inches, drummed, and shipped from the Site.

2.1.4 E.J. Prescott

On October 20, 1986, a UST of undetermined size and content was pulled at E.J. Prescott. This was overseen by Mr. Glenn Smith of the Vermont Department of Labor and Industry. Some soil contamination was noted around the fill pipe, and the bottom of the hole "...did not show anything". The UST had "some rust". According to Bob at E.J. Prescott, this UST likely contained diesel or gasoline. No information pertaining to past or present site investigation activities was discovered during this work.

2.1.5 Fecteau Construction

On October 30, 1990, two USTs - one 2,000 gallon gasoline and one 1,000 gallon diesel - were pulled at Fecteau Construction. Mr. Marc Roy of the DEC was the assessor. Approximately 10 to 15 cubic yards of petroleum contaminated soil exhibiting PID readings of 20 to 400 ppm were stockpiled and shipped out-of-state. No information pertaining to past or present site investigation activities was discovered during this work.

2.1.6 Knapp State Airport

DEC Active Site #900546

Four USTs (three 1,000 gallon and one 750 gallon all listed as containing "gas") were removed on July 3, 1990, and were listed as being in fair to poor condition. The tank pull form was completed by Mr. Michael Morissette of the Vermont Agency of Transportation. PID readings of the excavated soils ranged from 150 to 250 ppm. Approximately 30 cubic yards of contaminated soil were stockpiled on the former Airport Tractor site. An additional UST used to store heating oil was removed from the Site on June 3, 1991. PID readings of the excavated petroleum contaminated soils ranged from 15 to 40 ppm. Approximately 10 to 12 cubic yards of petroleum contaminated soils were stockpiled at the former Huntington Homes site. The latest file correspondence is a June 30, 1992 letter from Mr. Chuck Schwer of the DEC to Mr. Morissette inquiring about the status of the approximately 30 cubic yards of stockpiled soils resulting from the 1990 UST removals. Mr. Schwer indicated that if the soils have been properly disposed of, the Site can be closed. The Site remains on the Active Hazardous Sites list as of January 8, 1996. It is included here due to our present inability to determine whether non-aviation gasoline was ever stored in one or more of the USTs.

2.1.7 Lague Residence

UST Facility ID #2232524

The Lague residence has one permitted UST, a 2,000 gallon UST used to store gasoline. No further information is available regarding this installation.

2.1.8 *Lyons of Vermont*

Active DEC Site #951837

UST Facility ID #1472

Currently, Lyons has two permitted USTs located on the north side of the building, one 4,000 gallon UST used to store gasoline and one 3,000 gallon UST used to store waste oil.

In 1986, five USTs were permitted at the facility: two gasoline USTs, two oil USTs, and one diesel UST. On October 6, 1987, four USTs were pulled at the facility: two 4,000 gallon gasoline USTs, one 1,000 gallon waste oil UST, and one 500 gallon fuel oil UST. Of these, the gasoline and fuel oil USTs were replaced. Another UST was noted to still exist elsewhere on the property. No contaminated soils were noted during the UST removals (Bill Barry, DEC). The native soils were described as compact clay.

On July 27, 1988, one 6,000 gallon UST used to store lubrication oil was pulled. No contaminated soils were noted during this closure and the UST was not replaced. At this time, the UST removal form indicated that two USTs were left at the facility.

In January 1996, Dufresne-Henry, Inc. of Springfield, Vermont supervised the installation of three groundwater monitoring wells, two on either side of the USTs (north and south sides) and one near the mall access road near the east side of the property. Soils at the Site as determined through split spoon samples were reported to be a silt and silty clay material with occasional varves. The soils were dry at shallow depths, becoming moist and then saturated with depth. The well screens were set based upon the depth at which saturated soils were encountered; the tops of the 15-foot well screens ranged from 25 to 40 feet below ground surface. Upon equilibrium, water levels in the wells were noted to be much higher than the well screens, indicating that a confined or semi-confined condition exists in the area. Toluene was the only noted VOC noted in the samples collected from the three wells. The compound MTBE was not reported in groundwater samples above the detection limit of the laboratory analysis method employed.

2.1.9 Maplewood Store

UST Facility ID #1732

The Maplewood Store has four permitted USTs located on the south side of the store, one 10,000 gallon UST used to store diesel fuel, installed in 1986, one 8,000 gallon UST used to store gasoline, installed in 1986, and two 6,000 gallon USTs used to store gasoline, installed in 1986. Each of these tanks are double walled with interstitial monitoring and electronic product monitoring. No information pertaining to past or present site investigation activities was discovered during this work.

2.1.10 Pike Industries (former Cooley Asphalt Paving location)

DEC Sites #890464 and #911066 (closed)

Cooley Asphalt Paving Corporation commenced operations at a Granger Road site in 1973. Their activities primarily consisted of manufacture of bituminous concrete for road paving projects.

On September 30, 1986, Mr. Ronald Parker of the Vermont Department of Health visited the Cooley Asphalt Paving Plant on Granger Road. His findings, which are documented in an October 1, 1986 memorandum, were that several releases of petroleum and possibly other VOCs (paints and solvents) had occurred at this location, and that further site investigation work was merited. The State of Vermont subsequently issued an Administrative Order to Cooley Asphalt Paving which directed that a subsurface hydrogeological investigation be conducted.

In 1987, Cooley Asphalt Paving staff installed seven groundwater monitoring wells at the Site. The Johnson Company subsequently collected groundwater samples from these wells, from two small streams at the Site, and from the potable water supply well, on four dates over the course of a year.

The results of this investigation were that petroleum related compounds were detected in groundwater at concentrations below drinking water standards (0.6 ppb - 4 ppb) at two of seven groundwater monitoring wells. The compounds tested for included benzene, toluene, ethyl benzene, xylene, miscellaneous aromatics, miscellaneous alkanes, and hexane. The compound MTBE was not specifically reported by the laboratory.

The soils were described in the investigation report as glacial till. Water level measurements in groundwater monitoring wells “confirmed the suspected northward groundwater flow direction”, and that the wells were “adequately located to detect potentially migrating contaminants.” “The groundwater discharge area for the site is a swampy area approximately 250 feet north of the site. The nearest down gradient drinking water supplies are approximately 2,500 feet from the site.”

Based upon this information, the State of Vermont in a letter dated November 4, 1988, declared this Site to be “closed” with respect to the investigation and monitoring program which was instituted in 1987.

Subsequently, on November 20, 1989, two USTs used to store gasoline (6,600 gallon capacity) and waste oil (6,000 gallon capacity) were pulled at the Site. Approximately 30 to 40 cubic yards of petroleum contaminated soils with PID readings of 30 to 40 ppm were stockpiled on the Site. Mr. Patrick Coyne of the DEC was present on the Site during the UST removals.

On June 6, 1991, three additional USTs were pulled at the Site, two used to store diesel fuel and one used to store gasoline - all 8,000 gallon capacity. Mr. Peter Aldrich of Dufresne-Henry was present during the UST removals. During the removal of one of the USTs (number 3, used to store either gasoline or diesel fuel), discolored soil was encountered with PID readings of 40-140 ppm. Approximately 25 cubic yards of petroleum contaminated soils was stockpiled on the Site which was ultimately disposed of. On September 18, 1991, Dufresne-Henry completed an additional investigation at the Site consisting of the excavation of two, 18-foot deep test pits. Soil samples were collected from the bottoms of the test pits for laboratory analysis for VOCs. No VOCs were noted above laboratory detection limits. This Site (#911066) was closed via a March 25, 1992 letter from Mr. Robert Finucane of the DEC to Mr. Newbold LeRoy of Pike Industries. No documentation concerning the 30 to 40 cubic yards of soil stockpiled in 1989, or the closure of Site #890464 was found in the DEC files.

2.1.11 Town and Country Honda

UST Facility ID #1745

According to DEC records, Town and Country Honda has three USTs: one permitted 500 gallon UST used to store lubrication oil, installed in 1985, one permitted 275 gallon UST used to store used oil, installed in 1985, and one non-permitted 1,000 gallon heating oil UST.

An October 18, 1993 memorandum from Ms. June Middleton to "the file", indicated that one UST, formerly used to store gasoline, was converted to on-premises heating oil storage. No information pertaining to past or present site investigation activities was discovered during this work.

2.1.12 United Parcel Service

DEC Site #911150 (closed)

One 10,000 gallon UST used to store gasoline was removed from the United Parcel Service Site on October 15, 1991. Mr. David Kiefner of Groundwater Technology, Inc. was present on the Site during the UST closure. The UST was approximately 19 years old at the time of closure. Approximately 60 cubic yards of petroleum contaminated soils exhibiting PID readings of up to 546 ppm were stockpiled on the Site. A composite soil sample of the soils surrounding the UST indicate that concentrations of toluene, ethylbenzene, and xylenes were noted above laboratory detection limits. In a December 6, 1991 letter to Mr. Robert Rauker of UPS, Mr. Chuck Schwer of the Vermont DEC requested that a groundwater monitoring well be installed in the area of the former UST to enable groundwater sampling for analysis using Environmental Protection Agency (EPA) Method 8020. Griffin International, Inc. supervised the installation of the requested monitoring well and subsequently collected a groundwater sample from the well on January 31, 1992. No detections of VOC, including MTBE, were noted in this sample, and Griffin International recommended no further investigation at the Site. The DEC concurred in a February 27, 1992 letter.

On August 16, 1994, a 10,000 gallon UST used to store #2 fuel oil was pulled at the Site under the direction of Griffin International. PID readings of the soils during this removal were a maximum of 25 ppm and an average of 5 ppm. All excavated soils were placed back into the tank excavation after the UST was removed. No further investigations were performed concerning this UST closure.

The gasoline-contaminated soils were removed from the Site on February 27, 1995 for asphalt batching in New Hampshire. In a January 22, 1996 letter to Mr. Robert Rauker of UPS, Mr. Chuck Schwer of the Vermont DEC determined that the Site has Site Management Activity Completed (SMAC) designation.

2.2 GEOLOGIC AND HYDROGEOLOGIC STUDY

We reviewed available geologic and hydrogeologic information in the area of investigation. According to the “Geologic Map of Vermont” (Doll et. al, 1961), the bedrock in the area is mapped as the Barton River Member of the Waits River Formation comprised of siliceous limestone and phyllite, with some granitic intrusions. The publication “Groundwater Resources of the Barre-Montpelier Area, Vermont” (Butterfield, 1976) indicates that wells completed in the Barton River Member of the Waits River Formation and the Northfield Formation have the highest average yield of all bedrock formations in the study area. In “The Surficial Geology and Pleistocene History of Vermont”, MacClintock and Stewart (1968) indicate that the Lake Winooski and Lake Vermont stages 1 through 4 were all higher in elevation than is the area of investigation. It is likely that the entire area except for the hills was covered with water during these early lake stages. The “Surficial Geologic Map of Vermont” (Doll et. al., 1970) indicates that the primary overburden type in this area is glacial till. However, this observation is contradicted by field observations made during several of the UST pulls in the area as well as during the limited investigation at Lyons of Vermont that describe the overburden primarily consisting of clay or silty clay with occasional varves.

Well log information from this publication, augmented by additional well information from Johnson Company files and NHN information reviewed in WMD files, was used to develop a bedrock surface contour map and overburden thickness isopach map of the area. These maps are included in Attachment 2, Sheets 2 and 3 of 3. Note that the well identification names on these maps are not always the current owners of the wells, but are the names listed in the data sources from which the well information was obtained.

The dominant bedrock topographic feature beneath the area of investigation is a deep bedrock valley. This buried valley transects the area of investigation in a northeast-southwest direction. The valley has an apparent “saddle”, or drainage divide, in the Comstock Road vicinity. The bedrock valley slopes toward the northeast (Stevens Branch) north of the divide, and toward the southwest (Berlin Pond) south of the divide.

This buried valley most likely has a significant influence on the groundwater flow directions in the area of investigation, both in surficial deposits and in the bedrock itself. In a general sense, groundwater which flows through the fine-grained surficial deposits most likely converges near the trough line of the valley, into a down-valley flow regime. Bedrock groundwater flow through fractures most likely behaves in a similar manner, with the topographic high areas acting as bedrock recharge areas and the bedrock valley acting as a discharge point.

Although not referenced in any site investigation work to date, there is most likely a coarse-grained lag deposit immediately above the bedrock surface, separating the bedrock from the fine grained deposits. If this unit exists and is aerially-extensive, it most likely serves as an important groundwater flow conduit for the area.

The data used to develop these maps indicate that the overburden thickness ranges from just a few feet in the upland areas near Knapp State Airport and to the north of the Paine Turnpike, to over 300 feet in the vicinity of CVMC. Information from the limited site investigation at Lyons of Vermont indicates that the silt and clay valley fill deposit is dry at shallow depths, becoming moist and then saturated as depths of 40-50 feet below ground surface are attained. At this depth, there is an apparent confined or semi-confined surficial aquifer. Groundwater recharge from the surficial deposits would likely flow downgradient along the bedrock surface and into fractures in the bedrock.

However, it does not appear to be very likely that large quantities of groundwater flow downward through the thickest areas of silt and clay deposits. Given the glacial history of the area, the sedimentary deposits in the trough of the valley are most likely lacustrine in origin. This is further suggested by the observation of varves in samples collected at the Lyons site. Lacustrine silts and clays are typically very slightly permeable, sometimes with lower vertical permeabilities than horizontal. This theory is further confirmed by the presence of numerous small wetlands in the area of deep silt and clay deposits, such as in the Berlin Mall vicinity or north of the Maplewood Store. Rather, the dominant mechanism for groundwater flow in the area is most likely through either lag deposits, coarse grained interbeds in the silt and clay deposits, and through bedrock fractures.

The Johnson Company performed a fracture trace analysis to determine the locations and orientations of potential bedrock fractures which may act as possible contaminant migration pathways within the bedrock aquifer. The fracture trace analysis included a "double blind" method in which the operator views the stereo pair photographs through a stereoscope and picks out lineaments on the landscape which may represent fractures in the bedrock. A second operator then views the same set of photos and, without previous knowledge of the lineaments identified by the first operator, picks out fracture traces on the site.

Two sets of aerial stereo photographs were viewed: The 1975 VT7420 series, and the 1963 VT-62-H series. Both photograph series are at a scale of approximately 1:20,000. The results of the stereoscopic review were then compared and field verified, and a final fracture trace map developed. Aerial ortho-photographs from the 1979 Vermont Mapping Program, were used to transfer the fracture trace results to a 1" = 400' fracture map (see Attachment 2). Observations of bedding plane and fracture set orientation which were collected from ten nearby bedrock outcrops were also included on Attachment 2, sheet 2 of 3.

Based on the bedrock outcrop mapping performed during this study, the bedrock is primarily composed of interbedded layers of grey phyllites, calcareous mica schists, and marbles. The marbles weather to a brown, highly porous, grain-supported structure. Dissolution of the calcareous marbles likely causes preferential groundwater migration pathways parallel to the bedding in the bedrock. Bedding thickness varies from less than an inch, to several feet. Schistosity generally parallels the bedding. Based on its lithology and position, the bedrock is a member of either the Waits River or the Barton River Formation.

The strike of the bedding and schistosity is generally bearing between 30-45° magnetic north. A strike of 12-18° magnetic north was observed in outcrops #1 and #2, north of the contaminated hospital water supply well. The dip varies considerably, from vertical to 40° northwest. Lineaments parallel to the bedding were observed in aerial photographs at a number of locations, including one passing very close to the contaminated hospital water supply well.

One set of vertical fractures striking approximately 110° magnetic north was observed at nearly every outcrop. These fractures were planer, smooth features, spaced generally 2-3 feet apart. No precipitates, staining, or other evidence of groundwater flow through these fractures was observed. Surprisingly, very few fracture lineaments with a similar orientation were observed in the aerial photographs.

A set of sub-horizontal fractures were observed at outcrop #5. These may be due to blasting during construction of I-89. A water bearing vertical fracture oriented parallel to the bedding was observed at outcrop #10.

These observations are confirmed by NHN who indicated in their August 1995 report that there is "...a large degree of hydraulic connectivity [existing] between wells located in the area delineated by Fisher Road, Route 62 and Payne Turnpike" and that "...groundwater does not migrate towards the hospital wells from the north" and the hospital wells "...are located in an area of convergence of groundwater migrating from (the other) three directions..."

2.3 UTILITY CORRIDOR REVIEW

Long trenches installed for subsurface utilities can often form high-conductivity zones for groundwater flow (and contaminant migration) especially in lower-permeability sediments such as those present in the area of investigation. Thus, knowledge of the presence and configuration of buried utilities can sometimes assist with determining contaminant flow characteristics.

The dominant subsurface utility in the area of investigation appears to be the buried sewer system. We obtained underground sewer line corridor information from the Town of Berlin. This information is presented on the Area Plan, Attachment 2, Sheet 1 of 3. The sewer configuration consists of two buried collection sewers, one on either side of Route 62. The sewer to the south of Route 62 branches off to service the businesses in the Granger and East Road vicinities. The sewer to the north of Route 62 cuts across the Mall property, the Lyons property, coming to within 100 feet of CVMC well #3, before crossing the CVMC property and then plunging down the hill to Route 302.

Another buried utility in the area of investigation is the City of Montpelier water main. This main is not shown on the area plan, however, it generally cuts across the area of investigation in a north-northeast direction from Berlin Pond in the south, along Paine Turnpike.

Buried telephone and fiber-optic cables for television service are present in the Comstock Road-Granger Road-East Road vicinity. These lines service the buildings in this area and generally run along the roadsides. There is also a buried telephone line along the west side of Airport Road, from the Airport to the vicinity of the Blue Cross building.

There are numerous local buried services from utility poles to individual buildings for electric, telephone and television service.

2.4 AREA-WIDE WATER SUPPLY WELL TESTING

Twenty-three of the water supplies within the area of investigation were sampled and analyzed for BTEX and for MTBE using method 8020 for gasoline related constituents. This work had two objectives: first, to verify the safety of existing supplies; and second, if contamination had been detected, perhaps a spacial pattern would be revealed which could be linked with other data (fracture trace, potentiometric surface, etc.) to lead to a possible source of contamination.

The Johnson Company prepared an inventory of all known water supply wells within the area of investigation. This was performed by first compiling names and addresses of residents and businesses within the area of investigation at the Town Clerks office in Berlin, and then performing drive-by confirmation of this information. The inventory information is included with this report as Attachment 3.

Twenty-three water supply wells were selected for sampling, based on their location and in some cases, on the nature of past and present activities at the site. The bulk of the sampling was focused on the portions of the area of investigation which have relatively shallow depths of soil to bedrock, although water supply wells were sampled throughout the area of investigation. On May 3 and 16, Johnson Company personnel visited twenty-five locations to collect water supply samples.

Where access to a sampling point was granted, the team collected a water sample after running the water for at least 5-10 minutes. Samples from water supply wells were delivered under Chain-of-Custody procedures to the Vermont DEC LaRosa Laboratory in Waterbury, Vermont for analysis of major gasoline constituents (Benzene, Toluene, Ethylbenzene and Total Xylenes, and Methyl-t-butyl ether (MTBE)) using EPA Method 8020. Copies of all LaRosa Laboratory reports as well as a list of sampled wells and the mailing addresses of the occupants of each sampled structure, (as of the sample date) are included in Attachment 4.

The laboratory reports from the LaRosa Laboratory indicated that none of the 25 water supplies which were sampled were reported to contain any of the Method 8020 test compounds at concentrations at or above the laboratory quantitation limits.

2.5 MEASUREMENT OF HYDRAULIC POTENTIAL IN BEDROCK WELLS

The Johnson Company performed a limited program of measurement of water levels in selected bedrock wells in the area of investigation. The purpose of this work was to provide hydraulic gradient data which, when viewed together with the results of the bedrock fracture study, would indicate probable bedrock groundwater flow direction(s) and available routes of flow through the bedrock.

Eight bedrock wells were selected for measurement. The basis for selection of the wells was location, owner willingness to participate, and well construction. The eight wells together represent an array which provides hydraulic data over most of the area of investigation. Well construction is important because some of the older wells are buried or have construction which precludes easy access for water level measurement (such as a top-pump design).

For each of the eight wells, owner permission was first obtained. Then, each well was opened and a 3/4-inch black polyethylene plastic water pipe was placed in the well to serve as a conduit for the water level probe. The plastic pipe was inserted approximately ten feet into the standing water in the well on the afternoon of June 6, 1996. In a few cases, insertion of the pipe caused water discoloration in the building, notably at the Regional Library and at the USDA building. In both cases the water cleared up after a sustained period of pumping and the reason for the discoloration was most likely disruption of the stratified equilibrium which existed in the wells prior to insertion, or alternatively, dislocation of scale on the well sides, or both.

Water level measurements were collected on the mornings of Friday, June 7 and again on Saturday, June 8. Early morning measurements were obtained to maximize the degree of recharge from the previous day's usage. These measurements were converted to approximate water level elevations by subtracting the measurement from the approximate well elevation as indicated on the USGS topographic map of the Berlin area. The resulting hydraulic elevation for Friday, June 7 was plotted on Attachment 2, Sheet 2 of 3 and lines of equal presumed water elevation were drawn. The water level measurement data are presented below in Table 1.

Location	Est. Ground Elevation	Depth To Water 6/6/96 (9 A.M.-2 P.M.)	Depth to Water 6/7/96 (5 A.M.-6 A.M.)	Depth to Water 6/8/96 (5 A.M.-7:30 A.M.)
Berlin Mall Well # 2	945	15.0	16.2	15.9
CV Chamber of Commerce	938	5.8	5.8	5.8
CV Physicians Bldg	960	86.4	81.4	81.7
Town and Country Honda	976	19.2	18.6	18.4
Vt. Chamber of Commerce	980	38.1	37.0	37.1
Vt. Dept. Of Libraries	963	30.0	30.4	27.9
USDA Building	1100	35.5	35.2	35.2
Preston 151 Trucking	1085	25.3	25.0	24.1

Note: all data in feet.

3.0 DISCUSSION OF POTENTIAL SOURCES AND ROUTES OF CONTAMINATION

Several potential sources of MTBE contamination exist in the study area. However, some potential sources are more likely sources than others based on hydrogeology, age and protection of USTs, and the results of previous studies performed in the area. Following is a discussion of the

3.1 GEOLOGICAL AND HYDROGEOLOGICAL FACTORS

The overburden in the vicinity of the CVMC wells ranging from 98 feet at CVMC Well #1 to over 300 feet at the hospital. The overburden is 205 feet thick at the Berlin Elementary School, 140 feet thick at the Berlin Armory, and over 240 feet thick at Berlin Mall Well #2. Although fractures can develop in lacustrine silts and clays or in glacial till that may act as conduits for contaminant flow, the continuity of any such fractures, versus those that develop in competent bedrock, is limited. Due to the likely low vertical permeability of the soils in the area, migration of petroleum contaminants downward through these sediments, while not impossible, does not appear to be very likely either. The reported presence of a confined or semi-confined surficial aquifer beneath the area of investigation would further serve to protect the bedrock groundwater resource from degradation from sources of contamination which are located above it.

Several portions of the area of investigation contain thin or very thin soil over bedrock. These include the Airport Road Vicinity, the East Street-Granger Road areas, the Interstate 89 area, and the Scott Hill Road area. In these places, lake sediments, if they exist at all are much thinner and are more likely to be interbedded with sand and/or glacial till deposits. These topographically higher areas are likely to serve as groundwater recharge zones, with little or no groundwater in the surficial deposits, and greater distances from the bedrock surface to the bedrock water table, than in the topographically lower areas.

Contamination of the CVMC wells must have occurred through one of three mechanisms: direct contamination of the wells; contaminant transfer through surficial materials to the wells possibly followed by downward migration through a leaky well bore; or via contaminant release to the bedrock aquifer at an alternate location followed by movement through bedrock fractures to the wells. Combinations of these mechanisms are also possible, for example, release of contaminants to surficial materials, followed by downward migration to bedrock fractures, followed by contaminant migration through bedrock fractures to the wells.

The northeast sloping trough in the bedrock surface indicated on the bedrock surface contour map will affect the flow of groundwater at the overburden-bedrock interface in the vicinity of the wells. Groundwater from the overburden that reaches this interface can flow downgradient along the bedrock surface until areas of fractured bedrock are encountered through which the groundwater can enter the fractured bedrock aquifer. However, in the lowest portions of the buried bedrock valley the bedrock may be discharging groundwater to a lag deposit, which would make surficial groundwater flow to bedrock improbable at these locations. The CVMC wells are located on the southwestern "wall" of the buried bedrock valley, where the bedrock surface is approximately 100 to 200 feet higher than the bottom of the trough. To some extent, this would protect the CVMC wells from potential contamination sources that exist on the opposite (i.e., northeast) side of the trough. The potential sources of MTBE contamination on the northeast side of the trough include Lyons of Vermont, the Berlin Armory, and the Lague residence.

The bedrock groundwater contour map (Attachment 2) indicates that groundwater in the bedrock forms a trough beneath the hospital vicinity and reaches its highest potential beneath the airport vicinity. The overall form of the bedrock groundwater contours is similar to but not exactly the same as the

bedrock surface contours. Whereas there is a well-defined trough in the bedrock surface beneath the Berlin Mall vicinity, there the bedrock groundwater contours cross this trough and form a gently-sloping surface before forming a more well-defined trough beneath the hospital.

Comparison of the bedrock surface contours and the June 7 bedrock water level contours indicates an area near Granger and East Roads where the bedrock surface is higher in elevation than the bedrock groundwater potential. This area is technically a bedrock recharge area. Activities in this area may pose a contamination risk to the bedrock aquifer because if contaminants are released in this area, they could pass downward into bedrock fractures. This is especially true in areas where there is no surficial aquifer, where released contaminants would not receive the benefit of dilution prior to their entry to the bedrock aquifer. In other parts of the area of investigation, since the hydraulic potential in the bedrock aquifer appears to be higher than the bedrock surface, the opportunity for entry of contaminants from the surface into the bedrock appears to be limited.

The combined presentation of the isopotential bedrock groundwater lines and the verified fracture trace analysis indicates that there are several fracture traces which run normal or near-normal to the isopotential lines. These fracture traces could be zones in the bedrock aquifer where both a conduit for groundwater flow and a groundwater gradient exist and therefore where preferential groundwater flow occurs. One of these fractures crosses the CVH well field in a north-northwesterly direction. Its southeasterly projection, while not observed on air photos, crosses the former Airport Tractor site. Another parallel offset fracture trace crosses the CV Truckstop site. In as much as both of these sites are in the bedrock recharge area, they remain suspect sources of the MTBE in the CVMC wells.

3.2 SPECIFIC POTENTIAL SOURCES OF CONTAMINATION

3.2.1 Fisher Road Vicinity

The limited hydrogeologic investigation performed at Lyons by Dufresne-Henry indicated that the groundwater in the surficial deposits beneath Lyons property boundary contains no detectable concentrations of MTBE. If Lyons was the MTBE source area, we would expect to see detectable and possibly high concentrations of MTBE in the surficial aquifer beneath the site. One possibility that has not been investigated is that contaminants have been released but have not migrated to groundwater; instead, contaminant migration from Lyons could be occurring through the sewer line trench that crosses their property, toward the CVMC wells. This possibility would be relatively easy to investigate with test

pits.

The former gasoline UST at the Berlin Armory was removed in 1990. Although this UST was characterized as "LUST" by the assessor overseeing the UST removal, there was no noted evidence of product migration. The thick overburden at the Armory makes it a less likely candidate as the source of MTBE contamination. The gasoline UST at the Lague residence exists in an area of thick overburden of approximately 120 feet. No groundwater testing has apparently been performed at either the Armory or at the Lague residence.

3.2.2 Payne Turnpike/Route 62 Vicinity

Other potential sources can also be considered less likely based on the pertinent criteria. The three gasoline USTs at the Maplewood Store exist in an area of thin overburden near the divide in the bedrock surface topography. These USTs have safeguards in place to detect and protect against accidental releases of product. Therefore, these USTs are a potential but unlikely source of the MTBE contamination.

The former gasoline UST at Town and Country Honda, which has been used to store heating oil for approximately three years, exists in an area with approximately 100 feet of overburden near the divide in the bedrock surface topography. The age and condition of this UST is unknown.

3.2.3 Airport Road Vicinity

Potential sources of MTBE contamination along Airport Road are of greater concern. The overburden in this area is quite thin; however, these potential sources are some distance from the CVMC wells.

Knapp State Airport remains on the Active Hazardous Sites List because of petroleum contaminated soils excavated and stockpiled during the 1990 removal of four "gas" USTs. Our file review indicates that the status of these soils has not been reported to the DEC and, once this is done, the Site can be closed. It is not clear from the record whether these removed tanks contained only aviation or jet fuel (neither of which contain MTBE) or whether gasoline was also stored on the site.

A gasoline UST was also removed from the Fecteau Construction property in 1990. Petroleum contaminated soils from this UST closure were shipped out of state. A UST that may have contained

either gasoline or diesel fuel was removed from the E.J. Prescott property in 1986. Only minor areas of soil contamination were noted during this UST closure. These are all possible, but not likely, sources of the MTBE contamination.

3.2.4 Granger Road Vicinity

The potential sources of greatest concern are the closed and current gasoline USTs located along Granger Road. This is an area of relatively thin overburden, ranging from approximately 20 to 50 feet. This area is also located on the southwestern "wall" of the bedrock trough, higher up than the CVMC wells. A major sewer line trench runs downhill below these sites, and toward the CVMC wells. This trench could act as a preferential flow conduit. Past investigations at the UPS, Pike Industries (former Cooley Asphalt), and former Central Vermont Truck Stop Sites have indicated only low levels of petroleum contamination in the groundwater in the overburden at the Sites. However, each of these investigations have been of limited extent.

At the Central Vermont Truck Stop, only one of the monitoring wells showed high concentrations of petroleum contamination; however, this may have been due to a poor monitoring well layout that did not adequately characterize the subsurface conditions at the Site. MTBE concentrations in monitoring well MW-2 were as high as 3,430 ppb in February 1990 and in April 1990, the MTBE concentration was 360 ppb. Benzene, toluene, ethylbenzene, and xylenes were also detected during sampling events at monitoring well MW-2. Laboratory analysis of a groundwater sample collected from MW-2 during this investigation indicates that neither MTBE nor BTEX compounds were reported in groundwater at this location, above laboratory quantitation limits. Although MTBE has not been reported for soil and groundwater samples collected at the other two closed Sites along Granger Road, these still represent potential sources of contamination. In particular, the U.P.S. Site was closed with only one groundwater monitoring well installed at the Site, after having recovered contaminated soils with PID measurements in excess of 500 ppm. The Site investigation performed at the former Cooley Asphalt Paving Site did not specifically test for the presence of MTBE in either soils or in groundwater. The limited investigations at these Sites may have not fully characterized the subsurface conditions at the Sites. A.G. Anderson also operates a permitted gasoline UST along Granger Road.

4.0 RECOMMENDATIONS

Based on all the information reviewed to date, activities in the Granger Road area continue to appear to be the most likely source of the MTBE contamination noted at the CVMC wells. It is possible

that an unreported release(s)/spill(s) of gasoline in the area is also the cause of MTBE contamination. Additional investigation in the area should be performed to help to more accurately identify the contamination source(s).

4.1 CONFIRM REGISTERED UST STATUS

As a first step we recommend that the WMD perform a check on the upgrade and testing status of all USTs in the area of investigation. It is possible that one or more tanks have not been tested recently, or that protective devices have not been installed as required by the underground storage tank regulations.

4.2 ADDITIONAL TESTING AT LYONS OF VERMONT

We recommend that the sewer line trench which crosses the Lyons property be tested for contaminants to determine whether it could be acting as a conduit for contaminant migration toward the CVMC wells.

4.3 PERFORM AREA GROUNDWATER SAMPLING

The geological testing and research which has been performed to date indicates that there are several possible sources of gasoline contamination in or near the recharge area for the bedrock aquifer of the CVMC wells. Subsurface testing is needed to further narrow the range of suspected sources.

The Johnson Company recommends that surficial groundwater be sampled and tested for MTBE and for BTEX to narrow down the possible sources of contamination to the CVMC water wells. Rather than installing an extensive network of permanent monitoring wells, groundwater samples should be obtained from temporary groundwater monitoring wells at selected points within the area of investigation. We recommend that a vibratory soil coring device or a geoprobe be used to minimize soil disturbance and time spent collecting water samples. The samples could be obtained within the rights-of-way of the Town of Berlin and State of Vermont Roads, to expedite the production of information without having to gain permission from many different landowners.

This approach has several advantages. Samples will be collected faster and more economically than with permanent installations. Working in the right of way of the road will defer or eliminate the

need to access privately-held pieces of land for testing purposes; if MTBE or other contaminants are detected in groundwater samples during this testing, then selected private landowners could be approached with the new information as a basis to open or in some cases re-open site investigations. Later, after the information is available, the State may wish to approach selected landowners for further testing on specific sites.

The logistics of this proposal would involve selecting between 20-25 specific sites for advancement of temporary groundwater monitoring wells in the source area. These should be located based on the proximity of suspected sources of MTBE. One or two non-suspected locations should also be included as background samples. Permission to drill in the right-of-way of the roads in the area will need to be granted by the Town of Berlin and by the State of Vermont Agency of Transportation in the case of State Route 62. Permission from the State can be requested via a Right-of-way access permit application. Dig-safe will require advance notification of the work, and caution will also need to be taken to avoid the buried sewer and water lines and local electric and cable services which may not be part of the Dig-safe program. Traffic control will be required in certain parts of the area.

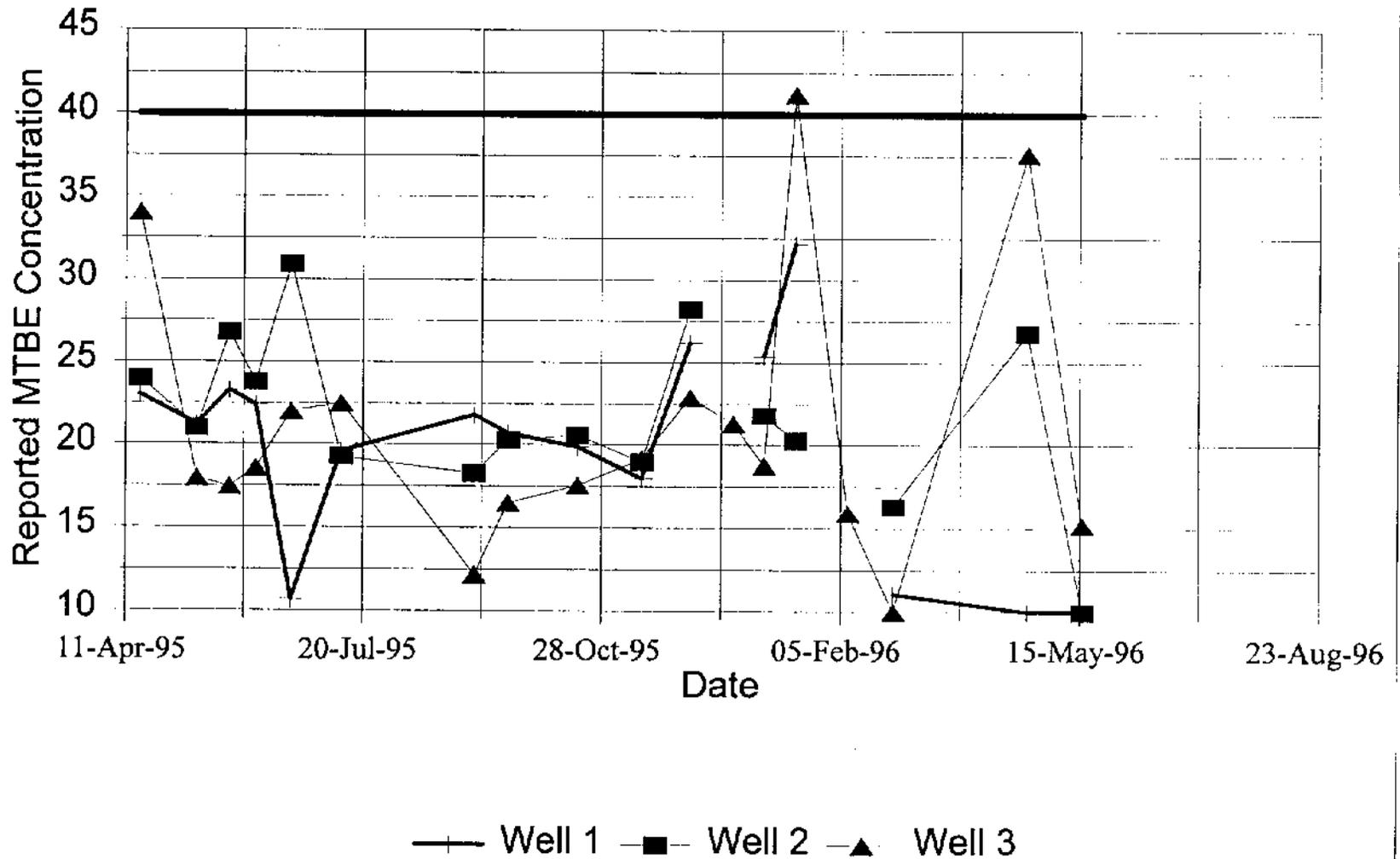
If surficial groundwater is encountered in any or all of these areas, it should be tested for MTBE and BTEX. If MTBE is detected in any of these samples then this would be indicative of a past release at that site. Such a release in a bedrock recharge area could have caused the contamination of the CVMC wells that is now being documented. Alternatively, the State may wish to have the samples tested for a more comprehensive volatiles scan, to determine whether industrial activities in the area have had a detrimental effect on groundwater quality.

We estimate that such an approach would utilize a truck-mounted drilling rig for about 1 week. During this time between 20-25 samples would be collected at an average rate of 3-5 samples per day. Analysis of these samples should be performed quickly (one-day turnaround time) so as to allow for the guidance of field operations by the analytical data.

Attachment 1
CVMC Water Supply Test Results

CVMC Water Supply Wells

Reported MTBE vs. Time



ARL

Central Vermont Hospital
Box 547, Barre, VT 05641

Plant Facilities

FAX

RECEIVED

Date:

5-28-96

MAY 28 1996

Number of pages including cover sheet:

14

JOHNSON CO. INC.
MONTPELIER, VT

To:

Alan Liptak
Johnson Company

From:

Joe Kaczmarek

Charlie Waterman

✓ Diane Collier

REMARKS:

Urgent

For your review

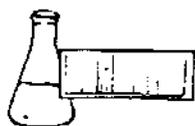
Reply ASAP

Please comment

Phone: (802)371-4161

Fax:

(802)371-4523


ENDYNE, INC.
Laboratory Services

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

LABORATORY REPORT
EPA METHOD 602-PURGEABLE AROMATICS

 CLIENT: Central Vermont Hospital
 PROJECT NAME: CVH
 REPORT DATE: May 22, 1996
 DATE SAMPLED: May 16, 1996
 DATE RECEIVED: May 16, 1996
 DATE ANALYZED: May 20, 1996

 PROJECT CODE: CVHC1768
 REF.#: 88,993
 STATION: Well #1
 TIME SAMPLED: 9:15
 SAMPLER: Roger Provost

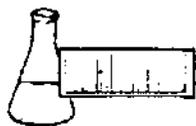
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 97%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected


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EPA METHOD 602--PURGEABLE AROMATICS

 CLIENT: Central Vermont Hospital
 PROJECT NAME: CVH
 REPORT DATE: May 22, 1996
 DATE SAMPLED: May 16, 1996
 DATE RECEIVED: May 16, 1996
 DATE ANALYZED: May 20, 1996

 PROJECT CODE: CVHG1768
 REF.#: 88,994
 STATION: Well #2
 TIME SAMPLED: 9:30
 SAMPLER: Roger Provost

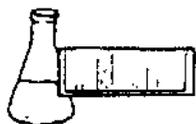
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 93%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected


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EPA METHOD 602--PURGEABLE AROMATICS

 CLIENT: Central Vermont Hospital
 PROJECT NAME: CVH
 REPORT DATE: May 22, 1996
 DATE SAMPLED: May 16, 1996
 DATE RECEIVED: May 16, 1996
 DATE ANALYZED: May 20, 1996

 PROJECT CODE: CVHG1768
 REF.#: 88,995
 STATION: Well #3
 TIME SAMPLED: 9:45
 SAMPLER: Roger Provost

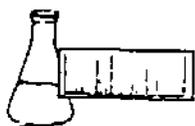
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Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	15.2

Bromobenzene Surrogate Recovery: 96%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected


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EPA METHOD 602 LABORATORY REPORT
MATRIX SPIKE AND DUPLICATE LABORATORY CONTROL DATA

 CLIENT: Central Vermont Hospital
 PROJECT NAME: CVH
 REPORT DATE: May 22, 1996
 DATE SAMPLED: May 16, 1996
 DATE RECEIVED: May 16, 1996
 DATE ANALYZED: May 20, 1996

 PROJECT CODE: CVHC1768
 REF.#: 88,993
 STATION: Well #1
 TIME SAMPLED: 9:15
 SAMPLER: Roger Provost

<u>Parameter</u>	<u>Sample(ug/L)</u>	<u>Spike(ug/L)</u>	<u>Dup1(ug/L)</u>	<u>Dup2(ug/L)</u>	<u>Avg % Rec</u>
Benzene	ND ¹	10	9.2	8.8	90%
Toluene	ND	10	10.0	9.7	98%
Ethylbenzene	ND	10	10.3	10.1	102%
Xylenes	ND	30	30.9	29.0	100%

NOTES:

1 None detected

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LABORATORY REPORTEPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Central Vermont Hospital
PROJECT NAME: CVH
REPORT DATE: April 25, 1996
DATE SAMPLED: April 23, 1996
DATE RECEIVED: April 23, 1996
DATE ANALYZED: April 24, 1996

PROJECT CODE: CVHC1515
REF.#: 87,995
STATION: Well #1
TIME SAMPLED: 9:15
SAMPLER: Roger Provost

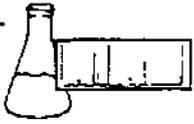
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 98%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

**ENDYNE, INC.**Laboratory Services

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(802) 879-4333
FAX 879-7103

LABORATORY REPORTEPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Central Vermont Hospital
PROJECT NAME: CVH
REPORT DATE: April 25, 1996
DATE SAMPLED: April 23, 1996
DATE RECEIVED: April 23, 1996
DATE ANALYZED: April 24, 1996

PROJECT CODE: CVHC1515
REF.#: 87,996
STATION: Well #2
TIME SAMPLED: 9:30
SAMPLER: Roger Provost

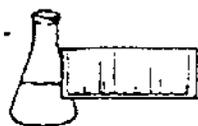
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	26.8

Bromobenzene Surrogate Recovery: 95%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected


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 FAX 879-7103

LABORATORY REPORT
EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Central Vermont Hospital
 PROJECT NAME: CVH
 REPORT DATE: April 25, 1996
 DATE SAMPLED: April 23, 1996
 DATE RECEIVED: April 23, 1996
 DATE ANALYZED: April 24, 1996

PROJECT CODE: CVHC1515
 REF.#: 87,997
 STATION: Well #3
 TIME SAMPLED: 9:45
 SAMPLER: Roger Provost

<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	37.6

Bromobenzene Surrogate Recovery: 93%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected



 Laboratory Services

32 James Brown Drive
 Williston, Vermont 05496
 (802) 879-4333
 FAX 879-7103

EPA METHOD 602 LABORATORY REPORT
MATRIX SPIKE AND DUPLICATE LABORATORY CONTROL DATA

CLIENT: Central Vermont Hospital
 PROJECT NAME: CVH
 REPORT DATE: April 25, 1996
 DATE SAMPLED: April 23, 1996
 DATE RECEIVED: April 23, 1996
 DATE ANALYZED: April 24, 1996

PROJECT CODE: CVHC1515
 REF.#: 87,995
 STATION: Well #1
 TIME SAMPLED: 9:15
 SAMPLER: Roger Provost

<u>Parameter</u>	<u>Sample(ug/L)</u>	<u>Spike(ug/L)</u>	<u>Dup1(ug/L)</u>	<u>Dup2(ug/L)</u>	<u>Avg % Rec</u>
Benzene	ND ¹	10	10.2	10.1	101%
Toluene	ND	10	10.0	9.7	98%
Ethylbenzene	ND	10	9.6	9.4	95%
Xylenes	ND	30	28.0	27.5	92%

NOTES:

1 None detected



ENDYNE, INC.

Laboratory Services

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

LABORATORY REPORT

EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: CVH
PROJECT NAME: CVH
REPORT DATE: February 28, 1996
DATE SAMPLED: February 27, 1996
DATE RECEIVED: February 27, 1996
DATE ANALYZED: February 28, 1996

PROJECT CODE: CVHC1952
REF.#: 86,168
STATION: Boiler Room
TIME SAMPLED: 10:30
SAMPLER: Roger Provost

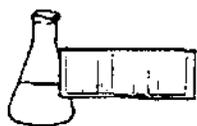
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	11.1

Bromobenzene Surrogate Recovery: 101%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected


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Laboratory Services

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LABORATORY REPORT
EPA METHOD 602-PURGEABLE AROMATICS

 CLIENT: CVH
 PROJECT NAME: CVH
 REPORT DATE: February 28, 1996
 DATE SAMPLED: February 27, 1996
 DATE RECEIVED: February 27, 1996
 DATE ANALYZED: February 28, 1996

 PROJECT CODE: CVHC1952
 REF.#: 86,169
 STATION: Boiler Room
 TIME SAMPLED: 11:07
 SAMPLER: Roger Provost

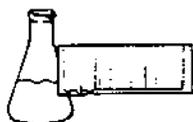
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	16.3

Bromobenzene Surrogate Recovery: 101%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected


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LABORATORY REPORT
EPA METHOD 602--PURGEABLE AROMATICS

 CLIENT: CVH
 PROJECT NAME: CVH
 REPORT DATE: February 28, 1996
 DATE SAMPLED: February 27, 1996
 DATE RECEIVED: February 27, 1996
 DATE ANALYZED: February 28, 1996

 PROJECT CODE: CVHC1952
 REF.#: 86,167
 STATION: Well #3
 TIME SAMPLED: 9:30
 SAMPLER: Roger Provost

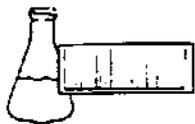
<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 103%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected


ENDYNE, INC.
Laboratory Services

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

LABORATORY REPORT
EPA METHOD 602--PURGEABLE AROMATICS

 CLIENT: Central Vermont Hospital
 PROJECT NAME: CVH
 REPORT DATE: February 21, 1996
 DATE SAMPLED: February 16, 1996
 DATE RECEIVED: February 16, 1996
 DATE ANALYZED: February 21, 1996

 PROJECT CODE: CVTH1876
 REF.#: 85,933
 STATION: Boiler Room
 TIME SAMPLED: 8:10
 SAMPLER: Provost

<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	ND

Bromobenzene Surrogate Recovery: 99%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected


ENDYNE, INC.
Laboratory Services

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

LABORATORY REPORT
EPA METHOD 602--PURGEABLE AROMATICS

 CLIENT: Central Vermont Hospital
 PROJECT NAME: CVH
 REPORT DATE: February 9, 1996
 DATE SAMPLED: February 8, 1996
 DATE RECEIVED: February 8, 1996
 DATE ANALYZED: February 9, 1996

 PROJECT CODE: CVHO1794
 REF.#: 85,605
 STATION: Well #3
 TIME SAMPLED: 9:30
 SAMPLER: Roger Provost

<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Benzene	1	ND ¹
Chlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
Ethylbenzene	1	ND
Toluene	1	ND
Xylenes	1	ND
MTBE	10	15.9

Bromobenzene Surrogate Recovery: 90%

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

Attachment 2

Maps

Attachment 3
Inventory of Known Water Supply Wells

1-2267-8
CVH wells

4/08/96 cc:ARL

Address Summary

Tax Map Reference	Tax Map ID	Well located in field?	Name	Address	City	State	ZIP	Telephone	Additional Info
R-2	1		Blow, Chester T. and Ella (Living Trust)	RR4 Box 3505	Montpelier	VT	05601	223-3633	phone listing "Chester"
R-2	10		AG Anderson Co. Inc.	PO Box 300	Waterbury	VT		229-0191	main office 244-7811
R-2	11		LaGue Inc.	RR4 Box 1720	Montpelier	VT	05602	229-5766	LaGue Inn phone listing
R-2	11A	Y	Zahm, Micheal and Christine	PO 278	Montpelier	VT	05602	229-4926	Granger Rd.
R-2	11B		EF Wall Assoc., Inc	PO Box 1310	Montpelier	VT	05601	479-1013	c/o Zalinger
R-2	12A		Vermont Mutual Insurance Co.	PO 188	Montpelier	VT	05601	476-1032	
R-2	12B	Y	LaParade Realty	PO 542	Barre	VT	05641		
R-2	12C		D&D Investment Corp.	PO 568	Montpelier	VT	05602		
R-2	12D	Y	Mountain Cable Company	18 Avenue B	Williston	VT	05495		
R-2	12E	Y	Poland, Elizabeth	Kings Road	Lebanon	NH	03766		Wilson Tire
R-2	12F	Y	Galfetti, Eugene	RR2 Box 325	Montpelier	VT	05602	883-5556	Corinth Rd. Wash.
R-2	12G		Galfetti, Eugene	RR2 Box 325	Montpelier	VT	05602	883-5556	Corinth Rd. Wash.
R-2	12H		LaGue Inc.	RR4 Box 1720	Montpelier	VT	05602	229-5766	LaGue Inn phone listing
R-2	12I		LaGue Inc.	RR4 Box 1720	Montpelier	VT	05602	229-5766	LaGue Inn phone listing
R-2	12J		LaGue Inc.	RR4 Box 1720	Montpelier	VT	05602	229-5766	LaGue Inn phone listing
R-2	13	Y	Lamberton, Wayne and Deidre	64 Main St.	Montpelier	VT	05602	456-8792	PRESTON 151 Trucking Line
R-2	13A		Heney, Lawrence P. and Mary M. Trustees	100 E. State St.	Montpelier	VT	05602	223-2500	UPS
R-2	13B		Nicholson, Mark A. and Robin C.	PO Box 727	Barre	VT	05641	476-4250	
R-2	13C	Y	Andreoletti, Robert C.	75 Merchant St.	Barre	VT	05641	479-9620	NICON
R-2	13D		Nicholson, Mark A. and Robin C.	PO Box 727	Barre	VT	05641	476-4250	
R-2	14-1	Y7	Parker, Charles R.	RR4 Box 2290	Montpelier	VT	05602		
R-2	14-2	Y7	Parker, Charles R.	RR4 Box 2290	Montpelier	VT	05602		white house
R-2	14-3	Y7	Parker, Charles R.	RR4 Box 2290	Montpelier	VT	05602		USDA building
R-2	14A		Barr, Kay J.	RR4	Montpelier	VT	05602	223-2466	
R-2	14B		Parker, Charles R.	RR4 Box 2290	Montpelier	VT	05602		
R-2	15		State of Vermont, Agency of Transport.	State Office Building	Montpelier	VT	05602	828-2691	Div. 6 Admin.
R-2	16		MacAuley, Roger	RR4 Box 9852	Barre	VT	05641	479-9808	Spruce Mt View Dr. Barre
R-2	17		Calmont Beverage Co., Inc.	21 Main St.	Barre	VT	05641	223-3281	2 AGST- 500g ea, gas
R-2	18		Berlin Town Cemetary Lot		Berlin	VT			
R-2	19A	Y	Tennis Unlimited	c/o Richard Staudt RR1	Montpelier	VT	05602	223-6161	Wedgewood Fitness listed

Tax Map Reference	Tax Map ID	Well located in field?	Name	Address	City	State	ZIP	Telephone	Additional Info
R-2	19B		Wavan Associates	58 East State St.	Montpelier	VT	05602		
R-2	19C		Poplawski, David J.	Box 647	Barre	VT	05641	223-9972	urologist's office
R-2	19D	Y	Central Vermont Home Health	L&B RR3 Box 6694	Barre	VT	05641	223-1878	
R-2	19E	Y	Blue Cross/ Blue Shield of VT	PO Box 186	Montpelier	VT	05602	223-6131	
R-2	2		Woodbury, Harold and Hilda	RR4	Montpelier	VT	05601	223-5678	
R-2	20		Central Vermont Hospital	PO Box 547	Barre	VT	05641	371-4100	
R-2	21		LaGue, Henry A. Jr.	RR4	Montpelier	VT	05602		see LaGue Inc.
R-2	22		Blow, Chester T. and Ella (Living Trust)	Box 3505	Montpelier	VT	05602	223-3633	
R-2	23		Irons, Paul F. and Margeret	139 Barre-Montp. Road	Barre	VT	05641	223-2120	
R-2	25	Y,2	Berlin Town School District		Berlin	VT		223-2796	
R-2	26		Gould, Jon F. and Deanne M.	RR4 Box 2035	Montpelier	VT	05602	223-6446	Paine Turnpike
R-2	27		Clark, Richard O. and Anita P.	RR4	Montpelier	VT	05602		
R-2	28		Moore, Thomas J. and Celina R.	RR4	Montpelier	VT	05602	454-7306	
R-2	3		Sancibrian, Joseph W.	PO Box 441	Barre	VT	05641	223-5096	Comstock Rd.
R-2	30	Y	State of Vermont Library	RR4	Montpelier	VT	05602	828-2320	
R-2	31		Vermont Mutual Insurance Co.	89 State St.	Montpelier	VT	05602	476-1032	
R-2	31A		Vermont Mutual Insurance Co.	89 State St.	Montpelier	VT	05602	476-1032	
R-2	33		Lyons, Daniel and Suzanne (Trustees)	RR4	Montpelier	VT	05602	229-9117	476-5799 (H)
R-2	33A		Lyons, Daniel and Suzanne (& Successors)	RR4	Montpelier	VT	05602	229-9117	476-5799 (H)
R-2	33B		Developers Diversified Realty Corp.	34555 Chagrin Boulevard	Moreland Hill	OH			
R-2	34		Montpelier, City of					223-9500	
R-2	35		LaGue Inc.	RR4 Box 1720	Montpelier	VT	05602	229-5766	LaGue Inn phone listing
R-2	36		State of Vermont					828-1110	general info.
R-2	37	Y,3	Central Vermont Hospital	Box 547	Barre	VT	05641	371-4100	
R-2	38		Central Vermont Hospital	Box 547	Barre	VT	05641	371-4100	
R-2	38A		Central Vermont Hospital	Box 547	Barre	VT	05641	371-4100	
R-2	38D	Y	Central Vermont Hospital	Box 547	Barre	VT	05641	371-4100	
R-2	38E		Central Vermont Hospital	Box 547	Barre	VT	05641	371-4100	
R-2	38F		Central Vermont Hospital	Box 547	Barre	VT	05641	371-4100	
R-2	39		Green Mountain Power Corp.	1 Main St.	Burlington	VT		864-5731	Corp. Headquarters
R-2	4		Berlin Properties, Inc.	253 So. Union St.	Burlington	VT			c/o George Page

Tax Map Reference	Tax Map ID	Well located in field?	Name	Address	City	State	ZIP	Telephone	Additional Info
R-2	40		LaGue Inc.	RR4 Box 1720	Montpelier	VT	05602	229-5766	LaGue Inn phone listing
R-2	40A		LaGue, Henry	RR4	Montpelier	VT	05602		see LaGue Inc.
R-2	43		Butsch, David W. and Linda	RR4	Montpelier	VT	05602		
R-2	44	Y?	Diego, Richard and Rita	RR3	Barre	VT	05641	223-5113	Airport Rd., white hse?
R-2	45		Parks, Steven	RR3	Barre	VT	05641	223-5020	Airport Rd.
R-2	46		Parks, Steven (CV Carpet tenant 223-6252)	RR3	Barre	VT	05641	223-5020	Airport Rd. See tenant #.
R-2	47		Johnson, Raymond and Donna G.	RR3	Barre	VT	05641	476-4071	listed as "Raymond K"
R-2	48		Johnson, Raymond and Donna G.	RR3	Barre	VT	05641	476-4071	listed as "Raymond K"
R-2	49		Kelley, Roy S. and Kathryn S.	527 Plain St.	Stoughton	MA	02072		
R-2	49A		LaGue, Henry A. Jr	RR4 Box 1720	Montpelier	VT	05602		see LaGue Inc.
R-2	49B	Y	Christ The Redeemer Evangelical Luthern	401 Prospect St.	Barre	VT	05641	223-6878	
R-2	49C		LaGue, Randolph W.	RR4 Box 1720	Montpelier	VT	05602	223-2959	phone listing is "R"
R-2	5		Fayette, James		Burlington	VT			complete address NA
R-2	50		Cisapi, Osvaldo and Gregory V. et al.	28 Hall St.	Barre	VT	05641	476-5134	aka "Ozzie"
R-2	56		Vermont National Bank	PO Box 1308	Burlington	VT	05401	223-6311	
R-2	56A		Vermont Insurance Management	PO Box 306	Montpelier	VT	05602	229-5042	Airport Rd.
R-2	56B		Prescott, Everett J., Inc.	PO Box 600	Gardiner	ME		223-2385	Airport Rd.
R-2	56C		Vermont National Bank	PO Box 1308	Burlington	VT	05401	223-6311	
R-2	56D		Vermont National Bank	PO Box 1308	Burlington	VT	05401	223-6311	
R-2	57		State of Vermont, Agency of Transport.	State Office Building	Montpelier	VT	05602	828-2691	Div. 6 Admin.
R-2	58		Batchelder, Ernest and Marlene	RR1 Box 3270	Barre	VT	05641	476-4840	
R-2	59		LaGue Inc.	RR4 Box 1720	Montpelier	VT	05602	229-5766	LaGue Inn phone listing
R-2	6		Berlin Properties, Inc.	253 So. Union St.	Burlington	VT			c/o Douglas Pierson
R-2	60		Brown, Virginia M. & Burrington, Stelle	RR3	Barre	VT	05641	223-2413	
R-2	61		Concord General Mutual Ins. Co.	4 Bouton St.	Concord	NH		229-0355	Airport Rd.
R-2	62		State of Vermont, Dept. of Aeronautics		Montpelier	VT	05602	828-2093	
R-2	63		Design Sales Systems	PO Box 546	Montpelier	VT	05602		
R-2	6A	Y	Allocca, Frank	RR4 Box 2100	Montpelier	VT	05602	223-9700	and Newton, NJ (T&C Honda)
R-2	7		State of Vermont, State Transp. Board	133 State Street	Montpelier	VT	05602	828-2691	Div. 6 Admin.
R-2	73		State of Vermont					828-1110	general info.
R-2	79		Berlin Corners Cemetary Assoc.		Berlin	VT			

Tax Map Reference	Tax Map ID	Well located in field?	Name	Address	City	State	ZIP	Telephone	Additional Info
R-2	8		Wall, Jonathon R. and Anne M.	PO Box 1347	Montpelier	VT	05601	223-6764	
R-2	8A	Y	Pike Industries, (8A not in town files)						
R-2	80		Velander, Eric H. and Etal	RR4 Box 2240	Montpelier	VT	05602	223-2895	
R-2	81		Wiggins, Doris B.	RR4	Montpelier	VT	05602		
R-2	82		First Congregational Church	RR4	Montpelier	VT	05602	229-0338	
R-2	83		LaGue Inc.	RR4 Box 1720	Montpelier	VT	05602	229-5766	LaGue Inn phone listing
R-2	84		State of Vermont, Agency of Transport.	133 State St.	Montpelier	VT	05602	828-2691	Div. 6 Admin.
R-2	9		Cooley Asphalt Paving Corp.	Box 542	Barre	VT	05641	476-3050	Websterville, VT
R-6	1		Lash, Betty B. Trustee	14 Southwind Dr. Box 5465	Burlington	VT	05401	433-6677	Williamstown
R-6	2	Y	Maplewood D. Limited	RR4 Box 2110	Montpelier	VT	05602	229-5291	Comfort Inns/Mobile
R-6	3	Y	LaGue Inc.	RR4 Box 1720	Montpelier	VT	05602	229-5766	LaGue Inn phone listing
R-6	4		Spence, William R. and Roxanne L.	RR4	Montpelier	VT	05602	223-0587	Crosstown Rd.
R-7	49		Emmons, Raymond F. & Simone A.	RR4	Montpelier	VT	05602	223-3733	
R-7	50		Emmons, Douglas C. & Jacqueline Crowell	RR4	Montpelier	VT	05602	229-0210	
R-7	51	Y	Windheuser, Ingrid, Michael and Stefan	22 Kent St.	Montpelier	VT	05602		c/o Charles Ballantyne
R-7	51A		Butsch, David and Linda L.	RR4	Montpelier	VT	05602		
R-7	52		Burke, Raymond and Anne	RR4	Montpelier	VT	05602	223-7927	
R-7	53	Y	Central Vermont Chamber of Commerce, Inc.	PO Box 336	Barre	VT	05641	229-5711	
R-7	54		Dwinell, Sterlings and Pauline	RR4	Montpelier	VT	05602	223-6729	Stewart Rd.
R-7	55		Burke, Kelly F.	RR4	Montpelier	VT	05602		
R-7	56		Burke, Raymond F. and Anne O.	RR4	Montpelier	VT	05602	223-7927	
R-7	57		Ghiringhelli, Janis G.	RR4	Montpelier	VT	05602		
R-7	58		Turner, Richard et al	RR4 Box 1900	Montpelier	VT	05602	223-3748	
R-7	58A		Turner, Vernon D. and Merrylees et al	RR4 Box 1900	Montpelier	VT	05602		
R-7	59		Turner, Pamela, Richard et al	RR4 Box 1900	Montpelier	VT	05602	223-3748	
R-7	60		Verchereau, Cheryl P.	RR4 Box 1890	Montpelier	VT	05602		
R-7	61		Montpelier, City of					223-9500	
R-7	62		Turner, Preston, Adm. F. Turner Estate	12 Walnut St.	Berlin	MA	01503		
R-7	63		Hudson, Noah W. and Barbara K.	RR4 Box 2025	Montpelier	VT	05602	223-3593	
R-7	64		Pearson, Kenneth M. and Arliene M.	RR4	Montpelier	VT	05602	229-0561	
R-7	65		Benoit, John T. and Pamela J.	RR1 Box 1392	Williamstown	VT	05679	433-5452	

Tax Map Reference	Tax Map ID	Well located in field?	Name	Address	City	State	ZIP	Telephone	Additional Info
R-7	66		McGinnis, John M. and Kristina M.	RR4 Box 2080	Montpelier	VT	05602	229-0440	
R-7	67	Y	Benolt, John T. and Pamela J.	RR1 Box 1392	Williamstown	VT	05679	433-5452	
R-7	68		Clark, O. Richard, Robert D. and Cheryl	RR4	Montpelier	VT	05602	223-2066	listed as Robt. & Cheryl
R-7	68A		Clark, William A. and Diane L.	RR4	Montpelier	VT	05602	223-6758	
R-7	69		Houle, Romeo A. and Margaret A.	RR4	Montpelier	VT	05602	223-6573	Birchwood Dr.
R-7	70		Mullen, Robert N. and Peggy A.	RR4 Box 1930	Montpelier	VT	05602	223-6639	
R-7	71		Kilburn, E. Stanley and Junetta	RR4	Montpelier	VT	05602	223-3273	
R-7	72		Brewer, Leeda J. and Charlotte M.	RR4 Box 1995	Montpelier	VT	05602	223-2436	
R-7	74		Walker, Marian E.	RR4 Box 1990	Montpelier	VT	05602		
R-7	75		Merchant, Stephan A.	RR4	Montpelier	VT	05602		
R-7	76		Flanagan, Anita M.	RR4	Montpelier	VT	05602	223-6406	
R-7	77		Murray, Wayne K.	PO Box 102	Williston	VT	05495		
R-7	77A		Roya, Herbert W. Jr. and Sherlie A.	RR4 Box 1910	Montpelier	VT	05602	223-3286	
R-7	77B		United States of America	12 New England Exec. Park	Boston	MA	10183		c/o Fed Aviation Admin.

Attachment 4

Water Supply Laboratory Analytical Results

5/21/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

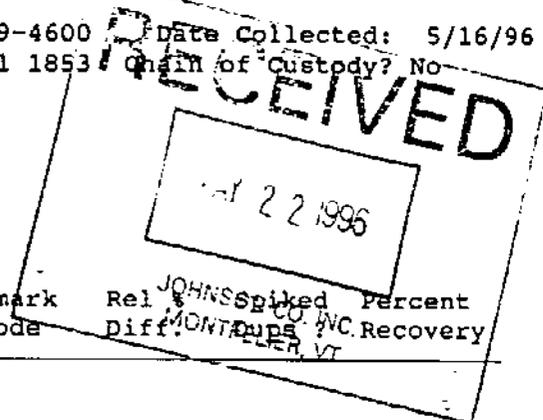
1-2267-8

Lab Id: 20539 Report To: L.FOREGGER.JOHNSON
Location: CVMC WELLS LAGUE QUARRY

Phone: 229-4600 Date Collected: 5/16/96
Program: 41 1853 Chain of custody? No

Notes:

Date Analyzed: 5/17/96 Over hold? No Dilution: 1



Parameter	Units are ug/l		Remark Code	Rel Diff	Spiked	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α, α, α -Trifluorotoluene 110% 4-Bromofluorobenzene . 104%

Notes: No second column confirmation used.

5/21/96

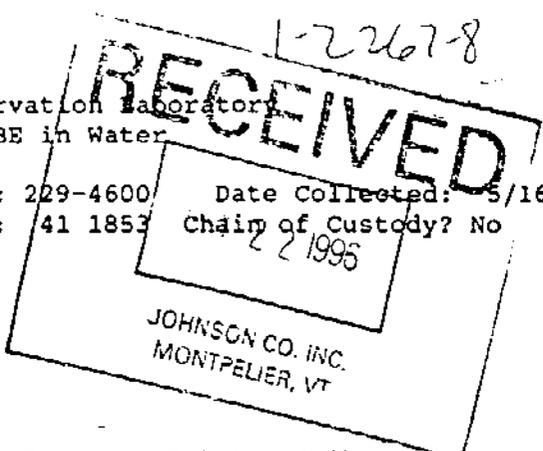
Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20540 Report To: L.FOREGGER.JOHNSON
Location: CVMC WELLS LAGUE RESIDENCE

Phone: 229-4600
Program: 41 1853

Date Collected: 5/16/96
Chain of Custody? No



Notes:

Date Analyzed: 5/17/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α, α, α -Trifluorotoluene 111% 4-Bromofluorobenzene . 105%

Notes: No second column confirmation used.

6/11/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20840 Report To: Liz Foregger@Johnson Phone: 229-4600 Date Collected: 6/05/96
Location: CVH Wells - Truck Stop Program: 41 1853 Chain of Custody? No

Notes:

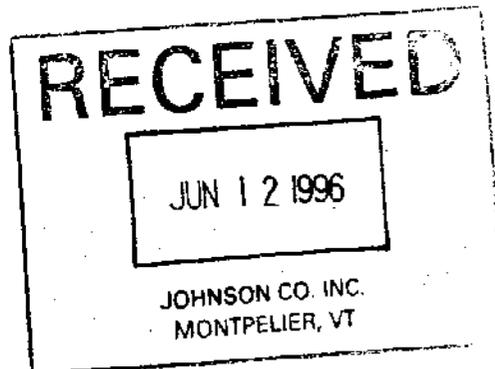
Date Analyzed: 6/07/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α,α,α -Trifluorotoluene 113% 4-Bromofluorobenzene . 107%

Notes: No second column confirmation used.



Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

ERF

GJD

Lab Id: 20324 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
Location: CVMC Wells - WS1, Lague Inn Program: 41 1853 Chain of Custody? No

Notes:

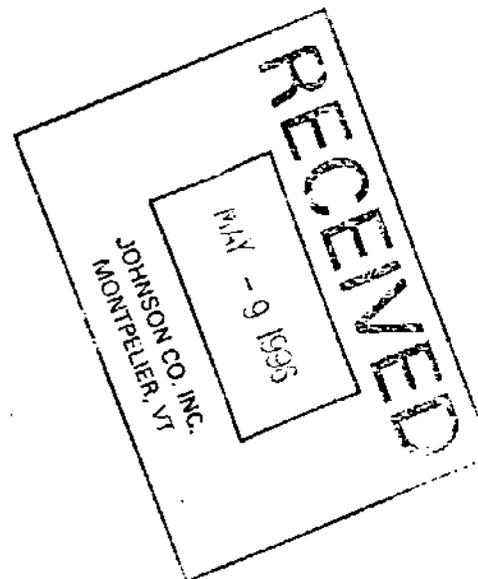
Date Analyzed: 5/06/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α,α,α -trifluorotoluene 111% 4-Bromofluorobenzene . 102%

Notes: No second column confirmation used.



5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20325 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
Location: CVHC Wells - WS2, Berlin Mall Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/06/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

a,a,a-Trifluorotoluene 109% 4-Bromofluorobenzene, 101%

Notes: No second column confirmation used.

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20326 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS3, Berlin Armor Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/06/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α,α,α -Trifluorotoluene 119% 4-Bromofluorobenzene . 69% S

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

 Department of Environmental Conservation Laboratory
 Method 8020 - BTEX and MTBE in Water

GJD

 Lab Id: 20327 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS4, Physican's Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/06/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

 α,α,α -Trifluorotoluene 108% 4-Bromofluorobenzene . 102%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

 Department of Environmental Conservation Laboratory
 Method 8020 - BTEX and MTBE in Water

GJD

 Lab Id: 20328 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WSS, Fmr. Trk. St Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/06/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

 α,α,α -Trifluorotoluene 107% 4-Bromofluorobenzene . 99%

Notes: No second column confirmation used.

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20329 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS6, Zahn Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/06/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (\$=Surrogate recovery out of range)

a,a,a-Trifluorotoluene 109% 4-Bromofluorobenzene . 104%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20330 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS7, Wilson Tire Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/06/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α,α,α -Trifluorotoluene 109% 4-Bromofluorobenzene . 104%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20331 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS8, USDA -Parker Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/07/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

 α,α,α -Trifluorotoluene 108% 4-Bromofluorobenzene . 101%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

Department of Environmental Conservation Laboratory
 Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20332 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS9, Preston 151 Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/07/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α,α,α -Trifluorotoluene 110% 4-Bromofluorobenzene . 104%

Notes: No second column confirmation used.

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20333 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS10, NICOM Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/07/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	QOL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (\$=Surrogate recovery out of range)

α,α,α -Trifluorotoluene 109% 4-Bromofluorobenzene . 103%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20334 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS11, Pike Ind. Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/07/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α,α,α -Trifluorotoluene 111% 4-Bromofluorobenzene . 103%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20335 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
Location: CVMC Wells - WS12, Calmont Bev Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/07/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α, α, α -Trifluorotoluene 111% 4-Bromofluorobenzene . 104%

Notes: No second column confirmation used.

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20336 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS13, Airport Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/07/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α,α,α -Trifluorotoluene 111% 4-Bromofluorobenzene .. 103%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

 Department of Environmental Conservation Laboratory
 Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20337 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS14, Luthern Chu Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/07/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α,α,α -Trifluorotoluene 110% 4-Bromofluorobenzene . 104%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20338 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS15, VT COC Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/07/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

 α,α,α -Trifluorotoluene 111% 4-Bromofluorobenzene 105%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20339 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS16, Wedgewood Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/07/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α,α,α -Trifluorotoluene 114% 4-Bromofluorobenzene . 65% S

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

 Department of Environmental Conservation Laboratory
 Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20340 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS17, CVHH Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/07/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α,α,α -Trifluorotoluene 111% 4-Bromofluorobenzene . 101%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

 Department of Environmental Conservation Laboratory
 Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20341 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS18, TTC Honda Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/07/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.		2	Y	113
Toluene	1	N.D.		2	Y	111
Ethylbenzene	1	N.D.		3	Y	150
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α,α,α -Trifluorotoluene 110% 4-Bromofluorobenzene . 103%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20342 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS19, Dr. Pearson Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/08/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

 α,α,α -Trifluorotoluene 111% 4-Bromofluorobenzene . 106%

Notes: No second column confirmation used.

5/09/96

 Department of Environmental Conservation Laboratory
 Method 8020 - BTEX and MTBE in Water

GJD

 Lab Id: 20342 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - WS19, Dr. Pearson Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/08/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

 α,α,α -Trifluorotoluene 111% 4-Bromofluorobenzene . 106%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTEE in Water

GJD

Lab Id: 20343 Report To: L. Foragger@Johnson Phone: 229-4600 Date Collected: 5/03/96
Location: CVHC Wells - WS20, VT Library Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/08/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

 α,α,α -Trifluorotoluene 112% 4-Bromofluorobenzene 105%

Notes: No second column confirmation used.

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20344 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
Location: CVMC Walls - WS21, CVCC Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/08/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

 α, α, α -Trifluorotoluene 111% 4-Bromofluorobenzene 103%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20345 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVHC Wells - Field Blank Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/08/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

α,α,α -Trifluorotoluene 112% 4-Bromofluorobenzene . 104%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve

5/09/96

Department of Environmental Conservation Laboratory
Method 8020 - BTEX and MTBE in Water

GJD

Lab Id: 20346 Report To: L. Foregger@Johnson Phone: 229-4600 Date Collected: 5/03/96
 Location: CVMC Wells - Trip Blank Program: 41 1853 Chain of Custody? No

Notes:

Date Analyzed: 5/08/96 Over hold? No Dilution: 1

Parameter	Units are ug/l		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Methyl-t-butylether	1	N.D.				
Benzene	1	N.D.				
Toluene	1	N.D.				
Ethylbenzene	1	N.D.				
Total Xylenes	1	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

Surrogate Percent Recoveries (S=Surrogate recovery out of range)

 α,α,α -Trifluorotoluene 112% 4-Bromofluorobenzene 104%

Notes: No second column confirmation used.

Remarks: E=Estimated Value J=Value may be in Error O=Value outside Standard Curve