

**INITIAL SITE CHARACTERIZATION
STUDY
STOWE HARDWARE SITE
STOWE, VERMONT**

**PREPARED FOR:
Mr. Bruce Pikaard
Stowe Hardware Store**

**PREPARED BY:
GZA GeoEnvironmental, Inc.
Manchester, New Hampshire**

**August 1993
File No. 21075**

August 10, 1993
File No. 21075



Mr. Bruce Pikaard
Stowe Hardware
P.O. Box 66
Stowe, Vermont 05672

Re: Initial Site Characterization Study
Stowe Hardware Site
Stowe, Vermont

380 Harvey Road
Manchester
New Hampshire 03103
603-623-3600
FAX 603-624-9463

Dear Mr. Pikaard:

GZA GeoEnvironmental, Inc. (GZA) is pleased to submit the attached report summarizing our recently completed Initial Site Characterization Study of the Stowe Village Hardware Store property, in Stowe, Vermont. The work was performed in accordance with our executed agreement with you dated July 2, 1993. Our work and this report are subject to the Limitations included in Appendix A.

GZA appreciates the opportunity to continue to be of service to you on this project, and we trust this report will be responsive to your needs. Should you have any questions, please call us.

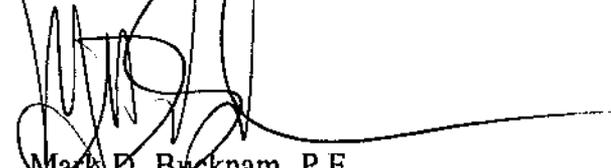
Very truly yours,

GZA GEOENVIRONMENTAL, INC

A Subsidiary of GZA
GeoEnvironmental
Technologies, Inc.



Steven R. Lamb
Senior Project Manager



Mark D. Bucknam, P.E.
Principal/Regional Manager

cc: Lynda Wedderspoon, Vermont DEC

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1.00 INTRODUCTION



GZA GeoEnvironmental, Inc. (GZA) has completed the tasks in the work plan entitled "Proposal for Environmental Consulting Services, Stowe Hardware Store, Stowe, Vermont," dated July 2, 1993 (see Figure 1 for site location). The purpose of this work was to evaluate groundwater and soil conditions proximate and downgradient of a former 500-gallon fuel oil UST at the site. The work was initiated at the request of Lynda Wedderspoon of the Sites Management Section (SMS) of the Vermont Agency of Natural Resources, Department of Environmental Conservation (DEC), Hazardous Materials Management Division as outlined in a letter dated June 2, 1993. The tasks performed during the study address DEC requirements to assess the existing environmental conditions at the site relative to the Vermont Petroleum Cleanup Fund guidelines. The methodology, results, and conclusions of this investigation are subject to the Limitations provided in Appendix A.

Specifically, the scope of the study included the following:

- Preliminary Groundwater Receptor Survey

GZA conducted a preliminary receptor survey which included obtaining information regarding locations of nearby public and private drinking water supplies and wells, basements of adjacent buildings, and surface water. GZA conducted a reconnaissance of the area and reviewed available information at municipal offices.

- Subsurface Explorations: Groundwater and Soil Sampling and Analysis

Three soil borings and monitoring wells were completed (GZ-1 through GZ-3) on July 9, 1993 by Cushing and Sons, Drilling and Boring Contractors of Keene, New Hampshire to obtain data on hydrogeologic conditions at the site. The locations of the monitoring wells are shown on Figure 2. The procedures followed and the boring logs completed during the field exploration program are presented in Appendix B. The borings were advanced using 4-1/4-inch hollow stem augers. Split spoon soil samples were collected at minimum 5-foot intervals. Three groundwater samples, one surface water and one sediment sample were collected and delivered to GZA's Environmental Chemistry Laboratory in Newton, Massachusetts to be analyzed for petroleum hydrocarbons (PHCs) and volatile organic compounds (VOCs) by EPA methods 418.1 and 8020, respectively (see Appendix C for analytical laboratory reports).



- Elevation Survey

GZA conducted an elevation survey of the monitoring wells installed during this study, using standard rod-and-level surveying techniques. The elevation data were used to estimate the direction of groundwater flow.

- Review of Contaminated Soil Disposal Status

GZA obtained a copy of the Indemnification Certificate confirming that contaminated soil previously excavated from the site has been sent to the MTS facility in New Hampshire for asphalt batching disposal. The Indemnification Certificate as well as the soil analysis results conducted on the excavated soil are included as Appendix D of this report.

- Report Preparation

GZA prepared this report summarizing site subsurface conditions, the findings of the preliminary receptor survey, and the results of groundwater, soil and sediment sampling. This report also includes GZA's conclusions and recommendations regarding site remediation.

2.00 BACKGROUND

The site property, identified as Lot No. 52 on Tax Map 7A, consists of approximately 0.3 acres of developed land located on Main Street in the Village of Stowe, Vermont. The site and abutting properties to the south and west are zoned "Commercial Village" by the Village of Stowe. The site is bordered to the east by residentially zoned properties. According to the Village of Stowe's Tax records, the site is owned by Douglas McKecknay of Wellington, Florida.

The majority of the lot is occupied by the Stowe Village Hardware Store. The property outside of the building footprint consists of a narrow strip of maintained lawn east of the building, with the remainder of the property generally paved and used for parking. The site is abutted by Route 100/Main Street to the south (including a Mobil gasoline station across Main Street) and a residential property across a vacant parcel to the east. A public access way leading to a recreational path which follows the Little River north of the site abuts the western boundary of the site. A church occupies the lot west of the site beyond the public access drive. Municipal water and sewer services enter the site from Main Street.

We understand based upon discussions with Mr. Thomas Anderson of Northeast Industrial Maintenance (NEIM), that a 500-gallon #2 fuel oil underground storage tank (UST) was removed from the site on April 29, 1993. During the UST removal, soil immediately



surrounding the tank appeared to be visibly stained and smelled of petroleum product. We understand that the excavation process was directed towards removing visibly stained and odorous contaminated soils at the time of UST removal, and was not intended to remove all contaminated soils in accordance with DEC guidelines. Approximately 40 tons of visibly stained soil was removed and stockpiled at the Cochran Pit property in Morrisville, Vermont. The soil has since been analyzed and shipped to MTS, Inc. in Epsom, New Hampshire for asphalt batching. A copy of the indemnification certificate and the results of the analysis are provided as Appendix D of this report.

3.00 PRELIMINARY GROUNDWATER RECEPTOR SURVEY

GZA performed a preliminary receptor survey including identification of public and private drinking water wells, within 1,000 feet of the site and basements of buildings, and surface water bodies proximate to the site. According to Mr. Edward Lambert of the Stowe Village Water and Light District there are no private drinking water wells or public water supply wells within 1,000 feet of the site. Sources of water for the Village of Stowe included a well and three springs along Route 108, all of which are located greater than 1,000 feet from the site.

Screening?

↘ GZA surveyed the properties surrounding the site to identify buildings with basements. The DEC requested the performance of this work because basements often are a point of groundwater or soil gas discharge. Table 1 summarizes names and lot numbers of properties which abut the site. Locations of these properties are shown on the Site Vicinity Map provided as Figure 3. In general, all properties abutting the site were observed to have basements.

There are no surface water bodies on the site. The closest surface water is the Little River, located approximately 250 feet north of the site. An oily sheen was observed alongside a bend in the river closest to the site. The sheen was possibly related to petroleum or iron bacteria. A sediment and surface water sample was obtained and submitted to GZA's Environmental Chemistry Laboratory for the analysis of total petroleum hydrocarbons (TPHs) and Volatile Organic Compounds (VOCs) by EPA methods 418.1 and 8020 respectively. Results of the analyses are discussed in Section 5.22.

4.00 SUBSURFACE CONDITIONS

The drilling and monitoring well installation program performed by GZA during this evaluation was directed towards collecting preliminary data regarding the hydrogeology of the site and the distribution, if present, of petroleum constituents in the groundwater and soils. The strategy of the drilling program was to initially drill a soil boring proximate to

the former fuel oil UST and screening the soils collected during advancement of the boring with a PID. If PID screening indicated the presence of VOCs in soil samples, then a monitoring well would be installed within the boring, as well as two downgradient locations to evaluate groundwater quality. The results of the PID screening (see Section 5.10) did indicate VOCs in the head space of containerized soil samples collected from the first boring, GZ-1. As such, two additional borings with monitoring wells were completed during this study. Specifically monitoring wells were installed at the following locations:



- GZ-1 - Installed near the location of the former UST;
- GZ-2 - Installed near a presumed downgradient location of the former UST; and
- GZ-3 - Installed between an adjacent residential property to the east of the site and at a presumed downgradient location of the former UST.

Our ability to place wells GZ-2 and GZ-3 in presumed downgradient locations was limited by the position of the hardware store building.

4.10 SOIL CONDITIONS

Soil borings were terminated at depths between 17 and 22 feet below ground surface. Soil conditions observed during drilling of GZ-1 consisted of approximately 10 feet of fine to medium sand fill, overlying a silt layer. The fill encountered in this area was reportedly used to backfill following removal of the former UST. Soil conditions encountered during drilling of GZ-2 consisted of a granular fill overlying fine sand, which was underlain by silt. Silt was encountered in GZ-3.

4.20 GROUNDWATER LEVELS

GZA recorded depth to groundwater measurements on July 10, 1993, they are summarized in Table 1. Depths to groundwater ranged from about 11 to 16 feet below ground surface. Based upon the July 10, 1993 data, the direction of groundwater flow is estimated to be northerly towards the Little River. This inferred direction of groundwater flow is consistent with what would be expected based upon topography and hydrologic features related to the study area.

5.00 SOIL, SEDIMENT, GROUNDWATER, AND SURFACE WATER FIELD SCREENING AND LABORATORY ANALYSES

5.10 SOIL AND SEDIMENT

5.11 Field Screening



Soil samples collected from test borings were screened in the field with a photoionization detector (PID) as outlined in Appendix B.1.3. The purpose of the screening was to assess the possible presence of VOC vapors in the headspace above containerized soil samples which may indicate possible soil contamination. PID readings are not considered to represent actual concentrations of VOCs in a sample; however, the readings are useful as a guide for determining if additional laboratory analysis should be conducted on a particular sample. The VOC screening data are listed on the boring logs in Appendix B.

The results of the PID screening indicated that VOCs were present in soil samples obtained from GZ-1, at depths of 7 to 9 and 9 to 11 feet below the ground surface at concentrations of 10 and 4 parts per million (ppm), respectively. Elevated PID readings were not recorded for soil samples collected from borings GZ-2 and GZ-3.

5.12 Laboratory Analysis

A sediment sample was obtained from the easterly bank of the Little River at an area where oily sheens were observed. The sheen may be related to petroleum products or iron bacteria. The sediment sample was submitted to GZA's Environmental Chemistry Laboratory in Newton, Massachusetts for analysis of volatile organic compounds (VOCs) by EPA method 8020 and petroleum hydrocarbons by EPA method 418.1. The analytical laboratory reports for the sediment sample are provided in Appendix C. Total petroleum hydrocarbons (TPHs) were detected in the sediment sample at a total concentration of 14 parts per million (ppm). In addition, benzene was detected in the sediment sample at a concentration below the 1 part per billion (ppb) method quantitative limit (BMQL).

5.20 GROUNDWATER AND SURFACE WATER

5.21 Field Screening

Groundwater and surface water samples were screened in the field for pH and temperature in accordance with methods outlined in Appendix C. The pH values recorded for groundwater samples ranged from 6.8 to 7.2. The pH recorded for the surface water sample was 7.3. The pH values are considered to be within the range of natural water.

5.22 Laboratory Analysis

The results of the laboratory analyses for groundwater samples collected by GZA from monitoring wells GZ-1, GZ-2 and GZ-3 and the surface water sample obtained from the Little River on July 10, 1993 are summarized in Table 3. The analytical reports provided by GZA's Environmental Chemistry Laboratory are included in Appendix C. Benzene, toluene, ethyl benzene, and xylenes (BTEX) and methyl tert-butyl ether (MTBE) were detected in the groundwater sample collected from GZ-1. MTBE is a common octane enhancing gasoline additive and is not typically associated with fuel oil. VOCs were not detected in samples collected from GZ-2 and GZ-3.



6.00 DISCUSSION OF SOIL AND GROUNDWATER QUALITY

The quantitative laboratory analytical data and field screening data are reflective of a release of petroleum product to the environment. Petroleum-related compounds were detected in soil and groundwater samples collected from GZ-1 drilled in the vicinity of the former fuel oil UST, and in a sediment sample collected from the vicinity of the easterly bank of the Little River.

6.10 SOIL AND SEDIMENT

VOCs were detected with a PID in the headspace above soil samples S-4 (7 to 9 feet) and S-5 (9-11 feet) collected from Boring GZ-1 at concentrations of 4 ppm and 10 ppm, respectively. These were the only soil samples collected from the soil borings that exuded VOCs detectable with the PID. The DEC document entitled "Agency Guidelines for Petroleum Contaminated Soil and Carbon Media" indicates that the remedial guideline for excavating #2 fuel oil contaminated soils is 10 ppm as indicated by PID screening of soil samples. In general, the DEC guidelines indicate that soils that exude VOCs below 10 ppm can be left in place. The concentrations of VOCs detected in soil samples collected from GZ-1 are below what would be required for excavation; however, the data only represent one location in the proximity of the former UST and it is possible that higher concentrations of VOCs exist at other locations.

Sediment sample SED-1 was collected from beneath surface water with an oily sheen on the easterly bank of the Little River, approximately 200 feet west of the site. SED-1 sampling point is at a location of the Little River that is closest to the site. The analytical laboratory data indicates petroleum contamination of the sediment at this location. In our experience, such low levels (i.e. less than 100 ppm) of PHCs are commonly detected using EPA Method 418.1 in soils which are apparently free of petroleum hydrocarbon content. However, based upon the detection of benzene in the sediment sample, it is possible that the contamination is related to gasoline.

6.20 GROUNDWATER



VOCs were detected in the groundwater sample collected from monitoring well GZ-1 located within the footprint of the former #2 fuel oil UST at concentrations below Safe Drinking Water Act Maximum Contaminant Levels (MCLs). No free-product was detected in GZ-1 or in other on-site monitoring wells during the study. Based upon the relative concentrations of VOCs detected in the groundwater sample collected from GZ-1, the fingerprint of the chemical detected appears to indicate a gasoline and fuel oil mixture. MTBE is an unleaded gasoline fuel additive, the detection of which indicates that gasoline appears to have impacted groundwater quality at the GZ-1 area. In addition, based upon the detection of lower volatile, BTEX-compounds (toluene, ethylbenzene, and xylenes) at relatively high concentrations, it also appears that fuel oil has impacted groundwater quality at the GZ-1 area.

The existing monitoring well network is not adequate to evaluate the quality of groundwater flowing onto the site relative to possible off-site upgradient sources, or to evaluate the possible influence of site contamination relative to the petroleum contamination detected in the sediment sample collected from the easterly bank of the downgradient Little River. Monitoring well GZ-1 is the most hydraulically upgradient well on the site property and is also within the footprint of the former UST. An additional monitoring well installed further upgradient (southerly towards Main Street) would be necessary to evaluate the quality of groundwater flowing onto the site relative to possible off-site upgradient sources. An additional monitoring well located near the downgradient property boundary would be required to better evaluate groundwater quality migrating from the site towards the Little River.

7.00 CONCLUSIONS AND RECOMMENDATIONS

Based upon the presence of BTEX compounds and MTBE detected in the groundwater sample collected from monitoring well GZ-1, it appears that a release of petroleum product to the environment has occurred; however, concentrations of the compounds are below applicable MCLs. Based upon the fingerprint of the chemicals detected in the groundwater sample collected from GZ-1, it appears that the petroleum-related contamination is a combination of gasoline and fuel oil. The detection of gasoline constituents indicates a possible off-site upgradient contribution of the petroleum contamination detected on-site. The existing network of monitoring wells is not adequate to evaluate the quality of groundwater flowing onto the site.

Petroleum contamination was also detected in a sediment sample collected off-site from the Little River at a location directly downgradient of the site. The existing network of on-site monitoring wells is not adequate to evaluate the possible source of the petroleum contamination detected in the Little River.

Although low concentrations of VOCs were detected in groundwater at the site, groundwater resources at the site and within 1,000 feet of the site are not used for a water supply. Considering the low concentrations of VOCs described above and the absence of receptors in the vicinity of the site, we believe that the contamination observed at the site would not impact human health via ingestion. Likewise, we do not believe that the site conditions, as presently understood, constitutes a likely threat to human health via vapor migration to buildings.



GZA recommends that an upgradient monitoring well be installed to evaluate groundwater quality flowing onto the site in consideration of MTBE detected in the groundwater sample collected from GZ-1 and that a monitoring well be installed near the downgradient property boundary to evaluate the quality of groundwater flowing from the site.

Previous contaminated soil removal at the site was directed towards excavation of visibly stained and odorous contaminated soils during UST removal, and was not intended to remove all contaminated soils in accordance with DEC guidelines. It is possible that contaminated soils may still exist in the former UST area that contain VOCs greater than DEC guidelines. If the DEC considers that additional soils should be removed from the former UST area, GZA recommends performing the remedial work in accordance with the plan presented below.

RECOMMENDED REMEDIAL MEASURES

Remedial Action Objective/Target Cleanup Goals

The remediation objective for the site is to excavate contaminated soils in the vicinity of the former fuel oil UST based upon DEC guidelines, and disposal of the contaminated soils off-site. Based upon the document entitled "Agency Guidelines for Petroleum Contaminated Soil and Carbon Media" prepared by DEC, the remedial target goal for fuel oil contaminated soils is 10 ppm total VOCs based upon screening with a PID. The following section discussed our proposal remedial program.

Excavation and Stockpiling

Contaminated soil will be excavated from the Stowe Hardware site by an experienced contractor using field personnel who meet Occupational Safety and Health Administration 1910.120 requirements with regard to training and medical monitoring for hazardous waste site operations. Excavation will be initially directed towards removing the recently placed fill material (assumed to be clean) which will be placed to one side of the excavation.

Subsequently, excavation will proceed initially to horizontal and vertical limits of apparent contamination as estimated based on photoionization detector (PID) headspace screening of soil samples. As indicated above, soils that exude VOCs greater than 10 ppm as indicated by PID screening will be excavated. If data indicate that additional contamination

is present, excavation will continue at the discretion of the field excavation manager until (1) contaminated soil appears to have been removed or (2) additional excavation cannot be performed because of groundwater conditions or structural stability requirements associated with on-site buildings.



Excavated soils will be temporarily stockpiled at a location that necessarily minimizes potential interruptions to other site activities. Soils will be placed on 6-millimeter (-mil) (0.006-inch-thick) polyethylene sheeting, and will be covered with weighted 6-mil polyethylene to reduce wind or water erosion and infiltration of rainwater. The stockpile area will also be bermed to control surface water runoff/runon, and temporary barricades will be erected to limit access to the stockpile.

Soil Stockpile Characterization Analyses

GZA will collect a composite sample from the contaminated soil stockpile and submit the sample to a Vermont-certified laboratory for Resource Conservation and Recovery Act (RCRA) characterization testing. Each composite sample will represent approximately eight individual core samples.

The Composite sample will be analyzed for a complete RCRA characterization [as well as for total VOCs and polychlorinated biphenyls (PCBs)] to evaluate criteria for off-site treatment by asphalt batching. The analyses will include the following:

- . Ignitability by EPA Method 1010;
- . Corrosivity by EPA Method 9045;
- . Reactive Sulfide by EPA Method 7.3.4.1;
- . Reactive Cyanide by EPA Method 7.3.3.2;
- . Toxicity Characteristic Leaching Procedure (TCLP) Extraction by EPA Method 1310/1311;
- . TCLP VOCs by EPA Method 8260;
- . TCLP Semi-VOCs by EPA Method 8270;
- . TCLP Metals by EPA 6000/7000 Series Methods;
- . TCLP Pesticides and Herbicides by EPA Method 8080/8150;
- . Total PCBs by EPA Method 8080; and
- . Total VOCs by EPA Method 8260.

Off-Site Treatment Using Asphalt Batching

If acceptable with DEC, we propose to employ off-site asphalt batching to treat the contaminated soils excavated from the Stowe Hardware site. A review of competitive costs will be made prior to selecting the facility.

TABLES

TABLE 1
PRELIMINARY RECEPTOR SURVEY
STOWE HARDWARE SITE
STOWE, VERMONT

Reference Lot No.	Potential Receptor Property Owner/ Address	Basement	Approximate Distance/ Direction from Site
53	Francis Manfredi	No	Downgradient and side gradient. Abuts site to the southeast.
55	Anne Herrick 181 Maple Street	Yes	Downgradient and side gradient. Abuts site to the northeast.
39.01 -	Town of Stowe	No, undeveloped	Downgradient. North of site, includes the Little River.
51	Stowe Community Church	Yes	Sidegradient & downgradient 20 feet west of site.
49	Gerald Good 128 Main Street	Yes	Upgradient across Main Street 100 feet southwest of site.
50	Vermont National Bank Trustee 144 Main Street	Yes	Upgradient across Main Street 50 feet south of site.
191	Russell Forgger	Yes	Upgradient across Main Street 75 feet south of site.
54	Stowe Community Church	Yes	Upgradient across Main Street abutting the site

NOTE:

1. Refer to Figure 3 for property locations.
2. The above listed properties are all serviced by Municipal Water supplies.
3. The distance, direction, and position relative to the groundwater flow directions from the site are inferred based upon property mapping data, distance from groundwater monitoring wells installed by GZA, and site reconnaissance observations.

TABLE 2
GROUNDWATER ELEVATIONS
STOWE HARDWARE STORE
STOWE, VERMONT

Water Level Location	Reference Elevation	Survey Reference Point	Depth to Groundwater (ft) 7-10-93	Groundwater Elevation (ft)
GZ-1	99.2	PVC	14.1	85.1
GZ-2	93.5	PVC	15.8	77.7
GZ-3	88.4	PVC	11.0	77.4
SW-1	71.5	TSS	2.3	69.2

NOTES:

1. Groundwater measurements were recorded on July 10, 1993 by GZA using a Slope Indicator water level meter relative to the survey reference point.
2. Datum is the southwest corner of the concrete slab forming the entrance way to the Hardware Store with an assumed elevation of 100 feet. See Figure 2 for benchmark location.
3. "PVC" is top of PVC well.
4. "TSS" is top of survey stake.
5. SW-1 is at a location in the Little River approximately 250 feet north of the site. Water level measurement for SW-1 is approximate only.

TABLE 3

CONCENTRATIONS OF VOCs AND PHCs DETECTED IN
SURFACE WATER AND GROUNDWATER SAMPLES
STOWE HARDWARE STORE
STOWE, VERMONT

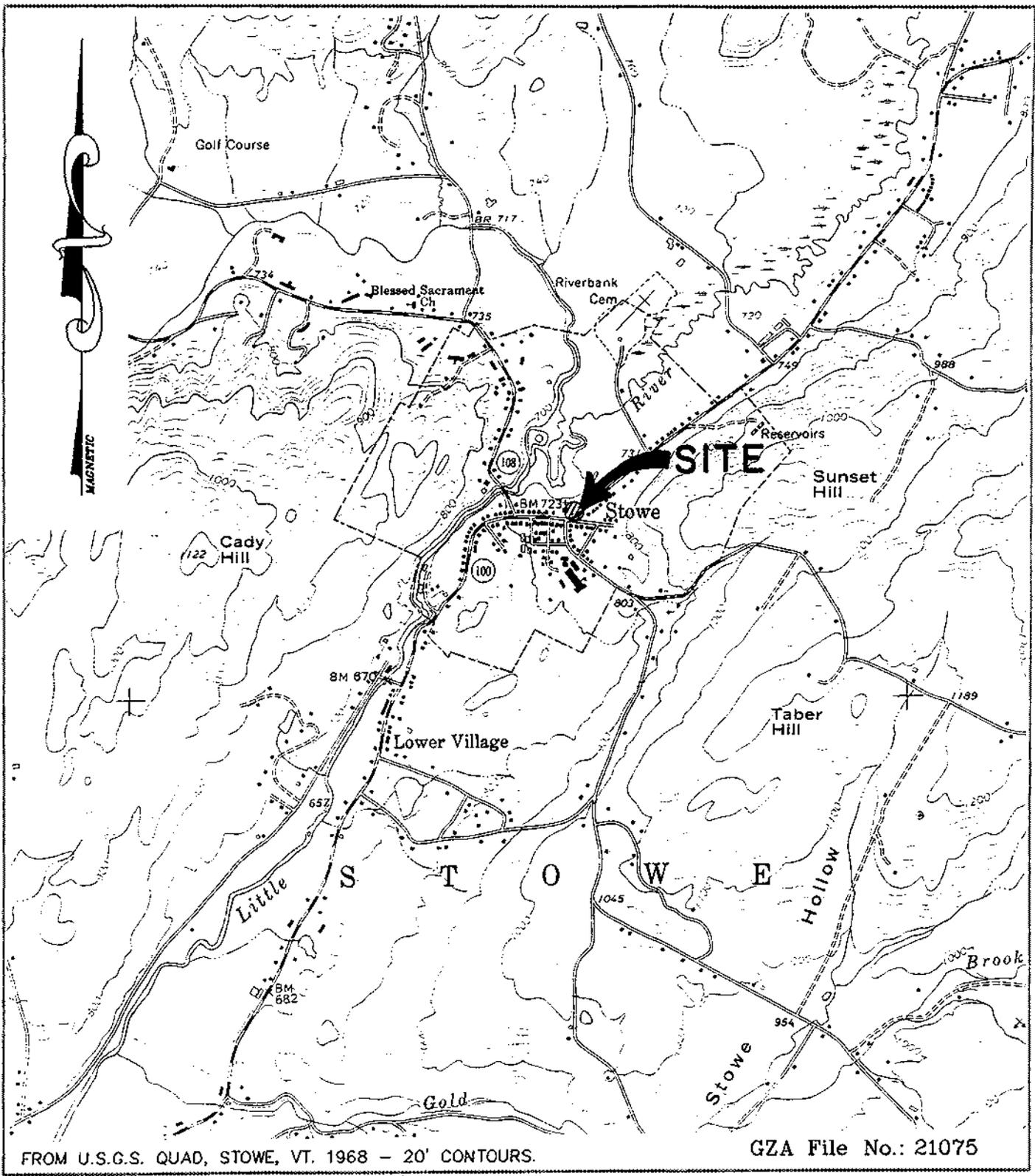
Analyte	SAMPLING LOCATIONS				MCL
	GZ-1	GZ-2	GZ-3	SW-1	
VOCs (ug/L, PPB) EPA Method 8020					
MTBE	BMQL	ND	ND	ND	-
Benzene	BMQL	ND	ND	ND	5
Toluene	40	ND	ND	ND	1,000
Ethyl Benzene	17	ND	ND	ND	700
Total Xylenes	119	ND	ND	ND	10,000
M&P Xylenes	73	ND	ND	ND	-
O-xylenes	46	ND	ND	ND	-
PHCs (ug/g, PPM) EPA Method 418.1					
	< 1.0	< 1.0	< 1.0	< 1.0	-

NOTES:

1. "MCL" refers to Maximum Contaminant Levels promulgated by the EPA. MCLs represent regulatory enforceable standards which apply to public water systems. MCLs are based upon technological feasibility and cost of treatment, plus health effects. Drinking water quality standards are from U.S. EPA, Office of Water, Drinking Water Regulations and Health Advisories, Washington, D.C., November 1991, revised 9/92.
2. VOCs stands for Volatile Organic Compounds.
3. PHCs stands for Petroleum Hydrocarbons.
4. ND indicates that no VOCs were detected.
5. "-" indicates no standard currently available.
6. "<" followed by a number indicates analytical detection limits at which none of the VOCs was detected.
7. Laboratory analyses were performed by GZA GeoEnvironmental, Inc.'s Environmental Chemistry Laboratory in Newton Upper Falls, Massachusetts.

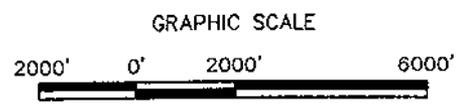
FIGURES

1993 GeoEnvironmental, Inc. S. 21075



FROM U.S.G.S. QUAD, STOWE, VT. 1968 - 20' CONTOURS.

GZA File No.: 21075

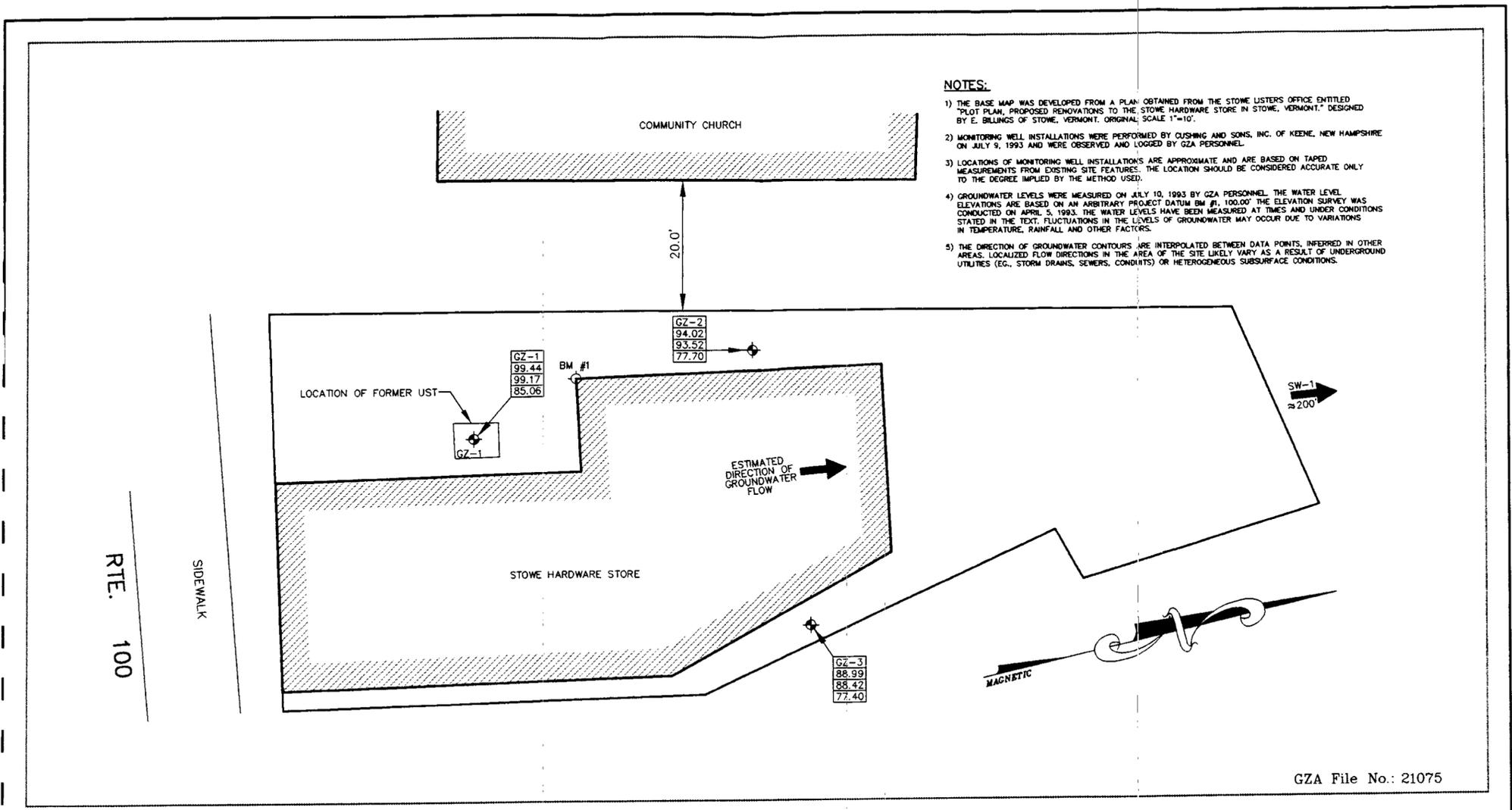


INITIAL SITE CHARACTERIZATION STUDY
 PROPERTY: STOWE HARDWARE STORE
 LOCATION: STOWE, VERMONT

GZA GeoEnvironmental, Inc.
 Engineers and Scientists

LOCUS PLAN
 DATE: JULY 1993
 FIGURE NO.: 1

GZA GeoEnvironmental, Inc. File No. 21075



NOTES:

- 1) THE BASE MAP WAS DEVELOPED FROM A PLAN OBTAINED FROM THE STOWE LISTERS OFFICE ENTITLED "PLOT PLAN, PROPOSED RENOVATIONS TO THE STOWE HARDWARE STORE IN STOWE, VERMONT," DESIGNED BY E. BILLINGS OF STOWE, VERMONT. ORIGINAL SCALE 1"=10'.
- 2) MONITORING WELL INSTALLATIONS WERE PERFORMED BY CUSHING AND SONS, INC. OF KEENE, NEW HAMPSHIRE ON JULY 9, 1993 AND WERE OBSERVED AND LOGGED BY GZA PERSONNEL.
- 3) LOCATIONS OF MONITORING WELL INSTALLATIONS ARE APPROXIMATE AND ARE BASED ON TAPED MEASUREMENTS FROM EXISTING SITE FEATURES. THE LOCATION SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
- 4) GROUNDWATER LEVELS WERE MEASURED ON JULY 10, 1993 BY GZA PERSONNEL. THE WATER LEVEL ELEVATIONS ARE BASED ON AN ARBITRARY PROJECT DATUM BM #1, 100.00'. THE ELEVATION SURVEY WAS CONDUCTED ON APRIL 5, 1993. THE WATER LEVELS HAVE BEEN MEASURED AT TIMES AND UNDER CONDITIONS STATED IN THE TEXT. FLUCTUATIONS IN THE LEVELS OF GROUNDWATER MAY OCCUR DUE TO VARIATIONS IN TEMPERATURE, RAINFALL AND OTHER FACTORS.
- 5) THE DIRECTION OF GROUNDWATER CONTOURS ARE INTERPOLATED BETWEEN DATA POINTS. INFERRED IN OTHER AREAS. LOCALIZED FLOW DIRECTIONS IN THE AREA OF THE SITE LIKELY VARY AS A RESULT OF UNDERGROUND UTILITIES (EG., STORM DRAINS, SEWERS, CONDUITS) OR HETEROGENEOUS SUBSURFACE CONDITIONS.

GZA File No.: 21075

APPROXIMATE GRAPHIC SCALE
15' 0' 15' 45'

GZA GeoEnvironmental, Inc.
Engineers and Scientists

<p>MONITORING WELL LOCATION & NUMBER</p> <p>GZ-2 94.02 93.52 77.70</p> <p>SW INDICATES SURFACE WATER SAMPLING LOCATION</p>	<p>WELL DESIGNATION PROTECTIVE CASING ELEVATION (FEET) PVC WELL CASING ELEVATION (FEET) WATER TABLE ELEVATION (FEET)</p>	<p>SITE BUILDING FOOTPRINT</p> <p>APPROXIMATE PROPERTY LINE</p> <p>GROUNDWATER FLOW DIRECTION</p>
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INITIAL SITE CHARACTERIZATION STUDY

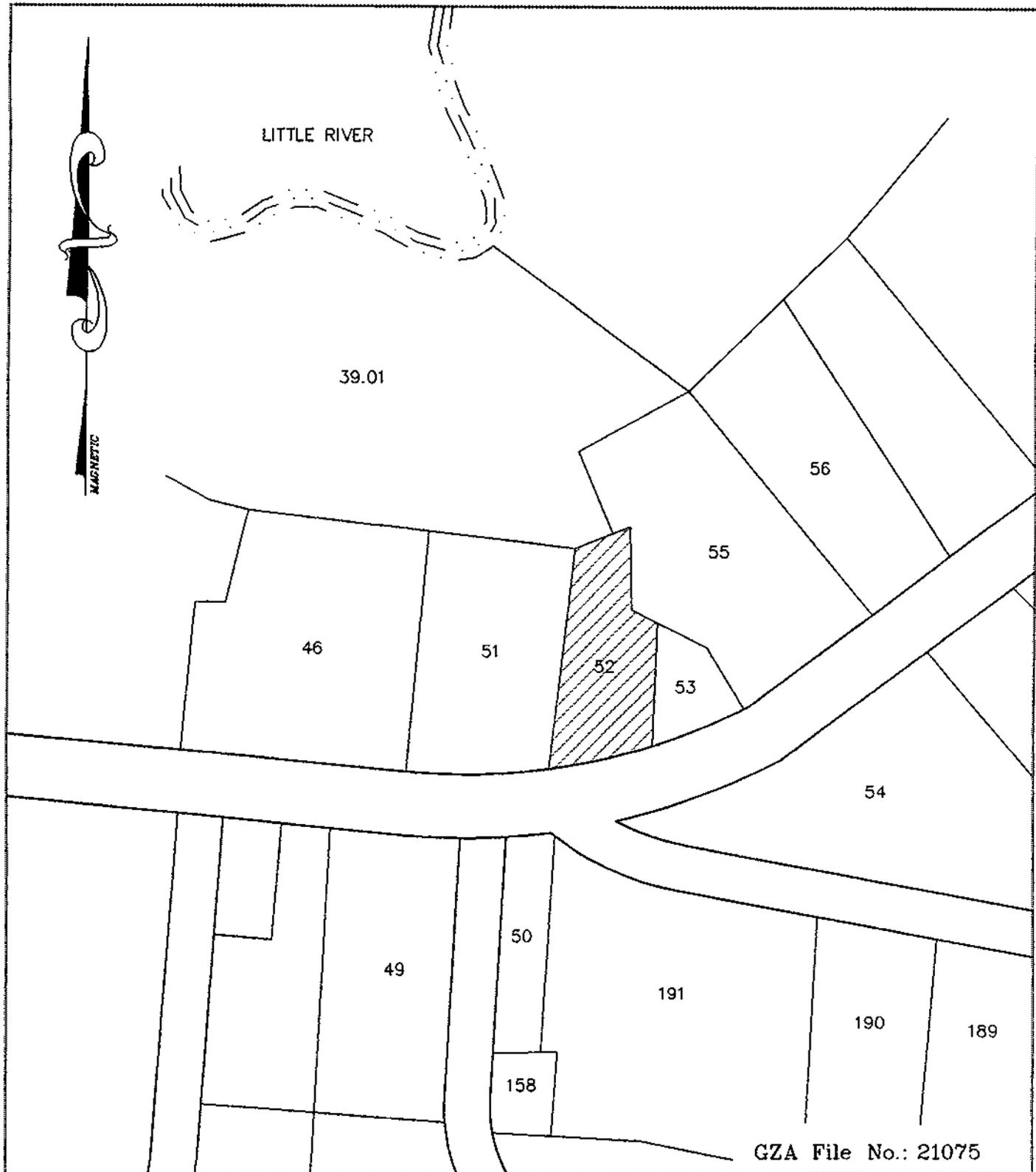
PROPERTY: STOWE HARDWARE STORE
LOCATION: STOWE VERMONT

SITE SKETCH

DATE: JULY 1993 FIGURE NO.: 2

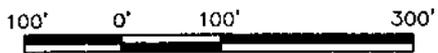
1075V

Intal. Envt. GZA



FROM THE VILLAGE OF STOWE'S TAX MAP 7A. ORIGINAL SCALE: 1"=208.33'

APPROXIMATE GRAPHIC SCALE



INITIAL SITE CHARACTERIZATION STUDY

PROPERTY: STOWE HARDWARE STORE
LOCATION: STOWE, VERMONT



SITE VICINITY MAP

DATE: JULY 1993

FIGURE NO.: 3

APPENDIX A
LIMITATIONS

APPENDIX A
LIMITATIONS

1. The observations described in this Report were made under the conditions stated therein. The conclusions presented in the Report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by the Client. The work described in this Report was carried out in accordance with the Terms and Conditions of Engagement attached to our agreement dated July 2, 1993.
2. In preparing this Report, GZA has relied on certain information provided by state and local officials and other parties referenced therein, and on information contained in the files of state and/or local agencies available to GZA at the time of the work. Although there may have been some degree of overlap in the information provided by these various sources, GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this site evaluation.
3. In the event that bank counsel or title examiner for Client obtains information on environmental or hazardous waste issues at the site not contained in this Report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this Report.
4. Observations were made of the site and of structures on the site as indicated within the Report. Where access to portions of the site or to structures on the site was unavailable or limited, GZA renders no opinion as to the presence of hazardous substances or oil, or to the presence of indirect evidence relating to hazardous substances or oil, in that portion of the site or structure. In addition, GZA renders no opinion as to the presence of hazardous substances or oil, or to the presence of indirect evidence relating to hazardous substances or oil, where direct observation of the interior walls, floor, or ceiling of a structure on a site was obstructed by objects or coverings on or over these surfaces.
5. Unless otherwise specified in the Report, GZA did not perform testing or analyses to determine the presence or concentration of asbestos or polychlorinated biphenyls (PCB's) at the site or in the environment at the site.

6. The conclusions and recommendations contained in this Report are based in part upon the data obtained from a limited number of soil and/or groundwater samples obtained from widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until further exploration. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the conclusions and recommendations of this Report.
7. Water level readings have been made in the test pits, borings, and/or observation wells at the times and under the conditions stated on the test pit or boring logs. However, it must be noted that fluctuations in the level of groundwater may occur due to variations in rainfall and other factors different from those prevailing at the time measurements were made.
8. Except as noted within the text of the Report, no quantitative laboratory testing was performed as part of the site evaluation. Where such analyses have been conducted by an outside laboratory, GZA has relied upon the data provided, and has not conducted an independent evaluation of the reliability of these data.
9. The conclusions and recommendations contained in this Report are based in part upon various types of chemical data and are contingent upon their validity. These data have been reviewed and interpretations made in the Report. As indicated within the Report, some of these data are preliminary "screening" level data, and should be confirmed with quantitative analyses if more specific information is necessary. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, and other factors. Should additional chemical data become available in the future, these data should be reviewed by GZA, and the conclusions and recommendations presented herein modified accordingly.
10. Chemical analyses have been performed for specific parameters during the course of this site evaluation, as described in the text. However, it should be noted that additional chemical constituents not searched for during the current study may be present in soil and/or groundwater at the site.
11. It is recommended that GZA be retained to provide further engineering services during construction and/or implementation of any remedial measures recommended in this Report. This is to allow GZA to observe compliance with the concepts and recommendations contained herein, and to allow the development of design changes in the event that subsurface conditions differ from those anticipated.

APPENDIX B
FIELD EXPLORATIONS

APPENDIX B.1
FIELD PROCEDURES

APPENDIX B.1

FIELD PROCEDURES

B.1.1 Drilling, Soil Sampling, and Well Installations

Drilling and well installations were performed on July 9, 1993 by Cushing and Sons, Inc. of Keene, New Hampshire. Test borings were advanced using 4-1/4-inch inner diameter (I.D.) hollow stem augers. In general, borings were advanced to a depth at least 5 feet below the estimated water table at each location. Steam cleaning of all downhole drilling equipment was conducted between borings.

Standard Penetration Tests (SPT) were performed at approximately 5-foot intervals in accordance with American Society of Testing and Materials (ASTM) Method 1586. In general, the SPT consists of driving a 2-inch-diameter split spoon sampler 24 inches using a 140-pound hammer dropping 30 inches. The number of blows required to drive the sampler from 6 to 18 inches is the SPT index value or N-value. Soil samples collected during the SPT were classified by GZA personnel and placed in 16-ounce glass jars with teflon-lined lids.

All well installations were completed with 2-inch I.D. Schedule 40 PVC riser and screen with threaded flush-jointed couplings. All PVC attachments were completed without the use of glues or solvents. A total of ten feet of well screen with 0.01-inch width machine cut slots was used for each installation. Where possible, the well screen was set to span the water table encountered in the boring during drilling. Filter sand was placed in the annular space around the well screen to approximately 1 to 2 feet above the top of screen, followed by an approximately 1- to 2-foot-thick bentonite (clay) pellet seal. Where necessary, native soil materials were used to backfill the borehole to within approximately 2 feet of the ground surface where a flush-mounted protective road box was placed over the well. The road boxes were set in place with a concrete surface seal, bentonite, or driven into existing asphalt.

GZA test boring logs with well installation details are provided in Appendix B.2.

B.1.2 Well Development

Following installation, monitoring wells were developed by removing a minimum of five to ten well volumes using polyethylene disposable bailers with PVC ballcheck valves. The purpose of the well development was to remove drilling water introduced during borehole advancement and to promote the exchange of water from the formation into the well.

B.1.3 Field Screening of Soil Samples

Soil samples obtained during drilling were screened in the field for total volatile organic compounds (VOCs) using a Thermo Environmental Instruments, Inc. Model 580B photoionization detector data logger (PID). The PID was equipped with a 10.6 electron-volt lamp and calibrated to an isobutylene standard. The PID readings are a general indicator of relative levels of VOCs referenced to the isobutylene standard. Although the PID screening cannot be directly used to quantify VOC concentrations or identify individual compounds, the results can serve as a relative indicator of the presence and concentration of VOCs.

Each soil sample obtained was placed in 16-ounce glass jar and then covered with aluminum foil and a teflon-lined lid. After approximately 15 minutes the headspace of the sample was then screened under ambient temperature conditions by inserting the probe of the PID through the aluminum foil.

B.1.4 Relative Elevation Survey

Relative elevations of monitoring wells installed during the Phase II field exploration program were determined by GZA personnel through a field survey using a Nikon automatic level. Elevations were referenced to a project datum using a temporary benchmark with an arbitrary elevation of 100.0 feet.

APPENDIX B.2
EXPLORATION LOGS



GZA
GeoEnvironmental, Inc.

STOWE HARDWARD STORE

STOWE, VERMONT

Boring No. GZ-1
Page 1 of 1
File No. 21075
Check _____

Contractor Cushing and Sons
Foreman Duane Drew
Logged by Darlene Autery
Date Start/Finish 7-9-93 7-9-93
Boring Location See Location Plan
GS Elev. _____ Datum _____

Auger/
Casing
Type HSA
I.D. 4-1/4
Hammer Wt. _____
Hammer Fall _____
Other _____

Sampler
SS
Z
140 lbs.
30"

Groundwater Readings

Date	Time	Depth	Casing	Stab.
7-10-93	08:00	14.11	MW	1 day

Depth	Casing Blows	Sample Information					PID Field Test Data	Sample Description & Classification	Stratum Desc.	R M K S	Equipment Installed			
		No.	Pen/Rec (In.)	Depth (Ft.)	Blows (/6")						CURB BOX	Concrete Surface Seal		
5		S-1	24/18	0-2	6-6	0	Medium dense, brown, fine SAND, little Gravel, trace Silt. Dry. Fill. Same as above.	SAND FILL	1	0.5	Bentonite Seal			
		S-2	24/10	2-4	6-8	0						2	2.0	2.0" Sch. 40 PVC Riser
					8-8									
10		S-3	24/8	5-7	3-1	0	Very loose, brown, fine to medium SAND, some Gravel. Wet. Loose, brown, fine to medium SAND, trace Silt. Wet. Changing to gray Silt.	SILT	3, 4	5.0	2.0" Sch. 40 PVC 0.01 Slot Well Screen			
					WR-1							10	15.0	
		S-4	24/4	7-9	2-3	10								
15		S-5	24/18	9-11	2-3	4	Loose, gray, SILT. Wet.							
					4-4									
		S-6	24/10	15-17	4-3	0						Loose, gray, SILT. Wet. Thin layers of soil staining observed.		
				5-5										
20							Bottom of boring at 17.0 feet.							
25														

- REMARKS
- The soil samples were screened for volatile organic compounds (VOCs) using a Thermo Environmental, Inc. Model 580B photoionization detector. The results, which are given in parts per million (ppm) and which are presented in the field test data column, serve as a relative indicator of VOCs in each sample.
 - Groundwater encountered at 5.0 to 7.0 feet.
 - Boring was terminated at 17.0 feet in silt. No refusal was encountered.
 - Schedule 40 PVC monitoring well was installed at the completion of the boring.



GZA
GeoEnvironmental, Inc.

STOWE HARDWARD STORE

STOWE, VERMONT

Boring No. GZ-2
Page 1 of 1
File No. 21075
Check _____

Contractor Cushing and Sons
Foreman Duane Drew
Logged by Darlene Autery
Date Start/Finish 7-9-93 7-9-93
Boring Location See Location Plan
GS Elev. _____ Datum _____

Auger/
Casing
Type HSA
I.D. 4-1/4
Hammer Wt. _____
Hammer Fall _____
Other _____

Sampler
SS
2"
140 lbs.
30"

Groundwater Readings

Date	Time	Depth	Casing	Stab.
7-9-93	14:14	16.05'	MW	1 hr.
7-10-93	08:30	15.82	MW	1 day

Depth	Casing Blows	Sample Information					Sample Description & Classification	Stratum Desc.	R M K S	Equipment Installed
		No.	Pen/Rec (In.)	Depth (Ft.)	Blows (/6")	PID Field Test Data				CURB BOX
5		S-1	24/10	0-2	6-4	0	Loose, brown to dark brown, fine SAND, little fine Gravel, little Silt. Dry. With fine pieces of brick.	0.2 SAND FILL	1	0.5 Concrete Surface
					3-4					Formation Material
10		S-2	24/15	5-7	4-6	0	Medium dense, gray, fine SAND, some Silt. Dry. Changing to fine to coarse SAND, trace Silt. Dry. Orange staining or particles observed at change.	fine to coarse SAND	2	6.0 Bentonite Seal
		S-2A			9-8					8.0
15		S-3	24/14	10-12	9-6	0	Loose, gray, fine SAND. Moist.	fine SAND	3	10.0 Schedule 40 PVC 0.01 Slot Well Screen
					4-4					15.0 OON Filter Sand
20		S-4	24/24	15-17	3-3	0	Loose, gray, SILT. Wet.	SILT	3	
					2-2					
25		S-5	24/	20-22	2-2	0	Loose, gray, SILT. Wet.		4	
					1-2					
							Bottom of boring at about 22.0 feet			

- REMARKS
1. The soil samples were screened for volatile organic compounds (VOCs) using a Thermo Environmental, Inc. Model 580B photoionization detector. The results, which are given in parts per million (ppm) and which are presented in the field test data column, serve as a relative indicator of VOCs in each sample.
 2. Encountered groundwater at approximately 15.0 feet.
 3. Bottom of boring at 22.0 feet. No refusal was encountered.
 4. Schedule 40 PVC monitoring well installed at completion of boring.



GZA
GeoEnvironmental, Inc.

STOWE HARDWARD STORE

STOWE, VERMONT

Boring No. GZ-3
Page 1 of 1
File No. 21075
Check _____

Contractor Cushing and Sons
Foreman Duane Drew
Logged by Darlene Autery
Date Start/Finish 7-9-93 7-9-93
Boring Location See Location Plan
GS Elev. _____ Datum _____

Auger/Casing Type HSA
I.D. 4-1/4
Sampler SS
2"
Hammer Wt. 140 lbs.
Hammer Fall 30"
Other _____

Groundwater Readings				
Date	Time	Depth	Casing	Stab.
7-9-93	18:53	10.59	MW	—
7-10-93	10:30	11.02	MW	14 hrs.

Depth	Casing Blows	Sample Information					Sample Description & Classification	Stratum Desc.	R M K S	Equipment Installed	
		No.	Pen/Rec. (In.)	Depth (Ft.)	Blows (/6")	PID Field Test Data					
5		S-1	24/2"	0-2	2-2	0	Very loose, brown, SILT, trace fine Sand, trace fine Gravel. Dry. TOPSOIL.		1	CURB BOX	0.5 Concrete Surface
					2-2						00N Filter Sand
10		S-2	24/0	5-7	5-3	0	Loose, dark brown, SILT. Dry.	SILT	2		2.0 Bentonite Seal
					4-3						4.0 Sched. 40 PVC Riser
15		S-3	24/18	10-12	2-2	0	Loose, olive-gray, SILT. Wet.		3		5.0 Sched. 40 PVC 0.01 Slot Well Screen
					2-2						00N Filter Sand
20		S-4	24/10	15-17	3-2	0	Loose, gray, SILT. Wet.		4, 5		15.0
					2-3						
						Bottom of Boring at 17.0 feet					

- R
E
M
A
R
K
S**
- The soil samples were screened for volatile organic compounds (VOCs) using a Thermo Environmental, Inc. Model 580B photoionization detector. The results, which are given in parts per million (ppm) and which are presented in the field test data column, serve as a relative indicator of VOCs in each sample.
 - Description is based on auger cuttings observed while drilling to 10.0 feet. No recovery in split spoon sample attempted at 5.0 to 7.0 feet.
 - Groundwater estimated at approximately 10.0 feet.
 - Boring terminated at approximately 17.0 feet. No refusal encountered.
 - Schedule 40 PVC monitoring well installed upon completion of the boring.

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No. GZ-3

APPENDIX C

SAMPLING METHODS AND ANALYTICAL LABORATORY REPORTS

APPENDIX C.1
SAMPLING METHODS

APPENDIX C.1

SAMPLING METHODS

C.1.1 Groundwater, Surface Water, and Sediment Sampling

Groundwater samples from the monitoring wells were obtained using polyethylene disposable bailers with PVC ballcheck valves. A separate bailer was used for each well. Before sampling, a minimum of three times the initial volume of standing groundwater in each of the wells was evacuated. The purging was conducted using single-use disposable bailers.

The groundwater samples were transferred to appropriate sample containers directly from the bailer in general accordance with the following sample collection order:

- Volatile organic compounds (VOCs);
- Petroleum hydrocarbons (PHCs).

The sediment samples were obtained using a stainless steel trowel. The sediment sample was transferred to appropriate sample containers directly from the bailer in accordance with the following sample collection order:

- Volatile Organic Compounds (VOCs);
- Petroleum Hydrocarbons (PHCs).

C.1.2 Field Screening of Water Samples

Groundwater and surface water samples were screened in the field for pH and temperature using a Beckman Model 10 pH meter. Prior to sampling, the pH meter was standardized to commercially available buffer solutions. The pH of a water sample gives an indication of the acidity or alkalinity of the sample.

C.1.3 Sample Preservation and Transport

Samples to be analyzed for VOCs/PHCs were pre-preserved with hydrochloric acid to obtain a pH less than 2.

Groundwater samples were packed in ice-filled coolers and transported to GZA's Environmental Chemistry Laboratory in Newton Upper Falls, Massachusetts, using GZA's standard chain of custody procedure.

APPENDIX C.2

ANALYTICAL LABORATORY REPORTS

GZA GEOENVIRONMENTAL, INC.
ENVIRONMENTAL CHEMISTRY LABORATORY
320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02164
MASSACHUSETTS LABORATORY I.D. NO.: MA092

EPA METHOD 418.1 PETROLEUM HYDROCARBONS
(SPECTROPHOTOMETRIC, INFRARED)
PHC-IR
CONCENTRATION (PPM, ug/g-Solid or ug/ml-Aqueous)

PROJECT: STOWE HARDWARE - STOWE, VT
FILE NO.: 21075
PROJECT MGR.: S. LAMB
DATE SAMPLED: 7/10/93
DATE TESTED: 7/13/93

SAMPLE ID:	METHOD	GZ-2
GZA LAB #:	BLANK 071393-QC	03153-IR
1. HYDROCARBON CONTENT - PPM	<1.0	<1.0
2. PERCENT SOLID CONTENT	N/A	N/A
3. MATRIX	AQUEOUS	AQUEOUS
4. DETECTION LIMIT - PPM	1.0	1.0

COMMENTS:

ANALYZED BY:



REVIEWED BY:



GZA GEOENVIRONMENTAL, INC.
ENVIRONMENTAL CHEMISTRY LABORATORY
320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02164
MASSACHUSETTS LABORATORY I.D. NO.: MA092

EPA METHOD 418.1 PETROLEUM HYDROCARBONS
(SPECTROPHOTOMETRIC, INFRARED)
PHC-IR
CONCENTRATION (PPM, ug/g-Solid or ug/ml-Aqueous)

PROJECT: STOWE HARDWARE - STOWE, VT
FILE NO.: 21075
PROJECT MGR.: S. LAMB
DATE SAMPLED: 7/10/93
DATE TESTED: 7/13/93

SAMPLE ID:	METHOD	GZ-3
GZA LAB #:	BLANK	
	071393-QC	03154-IR
1. HYDROCARBON CONTENT - PPM	<1.0	<1.0
2. PERCENT SOLID CONTENT	N/A	N/A
3. MATRIX	AQUEOUS	AQUEOUS
4. DETECTION LIMIT - PPM	1.0	1.0

COMMENTS:

ANALYZED BY:



REVIEWED BY:



GZA GEOENVIRONMENTAL, INC.
ENVIRONMENTAL CHEMISTRY LABORATORY
320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02164
MASSACHUSETTS LABORATORY I.D. NO.: MA092

EPA METHOD 418.1 PETROLEUM HYDROCARBONS
(SPECTROPHOTOMETRIC, INFRARED)
PHC-IR
CONCENTRATION (PPM, ug/g-Solid or ug/ml-Aqueous)

PROJECT: STOWE HARDWARE - STOWE, VT
FILE NO.: 21075
PROJECT MGR.: S. LAMB
DATE SAMPLED: 7/10/93
DATE TESTED: 7/13/93

SAMPLE ID: GZA LAB #:	METHOD BLANK 071393-QC	SW-1 03155-IR
1. HYDROCARBON CONTENT - PPM	<1.0	<1.0
2. PERCENT SOLID CONTENT	N/A	N/A
3. MATRIX	AQUEOUS	AQUEOUS
4. DETECTION LIMIT - PPM	1.0	1.0

COMMENTS:

ANALYZED BY:



REVIEWED BY:



GZA GEOENVIRONMENTAL, INC.
ENVIRONMENTAL CHEMISTRY LABORATORY
320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02164
MASSACHUSETTS LABORATORY I.D. NO.: MA092

EPA METHOD 418.1 PETROLEUM HYDROCARBONS
(SPECTROPHOTOMETRIC, INFRARED)
PHC-IR
CONCENTRATION (PPM, ug/g-Solid or ug/ml-Aqueous)

PROJECT: STOWE HARDWARE - STOWE, VT
FILE NO.: 21075
PROJECT MGR.: S. LAMB
DATE SAMPLED: 7/10/93
DATE TESTED: 7/13/93

SAMPLE ID: GZA LAB #:	METHOD BLANK 071393-QC	SED-1 03156-IR
1. HYDROCARBON CONTENT - PPM	<10	14
2. PERCENT SOLID CONTENT	N/A	71
3. MATRIX	SOLID	SOLID
4. DETECTION LIMIT - PPM	10	10

COMMENTS:

ANALYZED BY:



REVIEWED BY:



GZA GEOENVIRONMENTAL, INC.
 ENVIRONMENTAL CHEMISTRY LABORATORY
 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02164
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8020 ANALYSIS - PURGEABLE AROMATICS

PROJECT: STOWE HARDWARE - STOWE, VT
 FILE NO.: 21075 PROJECT MGR.: S. LAMB
 SAMPLE ID: GZ-1 DATE SAMPLED: 7/10/93
 MATRIX: AQUEOUS DATE TESTED: 7/13/93
 LABORATORY #: 10844-2 DILUTION FACTOR: 10

8020 COMPOUNDS	CONCENTRATION ug/l (PPB)	QUANTITATION LIMIT ug/l (PPB)
METHYL TERT-BUTYL ETHER (MTBE)	--BMQL--	50
BENZENE	--BMQL--	10
TOLUENE	--40--	10
ETHYL BENZENE	--17--	10
m & p-XYLENES	--73--	10
o-XYLENE	--46--	10
CHLOROBENZENE	ND	10
1,3-DICHLOROBENZENE	ND	10
1,4-DICHLOROBENZENE	ND	10
1,2-DICHLOROBENZENE	ND	10

SURROGATE	RECOVERY %	ACCEPTANCE LIMITS %
FLUOROBENZENE	105	80-115
4-BROMOFLUOROBENZENE	108	80-115

COMMENTS:

ANALYZED BY:

REVIEWED BY: *gmm*

GZA GEOENVIRONMENTAL, INC.
 ENVIRONMENTAL CHEMISTRY LABORATORY
 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02164
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8020 ANALYSIS - PURGEABLE AROMATICS

PROJECT: STOWE HARDWARE - STOWE, VT
 FILE NO.: 21075 PROJECT MGR.: S. LAMB
 SAMPLE ID: GZ-2 DATE SAMPLED: 7/10/93
 MATRIX: AQUEOUS DATE TESTED: 7/12/93
 LABORATORY #: 10845-2 DILUTION FACTOR: 1

8020 COMPOUNDS	CONCENTRATION ug/l (PPB)	QUANTITATION LIMIT ug/l (PPB)
METHYL TERT-BUTYL ETHER (MTBE)	ND	5.0
BENZENE	ND	1.0
TOLUENE	ND	1.0
ETHYL BENZENE	ND	1.0
m & p-XYLENES	ND	1.0
o-XYLENE	ND	1.0
CHLOROBENZENE	ND	1.0
1,3-DICHLOROBENZENE	ND	1.0
1,4-DICHLOROBENZENE	ND	1.0
1,2-DICHLOROBENZENE	ND	1.0

SURROGATE	RECOVERY %	ACCEPTANCE LIMITS %
FLUOROBENZENE	103	80-115
4-BROMOFLUOROBENZENE	119	80-115

COMMENTS:

ANALYZED BY: *[Signature]*

REVIEWED BY: *[Signature]*

GZA GEOENVIRONMENTAL, INC.
 ENVIRONMENTAL CHEMISTRY LABORATORY
 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02164
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8020 ANALYSIS - PURGEABLE AROMATICS

PROJECT: STOWE HARDWARE - STOWE, VT
 FILE NO.: 21075 PROJECT MGR.: S. LAMB
 SAMPLE ID: GZ-3 DATE SAMPLED: 7/10/93
 MATRIX: AQUEOUS DATE TESTED: 7/12/93
 LABORATORY #: 10846-2 DILUTION FACTOR: 1

8020 COMPOUNDS	CONCENTRATION ug/l (PPB)	QUANTITATION LIMIT ug/l (PPB)
METHYL TERT-BUTYL ETHER (MTBE)	ND	5.0
BENZENE	ND	1.0
TOLUENE	ND	1.0
ETHYL BENZENE	ND	1.0
m & p-XYLENES	ND	1.0
o-XYLENE	ND	1.0
CHLOROBENZENE	ND	1.0
1,3-DICHLOROBENZENE	ND	1.0
1,4-DICHLOROBENZENE	ND	1.0
1,2-DICHLOROBENZENE	ND	1.0

SURROGATE	RECOVERY %	ACCEPTANCE LIMITS %
FLUOROBENZENE	100	80-115
4-BROMOFLUOROBENZENE	114	80-115

COMMENTS:

ANALYZED BY:

REVIEWED BY: *[Signature]*

GZA GEOENVIRONMENTAL, INC.
 ENVIRONMENTAL CHEMISTRY LABORATORY
 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02164
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8020 ANALYSIS - PURGEABLE AROMATICS

PROJECT: STOWE HARDWARE - STOWE, VT
 FILE NO.: 21075 PROJECT MGR.: S. LAMB
 SAMPLE ID: SW-1 DATE SAMPLED: 7/10/93
 MATRIX: AQUEOUS DATE TESTED: 7/12/93
 LABORATORY #: 10847-2 DILUTION FACTOR: 1

8020 COMPOUNDS	CONCENTRATION ug/l (PPB)	QUANTITATION LIMIT ug/l (PPB)
METHYL TERT-BUTYL ETHER (MTBE)	ND	5.0
BENZENE	ND	1.0
TOLUENE	ND	1.0
ETHYL BENZENE	ND	1.0
m & p-XYLENES	ND	1.0
o-XYLENE	ND	1.0
CHLOROBENZENE	ND	1.0
1,3-DICHLOROBENZENE	ND	1.0
1,4-DICHLOROBENZENE	ND	1.0
1,2-DICHLOROBENZENE	ND	1.0

SURROGATE	RECOVERY %	ACCEPTANCE LIMITS %
FLUOROBENZENE	98.9	80-115
4-BROMOFLUOROBENZENE	111	80-115

COMMENTS:

ANALYZED BY: *[Signature]*

REVIEWED BY: *[Signature]*

GZA GEOENVIRONMENTAL, INC.
 ENVIRONMENTAL CHEMISTRY LABORATORY
 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02164
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8020 ANALYSIS - PURGEABLE AROMATICS

PROJECT: STOWE HARDWARE - STOWE, VT
 FILE NO.: 21075 PROJECT MGR.: S. LAMB
 SAMPLE ID: SED-1 DATE SAMPLED: 7/10/93
 MATRIX: SOLID DATE TESTED: 7/12/93
 LABORATORY #: 10848-2 DILUTION FACTOR: 1

8020 COMPOUNDS	CONCENTRATION ug/kg (PPB)	QUANTITATION LIMIT ug/kg (PPB)
METHYL TERT-BUTYL ETHER (MTBE)	ND	5.0
BENZENE	--BMQL--	1.0
TOLUENE	ND	1.0
ETHYL BENZENE	ND	1.0
m & p-XYLENES	ND	1.0
o-XYLENE	ND	1.0
CHLOROBENZENE	ND	1.0
1,3-DICHLOROBENZENE	ND	1.0
1,4-DICHLOROBENZENE	ND	1.0
1,2-DICHLOROBENZENE	ND	1.0

SURROGATE	RECOVERY %	ACCEPTANCE LIMITS %
4-BROMOFLUOROBENZENE	82.7	74-121
FLUOROBENZENE	88.8	74-121

COMMENTS:

ANALYZED BY: *[Signature]*

REVIEWED BY: *[Signature]*

GZA GEOENVIRONMENTAL, INC.
 ENVIRONMENTAL CHEMISTRY LABORATORY
 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02164 (617) 969-0050
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8010/8020/8021 ANALYSIS
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX

QUALITY CONTROL

DATE: 7/13/93

AQUEOUS

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
CHLOROBENZENE	---	60-120	---	20
TRICHLORETHENE	---	70-130	---	20
TOLUENE	---	70-125	---	20
TOLUENE (INSTR.#2)	---	70-125	---	20

SOLID

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
CHLOROBENZENE	---	60-120	---	35
TRICHLORETHENE	---	65-130	---	35
TOLUENE	127	65-125	2.39	35
TOLUENE (INSTR.#2)	---	65-125	---	35

GZA GEOENVIRONMENTAL, INC.
 ENVIRONMENTAL CHEMISTRY LABORATORY
 320 NEEDHAM STREET, NEWTON UPPER FALLS, MA 02164 (617) 969-0050
 MASSACHUSETTS LABORATORY I.D. NO. MA092

EPA METHOD 8010/8020/8021 ANALYSIS
 PURGEABLES IN AQUEOUS AND/OR SOLID MATRIX

QUALITY CONTROL

DATE: 7/12/93

AQUEOUS

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
CHLOROBENZENE	118	60-120	0.84	20
TRICHLORETHENE	119	70-130	0	20
TOLUENE	122	70-125	1.63	20
TOLUENE (INSTR.#2)	---	70-125	---	20

SOLID

COMPOUND	MATRIX SPIKE RECOVERY (%)	ACCEPTANCE LIMITS (%)	DUPLICATE SPIKE DIFFERENCE (%)	ACCEPTANCE LIMITS (%)
CHLOROBENZENE	112	60-120	6.06	35
TRICHLORETHENE	124	65-130	6.67	35
TOLUENE	128	65-125	0.78	35
TOLUENE (INSTR.#2)	---	65-125	---	35

APPENDIX D

**CONTAMINATED SOIL INDEMNIFICATION CERTIFICATE
AND
LABORATORY ANALYSES**



EST. 1975

O. BOX 359, EPSOM, NH 03234 • (603) 798-4557 • FAX (603) 798-5641

INDEMNIFICATION CERTIFICATE

This is to certify that MTS, Inc. agrees to forever indemnify and hold harmless STOWE HARDWARE, P.O. BOX 66, STOWE, VT for job # 25:3827:1

for 39.78 tons, including its officers and directors from any liabilities as they may or may not occur in the form of damages, arising from any discharge, deposit, dumping, spilling, leaking, or placing of any waste into onto any land or water so that the waste or any constituent of the waste may enter the environment, be emitted into the air, or be discharged into any waters, including groundwaters, or any other releases of oils or hazardous material as they may occur at its cold mix asphalt facilities at Route 4, Chichester, New Hampshire and River Road, Littleton, New Hampshire. This indemnification certification applies to the generator in so far as the materials he/she ships to any MTS, Inc. facility are indeed accepted and unloaded at the facility and shall not be construed to apply to any wastes which are in transit to an MTS, Inc. facility or rejected from the facility for not being suitable or for not being consistent with materials which are allowed to be accepted in accordance with its permits and licenses to operate a cold mix asphalt facility using soils contaminated with petroleum hydrocarbons (oils).

This certification applies equally to the subcontractors which may include transporters and consultants of MTS, Inc. as it applies to the delivery to MTS, Inc. and lawful processing of the soil materials which contain petroleum hydrocarbon contamination.

This certification is contingent upon the generator providing representative laboratory analyses of the waste materials (soils containing petroleum hydrocarbon contamination in accordance with MTS, Inc. approved and published procedure and the Generator's certification that his/her waste material contain no other constituents defined or listed as hazardous wastes in 40CFR 261 et. seq. This indemnification and hold harmless covenant shall not apply if it is subsequently determined by MTS, Inc. established quality control protocols that the waste materials (soil) shipped to an MTS, Inc. facility do contain toxic or hazardous waste constituents so listed in 40CFR 261, Hazardous Waste Laws, other than petroleum hydrocarbons.

Norman C. Fauteux MTS 7-26-93
Norman C. Fauteux, President & Treasurer

Post-It™ brand fax transmittal memo 7671 # of pages >

To	<u>Liaison</u>	From	<u>Linda</u>
Co.	<u>GZA</u>	Co.	<u>NEIm</u>
Dept.		Phone #	<u>802.863.5714</u>
Fax #	<u>207.879.0099</u>	Fax #	<u>862.863-</u>

AUG - 93

**TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100**

CUSTOMER: NEW ENGLAND INDUSTRIAL MAINTENANCE

LAB#: F28-93-03

SAMPLE LOCATION: STOWE HARDWARE

JOB#: 9304.071

SAMPLE IDENTITY: STOCKPILED SOILS

CONTROL #: 7004

DATE SAMPLED: 6/25/93

RECD: 6/28/93

DATE ANALYZED: 7/02/93

DATE EXTRACTED: 6/28/93

MATRIX: SOLID

PERCENT MOISTURE: 14.71%

COMPOUND

**CONCENTRATION
(MG/KG)
4,100**

**DETECTION LIMIT MULTIPLIER:
(MG/KG) X 1
10**

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: *cu*

CONTROL NO. 7504



317 Elm Street
 Milford, NH 03055
 (603) 673-5440
 FAX (603) 673-0366

CHAIN OF CUSTODY

A CUSTOMER INFORMATION

CUSTOMER: New England Industrial Maint.
 ADDRESS: 76 Ethan Allen Dr So. Buff.
 TELEPHONE: 802-863-8714
 CONTACT PERSON: Joe LaMountain
 P.O. NUMBER: #

B PROJECT INFORMATION

JOB NAME: Stowe Hardware
 JOB NUMBER: 9304.071
 LOCATION: Stowe VT
 TELEPHONE: _____
 CONTACT PERSON: (PRINT) Same

C SAMPLE INFORMATION

TURNAROUND TIME: (CIRCLE ONE)
 STANDARD RUSH
 RUSH T.A.T. 5/day (Check with lab)

STATION #	SAMPLE IDENTIFICATION & LOCATION	DATE COLLECTED	TIME COLLECTED	SAMPLE TYPE GRAB	COMP	MATRIX SOLID (S) LIQUID (L) COMBINED (C) HAZARD (H)	# OF CONTAINERS	CONTAINER & PRESERVATIVE										ANALYSIS				
	Stock Pile Soils	6/25	1000 AM	X		S	2															TPH 8100

M CUSTODY

(PRINT NAME)
 SAMPLER: Scott Borden SIGNATURE: [Signature] MILITARY DATE/TIME: 6/25 1030
 RELINQUISHED: Scott Borden MILITARY DATE/TIME: 6/25 1300
 RECEIVED: Amanda Fish MILITARY DATE/TIME: X
 RELINQUISHED: _____ MILITARY DATE/TIME: _____
 RECEIVED FOR LABORATORY: [Signature] MILITARY DATE/TIME: 6/25 1315

LAB USE ONLY

Shrink - 99¢ charge per T&W

A _____
 B _____
 C _____
 D _____
 E _____
 F _____
 G _____
 H _____
 I _____
 J _____
 K _____
 L _____
 M _____

The State of New Hampshire
Department of Environmental Services

**CERTIFICATE OF APPROVAL
Wastewater Analysis**

Issued to
Chemserve, Inc.

Located at
Elm Street, Milford, NH

Under the provisions of the Regulations in Env-C300
for the following analyses:

FULL CERTIFICATION: Total Coliform by Membrane Filtration, Fecal Coliform by Membrane Filtration, Aluminum, Arsenic, Beryllium, Cadmium, Copper, Iron, Mercury, Manganese, Nickel, Lead, Selenium, Vanadium, Zinc, Silver, Thallium, pH, TDS, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Sulfate, Ammonia-N, Nitrate-N, Orthophosphates, TKN, Total Phosphorus, COD, BOD, Total Cyanide, Non-Filterable Residue, Total Phenolics, Total Residual Chlorine, Pesticides and Volatile Organics.

PROVISIONAL CERTIFICATION: PCBs in Water and PCBs in Oil.

REPLACES CERTIFICATE #100892-B

CERTIFICATE NUMBER: 100892-C

DATE OF ISSUE: February 1, 1993

EXPIRATION DATE: December 2, 1993

Charles M. Maye
Certifying Officer

The State of New Hampshire
Department of Environmental Services

**CERTIFICATE OF APPROVAL
Drinking Water Analysis**

Issued to
Chemserve, Inc.

Located at
Elm Street, Milford, NH

Under the provisions of the Regulations in Env-C300
for the following analyses:

FULL CERTIFICATION: Total Coliform by Membrane Filtration, Fecal Coliform by Membrane Filtration, Colilert-MPN, Corrosivity, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Lead, Nickel, Silver, Thallium, pH, Sodium, Residual Free Chlorine, Turbidity, Alkalinity, Nitrate-N, Nitrite-N, Total Filterable Residue, Sulfates, Total Cyanides, Trihalomethanes and Vinyl Chloride.

PROVISIONAL CERTIFICATION: Aluminum, Manganese, Vanadium, Zinc and Volatile Organics.

REPLACES CERTIFICATE #100892-A

CERTIFICATE NUMBER: 100892-D

DATE OF ISSUE: March 10, 1993

EXPIRATION DATE: December 2, 1993

Charles M. Maye
Certifying Officer



TOXIC CHARACTERIZATION LEACHATE PROCEDURE (TCLP)
HERBICIDES
EPA METHOD 1311/8150

CUSTOMER: NEW ENGLAND INDUSTRIAL

LAB#: E25-93-02

SAMPLE LOCATION: STOWE HARDWARE, STOWE VT

JOB#: 9304.065

SAMPLE IDENTITY: COMP. FROM STOCKPILED CONTAMINATED SOILS

CONTROL #: 7003

DATE SAMPLED: 5/24/93

REC'D: 5/25/93

DATE ANALYZED: 6/02/93

DATE EXTRACTED: 5/28/93

MATRIX: SOLID

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

2,4-D
SILVEX

(UG/L)
BDL
BDL

(UG/L) X 2
10
10

BDL = BELOW DETECTION LIMIT

CERTIFIED: _____

**SEMIVOLATILE ORGANIC ANALYSIS
EPA METHOD 8270**

CUSTOMER: NEW ENGLAND INDUSTRIAL

LAB#: E25-93-02

SAMPLE LOCATION: STOWE HARDWARE, STOWE VT

JOB#: 9304.065

SAMPLE IDENTITY: COMP. FROM STOCKPILED CONTAMINATED SOILS

CONTROL #: 7003

DATE SAMPLED: 5/24/93

REC'D: 5/25/93

DATE ANALYZED: 6/01/93

DATE EXTRACTED: 5/28/93

MATRIX: SOLID

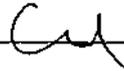
PERCENT MOISTURE: 11.53%

COMPOUND	CONCENTRATION (UG/KG)	DETECTION LIMIT MULTIPLIER: (UG/KG) X 100
2-Methylphenol	BDL	10
4-Methylphenol	BDL	10
Benzo[b]fluoranthene	BDL	10
Benzo[k]fluoranthene	BDL	10
Benzo[a]pyrene	BDL	10
Indeno[1,2,3-cd]pyrene	BDL	10
Dibenz[a,h]anthracene	BDL	10
Benzo[g,h,i]perylene	BDL	10

NOTE: NON-TARGET COMPOUNDS PRESENT

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: _____





PESTICIDES
EPA METHOD 8080

CUSTOMER: NEW ENGLAND INDUSTRIAL

LAB#: E25-93-02

SAMPLE LOCATION: STOWE HARDWARE, STOWE VT

JOB#: 9304.065

SAMPLE IDENTITY: COMP. FROM STOCKPILED CONTAMINATED SOILS

CONTROL #: 7003

DATE SAMPLED: 5/24/93

REC'D: 5/25/93

DATE ANALYZED: 6/02/93

DATE EXTRACTED: 5/26/93

MATRIX: SOLID

PERCENT MOISTURE: 11.53%

COMPOUND	CONCENTRATION (UG/KG)	DETECTION LIMIT MULTIPLIER: (UG/KG) X 100
ALPHA-BHC	BDL	0.1
BETA-BHC	BDL	0.1
DELTA-BHC	BDL	0.1
HEPTACHLOR	BDL	0.1
ALDRIN	BDL	0.1
HEPTACHLOR EPOXIDE	BDL	0.1
ENDOSULFAN 1	BDL	0.1
ENDOSULFAN 2	BDL	0.1
DIELDRIN	BDL	0.1
ENDRIN	BDL	0.1
4,4'-DDE	BDL	0.1
4,4'-DDD	BDL	0.1
4,4'-DDT	BDL	0.1
TOTAL-CHLORDANE	BDL	0.1
LINDANE	BDL	0.1
METHOXYCHLOR	BDL	1
TOXAPHENE	BDL	1

BDL = BELOW DETECTION LIMIT

CERTIFIED: _____

**PCB SCAN
EPA METHOD 8080**

CUSTOMER: NEW ENGLAND INDUSTRIAL

LAB#: E25-93-02

SAMPLE LOCATION: STOWE HARDWARE, STOWE VT

JOB#: 9304.065

SAMPLE IDENTITY: COMP. FROM STOCKPILED CONTAMINATED SOILS

CONTROL #: 7003

DATE SAMPLED: 5/24/93

REC'D: 5/25/93

DATE ANALYZED: 6/02/93

DATE EXTRACTED: 5/26/93

MATRIX: SOLID

PERCENT MOISTURE: 11.53%

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

TOTAL AROCLORS

(UG/KG)

(UG/KG) X 100

BDL

0.1

BDL = BELOW DETECTION LIMIT

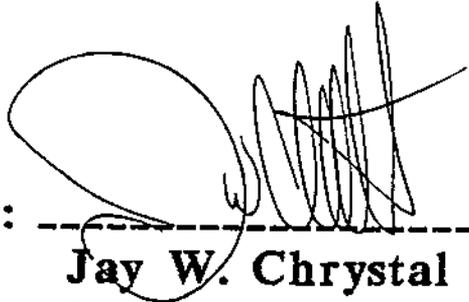
CERTIFIED: _____

Cy

All analyses performed in accordance with
USEPA/Standard Methods/ASTM Methods.

Inorganic results are in (mg/L) except as
noted.

Certified by: _____



Jay W. Chrystal
Laboratory Director





SEMIVOLATILE ORGANIC ANALYSIS
EPA METHOD 8270

CUSTOMER: NEW ENGLAND INDUSTRIAL

LAB#: E25-93-02

SAMPLE LOCATION: STOWE HARDWARE, STOWE VT

JOB#: 9304.065

SAMPLE IDENTITY: COMP. FROM STOCKPILED CONTAMINATED SOILS

CONTROL #: 7003

DATE SAMPLED: 5/24/93

REC'D: 5/25/93

DATE ANALYZED: 6/01/93

DATE EXTRACTED: 5/28/93

MATRIX: SOLID

PERCENT MOISTURE: 11.53%

COMPOUND	CONCENTRATION (UG/KG)	DETECTION LIMIT MULTIPLIER: (UG/KG) X 100
2-Chlorophenol	BDL	10
1,4-Dichlorobenzene	BDL	10
1,3-Dichlorobenzene	BDL	10
1,2-Dichlorobenzene	BDL	10
bis(2-chloroisopropyl)ether	BDL	10
n-Nitroso-di-n-propylamine	BDL	10
Napthalene	9,700	10
2-Methylnapthalene	36,000	10
2,4-Dimethylphenol	BDL	10
2,4-Dichlorophenol	BDL	10
4-Chloroaniline	BDL	10
4-Chloro-3-methylphenol	BDL	10
Hexachlorocyclopentadiene	BDL	10
2,4,5-Trichlorophenol	BDL	10
2,4,6-Trichlorophenol	BDL	10
2-Nitroaniline	BDL	10
Acenaphthylene	BDL	10
3-Nitroaniline	BDL	10
Acenaphthene	BDL	10
4-Nitrophenol	BDL	10
2,4-Dinitrotoluene	BDL	10
4-Nitroaniline	BDL	10
4,6-Dinitro-2-methylphenol	BDL	10
n-Nitrosodiphenylamine	BDL	10
4-Bromophenyl-phenylether	BDL	10
Hexachlorobenzene	BDL	10
Pentachlorophenol	BDL	10
Phenanthrene	9,000	10
Anthracene	BDL	10
Di-n-butylphthalate	BDL	10
Fluoranthene	BDL	10
Pyrene	1,500	10
Butylbenzylphthalate	BDL	10
Benzo[a]anthracene	BDL	10
3,3'-Dichlorobenzidine	BDL	10
Chrysene	BDL	10
bis(2-Ethylhexyl)phthalate	BDL	10
Di-n-octylphthalate	BDL	10
Dimethylphthalate	BDL	10
Flourene	BDL	10

**TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8015**

CUSTOMER: NEW ENGLAND INDUSTRIAL

LAB#: E25-93-02

SAMPLE LOCATION: STOWE HARDWARE, STOWE VT

JOB#: 9304.065

SAMPLE IDENTITY: COMP. FROM STOCKPILED CONTAMINATED SOILS

CONTROL #: 7003

DATE SAMPLED: 5/24/93

REC'D: 5/25/93

DATE ANALYZED: 6/03/93

MATRIX: SOLID

PERCENT MOISTURE: 11.53%

COMPOUND

**CONCENTRATION
(MG/KG)
470**

**DETECTION LIMIT MULTIPLIER:
(MG/KG) X 1
10**

TOTAL PETROLEUM
HYDROCARBONS AS
GASOLINE CONSTITUENTS

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: _____

CW



TOXIC CHARACTERIZATION LEACHATE PROCEDURE (TCLP)
HERBICIDES
EPA METHOD 1311/8150

CUSTOMER: NEW ENGLAND INDUSTRIAL

LAB#: E25-93-02

SAMPLE LOCATION: STOWE HARDWARE, STOWE VT

JOB#: 9304.065

SAMPLE IDENTITY: COMP. FROM STOCKPILED CONTAMINATED SOILS

CONTROL #: 7003

DATE SAMPLED: 5/24/93

REC'D: 5/25/93

DATE ANALYZED: 6/02/93

DATE EXTRACTED: 5/28/93

MATRIX: SOLID

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

2,4-D
SILVEX

(UG/L)
BDL
BDL

(UG/L) X 2
10
10

BDL = BELOW DETECTION LIMIT

CERTIFIED: _____



STANDARD TCLP DATA PACKAGE

**CUSTOMER: NEW ENGLAND INDUSTRIAL
MAINTENANCE**

**LABORATORY #: E25-93-02
CONTROL #: 7003
PROJECT #: 9304.065**

SAMPLE LOCATION: STOWE HARDWARE, STOWE, VT

MATRIX SPIKE RECOVERY FORM

SPIKE SAMPLE ID: 7003

PARAMETERS	SPIKE CONCENTRATION	SAMPLE CONCENTRATION	CONCENTRATION RECOVERED	% RECOVERY
ARSENIC	1.00	<0.10	1.03	103
BARIUM	2.00	0.51	2.35	92
CADMIUM	1.00	<0.05	1.01	101
CHROMIUM	2.00	<0.10	2.00	100
LEAD	2.00	<0.40	2.01	101
MERCURY	0.0030	<0.0005	0.0034	113
SELENIUM	1.00	<0.10	1.05	105
SILVER	2.00	<0.20	1.78	89

**DUPLICATE SAMPLE ID: 7003
MERCURY DUPLICATE SAMPLE ID: 6999
DUPLICATE SAMPLE RESULTS**

METHOD BLANK RESULTS

	RESULTS	ORIGINAL	RESULTS DUPLICATE	RPD
ARSENIC	<0.10	<0.10	<0.10	0
BARIUM	<0.03	0.51	0.47	8
CADMIUM	<0.05	<0.05	<0.05	0
CHROMIUM	<0.10	<0.10	<0.10	0
LEAD	<0.40	<0.40	<0.40	0
MERCURY	<0.0005	<0.0005	<0.0005	0
SELENIUM	<0.10	<0.10	<0.10	0
SILVER	<0.20	<0.20	<0.20	0

DATE : 06/02/93 LABORATORY #: E25-93-02
CUSTOMER : NEW ENGLAND INDUSTRIAL CONTROL #: 7003
MAINTENANCE

INORGANIC QUALITY CONTROL INFORMATION

Chemserv minimum quality control requires matrix or duplicate analysis every ten samples analyzed. In addition, all samples are compared to a minimum of a three point calibration curve and a reagent blank. Any digestion or extraction requires a method blank or equipment blank to verify no presence of cross contamination or carry-over. Matrix spike recoveries are generally required to be within plus or minus 25%. Extensive QC data is available for this project at our facility.

CERTIFICATION:

I certify that all quality control measures were within specification guidelines with the exception of noted deviation. (if any)

Certified by _____



MICHELLE R. COHEN - INORGANICS SUPERVISOR

A detailed QA/QC manual is available upon request.

**VOA SPIKE RECOVERY FORM
EPA METHOD 8260**

CUSTOMER: NEW ENGLAND INDUSTRIAL

LAB#: E25-93-03

SAMPLE LOCATION: STOWE HARDWARE, STOWE VT

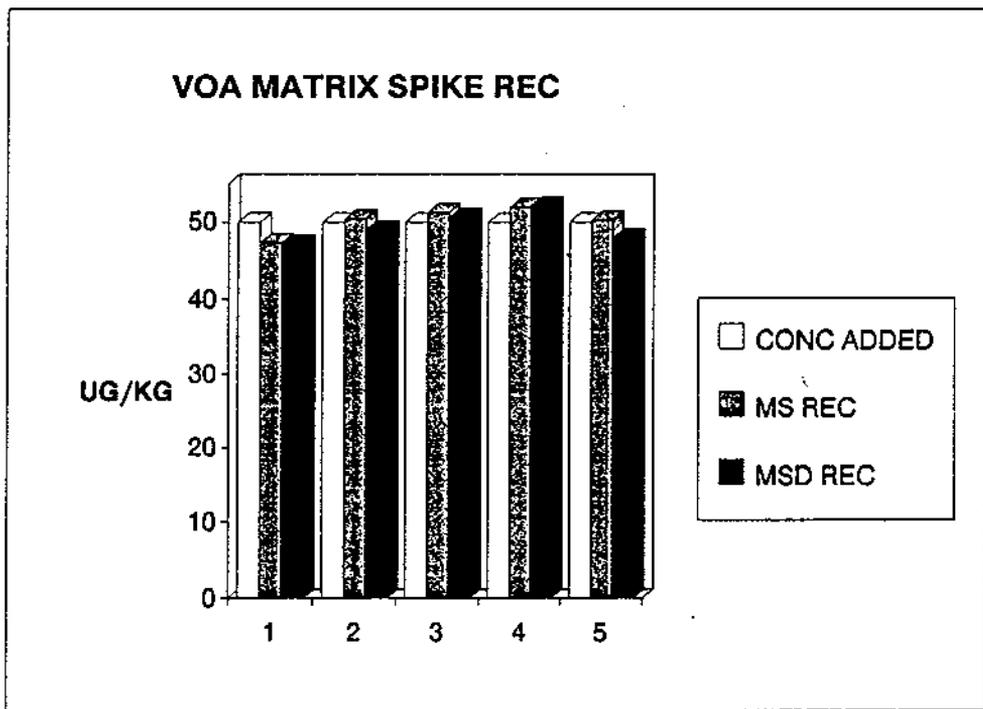
JOB#: 9212.425

SAMPLE IDENTITY: QC SPIKES / 7003

CONTROL #: 7003

DATE ANALYZED: 6/03/93

COMPOUND	CONC ADDED UG/KG	AMT REC UG/KG	DUP AMT REC UG/KG	%REC	DUP % REC	%DIFF
1,1-DICHLOROETHENE	50	47.3	47.08	95%	94%	0%
TRICHLOROETHENE	50	50.4	48.94	101%	98%	3%
BENZENE	50	51.19	50.56	102%	101%	1%
TOLUENE	50	51.85	52.05	104%	104%	0%
CHLOROBENZENE	50	50.18	47.9	100%	96%	5%



SPIKE RECOVERY LIMITS
 1,1-DICHLOROETHENE 59-172%
 TRICHLOROETHENE 62-137%
 BENZENE 66-142%
 TOLUENE 59-139%
 CHLOROBENZENE 60-133%

CUSTOMER: NEW ENGLAND INDUSTRIAL

LAB#: E25-93-03

SAMPLE LOCATION: STOWE HARDWARE, STOWE VT

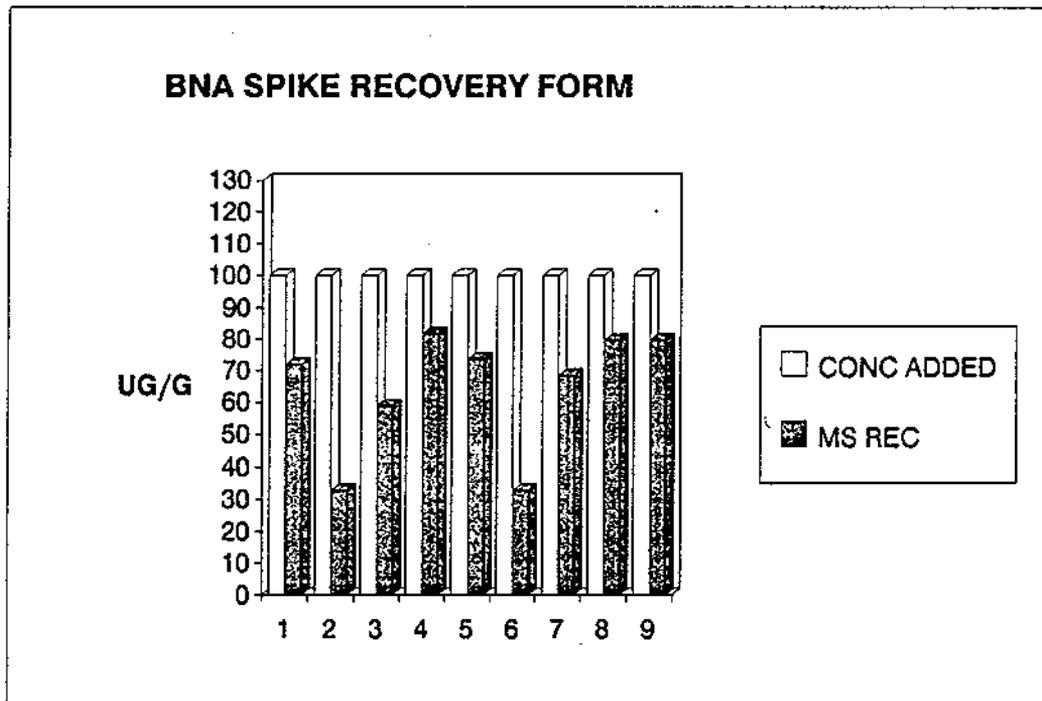
JOB#: 9212.425

SAMPLE IDENTITY: QC SPIKE/6557

CONTROL #: 7003

DATE ANALYZED: 6/01/93

COMPOUND	CONC ADDED	AMT REC	%RECOVERY
	UG/G	UG/G	
2-CHLOROPHENOL	100	71.87	72%
PHENOL	100	32.64	33%
1,4-DICHLOROBENZENE	100	58.87	59%
4-CHLORO-3-METHYLPHENOL	100	81.79	82%
ACENAPHTHENE	100	73.55	74%
4-NITROPHENOL	100	32.67	33%
2,4-DINITROTOLUENE	100	68.41	68%
PENTACHLOROPHENOL	100	79.59	80%
PYRENE	100	79.66	80%



SPIKE RECOVERY LIMITS

- PHENOL 26-100%
- 2-CHLOROPHENOL 25-102%
- 1,4-DICHLOROBENZENE 28-104%
- 4-CHLORO-3-METHYLPHENOL 26-103%
- ACENAPHTHENE 31-137%
- 4-NITROPHENOL 11-114%
- 2,4-DINITROTOLUENE 28-89%
- PENTACHLOROPHENOL 17-109%
- PYRENE 35-142%

**PESTICIDES
SPIKE RECOVERY FORM
EPA METHOD 8080**

CUSTOMER: NEW ENGLAND INDUSTRIAL

LAB#: E25-93-03

SAMPLE LOCATION: STOWE HARDWARE, STOWE VT

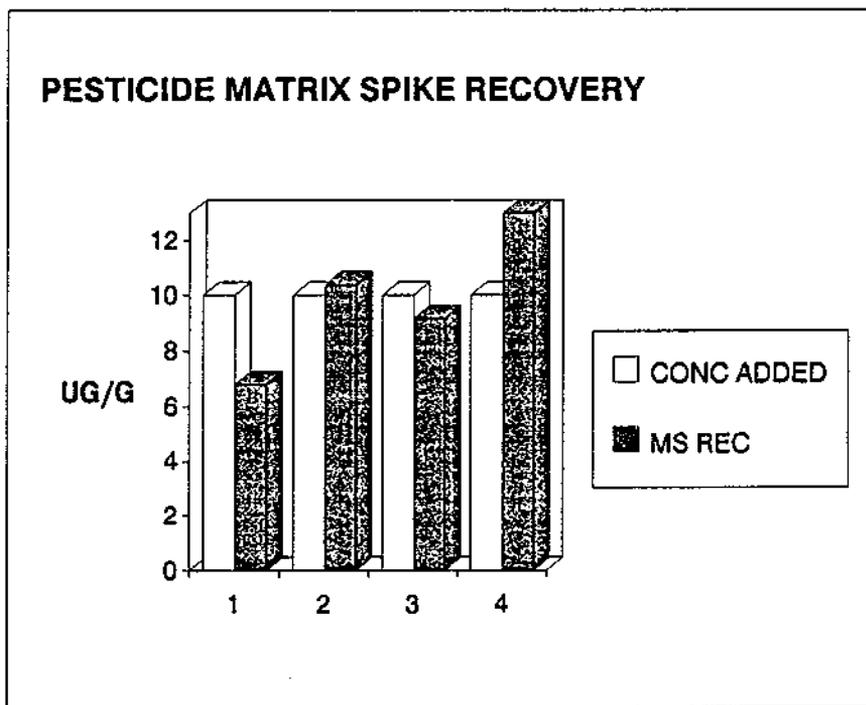
JOB#: 9212.425

SAMPLE IDENTITY: QC SPIKE / 7003

CONTROL #: 7003

DATE ANALYZED: 6/02/93

COMPOUND	CONC ADDED UG/G	AMT REC UG/G	%RECOVERY
LINDANE	10	6.77	68%
HEPTACHLOR	10	10.37	104%
HEPTACHLOR EPOXIDE	10	9.15	92%
ENDRIN	10	13.13	131%



SPIKE RECOVERY LIMITS

LINDANE 46-127%

HEPTACHLOR 35-130%

HEPTACHLOR EPOXIDE 34-132%

ENDRIN 42-139%

**TCLP HERBICIDE SPIKE RECOVERY FORM
 EPA METHOD 8150**

CUSTOMER: NEW ENGLAND INDUSTRIAL

LAB #: E25-93-03

SAMPLE LOCATION: STOWE HARDWARE, STOWE VT

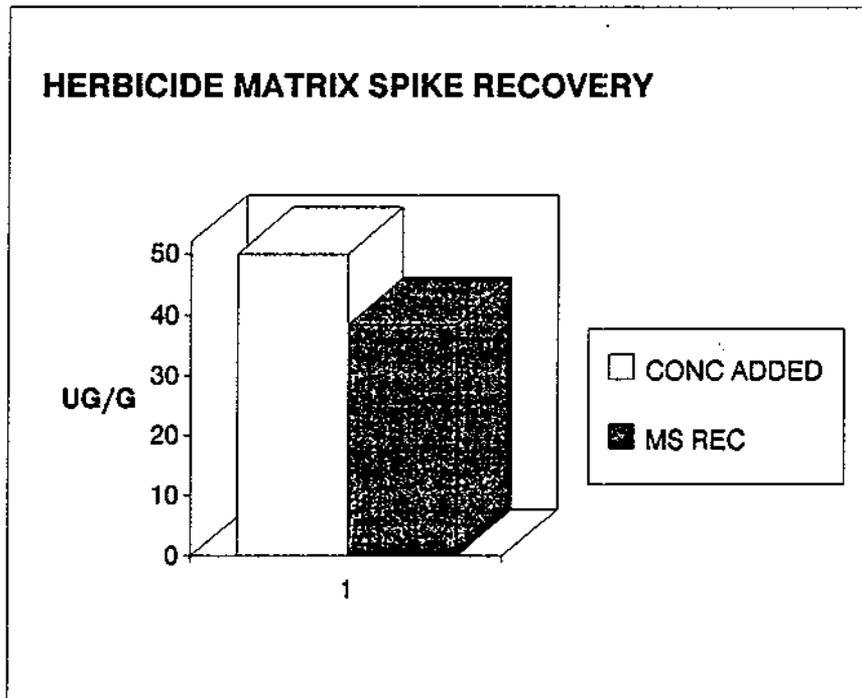
JOB #: 9212.425

SAMPLE IDENTITY: QC SPIKE / 7003

CONTROL #: 7003

DATE ANALYZED: 6/02/93

COMPOUND	CONC ADDED UG/G	AMT REC UG/G	%RECOVERY
SILVEX	50	38.41	77%



CONTROL LIMITS +/- 50%

Chain of Custody and Certification

The State of New Hampshire
Department of Environmental Services
CERTIFICATE OF APPROVAL
Wastewater Analysis

Issued to
Chemsolve, Inc.

Located at
Elm Street, Milford, NH

Under the provisions of the Regulations in Env-C300
for the following analyses:

FULL CERTIFICATION: Total Coliform by Membrane Filtration, Fecal Coliform by Membrane Filtration, Aluminum, Arsenic, Beryllium, Cadmium, Copper, Iron, Mercury, Manganese, Nickel, Lead, Selenium, Vanadium, Zinc, Silver, Thallium, pH, TDS, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Sulfate, Ammonia-N, Nitrate-N, Orthophosphates, TKN, Total Phosphorus, COD, BOD, Total Cyanide, Non-Filterable Residue, Total Phenolics, Total Residual Chlorine, Pesticides and Volatile Organics.

PROVISIONAL CERTIFICATION: PCBs in Water and PCBs in Oil.

REPLACES CERTIFICATE #100892-B

CERTIFICATE NUMBER: 100892-C

DATE OF ISSUE: February 1, 1993

EXPIRATION DATE: December 2, 1993


Certifying Officer

The State of New Hampshire
Department of Environmental Services
CERTIFICATE OF APPROVAL
Drinking Water Analysis

Issued to
Chemsolve, Inc.

Located at
Elm Street, Milford, NH

Under the provisions of the Regulations in Env-C300
for the following analyses:

FULL CERTIFICATION: Total Coliform by Membrane Filtration, Fecal Coliform by Membrane Filtration, Colilert-MPN, Corrosivity, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Lead, Nickel, Silver, Thallium, pH, Sodium, Residual Free Chlorine, Turbidity, Alkalinity, Nitrate-N, Nitrite-N, Total Filterable Residue, Sulfates, Total Cyanides, Trihalomethanes and Vinyl Chloride.

PROVISIONAL CERTIFICATION: Aluminum, Manganese, Vanadium, Zinc and Volatile Organics.

REPLACES CERTIFICATE #100892-A

CERTIFICATE NUMBER: 100892-D

DATE OF ISSUE: March 10, 1993

EXPIRATION DATE: December 2, 1993


Certifying Officer