

January 29, 1997

Joy Grossman
D&T Spinning
16 Mill Street/PO Box 467
Ludlow, VT 05149

Re: Initial Site Investigation, D&T Spinning

Dear Mrs. Grossman:

Enclosed is the above referenced report. Low-level exceedences of applicable groundwater standards were found. In order to close the site, we have recommended a spring sampling round of Monitoring Well-B (MW-B) and a check of the river.

We recommend forwarding a copy of the report to John Schmeltzer of the VTDEC-Sites Management Section, using the enclosed pre-addressed envelope. We would anticipate a response from him within 6 weeks.

Sincerely,
STRATEGIC ANALYTICAL SYSTEMS, INC.

Richard M. Pendleton

Richard M. Pendleton
Geologist

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

**INITIAL SITE INVESTIGATION:
GW MONITORING/RECEPTOR ASSESSMENT**

D&T Spinning, Inc.
16 Mill Street,
Ludlow, VT 05148
SMS Site # 96-2070
Lat./Long: 43°23'42"/72°41'24" (USGS Ludlow)

Prepared For:
D&T Spinning
16 Mill Street/PO Box 467
Ludlow, VT 05149
Contact: Joy Grossman

Prepared By:
STRATEGIC ANALYTICAL SYSTEMS, INC.
25 Centennial Square
Bellows Falls, VT 05101
(802) 463-0733/Fax 463-0723
Contact: Richard M. Pendleton

January 30, 1997
Project #: DTS-CM-002

John Schmeltzer
Project Manager
Waste Management Section
VTDEC
103 South Main Street/West Building
Waterbury, VT 05671-0404

**Re: Initial Site Investigation: GW Monitoring/Receptor
Assessment, D&T Spinning**

Dear Mr. Schmeltzer:

In accordance with Strategic Analytical System's (SAS) agreement with D&T Spinning of January 3, 1997 we are pleased to submit the above-referenced report.

1.0 INTRODUCTION

1.1 Objective

The objective of the Initial Site Investigation was to determine the risk to potential receptors, and define the degree and extent of groundwater contamination (if any) through the sampling of existing monitoring wells, and any at-risk receptors. There were four tasks: (1) Work Scope Preparation, (2) Receptor Survey, (3) Monitoring Well and Black River Sampling/Analysis and Survey, and (4) Report Preparation/Project Management.

1.2 Project Background

D&T Spinning manufactures yarn and is located on property owned by Paul and Harriet Dubin in Ludlow, VT (Figure 1). It is serviced by municipal water and sewer.

On September 11, 1996, SAS oversaw the re-excavation of soils at the former location of an 11,000 gallon UST at the site (Figures 1 and 2). Apparent soil and groundwater contamination was noted in terms of elevated PID readings and a black stained gravel unit. Two existing monitoring wells were noted on site. A site assessment report was submitted on September 16, 1996. The VT Department of Environmental Conservation requested a work plan for additional work on November 1, 1996. A previous environmental report was located during this time: "Environmental Site Assessment, Tucker Mills, Inc., Facility, Ludlow, VT" prepared by Dufresne-Henry, Inc. (1988) and submitted to SAS and the VTDEC. This report referred to a leaking (faulty return line and

overflow) 5,000 gallon fuel oil UST in the 1970s (Figure 3). A scavenger well had been subsequently installed and an unknown quantity of oil was recovered. The 11,000 gallon UST (removed 1996) (referred to as a 10,000 gallon in the Dufresne-Henry report) was installed (half buried below grade) in 1976. No reference was made to the monitoring wells noted on site.

The SAS Initial Site Investigation work plan was approved, with modifications, on December 24, 1996.

2.0 RESULTS

2.1 Work Scope Preparation

The work scope was prepared prior to project startup. A revised work scope was submitted to D&T Spinning in response to the approval letter by the VT Department of Environmental Conservation, Sites Management Section (VTDEC).

2.2 Receptor Survey

An area reconnaissance and review of Assessors office records was performed on January 8, 1997. The VTDEC Water Supply wellhead protection area (WHPA) maps for Ludlow were also acquired. As shown by Figure 2 there are no known drinking water supplies in the area and no downgradient basements. The only identified downgradient receptor is the Black River, which abuts the southern border of the site. On the far side of the Black River is a steep bank leading up to Pleasant Street and undeveloped woods and a railroad grade. To the west is Mill Street and an undeveloped residential yard, to the north is a residential neighborhood, and to the east is an undeveloped residential yard.

2.3 Monitoring Well and Black River Sampling/Analysis and Survey

Survey/Groundwater Flow. The monitoring wells were designated as MW-A and MW-B to avoid confusion with any previous designations. SAS conducted a site survey for the locations and relative elevations of the monitoring wells and surface water sample points. Water levels are shown in Table 1 with southeasterly groundwater flow shown on Figure 3. Seepage velocity (a.k.a. average linear velocity or V_x) between the location of the former 11,000 gallon UST and the river was determined to range from less than one to 10 feet per day. Based on the likelihood for the site to be underlain by poorly sorted sand, gravel and fill (based on sediments observed during the tank pull) it is likely that actual V_x is on the order of 1 ft/day, resulting in a travel time of 2 to 5 years, as shown in Table 2.

Groundwater Sampling. On January 9, 1997, groundwater samples were collected from the two monitoring wells using hand-driven inertial sampling pumps (tubing was dedicated). The monitoring wells are constructed of approximately 1.75 inch PVC, with protective standpipes. The lock on MW-A had to be cut off; the protective cap on MW-B was screwed off. Samples were also collected from the Black River. The presence of a concrete retaining wall limited where representative surface water samples could be collected. No oil odors or seeps were noted along the bank of the river. Three to five well volumes were purged from each monitoring well prior to sampling, and laboratory supplied containers were used. The samples were analyzed via EPA Method 8260 (volatile organic compounds or VOCs) and 8100 (total petroleum hydrocarbons or TPH).

Laboratory Analysis. Analytical results (Table 3, Attachment A) indicated no detectable contamination in groundwater near the former 11,000 gallon UST or in surface water. Low-level exceedences of VT Health Advisory levels (VHA) was detected at MW-B for 1,2,4-trimethylbenzene (10 parts per billion or ppb) and 1,3,5-trimethylbenzene (6 ppb). Non-exceedences were detected for xylenes, sec-butybenzene, isopropylbenzene, p-isopropyltoluene, naphthalene, and n-propylbenzene. MW-B is located near the former 5,000 gallon UST (Figure 3). The TPH scan indicated the low-level contamination is associated with a weathered fuel oil, consistent with the reported site history. Trimethylbenzenes typically do not biodegrade in the subsurface as readily as other regulated substances (e.g., benzene) and it is typical to detect low levels associated with an old fuel spill.

3.0 CONCLUSIONS/RECOMMENDATIONS

SAS has the following **conclusions**:

1. Visual and PID evidence collected at the time of soil excavation/tank closure for the 11,000 gallon UST indicated possible soil and/or groundwater contamination.
2. A receptor survey revealed no sensitive receptors downgradient except for the Black River. The risk to this receptor is believed to be limited in nature.
3. Potential sources have been removed.
4. Groundwater flow is toward the southeast and travel time from the former 11,000 gallon UST location to the river is on the order of 2-5 years. The UST was installed in 1976 according to a previous report prepared by others.
5. Low-level groundwater contamination was found near a former leaking 5,000 gallon UST (1970s) typical of weathered fuel oil and consistent with the reported site history. VHA exceedences were discovered for 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene (1.5 to 1.7 x VHAs).

Contamination was not noted in any other sampling locations (MW-A, or the Black River locations SW-A and SW-B). The extent of groundwater contamination is believed to be in the immediate area of MW-B.

6. In the opinion of SAS, the evidence suggests the low-level groundwater contamination is associated with the former 5,000 gallon UST, due to the fact that the contamination was limited to the MW-B location. It appears unlikely that VHA exceedences are occurring at the property line (river bank).

SAS has the following **recommendations**:

7. SAS recommends that a spring confirmatory sampling round of groundwater (MW-B) and sampling of any previously unobserved groundwater seeps to the river (no more than two) be conducted to insure that contaminant levels are decreasing or stabilized and that no contaminants are reaching the river above applicable standards. Given that finding, SAS would recommend the site be designated for closure (Sites Management Activity Completed).

Sincerely,
STRATEGIC ANALYTICAL SYSTEMS, INC.

Richard M. Pendleton

Richard M. Pendleton
Geologist

TABLES

Well	Depth		Elevation	
	Total	Water	Measuring Point ²	Water
MW-A	14.9	9.44	100.00	90.56
MW-B ¹	12.8	7.95	97.84	89.89
SW-A	N/A	1.39	91.36	89.97
SW-B	N/A	7.02	96.62	89.60

Notes: 1. An oil odor and sheen was noted in MW-B. 2. MW-A was assigned an arbitrary elevation of 100.00 feet.

$V_x = K \cdot (dh/dl) / n$, $dh/dl = 0.007$.				
Hydraulic Conductivity, K (ft/day) ²	Porosity, n ³	Vx (ft/day)	Time to Reach River (89 feet)	
			Days	Years
3	0.20	0	963	2.6
30		1	91	0.2
300		10	9	0.0
3	0.35	0	1,685	4.6
30		1	159	0.4
300		6	16	0.0

Notes: 1. Reference: Fetter, C. W., 1994. Applied Hydrogeology, 3rd Edition. Macmillan, New York. 2. Hydraulic Conductivity of well sorted sands, glacial outwash. 3. Porosity of a mixed sand and gravel.

Contaminant ^{1,2}	Standard ³	MW-A	MW-B	SW-A	SW-B
Total Xylenes	400	ND ⁴	3	ND	ND
sec-Butylbenzene	NS ⁵		4		
Isopropylbenzene	NS		2		
p-Isopropyltoluene	NS		8		
Naphthalene	20.0 ⁶		13		
n-Propylbenzene	NS		4		
1,2,4-Trimethylbenzene	6.0 ⁶		10		
1,3,5-Trimethylbenzene	4.0 ⁶	6			
Total Petroleum Hydrocarbons (mg/L, ³ ppm)	NS	ND	0.7 Weathered Fuel Oil	ND	ND

Notes: 1. Parts per billion unless otherwise noted. 2. Contaminants detected above detection limits are shown. See Attachment A for the complete contaminant test list. 3. VT Groundwater Enforcement Standard unless otherwise noted. 4. "ND": None detected. 5. "NS": no (applicable) standard. 6. VT Health Advisory Level

FIGURES



NORTH



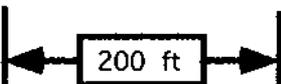
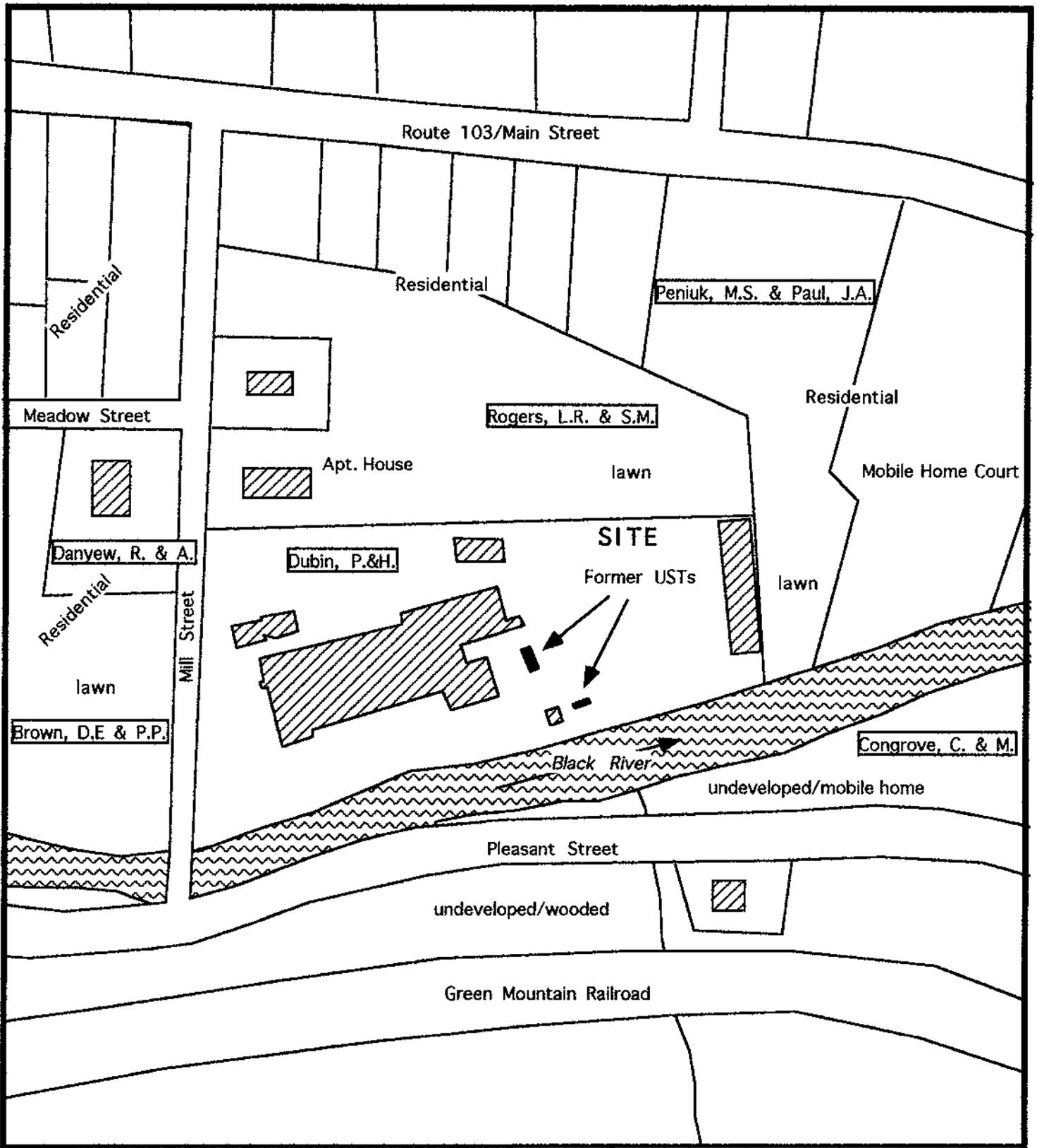
2000 ft

**Portion of the Ludlow, VT
1:24,000-scale topographic map, 1971.**

**Strategic Analytical Systems, Inc.
Bellows Falls, VT**

Figure 1. Site Location.

**Initial Site Investigation, D&T
Spinning, Ludlow, VT**

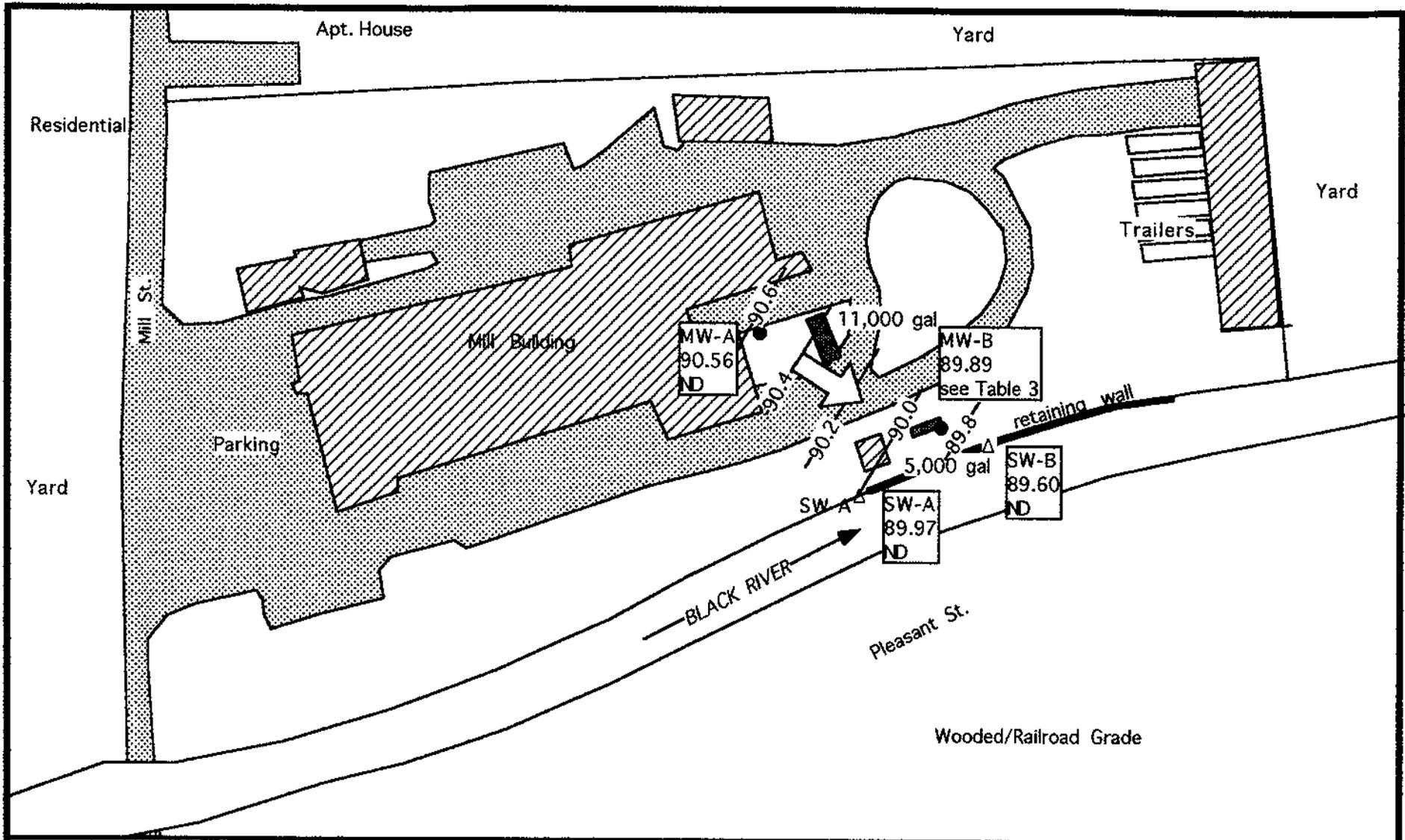


Strategic Analytical Systems, Inc.
Bellows Falls, VT

Figure 2. Area Map.

Initial Site Investigation, D&T
Spinning, Ludlow, VT

Notes: 1. Compiled from Ludlow assessors records, 1/8/97. 2. Property owners shown in boxes. 3. Building outlines shown approximate.



Legend:

- Monitoring Well
- △ Surface Water Monitoring Point
- 89.52 Water elevation (ft)
- ND Analytical Result

Notes: 1. Groundwater elevations: MW-A (PVC) assigned an arbitrary elevation of 100.00 ft. 2. Groundwater data collected 1/9/97.

Scale: 100 ft

Orientation: NORTH

Water Table Contour: 0.2 ft interval (90.6)

Groundwater Flow: Indicated by arrow

Former UST: Indicated by hatched area

Strategic Analytical Systems, Inc.
Bellows Falls, VT

Figure 3. Site Plan.

Initial Site Investigation, D&T Spinning, Ludlow, VT

ATTACHMENT A
ANALYTICAL RESULTS



Richard Pendleton
Strategic Analytical Systems
25 Centennial Square
Bellows Falls, VT 05101

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 7699 SASVT
Client Identification: DTS-CM-002
Date Received: 01/10/97
Sample Quantity/Type: 4 aqueous

Dear Mr. Pendleton:

Enclosed please find the laboratory report for the above identified project. All analyses were subjected to rigorous quality control measures to assure data accuracy.

The following standard abbreviations and conventions apply throughout all Eastern Analytical, Inc. reports:

- < = "less than" followed by the detection limit
- TNR = Testing Not Requested
- ND = None Detected, no established detection limit
- BRL = Below Reporting Limits

If you have any questions regarding the results contained within, please feel free to directly contact me, the department supervisor, or the analytical chemist who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Will Brunkhorst, President

Date

JAN 21 1997



LABORATORY REPORT

Eastern Analytical, Inc. ID#: 7699 SASVT

Client: Strategic Analytical Systems

Client Designation: **DTS-CM-002**

Volatile Organic Compounds

Sample ID:	DT00219.MWA	DT00219.MWB		DT00219.MWA	DT00219.MWB
Matrix:	Aqueous	Aqueous		Aqueous	Aqueous
Date Received:	1/10/97	1/10/97		1/10/97	1/10/97
Units:	µg/L	µg/L		µg/L	µg/L
Date of Analysis:	1/14/97	1/14/97		1/14/97	1/14/97
Analyst:	JDS	JDS		JDS	JDS
EPA Method:	8260	8260		8260	8260
Benzene	< 1	< 1	Ethylbenzene	< 1	< 1
Bromobenzene	< 1	< 1	Hexachlorobutadiene	< 2	< 2
Bromochloromethane	< 2	< 2	Isopropylbenzene	< 1	2
Bromodichloromethane	< 2	< 2	p-Isopropyltoluene	< 1	8
Bromoform	< 2	< 2	Methylene chloride	< 2	< 2
Bromomethane	< 10	< 10	Naphthalene	< 1	13
n-Butylbenzene	< 1	< 1	n-Propylbenzene	< 1	4
sec-Butylbenzene	< 1	4	Styrene	< 1	< 1
tert-Butylbenzene	< 1	< 1	1,1,1,2-Tetrachloroethane	< 2	< 2
Carbon tetrachloride	< 2	< 2	1,1,2,2-Tetrachloroethane	< 2	< 2
Chlorobenzene	< 2	< 2	Tetrachloroethene	< 2	< 2
Chloroethane	< 10	< 10	Toluene	< 1	< 1
Chloroform	< 2	< 2	1,2,3-Trichlorobenzene	< 1	< 1
Chloromethane	< 10	< 10	1,2,4-Trichlorobenzene	< 1	< 1
2-Chlorotoluene	< 2	< 2	1,1,1-Trichloroethane	< 2	< 2
4-Chlorotoluene	< 2	< 2	1,1,2-Trichloroethane	< 2	< 2
Dibromochloromethane	< 2	< 2	Trichloroethene	< 2	< 2
1,2-Dibromo-3-chloropropane	< 2	< 2	Trichlorofluoromethane	< 10	< 10
1,2-Dibromoethane	< 2	< 2	1,2,3-Trichloropropane	< 2	< 2
Dibromomethane	< 2	< 2	1,2,4-Trimethylbenzene	< 1	10
1,2-Dichlorobenzene	< 1	< 1	1,3,5-Trimethylbenzene	< 1	6
1,3-Dichlorobenzene	< 1	< 1	Vinyl chloride	< 2	< 2
1,4-Dichlorobenzene	< 1	< 1	o-Xylene	< 1	< 1
Dichlorodifluoromethane	< 10	< 10	m,p-Xylene	< 1	3
1,1-Dichloroethane	< 2	< 2	MTBE	< 20	< 20
1,2-Dichloroethane	< 2	< 2	Acetone	< 50	< 50
1,1-Dichloroethene	< 1	< 1	2-Butanone (MEK)	< 10	< 10
cis-1,2-Dichloroethene	< 2	< 2	4-Methyl-2-Pentanone (MIBK)	< 10	< 10
trans-1,2-Dichloroethene	< 2	< 2	2-Hexanone	< 10	< 10
1,2-Dichloropropane	< 2	< 2			
1,3-Dichloropropane	< 2	< 2			
2,2-Dichloropropane	< 2	< 2			
1,1-Dichloropropene	< 2	< 2			
cis-1,3-Dichloropropene	< 2	< 2			
trans-1,3-Dichloropropene	< 2	< 2			

Approved By: Clifford Chase, Volatile Organics Supervisor



LABORATORY REPORT

Eastern Analytical, Inc. ID#: 7699 SASVT

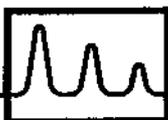
Client: Strategic Analytical Systems

Client Designation: DTS-CM-002

Volatile Organic Compounds

Sample ID:	DT00219.SWA	DT00219.SWB		DT00219.SWA	DT00219.SWB
Matrix:	Aqueous	Aqueous		Aqueous	Aqueous
Date Received:	1/10/97	1/10/97		1/10/97	1/10/97
Units:	µg/L	µg/L		µg/L	µg/L
Date of Analysis:	1/14/97	1/14/97		1/14/97	1/14/97
Analyst:	JDS	JDS		JDS	JDS
EPA Method:	8260	8260		8260	8260
Benzene	< 1	< 1	Ethylbenzene	< 1	< 1
Bromobenzene	< 1	< 1	Hexachlorobutadiene	< 2	< 2
Bromochloromethane	< 2	< 2	Isopropylbenzene	< 1	< 1
Bromodichloromethane	< 2	< 2	p-Isopropyltoluene	< 1	< 1
Bromoform	< 2	< 2	Methylene chloride	< 2	< 2
Bromomethane	< 10	< 10	Naphthalene	< 1	< 1
n-Butylbenzene	< 1	< 1	n-Propylbenzene	< 1	< 1
sec-Butylbenzene	< 1	< 1	Styrene	< 1	< 1
tert-Butylbenzene	< 1	< 1	1,1,1,2-Tetrachloroethane	< 2	< 2
Carbon tetrachloride	< 2	< 2	1,1,2,2-Tetrachloroethane	< 2	< 2
Chlorobenzene	< 2	< 2	Tetrachloroethene	< 2	< 2
Chloroethane	< 10	< 10	Toluene	< 1	< 1
Chloroform	< 2	< 2	1,2,3-Trichlorobenzene	< 1	< 1
Chloromethane	< 10	< 10	1,2,4-Trichlorobenzene	< 1	< 1
2-Chlorotoluene	< 2	< 2	1,1,1-Trichloroethane	< 2	< 2
4-Chlorotoluene	< 2	< 2	1,1,2-Trichloroethane	< 2	< 2
Dibromochloromethane	< 2	< 2	Trichloroethene	< 2	< 2
1,2-Dibromo-3-chloropropane	< 2	< 2	Trichlorofluoromethane	< 10	< 10
1,2-Dibromoethane	< 2	< 2	1,2,3-Trichloropropane	< 2	< 2
Dibromomethane	< 2	< 2	1,2,4-Trimethylbenzene	< 1	< 1
1,2-Dichlorobenzene	< 1	< 1	1,3,5-Trimethylbenzene	< 1	< 1
1,3-Dichlorobenzene	< 1	< 1	Vinyl chloride	< 2	< 2
1,4-Dichlorobenzene	< 1	< 1	o-Xylene	< 1	< 1
Dichlorodifluoromethane	< 10	< 10	m,p-Xylene	< 1	< 1
1,1-Dichloroethane	< 2	< 2	MTBE	< 20	< 20
1,2-Dichloroethane	< 2	< 2	Acetone	< 50	< 50
1,1-Dichloroethene	< 1	< 1	2-Butanone (MEK)	< 10	< 10
cis-1,2-Dichloroethene	< 2	< 2	4-Methyl-2-Pentanone (MIBK)	< 10	< 10
trans-1,2-Dichloroethene	< 2	< 2	2-Hexanone	< 10	< 10
1,2-Dichloropropane	< 2	< 2			
1,3-Dichloropropane	< 2	< 2			
2,2-Dichloropropane	< 2	< 2			
1,1-Dichloropropene	< 2	< 2			
cis-1,3-Dichloropropene	< 2	< 2			
trans-1,3-Dichloropropene	< 2	< 2			

Approved By: Clifford Chase, Volatile Organics Supervisor



LABORATORY REPORT

Eastern Analytical, Inc. ID#: 7699 SASVT

Client: Strategic Analytical Systems

Client Designation: DTS-CM-002

Total Petroleum Hydrocarbons

Sample ID:	DT00219.MWA	DT00219.MWB	DT00219.SWA	DT00219.SWB
Matrix:	Aqueous	Aqueous	Aqueous	Aqueous
Date Received:	1/10/97	1/10/97	1/10/97	1/10/97
Units:	mg/L	mg/L	mg/L	mg/L
Date of Extraction:	1/13/97	1/13/97	1/14/97	1/14/97
Date of Analysis:	1/14/97	1/14/97	1/15/97	1/15/97
Analyst:	DJS	DJS	DJS	DJS
EPA Method:	8100(mod)	8100(mod)	8100(mod)	8100(mod)
Carbon Range:	C9-C40*	C9-C40*	C9-C40*	C9-C40*
Identification:				
None Identified	< 0.5		< 0.5	< 0.5
Weathered Fuel Oil		0.7		

* Fuel (Diesel) and Lubricating Oil Range Organics.

Approved By: Timothy Schaper, Organics Supervisor

