

THE JOHNSON COMPANY, INC.

**Environmental Sciences and Engineering**

July 28, 1995

Mr. Chuck Schwer  
Hazardous Materials Management Division  
103 South Main Street/West Office  
Waterbury, Vermont 05671-0404

Re: Parsons Hill Family Housing, Castleton Corners, Vermont: June 1995 Site Investigation (Site #93-1414). JCO No. 1-2267-3.

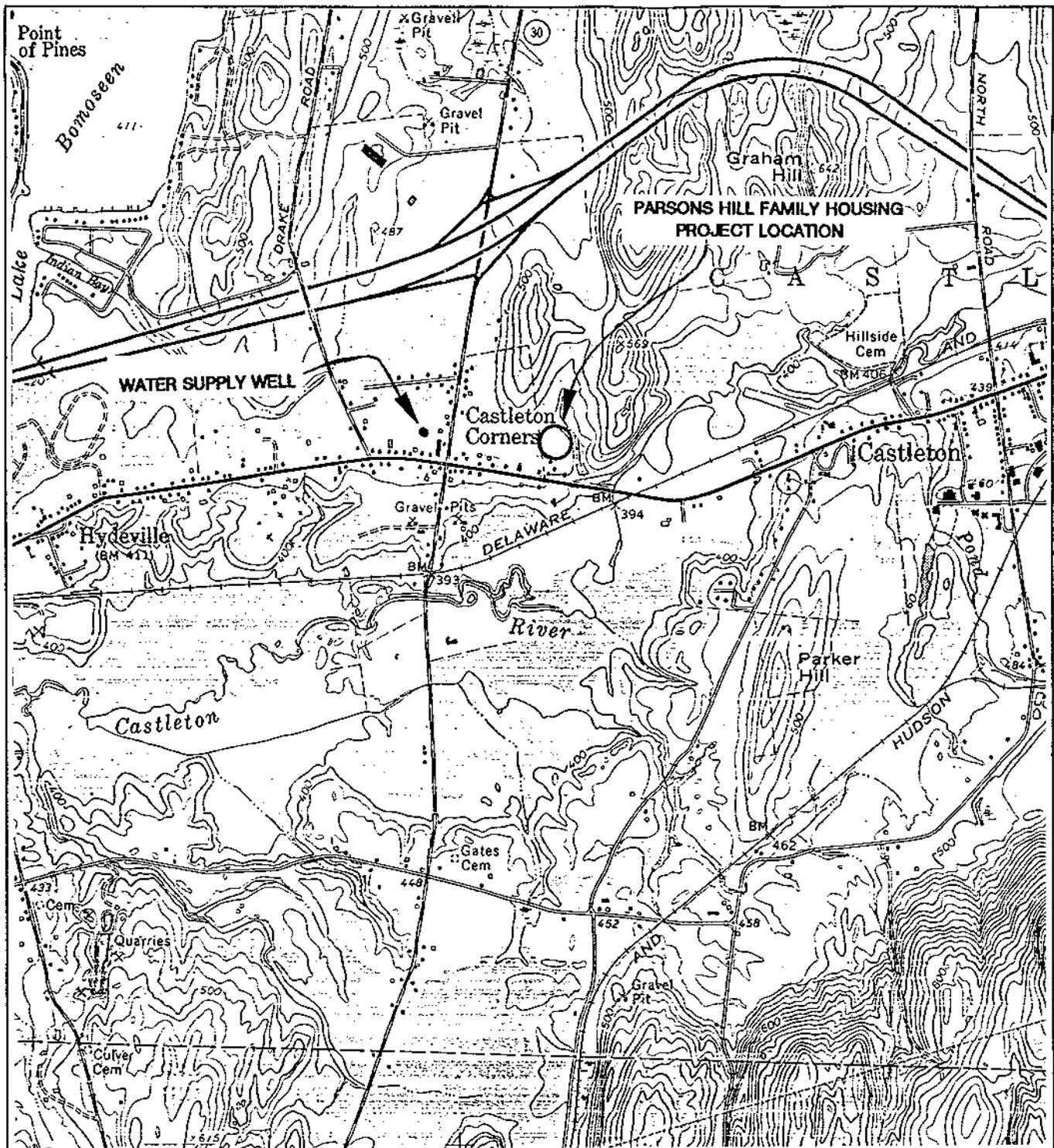
JUL 31 11 31 AM '95

Dear Chuck:

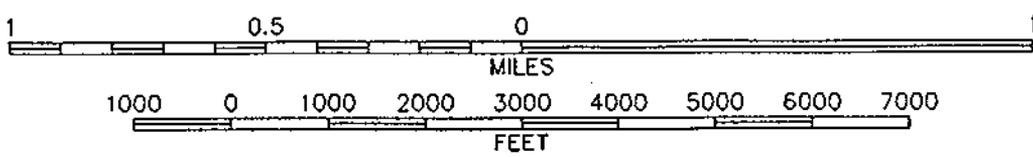
We have completed our site investigation for the referenced project in accordance with our workplan approved by you in letters dated June 9 and June 28, 1995. The site investigation was based on the working hypothesis that the water supply pipeline that serves the Parsons Hill Family Housing development passes through an area of soils contaminated with tetrachloroethene (PCE), and that diffusion of the PCE through the pipeline has contaminated the drinking water used at Parsons Hill. The location of the hypothesized soil contamination is thought to be between the Parsons Hill water storage tank and the last residential water supply connection prior to the Parsons Hill development (Calvin property). The drilled bedrock well that serves Parsons Hill also serves several other water users in Castleton Corners. Our site investigation was designed to determine if the suspected area of soil contamination exists. This letter/report presents the details of our investigation.

**1.0 INTRODUCTION**

Parsons Hill is a low-income housing project located in Castleton Corners, Vermont (Figure 1). Past studies performed by The Johnson Company for the Vermont Department of Environmental Conservation's (DEC) Hazardous Materials Management Division (HMMD) have documented PCE contamination in the drinking water at Parsons Hill. The PCE contamination is documented by several water supply samples collected primarily by Vermont Department of Health (VDOH) personnel since the water system was put on-line in March 1983. The Johnson Company collected the last round of water quality samples in November 1994. That sampling event indicated that PCE continues to be present in the Parsons Hill water distribution system at concentrations below the maximum contaminant level (MCL) of 5 parts per billion (ppb) but above the VDOH health advisory (HA) of 0.7 ppb. The drilled bedrock well that serves the Parsons Hill development, historically referenced as Spafford Well #3, has not exhibited detectable concentrations of PCE during past sampling events, nor have samples collected from other water users connected to the supply well. A site location map is included as Figure 1. Previous studies performed by The Johnson Company are discussed in detail in letters and letter/reports submitted to the HMMD dated December 1, 1993; January 14, 1994; June 14, 1994; September 30, 1994; and December 16, 1994.



NORTH ↑



CONTOUR INTERVAL 20 FEET



MAP LOCATION

BASE MAP : USGS 7.5 Minute Topographic Quadrangle; Poultney, VT.-N.Y. 1964, Photorevised 1972

FIGURE 1: Site and Well Location Map  
Parsons Hill Family Housing  
Castleton Corners, Vermont

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As discussed in our January 14, 1994 letter/report, the VDOH performed studies soon after the water system began operation in 1983 in an effort to determine the source of the PCE contamination. Laboratory analyses were performed on the solvent and cement used to join the PVC pipes within the Parsons Hill water distribution system and the PVC pipe itself was tested to determine if PCE was present in these items. The VDOH laboratory found no PCE in the solvent or cement and the manufacturers of these products confirmed that PCE is not used in the manufacture of these products. The Environmental Protection Agency (EPA) and National Sanitation Foundation (NSF) laboratories established that water that was placed in contact with the three-inch diameter "Crestline" PVC pipe from the Parsons Hill water distribution system which was sent to them contained high levels of PCE. The concentrations noted were from 150 to 175 ppb. The EPA recommended that a section of "Crestline" PVC pipe which was not installed in the Parsons Hill water system also be analyzed by their laboratory. A sample of this pipe was sent to the EPA; however, the analytical results could not be located in DEC Water Supply Division (WSD) files. Soil samples that were collected by VDOH personnel "...with a pigtail auger from several locations along the pipeline route..." were found to contain "...low levels..." of PCE by the NSF. Chemical Resistance Charts published by Cole-Parmer indicate that PCE has a severe chemical effect on PVC materials. The integrity of piping traversing contaminated soils could potentially be compromised by PCE.

Working with all the background information available, The Johnson Company developed a workplan at the request of the HMMD, dated May 23, 1995 with an addendum dated June 20, 1995, to further investigate the possibility of an area of PCE contaminated soils through which the water supply pipeline serving Parsons Hill passes. The objective of the work plan was to further isolate and identify the source of the PCE contamination.

## **2.0 SITE INVESTIGATION**

### **2.1 OVERVIEW OF WORK PERFORMED**

The fieldwork at Parsons Hill consisted of the following three tasks:

- 1) Water supply distribution system piping location.
- 2) Soil vapor screening and soil sampling along the route of the pipeline starting at the Parsons Hill hydropneumatic tank and continuing approximately 360 feet "up-pipeline".
- 3) Drinking water sampling for volatile organic compound (VOC) contamination from the supply well, the Calvin property, and the Parsons Hill hydropneumatic tank.

The fieldwork was completed on June 29, 1995 by Johnson Company personnel.

## **2.2 WATER SUPPLY DISTRIBUTION SYSTEM PIPING LOCATION**

### ***2.2.1 Information from DEC Water Supply Division***

The Johnson Company contacted Mr. Timothy Raymond with the WSD to acquire water distribution system plans to determine the location of the distribution line. Mr. Raymond supplied us with two drawings (reduced from original scale) produced by Jennison Engineering stamped "APPROVED" by the VDOH on September 7, 1982. Among other pertinent details, the drawings show the design location (i.e., not "as-built" location) of the proposed water supply pipeline. Copies of the drawings are included in Attachment 1. Jennison Engineering is no longer in business.

### ***2.2.2 Information from Installation Contractor***

We also contacted Mr. Richard Hall, the excavator who installed the pipeline to Parsons Hill in 1983. He indicated that he remembered the general location of the pipeline; however, due to his work schedule, he was not able to meet Johnson Company personnel on the site to physically locate the pipeline. In his absence, he sent his son, Mr. Rich Hall, who was also present during the installation of the pipeline. The younger Mr. Hall showed us what he recollected was the general route of the pipeline, although due the change in vegetation and anthropogenic changes over the years, and the length of time that has passed since the pipeline installation, his recollection of the pipeline's route became more foggy with increased distance from the Parsons Hill development. He did indicate, however, that electrical cable was buried in the same trench as the water supply pipeline. Therefore, it may be possible to locate the pipeline using a metal detector, if necessary. Using the design drawings and information from the younger Mr. Hall, we field-located the route of the pipeline for a distance of approximately 400 feet "up-pipeline" from Parsons Hill to the best of our ability.

The senior Mr. Hall indicated that during the installation of the pipeline he did not notice any unusual odors or soil conditions. He indicated that the soils were comprised of dry fine to medium sand that collapsed readily from the trench walls (i.e., they had trouble keeping the trench open to lay the pipeline). He has no recollection of passing through any areas of soil contamination. He indicated that the pipeline was installed to a minimum depth of five feet.

## **2.3 SOIL VAPOR SCREENING AND SOIL SAMPLING**

### ***2.3.1 Permission from Affected Property Owners***

According to Ms. Cathy Rooney of Parsons Hill Family Housing, information she received from Mr. William Mulholland, the current owner of the water supply well, indicates that the pipeline to Parsons Hill passes through a right-of-way and that performance of our investigation would not require permission from nearby property owners. We did, however, inform the neighbor immediately to the east of Parsons Hill of our investigation so she would have knowledge of what we were doing.

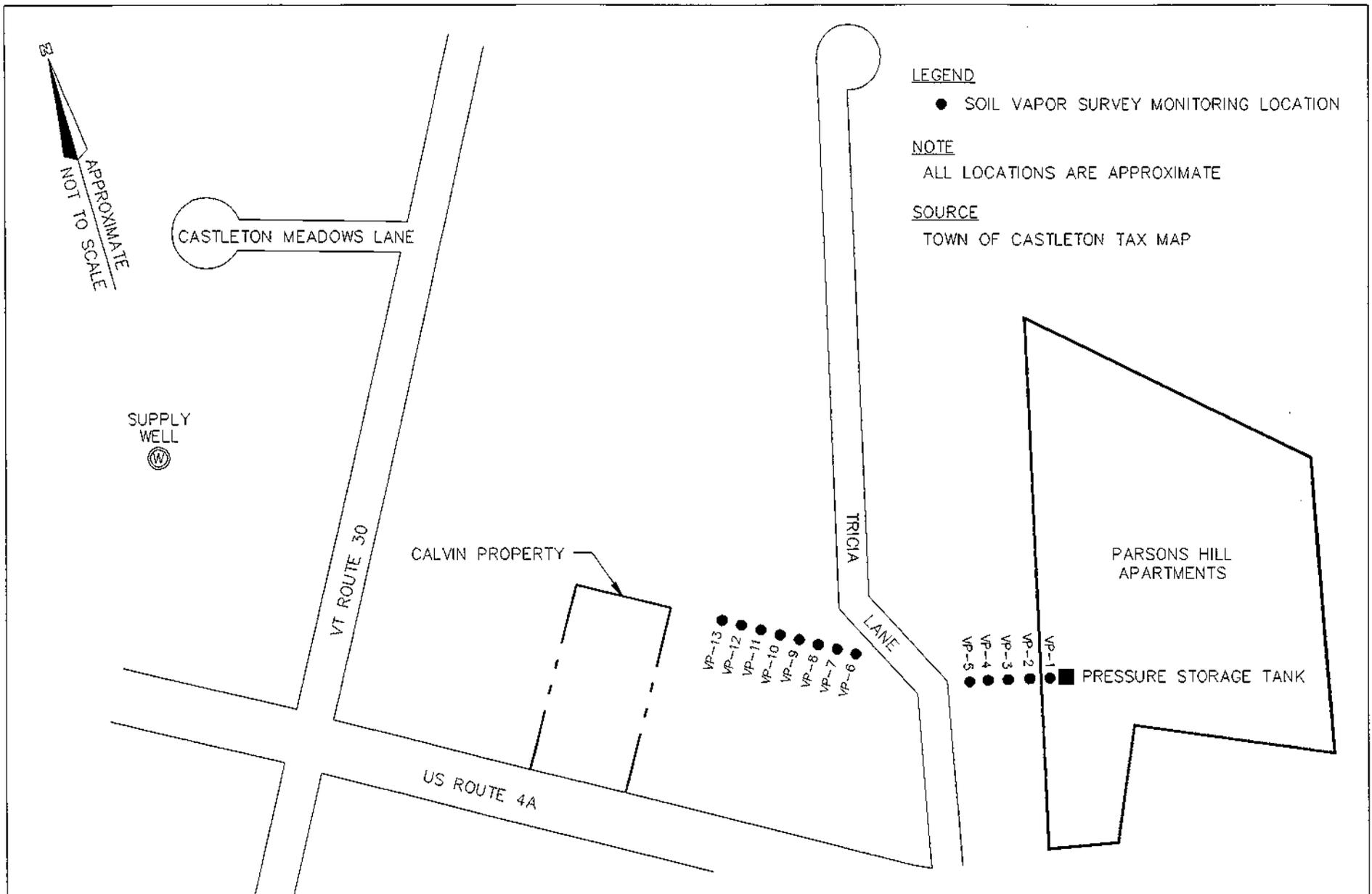
### 2.3.2 *Field Operations*

#### 2.3.2.1 *Soil Vapor Screening*

Soil vapor points were installed in thirteen locations at approximately thirty foot intervals as shown on Figure 2. To do so, The Johnson Company's Environmentalist's Sub-soil Probe (ESP) was used to create pilot holes approximately five feet deep and a soil description was made at each of the locations based on the soils retrieved in the three foot long clear acetate liners used in the ESP. After the pilot holes were created, we installed soil vapor points constructed of 3/4-inch diameter Schedule 80 steel pipe with a welded conical tip and a 1-foot length of machine-drilled holes to allow entry of soil vapor. The points were advanced to total depths ranging from 5.83 feet to 6.04 feet using a sledge hammer to drive the screened interval into previously undisturbed soils. Once driven to the desired depths, the vapor points were capped with a threaded steel cap. One soil vapor point, VP-10, was not installed because refusal was encountered at approximately 5 feet below ground surface (bgs) and, upon removal of the ESP, the hole collapsed to near ground surface.

After the successful installation of twelve of the thirteen vapor points, we screened them for volatile organic compound (VOC) vapors using a photoionization detector (PID). We used a Thermo-Environmental, Inc. OVM Model 580B calibrated in the field using 101.5 parts per million (ppm) isobutylene gas. At each soil vapor point, we conducted the PID measurement by removing the cap and installing an appropriate length of 3/4-inch diameter polyethylene tubing. The bottom terminus of the tubing was positioned within the screened interval of the vapor point. We then inserted the probe tip of the PID into the end of the polyethylene tubing extending above the top of the vapor point and recorded the peak and sustained readings. Details of the vapor point installation and results of the PID screening can be noted in Table 1.

Originally we had planned to install approximately 25 vapor points at 30 foot intervals to a location approximately 700 feet "up-pipeline" from the Parsons Hill hydropneumatic tank. This would have extended the area of vapor point installation and soil vapor screening to the rear of the Calvin property. Water samples collected in the past at this location have not shown PCE contamination. However, we were unable extend the vapor point survey this far due to lack of knowledge of the pipeline's location beyond where our survey terminated.



**LEGEND**  
 ● SOIL VAPOR SURVEY MONITORING LOCATION

**NOTE**  
 ALL LOCATIONS ARE APPROXIMATE

**SOURCE**  
 TOWN OF CASTLETON TAX MAP

FIGURE 2: SOIL VAPOR SURVEY & WATERY  
 SUPPLY SAMPLING LOCATION MAP  
 PARSONS HILL FAMILY HOUSING  
 CASTLETON CORNERS, VERMONT

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 100 STATE STREET                      MONTPELIER, VT 05602

Table 1: Soil Vapor Point Details and PID Screening Results				
Vapor Point ID	Depth of Installation (ft)	Soil Description	Time of PID Reading	Peak/Sustained PID Readings
VP-1	6.02	Dry-hum, v fri, fn-med brn sand	14:40	0.3/0.3
VP-2	6.04	as above	14:45	0.4/0.0
VP-3	6.00	as above	14:50	0.4/0.0
VP-4	5.94	as above	14:54	0.4/0.0
VP-5	5.83	as above	14:57	0.5/0.0
VP-6	6.04	Dry-hum, v fri, fn-med snd w/pebs	15:02	0.6/0.0
VP-7	5.94	Dry-hum, v fri, med-cse snd	15:05	0.3/0.0
VP-8	5.87	as above	15:08	0.3/0.0
VP-9	6.02	as above	15:12	0.3/0.0
VP-10	Not Installed			
VP-11	6.00	same as VP-7	15:17	0.0/0.0
VP-12	6.00	as above	15:19	0.3/0.0
VP-13	5.83	as above	15:23	0.0/0.0

2.3.2.2 Soil Sampling

We collected three soil samples at three vapor point locations for analysis by the DEC Laboratory using Environmental Protection Agency (EPA) Method 8260. The soil sample locations were based on a combination of the vapor point's location and the PID reading obtained at the vapor point. Soil samples were collected at VP-2, VP-5, and VP-6 and represent samples at locations where the highest PID readings were recorded. To collect the samples, the vapor point was first removed from the ground, and the ESP sample tube and extension was inserted in the hole. This setup was then driven beyond the depth of the vapor point to collect a sample of previously undisturbed soil in the acetate liner of the ESP sample tube. The sampling tube was then jacked out of the ground to retrieve the soil sample. We collected three soil samples, instead of the four specified in the workplan, as the extent of the investigation was shortened because the entire route of the pipeline is unknown.

It is likely that the soil in the sampling tube contained some native soil that may have sloughed of the sidewalls of the borehole while inserting the ESP sample tube. However, because most of the soil retrieved in the acetate liner was previously undisturbed and any sloughed soil present still represents soil from that individual borehole, we do not believe that the validity of the samples were hindered. The resultant soil samples were then placed in

wide-mouthed sample jars provided by the DEC Laboratory and placed immediately in a chilled cooler until they were delivered to the laboratory on the following morning, June 30, 1995.

## 2.4 SUPPLY WELL SAMPLING

We collected water samples from the water supply well (i.e., the pressure tank located adjacent to the wellhead), the Calvin property, and the hydropneumatic tank (pressure storage tank) at Parsons Hill (Figure 2). Samples were collected by running the water from the associated spigots with the valves fully opened for a minimum of five minutes. The samples were collected in 40 milliliter VOC vials provided to The Johnson Company by Scitest Laboratory Services of Randolph, Vermont. All samples were immediately placed in a chilled cooler after their collection and were kept chilled until their arrival at Scitest Laboratory Services on June 30, 1995. The water samples were analyzed using EPA Method 524.2. A trip blank was also be submitted for analysis.

## 3.0 RESULTS

Results of the soil and groundwater sampling are summarized in Table 2. Complete analytical results are included in Attachment 2.

Sample ID:	VP-2	VP-5	VP-6	Supply Well	Calvin	Reservoir (Parsons Hill)
	<5	<5	<5	<0.5	<0.5	1.5

Ms. Rooney of Parsons Hill also supplied us with a laboratory report for a sample collected at Parsons Hill Family Housing on May 9, 1995 associated with the WSD required monitoring program. The May 9 sample, analyzed using EPA Method 524.2 by Scitest Laboratory Services, was indicated to have <0.5 ppb PCE. This laboratory report is also included in Attachment 2.

As can be noted in Table 2, PCE was detected only in the sample collected from the hydropneumatic tank (reservoir) at Parsons Hill. This concentration of 1.5 ppb is below the MCL of 5 ppb but above the HA of 0.7 ppb. All analytical results for PCE for water samples collected to-date are presented in Attachment 3.

## 4.0 DISCUSSION

Despite the work performed for this site investigation, we have not fully achieved the objective of further isolating and identifying the source of the PCE contamination. This investigation does indicate that the water supply pipeline does not appear to pass through an area of measurably contaminated soils from its terminus at the Parsons Hill hydropneumatic tank to a location

approximately 360 feet "up-pipeline". Only very low PID readings were recorded and laboratory analysis of the three soil samples indicated that PCE is not present above the method detection limit of 5 ppb. Also, it was again confirmed that the PCE contamination appears to be confined to the Parsons Hill section of the distribution system as both the supply well and the last connection prior to Parsons Hill (Calvin property) water sample analyses indicate that PCE is not present above the method detection limit of 0.5 ppb.

It is interesting to note that, according to information in the WSD files, the pipeline that services Parsons Hill Family Housing that was installed in 1983 starts on the east side of Vermont Route 30 and connects to the "existing" three-inch PVC piping and continues eastward to the Parsons Hill property. This Parsons Hill pipeline enabled both the Red House Apartments and the Calvin property to connect to the Spafford Well #3 water system. Water samples from these two locations have not shown PCE contamination to-date even though the water is passing through the pipeline that was constructed to serve Parsons Hill. The only samples that have shown PCE contamination are those that have been collected at the Parsons Hill development.

Therefore, it appears that we have narrowed down the possible contamination sources to three possible areas:

- 1) a contaminated soil area that may exist at a location between the Calvin pipeline cutoff and a point approximately 360 feet "up-pipeline" from the Parsons Hill development,
- 2) a source associated with the construction of the hydropneumatic tank or associated components at the Parsons Hill development, or
- 3) an interval of contaminated PVC pipe between the Calvin service connection and the Parsons Hill hydropneumatic tank.

## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

The source of the ongoing PCE contamination at Parsons Hill has not been precisely identified despite attempts to accurately locate the source with studies initiated by the VDOH in 1983 and continuing through the performance of this study. The concentrations of PCE detected have been steadily decreasing through time and currently appear to be consistently below the MCL of 5 ppb at the Parsons Hill development. PCE contamination at Parsons Hill will likely be detectable for a long time to come as residual PCE continues to desorb from the PVC piping. No PCE contamination has been identified at other connections to the Spafford Well #3 water system to-date.

Three routes can be taken to address the ongoing PCE contamination. One route includes additional field investigation possibly including the continuation of the soil vapor/soil sampling investigation performed for this study beginning just "up-pipeline" of VP-13 and continuing to the Calvin property water connection. This would have to include performing a metal detector or other subsurface investigative technique to locate the pipeline.

Mr. Chuck Schwer  
Hazardous Materials Management Division  
Waterbury, Vermont

July 28, 1995  
Page 10

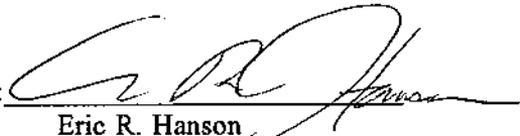
A second route that may be considered is that studies directed toward identifying the source of PCE contamination have been occurring since the water system was first put on-line in 1983. Both a VDOH memorandum dated October 5, 1987 and a Johnson Company letter dated September 30, 1994 state that the source of contamination appears to be in the Parsons Hill distribution system itself. In retrospect, the distribution piping at Parsons Hill should have been replaced in 1983 after it was determined that the pipe itself was contaminated as was discussed in our January 14, 1994 letter/report. This action could still be considered as an option to help eliminate the PCE that is still present in the water system.

We recommend, however, that a third option be seriously considered before continuing with either of the two routes just discussed. PCE contaminated water has only been detected to-date in the Parsons Hill hydropneumatic tank and at connections at the Parsons Hill development down-flow of the tank. Analysis of water samples collected at other water users connected to the same pipeline, namely the Red House Apartments and the Calvin property, have indicated that PCE contamination is not present at these locations above laboratory detection limits as low as 0.5 ppb. Water samples of the water entering the hydropneumatic tank at Parson Hill have not been collected to date because there are no readily available means (i.e., valve, sampling port) to do so. Therefore, we recommend that an Occupational Safety and Health Administration (OSHA) trained plumber be contracted to install a sampling port in the water line as it enters the building prior to its entry into the hydropneumatic tank. Sampling of the water at this location will allow for a characterization of the water quality before it enters the Parsons Hill distribution system. A comparison of water quality results from this location and locations after storage in the hydropneumatic tank will provide needed additional information as to the location of the PCE contamination source.

Please do not hesitate to call with any questions or comments you may have.

Respectfully Submitted,

THE JOHNSON COMPANY, INC.

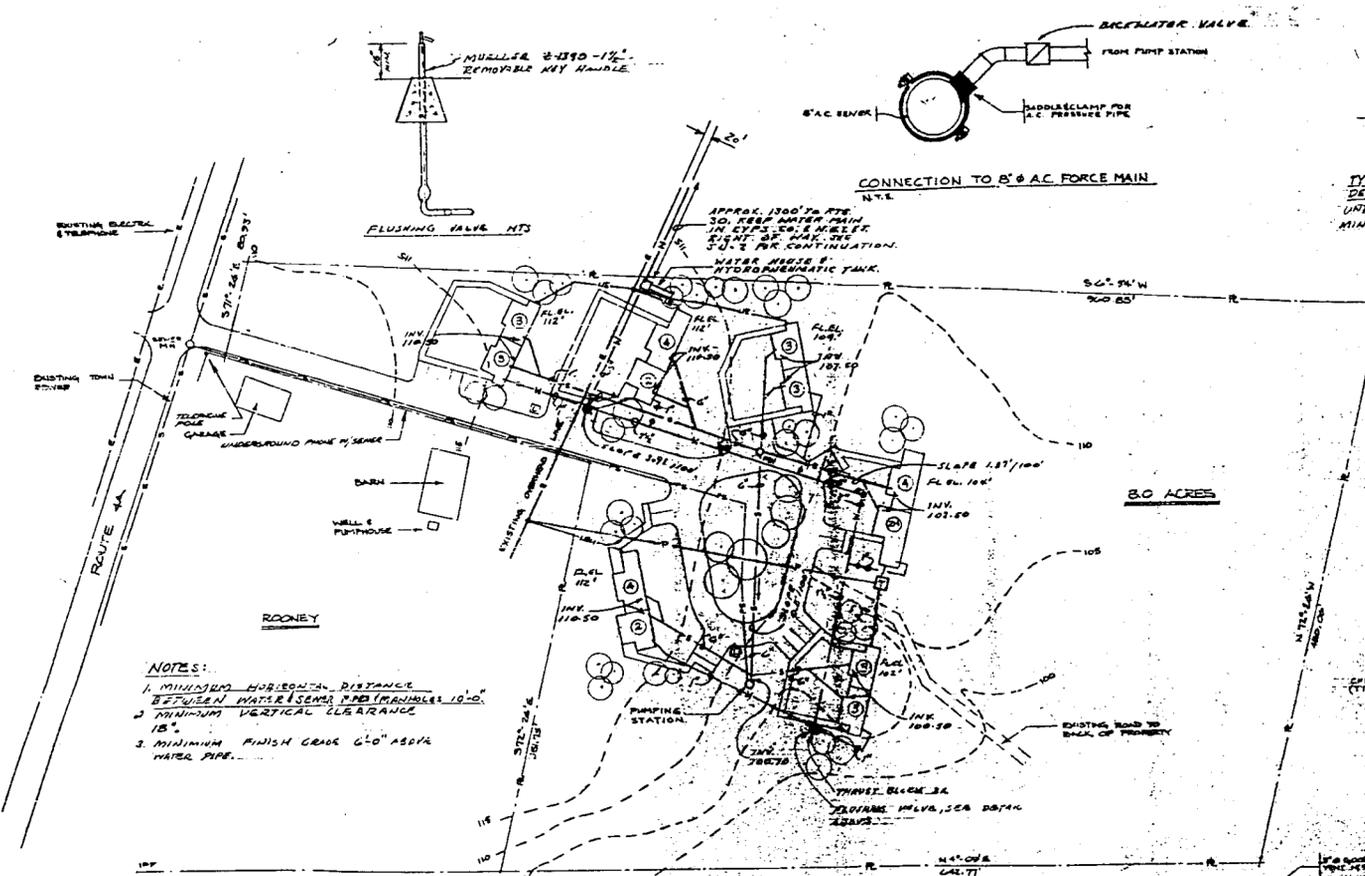
By:   
Eric R. Hanson  
Project Hydrologist

Enclosures

cc. Cathy Rooney  
Tim Raymond

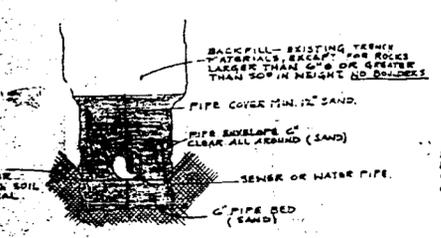
## **Attachment 1**

### **Parsons Hill Engineering Design Plans**

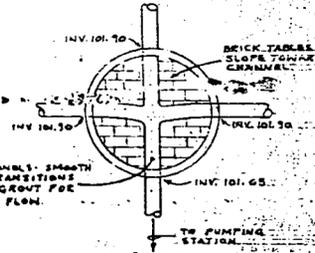


**NOTES:**  
 1. MINIMUM HORIZONTAL DISTANCE BETWEEN WATER SERVICE AND SANITARY IS 10'-0".  
 2. MINIMUM VERTICAL CLEARANCE IS 18".  
 3. MINIMUM FINISH GRADE 6'-0" ABOVE WATER PIPE.

- E - EXISTING OVERHEAD POWER LINE
- U - NEW UNDERGROUND UTILITY
- P - NEW UNDERGROUND PUMP
- W - NEW UNDERGROUND WATER
- S - SANITARY
- ST - STORM
- CS - CURB CODE



**TYPICAL TRENCH SECTION**  
NO SCALE

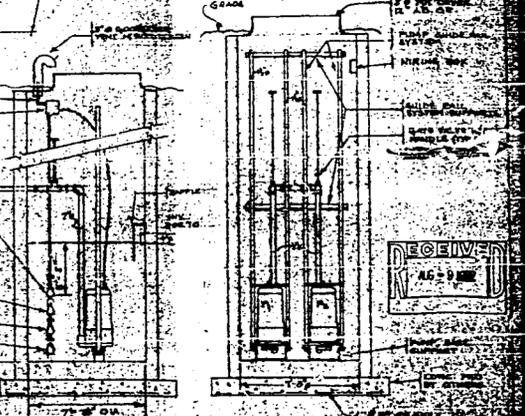


**MANHOLE DETAIL**  
NO SCALE



**SITE PLAN UTILITIES**  
SCALE 1/8\"/>

**NOTES:**  
 1. CONTRACTOR TO CUT INVERT SURFACE OF CHANNEL WITH ONE FOOT OF AUTOMATIC  
 2. CONTRACTOR TO INSTALL 2\"/>



**PUMPING STATION DETAILS**

APPROVED

SEP 7 1966  
 [Signature]



**Attachment 2**

**Laboratory Analytical Reports**

7/21/95

Department of Environmental Conservation Laboratory  
Method 8260 - Volatile Organics in Solids

SRL

Lab Id: 15305 Report To: The Johnson Company Phone: 229-4600 Date Collected: 6/29/95  
Location: Parsons Hill VP-5 Program: 41 1414 Chain of Custody? No

Notes:

Date Analyzed: 7/14/95 Over hold? Yes  
Heated Purge Sample wt.: 5.1 g Percent moisture: 9.5

Parameter	Units are ug/kg dw		Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
	PQL	Result				
Vinyl chloride	10	N.D.				
Chloromethane	10	N.D.				
Bromomethane	10	N.D.				
Chloroethane	10	N.D.				
Trichlorofluoromethane	10	N.D.				
Acetone	100	N.D.				
1,1-Dichloroethene	6	N.D.				
Carbon disulfide	100	N.D.				
Methylene chloride	6	N.D.				
Methyl-t-butylether (MTBE)	10	N.D.				
1,2-Dichloroethene	6	N.D.				
1,1-Dichloroethane	6	N.D.				
Vinyl acetate	60	N.D.				
2-Butanone	100	N.D.				
Chloroform	6	N.D.				
1,1,1-Trichloroethane	6	N.D.				
Carbon tetrachloride	6	N.D.				
Benzene	6	N.D.				
1,2-Dichloroethane	6	N.D.				
Trichloroethene	6	N.D.				
1,2-Dichloropropane	6	N.D.				
Bromodichloromethane	6	N.D.				
4-Methyl-2-pentanone	60	N.D.				
cis-1,2-Dichloropropene	6	N.D.				
Toluene	6	N.D.				
trans-1,3-Dichloropropene	6	N.D.				
1,1,2-Trichloroethane	6	N.D.				
2-Hexanone	60	N.D.				
Tetrachloroethene	6	N.D.				
Dibromochloromethane	6	N.D.				
Chlorobenzene	6	N.D.				
Ethylbenzene	6	N.D.				
Xylenes	6	N.D.				
Styrene	6	N.D.				
Bromoform	6	N.D.				
1,1,2,2-Tetrachloroethane	6	N.D.				
Total Volatile Hydrocarbons	100	N.D.				

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

Dibromofluoromethane . 122% D8-Toluene . . . . . 96% 4-Bromofluorobenzene . 84%

Notes:

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

/21/95

Department of Environmental Conservation Laboratory  
Method 8260 - Volatile Organics in Solids

SRI

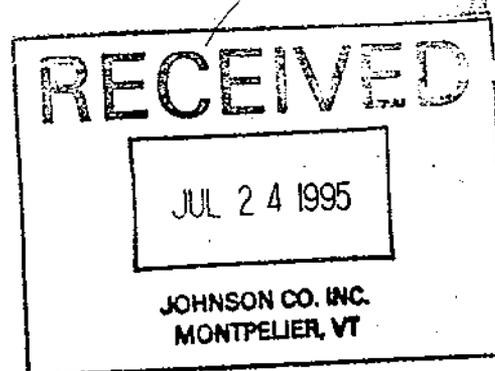
Lab Id: 15306 Report To: The Johnson Company Phone: 229-4600 Date Collected: 6/29/95  
Location: Parsons Hill VP-6 Program: 41 1414 Chain of Custody? No

Notes:

Date Analyzed: 7/14/95 Over hold? Yes  
Heated Purge Sample wt.: 5.1 g

Percent moisture: 3.6

Parameter	Units are ug/kg dw PQL	Remark Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
Vinyl chloride	10	N.D.			
Chloromethane	10	N.D.			
Bromomethane	10	N.D.			
Chloroethane	10	N.D.			
Trichlorofluoromethane	10	N.D.			
Acetone	100	N.D.			
1,1-Dichloroethene	5	N.D.			
Carbon disulfide	100	N.D.			
Methylene chloride	5	N.D.			
Methyl-t-butylether (MTBE)	10	N.D.			
1,2-Dichloroethene	5	N.D.			
1,1-Dichloroethane	5	N.D.			
Vinyl acetate	50	N.D.			
2-Butanone	100	N.D.			
Chloroform	5	N.D.			
1,1,1-Trichloroethane	5	N.D.			
Carbon tetrachloride	5	N.D.			
Benzene	5	N.D.			
1,2-Dichloroethane	5	N.D.			
Trichloroethene	5	N.D.			
1,2-Dichloropropane	5	N.D.			
Bromodichloromethane	5	N.D.			
4-Methyl-2-pentanone	50	N.D.			
cis-1,2-Dichloropropene	5	N.D.			
Toluene	5	N.D.			
trans-1,3-Dichloropropene	5	N.D.			
1,1,2-Trichloroethane	5	N.D.			
2-Hexanone	50	N.D.			
Tetrachloroethene	5	N.D.			
Dibromochloromethane	5	N.D.			
Chlorobenzene	5	N.D.			
Ethylbenzene	5	N.D.			
Xylenes	5	N.D.			
Styrene	5	N.D.			
Bromoform	5	N.D.			
1,1,2,2-Tetrachloroethane	5	N.D.			
Total Volatile Hydrocarbons	100	N.D.			



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

Dibromofluoromethane . 120% D8-Toluene . . . . . 98% 4-Bromofluorobenzene . 88%

Notes:

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

7/21/95

Department of Environmental Conservation Laboratory  
Method 8260 - Volatile Organics in Solids

SRL

Lab Id: 15304 Report To: The Johnson Company Phone: 229-4600 Date Collected: 6/29/95  
Location: Parsons Hill VP-2 Program: 41 1414 Chain of Custody? No

Notes:

Date Analyzed: 7/14/95 Over hold? Yes  
Heated Purge Sample wt.: 4.7 g Percent moisture: 8.7

Parameter	Units are ug/kg dw PQL	Remark Result Code	Rel % Diff.	Spiked Dups ?	Percent Recovery
Vinyl chloride	10	N.D.			
Chloromethane	10	N.D.			
Bromomethane	10	N.D.			
Chloroethane	10	N.D.			
Trichlorofluoromethane	10	N.D.			
Acetone	100	N.D.			
1,1-Dichloroethene	5	N.D.			
Carbon disulfide	100	N.D.			
Methylene chloride	5	N.D.			
Methyl-t-butylether (MTBE)	10	N.D.			
1,2-Dichloroethene	5	N.D.			
1,1-Dichloroethane	5	N.D.			
Vinyl acetate	50	N.D.			
2-Butanone	100	N.D.			
Chloroform	5	N.D.			
1,1,1-Trichloroethane	5	N.D.			
Carbon tetrachloride	5	N.D.			
Benzene	5	N.D.			
1,2-Dichloroethane	5	N.D.			
Trichloroethene	5	N.D.			
1,2-Dichloropropane	5	N.D.			
Bromodichloromethane	5	N.D.			
4-Methyl-2-pentanone	50	N.D.			
cis-1,2-Dichloropropene	5	N.D.			
Toluene	5	N.D.			
trans-1,3-Dichloropropene	5	N.D.			
1,1,2-Trichloroethane	5	N.D.			
2-Hexanone	50	N.D.			
Tetrachloroethene	5	N.D.			
Dibromochloromethane	5	N.D.			
Chlorobenzene	5	N.D.			
Ethylbenzene	5	N.D.			
Xylenes	5	N.D.			
Styrene	5	N.D.			
Bromoform	5	N.D.			
1,1,2,2-Tetrachloroethane	5	N.D.			
Total Volatile Hydrocarbons	100	N.D.			

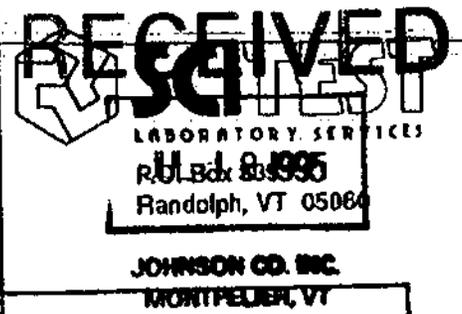
Surrogate Percent Recoveries (S=Surrogate recovery out of range)

Dibromofluoromethane . 124% D8-Toluene . . . . . 94% 4-Bromofluorobenzene . 82%

Notes:

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

# LABORATORY REPORT



CLIENT: The Johnson Company  
 ADDRESS: 100 State Street  
 Montpelier, VT 05602

LABORATORY NO: 5-1771  
 PROJECT NO: 78611

DATE OF SAMPLE: 06/29/95  
 DATE OF RECEIPT: 06/30/95  
 DATE OF ANALYSIS: 07/13/95  
 DATE OF REPORT: 07/18/95

SITE: Parsens Hill  
 ATTENTION: Eric Hanson  
 MATRIX: Drinking Water

All results in micrograms per liter (ppb)

PARAMETER	STATUS	All results in micrograms per liter (ppb)				PARAMETER	STATUS	Supply	Calvin	Reservoir	Trip
		Well	Well	Reservoir	Blank			Well	Well	Reservoir	Blank
Dichlorodifluoromethane		< 0.5	< 0.5	< 0.5	< 0.5	Chlorobenzene	R	< 0.5	< 0.5	< 0.5	< 0.5
Chloromethane	U	< 0.5	< 0.5	< 0.5	< 0.5	1,1,1,2-Tetrachloroethane	U	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride	R	< 0.5	< 0.5	< 0.5	< 0.5	Ethylbenzene	R	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane		< 0.5	< 0.5	< 0.5	< 0.5	m & p-Xylene	R	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane	U	< 0.5	< 0.5	< 0.5	< 0.5	o-Xylene	R	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane		< 0.5	< 0.5	< 0.5	< 0.5	Styrene	R	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethylene	R	< 0.5	< 0.5	< 0.5	< 0.5	Bromoform	U	< 0.5	< 0.5	< 0.5	< 0.5
Methylene Chloride	R	< 0.5	< 0.5	< 0.5	< 0.5	Isopropylbenzene		< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethylene	R	< 0.5	< 0.5	< 0.5	< 0.5	Bromobenzene	U	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane	U	< 0.5	< 0.5	< 0.5	< 0.5	1,2,3-Trichloropropane	U	< 0.5	< 0.5	< 0.5	< 0.5
c-1,2-Dichloroethylene	R	< 0.5	< 0.5	< 0.5	< 0.5	1,1,2,2-Tetrachloroethane	U	< 0.5	< 0.5	< 0.5	< 0.5
2,2-Dichloropropene	U	< 0.5	< 0.5	< 0.5	< 0.5	n-Propylbenzene		< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane		< 0.5	< 0.5	< 0.5	< 0.5	2-Chlorotoluene		< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	U	< 0.5	< 0.5	< 0.5	< 0.5	4-Chlorotoluene		< 0.5	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	R	< 0.5	< 0.5	< 0.5	< 0.5	1,3,5-Trimethylbenzene		< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	R	< 0.5	< 0.5	< 0.5	< 0.5	tert-Butylbenzene		< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloropropene	U	< 0.5	< 0.5	< 0.5	< 0.5	1,2,4-Trimethylbenzene		< 0.5	< 0.5	< 0.5	< 0.5
Benzene	R	< 0.5	< 0.5	< 0.5	< 0.5	sec-Butylbenzene		< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	R	< 0.5	< 0.5	< 0.5	< 0.5	1,3-Dichlorobenzene	U	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	R	< 0.5	< 0.5	< 0.5	< 0.5	1,4-Dichlorobenzene	R	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	R	< 0.5	< 0.5	< 0.5	< 0.5	p-Isopropyltoluene		< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane		< 0.5	< 0.5	< 0.5	< 0.5	1,2-Dichlorobenzene	R	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	U	< 0.5	< 0.5	< 0.5	< 0.5	n-Butylbenzene		< 0.5	< 0.5	< 0.5	< 0.5
cis-1,3-Dichloropropene	U	< 0.5	< 0.5	< 0.5	< 0.5	1,2,4-Trichlorobenzene	R	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	R	< 0.5	< 0.5	< 0.5	< 0.5	Hexachlorobutadiene		< 0.5	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene	U	< 0.5	< 0.5	< 0.5	< 0.5	Naphthalene		< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	R	< 0.5	< 0.5	< 0.5	< 0.5	1,2,3-Trichlorobenzene		< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	R	< 0.5	< 0.5	1.5	< 0.5						
1,3-Dichloropropene	U	< 0.5	< 0.5	< 0.5	< 0.5						
Dibromochloromethane	U	< 0.5	< 0.5	< 0.5	< 0.5						

EPA Method 5242

Scan Status: R = Regulated, U = Unregulated

Note: Sample preserved for 524.2.  
 Note: A lab analysis duplicate of the reservoir sample confirmed the presence of Tetrachloroethylene.

Post-It® Fax Note		7671	Date	7/18/95	# of pages	1
To	E. Hanson		From	L. Shipman		
Co./Dept.	Johnson Co.		Co.	Sickert		
Phone #			Phone #	729-6313		
Fax #	229-5876		Fax #			

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JUL 18 '95 14:36 SCITEST



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

### LABORATORY REPORT

CLIENT: Parsons Hill Family Housing  
 ADDRESS: Star Route, Box 90  
 Castleton, VT 05735

LABORATORY NO: 5-1233  
 PROJECT NO: 90015

ATTENTION: Catherine Rooney  
 SITE: WSID #5584  
 MATRIX: Drinking Water

DATE OF SAMPLE: 05/09/95  
 DATE OF RECEIPT: 05/10/95  
 DATE OF ANALYSIS: 05/11/95  
 DATE OF REPORT: 05/08/95

#### Drinking Water Results

All results are reported in micrograms per liter (ug/L).

PARAMETER EPA Method: 524.2	Status	Results	PARAMETER EPA Method: 524.2	Status	Results
Dichlorodifluoromethane		< 0.5	Dibromochloromethane	U	< 0.5
Chloromethane	U	< 0.5	Chlorobenzene	R	< 0.5
Vinyl Chloride	R	< 0.5	1,1,1,2-Tetrachloroethane	U	< 0.5
Bromomethane		< 0.5	Ethylbenzene	R	< 0.5
Chloroethane	U	< 0.5	m & p-Xylene	R	< 0.5
Trichlorofluoromethane		< 0.5	o-Xylene	R	< 0.5
1,1-Dichloroethylene	R	< 0.5	Styrene	R	< 0.5
Methylene Chloride	R	< 0.5	Bromoform	U	< 0.5
1,1,2-Dichloroethylene	R	< 0.5	Isopropylbenzene		< 0.5
1,1-Dichloroethane	U	< 0.5	Bromobenzene	U	< 0.5
cis-1,2-Dichloroethylene	R	< 0.5	1,2,3-Trichloropropane	U	< 0.5
2,2-Dichloropropane	U	< 0.5	1,1,2,2-Tetrachloroethane	U	< 0.5
Bromochloromethane		< 0.5	n-Propylbenzene		< 0.5
Chloroform	U	< 0.5	2-Chlorotoluene		< 0.5
1,1,1-Trichloroethane	R	< 0.5	4-Chlorotoluene		< 0.5
Carbon Tetrachloride	R	< 0.5	1,3,5-Trimethylbenzene		< 0.5
1,1-Dichloropropene	U	< 0.5	tert-Butylbenzene		< 0.5
Benzene	R	< 0.5	1,2,4-Trimethylbenzene		< 0.5
1,2-Dichloroethane	R	< 0.5	sec-Butylbenzene		< 0.5
Trichloroethylene	R	< 0.5	1,3-Dichlorobenzene	U	< 0.5
1,2-Dichloropropane	R	< 0.5	1,4-Dichlorobenzene	R	< 0.5
Dibromomethane		< 0.5	p-Isopropyltoluene		< 0.5
Bromodichloromethane	U	< 0.5	1,2-Dichlorobenzene	R	< 0.5
cis-1,3-Dichloropropene	U	< 0.5	n-Butylbenzene		< 0.5
Toluene	R	< 0.5	1,2,4-Trichlorobenzene	R	< 0.5
trans-1,3-Dichloropropene	U	< 0.5	Hexachlorobutadiene		< 0.5
1,1,2-Trichloroethane	R	< 0.5	Naphthalene		< 0.5
Tetrachloroethylene	R	< 0.5	1,2,3-Trichlorobenzene		< 0.5
1,3-Dichloropropane	U	< 0.5			

Status: R= Regulated U= Unregulated  
 Note: Sample preserved for 524.2.  
 Trihalomethanes preservative not used, as per 524.2 Method.  
 Units: 1ug/L = 1 part per billion (ppb)  
 1ppb = 0.001 part per million (ppm)

Respectfully Submitted,  
 Scitest, Inc.  
  
 Roderick Lamothe  
 Laboratory Director

**Attachment 3**

**History of Analytical Results for PCE**

Parsons Hill Family Housing  
 History of Analytical Results for Tetrachloroethene (PCE) Page 2

DATE	Location	PCE (ppb)	Analytical Method	PCE Detection Limit (ppb)	Laboratory	Comments
8/31/83	Apt. 2	9.00			VDOH	VDOH sample
9/08/83	Apt. 10	6.00			VDOH	VDOH sample
9/08/83	Apt. 2	9.00			VDOH	VDOH sample
9/13/83	Apt. 10	10.00			VDOH	VDOH sample
9/13/83	Apt. 2	6.00			VDOH	VDOH sample
9/22/83	Apt. 10	5.00			VDOH	VDOH sample
9/22/83	Apt. 2	6.00			VDOH	VDOH sample
10/06/83	Apt. 10	10.00			VDOH	VDOH sample
10/06/83	Apt. 2	12.00			VDOH	VDOH sample
11/22/83	Apts. 2 & 12				VDOH	VDOH sample, NA
11/29/83	Apt. 10				VDOH	VDOH sample
1/04/84	Apt. 10	2.00			VDOH	VDOH sample
1/04/84	Apt. 2	4.00			VDOH	VDOH sample
5/31/84	Apt. 10	12.00			VDOH	VDOH sample
5/31/84	Apt. 2	12.00			VDOH	VDOH sample
4/29/85	Apt. 2				VDOH	VDOH sample
4/29/85	Holding tank				VDOH	VDOH sample
7/22/85	Apt. 10	8.00			VDOH	VDOH sample
11/25/85	Apt. 2	8.00			VDOH	VDOH sample
2/05/86	N/A	3.00			VDOH	VDOH sample
4/24/86	N/A				VDOH	VDOH sample
5/25/86	N/A				VDOH	VDOH sample
6/16/87	Apt. 10		601/602		VDOH	VDOH sample
7/21/88	N/A	3.00	524.2	2.0	VDOH	VDOH sample
2/22/89	Unit 2		GC/FID	3.0	VDOH	VDOH sample
3/03/93	Apt. 12		524.2	.5	VDOH	WSD sample
6/08/93	Apt. 3	.90	524.2	.5	VDOH	WSD sample
9/01/93	N/A	5.00	8240	5.0	DEC	HMMD sample
10/07/93	N/A		8240	5.0	DEC	HMMD sample
11/23/93	N/A		8240	5.0	DEC	HMMD sample
11/30/93	Apt. 10		8240	5.0	DEC	JCO sample
11/30/93	Apt. 5		8240	5.0	DEC	JCO sample
11/30/93	Harbor Pharmacy		8240	5.0	DEC	JCO sample
11/30/93	Holding Tank		8240	5.0	DEC	JCO sample
11/30/93	Red House Apartments		8240	5.0	DEC	JCO sample
11/30/93	Veterinary Clinic		8240	5.0	DEC	JCO sample
11/30/93	Well		8240	5.0	DEC	JCO sample
5/12/94	Apt. 10		8240	5.0	DEC	JCO sample
5/12/94	Apt. 5		8240	5.0	DEC	JCO sample
5/12/94	Holding Tank		8240	5.0	DEC	JCO sample
5/12/94	Shallow well		8240	5.0	DEC	JCO sample
5/12/94	Well		8240	5.0	DEC	JCO sample
9/06/94	Apt. 10	3.70	524.2	.5	VDOH	JCO sample
9/06/94	Apt. 5-A	4.00	524.2	.5	VDOH	JCO sample
9/06/94	Apt. 5-B	4.00	524.2	.5	VDOH	JCO sample
9/06/94	Holding Tank	4.10	524.2	.5	VDOH	JCO sample
9/06/94	Well		524.2	.5	VDOH	JCO sample

Parsons Hill Family Housing  
 History of Analytical Results for Tetrachloroethene (PCE) Page 1

DATE	Location	PCE (ppb)	Analytical Method	PCE Detection Limit (ppb)	Laboratory	Comments
3/31/83	Apt. 1	790.00			VDOH	VDOH sample
4/14/83	Apt. 2	125.00			VDOH	VDOH sample
4/14/83	Backup Spafford well				VDOH	VDOH sample
4/14/83	Holding Tank	69.00			VDOH	VDOH sample
4/14/83	Well				VDOH	VDOH sample
4/14/83	Yvonne Rooney's house				VDOH	VDOH sample
4/20/83	Apt. 10	46.00	624		EPA	EPA sample
4/20/83	Apt. 10	65.00			VDOH	VDOH sample
4/20/83	Apt. 11	83.00			VDOH	VDOH sample
4/20/83	Apt. 2	56.00			VDOH	VDOH sample
4/20/83	Apt. 2	73.00	624		EPA	EPA sample
4/20/83	Apt. 4	31.00	624		EPA	EPA sample
4/20/83	Apt. 6	27.00	624		EPA	EPA sample
4/20/83	Apt. 6	32.00			VDOH	VDOH sample
4/20/83	Apt. 7	30.00	624		EPA	EPA sample
4/20/83	Backup Spafford well				VDOH	VDOH sample
4/20/83	Castleton Meadows well				VDOH	VDOH sample
4/20/83	Holding Tank	21.00			VDOH	VDOH sample
4/20/83	Holding Tank	23.00	624		EPA	EPA sample
4/20/83	Well				VDOH	VDOH sample
5/10/83	Apt. 11	32.00			VDOH	VDOH sample
5/10/83	Apt. 9	34.00			VDOH	VDOH sample
5/10/83	Holding Tank	23.00			VDOH	VDOH sample
5/10/83	Line from chlorinator	28.00			VDOH	VDOH sample
5/16/83	Apt. 10	22.00			VDOH	VDOH sample
5/16/83	Bleed line, Apt. 9	19.00			VDOH	VDOH sample
6/06/83	Chem. feed tank				VDOH	VDOH sample
6/06/83	Holding Tank	22.00			VDOH	VDOH sample
6/06/83	Well				VDOH	VDOH sample
6/13/83	Apt. 10	12.00			VDOH	VDOH sample
6/13/83	Apt. 2	9.00			VDOH	VDOH sample
6/22/83	Apt. 12	20.00			VDOH	VDOH sample
6/22/83	Apt. 2	22.00			VDOH	VDOH sample
6/29/83	Apt. 10	18.00			VDOH	VDOH sample
6/29/83	Apt. 2	19.00			VDOH	VDOH sample
7/19/83	Apt. 10	17.00			VDOH	VDOH sample
7/19/83	Apt. 2	26.00			VDOH	VDOH sample
7/25/83	Apt. 2	15.00			VDOH	VDOH sample
7/25/83	Apt. 8	5.00			VDOH	VDOH sample
8/04/83	Apt. 10	14.00			VDOH	VDOH sample
8/04/83	Apt. 2	15.00			VDOH	VDOH sample
8/09/83	Apt. 10	8.00			VDOH	VDOH sample
8/09/83	Apt. 2	8.00			VDOH	VDOH sample
8/17/83	Apt. 10	13.00			VDOH	VDOH sample
8/17/83	Apt. 2	13.00			VDOH	VDOH sample
8/31/83	Apt. 10	9.00			VDOH	VDOH sample

Parsons Hill Family Housing  
 History of Analytical Results for Tetrachloroethene (PCE) Page 3

DATE	Location	PCE (ppb)	Analytical Method	PCE Detection Limit (ppb)	Laboratory	Comments
11/18/94	Apt. 10	.80	524.2	.5	SCITEST	JCO sample
11/18/94	Apt. 5	.77	524.2	.5	SCITEST	JCO sample
11/18/94	Calvin		524.2	.5	SCITEST	JCO sample
11/18/94	Harbor Pharmacy		524.2	.5	SCITEST	JCO sample
11/18/94	Holding Tank	.79	524.2	.5	SCITEST	JCO sample
11/18/94	Red House Apartments		524.2	.5	SCITEST	JCO sample
11/18/94	Veterinary Clinic		524.2	.5	SCITEST	JCO sample
6/29/95	Calvin		524.2	.5	SCITEST	JCO sample
6/29/95	Holding Tank	1.50	524.2	.5	SCITEST	JCO sample
6/29/95	Well		524.2	.5	SCITEST	JCO sample

Blank entries signify that PCE concentration was below method detection limit

Analytical methods and PCE detection limits signified where known

NA = not analyzed (bubbles in sample vials)

N/A = not applicable (sample locations not given)

JCO = The Johnson Company

VDOH = Vermont Department of Health

DEC = Vermont Department of Environmental Conservation

HMMD = DEC Hazardous Materials Management Division

EPA = U.S. Environmental Protection Agency