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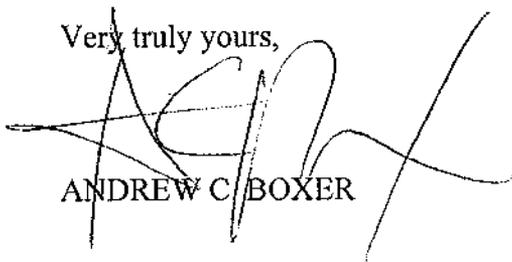
Re: DEC Site #98-2404

Dear Bob:

It appears that everyone's reliance on CEA's home office to provide you with a copy of the Site Investigation Report was misplaced. I enclose for your records a copy of the SIR which we received about a month ago.

Thank you for your attention to this matter.

Very truly yours,

  
ANDREW C. BOXER

encl.

cc(w/o encl): Harry Black, Esq.  
John Zawistoski, Esq.  
Paul Renouf

FEB 2 10 15 AM '99



CORPORATE ENVIRONMENTAL ADVISORS, INC.

Phase (check one)	Type (check one)
<input checked="" type="checkbox"/> Site Investigation	<input type="checkbox"/> Work Scope
<input type="checkbox"/> Corrective Action Feasibility Investigation	<input checked="" type="checkbox"/> Technical Report
<input type="checkbox"/> Corrective Action Plan	<input type="checkbox"/> PCF Reimbursement Request
<input type="checkbox"/> Corrective Action Summary Report	<input type="checkbox"/> General Correspondence
<input type="checkbox"/> Operations & Monitoring Report	

## SITE INVESTIGATION REPORT

The Sparrow Building  
40 Main Street  
Springfield, VT

DEC Site #98-2404

December 21, 1998

Prepared for:  
Mr. K Psihopedas and Mr. S. Psychopedas  
40 Main Street  
Springfield, VT 05156

Prepared by:  
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CEA Ref. File #V140-98-2

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CERTIFICATION STATEMENT

FIGURE 1 Site Locus

FIGURE 2 Site Layout

ATTACHMENT 1 Limitations

ATTACHMENT 2 List of Abutting Property Owners

ATTACHMENT 3 Laboratory Analytical Reports



## 1. EXECUTIVE SUMMARY

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This investigation was conducted by Corporate Environmental Advisors, Inc. (CEA) of White River Junction, Vermont to define the degree and extent of fuel oil constituents in the subsurface of the Sparrow Building at 40 Main Street, Springfield, Vermont ("the site") and to identify sensitive receptors which may be impacted by such constituents. The site has operated as a restaurant since the early 1990s. The site has been owned by Mr. K. Psihopedas and Mr. S. Psychopedas of Springfield, Vermont since 1993.

The site and vicinity are served by municipal drinking water and sanitary sewer systems. The properties adjacent to the site consist of commercial developments to the north, southeast and west. The Black River is located approximately 200 feet west of the site and flows southeast.

A 1,000-gallon #2 fuel oil underground storage tank (UST) located adjacent to a basement wall was used for heating the building until 1993. At the time of the sale of the building in July of 1993, an alternative heating system was in place and the underground tank was taken out of use. The tank had last been tested in April 1992, at which time it passed a pressure tightness test.

During a property inspection in September 1996, a representative of Jaworski Geotech Inc. noted evidence suggesting that oil had impacted the basement along the foundation wall adjacent to the UST. In August 1997 personnel from Corporate Environmental Advisors Inc. observed staining and fuel oil odors along the basement wall adjacent to the UST. The Vermont Department of Environmental Conservation was notified of a potential fuel oil release on September 3, 1997 and Site Number 98-2404 was issued.

The UST and approximately 550 gallons of residual fuel oil in the tank were removed on June 25, 1998. The UST was observed to be rusted and pitted upon removal. In addition, approximately six cubic yards of petroleum impacted soil were removed for off-site recycling. A concrete slab believed to be part of a basement floor of a former adjacent building was encountered under the UST at the time of removal.

Soil samples collected from beneath the concrete basement floor of the Sparrow Building indicated that fuel oil had migrated under the building. After backfilling and repaving the UST excavation, it was noted that water was no longer getting into the basement during rain events, indicating that surface water had been infiltrating into the area of the former UST and likely causing or exacerbating the migration of fuel oil. It appears that site conditions have been stabilized and the source of the release has been removed, although the extent of impacts has not been fully delineated.



## 2. INTRODUCTION

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This Site Investigation Report (SIR) was prepared by Corporate Environmental Advisors, Inc. (CEA) to present the findings of a local and state file review, subsurface investigation, and an assessment of the potential receptors within 1,000 feet of the Sparrow Building located at 40 Main Street, Springfield, Vermont ("the site"). The site is owned by Mr. Konstantinos Psihopedas and Mr. S. Psychopedas of Springfield, Vermont. This SIR is subject to Limitations detailed in Attachment 1 of this report.

This SIR was prepared in general accordance with a workscope prepared by CEA dated August 3, 1998 and with Vermont Department of Environmental Conservation's (DEC) Site Investigation Guidance (Effective August 1996). DEC's Site Management Section approved of the SIR workscope in their August 4, 1998 letter to Mr. Psihopedas.

### 2.1. The Site and Vicinity

The Sparrow Building is located at the intersection of Main Street (Route 11) and Route 143 on the east side of Main Street. According to the Town of Springfield's Tax Assessors Cards, the 0.2 acre site (Lot No. 26-5-11) consists of a three story 6,315 square-foot building, serving as a restaurant and residential rental units. The lot consists of the footprint of the building (2,105 square feet). A Site Locus based on the Springfield, Vermont USGS Topographical Quadrangle is presented in Figure 1 of this report. The map shows the site to be at an elevation of approximately 413 feet above mean sea level. The area within approximately one-half mile of the site has a relief of approximately 469 feet from hill to valley with topography generally higher to the north. The site is located at N43° 17.911', W72° 28.934'.

### 2.2. Project Background

#### UST Tank Tightness Test (April 1992)

Following the recommendations of an April 1992 Phase I Environmental Site Assessment prepared by Jaworski Geotech, Inc (JGI) of White River Junction, VT, the previous owners of the property (Mr. Kritikous and Mr. Makris) contracted with JGI to conduct a tightness test on the site's 1,000-gallon #2 fuel oil UST which test revealed a pressure loss of 0.0158 gallons per hour. The measured rate was below the existing State of Vermont guidelines of 0.05 gallons per hour and therefore was considered tight. In a September 14, 1998 discussion with a JGI representative, CEA learned that the recorded pressure loss may have been the result of tank expansion, a loss of pressure at the test equipment/tank interface, an actual loss through the walls of the UST, or a combination of those avenues. At some time between the tank test in April 1992 and the sale of the property in July 1993, the previous owners of the site installed propane fired heating system and the 1,000-gallon UST was abandoned.



#### Follow-up Site Visit (September 1996)

At the request of the current owners of the property, JGI returned to the site in September 1996 to conduct a site visit and evaluate the site's conditions relative to current Federal and Vermont asbestos rules and regulations. JGI also documented visual and photoionization detector (PID) evidence suggesting that oil had impacted the basement along the foundation wall adjacent to the UST. PID readings near a stained area on the wall revealed PID readings ranging from 20 parts per million by volume (ppmv) to 25 ppmv. JGI also observed that the majority of the asbestos material that was noted by JGI in April 1992 had been removed. The current owners of the property were not aware of permits, bills of lading or disposal documentation that would provide evidence that a licensed contractor had performed the asbestos abatement. JGI also noted, that according the current owners, a contractor for the previous owners had stated that an oil furnace with asbestos insulation had been buried at the base of the stairs under the basement floor.

#### Site Visit (August 18, 1997)

On August 28, 1997, CEA conducted a site visit at the request of the current owner of the property, Mr. Psihopedas. The owner stated that during April 1997 small amounts of what appeared to be fuel oil were observed to have apparently seeped up through the concrete basement floor in several locations. In addition, a fuel oil-like odor had been noted during times when the basement area was not well ventilated. During the August 1997 site visit, CEA did not note an odor of fuel oil in the ambient air of the basement, but staining and a fuel oil odor were noted along the basement wall adjacent to the location of the UST. Following the site visit and review of JGI documents, CEA recommended to the site owner that the DEC be notified of the potential of a release. On September 3, 1997, CEA relayed the site information by telephone to a DEC representative. A follow-up letter was sent to the DEC on September 4, 1997.

#### UST Removal (June 25, 1998)

On June 25, 1998, CEA oversaw the removal of the site's 1,000-gallon #2 fuel oil UST. Approximately 550 gallons of fuel oil were pumped from the UST and approximately 20 gallons of sludge were removed from the UST during cleaning. Soil samples collected from above the UST and the walls of the excavation (approximately 1 foot below ground surface (bgs) to 5 feet bgs) did not display visual or olfactory evidence of a fuel oil impact. Soil screening with the PID did not reveal volatile organic compounds (VOCs) above detectable levels. Soils surrounding the fill and vent lines appeared somewhat darker than the soils observed in the excavation. However, soil samples collected from the vicinity of the piping did not display a fuel oil odor and screening with the PID did not reveal VOCs above detectable levels. Following the removal of the UST from the excavation, the UST was observed to be rusted and pitted.

Soil beneath the UST was observed to be stained dark gray with an odor and appearance suggesting weathered petroleum product. Soil samples retrieved from the base of the



excavation (approximately 6 feet bgs) revealed PID readings ranging from 7 ppmv to 20 ppmv. At approximately 7 feet bgs a concrete slab was encountered. The stained soil was observed to be situated above the slab at a thickness of approximately 0.5 foot to 1 foot throughout the base of the excavation. The approximately 10-foot wide excavation was extended to a total of 22 feet long in an attempt to define the extent of the fuel oil impact and the concrete slab. This effort was constrained by the presence of a propane line to the northeast, a propane line and 15-foot high retaining wall to the east, potential utilities to the southeast and the site building to the west. The visible portion of the concrete slab appeared to be relatively intact, but an investigation of the material below the concrete slab was not possible with the equipment available. Neither bedrock nor groundwater was encountered during the UST excavation.

The concrete slab encountered below the UST extended to the foundation of the Sparrow Building and at the same approximate depth as the basement floor of the Sparrow Building. Discussions with the property owner and a review of historical photographs, suggested that the slab was part of the former basement of the former Ideal Theater that was demolished during the 1960s.

Approximately 6 cubic yards (9.3 tons) of the oil-impacted soil with elevated PID readings was excavated from the tank bed and along the foundation wall of the site structure. The impacted material was removed to reduce the potential for continued impact to the basement of the Sparrow Building.

The DEC was notified of CEA's observations and that further excavation was being discontinued. In addition, CEA requested and received approval from DEC to transport the fuel oil-impacted soil to Environmental Soil Management, Inc. (ESMI) in Loudon, New Hampshire for thermal desorbtion.

CEA screened the basement area adjacent to the former UST location. The basement wall consists of sections of both concrete block and stone construction. The PID did not detect VOCs in the ambient air space of the basement. The damp area at the base of the basement wall revealed a PID reading of 0.5 ppmv.

Following cleaning of the UST, the tank appeared to be in poor condition, with numerous small holes noted. Although some of the holes may have been aggravated during the tank closure, the holes are evidence of significant weaknesses in the tank walls. Given the need for the UST to be filled to capacity prior to tightness testing in 1992 and the 570 gallons of fuel oil and sludge removed on June 25, 1998, approximately 430 gallons of fuel oil were unaccounted for. The extent of the fuel oil impact was not been defined during the UST closure.

On June 25, 1998, CEA submitted an Underground Storage Tank Permanent Closure Report to the DEC documenting the above noted site conditions. CEA submitted a Work Scope and Cost Estimate for DEC review dated August 3, 1998 and received DEC approval in a letter dated August 4, 1998.



### 3. BACKGROUND REVIEW

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#### 3.1. Town Record Review

According to the Springfield Town Lister's Office, the subject property has been owned and operated as a restaurant (Village Pizza) by Mr. K. Psihopedas and Mr. S. Psychopedas since 1993. Prior to that time the property served as a restaurant (also Village Pizza) owned and operated by Mr. S. Kritikos and Mr. G. Makris from 1992 to 1993. Site ownership history is as follows in Table 1:

Table 1: Ownership History

Date	Property Owner
1993 - Present	K Psihopedas & S. Psychopedas
1992 - 1993	S. Kritikos & G. Makris
1986 - 1992	A. & S. Adlerbert/First VT Bank & Trust
1966 - 1986	Lawrence & Wheeler Real Estate Corp.
1960 - 1966	H. & C. Lafountain
1950 - 1960	Latchis Corp.

In addition to Village Pizza, the 6,315 square foot building is occupied by four residential apartments and a basement area used for food preparation and storage. The site is served by municipal water and sanitary sewer service.

According to town official and the current site owners, the Sparrow Building has served as a clothing store, a Sherman Williams paint store and a dentist's office.

A review of blueprints produced in 1962 revealed that the concrete slab encountered during the UST closure was most likely associated with the former Ideal Theater. The theater building was demolished in 1961. The Sparrow Building and the Ideal Theater appear to have shared what is now the eastern wall of the Sparrow Building. An approximately 4-foot wide section of concrete block wall was noted in the otherwise stone block foundation wall of the eastern wall of the Sparrow Building. The concrete block section may have been a former access-way between the basement areas of the Sparrow Building and the Ideal Theater. Based on observations made during the UST closure, it appears that the basement floors of the Sparrow Building and the former Ideal Theater are at the same approximate elevation. A review of the blueprints reveals that the former Ideal Theater extended approximately 30 feet east and approximately 126 feet south of the northeastern corner of the Sparrow Building. However,



the blueprint did not reveal the extent of the concrete slab underlying the footprint of the Ideal Theater. **Figure 2** of this report includes the approximate footprint of the Ideal Theater as well as other site features identified in the review of the 1962 blueprints.

### 3.2. State File Review

On August 21, 1998, CEA reviewed available files at the DEC Waste Management Division in Waterbury, Vermont relating to the documentation of releases of petroleum products or hazardous materials within 1,000 feet of the Sparrow Building.

#### Active Vermont Hazardous Waste Sites

**DEC Site #98-2404:** Sparrow Building/Village Pizza, 40 Main Street, Springfield, Vermont. This is the subject site of this investigation.

**DEC Site #97-2318:** Springfield Electroplating, 135 Main Street, Springfield, Vermont. Following the closure of 1,000-gallon fuel oil UST by Griffin International (GI) of Williston, VT in November of 1997, Stone Environmental, (SE) of Montpelier, Vermont initiated a Site Investigation. No Site Investigation was found in the DEC file for this site.

**DEC Site #97-2315:** Lovejoy Tool Company, 133 Main Street, Springfield, Vermont. Following the closure of 1,000-gallon fuel oil by Griffin International in November of 1997, Stone Environmental initiated a Site Investigation. No Site Investigation was found in the DEC file for this site.

Additional documentation was not found relating to the presence of Active Vermont Hazardous Waste Sites, other than those mentioned above, currently existing within 1,000 feet of the site.

#### Closed Vermont Hazardous Waste Sites

**DEC Site #92-1253:** First National Bank of Vermont, 56 Main Street, Springfield, VT. Following the removal of a 2,000-gallon gasoline UST removed in June 1992 a soil boring was installed in the former UST bed. A PID reading of 95 ppm was obtained at a depth of 9 feet bgs. Auger refusal was encountered at a depth of 9.5 feet bgs which was believed to be bedrock. Groundwater was not encountered during the installation of the soil boring. The contamination found was attributed to a fuel oil UST removed in 1982, however there were two other fuel oil USTs on-site which may have contributed to the contamination, as well as the gasoline UST removed in 1992. Due to the absence of groundwater and other sensitive receptors in close proximity to the site, no further action was requested by DEC.

Additional documentation was not found relating to the presence of Closed Vermont Hazardous Waste Sites, other than those mentioned above, currently existing within 1,000 feet of the site.



### UST File Review

The following Springfield, Vermont facilities maintain registered USTs within approximately 1,000 feet of the site. No data other than facility name was included in the DEC UST list reviewed by CEA.

East School, 199 Summer St.	USPS, 132 Main St.
Lovejoy Tool Co., 133 Main St.	Springfield S & L, 85 Main St.
First National Bank of VT, 56 Main St.	Bank Block, 56 Main St.
Springfield Community Center, 139 Main St.	First Cong. Church, 77 Main St.

Additional documentation was not found relating to the presence of DEC registered USTs, other than those mentioned above, currently existing within 1,000 feet of the site.

During this investigation CEA noted the presence of a fill pipe for a UST located approximately 50 feet south of the site, estimated to be downgradient of the site. The UST stores fuel for the heating system of the Lawrence & Wheeler Building. No other information was obtained during this investigation regarding the capacity, age or condition of the UST.

In addition, CEA reviewed a 1962 blueprint of the Sparrow Building drawn up to plan site remodeling and found a note to "move oil tank fill pipes over". During this investigation, CEA noted the presence of fill and vent line extending under the Lawrence and Wheeler extension and then into the Sparrow Building. CEA observed that the pipes entered the southern basement wall of the Sparrow Building but did not appear to be currently piped to a UST or AST in the basement of the Sparrow Building. No further information was obtained in reference to the exact location, age or the condition of the UST, or the date of closure.

### Closed UST File Review

For documentation relating to closed UST, formerly located within 1,000 feet of the site, refer to the sites listed in Active Vermont Hazardous Waste Sites and Closed Vermont Hazardous Waste Sites file review sections above. Additional documentation was not found relating to closed USTs formerly located within 1,000 feet of the site, other than those listed above.

### Solid Waste Program Files

Documentation was not found relating to the presence of DEC listed solid waste sites within 1,000 feet of the site.

### Vermont Spills Data Base Listing

The DEC Spills DataBase Listing for the Town of Springfield documents spills of petroleum products and hazardous materials from January 1973 to the present. A review of the Spills DataBase Listing on January 21, 1998 did not reveal any significant releases within a 1,000-foot radius of the site.

### RCRA

The following Springfield, VT facilities are listed with the DEC as regulated generators of hazardous waste, as required by United States Environmental Protection Agency (EPA) under the Resource Conservation and Recovery Act (RCRA).



Data Material Corp., 127 Main Street, Springfield, VT (14-18-028, VTD088581848).  
Status: out of business.

Fair-Rite Products Corp., 127 Main Street, Springfield, VT (14-18-021,  
VTD988375390). Status: not listed.

Lovejoy Tool Co., 133 Main Street, Springfield, VT (14-18-036, VTD001087063).  
Status: fully regulated generator of hazardous waste (> 100 kilograms/month).

Springfield Electroplating, 135 Main Street, Springfield, VT (14-18-007,  
VTD001079367). Status: fully regulated generator of hazardous waste (> 100  
kilograms/month).

Town of Springfield, VT (14-18-061). Status: conditionally exempt small quantity  
generators (< 100 kilograms/month).

Documentation was not found relating to the presence of RCRA regulated hazardous waste  
generators, other than those listed above, existing within 1,000 feet of the site.



## 4. SUBSURFACE EXPLORATIONS AND ANALYSES

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### 4.1. Soil Boring Advancement

On August 25, 1998, CEA oversaw the advancement of six soil borings in the basement of the subject property. The soil borings were advanced with a coring drill and Geoprobe® tools operated by Twin State Environmental Corporation (TSEC) of Richmond, VT. The objective of this subsurface investigation was to gather evidence relating to the presence, and if encountered, the extent and degree, of fuel oil contamination existing below the basement slab of the site building. CEA planned to advance the first borings near areas that the site owners had observed the apparent fuel oil stains. CEA would then direct soil borings to be advanced at distances and locations suggested by the evidence gathered during the initial soil borings.

During the installation of the soil borings a representative of Catamount Environmental, Inc. (CEI) of Wilmington, VT was present to provide health and safety oversight and guidance should suspected asbestos containing material (ACM) be encountered. CEI did not note visual evidence of ACM. Two confirmatory samples were submitted to EMSL Analytical, Inc. of Westmount, NJ for laboratory analysis by Polarized Light Microscopy with Dispersion Staining. Both samples tested negative for asbestos content.

Prior to the advancement of the soil borings, a coring drill was used to core through the basement's concrete floor. The thickness of the concrete floor in the area of the investigation ranged from 0.25 feet to 1.2 feet. Corings revealed two segments of concrete, some separated by a thin layer of paint, suggesting that much of the floor in the area of investigation consisting of two separate concrete pours.

To assess the potential impact to the ambient air of the basement, CEA collected vapor samples from the first four borings of the investigation. A Geoprobe rod with tygon tubing was advanced to approximately 0.5 feet below the concrete slab and a vapor sample was drawn into a Tedlar sampling bag. The vapor sample was then screened with a PID. The four vapor samples revealed PID readings ranging from non-detect to 30 parts per million (ppm).

CEA attempted to collect soil samples with the Geoprobe® tools at intervals of two feet. Auger refusal was encountered at depths ranging from 0.5 feet below the concrete slab to 4.5 feet below the concrete slab. These findings are consistent with the findings of a 1992 soil boring advanced within 300 feet of the site (DEC Site #92-1253: First National Bank of Vermont) where bedrock was believed to have been encountered at 9.5 feet bgs. Soil boring locations are shown in the Site Layout map in Figure 2 of this report.

### 4.2. Field Screening of Soil Samples

During advancement of the soil borings on August 25, 1998, CEA attempted to obtain soil samples at two foot intervals from each of the boreholes and field screen the samples for VOCs with a PID (HNU Model PL101) with a 10.2 eV lamp. VOCs were detected in soil samples



collected from SB-2, SB-4 and SB-5, with a peak reading of 35 ppm obtained from SB-4. Soil samples exhibiting elevated PID readings appeared to be stained dark gray with an odor and appearance suggesting weathered petroleum product. **Table 2** summarizes the findings of the PID screening of the soil samples collected from the soil borings.

**Table 2. PID Readings of Total VOCs in the Soil Borings**

Depth Below Concrete Slab	Soil Borings					
	SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
0.0' - 2.0'		28 ppmv				
		refusal		35 ppmv		
				refusal		
		ND	ND		8.5 ppmv	ND
2.0' - 4.0'		refusal				
			ND		6 ppmv	
			refusal		4.5 ppmv	
					refusal	ND
						ND
						refusal
ND = non-detected                      ppmv = parts per million by volume Shaded blocks are soil samples selected for laboratory analysis.						

### 4.3. Laboratory Analysis of Soil Samples

On August 25, 1998, CEA collected soil samples for laboratory analysis from the six soil borings. One soil sample was collected from each of the borings for laboratory analysis of total petroleum hydrocarbons (TPH) concentrations by EPA Method 8100M. Three samples were collected for analysis of volatile organic compounds (VOCs) concentrations by EPA Method 8260. The selection of soil samples for analysis was limited by the amount of material collected in some of the hollow spoon samples. Soil samples were submitted to Spectrum Analytical, Inc. of Agawam, MA.

As stated in VTDEC's Site Investigation Guidance (August 1996), a risk based approach is required in evaluating the results of soil analysis. The VTDEC has not adopted formal soil standards but instead accepts any valid approach to the modeling of risk, including use of US Environmental Protection Agency (EPA) generic soil screening levels (SSL). SSL values are presented in EPA's Soil Screening Guidance: Technical Background Document (May 1996), Appendix A.

Table 3 of this report presents concentrations of VOCs and TPH detected in the soil samples collected on August 25, 1998 and the corresponding EPA generic SSLs. No SSL exists for TPH. The appropriate generic SSL is dependent on the potential exposure pathway(s). Included in the table are SSLs based on the exposure pathways of direct ingestion of the soil,



the inhalation of volatiles in the soil, and two SSLs based on the potential impact to groundwater from the soil. The SSLs developed to assess the risk posed to groundwater use a default dilution-attenuation factor (DAF) of 20 to account for natural processes that reduce contaminant concentrations in the subsurface or a DAF of 1 that assumes no dilution or attenuation between the source and a receptor well. A complete laboratory report for the August 25, 1998 sampling event is presented in **Attachment 3**.

**Table 3. Summary of Soil Analysis and EPA SSLs**

Date	Compound	Standard				SB-1	SB-2	SB-3	SB-4	SB-5	SB-6
		EPA Ingest.	EPA Inhale.	EPA 20 DAF	EPA 1 DAF						
8/25/98	n-Butylbenzene					NS	8.6	NS	12.6	ND	NS
	sec-Butylbenzene					NS	4.4	NS	6.1	ND	NS
	4-Isopropyltoluene					NS	3.8	NS	5.5	ND	NS
	n-Propylbenzene					NS	3.5	NS	5.0	ND	NS
	1,2,4-Trimethylbenzene					NS	21.4	NS	27.5	ND	NS
	1,3,5-Trimethylbenzene					NS	8.2	NS	10.8	ND	NS
	Ethylbenzene	7,800	400	13	0.7	NS	1.9	NS	2.0	ND	NS
	Isopropylbenzene					NS	2.0	NS	2.7	ND	NS
	Naphthalene	3,100	--	84	4	NS	10.7	NS	17.4	ND	NS
	Toluene	16,000	650	12	0.6	NS	0.38	NS	ND	ND	NS
	m,p Xylenes	1.6E+05	870	410	20	NS	3.1	NS	6.3	ND	NS
	o-Xylene	1.6E+05	410	190	9	NS	2.2	NS	3.1	ND	NS
	TPH					57	1,700	130	25,000	2,700	ND

NS = Not Sampled, sample not submitted for analysis by EPA Method 8260

In selecting the appropriate SSL a review of site conditions is required:



Ingestion: The majority of the impacted soil appears to lie beneath either a paved parking area or beneath between 0.25 feet and 1.2 feet of concrete. Therefore there appears to be a low potential for direct contact and ingestion of the impacted soil.

Inhalation: Site owners have noted the presence of a fuel oil odor in the basement during times that the basement is not ventilated and a fuel oil-like residue in small pools of water in several areas of the basement floor. CEA did not determine whether this material had migrated through weaknesses in the concrete or whether the residue was left by the periodic flooding of the basement. PID readings along the stained area at the base of basement wall have revealed PID readings of between 0.5 ppmv to 25 ppmv.

EPA 20 DAF and EPA 1 DAF: During the site's UST closure, the advancement of soil borings within the site's basement, and a 1992 off-site UST closure, groundwater was not encountered at a maximum approximate depth of approximately 12.5 bgs. Evidence collected during this investigation suggests that bedrock exists at an approximate range of 8.5 feet bgs to 12.5 feet bgs. CEA did not determine whether the fuel oil had migrated into fractured bedrock. If fuel oil has migrated to bedrock, little attenuation or dilution would take place prior to reaching potential downgradient receptors.

The evidence gathered by CEA in this investigation suggests that two possible pathways for contaminant exposure are inhalation of ambient air in the basement and the potential for contaminant migration in bedrock. If the EPA SSL for inhalation is applied then analytes in the soil samples do not exceed the inhalation SSL. Only if the most stringent standard of EPA 1DAF is applied then do detected analytes exceed the SSL.

A conservative approach would be based on the most stringent SSL, EPA 1DAF. A comparison of the concentrations detected in the soil samples with the corresponding SSL reveals levels of analytes above 1 DAF SSL in SB-1 and SB-2. Soil samples retrieved from SB-1 and SB-2 exceed 1DAF SSL for Ethylbenzene and Naphthalene.

TPH concentration in the soil samples was found to range from non-detect to 25,000 ppmv, with an average of 4,931ppmv for the six borings. DEC typically uses 400 ppmv as a guideline for assessing impact beneath a residential structure and 1,000 ppmv for impacted soil outside of a structure.



## 5. SITE HYDROGEOLOGY

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### 5.1. Surficial Geology

Soils encountered during drilling consisted primarily of silty fine to medium sand. Auger refusal was encountered at depths ranging from 0.5 feet below the concrete slab to 4.5 feet below the concrete slab. The depth to refusal is approximately equivalent to 8.5 feet bgs to 12.5 bgs, given the height of the basement and the thickness of the concrete slab. This depth to refusal is not inconsistent with the findings of a 1992 UST closure (DEC Site #92-1253) conducted approximately 300 feet south of the site that encountered bedrock at approximately 9.5 feet bgs. During the site's UST closure, the advancement of soil borings within the site's basement and the above noted UST closure, groundwater was not encountered at a maximum approximate depth of 12.5 bgs. In addition, CEA observed exposed bedrock on the banks of the Black River, approximately 200 feet west of the site.

## 6. INITIAL RISK EVALUATION

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### 6.1. Potential Sources

Based the site's history, the observations made during the UST removal in June 1998 and the soil boring advancement in the basement of the site in August 1998, evidence suggests that petroleum-impacted soil beneath the UST and the concrete floor of the basement may be due to a release from the site's former 1,000-gallon heating oil UST.

Given the need for the UST to be filled to capacity prior to tightness testing in 1992 and the 570 gallons of fuel oil and sludge removed on June 26, 1998, approximately 430 gallons of fuel oil are unaccounted for.

A heating oil UST currently exists approximately 30 southwest of the site and evidence noted previously suggests that at one time a UST may have existed near the southern wall of the Sparrow Buildings. However these two UST appear to somewhat downgradient of the area of heaviest impact noted during the UST closure and the soil borings, and therefore appear less likely to have caused the impact to soil noted during June 1998 UST closure.



## 6.2. Potential Receptors

The following sensitive receptors were assessed for potential impact resulting from the apparent release from site's former UST system.

The site and vicinity are served by municipal water and sanitary sewer systems. According to the Basic Well Data Sheets for the town of Springfield, Vermont provided by the Water Supply Division of the DEC there are approximately 3 private drinking water wells within a 3,000-foot radius of the site, and none within a 1,000-foot radius. The Basic Well Data Sheets list the three wells as having yields of from 2 gallons per minute (gpm) to 5 gpm.

The current owners of the site reported several instances of small amounts of what appeared to be fuel oil apparently seeping up through weaknesses in the concrete basement floor in several locations. In addition, the owners have noted a fuel oil-like odor when the basement area was not well ventilated.

On August 25, 1998, CEA screened the ambient airspace within the site's basement area for VOCs with a PID. The basement consists of a poured concrete floor with stone block foundation walls. Portions of the foundation have been completed with concrete block sections. It appears that the more recent concrete block sections were added during renovations to the building in the early 1960s. During a September 1996 site visit, JGI obtained PID readings of 20 ppmv to 25 ppmv along the damp area at the base of the basement wall nearest the UST. Following the closure of the UST in June 1998, CEA did not detect VOCs with a PID in the ambient air of the basement, but the damp area of the basement wall revealed a reading of 0.5 ppmv.

The crawl space beneath the Lawrence and Wheeler extension abutting the Sparrow Building did not reveal olfactory or PID evidence of a fuel oil impact. Prior to the early 1960s the site of the Lawrence and Wheeler extension was an alleyway between the Sparrow Building and the Lawrence and Wheeler Building. The basement of the Lawrence and Wheeler Building did not reveal olfactory or PID evidence of a fuel oil impact. The observed portion of the basement of the Lawrence and Wheeler Building consists of poured concrete floor and walls. Ambient air beneath other commercial and/or residential structures that exist within 1,000 feet were not screened for VOCs because of the apparent low potential for VOC migrating the distance and/or direction from the site.

VOCs were not detected and olfactory evidence was not noted that would suggest an impact to the outdoor air of the site. The potential for direct contact with impacted soil in the site's subsurface and/or VOCs in the outdoor air of the site is reduced due to asphalt and concrete coverage of the ground's surface above the former UST.

Bedrock in the immediate vicinity of the site is estimated to be at depths ranging from 8.5 feet bgs to 12.5 bgs. The Black River exists approximately 200 feet west and topographically downgradient of the site. CEA observed exposed bedrock approximately 200 feet west of the site on the bank of the Black River at an elevation that is not inconsistent with the depth to bedrock noted above. Significant wetland areas or other sensitive ecological areas within 1,000 feet of the site were not observed by CEA during this investigation.



Municipal water and sanitary sewer service are carried to the site and vicinity by below ground service lines. However, the absence of groundwater down to a depth of 12.5 feet bgs reduces the potential for subsurface utilities to act as pathways for contaminant migration.

A storm drain was noted approximately 36 feet south of the Sparrow Building. The site owner stated that while observing the cleaning of the storm drains approximately 2 years ago, he had noted a strong odor of fuel oil. When questioned, workers stated that they believed the fuel oil in the drain was from a minor overflow of the Lawrence and Wheeler UST, located approximately 10 feet upgradient of the storm drain. During the June UST closure and subsequent site visits, CEA has not noted olfactory or PID evidence of a fuel oil impact to the storm drain.

### 6.3. Contaminant Distribution

Contaminant levels, based on laboratory analysis of groundwater samples from the January 20, 1998 sampling event, are presented in the Site Layout presented in Figure 2.

- During the June 1998 UST closure, soil beneath the UST was observed to be stained dark gray with an odor and appearance suggesting weathered petroleum product. Soil samples retrieved from the base of the excavation (approximately 6 feet bgs) revealed PID readings ranging from 7 ppmv to 20 ppmv. At approximately 7 feet bgs a concrete slab was encountered. The stained soil was observed to be situated above the slab at a thickness of approximately 0.5 feet to 1 foot throughout the base of the excavation. The approximately 10-foot wide by 22 feet long excavation did not determine the extent of the fuel oil impact and the concrete slab.
- A review of blueprints produced in 1962 revealed that the concrete slab encountered during the UST closure is most likely associated with the former Ideal Theater, demolished in 1961. The former Ideal Theater extended approximately 30 feet east and approximately 126 feet south of the northeastern corner of the Sparrow Building, but the blue prints did not specify the extent of the concrete slab and basement of the theater.
- During advancement of the soil borings beneath the basement's concrete floor, hollow spoon soil samples were obtained at two foot intervals from each of the boreholes and field screened for VOCs with a PID. VOCs were detected at a peak level of 35 ppmv.
- Analytes detected in the soil samples do not exceed all but the most stringent EPA generic SSL (EPA 1 DAF). A comparison of the concentrations found in the soil samples with the corresponding SSL reveal levels of Ethylbenzene and Naphthalene above 1 DAF SSL in SB-1 and SB-2.
- TPH concentration in the soil samples were found to range from non-detect to 25,000 ppmv, with an average of 4,931 ppmv for the six borings.

#### 6.4. Contaminant Fate and Transport

The owners of the site have reported numerous instances of the southwestern portion of the basement (near the former UST) flooding during periods of heavy rainfall. Evidence suggests that surface water run-off, and not shallow groundwater, may have caused this seasonal flooding of the basement. The relatively steep surficial topography of the area surrounding the site results into a significant volume of surface water run-off during rain events. Run-off from the road and parking area east of the site may have migrated down through breaks in the paving to the former theatre's basement and then transported fuel oil against the Sparrow Building's foundation and under the basement slab. This conclusion is supported by the absence of evidence suggesting the interception of the groundwater table during this investigation and by the observation that since the area over the former UST has been re-paved and pitched away from the building, the flooding has not reoccurred.

Given the observations of the area of stained soil existing on top of the former theater's basement slab, the area of impact observed during the advancement of soil borings beneath the Sparrow Building's basement floor, and surficial topography, a potential exists for fuel oil to have migrated downgradient to beneath the existing parking area south of the site.

Based on evidence gathered during this investigation, CEA estimates that bedrock exists at approximately 9.5 feet bgs to 12.5 feet bgs. The fate of residual fuel oil once encountering bedrock was not determined during this investigation.

## 7. CONCLUSIONS AND RECOMMENDATIONS

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Conclusions and recommendations presented in this report are based solely on information obtained during the course of this investigation. Changes in site conditions, or information not available for review at the time of this investigation, may necessitate an update of these conclusions and recommendations.

### 7.1. Conclusions

- The site and vicinity are served by municipal drinking water system and sanitary sewer system. The properties adjacent to the site consist of commercial developments to the north, southeast and west.
- An April 1992 tightness test of the site's 1,000-gallon #2 fuel oil UST revealing a pressure loss of 0.0158 gallons per hour. At some time between April 1992 and July 1993 the UST was abandoned.
- The current owners of the site have reported instances of small amounts of what appeared to be fuel oil apparently seeping up through the concrete basement floor in several locations. In addition, the owners have noted a fuel oil-like odor when the basement area was not well ventilated. The basement of the Sparrow Building is used for food preparation and storage.
- During a September 1996 site visit, JGI obtained PID readings of 20 ppmv to 25 ppmv along the stained area at the base of the basement wall nearest the UST. Following the closure of the UST in June 1998, CEA obtained PID readings of 0.5 ppmv along the stained area of the basement wall.
- On June 25, 1998, CEA oversaw the removal of the site's 1,000-gallon #2 fuel oil UST. Soil beneath the UST was observed to be stained dark gray with an odor and appearance suggesting weathered petroleum product. Soil samples retrieved from the base of the excavation revealed PID readings ranging from 7 ppmv to 20 ppmv. At approximately 7 feet bgs a concrete slab was encountered. The stained soil was observed to be situated above the slab at a thickness of approximately 0.5 foot to 1 foot throughout the base of the excavation. The extent of the fuel oil impacted soil and the concrete slab were not defined during the UST closure. The concrete slab below the UST was most likely associate with former Ideal Theater.
- The UST appeared to be in poor condition, with numerous small holes noted. Given the need for the UST to be filled to capacity prior to tightness testing in 1992 and the 570 gallons of fuel oil and sludge removed in June 1998, approximately 430 gallons of fuel oil are unaccounted for.

- Approximately 6 cubic yards of the oil-impacted soil with elevated PID readings were excavated from the tank bed and along the foundation wall of the site structure and transported off-site for thermal desorbition.
- On August 25, 1998, CEA oversaw the advancement of six soil borings in the basement of the Sparrow Building. CEA field screened the soil samples collected from the soil borings for VOCs with a PID. VOCs were detected in soil samples from three of the borings, with a peak reading of 35 ppmv.
- CEA collected soil samples for laboratory analysis of TPH from six of the soil borings and two samples for laboratory analysis of VOCs from three of the soil borings. Laboratory analysis revealed concentrations of analytes exceeded EPA SSL 1DAF for Ethylbenzene and Naphthalene in two of the soil samples. TPH concentrations in the soil samples were found to range from non-detect to 25,000 ppmv.
- The owners of the site have reported numerous instances of the southwestern portion of the basement (near the former UST) flooding during periods of heavy rainfall. Evidence suggests that surface water run-off, and not shallow groundwater, may have caused the flooding of the basement. Run-off from the road and parking area east of the site may have migrated down through breaks in the paving to the former theatre's basement and then transported fuel oil from the UST area against the Sparrow Building's foundation and under the basement slab. Since the area over the former UST has been re-paved and pitched away from the building, the flooding has not reoccurred.
- VOCs were not detected in the basement or crawl space beneath the Lawrence and Wheeler Building or the Lawrence and Wheeler extension that abut the Sparrow Building. Ambient air beneath other commercial and/or residential structures that exist within 1,000 feet were not screened for VOCs because of the apparent low potential for VOC migrating the distance and/or direction from the site.
- Bedrock in the immediate vicinity of the site is estimated to exist at depths ranging from 8.5 feet bgs to 12.5 bgs. The fate of residual fuel oil once encountering bedrock was not determined during this investigation.
- During this investigation groundwater was not encountered at a maximum approximate depth of 12.5 bgs. The Black River exists approximately 200 feet west and topographically downgradient of the site. Significant wetland areas or other sensitive ecological areas within 1,000 feet of the site were not observed by CEA during this investigation.
- There are approximately 3 private drinking water wells within a 3,000-foot radius of the site, and none within a 1,000-foot radius. The DEC's Basic Well Data Sheets list the three wells as having yields of from 2 gpm to 5 gpm.
- VOCs were not detected and olfactory evidence was not noted that would suggest an impact to the outdoor air of the site. The potential for direct contact with impacted soil in the site's subsurface and/or VOCs in the outdoor air of the site is reduced due to asphalt and concrete coverage of the ground's surface above the former UST.



Evidence gathered during this investigation suggests that soil along the eastern wall of the site building and beneath a portion of the basement floor of the site building have been impacted by a release of #2 fuel oil, most likely originating from the site's former 1,000-gallon UST. Field screening with a PID and laboratory analysis of soil samples suggests that an approximately 100 square-foot area below the basement floor of the Sparrow Building has been significantly impacted by the release. The impacted soil along the foundation wall and beneath the basement floor appears to provide a source for recurring impact to the ambient air of the basement.

The recent paving and sealing of the area along the exterior of the eastern wall of the site building (and above the former UST bed) appears to have reduced the volume of water migrating into basement. However, as the blacktop paving weathers a potential exists for the reoccurrence of the flooding events that may have caused a majority of the impact to the basement. Due to use of the basement for food preparation and storage, CEA believes that the potential for a recurrence of the fuel-oil impact to the basement air space warrants further remedial actions.

The observations of the area of stained soil existing on top of the former theater's basement slab, the area of impact observed during the advancement of soil borings beneath the Sparrow Building's basement floor, and surficial topography, suggest a potential for fuel oil from the site's former UST to have migrated downgradient to beneath the existing parking area south of the site. During the UST closure and this investigation CEA was not able to determine whether fuel oil had migrated below the basement slab of the former Ideal Theater. In addition, the fate of residual fuel oil once encountering bedrock was not determined during this investigation.

## 7.2. Recommendations

Given the above described site conditions, CEA believes that the fuel oil-impacted soil existing along the exterior of the foundation wall, the former basement slab of the Ideal Theater and below the basement floor of the site building are potential sources for recurring impact to the site building's basement work area. Therefore, CEA recommends that further remedial actions be undertaken to reduce the potential for a recurring impact. An assessment of remedial approaches should include both in-situ treatment (such as venting and the enhancement of biodegradation) and the excavation of impacted soil. A remedial approach involving excavation is complicated by structural concerns for the site building and the retaining wall located approximately 20 feet east of the site.

Prior to the initiation of an assessment of remedial actions, further investigation of the extent of the off-site impact of the release should be conducted. A total of approximately 3 soil borings should be advanced, including: one boring through the slab of the former Ideal Theater in the area of the former UST; and, two downgradient soil borings in the parking area south of the site. The advancement of these soil borings would aid in the assessment of remedial actions and further delineate the impact of the release.

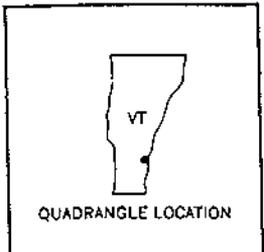
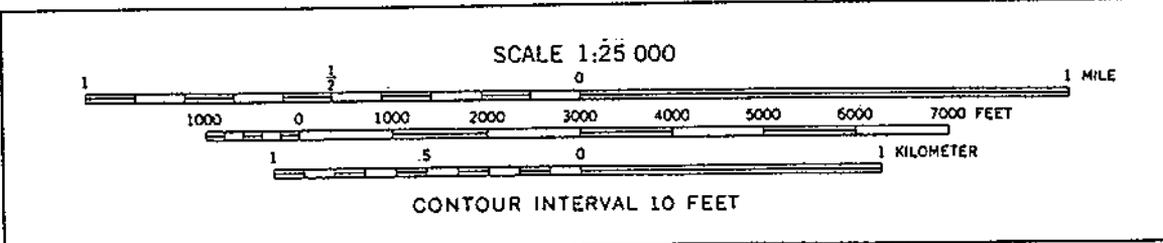
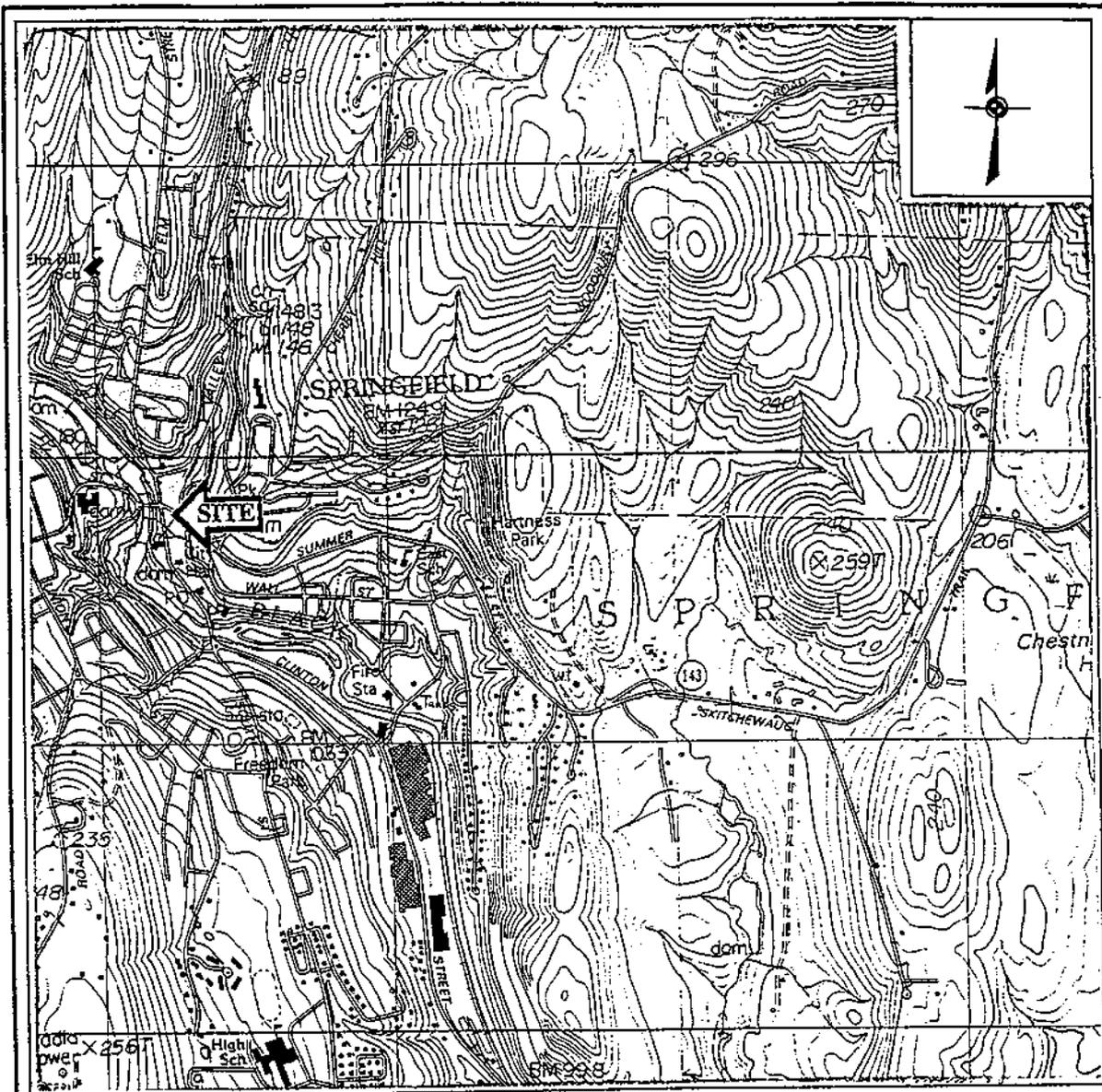
The fate of residual fuel oil once encountering bedrock was not determined during this investigation. The most effective way to assess the potential for impact to bedrock aquifers is the installation of bedrock monitoring wells. However, given the above described site conditions and the apparent absence of downgradient receptors, additional investigation of the impact to bedrock may not be warranted.



**FIGURE 1**

**Site Locus**



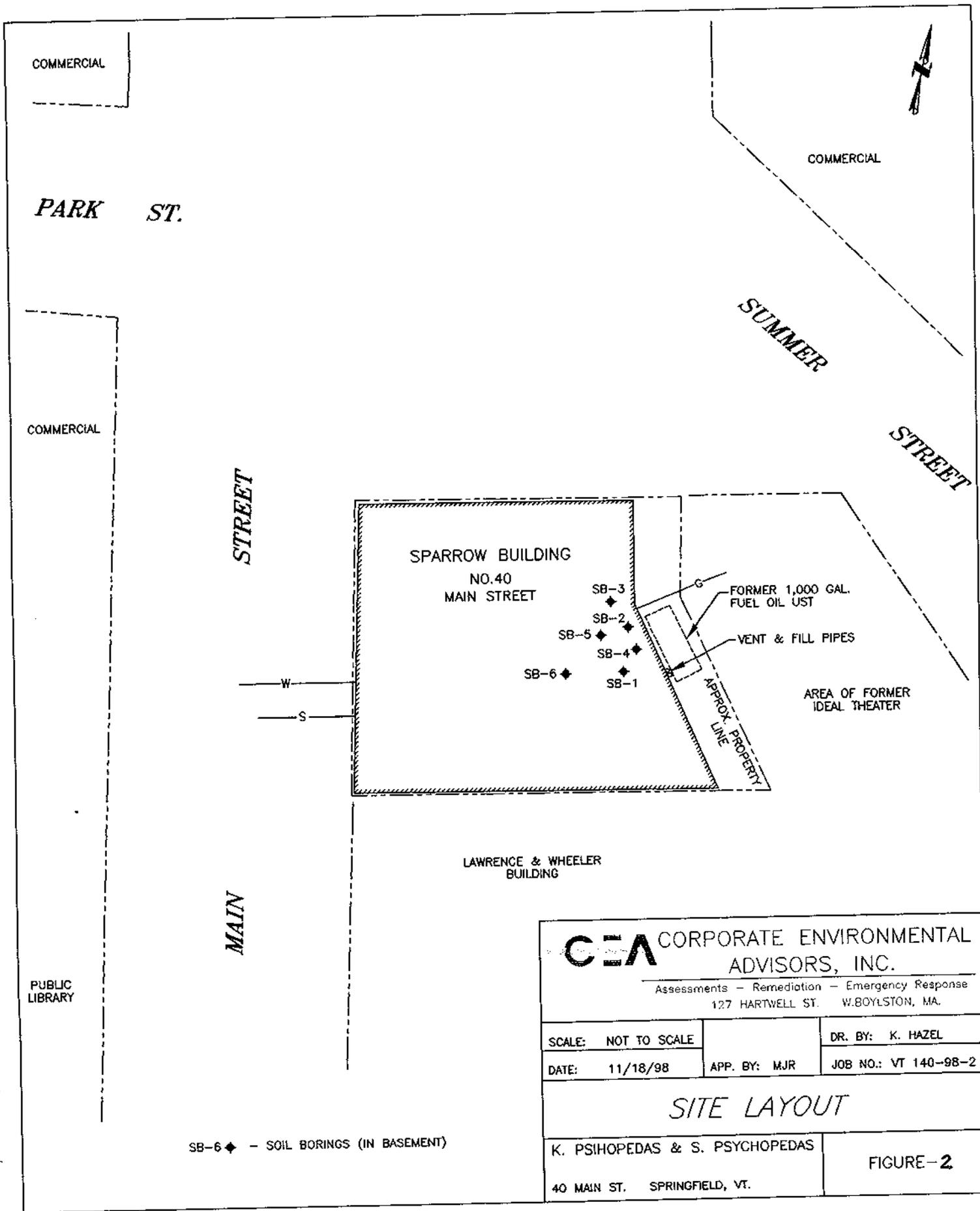


USGS Topographical Map  
Springfield, VT Quadrangle  
(Prov. Ed. 1984)  
1 : 25 000

**FIGURE 1**  
SITE LOCUS

**FIGURE 2**  
**Site Layout**





SB-6 ◆ - SOIL BORINGS (IN BASEMENT)

 <b>CORPORATE ENVIRONMENTAL ADVISORS, INC.</b>		
Assessments - Remediation - Emergency Response 127 HARTWELL ST. W. BOYLSTON, MA.		
SCALE: NOT TO SCALE		DR. BY: K. HAZEL
DATE: 11/18/98	APP. BY: MJR	JOB NO.: VT 140-98-2
<i>SITE LAYOUT</i>		
K. PSIHOPEDAS & S. PSYCHOPEDAS		FIGURE-2
40 MAIN ST. SPRINGFIELD, VT.		

**ATTACHMENT 1**  
**Limitations**



## Limitations

1. The sole purpose of the investigation and of this report is to assess the physical characteristics of the subject property with respect to the presence or absence in the environment of oil and/or hazardous materials and substances as defined in the applicable state and federal environmental laws and regulations, and to gather information regarding current and past environmental conditions at the subject property.
2. Corporate Environmental Advisors, Inc. (CEA) derived the data in this report primarily from visual inspections, examination of records in the public domain, interviews with individuals with information about the subject property, and a limited number of subsurface explorations made on the dates indicated. The passage of time, manifestation of latent conditions or occurrence of future events may require further exploration at the subject property, analysis of the data, and reevaluation of the findings, observations, and conclusions expressed in the report in accordance with local, state, and Federal regulations.
3. In preparing this report, CEA has relied upon, and presumed accurate, certain information (or the absence thereof) about the subject property and adjacent property provided by governmental officials and agencies, the Client, and others identified herein. Except as otherwise stated in the report, CEA has not attempted to verify the accuracy or completeness of any such information that is outside of the approved scope of this project.
4. The data reported and the findings, observations, and conclusions expressed in the report are limited by the Scope of Work, including the extent of subsurface exploration and other tests. The Scope of Work was defined by the requests of the Client, the time and budgetary constraints imposed the by Client, and the availability of access to the subject property.
5. Because of the limitations stated above, the findings, observations, and conclusions expressed by CEA in this report are not, and should not be considered, an opinion concerning the compliance of any past or present owner or operator of the subject property with any federal, state or local law or regulation. No warranty or guarantee, whether express or implied, is made with respect to the data reported or findings, observations, and conclusions expressed in this report. Further, such data, findings, observations, and conclusions are based solely upon subject property conditions in existence at the time of investigation.
6. This report has been prepared on behalf of and for the exclusive use of the Client, and is subject to and issued in connection with the Agreement and the provisions thereof.
7. This report was prepared for the exclusive use of **Mr. Psihopedas and Mr. Psychopedas** solely for the use in connection with the Environmental Site Assessment of the subject property at **40 Main Street, Springfield, MA**, in conjunction with the proximate transaction (i.e. purchase, refinance, regulatory enforcement action) of the subject property. This report was prepared in accordance with generally accepted environmental engineering practice. No other warranty, expressed or implied, is made.



**ATTACHMENT 2**  
**List of Abutting Property Owners**



List of Properties in the vicinity of the Sparrow Building  
40 Main Street  
Springfield, VT

Direction from Site	Lot Number	Owner	Size of Lot	Property Type
Site	26-5-11	K. Psihopedas & S. Psychopedas 40 Main Street Springfield, VT 05156	0.2 acres	commercial
South and East	26-5-12	Lawrence & Wheeler, Inc. 46 Main Street Springfield, VT 05156	0.12 acres	commercial, lot appears to include town right-of-way
North	26-5-67	P. Larkin 148 Main Street Springfield, VT 05156	0.25 acres	commercial
Southwest	26-5-43	Town of Springfield Public Library		public building
West	26-5-44	Woolson Block, Inc. 35 Brockway Mills Road Springfield, VT 05156	0.21 acres	commercial
Northwest	26-5-31	P. Larkin 148 Main Street Springfield, VT 05156	0.25 acres	commercial



**ATTACHMENT 3**  
**Laboratory Analytical Reports**





**SPECTRUM ANALYTICAL, INC.**

Massachusetts Certification M-MA 138  
Connecticut Approval # PH 0777  
Rhode Island # 98 & Maine # n/a  
New Hampshire ID # 2538  
New York ID #11393  
Florida HRS87448

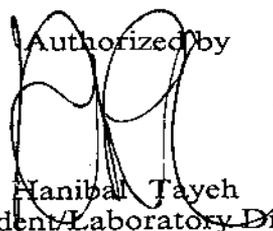
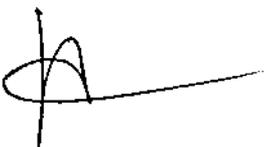
CEA, Inc.  
P.O. Box 260  
Putney, VT 05346

September 4, 1998

Attn: Paul Renouf

Client Project No.: VT140982 Location: Village Pizza-Springfield, MA

<u>Lab ID No.</u>	<u>Client ID</u>	<u>Analysis Requested</u>
AB16594	SB-1	TPH by GC
AB16595	SB-2	TPH by GC EPA Method 8260
AB16596	SB-3	TPH by GC
AB16597	SB-4	TPH by GC EPA Method 8260
AB16598	SB-5	TPH by GC EPA Method 8260
AB16599	SB-6	TPH by GC
AB16600	TRIP	EPA Method 8260

Authorized by  

Hanibal Tayeh  
President/Laboratory Director

ENVIRONMENTAL ANALYSES

# SPECTRUM ANALYTICAL, INC.

## Laboratory Report

Client ID: **SB-1**  
Lab ID No.: **AB16594**

Location: **Village Pizza-Springfield, MA**  
Client Job No.: **VT140982**

Matrix: Soil  
Collected: 08/25/98 by CEA  
Received on 08/27/98 by DDR  
QC and Data Review by AM

Preservative: Refrigeration  
Container: 1 Glass Soil Jar  
Condition of Sample as Received: Satisfactory  
Delivered by: Federal Express

### Total Hydrocarbons by GC

Modified EPA Method 8100

Parameter	Result (mg/Kg)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	57		09/03/98	09/04/98	ATP
<b>Fingerprint based quantification:</b>					
Gasoline	Not detected	40	09/03/98	09/04/98	ATP
Fuel Oil #2	*	40	09/03/98	09/04/98	ATP
Fuel Oil #4	Not detected	40	09/03/98	09/04/98	ATP
Fuel Oil #6	Not detected	80	09/03/98	09/04/98	ATP
Motor Oil	Not detected	80	09/03/98	09/04/98	ATP
Ligroin	Not detected	40	09/03/98	09/04/98	ATP
Aviation Fuel	Not detected	40	09/03/98	09/04/98	ATP
Other Oil	**	80	09/03/98	09/04/98	ATP
Unidentified	57		09/03/98	09/04/98	ATP
% Solids	86.3	0.1	09/03/98	09/04/98	DD

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

Gasoline - includes regular, unleaded, premium, etc.

Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.

Fuel Oil #4 - Includes #4 Fuel Oil.

Fuel Oil #6 - includes #6 oil and bunker "C" oil.

Motor Oil - includes virgin and waste automobile.

Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.

Aviation Fuels - includes Kerosene, Jet A and JP-4.

Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample.

A \* in the results column indicates the petroleum calibration used to quantify unidentified samples.

# SPECTRUM ANALYTICAL, INC.

## Laboratory Report

Client ID: SB-2  
Lab ID No.: AB16595

Location: Village Pizza-Springfield, MA  
Client Job No.: VT140982

Matrix: Soil  
Collected: 08/25/98 by CEA  
Received on 08/27/98 by DDR  
QC and Data Review by

Preservative: Refrigeration  
Container: 1 Glass Soil Jar  
Condition of Sample as Received: Satisfactory  
Delivered by: Federal Express

### Volatile Organics

EPA Method 8260

Parameter for AB16595	Result (ug/Kg)	MDL	Extracted	Analyzed	Analyst
Benzene	Not detected	260.0	09/03/98	09/04/98	DG
Bromobenzene	Not detected	260.0	09/03/98	09/04/98	DG
Bromochloromethane	Not detected	260.0	09/03/98	09/04/98	DG
Bromodichloromethane	Not detected	260.0	09/03/98	09/04/98	DG
Bromoform	Not detected	260.0	09/03/98	09/04/98	DG
n-Butylbenzene	8,600	260.0	09/03/98	09/04/98	DG
sec-Butylbenzene	4,400	260.0	09/03/98	09/04/98	DG
tert-Butylbenzene	Not detected	260.0	09/03/98	09/04/98	DG
Carbon tetrachloride	Not detected	260.0	09/03/98	09/04/98	DG
Chlorobenzene	Not detected	260.0	09/03/98	09/04/98	DG
Chloroform	Not detected	260.0	09/03/98	09/04/98	DG
2-Chlorotoluene	Not detected	260.0	09/03/98	09/04/98	DG
4-Chlorotoluene	Not detected	260.0	09/03/98	09/04/98	DG
1,2-Dibromo-3-chloropropane	Not detected	260.0	09/03/98	09/04/98	DG
Dibromochloromethane	Not detected	260.0	09/03/98	09/04/98	DG
1,2-Dibromoethane (EDB)	Not detected	260.0	09/03/98	09/04/98	DG
Dibromomethane	Not detected	260.0	09/03/98	09/04/98	DG
1,2-Dichlorobenzene	Not detected	260.0	09/03/98	09/04/98	DG
1,3-Dichlorobenzene	Not detected	260.0	09/03/98	09/04/98	DG
1,4-Dichlorobenzene	Not detected	260.0	09/03/98	09/04/98	DG
1,1-Dichloroethane	Not detected	260.0	09/03/98	09/04/98	DG
1,2-Dichloroethane	Not detected	260.0	09/03/98	09/04/98	DG
1,1-Dichloroethene	Not detected	260.0	09/03/98	09/04/98	DG
cis-1,2-Dichloroethene	Not detected	260.0	09/03/98	09/04/98	DG
trans-1,2-Dichloroethene	Not detected	260.0	09/03/98	09/04/98	DG
1,2-Dichloropropane	Not detected	260.0	09/03/98	09/04/98	DG
1,3-Dichloropropane	Not detected	260.0	09/03/98	09/04/98	DG
2,2-Dichloropropane	Not detected	260.0	09/03/98	09/04/98	DG

Parameter for AB16595	Result (ug/Kg)	MDL	Extracted	Analyzed	Analyst
1,1-Dichloropropene	Not detected	260.0	09/03/98	09/04/98	DG
cis-1,3-Dichloropropene	Not detected	260.0	09/03/98	09/04/98	DG
trans-1,3-Dichloropropene	Not detected	260.0	09/03/98	09/04/98	DG
Ethylbenzene	1,900	260.0	09/03/98	09/04/98	DG
Hexachlorobutadiene	Not detected	260.0	09/03/98	09/04/98	DG
Isopropylbenzene	2,000	260.0	09/03/98	09/04/98	DG
4-Isopropyltoluene	3,800	260.0	09/03/98	09/04/98	DG
Methylene chloride	Not detected	260.0	09/03/98	09/04/98	DG
Naphthalene	10,700	260.0	09/03/98	09/04/98	DG
n-Propylbenzene	3,500	260.0	09/03/98	09/04/98	DG
Styrene	Not detected	260.0	09/03/98	09/04/98	DG
1,1,1,2-Tetrachloroethane	Not detected	260.0	09/03/98	09/04/98	DG
1,1,2,2-Tetrachloroethane	Not detected	260.0	09/03/98	09/04/98	DG
Tetrachloroethene	Not detected	260.0	09/03/98	09/04/98	DG
Toluene	380	260.0	09/03/98	09/04/98	DG
1,2,3-Trichlorobenzene	Not detected	260.0	09/03/98	09/04/98	DG
1,2,4-Trichlorobenzene	Not detected	260.0	09/03/98	09/04/98	DG
1,1,1-Trichloroethane	Not detected	260.0	09/03/98	09/04/98	DG
1,1,2-Trichloroethane	Not detected	260.0	09/03/98	09/04/98	DG
Trichloroethene	Not detected	260.0	09/03/98	09/04/98	DG
Trichlorofluoromethane	Not detected	260.0	09/03/98	09/04/98	DG
1,2,3-Trichloropropane	Not detected	260.0	09/03/98	09/04/98	DG
1,2,4-Trimethylbenzene	21,400	260.0	09/03/98	09/04/98	DG
1,3,5-Trimethylbenzene	8,200	260.0	09/03/98	09/04/98	DG
m,p-Xylenes	3,100	520.0	09/03/98	09/04/98	DG
o-Xylene	2,200	260.0	09/03/98	09/04/98	DG
Methyl-t-butyl ether	Not detected	260.0	09/03/98	09/04/98	DG
BFB Surrogate Recovery (%)	125		09/03/98	09/04/98	DG
p-DFB Surrogate Recovery (%)	98		09/03/98	09/04/98	DG
CLB-d5 Surrogate Recovery (%)	104		09/03/98	09/04/98	DG
% Solids	87.6	0.1	09/04/98	09/04/98	JK

# SPECTRUM ANALYTICAL, INC.

## Laboratory Report

Client ID: SB-2  
Lab ID No.: AB16595

Location: Village Pizza-Springfield, MA  
Client Job No.: VT140982

Matrix: Soil  
Collected: 08/25/98 by CEA  
Received on 08/27/98 by DDR  
QC and Data Review by

Preservative: Refrigeration  
Container: 1 Glass Soil Jar  
Condition of Sample as Received: Satisfactory  
Delivered by: Federal Express

### Total Hydrocarbons by GC

Modified EPA Method 8100

Parameter	Result (mg/Kg)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	1,700		09/03/98	09/04/98	ATP
<b>Fingerprint based quantification:</b>					
Gasoline	Not detected	40	09/03/98	09/04/98	ATP
Fuel Oil #2	1,700	40	09/03/98	09/04/98	ATP
Fuel Oil #4	Not detected	40	09/03/98	09/04/98	ATP
Fuel Oil #6	Not detected	80	09/03/98	09/04/98	ATP
Motor Oil	Not detected	80	09/03/98	09/04/98	ATP
Ligroin	Not detected	40	09/03/98	09/04/98	ATP
Aviation Fuel	Not detected	40	09/03/98	09/04/98	ATP
Other Oil	Not detected	80	09/03/98	09/04/98	ATP
Unidentified	Not detected		09/03/98	09/04/98	ATP
% Solids	87.6	0.1	09/04/98	09/04/98	JK

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

Gasoline - includes regular, unleaded, premium, etc.

Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.

Fuel Oil #4 - Includes #4 Fuel Oil.

Fuel Oil #6 - includes #6 oil and bunker "C" oil.

Motor Oil - includes virgin and waste automobile.

Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.

Aviation Fuels - includes Kerosene, Jet A and JP-4.

Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample.

A \* in the results column indicates the petroleum calibration used to quantify unidentified samples.

# SPECTRUM ANALYTICAL, INC.

## Laboratory Report

Client ID: SB-3  
Lab ID No.: AB16596

Location: Village Pizza-Springfield, MA  
Client Job No.: VT140982

Matrix: Soil  
Collected: 08/25/98 by CEA  
Received on 08/27/98 by DDR  
QC and Data Review by

Preservative: Refrigeration  
Container: 1 Glass Soil Jar  
Condition of Sample as Received: Satisfactory  
Delivered by: Federal Express

### Total Hydrocarbons by GC

Modified EPA Method 8100

Parameter	Result (mg/Kg)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	130		09/03/98	09/04/98	ATP
<b>Fingerprint based quantification:</b>					
Gasoline	Not detected	40	09/03/98	09/04/98	ATP
Fuel Oil #2	*	40	09/03/98	09/04/98	ATP
Fuel Oil #4	Not detected	40	09/03/98	09/04/98	ATP
Fuel Oil #6	Not detected	80	09/03/98	09/04/98	ATP
Motor Oil	Not detected	80	09/03/98	09/04/98	ATP
Ligroin	Not detected	40	09/03/98	09/04/98	ATP
Aviation Fuel	Not detected	40	09/03/98	09/04/98	ATP
Other Oil	**	80	09/03/98	09/04/98	ATP
Unidentified	130		09/03/98	09/04/98	ATP
% Solids	85.7	0.1	09/03/98	09/04/98	DD

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

- Gasoline - includes regular, unleaded, premium, etc.
- Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.
- Fuel Oil #4 - Includes #4 Fuel Oil.
- Fuel Oil #6 - includes #6 oil and bunker "C" oil.
- Motor Oil - includes virgin and waste automobile.
- Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.
- Aviation Fuels - includes Kerosene, Jet A and JP-4.
- Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample.

A \* in the results column indicates the petroleum calibration used to quantify unidentified samples.

**SPECTRUM ANALYTICAL, INC.**

## Laboratory Report

Client ID: **SB-4**  
Lab ID No.: **AB16597**Location: **Village Pizza-Springfield, MA**  
Client Job No.: **VT140982**Matrix: Soil  
Collected: 08/25/98 by CEA  
Received on 08/27/98 by DDR  
QC and Data Review byPreservative: Refrigeration  
Container: 1 Glass Soil Jar  
Condition of Sample as Received: Satisfactory  
Delivered by: Federal Express**Volatile Organics**

EPA Method 8260

<b>Parameter for AB16597</b>	<b>Result (ug/Kg)</b>	<b>MDL</b>	<b>Extracted</b>	<b>Analyzed</b>	<b>Analyst</b>
Benzene	Not detected	278.0	09/03/98	09/03/98	DG
Bromobenzene	Not detected	278.0	09/03/98	09/03/98	DG
Bromochloromethane	Not detected	278.0	09/03/98	09/03/98	DG
Bromodichloromethane	Not detected	278.0	09/03/98	09/03/98	DG
Bromoform	Not detected	278.0	09/03/98	09/03/98	DG
n-Butylbenzene	12,600	278.0	09/03/98	09/03/98	DG
sec-Butylbenzene	6,100	278.0	09/03/98	09/03/98	DG
tert-Butylbenzene	Not detected	500.0	09/03/98	09/03/98	DG
Carbon tetrachloride	Not detected	278.0	09/03/98	09/03/98	DG
Chlorobenzene	Not detected	278.0	09/03/98	09/03/98	DG
Chloroform	Not detected	278.0	09/03/98	09/03/98	DG
2-Chlorotoluene	Not detected	278.0	09/03/98	09/03/98	DG
4-Chlorotoluene	Not detected	278.0	09/03/98	09/03/98	DG
1,2-Dibromo-3-chloropropane	Not detected	278.0	09/03/98	09/03/98	DG
Dibromochloromethane	Not detected	278.0	09/03/98	09/03/98	DG
1,2-Dibromoethane (EDB)	Not detected	278.0	09/03/98	09/03/98	DG
Dibromomethane	Not detected	278.0	09/03/98	09/03/98	DG
1,2-Dichlorobenzene	Not detected	278.0	09/03/98	09/03/98	DG
1,3-Dichlorobenzene	Not detected	278.0	09/03/98	09/03/98	DG
1,4-Dichlorobenzene	Not detected	278.0	09/03/98	09/03/98	DG
1,1-Dichloroethane	Not detected	278.0	09/03/98	09/03/98	DG
1,2-Dichloroethane	Not detected	278.0	09/03/98	09/03/98	DG
1,1-Dichloroethene	Not detected	278.0	09/03/98	09/03/98	DG
cis-1,2-Dichloroethene	Not detected	278.0	09/03/98	09/03/98	DG
trans-1,2-Dichloroethene	Not detected	278.0	09/03/98	09/03/98	DG
1,2-Dichloropropane	Not detected	278.0	09/03/98	09/03/98	DG
1,3-Dichloropropane	Not detected	278.0	09/03/98	09/03/98	DG
2,2-Dichloropropane	Not detected	278.0	09/03/98	09/03/98	DG

Parameter for AB16597	Result (ug/Kg)	MDL	Extracted	Analyzed	Analyst
1,1-Dichloropropene	Not detected	278.0	09/03/98	09/03/98	DG
cis-1,3-Dichloropropene	Not detected	278.0	09/03/98	09/03/98	DG
trans-1,3-Dichloropropene	Not detected	278.0	09/03/98	09/03/98	DG
Ethylbenzene	2,000	278.0	09/03/98	09/03/98	DG
Hexachlorobutadiene	Not detected	278.0	09/03/98	09/03/98	DG
Isopropylbenzene	2,700	278.0	09/03/98	09/03/98	DG
4-Isopropyltoluene	5,500	278.0	09/03/98	09/03/98	DG
Methylene chloride	Not detected	278.0	09/03/98	09/03/98	DG
Naphthalene	17,400	278.0	09/03/98	09/03/98	DG
n-Propylbenzene	5,000	278.0	09/03/98	09/03/98	DG
Styrene	Not detected	278.0	09/03/98	09/03/98	DG
1,1,1,2-Tetrachloroethane	Not detected	278.0	09/03/98	09/03/98	DG
1,1,2,2-Tetrachloroethane	Not detected	278.0	09/03/98	09/03/98	DG
Tetrachloroethene	Not detected	278.0	09/03/98	09/03/98	DG
Toluene	Not detected	278.0	09/03/98	09/03/98	DG
1,2,3-Trichlorobenzene	Not detected	278.0	09/03/98	09/03/98	DG
1,2,4-Trichlorobenzene	Not detected	278.0	09/03/98	09/03/98	DG
1,1,1-Trichloroethane	Not detected	278.0	09/03/98	09/03/98	DG
1,1,2-Trichloroethane	Not detected	278.0	09/03/98	09/03/98	DG
Trichloroethene	Not detected	278.0	09/03/98	09/03/98	DG
Trichlorofluoromethane	Not detected	278.0	09/03/98	09/03/98	DG
1,2,3-Trichloropropane	Not detected	278.0	09/03/98	09/03/98	DG
1,2,4-Trimethylbenzene	27,500	278.0	09/03/98	09/03/98	DG
1,3,5-Trimethylbenzene	10,800	278.0	09/03/98	09/03/98	DG
m,p-Xylenes	6,300	556.0	09/03/98	09/03/98	DG
o-Xylene	3,100	278.0	09/03/98	09/03/98	DG
Methyl-t-butyl ether	Not detected	278.0	09/03/98	09/03/98	DG
BFB Surrogate Recovery (%)	79		09/03/98	09/03/98	DG
p-DFB Surrogate Recovery (%)	106		09/03/98	09/03/98	DG
CLB-d5 Surrogate Recovery (%)	103		09/03/98	09/03/98	DG
% Solids	87.2	0.1	09/04/98	09/04/98	JK

# SPECTRUM ANALYTICAL, INC.

## Laboratory Report

Client ID: SB-4  
Lab ID No.: AB16597

Location: Village Pizza-Springfield, MA  
Client Job No.: VT140982

Matrix: Soil  
Collected: 08/25/98 by CEA  
Received on 08/27/98 by DDR  
QC and Data Review by

Preservative: Refrigeration  
Container: 1 Glass Soil Jar  
Condition of Sample as Received: Satisfactory  
Delivered by: Federal Express

### Total Hydrocarbons by GC

Modified EPA Method 8100

Parameter	Result (mg/Kg)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	25,000		09/03/98	09/03/98	TG
<b>Fingerprint based quantification:</b>					
Gasoline	Not detected	40	09/03/98	09/03/98	TG
Fuel Oil #2	25,000	40	09/03/98	09/03/98	TG
Fuel Oil #4	Not detected	40	09/03/98	09/03/98	TG
Fuel Oil #6	Not detected	80	09/03/98	09/03/98	TG
Motor Oil	Not detected	80	09/03/98	09/03/98	TG
Ligroin	Not detected	40	09/03/98	09/03/98	TG
Aviation Fuel	Not detected	40	09/03/98	09/03/98	TG
Other Oil	Not detected	80	09/03/98	09/03/98	TG
Unidentified	Not detected		09/03/98	09/03/98	TG
% Solids	87.2	0.1	09/04/98	09/04/98	JK

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

Gasoline - includes regular, unleaded, premium, etc.

Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.

Fuel Oil #4 - Includes #4 Fuel Oil.

Fuel Oil #6 - includes #6 oil and bunker "C" oil.

Motor Oil - includes virgin and waste automobile.

Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.

Aviation Fuels - includes Kerosene, Jet A and JP-4.

Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample.

A \* in the results column indicates the petroleum calibration used to quantify unidentified samples.

**SPECTRUM ANALYTICAL, INC.**

## Laboratory Report

Client ID: **SB-5**  
Lab ID No.: **AB16598**Location: **Village Pizza-Springfield, MA**  
Client Job No.: **VT140982**Matrix: Soil  
Collected: 08/25/98 by CEA  
Received on 08/27/98 by DDR  
QC and Data Review byPreservative: Refrigeration  
Container: 1 Glass Soil Jar  
Condition of Sample as Received: Satisfactory  
Delivered by: Federal Express**Volatile Organics**

EPA Method 8260

<b>Parameter for AB16598</b>	<b>Result (ug/Kg)</b>	<b>MDL</b>	<b>Extracted</b>	<b>Analyzed</b>	<b>Analyst</b>
Benzene	Not detected	127.0	09/03/98	09/03/98	DG
Bromobenzene	Not detected	127.0	09/03/98	09/03/98	DG
Bromochloromethane	Not detected	127.0	09/03/98	09/03/98	DG
Bromodichloromethane	Not detected	127.0	09/03/98	09/03/98	DG
Bromoform	Not detected	127.0	09/03/98	09/03/98	DG
n-Butylbenzene	Not detected	200.0	09/03/98	09/03/98	DG
sec-Butylbenzene	Not detected	127.0	09/03/98	09/03/98	DG
tert-Butylbenzene	Not detected	127.0	09/03/98	09/03/98	DG
Carbon tetrachloride	Not detected	127.0	09/03/98	09/03/98	DG
Chlorobenzene	Not detected	127.0	09/03/98	09/03/98	DG
Chloroform	Not detected	127.0	09/03/98	09/03/98	DG
2-Chlorotoluene	Not detected	127.0	09/03/98	09/03/98	DG
4-Chlorotoluene	Not detected	127.0	09/03/98	09/03/98	DG
1,2-Dibromo-3-chloropropane	Not detected	127.0	09/03/98	09/03/98	DG
Dibromochloromethane	Not detected	127.0	09/03/98	09/03/98	DG
1,2-Dibromoethane (EDB)	Not detected	127.0	09/03/98	09/03/98	DG
Dibromomethane	Not detected	127.0	09/03/98	09/03/98	DG
1,2-Dichlorobenzene	Not detected	127.0	09/03/98	09/03/98	DG
1,3-Dichlorobenzene	Not detected	127.0	09/03/98	09/03/98	DG
1,4-Dichlorobenzene	Not detected	127.0	09/03/98	09/03/98	DG
1,1-Dichloroethane	Not detected	127.0	09/03/98	09/03/98	DG
1,2-Dichloroethane	Not detected	127.0	09/03/98	09/03/98	DG
1,1-Dichloroethene	Not detected	127.0	09/03/98	09/03/98	DG
cis-1,2-Dichloroethene	Not detected	127.0	09/03/98	09/03/98	DG
trans-1,2-Dichloroethene	Not detected	127.0	09/03/98	09/03/98	DG
1,2-Dichloropropane	Not detected	127.0	09/03/98	09/03/98	DG
1,3-Dichloropropane	Not detected	127.0	09/03/98	09/03/98	DG
2,2-Dichloropropane	Not detected	127.0	09/03/98	09/03/98	DG

Parameter for AB16598	Result (ug/Kg)	MDL	Extracted	Analyzed	Analyst
1,1-Dichloropropene	Not detected	127.0	09/03/98	09/03/98	DG
cis-1,3-Dichloropropene	Not detected	127.0	09/03/98	09/03/98	DG
trans-1,3-Dichloropropene	Not detected	127.0	09/03/98	09/03/98	DG
Ethylbenzene	Not detected	127.0	09/03/98	09/03/98	DG
Hexachlorobutadiene	Not detected	127.0	09/03/98	09/03/98	DG
Isopropylbenzene	Not detected	127.0	09/03/98	09/03/98	DG
4-Isopropyltoluene	Not detected	127.0	09/03/98	09/03/98	DG
Methylene chloride	Not detected	127.0	09/03/98	09/03/98	DG
Naphthalene	Not detected	200.0	09/03/98	09/03/98	DG
n-Propylbenzene	Not detected	127.0	09/03/98	09/03/98	DG
Styrene	Not detected	127.0	09/03/98	09/03/98	DG
1,1,1,2-Tetrachloroethane	Not detected	127.0	09/03/98	09/03/98	DG
1,1,2,2-Tetrachloroethane	Not detected	127.0	09/03/98	09/03/98	DG
Tetrachloroethene	Not detected	127.0	09/03/98	09/03/98	DG
Toluene	Not detected	127.0	09/03/98	09/03/98	DG
1,2,3-Trichlorobenzene	Not detected	127.0	09/03/98	09/03/98	DG
1,2,4-Trichlorobenzene	Not detected	127.0	09/03/98	09/03/98	DG
1,1,1-Trichloroethane	Not detected	127.0	09/03/98	09/03/98	DG
1,1,2-Trichloroethane	Not detected	127.0	09/03/98	09/03/98	DG
Trichloroethene	Not detected	127.0	09/03/98	09/03/98	DG
Trichlorofluoromethane	Not detected	127.0	09/03/98	09/03/98	DG
1,2,3-Trichloropropane	Not detected	127.0	09/03/98	09/03/98	DG
1,2,4-Trimethylbenzene	Not detected	200.0	09/03/98	09/03/98	DG
1,3,5-Trimethylbenzene	Not detected	200.0	09/03/98	09/03/98	DG
m,p-Xylenes	Not detected	254.0	09/03/98	09/03/98	DG
o-Xylene	Not detected	127.0	09/03/98	09/03/98	DG
Methyl-t-butyl ether	Not detected	127.0	09/03/98	09/03/98	DG
BFB Surrogate Recovery (%)	119		09/03/98	09/03/98	DG
p-DFB Surrogate Recovery (%)	85		09/03/98	09/03/98	DG
CLB-d5 Surrogate Recovery (%)	107		09/03/98	09/03/98	DG
% Solids	90.3	0.1	09/04/98	09/04/98	JK

# SPECTRUM ANALYTICAL, INC.

## Laboratory Report

Client ID: SB-5  
Lab ID No.: AB16598

Location: Village Pizza-Springfield, MA  
Client Job No.: VT140982

Matrix: Soil  
Collected: 08/25/98 by CEA  
Received on 08/27/98 by DDR  
QC and Data Review by

Preservative: Refrigeration  
Container: 1 Glass Soil Jar  
Condition of Sample as Received: Satisfactory  
Delivered by: Federal Express

### Total Hydrocarbons by GC

Modified EPA Method 8100

Parameter	Result (mg/Kg)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	2,700		09/03/98	09/04/98	ATP
<b>Fingerprint based quantification:</b>					
Gasoline	Not detected	40	09/03/98	09/04/98	ATP
Fuel Oil #2	2,700	40	09/03/98	09/04/98	ATP
Fuel Oil #4	Not detected	40	09/03/98	09/04/98	ATP
Fuel Oil #6	Not detected	80	09/03/98	09/04/98	ATP
Motor Oil	Not detected	80	09/03/98	09/04/98	ATP
Ligroin	Not detected	40	09/03/98	09/04/98	ATP
Aviation Fuel	Not detected	40	09/03/98	09/04/98	ATP
Other Oil	Not detected	80	09/03/98	09/04/98	ATP
Unidentified	Not detected		09/03/98	09/04/98	ATP
% Solids	90.3	0.1	09/04/98	09/04/98	JK

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

Gasoline - includes regular, unleaded, premium, etc.

Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.

Fuel Oil #4 - Includes #4 Fuel Oil.

Fuel Oil #6 - includes #6 oil and bunker "C" oil.

Motor Oil - includes virgin and waste automobile.

Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.

Aviation Fuels - includes Kerosene, Jet A and JP-4.

Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample.

A \* in the results column indicates the petroleum calibration used to quantify unidentified samples.

# SPECTRUM ANALYTICAL, INC.

## Laboratory Report

Client ID: SB-6  
Lab ID No.: AB16599

Location: Village Pizza-Springfield, MA  
Client Job No.: VT140982

Matrix: Soil  
Collected: 08/25/98 by CEA  
Received on 08/27/98 by DDR  
QC and Data Review by AM

Preservative: Refrigeration  
Container: 1 Glass Soil Jar  
Condition of Sample as Received: Satisfactory  
Delivered by: Federal Express

### Total Hydrocarbons by GC

Modified EPA Method 8100

Parameter	Result (mg/Kg)	MDL	Extracted	Analyzed	Analyst
Total Hydrocarbons (GC)	Not detected		09/03/98	09/04/98	ATP
<b>Fingerprint based quantification:</b>					
Gasoline	Not detected	40	09/03/98	09/04/98	ATP
Fuel Oil #2	Not detected	40	09/03/98	09/04/98	ATP
Fuel Oil #4	Not detected	40	09/03/98	09/04/98	ATP
Fuel Oil #6	Not detected	80	09/03/98	09/04/98	ATP
Motor Oil	Not detected	80	09/03/98	09/04/98	ATP
Ligroin	Not detected	40	09/03/98	09/04/98	ATP
Aviation Fuel	Not detected	40	09/03/98	09/04/98	ATP
Other Oil	Not detected	80	09/03/98	09/04/98	ATP
Unidentified	Not detected		09/03/98	09/04/98	ATP
% Solids	92.4	0.1	09/03/98	09/04/98	DD

Petroleum identification is determined by comparing the GC fingerprint obtained from the sample with a library of GC fingerprints obtained from petroleum products. Possible match categories are as follows;

Gasoline - includes regular, unleaded, premium, etc.

Fuel Oil #2 - includes home heating oil, #2 fuel oil and diesel.

Fuel Oil #4 - Includes #4 Fuel Oil.

Fuel Oil #6 - includes #6 oil and bunker "C" oil.

Motor Oil - includes virgin and waste automobile.

Ligroin - includes mineral spirits, petroleum naphtha, vm&p naphtha.

Aviation Fuels - includes Kerosene, Jet A and JP-4.

Other Oil - includes lubricating and cutting oil and silicon oil.

Factors such as microbial degradation, weathering and solubility generally prevent specific identification within a petroleum category. A finding of "unidentified" means that the sample fingerprint was characteristic of a petroleum product, but could not be matched to a fingerprint in the library.

After fingerprint identification, the amount present in the sample is quantified using a calibration curve prepared from a petroleum product of the same category as the identified petroleum. Unidentified petroleum is quantified using a petroleum calibration that approximates the distribution of compounds in the sample.

A \* in the results column indicates the petroleum calibration used to quantify unidentified samples.

**SPECTRUM ANALYTICAL, INC.**

## Laboratory Report

Client ID: **TRIP**  
Lab ID No: **AB16600**Location: **Village Pizza-Springfield, MA**  
Client Job No.: **VT140982**Matrix: **Aqueous**  
Sampled on 03/09/98 by CEA  
Received on 08/27/98 by DDR  
QC and Data Review byPreservative: **Refrigeration, HCl**  
Container : **1 VOA Vial**  
Condition of Sample as Received: **Satisfactory**  
Delivered by: **Federal Express****Volatile Organics**

EPA Method 8260

Parameter for AB16600	Result (ug/L)	MDL	Analyzed	Analyst
Benzene	Not detected	1.0	09/03/98	CH
Bromobenzene	Not detected	1.0	09/03/98	CH
Bromochloromethane	Not detected	1.0	09/03/98	CH
Bromodichloromethane	Not detected	1.0	09/03/98	CH
Bromoform	Not detected	1.0	09/03/98	CH
Bromomethane	Not detected	1.0	09/03/98	CH
n-Butylbenzene	Not detected	1.0	09/03/98	CH
sec-Butylbenzene	Not detected	1.0	09/03/98	CH
tert-Butylbenzene	Not detected	1.0	09/03/98	CH
Carbon tetrachloride	Not detected	1.0	09/03/98	CH
Chlorobenzene	Not detected	1.0	09/03/98	CH
Chloroethane	Not detected	1.0	09/03/98	CH
Chloroform	Not detected	1.0	09/03/98	CH
Chloromethane	Not detected	1.0	09/03/98	CH
2-Chlorotoluene	Not detected	1.0	09/03/98	CH
4-Chlorotoluene	Not detected	1.0	09/03/98	CH
1,2-Dibromo-3-chloropropane	Not detected	1.0	09/03/98	CH
Dibromochloromethane	Not detected	1.0	09/03/98	CH
1,2-Dibromoethane (EDB)	Not detected	1.0	09/03/98	CH
Dibromomethane	Not detected	1.0	09/03/98	CH
1,2-Dichlorobenzene	Not detected	1.0	09/03/98	CH
1,3-Dichlorobenzene	Not detected	1.0	09/03/98	CH
1,4-Dichlorobenzene	Not detected	1.0	09/03/98	CH
Dichlorodifluoromethane	Not detected	1.0	09/03/98	CH
1,1-Dichloroethane	Not detected	1.0	09/03/98	CH
1,2-Dichloroethane	Not detected	1.0	09/03/98	CH
1,1-Dichloroethene	Not detected	1.0	09/03/98	CH
cis-1,2-Dichloroethene	Not detected	1.0	09/03/98	CH
trans-1,2-Dichloroethene	Not detected	1.0	09/03/98	CH
1,2-Dichloropropane	Not detected	1.0	09/03/98	CH
1,3-Dichloropropane	Not detected	1.0	09/03/98	CH
2,2-Dichloropropane	Not detected	1.0	09/03/98	CH
1,1-Dichloropropene	Not detected	1.0	09/03/98	CH
cis-1,3-Dichloropropene	Not detected	1.0	09/03/98	CH

**Volatile Organics**  
EPA Method 8260

Parameter for AB16600	Result (ug/L)	MDL	Analyzed	Analyst
trans-1,3-Dichloropropene	Not detected	1.0	09/03/98	CH
Ethylbenzene	Not detected	1.0	09/03/98	CH
Hexachlorobutadiene	Not detected	1.0	09/03/98	CH
Isopropylbenzene	Not detected	1.0	09/03/98	CH
4-Isopropyltoluene	Not detected	1.0	09/03/98	CH
Methylene chloride	Not detected	1.0	09/03/98	CH
Naphthalene	Not detected	1.0	09/03/98	CH
n-Propylbenzene	Not detected	1.0	09/03/98	CH
Styrene	Not detected	1.0	09/03/98	CH
1,1,1,2-Tetrachloroethane	Not detected	1.0	09/03/98	CH
1,1,2,2-Tetrachloroethane	Not detected	1.0	09/03/98	CH
Tetrachloroethene	Not detected	1.0	09/03/98	CH
Toluene	Not detected	1.0	09/03/98	CH
1,2,3-Trichlorobenzene	Not detected	1.0	09/03/98	CH
1,2,4-Trichlorobenzene	Not detected	1.0	09/03/98	CH
1,1,1-Trichloroethane	Not detected	1.0	09/03/98	CH
1,1,2-Trichloroethane	Not detected	1.0	09/03/98	CH
Trichloroethene	Not detected	1.0	09/03/98	CH
Trichlorofluoromethane	Not detected	5.0	09/03/98	CH
1,2,3-Trichloropropane	Not detected	1.0	09/03/98	CH
1,2,4-Trimethylbenzene	Not detected	1.0	09/03/98	CH
1,3,5-Trimethylbenzene	Not detected	1.0	09/03/98	CH
m,p-Xylenes	Not detected	2.0	09/03/98	CH
o-Xylene	Not detected	1.0	09/03/98	CH
Vinyl chloride	Not detected	1.0	09/03/98	CH
Methyl-t-butyl ether	Not detected	1.0	09/03/98	CH
BFB Surrogate Recovery (%)	119		09/03/98	CH
p-DFB Surrogate Recovery (%)	102		09/03/98	CH
CLB-d5 Surrogate Recovery (%)	111		09/03/98	CH

# Spectrum Analytical, Inc.

## Laboratory Report Supplement

### References

- Methods for the Determination of Organic Compounds in Drinking Water. EPA-600/4-88/039. EMSL 1988.
- Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020. EMSL 1983.
- Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater. EPA 600/4-82-057. EMSL 1982.
- Test Methods for Evaluating Solid Waste. Physical/Chemical Methods. EPA SW-846. 1986.
- Standard Methods for the Examination of Water and Wastes. APHA-AWWA-WPCF. 16th Edition. 1985.
- Standard Methods for Comparison of Waterborne Petroleum Oils by Gas Chromatography. ASTM D 3328. 1982.
- Oil Spill Identification System. U.S. Coast Guard CG-D-52-77. 1977.
- Handbook for Analytical Quality Control in Water and Wastewater Laboratories. EPA 600/4-79-019. EMSL 1979.
- Choosing Cost-Effective QA/QC (Quality Assurance/Quality Control) Programs for Chemical Analyses. EPA 600/4-85/056. EMSL 1985.

### Report Notations

Not Detected, Not Det, ND or nd	=	<i>The compound was not detected at a concentration equal to or above the established method detection limit.</i>	
NC	=	<i>Not Calculated</i>	
MCL	=	<i>EPA Maximum Contamination Level</i>	
VOA	=	<i>Volatile Organic Analysis</i>	
BFB	=	<i>4-Bromofluorobenzene</i>	<i>(An EPA 624 Surrogate)</i>
p-DFB	=	<i>1,4-Difluorobenzene</i>	<i>(An EPA 624 Surrogate)</i>
CLB-d5	=	<i>Chlorobenzene-d5</i>	<i>(An EPA 624 Surrogate)</i>
BCP	=	<i>2-Bromo-1-chloropropane</i>	<i>(An EPA 601 Surrogate)</i>
TFT	=	<i>a,a,a-Trifluorotoluene</i>	<i>(An EPA 602 Surrogate)</i>
Decachlorobiphenyl	=	<i>(an EPA 608/8080 Surrogate)</i>	

### Definitions

**Surrogate Recovery** = The recovery (expressed as a percent) of a non-method analyte (see surrogates listed above) added to the sample for the purpose of monitoring system performance.

**Matrix Spike Recovery** = The recovery (expressed as a percent) of method analytes added to the sample for the purpose of determining any effect of sample composition on analyte recovery.

**Laboratory Replicate** = Two sample aliquots taken in the analytical laboratory and analyzed separately with identical procedures. Analyses of laboratory duplicates give a measure of the precision associated with laboratory procedures, but not with sample collection, preservation, or storage procedures.

**Field Duplicate** = Two separate samples collected at the same time and place under identical circumstances and treated exactly the same throughout field and laboratory procedures. Analysis of Field duplicates give a measure of the precision associated with sample collection, preservation and storage, as well as with laboratory procedures.

**Relative Percent Difference (% RPD)** = The precision measurement obtained on duplicate/replicate analyses. %RPD is calculated as:

$$\%RPD = \frac{(\text{value1} - \text{value2})}{\text{ave. value}} * 100\%$$

# CHAIN OF CUSTODY RECORD



SPECTRUM ANALYTICAL

Page 1 of 1

PROJECT NO.: <u>VT-140-98-2</u>	REPORT TO: <u>PAUL REZOUF</u>
SITE NAME: <u>VILLAGE PIZZA</u>	<u>CEA-VT</u>
LOCATION: <u>SPRINGFIELD</u> STATE <u>VT</u>	ADDRESS: <u>R/R 2 Box 260</u>
REFERENCE QUOTE NUMBER (RQN):	CITY <u>FUTLEY</u> STATE <u>VT</u> ZIP <u>05346</u>
PURCHASE ORDER NO.:	INVOICE TO: <u>CEA-MA</u>
PROJECT Mgr: <u>PSN</u>	
SAMPLER(s): <u>PSN</u>	CITY <u>P. BOSTON</u> STATE <u>MA</u> ZIP

SAMPLE TYPE & MATRIX CODES:  
 1 = 4°C 2 = HCl 3 = H<sub>2</sub>SO<sub>4</sub> 4 = HNO<sub>3</sub> 5 = OTHER

C = COMPOSITE G = GRAB

1 = AQUEOUS 3 = SLUDGE 5 = OTHER  
 2 = SOIL 4 = SEDIMENT

LAB USE ONLY	SAMPLE I.D.	DATE	TIME	MATRIX	SAMPLE TYPE	PRESERVATIVE	CONTAINERS	VOC's	SVOC's	TPH	METALS	OTHER
AA/16594	SB-1	8-25-98	9:00	2	G	1	40 ml VOA VIALS	1-601/8010 2-602/8020			1 - Soluble	
AA/16595	SB-2		10:00	2	G	1	# OF AMBER GLASS LITERS	1-502/8021 2-524			2 - Total	
AA/16596	SB-3		10:45	2	G	1	# OF PLASTIC LITERS	1-624/8240 2-8280			3 - TCLP	
AA/16597	SB-4		11:30	2	G	1	# OF GLASS SOIL JARS	1-MTBE 2-KETONES				
AA/16598	SB-5		13:00	2	G	1		1-8270 2-BN 3-PAHS				
AA/16599	SB-6		14:15	2	G	1		1-PCBS 2-PEST (608/8080)				
AA/16600	TRIP	3-4-98	17:30	1	G	1/2		1-GC(8'00M) 2-GC(8015M)				
AA								1-VPH 2-EPH 3-ID				
AA								1-IR(418.1) 2-OIL/GREASE				
AA								PP13				
AA								RCRAB				
AA								As, Cd, Cr, Hg, Pb				
AA								1-PH 2-FLASH 3-REACT				

RELINQUISHED BY:

Paul S. N.  
 FedEx

RECEIVED BY:

VIA FEDEX  
Lee Cooper

DATE

8-26-98

TIME

1005

SPECIAL INSTRUCTIONS: HANDBOOK: PLEASE  
PROVIDE EST. OF AGE OF #2 FUEL OIL  
IN SAMPLE # SB-4 - THANK YOU - PLEASE  
CALL WITH ANY QUESTIONS 802-295-5222

Fax results when available to (802) 295-5225

SPECIAL HANDLING:

Please check

- Return Sample after Analysis
- Dispose of Sample after 60 days
- Standard TAT - 7 to 10 Business days
- Special TAT - 24 hr - 48 hr - 72 hr 5 days
- TAT begins when sample is received at test facility.
- TAT for samples rec'd after 3 pm will begin on the next business day.
- All TAT's are subject to laboratory approval and customer consent.

DATE RESULTS NEEDED: 9-4-98 - 9-5-98