

**DuBOIS & KING, INC.**  
**Engineering \* Planning**  
**\* Development \* Management**

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**LETTER OF TRANSMITTAL**

DATE	3-25-1999	JOB NO.	R15476P4
ATTENTION	LINDA ELLIOTT		
RE:	CVPS / ST. ALBANS DIESEL SMS # 98-2487		

TO WASTE MANAGEMENT DIVISION  
103 SOUTH MAIN STREET, WEST BUILDING  
WATERBURY, VT. 05671-0404

WE ARE SENDING YOU  Attached  Under separate cover via \_\_\_\_\_ the following items:

Shop drawings  Prints  Plans  Samples  Specifications  
 Copy of letter  Change order  SECOND COPY OF RELEASE INVESTIGATION

COPIES	DATE	NO.	DESCRIPTION
1	2-18-1999		PETROLEUM PRODUCT RELEASE INVESTIGATION CENTRAL VERMONT PUBLIC SERVICE CORP ST. ALBANS DIESEL PLANT

THESE ARE TRANSMITTED as checked below:

For approval  Approved as submitted  Resubmit \_\_\_\_\_ copies for approval  
 For your use  Approved as noted  Submit \_\_\_\_\_ copies for distribution  
 As requested  Returned for corrections  Return \_\_\_\_\_ corrected prints  
 For review and comment  \_\_\_\_\_  
 FOR BIDS DUE \_\_\_\_\_ 19 \_\_\_\_\_  PRINTS RETURNED AFTER LOAN TO US

REMARKS Linda -  
Second copy of report as you requested.  
Hope you are able to meet with Skip and Chuck  
re: Marble Valley soon.

*Thomson*

SIGNED: Robert B. Nichols

COPY TO \_\_\_\_\_



*Central Vermont Public Service Corporation*

March 1, 1999

Mr. Chuck Schwer  
Sites Management Section  
Waste Management Division  
Department of Environmental Conservation  
Agency of Natural Resources  
103 South Main St.  
Waterbury, VT 05671-0404

RE: CVPS St. Albans Diesel Plant  
(Site #98-2487)

Dear Mr. Schwer:

I am forwarding the enclosed report on the investigation of the CVPS St. Albans Diesel Plant. Mr. Bob Butler said that correspondence to him should be redirected to your attention after February 24, 1999.

CVPS hired DuBois & King to investigate and report on the St. Albans Diesel Plant site after the Sites Management Section directed CVPS to determine the severity of contamination there. The Sites Management Section directed CVPS to complete this work beyond the activities associated with the replacement of a 10,000 gallon underground storage tank in August 1998.

The attached DuBois & King report presents a comprehensive summary of site conditions. CVPS concurs with DuBois & King's recommendations and requests that the Site Management Section considers closure of this site. Please call me at 747-5707 if you have any questions or comments.

Sincerely,

John C. Greenan, P.E.  
Project Coordinator

**PETROLEUM PRODUCT RELEASE INVESTIGATION**  
**CENTRAL VERMONT PUBLIC SERVICE CORPORATION**  
**ST. ALBANS DIESEL PLANT**

**64 Lower Welden Street**  
**ST. ALBANS, VERMONT**

**(SMS SITE # 98-2487)**

MAR 26 10 25 AM '99

Prepared for:

Central Vermont Public Service Corporation  
77 Grove Street  
Rutland, Vermont 05701

February 18, 1999  
DuBois & King Project # R15476P4

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## 1.0 INTRODUCTION

The Central Vermont Public Service Corporation (CVPS) St. Albans Diesel Plant, located at 64 Lower Welden Street, in St. Albans, was listed as an active site in November 1998, after the Sites Management Section completed their review of UST closure activities documented in a letter-report dated August 28, 1998. One 10,000 gallon diesel fuel UST was closed and replaced at the site on August 24th and 25th, 1998. During the closure activities, low to moderate (3 to 40 ppm as measured with a PID) levels of organic compound contamination were noted in the soils. The tank was in good condition. A small release from the piping to the building was noted, however, free product was not observed. The SMS requested the initiation of an investigation to define the degree and extent of contamination in groundwater and soils. A work plan for the investigation was prepared and submitted to the Sites Management Section in early December and was approved on December 18, 1998.

The work plan called for the installation of soil borings, field screening of soils with a PID, the installation of two new groundwater monitoring wells, and the collection of groundwater samples from the existing wells and new wells for BTEX and TPH analysis. Method 8100 analysis was also proposed to characterize the nature of petroleum product contaminants found at the site.

A USGS site location map is included in Appendix A. Appendix B is the site plan. Surrounding property ownership and use is shown on the Appendix C exhibit.

## 2.0 AREA CHARACTERISTICS AND SITE HISTORY

The CVPS St. Albans Diesel Plant is located near the edge of a commercial, light industrial area that includes a Central Vermont Railroad rail yard to the east of the diesel plant, a CVPS Service Center to the north, the S.B. Collins bulk petroleum product storage facility to the east, Immigration and Naturalization Services offices to the north and northwest, and vacant land to the south. Residential properties are located on the west side of Stevens Brook, located approximately 500 feet west of the diesel plant.

Spills and releases of petroleum products have occurred on the CVPS property and the adjoining S.B. Collins property. These incidents are suspected as the source of residual contamination found at this site. Spill Report # 84-114, which occurred on August 26, 1984 on the CVPS property, resulted in the release of an estimated 4,000 gallons of diesel product from a broken feed line at the former above-ground tank used for fuel storage for this diesel plant. The above ground tank was located to the south of the UST that was removed in August 1998. The fuel flowed over the ground surface for about 100 feet to the cooling water pond immediately downgradient. New England Marine Contractors was retained to recover product from the pond. The Vermont Hazardous Materials Management Section did not require further investigation of the incident.

A release of gasoline was discovered, in September 1991, during UST closure, on the adjoining upgradient S.B. Collins property. This release resulted in the stockpiling of 80 cubic yards of petroleum contaminated soils. Monthly baling of free product from monitoring wells was required, however, further investigations were considered (in May 1992), by the SMS, "unnecessary at this time in light of the topographical characteristics and the historical use/purpose of the surrounding land." The site was removed from the active sites list. The release investigation at this site is documented in SMS file # 91-1174.

The S.B. Collins property was again listed as an active site in 1995 (SMS #95-1906) and remains on the active sites list as of the time of filing this report. There is currently 235 cubic yards of petroleum contaminated soils stockpiled at this site within 300 feet of the CVPS UST site at the location indicated on the site plan. The most recent release investigation activity includes the closure of two kerosene USTs and one diesel fuel UST, in March 1998, the discovery of free product, the installation of additional monitoring wells in June 1998, and submittal of an investigation report in August 1998.

### **3.0 SOIL BORINGS AND NEW MONITORING WELLS**

Soil borings, completed on December 21, 1998, were advanced with vibratory driven, polyethylene-lined sampling tubes constructed of 5 feet by 2.375 inch ID NQ casing at the locations shown on the site plan. Soil samples were screened at one- to two-foot intervals in each borehole. Soil samples were collected in air-tight sandwich bags, allowed to equilibrate to room temperature, and then the vapor space was screened with the PID. The results of screening, summarized in Table 1, indicate that moderate levels of soil contamination are present in the vicinity of the site between the existing UST and the diesel plant building, but are not present on the west side of the access drive to the pole storage area. Soil borings SB-1 and SB-2 are located in the low portion of the site where diesel fuel from the 1984 diesel fuel spill pooled before crossing the road and entering the cooling water pond, where it was collected and removed. The absence of detected soil contamination at SB-3, located on the west side of the access road, defines the limit of the soil contamination in this direction at or under the access drive. Soils in the boreholes at monitoring wells MW-5 and MW-6, installed on the upgradient side of the site, were generally free of detectable soil contamination, however, low levels of contamination were encountered at the depth of the water table in MW-6.

Two new monitoring wells, MW-5 and MW-6, were installed to assess the possibility of upgradient contaminant sources and to determine groundwater flow direction through the site. The wells were completed with 1.5 inch PVC pipe and 7-inch manways, to depths of 17 feet (MW-5) and 19.9 feet (MW-6). Each well was developed with a peristaltic pump for about two hours. Existing well MW-4 was also developed. The well drillers logs for these wells are included in Appendix E. This Appendix also contains the well drillers logs for the observation wells (MW-1, MW-2, MW-3, and MW-4) installed in October 1991. Monitoring well MW-3 was destroyed during the tank closure activities in August 1998.

**TABLE 1**  
**CVPS - ST. ALBANS DIESEL PLANT**  
**SOIL PID READINGS (ppm)**  
**December 21, 1998**

DEPTH	SB-1		SB-2		SB-3		MW-5		MW-6	
	Soil	PID	Soil	PID	Soil	PID	Soil	PID	Soil	PID
1'	Sand	1	Brown sand	30	Sandy silt	0	Fill	0	Fill	
2'	Coal ash	20	Silt	30	Sandy silt	0	Fill	0	Fill	
3'	Silt	50	Silt	2					Fill	
4'			Silt	2	Sandy silt	0	Coarse sand	0		
5'	Silt	30								
6'	Silt	40	Silt	2	Sandy silt	0	Coarse sand	0	Fill	0
7'	Silty sand	15	Silt	35	Sandy silt	0	Coarse sand	0		
8'			Silt	5	Sandy silt	0	Coarse sand	0		
9'	Silty sand	7	Silt	55			Coarse sand	0		
10'	Silty sand	2	Silt	50	Sandy silt	0			Silty sand	0
12'							Silty sand	0		
14'							Silty sand	0	Silty sand	8
16'							Silty sand	0	Coarse sand	0
18'							Brwn sand	0	Silty sand	0
WT @	5'-6"		8'-0"		6'-6"		9'-6"		13'-6"	

**Central Vermont Public Service Corporation - St. Albans Diesel Plant**  
**Table 2: Summary of Organic Compounds Detected in Water Samples**  
 All concentrations given in micrograms per liter (ug/l) unless otherwise noted

Sample ID	Sampling Date	EPA TEST METHOD	Benzene	Ethylbenzene	Toluene	Total Xylenes	MTBE	1,3,5-Trimethylbenzene	1,2,4-Trimethylbenzene	Napthalene	Total Petroleum Hydrocarbon - EPA Method 8100					
											As Gasoline	As Kerosine	As Diesel or #2FO	As #4FO	As Jet Fuel	As Mineral Spirits
MW-1	12/10/98	8021B	BDL	BDL	BDL	BDL	2.8	BDL	BDL	5.6	BDL	BDL	BDL	BDL	BDL	BDL
MW-2	12/10/98	8021B	BDL	BDL	BDL	BDL	31	BDL	BDL	1.6	BDL	BDL	BDL	BDL	BDL	BDL
(blind dupl)	12/10/98	8021B	BDL	BDL	BDL	BDL	28	BDL	BDL	1.9	BDL	BDL	BDL	BDL	BDL	BDL
MW-4	12/10/98	8021B	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2.7	BDL	BDL	BDL	BDL	BDL	BDL
MW-5	12/22/98	8021B	BDL	BDL	BDL	BDL	10	BDL	BDL	BDL						
(blind dupl)	12/22/98	8021B	BDL	BDL	BDL	BDL	11	BDL	BDL	BDL						
MW-6	12/22/98	8021B	BDL	BDL	BDL	BDL	3.2	BDL	BDL	BDL						

Vermont Health Advisory level for MTBE is 40 ppb  
 Vermont Health Advisory level for Napthalene is 20 ppb

Table 3 summarizes groundwater surface elevations at the monitoring points. A groundwater contour map is included in Appendix F.

**TABLE 3**  
**CENTRAL VERMONT PUBLIC SERVICE CORPORATION**  
**ST. ALBANS DIESEL PLANT**  
**GROUNDWATER ELEVATIONS**

<b>MONITORING POINT</b>	<b>TOP OF CASING (Feet)</b>	<b>WATER DEPTH BELOW TOC</b>	<b>GROUNDWATER ELEVATION</b>
MW-1	103.58	14.95	88.63
MW-2	100.89	12.60	88.29
MW-4	99.60	8.88	90.72
MW-5	102.08	9.50	92.58
MW-6	104.27	13.50	90.77

#### **4.0 GROUNDWATER SAMPLING**

Groundwater samples were collected from the network of three existing monitoring wells on December 10, 1998 and were analyzed for the 8021B aromatic volatile organic compounds and TPH. Groundwater samples were collected from the new wells, MW-5 and MW-6, on December 22, 1998. The analytical results are summarized in Table 2.

The results of these analyses indicate that only two aromatic volatile organic compounds were detected at the concentrations greater than the method detection limit at any of the five monitoring points. The laboratory reports are included in Appendix D.

#### **5.0 SENSITIVE ENVIRONMENTAL RECEPTORS**

The Diesel Plant building is occupied only when the diesel engines are running, which is normally about 150 hours per year. The building does not have a basement. The floor surface of the building was screened with the PID on the day of the soil borings to determine if vapors from the release were entering the building. No significant concentrations of organic vapors were detected during this screening.

A review and identification of nearby water supplies and sensitive receptors was completed by Hoffer & Associates, in August 1998, for the S.B. Collins Bulk Facility, which is the adjoining property and upgradient property to the east of the subject property. The identification of private water supplies within a half mile of the S.B. Collins property is

included in Appendix F. This information was accepted as-is and was not independently verified for the current investigation. The Hoffer map indicates that there are no nearby domestic water supplies in this area.

No other potential sensitive receptors are identified in the vicinity of this site.

## 6.0 CONCLUSIONS

DuBois & King, Inc. has completed an investigation into a suspected release of petroleum product at the CVPS St. Albans Diesel Plant, located at 64 Lower Welden St, St. Albans. This investigation confirmed the presence of low to moderate levels of contaminants in soils described earlier in the UST closure report and, in addition, documented the presence of contaminants at upgradient monitoring points. Free product was not found at this site.

The organic compounds detected in groundwater during this investigation include MTBE (Methyl tertiary Butyl Ether) and Naphthalene. MTBE is exclusively used in gasoline, as an octane enhancer to improve automotive emissions characteristics, and is not present in diesel or fuel oil products. Gasoline has not been used or stored at this site and, therefore, the presence of MTBE in upgradient and downgradient monitoring wells is an indication of off-site contamination.

The upgradient site, the S.B. Collins Bulk Facility, has stored gasoline in above ground and underground storage tanks. The release of product, including free product, was noted at this facility during UST closure activities in March 1998. MTBE has been detected in groundwater monitoring at the S.B. Collins facility.

Naphthalene was detected in groundwater samples at the CVPS property. This compound is present in gasoline, diesel fuel, and fuel oil. Its detection only in the down gradient monitoring wells and not in MW-5 or MW-6 suggests that it may represent residual contamination from the 1984 diesel fuel spill. Of the compounds typically found in petroleum products, Naphthalene is more resistant to degradation than the BTEX compounds and will be found after the more biodegradable compounds have degraded.

The Vermont Health Advisory levels established by the Vermont Health Department for MTBE and Naphthalene is 40 ppb and 20 ppb respectively. The levels detected in groundwater samples collected in December 1998 are significantly less than these health advisory levels.

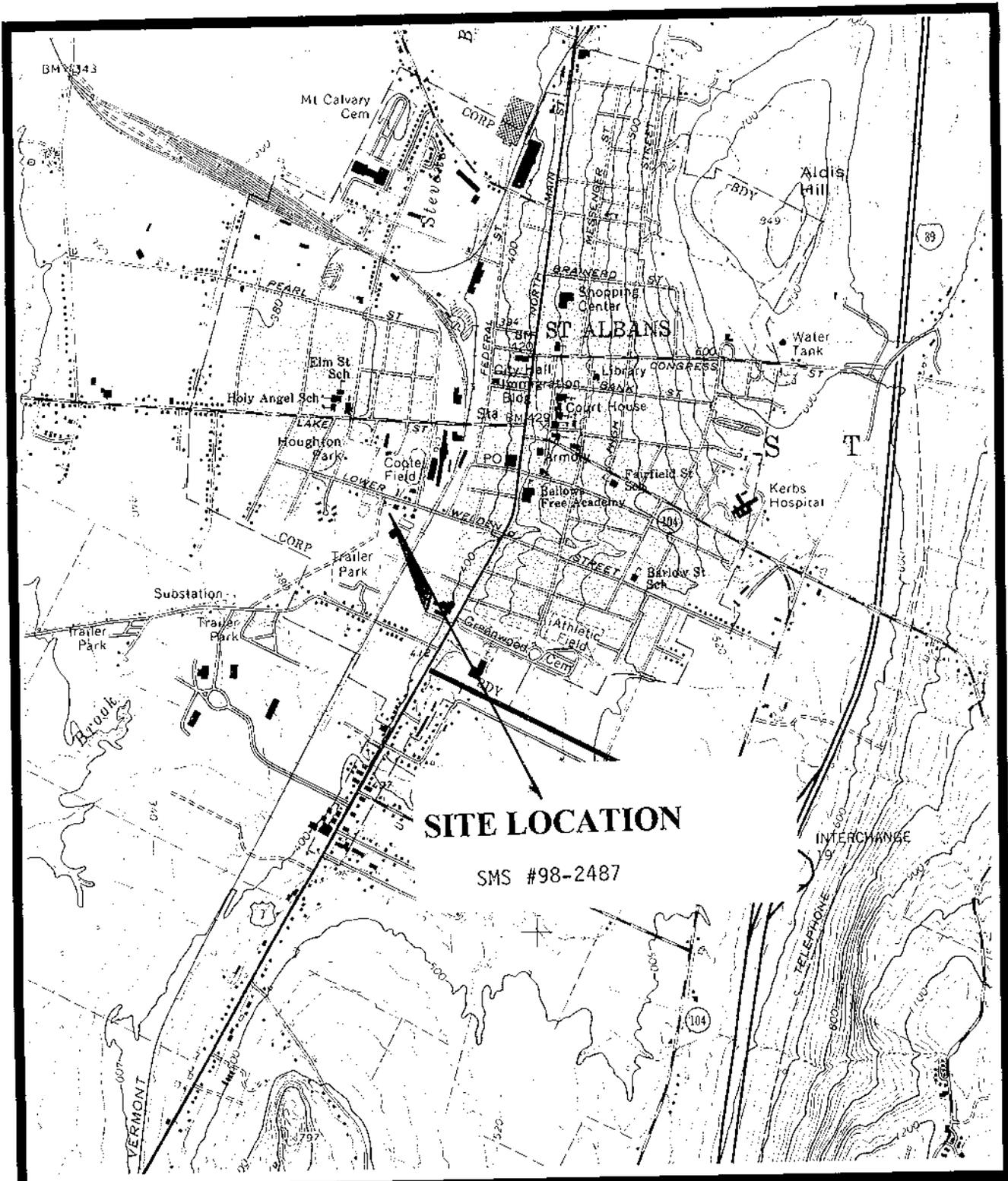
## 7.0 RECOMMENDATIONS

Due to the presence of volatile organic compounds at concentrations that are less than the Vermont Health Advisory Level, as well as the identification of off-site contaminants from adjoining properties, DuBois & King, Inc., recommends that the site be considered for site

closure. In accordance with the guidance document *Site Management Activity Completed Classification Procedure*, prepared in draft form in December 1993, the following basis for this recommendation is presented:

1. The source, nature and extent of contamination have been defined in this report.
2. The source of contamination consists of off-site migration of gasoline product constituents and residual diesel product constituents from a surface spill in 1984. The diesel fuel products were contained and removed at the time of the spill although low levels of contaminants remain in the site soils.
3. The detected concentration of the groundwater contaminants MTBE and Napthalene are less than the groundwater enforcement standards for these compounds. A region of soil contamination exists in the neighborhood of SB-1 and SB-2 at concentrations of 1 to 55 ppm, as measured with PID instrumentation. This contamination is presumed to be residual diesel fuel product in the unsaturated zone and is associated with fine grain native soils providing little potential for migration of contaminants. Contact or inhalation hazards are not present because the site is private industrial property, the contaminated soils are at 1 to 10 feet below grade, and there are no nearby structures with basements that could be impacted by petroleum product vapors.
4. No unacceptable threat to human health or the environment exists at the site from exposure to hazardous materials.

**APPENDIX A**  
**SITE LOCATION MAP**



Map Source: USGS  
 Topographic, 7.5 minute  
 St. Albans, VT Quadrangle  
 1964, Photorevised 1987  
 Scale: 1"=2000'  
 Contour Interval: 20 feet

**Location Plan**

**Central Vermont Public Service Corporation  
 Diesel Plant, 64 Lower Welden Street  
 St. Albans, Vermont**

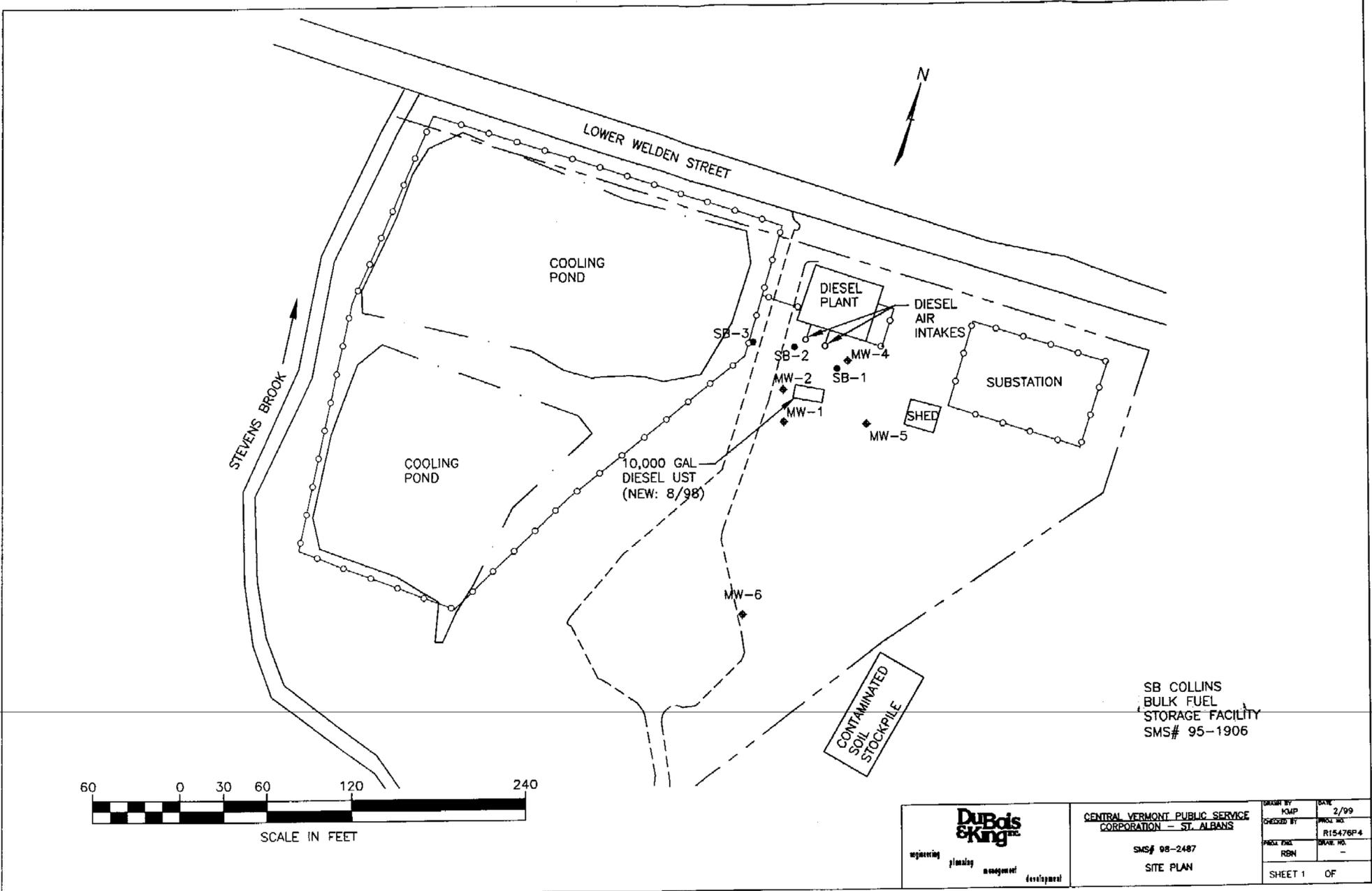
2/12/99

Project Eng.  
 R. B. Nichols

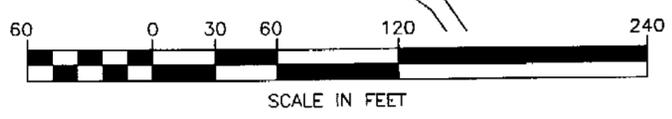
R15476P4

**APPENDIX B**

**SITE PLAN**



SB COLLINS  
BULK FUEL  
STORAGE FACILITY  
SMS# 95-1906



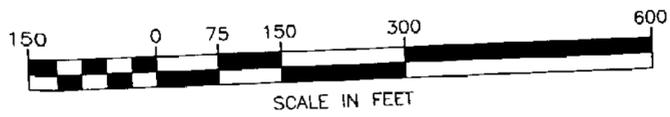
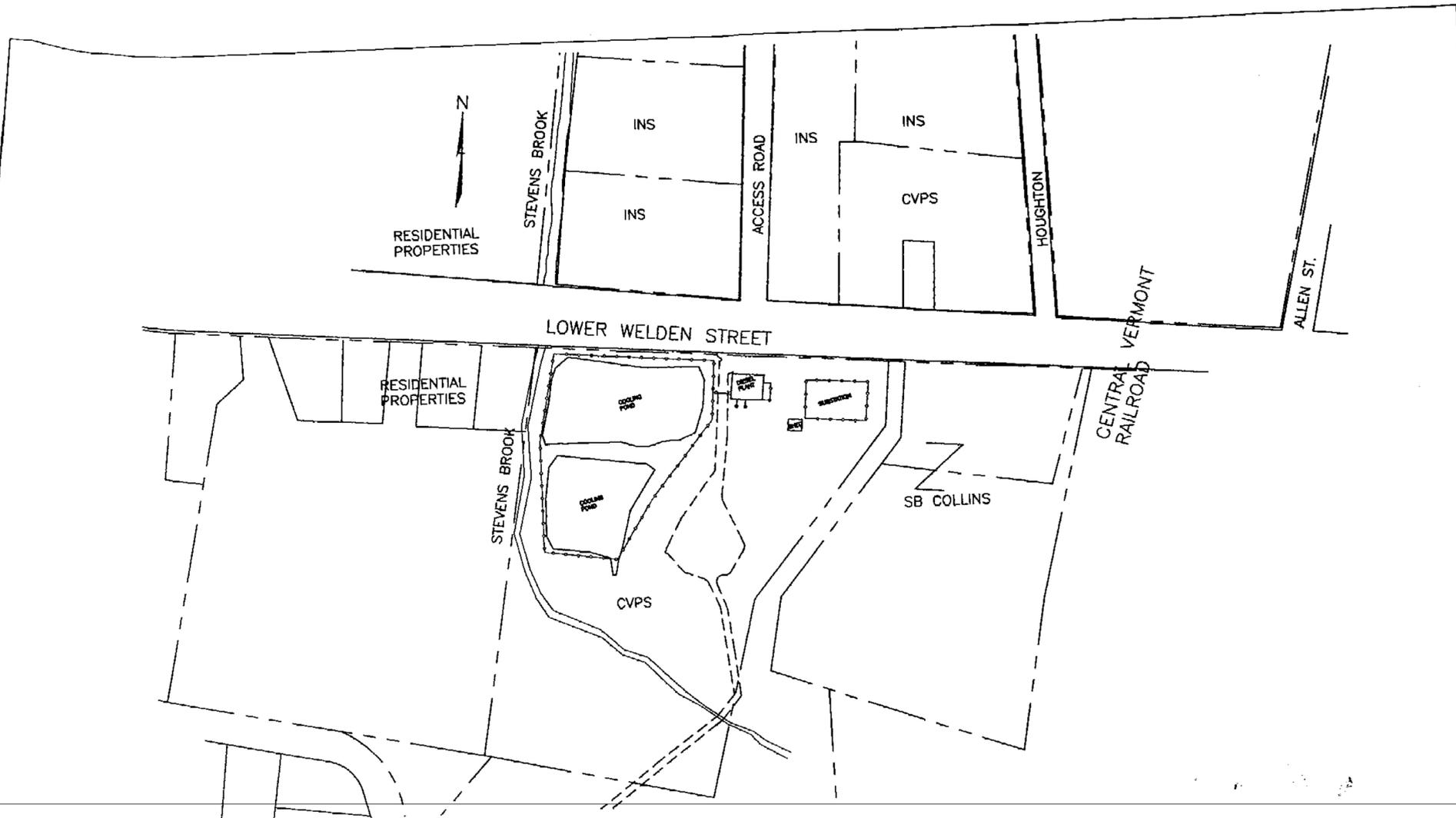
**DuBois & King**  
INC.  
engineering planning management development

CENTRAL VERMONT PUBLIC SERVICE  
CORPORATION - ST. ALBANS  
SMS# 98-2487  
SITE PLAN

DESIGN BY	KMP	DATE	2/99
CHECKED BY	RBN	PROJECT NO.	R15476P-4
PAGE NO.	RBN	SHEET NO.	-
		SHEET 1 OF	

**APPENDIX C**

**SURROUNDING PROPERTIES**



<p>engineering planning management development</p>	CENTRAL VERMONT PUBLIC SERVICE CORPORATION - ST. ALBANS	
	SURROUNDING PROPERTIES	
	DATE BY JGMP	DATE 2/99
	DESIGNED BY RBN	PROJ. NO. R15476P-A
	DATE -	
		SHEET 1 OF

**APPENDIX D**

**LABORATORY REPORTS - GROUNDWATER SAMPLES**



ANALYTICAL REPORT

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

Dubois & King  
 P.O. Box 339  
 Rte 66 Professional Center  
 Randolph, VT 05060

Work Order No.: 9812-04608

Project Name: CVPS - St. Albans  
 Customer Nos.: 080439

Date Received: 12/22/98  
 Date Reported: 1/28/99

Sample Desc.:	Method	Results	Units	Analyst	Analysis Date
MW-5					
Sample Nos: 001					
Test Performed	EPA 8021B			JPM	12/22/98
Volatiles, BTEX	EPA 8021B	10	ug/L	JPM	12/22/98
Methyl tertiary-Butyl Ether	EPA 8021B	< 0.5	ug/L	JPM	12/22/98
Benzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Toluene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Ethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Total Xylenes	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
1,3,5-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
1,2,4-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Naphthalene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Surrogate: 8021B				JPM	12/22/98
***Bromofluorobenzene-8021B		87	% Recovery	JPM	12/22/98

Sample Date: 12/22/98  
 Collection Time: 10:30

Sample Desc.:	Method	Results	Units	Analyst	Analysis Date
MW-6					
Sample Nos: 002					
Test Performed	EPA 8021B			JPM	12/22/98
Volatiles, BTEX	EPA 8021B	3.2	ug/L	JPM	12/22/98
Methyl tertiary-Butyl Ether	EPA 8021B	< 0.5	ug/L	JPM	12/22/98
Benzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Toluene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Ethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Total Xylenes	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
1,3,5-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
1,2,4-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Naphthalene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Surrogate: 8021B				JPM	12/22/98
***Bromofluorobenzene-8021B		104	% Recovery	JPM	12/22/98

Sample Date: 12/22/98  
 Collection Time: 10:00

## ANALYTICAL REPORT

Project Name: CVPS - St. Albans  
Project No.: 080439

Work Order No.: 9812-04608

Sample Desc.:	Method	Results	Units	Analyst	Analysis Date
Blind Duplicate					
Sample Nos: 003					
Test Performed	EPA 8021B			JPM	12/22/98
Volatiles, BTEX	EPA 8021B	11	ug/L	JPM	12/22/98
Methyl tertiary-Butyl Ether	EPA 8021B	< 0.5	ug/L	JPM	12/22/98
Benzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Toluene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Ethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Total Xylenes	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
1,3,5-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
1,2,4-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Naphthalene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Surrogate: 8021B				JPM	12/22/98
***Bromofluorobenzene-8021B		104	% Recovery	JPM	12/22/98

Sample Date: 12/22/98  
Collection Time: 10:30

Sample Desc.:	Method	Results	Units	Analyst	Analysis Date
Trip Blank					
Sample Nos: 004					
Test Performed	EPA 8021B			JPM	12/22/98
Volatiles, BTEX	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Methyl tertiary-Butyl Ether	EPA 8021B	< 0.5	ug/L	JPM	12/22/98
Benzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Toluene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Ethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Total Xylenes	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
1,3,5-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
1,2,4-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Naphthalene	EPA 8021B	< 1.0	ug/L	JPM	12/22/98
Surrogate: 8021B				JPM	12/22/98
***Bromofluorobenzene-8021B		102	% Recovery	JPM	12/22/98

Sample Date: 12/22/98  
Collection Time: 10:30

Authorized by: *Juan Wood*



# SCITEST

LABORATORY SERVICES

## ANALYTICAL REPORT

P.O. Box 339  
Randolph, Vermont 05060-0339  
(802) 728-6313  
(802) 728-6044 (fax)  
<http://www.scitestlabs.com>

Dubois & King  
P.O. Box 339  
Rte 66 Professional Center  
Randolph, VT 05060

Work Order No.: 9812-04454

Project Name: CVPS - St. Albans  
Customer Nos.: 080439

Date Received: 12/10/98  
Date Reported: 1/11/99

Sample Desc.: MW-1	Method	Results	Units	Analyst	Analysis Date
Sample Nos: 001					
Test Performed	EPA 8021B			JPM	12/21/98
Volatiles, BTEX	EPA 8021B	2.8	ug/L	JPM	12/21/98
Methyl tertiary-Butyl Ether	EPA 8021B	< 0.5	ug/L	JPM	12/21/98
Benzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Toluene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Ethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Total Xylenes	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
1,3,5-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
1,2,4-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Naphthalene	EPA 8021B	5.6	ug/L	JPM	12/21/98
Surrogate: 8021B				JPM	12/21/98
***Bromofluorobenzene-8021B		100	% Recovery	JPM	12/21/98
TPH 8100	EPA 8100			JPM	12/23/98
Gasoline	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Kerosene	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Diesel Fuel (Fuel Oil #2)	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Fuel Oil #4	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Jet Fuel	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Mineral Spirits	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98

Sample Date: 12/10/98  
Collection Time: 11:00

Sample Desc.: MW-2	Method	Results	Units	Analyst	Analysis Date
Sample Nos: 002					
Test Performed	EPA 8021B			JPM	12/21/98
Volatiles, BTEX	EPA 8021B	31	ug/L	JPM	12/21/98
Methyl tertiary-Butyl Ether	EPA 8021B	< 0.5	ug/L	JPM	12/21/98
Benzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Toluene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Ethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Total Xylenes	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
1,3,5-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
1,2,4-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Naphthalene	EPA 8021B	1.6	ug/L	JPM	12/21/98
Surrogate: 8021B				JPM	12/21/98

Sample Date: 12/10/98  
Collection Time: 11:30

## ANALYTICAL REPORT

Project Name: CVPS - St. Albans  
Project No.: 080439

Work Order No.: 9812-04454

Sample Desc.: MW-2		Sample Date: 12/10/98			
Sample Nos: 002		Collection Time: 11:30			
Test Performed	Method	Results	Units	Analyst	Analysis Date
***Bromofluorobenzene-8021B		100	% Recovery	JPM	12/21/98
TPH 8100	EPA 8100			JPM	12/23/98
Gasoline	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Kerosene	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Diesel Fuel (Fuel Oil #2)	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Fuel Oil #4	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Jet Fuel	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Mineral Spirits	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98

Sample Desc.: MW-4		Sample Date: 12/10/98			
Sample Nos: 003		Collection Time: 11:45			
Test Performed	Method	Results	Units	Analyst	Analysis Date
Volatiles, BTEX	EPA 8021B			JPM	12/21/98
Methyl tertiary-Butyl Ether	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Benzene	EPA 8021B	< 0.5	ug/L	JPM	12/21/98
Toluene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Ethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Total Xylenes	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
1,3,5-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
1,2,4-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Naphthalene	EPA 8021B	2.7	ug/L	JPM	12/21/98
Surrogate: 8021B				JPM	12/21/98
***Bromofluorobenzene-8021B		82	% Recovery	JPM	12/21/98
TPH 8100	EPA 8100			JPM	12/23/98
Gasoline	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Kerosene	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Diesel Fuel (Fuel Oil #2)	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Fuel Oil #4	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Jet Fuel	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98
Mineral Spirits	EPA 8100 TPH	< 1.3	mg/L	JPM	12/23/98

Sample Desc.: Blind Duplicate		Sample Date: 12/10/98			
Sample Nos: 004		Collection Time: 12:30			
Test Performed	Method	Results	Units	Analyst	Analysis Date
Volatiles, BTEX	EPA 8021B			JPM	12/21/98
Methyl tertiary-Butyl Ether	EPA 8021B	28	ug/L	JPM	12/21/98
Benzene	EPA 8021B	< 0.5	ug/L	JPM	12/21/98
Toluene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98

## ANALYTICAL REPORT

Project Name: CVPS - St. Albans  
Project No.: 080439

Work Order No.: 9812-04454

Sample Desc.:	Method	Results	Units	Analyst	Analysis Date
Blind Duplicate					
Sample Nos: 004					
Test Performed					
Ethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Total Xylenes	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
1,3,5-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
1,2,4-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Naphthalene	EPA 8021B	1.9	ug/L	JPM	12/21/98
Surrogate: 8021B				JPM	12/21/98
***Bromofluorobenzene-8021B		100	% Recovery	JPM	12/21/98

Sample Date: 12/10/98  
Collection Time: 12:30

Sample Desc.:	Method	Results	Units	Analyst	Analysis Date
Trip Blank					
Sample Nos: 005					
Test Performed					
Volatiles, BTEX	EPA 8021B			JPM	12/21/98
Methyl tertiary-Buryl Ether	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Benzene	EPA 8021B	< 0.5	ug/L	JPM	12/21/98
Toluene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Ethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Total Xylenes	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
1,3,5-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
1,2,4-Trimethylbenzene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Naphthalene	EPA 8021B	< 1.0	ug/L	JPM	12/21/98
Surrogate: 8021B				JPM	12/21/98
***Bromofluorobenzene-8021B		101	% Recovery	JPM	12/21/98

Sample Date: 12/09/98  
Collection Time: 11:00

Authorized by:



**APPENDIX E**

**MONITORING WELL BORING LOGS**

ADAMS ENGINEERING  
Gerard Adams  
#47 Blakey Rd., Underhill, VT 05489-9493  
(802)-899-4945

December 22, 1998

Mr. Bob Nichols PE  
Dubois & King  
Well logs: CVPS Diesel Plant/St. Albans

Soils sampled in open borehole with 2 3/4" OD X 2 3/8" ID X 5' NQ sampler lined with a polyethylene bag, the sampler brought to the surface, and the sample contained in the liner vibrated out for examination. Monitor well with a point at the bottom that is larger in OD than well screen to create an annulus, is placed in the open borehole left by sampling down to top of "collapsed native soils", the borehole annulus partially filled with pack sand, the well with some pack sand vibrated to depth creating a partial sand pack enhancing natural development, the open annulus refilled with sand pack above well screen "complete sand pack", a granular bentonite seal is then placed in the open annulus, and a 7" manway cemented in place. Well developed with peristaltic pump using dedicated polyethylene suction tubing.

12/21/98 SB#1

SOILS WELL

0 > -5.0' Sod // (over) black cinder fill.  
-5 > 10.0' Gray moist silty fine sand becoming saturated // gray silt // black coarse sand lens  
smells of petroleum.

SB #2 Same as SB #1.

SB #3 SAME as 1 & 2, but no smell of petroleum.

MW #5

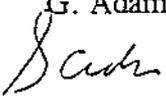
G Manway cemented in place.  
0 > -5.0' Cinders.  
-.3' Top well 1.5" solid riser, test plug.  
-2' Top of granular bentonite.  
-4' Bottom bentonite - top complete sand pack placed in open annulus.  
-7.0' Top well screen 2-5' X 1.5" X .010" slot Monoflex, typ.  
-5 > 10.0' Gray silty fine sand, water -9.5'.  
-13' Bottom complete sand pack-top native collapse partial sand pack & natural  
development.  
-10 > 15.0' Gray silt // coarse sand lens.  
-17' Bottom well screen, point.  
-15 > 18.0' Blue dense gray fine sandy silt  
Well developed: fair flow, cloudy.

MW #6

G Manway cemented in place.  
0 > -5.0' Brick & rubble fill.  
-.3' Top well 1.5" solid riser, test plug.  
-4' Top of granular bentonite.  
-6' Bottom bentonite - top complete sand pack placed in open annulus.  
-9.9' Top well screen 2-5'.

- 5 > 10.0' Same.
- 13' Bottom complete sand pack-top native collapse partial sand pack & natural development.
- 10 > 15.0' Gray silty fine sand becoming saturated // gray silt.
- 19.9' Bottom well screen, point.
- 15 > 19.9' Refusal, blue dense gray fine sandy silt  
Well developed: fair flow, cloudy.

G. Adams



# Green Mountain Boring Co., Inc.

R. D. 2 - BARRE, VERMONT 05641

SHEET 1 OF         
 DATE 10, 28, 91  
 HOLE NO. M.W.-1  
 LINE & STA.         
 OFFSET NONE

TO        ADDRESS         
 PROJECT NAME C.V.P.S./UNDERGROUND TANK LOCATION ST. ALBANS, VT.  
 REPORT SENT TO        PROJ. NO.         
 SAMPLES SENT TO        OUR JOB NO. 91-224

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR.	SURFACE ELEV. <u>      </u>
At <u>3' 8"</u>	at <u>1</u> Hours	Type <u>AUGERS</u>	<u>SPLIT SPOON</u>	<u>      </u>	DATE STARTED <u>10, 28, 91</u>
At <u>      </u>	at <u>      </u> Hours	Size I. D. <u>4.25"</u>	<u>1 3/8"</u>	<u>      </u>	DATE COMPL. <u>10, 28, 91</u>
		Hammer Wt. <u>      </u>	<u>140#</u>	<u>      </u>	BORING FOREMAN <u>LAWRANCE</u>
		Hammer Fall <u>      </u>	<u>30"</u>	<u>      </u>	INSPECTOR <u>      </u>
					SOILS ENGR. <u>J. GREENAN</u>

LOCATION OF BORING: AS LAYED OUT BY J. GREENAN (UP GRADE WELL)

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler			Moisture Density or Consist.	Strata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc.	SAMPLE	
				0-6	6-12	12-18				No.	Pen
		<u>5'-7'</u>	<u>DRY</u>	<u>7</u>	<u>9</u>	<u>9</u>	<u>DRY</u>		<u>SILTY SAND w/ COAL + CINDERS</u>	<u>1</u>	<u>24"</u>
		<u>10'-12'</u>	<u>"</u>	<u>13</u>	<u>7</u>	<u>10</u>			<u>(NO RECOVERY)</u>	<u>2</u>	<u>24"</u>
		<u>15'-17'</u>	<u>"</u>	<u>9</u>	<u>12</u>	<u>17</u>	<u>DRY</u>		<u>HARDPACKED SILT TRACE SAND</u>	<u>3</u>	<u>24"</u>
									<u>INSTALLED WELL USED</u>		
									<u>10' x 2" x 010 SCREEN</u>		
									<u>8' x 2' RISER</u>		
									<u>3 BAGS SAND</u>		
									<u>10 lbs. BENTONITE</u>		
									<u>1 BOT SLIP CAP</u>		
									<u>1 TOP WING CAP</u>		
									<u>1 5' PROTECTIVE CASING</u>		
									<u>1/2 BAG SAND MIX</u>		

GROUND SURFACE TO <u>15'</u>	USED <u>4.25"</u> AUGERS: THEN <u>S.S. To 17'</u> INSTALLER'S WELL	140 lb. Wt. x 30" fall an 2" O. D. Sampler	SUMM
Sample Type	Proportions Used	Cohesionless Density	Earth Borr Rock Corr Samples
D = Dry C = Cored W = Washed	trace 0 to 10%	0-10 Loose	0-4 Soft 30 + Hard
UP = Undisturbed Piston	little 10 to 20%	10-30 Med. Dense	4-8 M/Stiff
TP = Test Pit A = Auger V = Vane Test	some 20 to 35%	30-50 Dense	8-15 Stiff
UT = Undisturbed Thinwall	and 35 to 50%	50 + Very Dense	15-30 V-Stiff

HOLE NO.



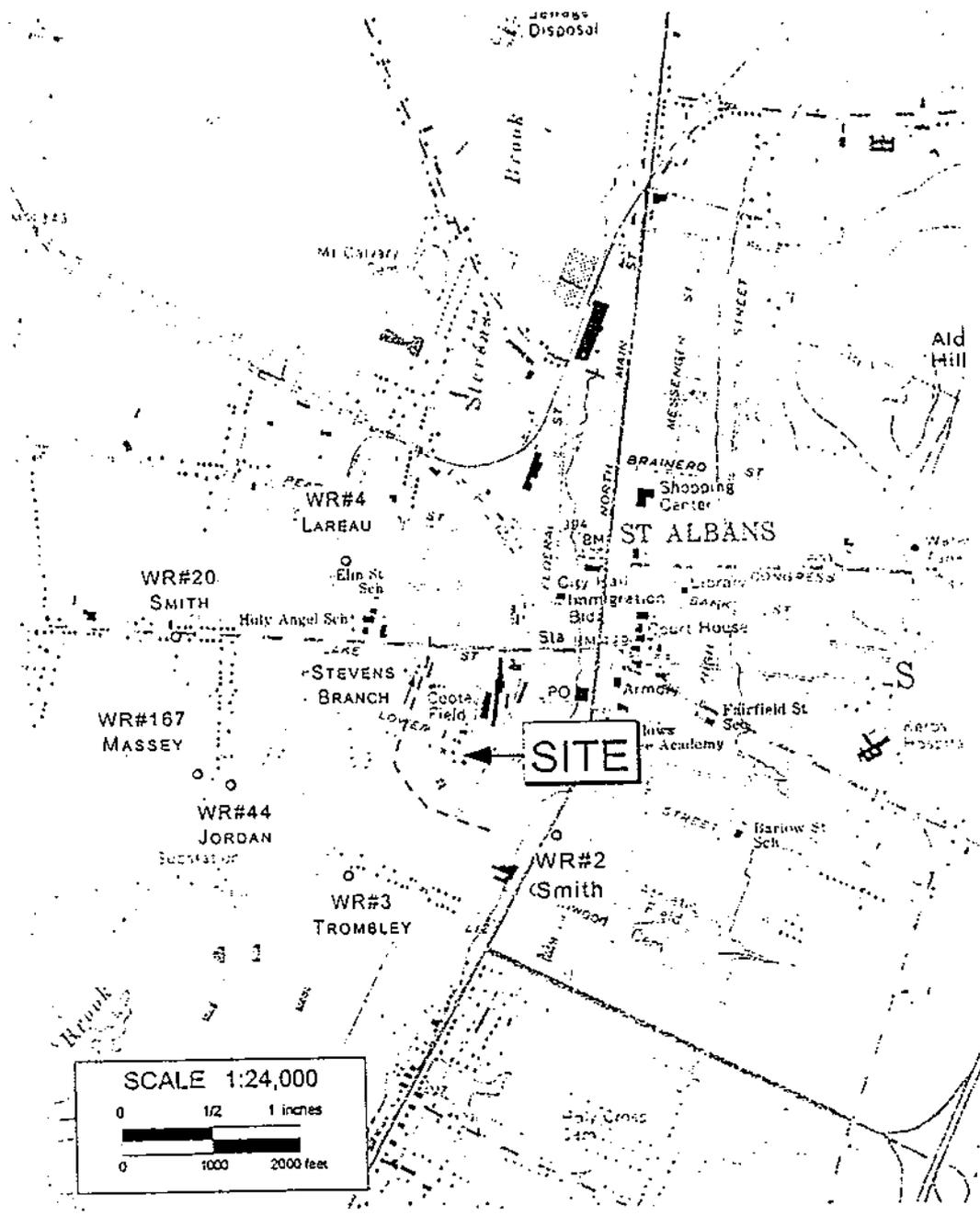




**APPENDIX F**

**AREA DOMESTIC WATER SUPPLIES (Prepared by Hoffer &  
Associates)**

BASE FROM U.S. GEOLOGICAL SURVEY, 1:24,000;  
ST. ALBANS, VT, PHOTOREVISED 1987

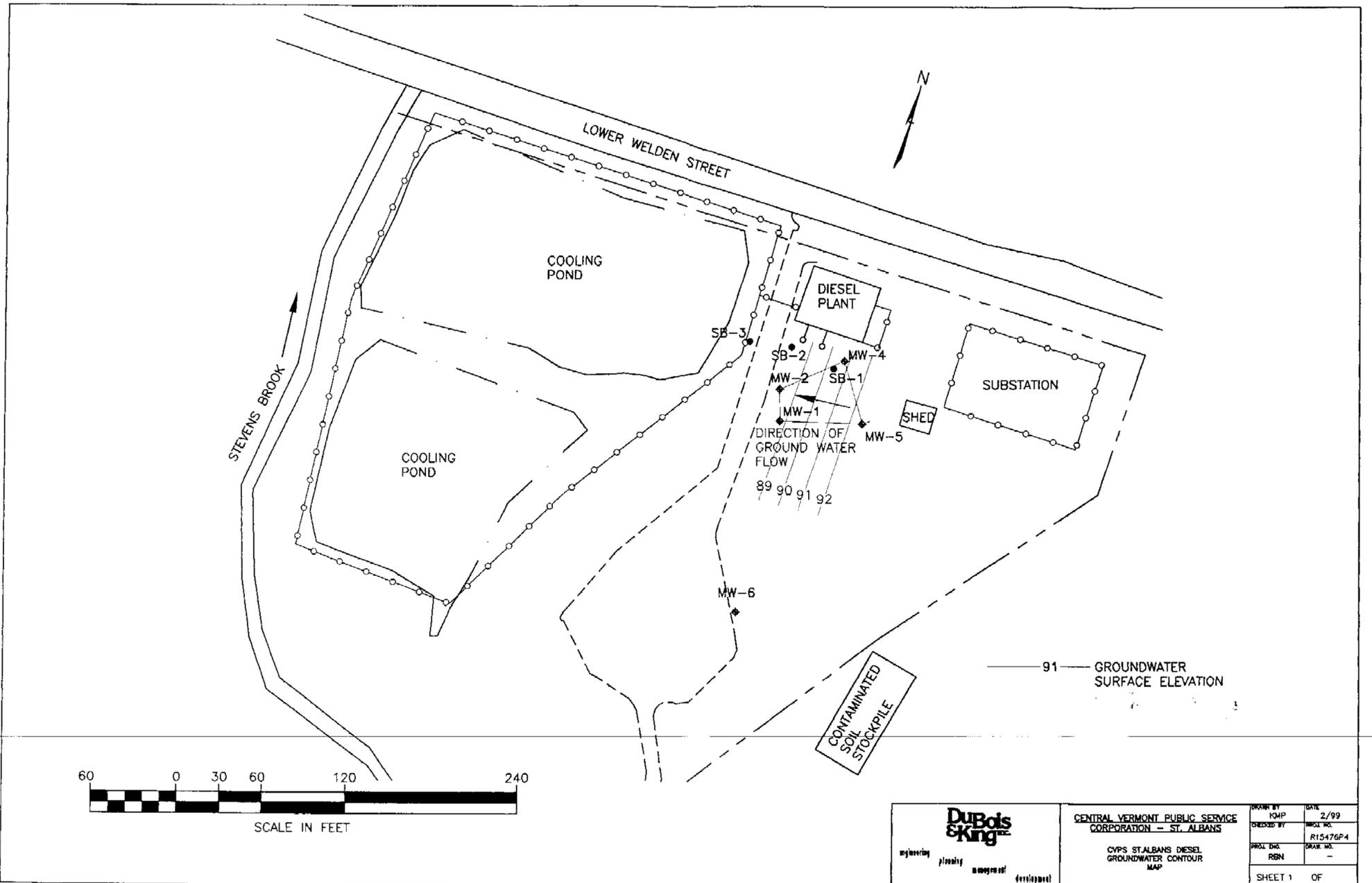


WR#167 MASSEY ○ DOMESTIC WATER WELL, WATER RESOURCES WELL LOG #, AND WELL OWNER, FROM THE WATER SUPPLY DIVISION'S WATER WELL INVENTORY FOR ST. ALBANS.

**FIGURE 1**  
USGS TOPOGRAPHIC MAP SHOWING LOCATION OF  
S.B. COLLINS BULK FACILITY  
54 LOWER WELDEN STREET, ST. ALBANS, VERMONT  
SMS SITE #95-1906

**APPENDIX G**

**GROUNDWATER CONTOUR MAP**



CENTRAL VERMONT PUBLIC SERVICE CORPORATION - ST. ALBANS  
 CVPS ST. ALBANS DIESEL GROUNDWATER CONTOUR MAP

DRAWN BY KOMP	DATE 2/99
CHECKED BY RSH	PROJECT NO. R15476P4
SCALE RSH	DRAWN NO. -
SHEET 1 OF	