



TWIN STATE ENVIRONMENTAL CORP.

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September 23, 1994

Mr. Chuck Schwer
Agency of Natural Resources
Sites Management Section
103 South Main Street/West Office
Waterbury, Vermont 05671-0404

RE: Site Investigation Report
Memorial United Methodist Church
Swanton, Vermont
SMS # 94-1595
TSEC # 94-116

Dear Mr. Schwer:

1.0 INTRODUCTION

The following presents Twin State Environmental Corporation's (TSEC's) site investigation report for the Memorial United Methodist Church (Church) site. This investigation was requested by the Vermont Agency of Natural Resources, Sites Management Section (SMS), to address petroleum contamination at this site. The activities conducted are in accordance with TSEC's Site Investigation Work Plan dated June 20, 1994, with the modifications outlined in the SMS approved letter dated June 29, 1994.

An emergency tank pull was conducted under the direction of TSEC on April 8, 1994, in order to remove a 2,000 gallon fuel oil tank, which was located off the east end of the Church. This tank was suspected to have been leaking, due to the accumulation of fuel oil in a sump in the basement of the Church. A groundwater treatment system was installed by TSEC in the basement sump, to prevent contaminated water from being discharged into the municipal wastewater system.

During the tank excavation, numerous pin sized holes were observed on the north end of the tank, and a small amount of oil was detected along the outside of the tank. In addition, a six inch sleeve which had been situated over the fill pipe, contained residual amounts of oil, and the vent pipe was broken off at the top of the tank. Further

information on this tank pull is available in TSEC's UST Closure Report dated April 11, 1994.

In response to the SMS's request, the objectives of this site investigation are: 1) to determine the extent and degree of contamination associated with this site, and; 2) to monitor the efficiency of the groundwater treatment system.

2.0 SCOPE OF WORK

The following activities were conducted as part of TSEC's site investigation.

2.1 Soil Boring Survey

In order to determine the degree and extent of soil contamination, a soil boring survey was conducted in the immediate vicinity of the former fill pipe, as well as in the vicinity of the tank excavation. These features are presented on Figures 1 and 2.

The area in the immediate vicinity of the former fill pipe was investigated through the completion of hand auger borings. This area was not accessible to a drilling rig due to an exterior set of stairs along the side of the building. A total of six (6) soil borings were completed to a depth of approximately 1.5 to 3 feet below the ground surface using a decontaminated stainless steel hand auger.

Soil borings in the vicinity of the tank excavation were conducted by Tri State Drilling & Boring of West Burke, Vermont, with oversight provided by TSEC. A total of three (3) soil borings were advanced using a truck mounted drilling rig equipped with 4.25 inch hollow inch stem augers. Split spoon soil samples were collected continuously to depths ranging from ten to twelve feet (10-12') below ground surface. As requested by the SMS, the borings were advanced within a forty (40) foot radius of the tank excavation.

Soils encountered at each boring location were screened both visually and with the use of a photo ionization detector (PID) equipped with a 10.6 electron volt (eV) lamp for the presence of volatile organic contamination (VOC). The soils were screened using both ambient and head space techniques. The PID was calibrated to detect organic vapors relative to isobutylene, a benzene equivalent. The soils were logged using conventional soil classification techniques.

2.2 Monitoring Well Installations

In order to evaluate the overburden aquifer for the presence of contamination, a groundwater monitoring well was installed in each of the soil borings advanced with the drilling rig. These borings/monitoring wells were positioned to allow for the determination of the groundwater flow direction as well as the horizontal

hydraulic gradient. MW-1 was located just outside the fence, northwest of the tank excavation. MW-2 was located along the north side of the Church in the vicinity of the basement sump, and MW-3 was located just north of the tank excavation within the fenced in area.

Each monitoring well was constructed of two (2) inch diameter schedule 40 PVC pipe. The well screen consisted of a five (5) foot section of 0.010 inch machine slotted PVC. The annulus surrounding each well was backfilled with clean filter sand to a depth approximately 1.5 feet above the top of the well screen. A two (2) foot bentonite seal was placed above the sand pack. The wells were completed at the ground surface, with a flush-with-the-ground protective casing cemented in place.

Following installation, each monitoring well was developed using a peristaltic pump equipped with dedicated polyethylene tubing in order to remove stagnant water and any drill cuttings introduced to the well. The wells were developed for a minimum of one hour. All purge water was discharged directly to the ground surface.

2.3 Monitoring Well Sampling

Water quality samples were collected from each of the wells in accordance with TSEC's Standard Operating Procedure (Appendix 5). The wells were sampled on July 27, 1994 for analysis of purgeable aromatics by USEPA Method 8020. Additional groundwater samples were collected on August 4, 1994, and analyzed for total petroleum hydrocarbons in accordance with modified EPA Method 8100. For QA/QC purposes, both sampling events included a duplicate sample, and the July 27, 1994 sampling also included one (1) field blank. These two sampling events constitute the first round of groundwater sampling conducted on these wells. All groundwater samples were analyzed by Chemserve Environmental Analysts (Chemserve) of Milford, New Hampshire.

2.4 Potential Receptor Survey

TSEC conducted a door to door survey of adjacent property owners to determine if the nearby buildings contained basements and if the owners had noticed petroleum odors. A survey was conducted of the Post Office building located north-northwest (downgradient) of the site, and of the library, which is located south-southeast of the site.

Other potential receptors such as surface waters and private water supplies were also considered as part of this survey.

2.5 Site Survey

In order to generate an accurate and complete site plan and groundwater contour map, pertinent features of this site (including buildings, monitoring wells and the former tank location) were surveyed by TSEC for location and elevation on July 27, 1994. These data were incorporated into a base map of the site (Figure 1).

2.6 Groundwater Treatment System Monitoring

TSEC conducted a weekly system inspection in order to monitor the efficiency of the groundwater treatment system. During this inspection, the water level in the basement sump as well as the presence of any free product was noted. The groundwater treatment system consisted of two carbon canisters connected in a series. Groundwater from the sump was pumped through the carbon canisters, prior to being discharged into the municipal wastewater treatment system. A brief overview is presented below, with a more complete summary presented in Appendix 1.

Water quality samples were collected from the groundwater treatment system approximately every two (2) weeks, throughout the past four (4) months. The samples were analyzed by Chemserve for purgeable aromatics in accordance with EPA Method 8020 and for TPH in accordance with Modified EPA Method 8100. Samples locations included: the sump itself (influent), the sample port between the two carbon canisters (mid), as well as a sample port beyond the second carbon canister (effluent). As requested by the SMS, not all analyses were conducted at each location during each event.

It should be noted that on June 21, 1994, the groundwater treatment system had to be bypassed, due to a restriction in flow into one or both of the carbon canisters. At this time, the basement sump was connected directly to the Municipal wastewater treatment system. Due to the favorable water quality results of samples from the sump, the system remains disconnected. TSEC is currently collecting samples only from the basement sump.

Summary reports have been submitted to the SMS periodically throughout this investigation which present the results of the groundwater system monitoring. However, as requested by the SMS, a complete summary of the monitoring of the groundwater system as well as results of the analytical sampling in the vicinity of the sump, are also included in this report as Appendix 1.

As per a written request from the SMS dated August 11, 1994, the frequency of the visual system check was recently changed from weekly to biweekly and the frequency analytical sample collection was changed from biweekly to monthly.

3.0 RESULTS

3.1 Soil Boring/Monitoring Well Results

Soils in the site vicinity were reported to consist of tan to gray finely stratified sands. The depth to groundwater across the site at the time of our investigation was on the order of 6 - 7 feet below ground surface. PID levels of the soils collected from each of the groundwater monitoring wells, was found to be at background concentrations. In addition, no visual signs of petroleum contamination were noted at these locations. Figure 1 presents the monitoring well locations. TSEC soil boring logs and construction diagrams are presented in Appendix 2. Drillers logs are presented in Appendix 3.

3.2 Hand Auger Soil Boring Results

The results of the hand auger borings which were conducted in the vicinity of the former fill pipe are presented in Table 1. Soil boring locations are presented on Figure 2. SB-1, which was located in the immediate vicinity of the fill pipe was found to contain PID head space concentrations ranging from 32 to 52 ppm. The PID concentration taken at the top of this open boring was determined to be 60 ppm. All other hand auger soil boring locations were found to contain PID concentrations of 3 ppm or less for both head space and open boring screening techniques.

3.3 Groundwater Flow Direction

Groundwater flow across the site was determined to be from east to west. The horizontal hydraulic gradient was very shallow, on the order of 0.014. A groundwater elevation summary table for data collected on July 27, 1994 is presented in Table 2. The groundwater contour map for this date is presented on Figure 3.

3.4 Groundwater Quality

All three (3) groundwater monitoring wells, namely MW-1, MW-2 and MW-3 were found to be free from detectable concentrations of all EPA Method 8020 compounds. All wells were also reported to be free of detectable levels of total petroleum hydrocarbons (TPH) analyzed in accordance with Modified EPA Method 8100. All field and duplicate samples were also reported to be free from detectable concentrations of the compounds tested. The laboratory analytical results of the groundwater monitoring well sampling are presented in Appendix 4.

3.5 Potential Receptors

Based on the results of TSEC's door to door survey of the occupants of the neighboring buildings, no petroleum odors were reported in the basement of the Swanton Public Library, which is located south-southeast of the MUMC site. The post office, which is

located downgradient and to the north-northeast of the MUMC, reportedly does not contain a basement, and there have been no reports of petroleum odors.

According to personnel at the municipal office, the municipal water system is available to all the buildings in the site vicinity. However, some owners reportedly continue to utilize their own private on-site water system. Given the favorable water quality results reported for the groundwater monitoring wells, no attempt was made to determine the actual water systems used by the nearby buildings, other than those immediately adjacent to the site, namely the Post Office, and the Swanton Public Library. Both of these buildings are reportedly serviced by the Municipal water system.

The ultimate potential receptor is thought to be the Missisquoi River, which is located approximately 800 feet west of the site. No other sensitive receptors were identified in the site vicinity.

3.6 Groundwater Treatment System

A summary of the results of the groundwater treatment system monitoring, and more recently, the monitoring of the sump only, is presented in Table 3. Laboratory analytical reports associated with this monitoring are presented in Appendix 1. A history of the events associated with the groundwater treatment system are also presented in Appendix 1. While the groundwater system was on-line, the samples from the sump were identified as "influent". After the groundwater treatment system was disconnected, and the sump was piped directly to the municipal wastewater treatment system, samples from the sump were identified as "effluent".

As indicated on Table 3, the influent (sump) concentration of total BTEX on April 8, 1994, was reported to be 133 ug/l and the concentration of TPH was reported to be 17,000 mg/l. The "mid" sample, which was collected between the two carbon canisters on the same date, was reported to be free of detectable concentrations of both total BTEX, as well as TPH. These samples were both collected the day of the tank removal.

The influent (sump) concentration had dropped to "not detected" for total BTEX and 5.4 mg/l for TPH on June 15, 1994. All subsequent samples collected from the sump have been "not detected" for both total BTEX and TPH. As previously mentioned, the samples collected from the sump after June 15, 1994, are identified in Table 3 as "effluent" concentrations, because the groundwater treatment system had been taken off-line.

MTBE was reported at detectable concentrations in both the mid and effluent samples collected on June 15, 1994. This is thought to be due to cross contamination from another site as discussed in more detail in Appendix 1.

4.0 SUMMARY AND CONCLUSIONS

- The groundwater quality results from the on-site monitoring wells indicate that petroleum contamination has not been detected at any sampled location. This includes MW-3 which is located immediately adjacent to the former tank excavation.
- Groundwater samples collected from the basement sump at the time of the tank excavation, were determined to contain a total BTEX concentration of 133 ug/l, and a TPH concentration of 17,000 mg/l. However, based on water quality results collected as part of this investigation, the sump has been free of detectable concentrations of total BTEX compounds as well as TPH since at least July 5, 1994.
- Based on the PID screening of the hand augured soil borings, residual petroleum contamination of the shallow soils appears to be primarily limited to the immediate vicinity of the former fill pipe. These data suggest that there may have been a spill or over-fill of fuel oil in this area.
- Based on the results of TSEC's door to door survey, no petroleum odors were reported in either of the buildings located adjacent to the MUMC site. The area in the vicinity of the site is serviced by the Municipal water system. The ultimate potential receptor identified as part of this study is the Missisquoi River which is located approximately 800 feet west of the site.
- While in operation, the groundwater treatment system appeared to be effective at removing petroleum contamination from the sump water prior to its discharge into the municipal wastewater treatment system. The treatment system was disconnected on June 21, 1994 due to a restriction of flow in the carbon canisters. Since that time, the water quality of the sump water has been reported to be free of detectable concentrations of the petroleum compounds tested. Therefore, the sump continues to be connected directly to the municipal waste water system, without additional pretreatment.
- Based on these data, it appears that the fuel oil which accumulated in the sump in the basement of the MUMC, may be a result of an overfill or spill in the vicinity of the fill pipe, and/or vent pipe of the tank. In addition, the tank itself may have contained minor leaks which contributed to the contamination. It is possible that the fuel oil remained "perched" on top of the frost layer, and once the ground thawed, was released into the groundwater. Given the proximity of the tank system to the building and associated footing drains, it is possible that the fuel oil was routed directly to the basement sump, via the building's footing drains.

5.0 RECOMMENDATIONS

Based on the results of this investigation, it is recommended that monitoring of the basement sump be discontinued pending the results from the latest round of sampling.

The most recent round of sampling was conducted on September 21, 1994, thus results are expected to be available on or around October 5, 1994.

It is recommended that a second round of water quality samples be collected from the on-site monitoring wells for confirmation purposes. These samples should be analyzed in accordance with EPA Method 8020 and for TPH in accordance with modified EPA Method 8100. If these samples are determined to be free of detectable concentrations of the compounds tested, then the site should be considered for a "Site Management Activity Completed" (SMAC) designation.

ooOoo

If you have any questions or comments regarding this report, please feel free to give me a call at (802) 434-3350.

Sincerely,

TWIN STATE ENVIRONMENTAL CORPORATION



Cynthia Sprague
Hydrogeologist

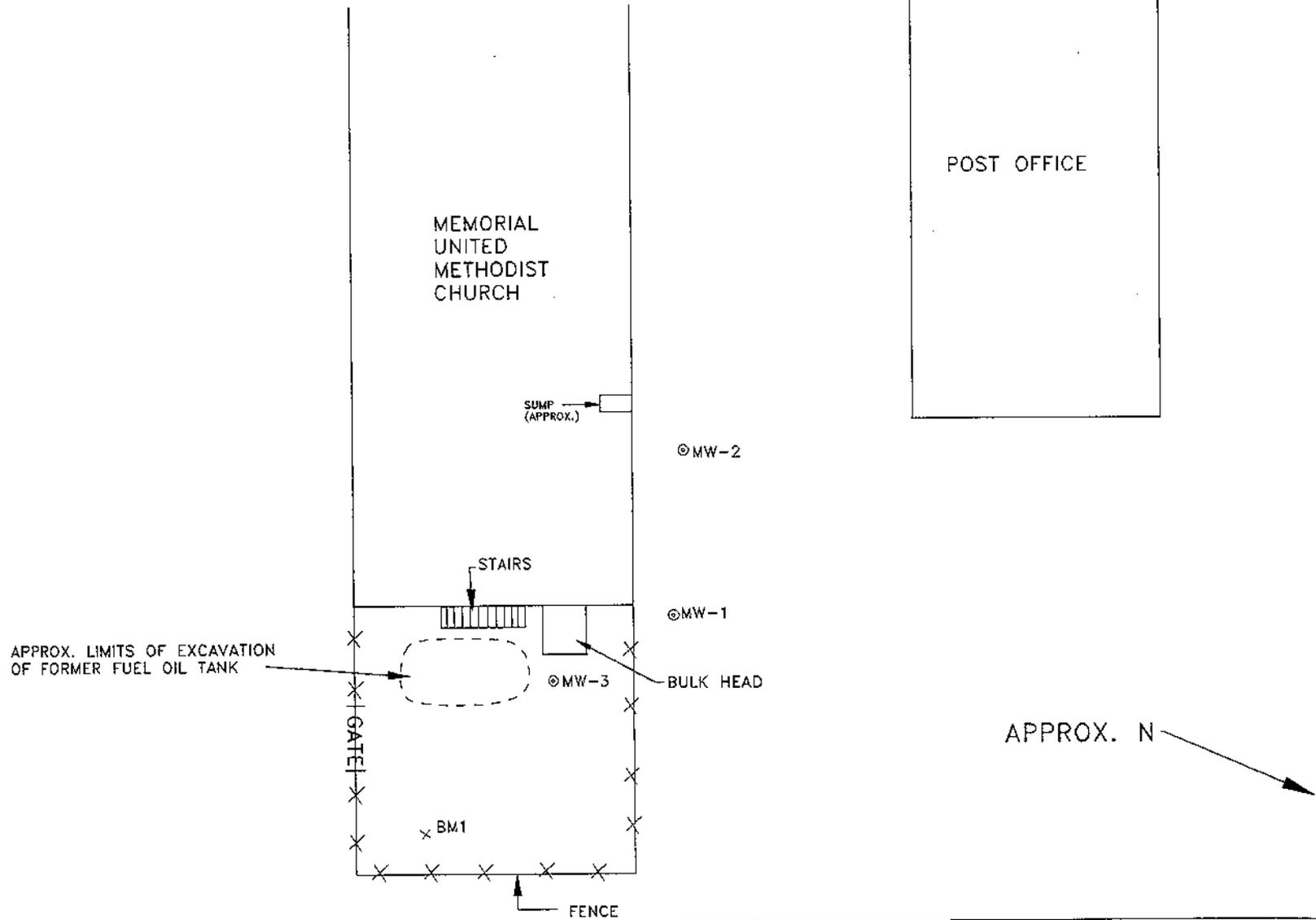
Reviewed by JR 9.23.94

enclosure

cc: Mr. Robert LaSalle (MUMC)

b:mumcsi.rpt

FIGURES



SPECIFICATIONS:

- × BM1 - INDICATES SITE BENCHMARK.
- ⊙ MW-1 - INDICATES SOIL BORING/MONITORING WELL LOCATION.

MEMORIAL UNITED METHODIST CHURCH

SITE PLAN

FIGURE 1

SCALE	DATE	TSEC
1" = 20'	08/08/94	

APPROX. N

MEMORIAL
UNITED
METHODIST
CHURCH

SUMP
(APPROX.)

⊙ MW-2

STAIRS

LOCATION OF FORMER
FILL PIPE (APPROX.)

SB-3 ● SB-1 ● SB-4 ●

⊙ MW-1

APPROX. LIMITS OF EXCAVATION
OF FORMER FUEL OIL TANK

SB-2 ● SB-6 ●

SB-5 ● ⊙ MW-3

BULK HEAD

GATE

× BM1

FENCE

SPECIFICATIONS:

LOCATION OF HAND AUGER SOIL BORINGS ARE APPROXIMATE.

× BM1 - SITE BENCHMARK.

⊙ MW-1 - SOIL BORING/MONITORING WELL.

● SB-1 - HAND AUGER SOIL BORING.

MEMORIAL UNITED METHODIST CHURCH

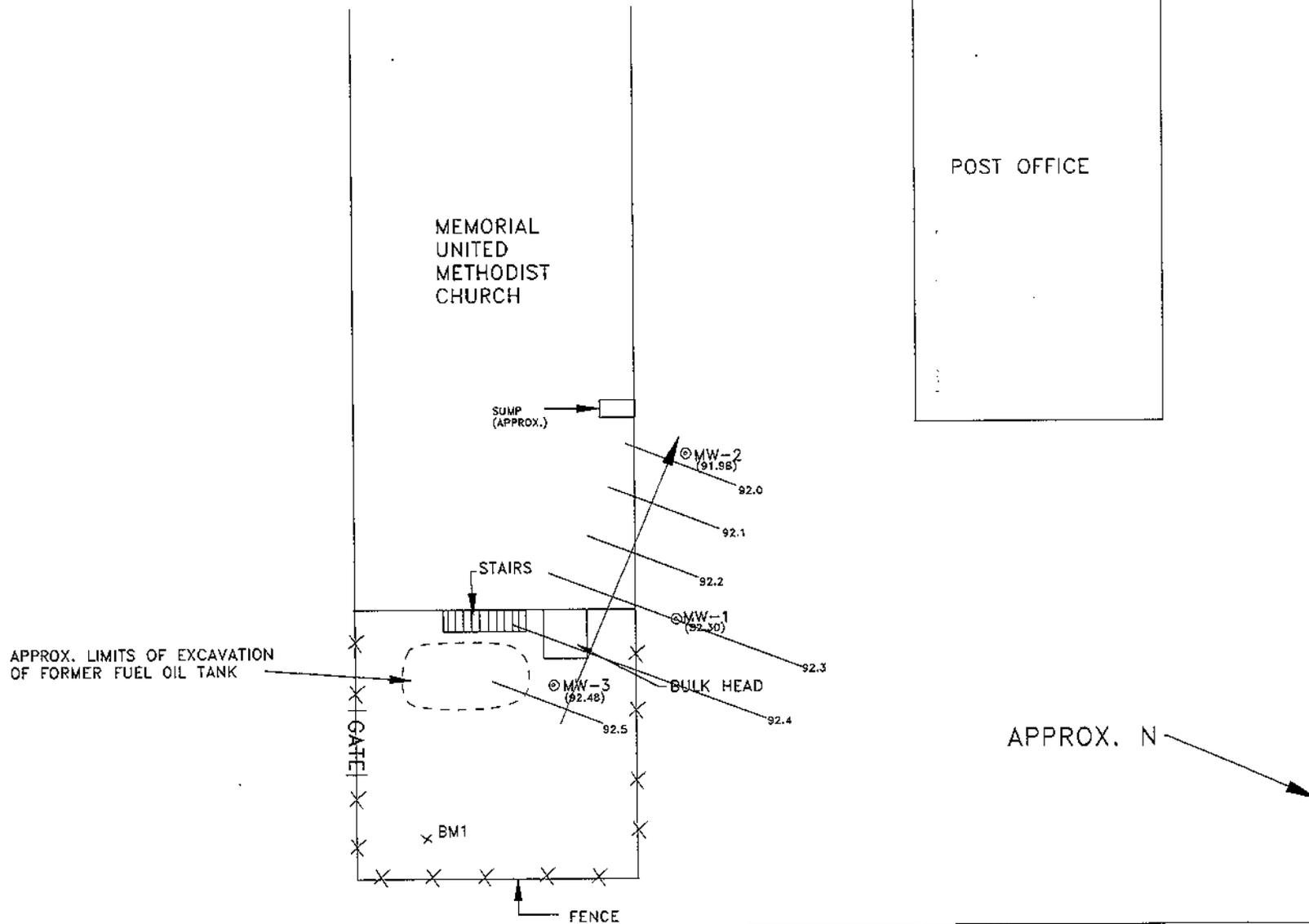
HAND AUGER SOIL BORING LOCATIONS

FIGURE 2

SCALE 1" = 10'

DATE 08/08/94

TSEC



SPECIFICATIONS

ALL ELEVATIONS ARE IN FEET AND ARE RELATIVE TO BM#1 WHICH HAS AN ASSIGNED ELEVATION OF 100 FEET.

MEMORIAL UNITED METHODIST CHURCH
 GROUNDWATER CONTOUR FOR 7/27/94

FIGURE 3

SCALE 1"=20'	DATE 08/08/94	TSEC
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TABLES

TABLE 1

MEMORIAL UNITED METHODIST CHURCH
 Hand Auger Soil Boring
 PID Screening Summary Table

PID Readings (ppm)

Boring #	Sample Depth (ft)	Headspace	Open Boring	Comments
SB-1	0-1	42	60	Collected from vicinity of former UST fill pipe
	1-2	52		
	2-3	32		
SB-2	0-1	0.7	0.0	
	1-2	0.7		
SB-3	0-1	1.4	3.0	
	1-2	1.4		
SB-4	0-1	-	0.0	Soil too loose - could not get samples for headspace analysis
	1-1.5	-		
SB-5	0-1	0.0	0.0	
	refusal			
SB-6	0-1	0.0	0.0	
	1-2	0.0		

Notes:

- Boring number corresponds to monitoring well locations illustrated on Figure 2.
- PID readings collected by TSEC on 7/19/94 with the use of a Thermo Instrument OVM 580B equipped with a 10.6 eV lamp.
- PID was calibrated to detect organic vapors relative to a benzene equivalent prior to use.

TABLE 2

MEMORIAL UNITED METHODIST CHURCH
Water Level Summary Table for 7/27/94

Well No.	Elevation Top of PVC (ft)	Depth to Water (ft)	Water Table Elevation (ft)
MW-1	98.68	6.38	92.30
MW-2	98.63	6.65	91.98
MW-3	99.03	6.55	92.48

Notes:

- All elevations are relative to an on-site benchmark, assigned an elevation of 100 feet.

TABLE 3

**Analytical Results for the Groundwater Treatment System
Memorial United Methodist Church - Swanton, Vermont**

Date	Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes	Total BTEX	MTBE	TPH (mg/l)
4/8/94	Influent (sump)	ND	5	18	110	133	ND	17,000
	Mid	ND	ND	ND	ND	ND	ND	ND
	Effluent	NS	NS	NS	NS	NS	NS	NS
5/24/94	Mid	NA	NA	NA	NA	NA	NA	ND
6/15/94	Influent (sump)	ND	ND	ND	ND	ND	ND	5.4
	Mid	ND	ND	ND	ND	ND	100 ¹	ND
	Effluent	ND	ND	ND	ND	ND	48 ¹	ND
7/5/94 ²	Effluent (sump)	NA	NA	NA	NA	NA	NA	ND
7/27/94 ²	Effluent (sump)	ND	ND	ND	ND	ND	ND	ND
8/17/94 ²	Effluent (sump)	ND	ND	ND	ND	ND	ND	ND

NOTES:

- Results are reported in ug/l unless otherwise noted.
- ND indicates compound not detected above method detection limits.
- NS indicates not sampled.
- NA indicates identified compound was not analyzed.
- Analyses provided by ChemServe per USEPA Method 8020 and USEPA Modified Method 8100.
- The analytical reports are provided in Attachment 3.

¹Concentrations of MTBE have been determined to be the result of cross-contamination in the field.

²Samples collected from 7/5/94 through 8/4/94 ("Effluent") were collected directly from the sump since the groundwater treatment system was disconnected.

APPENDIX 1

GROUNDWATER TREATMENT SYSTEM SUMMARY

GROUNDWATER TREATMENT SYSTEM

During the emergency removal of the UST at the site on April 8, 1994, a groundwater treatment system was completed in the Church basement. An oil/water separator was built around the sump pump to prevent any floating product from entering the sump pump. This was accomplished by submerging the pump into a 5 gallon perforated pail which was wrapped with filter fabric. Furthermore, absorbent material was wrapped around the 5 gallon pail to absorb any oil material that could seep through the perforations. The sump pump was then re-plumbed through two (2) aqueous phase carbon filters set up in series. Sampling ports and pressure gauges were installed in order to monitor the effectiveness of the system.

Samples were collected from the groundwater treatment system for water quality analyses. All samples collected from this system were submitted to ChemServe Environmental Analysts of Milford, New Hampshire for the analytical determination of volatile organic compounds per USEPA Method 8020 and/or total petroleum hydrocarbons (TPH) by USEPA Modified Method 8100. These results are tabulated on Table 3, and the analytical reports are provided in Attachment 3.

Water quality samples were initially collected on April 8, 1994 (following the installation of the carbon canisters), from the sump (influent) and the sample port between the 2 carbon canisters (mid) locations. These samples were submitted to ChemServe for both volatile organics and TPH analyses. The analytical results indicated that the groundwater entering the treatment system was contaminated with No. 2 fuel oil; however, as indicated by the results of the mid sample, the first carbon canister was adequately removing the contaminants from the waste prior to being discharged into the sewer system.

TSEC visited the site on Friday May 13, 1994 but was unable to gain access to the basement to inspect the system. On Tuesday May 17, 1994, R.L. Vallee, Inc. received a report that the system was not functioning properly, and as a result, water had flooded the basement floor within the Church. On Wednesday May 18, 1994, both TSEC and Vallee representatives visited the site. Apparently the product water separator had clogged from iron precipitation and silt allowing water to enter the basement sump faster than the water was being removed. As a result, the water level within the sump rose above the top of the 5 gallon pail. Although absorbent material was placed around the pail to accumulate oil product, some oil did enter the pump and was pumped directly into the carbon canisters. The carbon canisters restricted flow to the sewer line subsequently causing the basement to flood. It appeared that all the free product flowed into the sump and was pumped into the carbon canisters and not onto the basement floor. Two new carbon canisters were placed in line because the old carbon canisters were completely fouled with oil. A second pump was set into the sump at an elevated level to provide for auxiliary pumping capabilities in the event that the first separator and/or pump malfunctioned or became clogged.

TSEC began monitoring the treatment system on a weekly basis and collecting water quality samples on a bi-weekly basis as provided in our Site Investigation Work Plan dated June 20, 1994.

Samples were collected on Tuesday May 24, 1994 for TPH from the mid location of the treatment system. Results indicated that no fuel oil was present in this sample, thus, the treatment system was operating properly. During this inspection, no petroleum odors were present in the basement and no visible sheen or free product was observed on the sump water. The absorbent material around the 5 gallon pail did not appear to be saturated with oil.

Again, on Thursday June 2, 1994, TSEC inspected the sump and groundwater treatment system. No petroleum odors were present, and no visible sheen or free product was observed on the sump water. The absorbent material around the 5 gallon pail did not appear saturated with oil.

When TSEC visited the site on Tuesday June 7, 1994, the basement of the Church was flooded with approximately one inch of water. Although the area adjacent to the groundwater treatment system was wet, no standing water was present in this area. Water in the sump was lower than the action level of the pump; therefore, the system was not pumping at the time. No petroleum odors were noted, and no visible sheen or

free product were observed on the sump water. Again, the absorbent material around both the primary and back-up sump pumps did not appear to be saturated with oil. Because the water appeared to be lower than on June 2, 1994, TSEC believed the system was functioning properly and that water had entered the basement floor through other sources. In addition, heavy thunder showers occurred on the previous evening, Monday June 6, 1994, and could have resulted in the basement flooding.

TSEC collected samples from the influent, mid, and effluent locations of the water treatment system on Wednesday June 15, 1994. Samples were submitted to the laboratory for volatile organic as well as TPH analyses. These results indicated low concentrations of TPH in the influent sample although 100 ug/l and 48 ug/l of MTBE were detected in the mid and effluent samples, respectively. Based on dialogue with ChemServe, TSEC believed the presence of MTBE in the mid and effluent locations to be attributable to cross-contamination in the field since MTBE was not found to be present in previous sampling at the Church, and the field representative coordinated this site visit with other sites in the area. Sections of the basement floor remained wet from the flooding noted on June 7, 1994; however, no standing water was present. No petroleum odors were present in the basement, and no visible sheen or free product was apparent on the water in the sump. Additionally, the absorbent material around the 5 gallon pail did not appear to be saturated with oil.

On Tuesday June 21, 1994, both sump pumps were in operation; however, a restriction in flow was noted as the water level in the sump was not being lowered (water in the sump was level with the basement floor). No flooding was evident, no petroleum odors were noted, and no visible sheen was apparent on the water in the sump. TSEC contacted R.L. Vallee who then diverted the water from the carbon canister system directly to the sewer system to prevent water in the sump from flooding the basement. TSEC did not replace the carbon canisters based on the favorable observations noted during the weekly inspections.

On July 5, 1994, TSEC had collected water samples from the sump for TPH. The results indicated no detectable levels of TPH were present in the sump sample. As noted above, water from the sump had been routed directly to the sewer line on June 21, 1994. Later that day, per TSEC's telephone conversation with the SMS, TSEC discontinued bi-weekly sampling of the sump water.

On Friday July 22, 1994, the SMS requested that TSEC sample the sump every two weeks for volatile organics and TPH analyses.

The water sample collected from the sump on July 27, 1994, showed no detectable levels of either volatile organic compounds or TPH.

TSEC visited the site to inspect the sump on August 4, August 11, and August 17, 1994. On all three occasions, no evidence of free product on the sump water was observed. In addition, no sheen was evident; however, the site representative noted the presence of "scum" on the water as well as mold and iron staining. Samples collected on August 4 and August 17, 1994 showed no detectable levels of volatile organics or TPH.

Since receiving the SMS' letter dated August 11, 1994, TSEC has accordingly changed the frequency of visual monitoring the sump for the evidence of free product to a bi-weekly basis and analytical sample collection to a monthly basis.

No evidence of free product or a sheen was observed on the sump water on Tuesday August 30, 1994.

The next sampling event is scheduled for the week of September 19, 1994.

**LABORATORY REPORTS
FOR
APRIL 8, 1994**



VOLATILE ORGANIC ANALYSIS
EPA METHOD 8020

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: D11-94-07

SAMPLE LOCATION: UNITED METHODIST CHURCH SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: INF

CONTROL #: 9525

DATE SAMPLED: 4/08/94

REC'D: 4/11/94

DATE ANALYZED: 4/22/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND	CONCENTRATION (UG/L)	DETECTION LIMIT MULTIPLIER: (UG/L) X 1
BENZENE	BDL	1
METHYL-TERTIARY-BUTYL ETHER	BDL	1
TOLUENE	5	1
ETHYLBENZENE	18	1
TOTAL XYLENES	110	1

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: _____



TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: D11-94-07

SAMPLE LOCATION: UNITED METHODIST CHURCH SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: INF

CONTROL #: 9525

DATE SAMPLED: 4/08/94

REC'D: 4/11/94

DATE ANALYZED: 4/13/94

DATE EXTRACTED: 4/12/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION
(MG/L)

DETECTION LIMIT MULTIPLIER:
(MG/L) X 25

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

17,000

0.1

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: _____



VOLATILE ORGANIC ANALYSIS
EPA METHOD 8020

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: D11-94-07

SAMPLE LOCATION: UNITED METHODIST CHURCH SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: MID

CONTROL #: 9525

DATE SAMPLED: 4/08/94

REC'D: 4/11/94

DATE ANALYZED: 4/22/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND	CONCENTRATION (UG/L)	DETECTION LIMIT MULTIPLIER: (UG/L) X 1
BENZENE	BDL	1
METHYL-TERTIARY-BUTYL ETHER	BDL	1
TOLUENE	BDL	1
ETHYLBENZENE	BDL	1
TOTAL XYLENES	BDL	1

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: Cy



TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: D11-94-07

SAMPLE LOCATION: UNITED METHODIST CHURCH SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: MID

CONTROL #: 9525

DATE SAMPLED: 4/08/94

REC'D: 4/11/94

DATE ANALYZED: 4/13/94

DATE EXTRACTED: 4/12/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

(MG/L)
BDL

(MG/L) X 25
0.1

BDL= BELOW DETECTION LIMIT

CERTIFIED BY: _____

**LABORATORY REPORTS
FOR
MAY 24, 1994**



TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: E27-94-05

SAMPLE LOCATION: MEMORIAL UNITED CHURCH SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: MID

CONTROL #: 9519

DATE SAMPLED: 5/24/94

RECD: 5/27/94

DATE ANALYZED: 5/31/94

DATE EXTRACTED: 5/27/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION
(MG/L)
BDL

DETECTION LIMIT MULTIPLIER:
(MG/L) X 1
0.1

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

SURROGATE
M-TERPHENYL

PERCENT RECOVERY
75%

ACCEPTANCE LIMITS
60-120%

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: _____

**LABORATORY REPORTS
FOR
JUNE 15, 1994**



**TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100**

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP

LAB#: F17-94-01

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: INF

CONTROL#: 10673

DATE SAMPLED: 6/15/94

REC'D: 6/17/94

DATE ANALYZED: 6/22/94

DATE EXTRACTED: 6/21/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

(MG/L)

(MG/L) X 1

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

5.4

0.1

**SURROGATE
M-TERPHENYL**

**PERCENT RECOVERY
83%**

**ACCEPTANCE LIMITS
60-120%**

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: _____



VOLATILE ORGANIC ANALYSIS
EPA METHOD 8020

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP

LAB#: F17-94-01

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: INF

CONTROL#: 10673

DATE SAMPLED: 6/15/94

REC'D: 6/17/94

DATE ANALYZED: 6/28/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND	CONCENTRATION (UG/L)	DETECTION LIMIT MULTIPLIER: (UG/L) X 1
BENZENE	BDL	1
METHYL-TERTIARY-BUTYL ETHER	BDL	1
TOLUENE	BDL	1
ETHYLBENZENE	BDL	1
TOTAL XYLENES	BDL	1

BDL=BELOW DETECTION LIMIT

CERTIFIED BY: _____



**TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100**

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP

LAB#: F17-94-01

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: MID

CONTROL#: 10673

DATE SAMPLED: 6/15/94

REC'D: 6/17/94

DATE ANALYZED: 6/22/94

DATE EXTRACTED: 6/21/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

(MG/L)
BDL

(MG/L) X 1
0.1

SURROGATE
M-TERPHENYL

PERCENT RECOVERY
86%

ACCEPTANCE LIMITS
60-120%

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: _____

**LABORATORY REPORTS
FOR
JULY 5, 1994**



TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: G07-94-05

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: EFFLUENT

CONTROL #: 10676

DATE SAMPLED: 7/05/94

REC'D: 7/07/94

DATE ANALYZED: 7/12/94

DATE EXTRACTED: 7/08/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

(MG/L)

(MG/L) X 1

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

BDL

0.1

SURROGATE
M-TERPHENYL

PERCENT RECOVERY
78%

ACCEPTANCE LIMITS
60-120%

BDL = BELOW DETECTION LIMIT

CERTIFIED BY:



**LABORATORY REPORTS
FOR
JULY 27, 1994**



VOLATILE ORGANIC ANALYSIS
EPA METHOD 8020

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: G29-94-08

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: EFF

CONTROL #: 10681

DATE SAMPLED: 7/27/94

REC'D: 7/29/94

DATE ANALYZED: 8/01/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

	(UG/L)	(UG/L) X 1
BENZENE	BDL	1
METHYL-TERTIARY-BUTYL ETHER	BDL	1
TOLUENE	BDL	1
ETHYLBENZENE	BDL	1
TOTAL XYLENES	BDL	1

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: _____

Cu



TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: G29-94-08

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: EFF

CONTROL #: 10681

DATE SAMPLED: 7/27/94

REC'D: 7/29/94

DATE ANALYZED: 8/01/94

DATE EXTRACTED: 7/29/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

(MG/L)
BDL

(MG/L) X 1
0.1

SURROGATE
M-TERPHENYL

PERCENT RECOVERY
83%

ACCEPTANCE LIMITS
60-120%

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: _____ *Cy*

**LABORATORY REPORTS
FOR
AUGUST 17, 1994**

**TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100**

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP

LAB#: H18-94-05

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: EFFLUENT

CONTROL#: 10810

DATE SAMPLED: 8/¹⁷~~12~~/94

REC'D: 8/18/94

DATE ANALYZED: 8/21/94

DATE EXTRACTED: 8/19/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

**CONCENTRATION
(MG/L)
BDL**

**DETECTION LIMIT MULTIPLIER:
(MG/L) X 1
0.1**

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

**SURROGATE
M-TERPHENYL**

**PERCENT RECOVERY
80%**

**ACCEPTANCE LIMITS
60-120%**

BDL=BELOW DETECTION LIMIT

CERTIFIED BY: _____

Cy

VOLATILE ORGANIC ANALYSIS
EPA METHOD 8020

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP

LAB#: H18-94-05

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: EFFLUENT

CONTROL#: 10810

DATE SAMPLED: 8/17/94

REC'D: 8/18/94

DATE ANALYZED: 8/26/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION
(UG/L)

DETECTION LIMIT MULTIPLIER:
(UG/L) X 1

BENZENE

BDL

1

METHYL-TERTIARY-BUTYL ETHER

BDL

1

TOLUENE

BDL

1

ETHYLBENZENE

BDL

1

TOTAL XYLENES

BDL

1

BDL=BELOW DETECTION LIMIT

CERTIFIED BY: Ca

APPENDIX 2

TSEC SOIL BORING LOGS
WELL CONSTRUCTION DIAGRAMS

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO. MW-3
 PROJECT NAME/NO. MEMORIAL UNITED METHODIST CHURCH
 INSTALL DATE JULY 19, 1994
 TSEC REP CINDY SPRAGUE
 DRILLING CO. TRI-STATE DRILLING
 DRILLING METHOD HSA

TOTAL DEPTH OF HOLE 10'
 DEPTH TO WATER 6.55' (7/27/94)
 SCREEN DIA. 2" DEPTH 5-10'
 SCREEN TYPE & SIZE .010" PVC
 RISER TYPE 2" PVC
 RISER DIA. 2" DEPTH 0-5'
 GUARD TYPE ROAD BOX

DEPTH IN FEET	WELL PROFILE	WELL NOTES	PID (PPM)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
1			0.0	1,6,6,10 REC=0.5'	0-2' DK. BROWN SANDY LOAM, TRACE BRICK & GRAVEL, DRY.	CEMENT GROUT
2			0.0	3,5,6,7 REC=0.4'	2-4' ORANGE STAINED SAND, DAMP (ROCK IN TIP OF SPOON).	NATIVE BACKFILL
3			0.0	8,10,9,9 REC=1.4'	4-6' TAN FINELY STRATIFIED F-M SAND, MOIST TO WET. MODERATE FE STAINING.	BENTONITE SEAL
4			0.0	4,6,6,4 REC=1.5'	6-8' TAN TO GRAY TAN STRATIFIED F-M SAND, SATURATED, SOME FE BANDING.	SAND PACK
5			0.0	1,2,2,4 REC=0.9'	8-10' GRAY TAN SAND, SATURATED.	WELL SCREEN
6						RISER PIPE
7						HS HEAD SPACE
8						WATER LEVEL (APPROX)
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

GRANULAR SOILS
 BLOWS/FT DENSITY
 0-4 V.LOOSE
 4-10 LOOSE
 10-30 M.DENSE
 30-50 DENSE
 >50 V.DENSE

COHESIVE SOILS
 BLOWS/FT DENSITY
 <2 V.SOFT
 2-4 SOFT
 4-8 M.STIFF
 8-15 STIFF
 15-30 V.STIFF
 >30 HARD

PROPORTIONS USED
 TRACE 0-10%
 LITTLE 10-20%
 SOME 20-35%
 AND 35-50%

WELL/BORING LOCATION: INSIDE FENCE, JUST NORTH OF TANK EXCAVATION AND EAST OF BULK HEAD.

MONITORING WELL/SOIL BORING LOG

WELL/BORING NO. MW-2 TOTAL DEPTH OF HOLE 10'
 PROJECT NAME/NO. MEMORIAL UNITED METHODIST CHURCH DEPTH TO WATER 6.65' (7/27/94)
94-116 SCREEN DIA. 2" DEPTH 5-10'
 INSTALL DATE JULY 19, 1994 SCREEN TYPE & SIZE .010" PVC
 TSEC REP CINDY SPRAGUE RISER TYPE 2" PVC
 DRILLING CO. TRI-STATE DRILLING RISER DIA. 2" DEPTH 0-5'
 DRILLING METHOD HSA GUARD TYPE ROAD BOX

DEPTH IN FEET	WELL PROFILE	WELL NOTES	PID (PPM)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
1			0.0	1,2,1,5 REC=0.5'	0-2' DK. BROWN SANDY LOAM, TRACE GRAVEL & PIECES OF BRICK, DRY TO DAMP.	CEMENT GROUT
2			0.0	1,1,4,15 REC=1.5'	2-4' BROWN F-M SAND, DAMP. LOWER PORTION IS HEAVILY FE STAINED.	NATIVE BACKFILL
3			0.0	15,13,11,11 REC=1.4'	4-6' TAN STRATIFIED SAND, MOIST TO WET. UPPER PORTION OF SAMPLE IS HEAVILY FE STAINED.	BENTONITE SEAL
4			0.0	5,6,5,6 REC=1.5'	6-8' TAN F-M STRATIFIED SAND, LOOSE SATURATED. LITTLE FE STAINING.	SAND PACK
5			0.0	2,2,3,4 REC=1.3'	8-10' GRAY F-M STRATIFIED SAND, LOOSE SATURATED.	WELL SCREEN
6						RISER PIPE
7						HS HEAD SPACE
8						WATER LEVEL (APPROX)
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

GRANULAR SOILS BLOWS/FT DENSITY 0-4 V.LOOSE 4-10 LOOSE 10-30 M.DENSE 30-50 DENSE >50 V.DENSE	COHESIVE SOILS BLOWS/FT DENSITY <2 V.SOFT 2-4 SOFT 4-8 M.STIFF 8-15 STIFF 15-30 V.STIFF >30 HARD	PROPORTIONS USED TRACE 0-10% LITTLE 10-20% SOME 20-35% AND 35-50%	WELL/BORING LOCATION: APPROX. 20' WEST OF MW-1 (ALONG MUMC BUILDING).
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MONITORING WELL/SOIL BORING LOG

WELL/BORING NO. MW-1
 PROJECT NAME/NO. MEMORIAL UNITED METHODIST CHURCH
 INSTALL DATE JULY 19, 1994
 TSEC REP CINDY SPRAGUE
 DRILLING CO. TRI-STATE DRILLING
 DRILLING METHOD HSA

TOTAL DEPTH OF HOLE 12'
 DEPTH TO WATER 6.38' (7/27/94)
 SCREEN DIA. 2" DEPTH 7-12'
 SCREEN TYPE & SIZE .010" PVC
 RISER TYPE 2" PVC
 RISER DIA. 2" DEPTH 0-7'
 GUARD TYPE ROAD BOX

DEPTH IN FEET	WELL PROFILE	WELL NOTES	PID (PPM)	BLOWS/6" AND RECOVERY	SOIL DESCRIPTION AND NOTES	LEGEND
1			0.0	1,10,16,11 REC=0.5'	0-2' BROWN SANDY LOAM, DAMP TO DRY, ROCK IN TIP OF SPOON.	
2			0.0	2,1,1,6 REC=0.4'	2-4' BROWN AND TAN SAND WITH BRICK WHITE STONE, DAMP. APPEARS TO BE OLD STONE WALL OR FOUNDATION.	
3			0.0	9,8,8,9 REC=1.4'	4-6' TAN F-M+ SAND, FINELY STRATIFIED MOIST TO WET (AT TIP), HEAVY FE STAINING.	
4			0.0	6,8,7,6 REC=1.5'	6-8' TAN TO OLIVE GRAY TAN, STRATIFIED F-M SAND, WET TO SATURATED.	
5			0.0	2,2,4,5 REC=0.9'	8-10' GRAY STRATIFIED F-M SAND, SATURATED.	
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

GRANULAR SOILS
 BLOWS/FT DENSITY
 0-4 V.LOOSE
 4-10 LOOSE
 10-30 M.DENSE
 30-50 DENSE
 >50 V.DENSE

COHESIVE SOILS
 BLOWS/FT DENSITY
 <2 V.SOFT
 2-4 SOFT
 4-8 M.STIFF
 8-15 STIFF
 15-30 V.STIFF
 >30 HARD

PROPORTIONS USED
 TRACE 0-10%
 LITTLE 10-20%
 SOME 20-35%
 AND 35-50%

WELL/BORING LOCATION: OUTSIDE OF FENCE - JUST NORTH OF NE CORNER OF CHURCH BUILDING.

APPENDIX 3
DRILLERS LOGS

SOIL PROBE LOG

TU 8:30 AM

United Methodist Church
Swanton, VT

TRI STATE
DRILLING & BORING, INC.

RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

	SAMPLER		SOIL
TYPE	Continuous		Saturated
SIZE	SS		Wet
HAMMER			Moist
FALL			Damp
			Slightly Damp

DATE STARTED: 07/19/94

DATE COMPLETED: 07/19/94

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

0.4' Topsoil.

0.4-4' Brown dry cobbles, coarse to fine gravel, fine to coarse sand, bricks, fill.

4-7.5' Brown moist fine to medium sand.

7.5-8' Brown wet fine to medium sand.

8-12' Gray wet fine/medium sand.

Bottom 12.0'.

Screen 12' to 7' below GS.

Riser 7' to GS.

Sand 12' to 5.5' below GS.

Chips 5.5' to 3.5' below GS.

Backfill 3.5' to 0.5' below GS.

Cement 0.5' to GS.

Client: United Methodist Church
Job Location: Swanton, VT
Engineer: Twin State Environment
St. Albans, VT
Inspector: Cindy Sprague

Driller: Ray Gilfillan
Helper: Sean Hogan
Materials: 5' screen, 7' riser,
1 cap, 1 locking plug, 2 sand,
1 hole plug, 1 road box.

SOIL PROBE LOG

United Methodist Church
Swanton, VT

TRI STATE
DRILLING & BORING, INC.

RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

		SAMPLER	SOIL
TYPE	H5A	Continuous	Saturated
SIZE	2"	SS	Wet
HAMMER	140#		Moist
FALL	30"		Damp
			Slightly Damp

DATE STARTED: 07/19/94

DATE COMPLETED: 07/19/94

FOOTAGE						DRILLER'S NOTES & COMMENTS
DEPTH	BLOW	COUNTS	REC			

6 12 18 24

0.3' Topsoil.

0.3-2' Brown dry fine to coarse sand,
fine to medium gravel, brick fill.

2-2.5' Red/orange/brown silty fine to
medium sand.

2.5-4.5' Rust damp fine to medium sand.

4.5-5.5' Brown damp fine to medium sand.

5.5-8' Brown wet fine to medium sand.

8-10' Gray wet fine/medium sand.
Bottom 10.0'.

Screen 10' to 5' below GS.

Riser 5' to GS.

Sand 10' to 3.5' below GS.

Chips 3.5' to 1.5' below GS.

Backfill 1.5' to 0.5' below GS.

Cement 0.5' to GS.

Client: United Methodist Church
Job Location: Swanton, VT
Engineer: Twin State Environment
St. Albans, VT
Inspector: Cindy Sprague

Driller: Ray Gilfillan
Helper: Sean Hogan
Materials: 5' screen, 5' riser,
1 cap, 1 locking plug, 2 sand,
1 hole plug, 1 road box.

SOIL PROBE LOG

United Methodist Church
Swanton, VT

TRI STATE
DRILLING & BORING, INC.

RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

		SAMPLER	SOIL
TYPE	HSA	Continuous	Saturated
SIZE	2"	SS	Wet
HAMMER	140#		Moist
FALL	30"		Damp
			Slightly Damp

DATE STARTED: 07/19/94

DATE COMPLETED: 07/19/94

FOOTAGE
DEPTH BLOW COUNTS REC DRILLER'S NOTES & COMMENTS

6 12 18 24

0-0.2'	1	6	6	10	0.5'	0.2' Topsoil.
0.2-2'	1	6	6	10	0.5'	0.2-3' Brown fine to coarse sand, fine gravel, bricks, fill.
2-4'	3	5	6	7	0.2'	3-5.5' Orange/brown moist fine/medium sand.
4-6'	8	10	9	9	1.3'	5.5-8' Brown wet fine/medium sand.
6-8'	4	6	6	4	1.3'	
8-10'	1	2	2	4	1.2'	8-10' Gray wet fine/medium sand.
						Bottom 10.0'.
						Screen 10' to 5' below GS.
						Riser 5' to GS.
						Sand 10' to 3.5' below GS.
						Chips 3.5' to 1.5' below GS.
						Backfill 1.5' to 0.5' below GS.
						Cement 0.5' to GS.

Client: United Methodist Church
Job Location: Swanton, VT
Engineer: Twin State Environment
St. Albans, VT
Inspector: Cindy Sprague

Driller: Ray Gilfillan
Helper: Sean Hogan
Materials: 5' screen, 5' riser,
1 cap, 1 locking plug, 2 sand,
1 hole plug, 1 road box.

APPENDIX 4
LABORATORY REPORTS
FOR
GROUNDWATER MONITORING WELLS

August 2, 1994

AUG - 8 1994

Ms. Maria Dunn
Twin State Environmental Corp
P O Box 719
Richmond VT 05477

**Job Name : Memorial United
Methodist Church
Job Number : 94-116
Location : Swanton, Vt**

**Laboratory # : G29-94-08
Purchase Order # : N/A
Control # : 10681**

Dear Ms. Dunn,

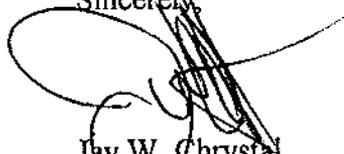
Enclosed please find the laboratory results for the above referenced samples which were received, by the Chemserve sample custodian, under chain of custody control number 10681 on July 29, 1994. Samples were collected by Maria Dunn on July 27, 1994. Any abnormalities to the samples would be noted on the enclosed chain of custody document or laboratory report form. Chemserve follows protocols for analysis corresponding to the methods referenced unless a modification is noted. Unless otherwise stated, all holding times, preservation techniques and container types are analogous with those outlined by the U.S. EPA.

A formal quality assurance/quality control QA/QC program is maintained and updated by Chemserve on a routine basis. This QA/QC manual is available upon request.

This report is not valid without a completed chain of custody with the corresponding control number attached.

If you have questions or concerns regarding this analysis, please feel free to contact me.

Sincerely,



Jay W. Chrystal
President/Laboratory Director



Enclosures

**VOLATILE ORGANIC ANALYSIS
EPA METHOD 8020**

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: G29-94-08

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: TB

CONTROL #: 10681

DATE SAMPLED: 7/27/94

REC'D: 7/29/94

DATE ANALYZED: 8/01/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

	(UG/L)	(UG/L) X 1
BENZENE	BDL	1
METHYL-TERTIARY-BUTYL ETHER	BDL	1
TOLUENE	BDL	1
ETHYLBENZENE	BDL	1
TOTAL XYLENES	BDL	1

BDL = BELOW DETECTION LIMIT

CERTIFIED BY:

Cy

VOLATILE ORGANIC ANALYSIS
EPA METHOD 8020

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: G29-94-08

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: MW-1

CONTROL #: 10681

DATE SAMPLED: 7/27/94

REC'D: 7/29/94

DATE ANALYZED: 8/01/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND	CONCENTRATION (UG/L)	DETECTION LIMIT MULTIPLIER: (UG/L) X 1
BENZENE	BDL	1
METHYL-TERTIARY-BUTYL ETHER	BDL	1
TOLUENE	BDL	1
ETHYLBENZENE	BDL	1
TOTAL XYLENES	BDL	1

BDL = BELOW DETECTION LIMIT

CERTIFIED BY:

 _____



VOLATILE ORGANIC ANALYSIS
EPA METHOD 8020

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: G29-94-08

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: MW-2

CONTROL #: 10681

DATE SAMPLED: 7/27/94

REC'D: 7/29/94

DATE ANALYZED: 8/01/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

(UG/L)

(UG/L) X 1

BENZENE

BDL

1

METHYL-TERTIARY-BUTYL ETHER

BDL

1

TOLUENE

BDL

1

ETHYLBENZENE

BDL

1

TOTAL XYLENES

BDL

1

BDL = BELOW DETECTION LIMIT

CERTIFIED BY:





VOLATILE ORGANIC ANALYSIS
EPA METHOD 8020

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: G29-94-08

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: MW-3

CONTROL #: 10681

DATE SAMPLED: 7/27/94

REC'D: 7/29/94

DATE ANALYZED: 8/01/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION
(UG/L)

DETECTION LIMIT MULTIPLIER:
(UG/L) X 1

BENZENE
METHYL-TERTIARY-BUTYL ETHER
TOLUENE
ETHYLBENZENE
TOTAL XYLENES

BDL
BDL
BDL
BDL
BDL

1
1
1
1
1

BDL = BELOW DETECTION LIMIT

CERTIFIED BY:





VOLATILE ORGANIC ANALYSIS
EPA METHOD 8020

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: G29-94-08

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: MW-3(D)

CONTROL #: 10681

DATE SAMPLED: 7/27/94

REC'D: 7/29/94

DATE ANALYZED: 8/01/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION
(UG/L)

DETECTION LIMIT MULTIPLIER:
(UG/L) X 1

BENZENE
METHYL-TERTIARY-BUTYL ETHER
TOLUENE
ETHYLBENZENE
TOTAL XYLENES

BDL
BDL
BDL
BDL
BDL

1
1
1
1
1

BDL = BELOW DETECTION LIMIT

CERTIFIED BY:



**SPIKE RECOVERY FORM
EPA METHOD 8020**

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP.

LAB#: G29-94-08

SAMPLE LOCATION: MUMC SWANTON, VT

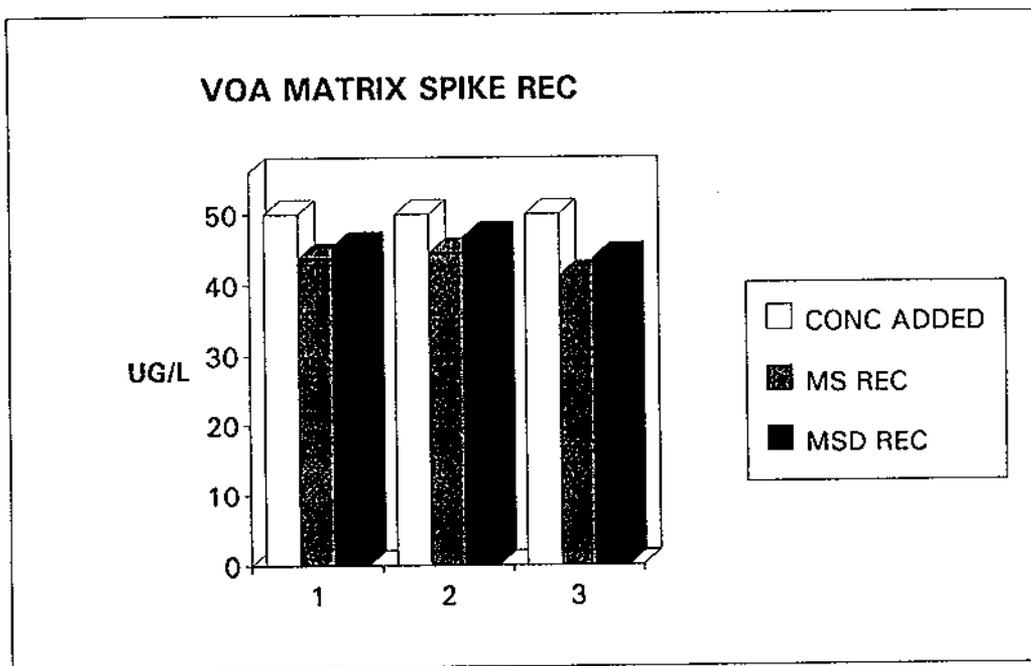
JOB#: 94-116

SAMPLE IDENTITY: OC SPIKES/10681

CONTROL #: 10681

DATE ANALYZED: 8/01/94

COMPOUND	CONC ADDED (UG/L)	AMT REC (UG/L)	DUP AMT REC (UG/L)	%REC	DUP % REC	%DIFF
BENZENE	50	43.81	45.51	88%	91%	3%
TOLUENE	50	44.56	46.84	89%	94%	5%
CHLOROBENZENE	50	41.29	43.86	83%	88%	5%



CONTROL LIMITS +/- 25%

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, ICP Metals, Mercury, pH, TDS, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Sulfate, Ammonia, Nitrate-N, Orthophosphate, TKN, Total Phosphorus, COD, BOD, Total Cyanide, Non-Filterable Residue, Total Phenolics, PCBs in Water, PCBs in Oil, Pesticides, and Volatile Organics.

PROVISIONAL CERTIFICATION: Specific Conductance, and Fluoride.

REPLACES CERTIFICATE #100893-8

CERTIFICATE NUMBER: 100893-C

DATE OF ISSUE: February 11, 1994

EXPIRATION DATE: December 2, 1994

Charles N. Meyer
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, Colifert-MPN, Metals by Graphite Furnace, Metals by ICP, Nitrate-N, Nitrite-N, Residual Free Chlorine, Turbidity, Total Filterable Residue, Calcium, pH, Alkalinity, Corrosivity, Sodium, Sulfate, Total Cyanide, Trihalomethanes, Volatile Organics, and Vinyl Chloride.

PROVISIONAL CERTIFICATION: Mercury, Fluoride, Base/Neutrals, DBCP, and EDB.

CERTIFICATE NUMBER: 100893-A

DATE OF ISSUE: December 3, 1993

EXPIRATION DATE: December 2, 1994

Charles N. Meyer
Certifying Officer

629-94-08 7/10/94

CONTROL NO. 10681



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

CHAIN OF CUSTODY

A CUSTOMER INFORMATION

CUSTOMER: TSEC
ADDRESS: PO BOX 719 RICHMOND VT
TELEPHONE: 802 434 3350
CONTACT PERSON: MARIA DUNN
P.O. NUMBER: _____

B PROJECT INFORMATION

JOB NAME: MEMORIAL UNITED METHODIST CHURCH
JOB NUMBER: 94-116
LOCATION: SWANTON VT
TELEPHONE: _____
CONTACT PERSON: (PRINT) _____

G SAMPLE INFORMATION

TURNAROUND TIME: (CIRCLE ONE)

STANDARD

RUSH

RUSH T.A.T. _____ (Check with lab)

(D) STATION #	(E) SAMPLE IDENTIFICATION & LOCATION	(F) DATE COLLECTED	(G) TIME COLLECTED	(H) SAMPLE TYPE GRAB COMP	(I) MATRIX SOLID (S) LIQUID (L) COMBINED (C) HAZARD (H)	(J) # OF CONTAINERS	(K) CONTAINER & PRESERVATIVE	(L) ANALYSIS
	TB	7/27/94	1130	✓	L	2	✓	8020
	MW-1	7/27/94	1155	✓	L	2	✓	8020
	MW-2	7/27/94	1205	✓	L	2	✓	8020
	MW-3	7/27/94	1145	✓	L	2	✓	8020
	MW-3(D)	7/27/94	1150	✓	L	2	✓	8020
	EFF	7/27/94	1221	✓	L	3	✓	8020/8100

(M) CUSTODY

(PRINT NAME)
SAMPLER: MARIA CDUNN SIGNATURE: Maria C. Dunn

RELINQUISHED: _____

RECEIVED: _____

RELINQUISHED: _____

RECEIVED FOR LABORATORY: M. All

MILITARY DATE/TIME: 27 JUL 94 1235

MILITARY DATE/TIME: _____

MILITARY DATE/TIME: _____

MILITARY DATE/TIME: _____

MILITARY DATE/TIME: 7/29/94 1335

LAB USE ONLY

one vial mw-1 broke in shipping
HRC

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

August 16, 1994

AUG 23 REC'D

Ms. Maria Dunn
Twin State Environmental Corp.
P O Box 719
Richmond VT 05477

Job Name : MUMC
Job Number : 94-116
Location : Swanton, VT

Laboratory # : H09-94-02
Purchase Order # : N/A
Control # : 10589

Dear Ms. Dunn,

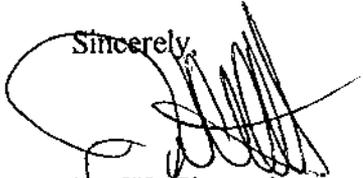
Enclosed please find the laboratory results for the above referenced samples which were received, by the Chemserve sample custodian, under chain of custody control number 10589 on August 9, 1994. Samples were collected by Maria Dunn on August 4, 1994. Any abnormalities to the samples would be noted on the enclosed chain of custody document or laboratory report form. Chemserve follows protocols for analysis corresponding to the methods referenced unless a modification is noted. Unless otherwise stated, all holding times, preservation techniques and container types are analogous with those outlined by the U.S. EPA.

A formal quality assurance/quality control QA/QC program is maintained and updated by Chemserve on a routine basis. This QA/QC manual is available upon request.

This report is not valid without a completed chain of custody with the corresponding control number attached.

If you have questions or concerns regarding this analysis, please feel free to contact me.

Sincerely,


Jay W. Chrystal
President/Laboratory Director

Enclosures



**TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100**

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP

LAB#: H09-94-02

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: MW-1

CONTROL #: 10589

DATE SAMPLED: 8/04/94

REC'D: 8/09/94

DATE ANALYZED: 8/12/94

DATE EXTRACTED: 8/11/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

(MG/L)

(MG/L) X 1

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

BDL

0.1

**SURROGATE
M-TERPHENYL**

**PERCENT RECOVERY
82%**

**ACCEPTANCE LIMITS
60-120%**

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: _____



**TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100**

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP

LAB#: H09-94-02

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: MW-2

CONTROL #: 10589

DATE SAMPLED: 8/04/94

REC'D: 8/09/94

DATE ANALYZED: 8/12/94

DATE EXTRACTED: 8/11/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

(MG/L)
BDL

(MG/L) X 1
0.1

**SURROGATE
M-TERPHENYL**

**PERCENT RECOVERY
98%**

**ACCEPTANCE LIMITS
60-120%**

BDL=BELOW DETECTION LIMIT

CERTIFIED BY: 

**TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100**

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP

LAB#: H09-94-02

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: MW-3

CONTROL #: 10589

DATE SAMPLED: 8/04/94

RECD: 8/09/94

DATE ANALYZED: 8/12/94

DATE EXTRACTED: 8/11/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

(MG/L)

(MG/L) X 1

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

BDL

0.1

**SURROGATE
M-TERPHENYL**

**PERCENT RECOVERY
70%**

**ACCEPTANCE LIMITS
60-120%**

BDL = BELOW DETECTION LIMIT

CERTIFIED BY: _____



**TOTAL PETROLEUM HYDROCARBONS
EPA MODIFIED METHOD 8100**

CUSTOMER: TWIN STATE ENVIRONMENTAL CORP

LAB#: H09-94-02

SAMPLE LOCATION: MUMC SWANTON, VT

JOB#: 94-116

SAMPLE IDENTITY: MW-3D

CONTROL #: 10589

DATE SAMPLED: 8/04/94

REC'D: 8/09/94

DATE ANALYZED: 8/12/94

DATE EXTRACTED: 8/11/94

MATRIX: LIQUID

PERCENT MOISTURE: N/A

COMPOUND

CONCENTRATION

DETECTION LIMIT MULTIPLIER:

(MG/L)

(MG/L) X 1

TOTAL PETROLEUM
HYDROCARBONS AS
FUEL CONSTITUENTS

BDL

0.1

**SURROGATE
M-TERPHENYL**

**PERCENT RECOVERY
93%**

**ACCEPTANCE LIMITS
60-120%**

BDL=BELOW DETECTION LIMIT

CERTIFIED BY: _____

Cy

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, ICP Metals, Mercury, pH, TDS, Total Hardness, Calcium, Magnesium, Sodium, Potassium, Total Alkalinity, Chloride, Sulfate, Ammonia, Nitrate-N, Orthophosphate, TKN, Total Phosphorus, COD, BOD, Total Cyanide, Non-Filterable Residue, Total Phenolics, PCBs in Water, PCBs in Oil, Pesticides, and Volatile Organics.

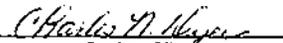
PROVISIONAL CERTIFICATION: Specific Conductance, and Fluoride.

REPLACES CERTIFICATE #100893-B

CERTIFICATE NUMBER: 100893-C

DATE OF ISSUE: February 11, 1994

EXPIRATION DATE: December 2, 1994


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:

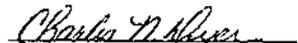
FULL CERTIFICATION: Total Coliform by Membrane Filtration, Fecal Coliform by Membrane Filtration, Collert-MPN, Metals by Graphite Furnace, Metals by ICP, Nitrate-N, Nitrite-N, Residual Free Chlorine, Turbidity, Total Filterable Residue, Calcium, pH, Alkalinity, Corrosivity, Sodium, Sulfate, Total Cyanide, Trihalomethanes, Volatile Organics, and Vinyl Chloride.

PROVISIONAL CERTIFICATION: Mercury, Fluoride, Base/Neutrals, DBCP, and EDB.

CERTIFICATE NUMBER: 100893-A

DATE OF ISSUE: December 3, 1993

EXPIRATION DATE: December 2, 1994


Certifying Officer

APPENDIX 5
TSEC STANDARD OPERATING PROCEDURES
FOR
GROUNDWATER SAMPLING

TWIN STATE ENVIRONMENTAL CORPORATION

STANDARD OPERATING PROCEDURE FOR GROUNDWATER SAMPLING

Static water levels measurements from all of the wells requiring sampling will be collected prior to the collection of any samples. The depth to groundwater and the total depth to the bottom of the well screen will be measured with an electronic depth indicating probe. The probe will be lowered into the well until the meter indicates water is reached. The probe will be raised above the water level and slowly lowered again until the water level is detected. The cable will then be held against the side of the inner protective casing at the point designated for water level measurements and a depth reading taken. The measurement obtained will be recorded to the nearest 0.01 foot in the project log book. Using the probe in a similar fashion, the depth to the bottom of the well will be determined and recorded in the project log book.

Three well volumes will be purged from each well prior to sampling. Wells will be purged either by hand bailing, or with the use of a peristaltic pump equipped with dedicated polyethylene tubing.

The well will be allowed to recharge to seventy five (75) percent of the static water level before sampling, unless the well is bailed dry. In the latter case, the well may be sampled when sufficient recharge has occurred to enable sample containers to be filled. The bailer line will be prevented from contacting the ground surface to avoid the introduction of surface soils into the well during purging. All purge water removed from each well will either be containerized or discharged directly to the ground surface, depending on project requirements. Any water which is containerized will subsequently be sampled to determine the appropriate disposal method.

The time of sample collection, as well as the volume of water removed from the well will be recorded in the project log book.

Samples for analysis will be collected from the well using a newly decontaminated bailer. This will be conducted in a manner which minimizes sample agitation and contact with the atmosphere. Additionally, the following considerations will be incorporated in this sampling:

1. Bailer check valves will be inspected prior to sample collection.
2. Bailers will be carefully lowered into the well to minimize degassing of the water upon impact.
3. The bailer contents will be transferred to sample container(s) in a manner which minimizes agitation or aeration.
4. Decontaminated sampling equipment will not be placed directly on the ground or any other potentially contaminated surface prior to insertion into the well.