

**LAMOUREUX & STONE**  
Consulting Engineers and Land Surveyors

14 Morse Drive  
Essex Junction, Vermont 05452  
(802) 878-4450

27 High Street  
St. Albans, Vermont 05478  
(802) 524-5245

October 7, 1993

Lynda Wedderspoon  
Site Manager  
Sites Management Section  
Hazardous Materials Management Division  
103 South Main Street / West Building  
Waterbury, VT 05671-0404

RE: Williston Landfill Petroleum Contamination, Redmond Road, Williston, VT  
(Site #92-1297)

Dear Lynda:

I have enclosed the final report detailing our work and findings at the above waste oil contamination site.

If you have any questions or require further information, please give me a call.

Sincerely,



Brian Tremback, Soil Scientist

Enclosures

c: Neil Boyden

OCT 08 1993

**WILLISTON LANDFILL  
PETROLEUM CONTAMINATION SITE**

**Final Report**

October 1993

Prepared For:

**The Town of Williston, Vermont**

Prepared By:

**Lamoureux & Stone Consulting Engineers, Inc.  
14 Morse Drive  
Essex Junction, VT 05452**

# **WILLISTON LANDFILL PETROLEUM CONTAMINATION SITE**

## ***Introduction***

On September 3 and 4, 1992, Jet-Line Services, Inc. removed 8 underground storage tanks from an area at the Williston Landfill (Figure 1). The tanks had been used for disposal of waste crankcase oil by the Town of Williston. Soil around one of the tanks showed oil contamination and was removed and polyencapsulated at the site.

On October 14, 1992, Lamoureux & Stone was retained by the Town of Williston to provide investigation, analysis, and planning services for this site.

## ***Description of the Site***

The clearing where the underground storage tank (UST) excavation is located has a layer of sandy deltaic sediments mantling lakebed sediments consisting of dense, varved silt and clay. The clearing downhill from the UST excavation, was used in the past as a borrow area for daily landfill cover material. In the former borrow area, the mantle of sandy material ranges in thickness from 1½ to 2½ feet. From the area of the UST excavation eastward, the full thickness of the sandy mantle still exists and ranges in thickness from 6 to 8 feet or more.

Soil investigations conducted during June 1990, August 1991, and October 1992 in this field and adjacent areas revealed a thin layer of perched groundwater and a layer up to 1 foot thick that showed evidence of seasonal saturation (distinct soil mottling) immediately above the varved sediments. In-situ mean permeability tests performed on the varved silts and clays yielded permeability rates on the order of  $10^{-7}$  cm/s.

## ***Purpose of Investigation***

The purpose of this investigation was to evaluate the potential for petroleum contamination of ground water at the site, assess the hazards posed by this potential contamination to sensitive receptors in the area, and to recommend site remediation measures, if appropriate.

## ***Method***

Three 2" PVC groundwater sampling wells (PC-1, -2, and -3) were installed within 150 feet of the UST excavation at locations judged to be potentially downgradient of the

excavation. The wells were installed in order to intercept and sample groundwater potentially affected by the former tanks (Figure 2). See attached well logs for soil profile descriptions from the boreholes.

The wells were sampled in November and December 1992. Samples were collected with a Teflon baler after baling the wells dry and allowing the water level to recover. The samples were analyzed by Endyne, Inc. of Williston, Vermont, using EPA Method 8240.

On April 30, 1993, a composite soil sample was collected from the stockpiled and polyencapsulated soil. Ten soil aliquots were collected from locations evenly distributed over the stockpile using a soil sampling auger. Each aliquot was obtained from approximately six inches below the surface. The aliquots were thoroughly mixed into one composite sample. The sample was analyzed by Endyne, Inc. using EPA Method 8240.

### **Results**

Analyses for groundwater samples from the three wells were reported as non-detects for all 39 parameters tested for in EPA Method 8240 (see attached Groundwater Analysis Laboratory Reports).

Analysis of the composite sample from the stockpiled soil resulted in a reported detection of four of the 39 parameters tested for in EPA Method 8240. The laboratory soil analysis results are included in the attachments. Table 1 shows detected parameters and the groundwater enforcement standard for each parameter.

### **Discussion**

It is assumed that when Jet-Line Services, Inc. removed the tanks, they excavated and stockpiled all soil exhibiting signs of contamination. The stockpiled soil is assumed to represent the highest contaminant level. The soil was analyzed using EPA Method 8240 and all parameters were either non-detectable or significantly below enforcement standards. Consequently, it is assumed that the former tank locations are considered to be closed. The tank excavations were backfilled with clean soil.

Groundwater samples obtained from wells adjacent to and downgradient of the former tank site showed no detectable levels of any of the parameters tested for in EPA

Method 8240. There is little potential for impacts to potable water supplies in any case, according to the report on a hydrogeological investigation for the nearby operating lined landfill on this property by Wagner, Heindel, and Noyes, Inc. of Burlington, Vermont. The report states that potable water supplies within 2,000 to 3,500 feet of the lined landfill are isolated "...by major groundwater discharge zones, including the Winooski River, Redmond Creek, and an unnamed ephemeral drainage swale."

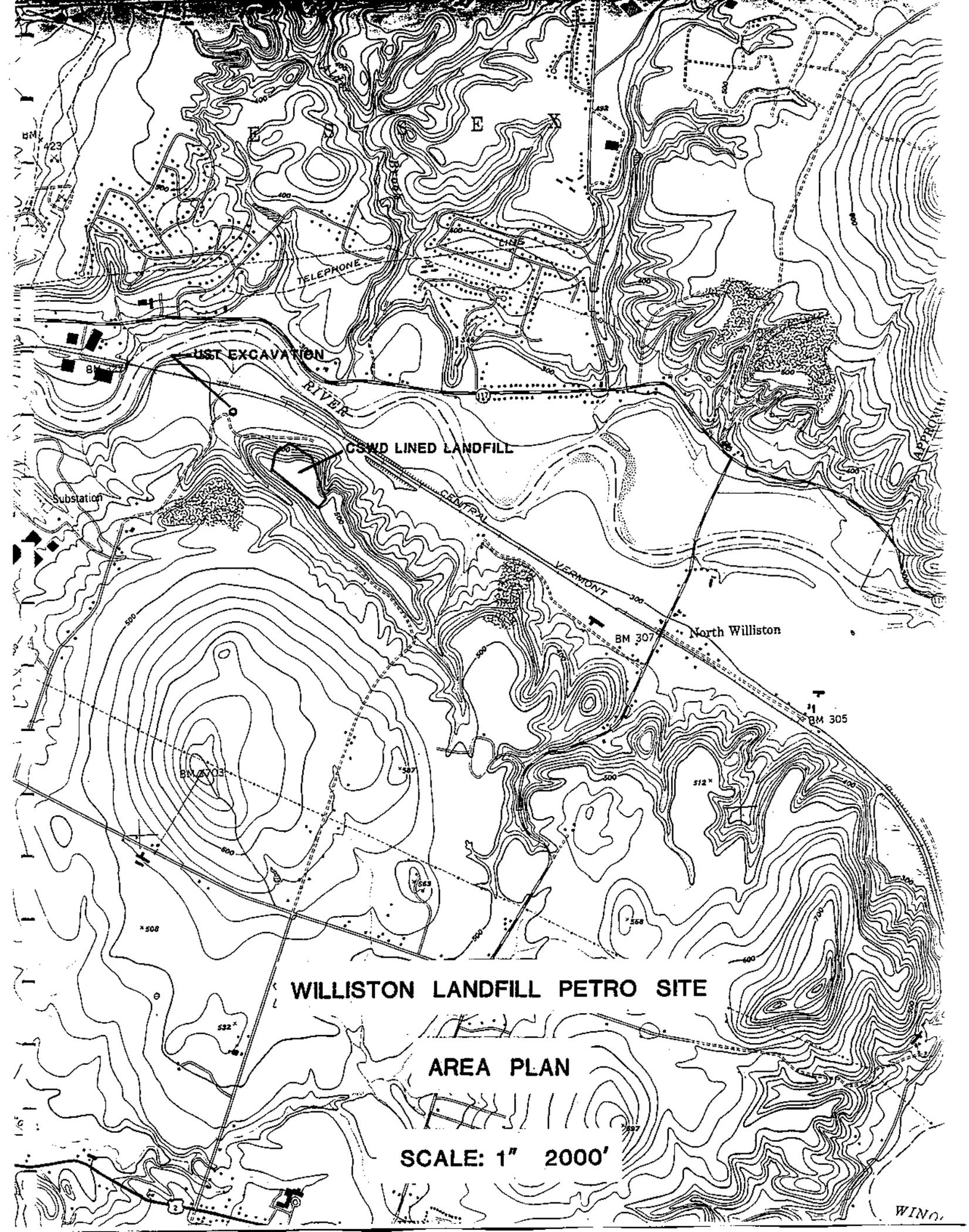
The stockpiled soil showed levels of contaminants significantly lower than the enforcement standards. Therefore, following approval from the Hazardous Waste Division, the Town of Williston has obtained permission from the State of Vermont Solid Waste Management Division and the Chittenden Solid Waste District to dispose of the soil in the lined landfill on this site. The soil was placed in the landfill on August 30, 1993 (see attached letter).

No soil or groundwater remediation measures are recommended, given the low soil concentrations and non-detect groundwater concentrations at the site.

## ***LIST OF ATTACHMENTS***

1. Figure 1. Area Plan
2. Figure 2. Site Plan
3. Well Logs
4. Groundwater Analysis Laboratory Reports
5. Soil Stockpile Analysis Laboratory Report
6. Table 1. Summary of Soil Stockpile Analysis Detections
7. Notification of soil stockpile removal from Park Construction Corporation

**1. *Figure 1. Area Plan***



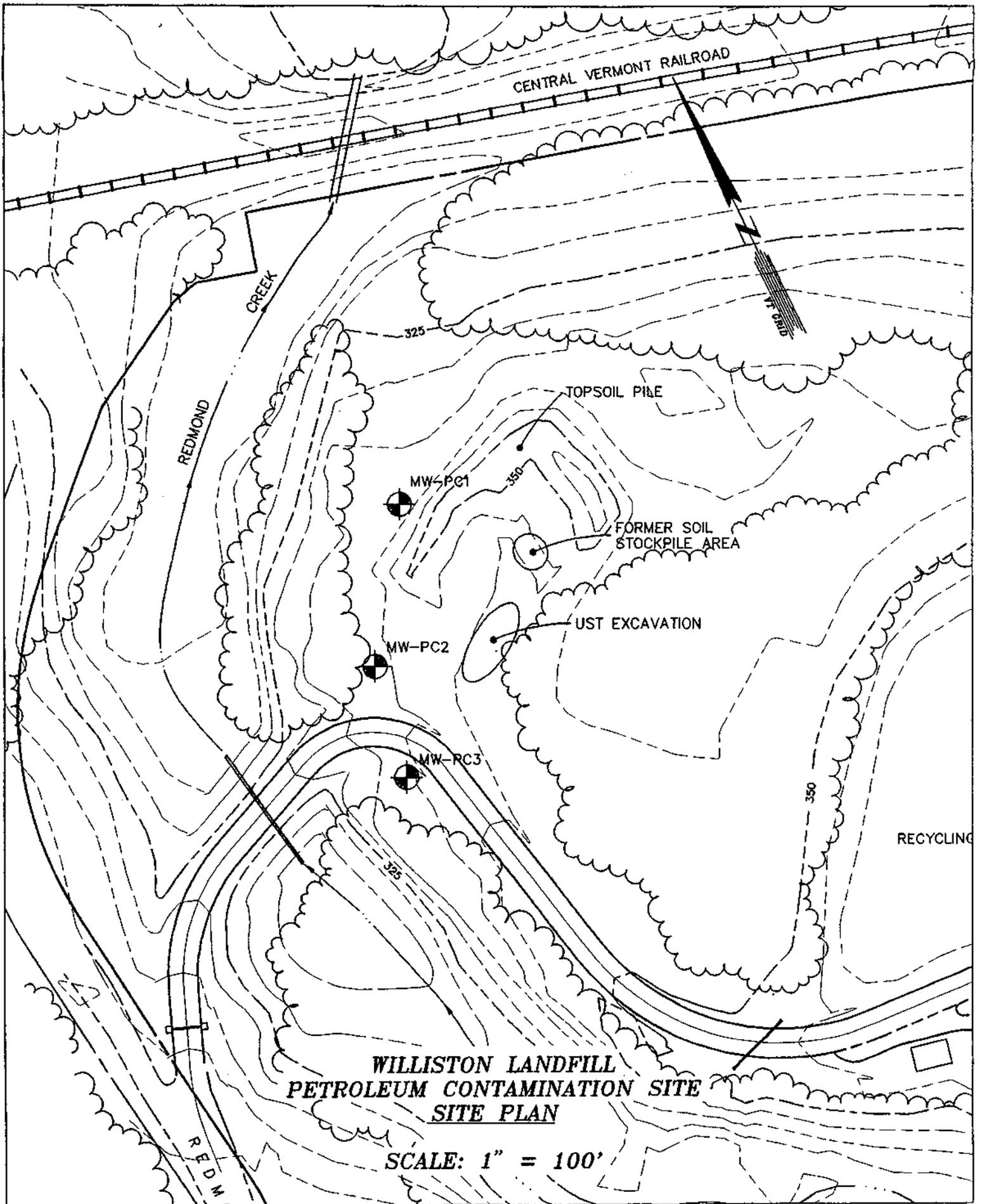
WILLISTON LANDFILL PETRO SITE

AREA PLAN

SCALE: 1" 2000'

WIND

**2. Figure 2. Site Plan**



CENTRAL VERMONT RAILROAD

REDMOND CREEK

REDMOND

325

VT. GRID

TOPSOIL PILE

MW-PC1

350

FORMER SOIL STOCKPILE AREA

MW-PC2

UST EXCAVATION

MW-PC3

350

RECYCLING

WILLISTON LANDFILL  
PETROLEUM CONTAMINATION SITE  
SITE PLAN

SCALE: 1" = 100'

R.D.M.

### **3. *Well Logs***

## **WELL LOGS FOR WATER QUALITY MONITORING WELLS**

### Well log - PC-1

0 - 0.5 ft	Brown to dark brown sandy loam
0.5 - 1.2 ft	Brown to dark brown gravelly loamy sand
1.2 - 7.5 ft	Dense, varved olive gray silty clay loam and silt loam in 1" to 3" layers
7.5 - 11.0 ft	Dense, varved gray silty clay loam and silt loam in 1" to 3" layers

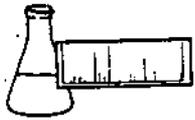
### Well log - PC-2

0 - 0.3 ft	Dark brown fine sandy loam
0.3 - 1.1 ft	Dark yellowish brown sandy loam with common medium distinct strong brown mottles
1.1 - 1.5 ft	Brown to dark brown very gravelly sandy loam
1.5 - 6.3 ft	Dense, varved olive gray silty clay, silty clay loam, and silt loam in 1" to 3" layers
6.3 - 8.5 ft	Dense, varved gray silty clay, silty clay loam, and silt loam in 1" to 3" layers

### Well log - PC-3

0 - 0.8 ft	Very dark grayish brown loamy fine sand
0.8 - 2.5 ft	Dark yellowish brown loamy fine sand with common medium distinct strong brown mottles
2.5 - 16.0 ft	Dense varved gray silty clay, silty clay loam, and silt loam

#### **4. *Groundwater Analysis Laboratory Reports***



**ENDYNE, INC.**

Laboratory Services

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

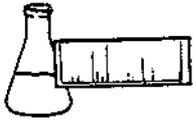
LABORATORY REPORT

EPA METHOD 8240 WATER MATRIX

CLIENT: Lamoureux & Stone  
PROJECT NAME: Williston Landfill  
REPORT DATE: December 29, 1992  
DATE SAMPLED: December 11, 1992  
DATE RECEIVED: December 14, 1992  
ANALYSIS DATE: December 23, 1992

PROJECT CODE: LSWL1677  
REF.#: 39,870  
STATION: ~~WVWPC PETS WELL~~  
TIME SAMPLED: Not Indicated  
SAMPLER: Len Amblo

<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Dichlorodifluoromethane	10	ND <sup>1</sup>
Chloromethane	10	ND
Vinyl Chloride	10	ND
Bromomethane	5	ND
Chloroethane	5	ND
Trichlorofluoromethane	2	ND
Acetone	50	ND
1,1-Dichloroethene	2	ND
Methylene Chloride	20	ND
Carbon Disulfide	1	ND
MTBE	3	ND
trans-1,2-Dichloroethene	2	ND
1,1-Dichloroethane	2	ND
2-Butanone	20	ND
Chloroform	10	ND
1,1,1-Trichloroethane	1	ND
Carbon Tetrachloride	1	ND
1,2-Dichloroethane	1	ND
Benzene	1	ND
Trichloroethene	1	ND
1,2-Dichloropropane	1	ND
Bromodichloromethane	1	ND



# ENDYNE, INC.

## Laboratory Services

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

REF.#: 39,870

<u>Parameter</u>	<u>Detection Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
4-Methyl-2-Pentanone	10	ND
cis-1,3-Dichloropropene	1	ND
Toluene	1	ND
trans-1,2-Dichloropropene	1	ND
1,1,2-Trichloroethane	2	ND
2-Hexanone	10	ND
Tetrachloroethene	2	ND
Dibromochloromethane	2	ND
Chlorobenzene	2	ND
Ethyl Benzene	1	ND
Total Xylenes	3	ND
Styrene	1	ND
Bromoform	5	ND
1,1,2,2-Tetrachloroethane	1	ND
1,3 Dichlorobenzene	2	ND
1,4 Dichlorobenzene	2	ND
1,2 Dichlorobenzene	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

### ANALYTICAL SURROGATE RECOVERY:

1,2-Dichloroethane-d4 : 108.%  
Toluene-d8 : 114.%  
4-Bromofluorobenzene : 109.%

### 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 8240

CLIENT: Lamoureux & Stone  
PROJECT NAME: Williston Landfill  
REPORT DATE: November 17, 1992  
SAMPLER: Doug Goulette  
DATE SAMPLED: October 30, 1992  
DATE RECEIVED: October 30, 1992

PROJECT CODE: LSWL1856  
ANALYSIS DATE: November 12, 1992  
STATION: ~~PC2~~  
REF.#: 37,983  
TIME SAMPLED: 9:40

<u>Parameter</u>	<u>Quantitation Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Acetone	50	ND <sup>1</sup>
Benzene	2	ND
Bromodichloromethane	4	ND
Bromoform	1	ND
Bromomethane	2	ND
2-Butanone	50	ND
Carbon Disulfide	5	ND
Carbon Tetrachloride	2	ND
Chlorobenzene	1	ND
Chloroethane	1	ND
2-Chloroethylvinyl ether	10	ND
Chloroform	2	ND
Chloromethane	6	ND
Dibromochloromethane	2	ND
1,1-Dichloroethane	1	ND
1,2-Dichloroethane	1	ND
1,1-Dichloroethene	2	ND
trans-1,2-Dichloroethene	2	ND
1,2-Dichloropropane	1	ND
cis-1,3-Dichloropropene	2	ND
trans-1,3-Dichloropropene	3	ND
1,3 Dichlorobenzenes	2	ND
1,2 Dichlorobenzenes	2	ND
1,4 Dichlorobenzenes	2	ND



**ENDYNE, INC.**

Laboratory Services

32 James Brown Drive  
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(802) 879-4333  
FAX 879-7103

EPA METHOD 8240 (continued)

Ref.#: 37,983

<u>Parameter</u>	<u>Quantitation Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Ethyl Benzene	3	ND
2-Hexanone	25	ND
4-Methyl-2-Pentanone	25	ND
Methylene Chloride	1	ND
Styrene	5	ND
1,1,2,2-Tetrachloroethane	3	ND
Tetrachloroethene	2	ND
Toluene	2	ND
1,1,1-Trichloroethane	2	ND
1,1,2-Trichloroethane	2	ND
Trichloroethene	2	ND
Vinyl Acetate	50	ND
Vinyl Chloride	3	ND
Total Xylenes	5	ND
MTBE	5	ND
Trichloroflouromethane	2	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

Reviewed by \_\_\_\_\_



**ENDYNE, INC.**

Laboratory Services

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

LABORATORY REPORT

EPA METHOD 8240

CLIENT: Lamoureux & Stone  
PROJECT NAME: Williston Landfill  
REPORT DATE: November 17, 1992  
SAMPLER: Doug Goulette  
DATE SAMPLED: October 30, 1992  
DATE RECEIVED: October 30, 1992

PROJECT CODE: LSWL1856  
ANALYSIS DATE: November 12, 1992  
STATION: **RC-3**  
REF.#: 37,984  
TIME SAMPLED: 9:30

<u>Parameter</u>	<u>Quantitation Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Acetone	50	ND <sup>1</sup>
Benzene	2	ND
Bromodichloromethane	4	ND
Bromoform	1	ND
Bromomethane	2	ND
2-Butanone	50	ND
Carbon Disulfide	5	ND
Carbon Tetrachloride	2	ND
Chlorobenzene	1	ND
Chloroethane	1	ND
2-Chloroethylvinyl ether	10	ND
Chloroform	2	ND
Chloromethane	6	ND
Dibromochloromethane	2	ND
1,1-Dichloroethane	1	ND
1,2-Dichloroethane	1	ND
1,1-Dichloroethene	2	ND
trans-1,2-Dichloroethene	2	ND
1,2-Dichloropropane	1	ND
cis-1,3-Dichloropropene	2	ND
trans-1,3-Dichloropropene	3	ND
1,3 Dichlorobenzenes	2	ND
1,2 Dichlorobenzenes	2	ND
1,4 Dichlorobenzenes	2	ND



**ENDYNE, INC.**

**Laboratory Services**

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

EPA METHOD 8240 (continued)

Ref.#: 37,984

<u>Parameter</u>	<u>Quantitation Limit (ug/L)</u>	<u>Concentration (ug/L)</u>
Ethyl Benzene	3	ND
2-Hexanone	25	ND
4-Methyl-2-Pentanone	25	ND
Methylene Chloride	1	ND
Styrene	5	ND
1,1,2,2-Tetrachloroethane	3	ND
Tetrachloroethene	2	ND
Toluene	2	ND
1,1,1-Trichloroethane	2	ND
1,1,2-Trichloroethane	2	ND
Trichloroethene	2	ND
Vinyl Acetate	50	ND
Vinyl Chloride	3	ND
Total Xylenes	5	ND
MTBE	5	ND
Trichloroflouromethane	2	ND

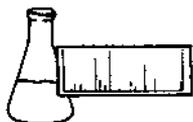
NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected

Reviewed by \_\_\_\_\_

**5. Soil Stockpile Analysis Laboratory Reports**



**ENDYNE, INC.**

Laboratory Services

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

LABORATORY REPORT

EPA METHOD 8240 SOIL MATRIX

CLIENT: Lamoureux & Stone  
PROJECT NAME: Will. LF Petro. Contam.  
REPORT DATE: May 17, 1993  
DATE SAMPLED: Not Indicated ← 4/30/93  
DATE RECEIVED: April 30, 1993  
ANALYSIS DATE: May 13, 1993

PROJECT CODE: LSWL1515  
REF #: 45,229<sup>1</sup>  
STATION: Soil Stockpile  
TIME SAMPLED: 11:15  
SAMPLER: Brian Tremback

<u>Parameter</u>	<u>Detection Limit (ug/kg)</u>	<u>Concentration As Received (ug/kg)</u>
Dichlorodifluoromethane	100	ND <sup>2</sup>
Chloromethane	100	ND
Vinyl Chloride	100	ND
Bromomethane	50	ND
Chloroethane	50	ND
Trichlorofluoromethane	20	ND
Acetone	500	ND
1,1-Dichloroethene	20	ND
Methylene Chloride	200	ND
Carbon Disulfide	10	ND
MTBE	30	ND
trans-1,2-Dichloroethane	20	ND
1,1-Dichloroethane	20	ND
2-Butanone	500	ND
Chloroform	100	ND
1,1,1-Trichloroethane	10	ND
Carbon Tetrachloride	10	ND
1,2-Dichloroethane	10	ND
Benzene	10	ND
Trichloroethene	10	ND
1,2-Dichloropropane	10	ND
Bromodichloromethane	10	ND



# ENDYNE, INC.

REF #: 45,229

## Laboratory Services

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

<u>Parameter</u>	<u>Detection Limit (ug/kg)</u>	<u>Concentration As Received (ug/kg)</u>
4-Methyl-2-Pentanone	100	ND
cis-1,3-Dichloropropene	10	ND
Toluene	20	45.4
trans-1,2-Dichloropropene	10	ND
1,1,2-Trichloroethane	20	ND
2-Hexanone	100	ND
Tetrachloroethene	20	ND
Dibromochloromethane	20	ND
Chlorobenzene	20	ND
Ethyl Benzene	10	ND
Total Xylenes	30	48.2
Styrene	10	ND
Bromoform	50	ND
1,1,2,2-Tetrachloroethane	10	ND
1,3 Dichlorobenzene	20	ND
1,4 Dichlorobenzene	20	28.7
1,2 Dichlorobenzene	20	54.6

NUMBER OF UNIDENTIFIED PEAKS: >25

### ANALYTICAL SURROGATE RECOVERY:

4-Bromofluorobenzene: 88.%  
1,2-Dichloroethane-d4: 98.%  
Toluene-d8: 101.%

PERCENT SOLIDS: 87.%

### Notes:

- 1 Sampled in an inappropriate container.
- 2 None detected

**6. Table 1. Summary of  
Soil Stockpile  
Analysis Detections**

**Table 1. Summary of soil stockpile analysis detections.**

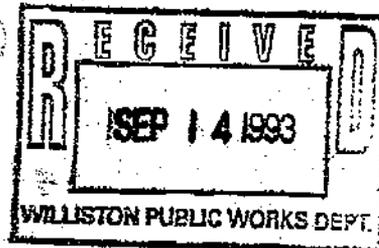
Parameter	Reported Concentration ( $\mu\text{g}/\text{kg}$ )	Groundwater Enforcement Standard ( $\mu\text{g}/\text{l}$ )	Twenty Times Enforcement Standard ( $\mu\text{g}/\text{l}$ )
Toluene	45.4	2,420	48,400
Total xylenes	48.2	400	8,000
1,4 Dichlorobenzene	28.7	75	1,500
1,2 Dichlorobenzene	54.6	620	12,400

**7. Notification of Soil  
Stockpile Removal  
from Park Construction  
Corporation**



September 8, 1993

*Level fill  
under road  
3000 sq yds*



Mr. Neil Boyden  
Public Works Director  
722 Williston Road  
Williston, Vermont 05495

RE: WILLISTON LANDFILL

Dear Neil:

This letter is to notify you that on Monday, August 30, 1993, Vicor Corp. removed approximately 50 to 60 cubic yards of contaminated soil from the Williston Landfill. This material was placed in the Phase III Lined Landfill Area.

Sincerely,

Gary Somero  
General Superintendent  
Park Construction Corporation

GS/sw

Post-It™ brand fax transmittal memo 7671		# of pages	1
To	Brian Timbush	From	Neil Boyden
Co.	L&S	Co.	WPW
Dept.		Phone #	878-1239
Fax #		Fax #	878-4591