

**SITE INVESTIGATION
REPORT**

**HEMMING'S SUNOCO
216 WEST MAIN STREET
BENNINGTON, VERMONT**

VT-DEC Site # 97-2195

APRIL 20, 1999

Submitted to:

Sites Management Section
Vermont Department of Environmental Conservation
103 South Main Street/ West Office Bldg.
Waterbury, VT 05041-0404

Prepared by:

**COLER &
COLANTONIO**
ENGINEERS & SCIENTISTS

One Sugarloaf Street
South Deerfield, Massachusetts 01373
(413)-665-5300

April 20, 1999

Mr. Michael Young, Project Manager
Sites Management Section
Vermont Department of Environmental Conservation
103 South Main Street/ West Office Bldg.
Waterbury, VT 05041-0404

**Re: Site Investigation Report
Hemming's Sunoco
216 West Main Street
Bennington, Vermont
VT DEC Site #97-2195**

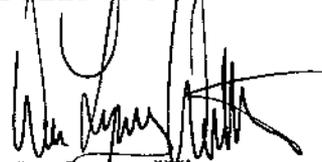
Dear Mr. Young:

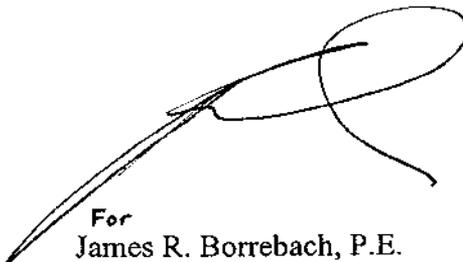
On behalf of our client, Hemming's Motor News, Coler & Colantonio, Inc. (C&C) is pleased to submit the attached *Site Investigation Report* for Hemming's Sunoco located at 216 West Main Street in Bennington, Vermont (the Site). This work was conducted as a continuation of our Subsurface Investigation Report dated February 1999.

Should you have any questions please do not hesitate to contact our office at 413-665-5300.

Sincerely,

COLER & COLANTONIO, INC.


Wm. Lyons Witten
Hydrogeologist/ Project Manager


For
James R. Borrebach, P.E.
Director of Environmental Services

CC: Janet Thompson, Facilities Manager, Hemming's Sunoco
Prez Ehrich, Vice President, Watering, Inc.

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1.0 INTRODUCTION

Coler & Colantonio, Inc. (C&C) is pleased to submit the following results of the Site investigation at Hemming's Sunoco located at 216 West Main Street in Bennington, Vermont, herein referred to as the "Site" (see Figure 1, Locus Map). This Site is listed as Site # 97-2195 with the Vermont Department of Environmental Conservation (DEC).

2.0 PREVIOUS REPORTS

2.1 UST Removal Report (April 1997)

This UST Removal Report, prepared by A.R. Sandri, Inc. of Greenfield, Massachusetts, summarized the removal of three petroleum (two gasoline and one diesel) underground storage tanks (USTs) from the Site in April 1997. This tank replacement project included the installation of two new petroleum USTs, four UST leak detection wells (ARS-1 ARS-2, ARS-3, and ARS-4) in the corners of the tank pad, and the removal of contaminated soil from the former tank grave off-site for recycling.

The report was reviewed by the Sites Management Section (SMS) of the Vermont Department of Environmental Conservation (DEC) in a letter dated September 9, 1997.

2.2 Groundwater Sampling and Sensitive Receptor Assessment (May 1998)

During this May 1998 investigation, C&C located and inspected six monitoring wells (MW-1 through MW-6) installed during previous studies of the Site. None of those wells were found in a usable condition. Therefore, the only wells sampled were the four UST leak detection wells installed by Sandri, Inc. in 1997. The well sampling and sensitive receptor assessment were summarized in our report dated May 1998. C&C concluded that because these wells were installed in the pea stone backfill of the new tanks, not in native materials, that they were not likely to be representative of the highest concentrations of contaminants in groundwater on site. Consequently, C&C recommended the installation of four additional monitoring wells, three to be installed downgradient of the former tanks, and a fourth, cross gradient from the former tanks in the most upgradient location possible. The locations of the proposed monitoring wells were based in part by the limitations imposed by the abundance of aboveground and underground utilities in the area. In their letter dated September 14, 1998, DEC approved C&C's proposal recommending that groundwater from these monitoring wells be sampled for VOCs and TPH.

2.3 Subsurface Investigation Report (February 1999)

This report, prepared by C&C, summarized the results of a subsurface investigation conducted in October and November of 1998. This investigation entailed the installation, development and sampling of four on-site monitoring wells designated as CC(MW)-1, CC(MW)-2, CC(MW)-3, and CC(MW)-4. Soil samples were collected at five-foot intervals in each boring, and were

inspected for visual evidence of contamination. In addition, the samples were subjected to jar-headspace screening in the field using an ThermoEnvironmental Organic Vapor Meter (OVM) in accordance with the C&C Standard Operating Protocols (SOP) included in Appendix A to evaluate the concentration of total organic vapors (TOVs) in each sample. Visual evidence of possible contamination was identified in borings CC(MW)-3 and CC(MW)-4. A black, oily film on the soil particles was observed in the soil at a depth of approximately five to seven (5-7) feet with a screening result of 15 ppm TOV in CC(MW)-3. A black, oily film was also observed on the soil particles in CC(MW)-4 at a depth of approximately ten to twelve (10-12) feet with a screening result 6 ppm TOV. Although no visual evidence of soil contamination was observed in boring CC(MW)-2, a reading of 62 ppm TOV was recorded at a depth of 10-12 feet during soil screening with the OVM. Minimal levels of TOVs (< 6 ppm) were detected in the remaining borings.

Measured groundwater elevation data obtained on November 5, 1998 indicated the direction of groundwater flow at the Site was northeast toward the Walloomsac River at a gradient of approximately 0.11 feet per foot.

Results of groundwater analysis on samples collected from the wells revealed that the Vermont Primary Groundwater Enforcement (VPGE) Standard for benzene [5.0 micrograms per liter (ug/L)] was exceeded in the sample from well CC(MW)-2 (35.6ug/L). Petroleum hydrocarbons were also detected in this sample. Ethylbenzene, MTBE, and xylenes were detected in the samples from wells CC(MW)-1, CC(MW)-2 and CC(MW)-4 at concentrations below their respective VPGE standards.

Based on the results of this investigation, Coler & Colantonio concluded in our February 1999 report that further subsurface investigation was necessary assess the full nature and extent of subsurface petroleum contamination at the Site.

3.0 SITE INVESTIGATION

This investigation is a continuation of C&C's previous subsurface investigation summarized in our February 1999 report, and presents the results of the activities performed by C&C in March 1999. This March 1999 investigation included the installation and sampling of four new monitoring wells (CC(MW)-5, CC(MW)-6, CC(MW)-7, and CC(MW)-8) strategically placed on Site to determine the full nature and extent of the contamination encountered in the previous subsurface investigation.

3.1 Soil Borings and Well Installations

On March 8, 1999 a C&C staff geologist observed T&K Drilling, Inc. of Troy, New Hampshire, drill four on-site soil borings with a truck-mounted hollow stem auger rig. Soil samples were collected from the borings at five-foot intervals using a stainless steel split spoon sampler. Four wells, designated CC(MW)-5, CC(MW)-6, CC(MW)-7, and CC(MW)-8, were installed in the completed test borings following the C&C Standard Operating Protocol (Appendix A). Soil

boring logs for wells CC(MW)-5 through CC(MW)-8 which summarize the subsurface stratum and well construction details are provided in Appendix B.

Soil boring CC(MW)-5 was drilled to 15 feet below grade near the southwestern corner of the Sunoco building, as shown on Figure 2. Soil boring CC(MW)-6 was drilled to 17 feet below grade approximately 40 feet north of CC(MW)-5. Soil boring CC(MW)-7 was drilled to 17.5 feet below grade on the westerly portion of the lot, between the visitor and the employee parking areas. Soil boring CC-8 was drilled to a depth of 17 feet below grade near the north end of the walkway between the Hemming's Sunoco and Hemming's Motor News buildings. Depth to water was encountered in each on-site boring between 7 and 9 feet below grade on March 8, 1999.

Soil samples were inspected for visual evidence of contamination and were subjected to jar-headspace screening using an OVM in accordance with the SOP (Appendix A). Evidence of possible contamination was identified by visual observations and/or vapor readings in borings CC-6, CC-7 and CC-8. Laboratory analysis of the soil samples collected from the Site was not included in the scope of this investigation. Further explanation of the field observations of soil quality is discussed in Section 3.4.1 *Subsurface Soil Quality*, below

3.2 Groundwater Sample Collection

On March 19, 1998 C&C developed the four new monitoring wells and collected groundwater samples from wells CC(MW)-5, CC(MW)-6, CC(MW)-7 and CC(MW)-8. Prior to sampling, well headspace was screened using an OVM, and the depth to water was measured using a water level indicator which was decontaminated between wells. The depth to water measurements are presented in Table 1 and also on the Groundwater Sampling Log attached in Appendix B. Groundwater sampling was conducted in accordance with the C&C Standard Operating Protocols attached in Appendix A. The groundwater samples were collected in laboratory-prepared glassware, preserved on ice, and submitted under standard chain-of-custody procedures to Con-Test Analytical of East Longmeadow, MA, for volatile organic compound (VOC) including methyl-t-butyl-ether (MTBE), and total petroleum hydrocarbons (TPH) analysis by EPA methods 8020 and 8100M, respectively.

3.3 Monitoring Well Survey

An elevation survey of monitoring wells CC(MW)-1 through CC(MW)-8 was conducted by C&C on March 19, 1999. The north corner of the poured concrete foundation of the car wash spray-down area was assigned an arbitrary datum of 100.00 feet and used as a benchmark (refer to Figure 2-Site Plan). The elevations of the eight wells were surveyed relative to this point. Monitoring well elevations are summarized in Table 1.

Depth to water measurements were collected again on April 18, 1999 from the eight on-site monitoring wells. The water level probe was decontaminated between wells. Depth to water measurements are summarized in Table 1.

3.4 Results

3.4.1 *Subsurface Soil Quality*

Soil samples were inspected for visual evidence of contamination and were subjected to jar-headspace screening using an OVM. Evidence of possible soil contamination was identified by visual observation in borings CC(MW)-7 and CC(MW)-8. A black, oily film on the soil particles was observed in the soil at approximately 10-12 feet with an OVM screening result of 0.6 ppm TOV in CC(MW)-7. A black, oily film was also observed on the soil particles in CC(MW)-8 at approximately 10-12 feet with a screening result 5 ppm TOV. Although no visual evidence of contamination was observed in boring CC(MW)-6, a strong petroleum odor and an OVM screening result of 88 ppm TOV was indicated during screening of the drill cuttings with the OVM. Minimal levels of TOVs (< 6 ppm) were detected in the remaining samples screened from CC(MW)-5 and CC(MW)-7. Refer to the boring logs in Appendix B for specific readings obtained. Laboratory analysis of the soil samples collected from the Site was not included in the scope of this investigation.

3.4.2 *Groundwater Quality*

The VPGE Standard of 5.0 ug/L for benzene was exceeded in the sample from well CC(MW)-6 at a concentration of 6.0 ug/l. Ethylbenzene, toluene, and xylenes were also detected in CC(MW)-6 at concentrations below their respective VPGE standards. In addition, petroleum hydrocarbons were detected at a concentration of 1.07 milligrams per liter (mg/L) in CC(MW)-6 and 0.34 mg/L in CC(MW)-8. Although DEC requires detected petroleum hydrocarbons be reported, a petroleum hydrocarbon enforcement standard has not been established. The laboratory analytical results are summarized in Table 2, and laboratory certificates of analysis are included in Appendix C with the chemical laboratory data sheets.

3.4.3 *Groundwater Flow Direction*

Measured groundwater elevation data obtained on March 19, 1999 and April 18, 1999 indicate the direction of groundwater flow at the Site is north/northeast toward the Walloomsac River. Groundwater contours generated from the March and April data are shown on Figure 2. Based on this elevation data, the groundwater gradient at the Site was determined to be approximately 0.12 feet per foot.

4.0 CONCLUSIONS & RECOMMENDATIONS

- 4.1 No chemical laboratory testing of soil samples was conducted; however, headspace screening of soil samples from the four soil borings detected organic vapors. The highest reading was 88 ppm TOV, detected in CC(MW)-6.
- 4.2 VOCs and TPH were not detected in the groundwater samples from CC(MW)-5 and CC(MW)-7. Analyses of groundwater samples indicates the Vermont Primary Groundwater Enforcement Standard of 5.0 ug/l for benzene was exceeded in well CC(MW)-6 at a concentration of 6.0 ug/l. Ethylbenzene, toluene, and xylenes were also

detected in CC(MW)-6 at concentrations well below their respective enforcement standards. Petroleum hydrocarbons were also detected slightly above the detection limit in the groundwater samples from wells CC(MW)-6 and CC(MW)-8.

- 4.3 Data obtained from this and previous Site investigations indicate that elevated levels of benzene are concentrated in the vicinity of monitoring wells CC(MW)-2 (35.6 ug/L) and CC(MW)-6 (6.0 ug/L), on the southwestern portion of the property. The two monitoring wells downgradient of this area, CC(MW)-7 and CC(MW)-8, have not shown evidence of being impacted by this contamination, suggesting that the contamination is not migrating at an accelerated rate. This may be primarily attributed to the fact that the subsurface material in this vicinity is comprised mainly of tightly packed silt and clay which have low hydraulic conductivities thereby inhibiting the movement of water and fluids through the subsurface materials. Secondly, it would appear that either the contaminants are biodegrading at a rate faster than they can migrate downgradient, or that they are diluting to minimal concentrations as they enter the groundwater.
- 4.4 This data suggests that the Walloomsac River, as identified in our May 1998 Groundwater sampling and Sensitive Receptor Report, has not been adversely impacted by the detected petroleum compounds.
- 4.5 C&C recommends that the eight on-site monitoring wells [CC(MW)-1 through CC(MW)-8] be sampled quarterly for a year at three month intervals to monitor potential seasonal fluctuations of groundwater quality at the Site. Upon completion of this monitoring period, C&C recommends the situation be re-assessed to determine appropriate future response actions based upon the on-site groundwater conditions at that time. A proposal to conduct this quarterly groundwater sampling is attached in Appendix D.

5.0 STATEMENT OF LIMITATIONS

The observations described in this report were made under the conditions and dates stated herein. The conclusions presented in the report were based solely upon the services described herein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by Hemming's Motor News. The work described in this report was carried out in accordance with the Terms & Conditions of Engagement.

C&C, Inc. has relied on information available at federal, state, and municipal agencies, and provided by other parties referenced herein. C&C, Inc. provides no warranties on the accuracy or completeness of information provided by third parties.

Observations were made of the site and of structures on the site only on those dates as indicated within this report. Where visual observation of the structures and ground surface was obscured by snow or ice, and where access to portions of the site or to structures on the site was unavailable or limited, C&C, Inc. renders no opinion as to the presence of hazardous material or oil, or to the presence of indirect evidence relating to hazardous material or oil, in that portion of the site or structure. In addition, C&C, Inc. renders no opinion as to the presence of hazardous material or oil, or to the presence of indirect evidence relating to hazardous material 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.

Unless otherwise specified in the Scope of Work, C&C, Inc. did not perform testing or analyses to determine the presence or concentration of asbestos, polychlorinated biphenyls (PCB's), radon, lead-based paint, or lead in drinking water at the site.

The purpose of this report was to assess the physical characteristics of the subject site with respect to the presence in the environment of hazardous material or oil, as defined within the general laws and statutes of the particular state. No specific attempt was made to check on the compliance of present or past owners or operators of the site with federal, state, or local laws and regulations, environmental or otherwise.

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TABLES

Table 1
Water Table Measurements
 Hemming's Sunoco
 216 West Main Street
 Bennington, VT

Well ID	Well Elevation (PVC)	Depth to Water	Water Table Elevation
March 19, 1999			
CC(MW)-5	99.41	6.33	93.08
CC(MW)-6	98.53	7.31	91.22
CC(MW)-7	98.58	8.19	90.39
CC(MW)-8	98.42	8.57	89.85
April 18, 1999			
CC(MW)-1	100.19	5.89	94.30
CC(MW)-2	98.66	8.10	90.56
CC(MW)-3	91.96	5.59	86.37
CC(MW)-4	98.48	8.08	90.40
CC(MW)-5	99.41	7.24	92.17
CC(MW)-6	98.53	8.03	90.50
CC(MW)-7	98.58	8.61	89.97
CC(MW)-8	98.42	9.24	89.18

Notes:

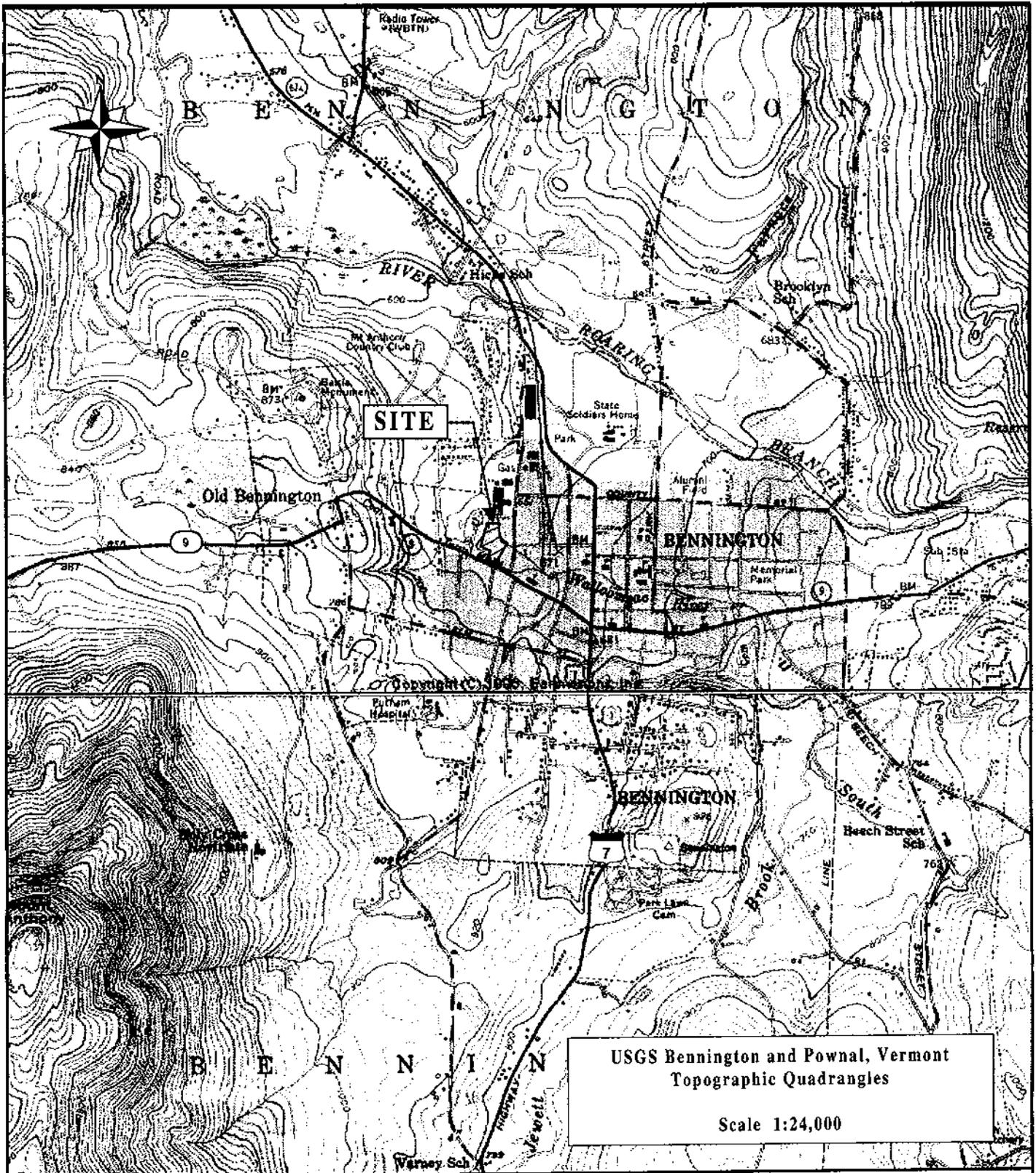
1. Benchmark = 100.00 feet, assumed, at top of poured concrete foundation at corner of carwash spray-down area.
2. All elevations in feet.
3. Well elevations measured to the top of PVC.

Table 2
Chemical Laboratory Results-Groundwater
Hemming's Sunoco
216 West Main Street
Bennington, VT

Sample I.D. Sampling Date	CC(MW)-1 11/5/98	CC(MW)-2 11/5/98	CC(MW)-3 11/5/98	CC(MW)-4 11/5/98	CC(MW)-5 3/19/99	CC(MW)-6 3/19/99	CC(MW)-7 3/19/99	CC(MW)-8 3/19/99	GW STD*
Well Headspace Screening (ppmv)	1.8	2.3	6.4	4.8	0.7	0.3	0.1	0.3	NS
<i>Volatile Organic Compounds (µg/L)</i>									
Benzene	< 0.2	35.6	< 0.2	< 0.2	< 0.2	6.0	< 0.2	< 0.2	5
Chlorobenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	100
1,2-Dichlorobenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NS
1,3-Dichlorobenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NS
1,4-Dichlorobenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NS
Ethyl benzene	< 0.5	1.7	< 0.5	< 0.5	< 0.5	7.9	< 0.5	< 0.5	680
Methyl-t-butyl ether	2.8	7.2	< 0.5	5.1	< 0.5	< 0.5	< 0.5	< 0.5	70
Toluene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.7	< 1.0	< 1.0	2420
m/p-Xylene	< 1.0	18.6	< 1.0	< 1.0	< 1.0	184.0	< 1.0	< 1.0	400
o-Xylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	2.0	< 0.5	< 0.5	400
Petroleum Hydrocarbons (mg/L)	< 0.25	0.39	< 0.31	< 0.25	< 0.25	1.07	< 0.25	0.34	NS

1. * = Vermont Primary Ground Water Quality Standard, Rule Number 88-37, September 1988
2. NS = No standard
3. Results in red exceed listed standard.
4. Results in blue exceed listed standard.
5. < 0.5 indicates a result less than the listed method detection limit.
6. ppmv = parts per million vapor
7. µg/L = micrograms per liter
8. mg/L = milligrams per liter

FIGURES



**COLER &
COLANTONIO**
ENGINEERS AND SCIENTISTS

Hemmings Sunoco
216 Main Street
Bennington, Vermont

Figure 1
Locus Map

REVISIONS:

No.	DATE

NOTES

This Plan is based on a Site Plan titled "Record Utility Plan" by Enman Engineering dated January 20, 1998. Being that a properly filed retraction or verification has not been performed by Coler & Colantonio, Inc., this firm bears no responsibility for the depiction thereof.

All locations & dimensions of the Site features & property lines are approximate. This plan should not be used for construction or land conveyance purposes.

Vertical & horizontal locations of monitoring points determined by site survey conducted by C&C personnel.

Groundwater elevations are based on an assumed benchmark of 100.00 feet located at the top of the roadbox of well CC-1.

Groundwater contours are based upon measurements collected on 3/19/99 and 4/16/99. Fluctuations in the level of groundwater may occur due to factors not accounted for at the time of measurement.

Groundwater contours & flow directions assume homogeneous, isotropic aquifer conditions & horizontal flow.

Groundwater contours are interpolated between data points & inferred in other areas.

Groundwater levels are corrected for the presence of free-phase petroleum product, where detected.

COLER & COLANTONIO INC
ENGINEERS AND SCIENTISTS

(413) 665-5300 1 Sugarloaf Street
Fax: (413) 665-5390 South Deerfield, MA 01373

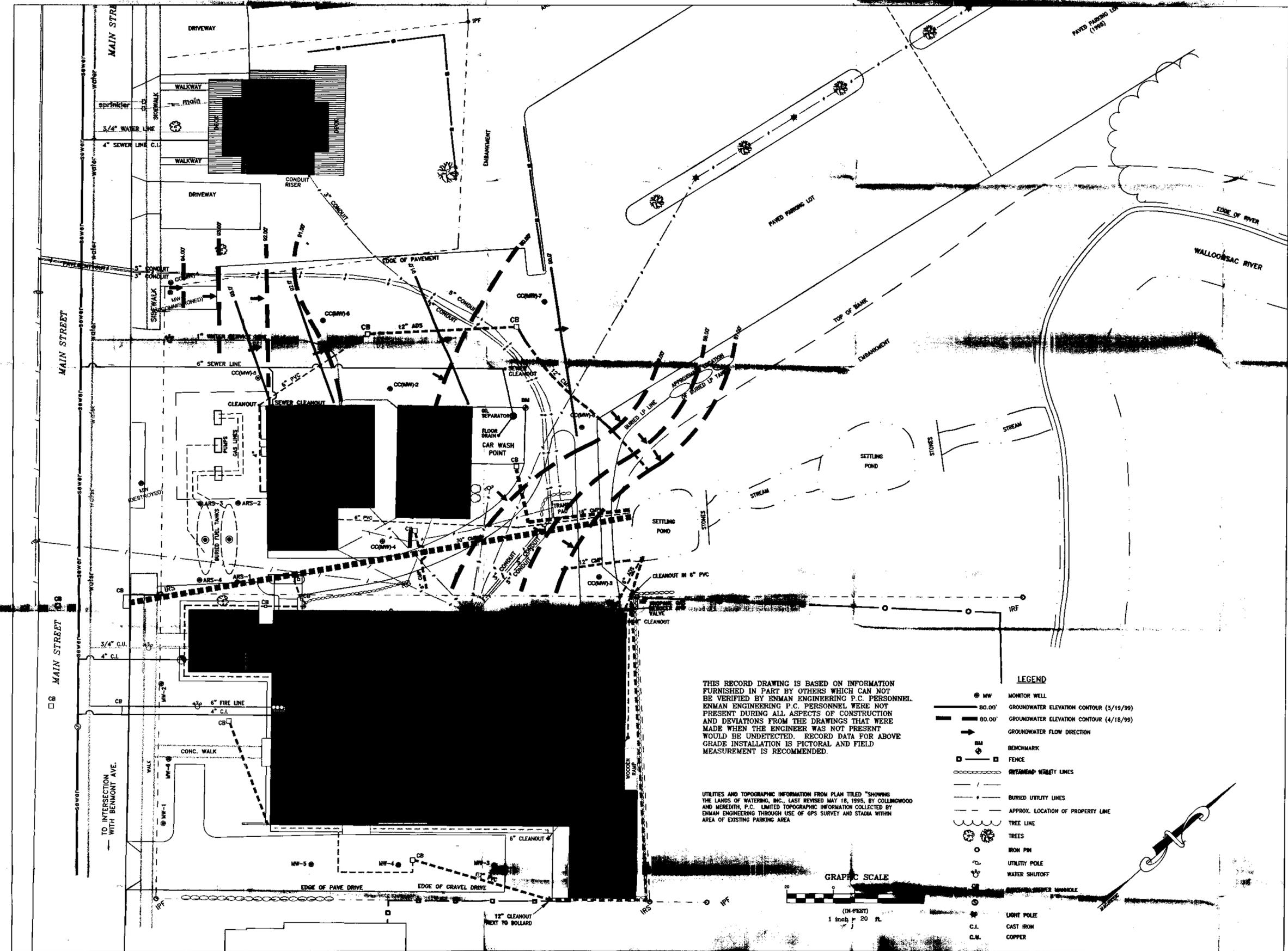
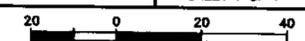
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Figure 2
SITE PLAN
HEMMING'S SUNOCO
216 WEST MAIN STREET
BENNINGTON, VT 05201

PREPARED FOR:

HEMMING'S MOTOR NEWS
222 WEST MAIN STREET
BENNINGTON, VT 05201

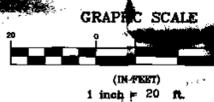
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COMP./DESIGN:	
CHECK: WLW	
DRAWN:	
SCALE: 1" = 20'	
JOB NO.: 61-17	
DWG NO.: 61-17SP	SHEET 1 OF 1



THIS RECORD DRAWING IS BASED ON INFORMATION FURNISHED IN PART BY OTHERS WHICH CAN NOT BE VERIFIED BY ENMAN ENGINEERING P.C. PERSONNEL. ENMAN ENGINEERING P.C. PERSONNEL WERE NOT PRESENT DURING ALL ASPECTS OF CONSTRUCTION AND DEVIATIONS FROM THE DRAWINGS THAT WERE MADE WHEN THE ENGINEER WAS NOT PRESENT WOULD BE UNDETECTED. RECORD DATA FOR ABOVE GRADE INSTALLATION IS PICTORIAL AND FIELD MEASUREMENT IS RECOMMENDED.

UTILITIES AND TOPOGRAPHIC INFORMATION FROM PLAN TITLED "SHOWING THE LANDS OF WATERING, INC., LAST REVISED MAY 18, 1995, BY COLLINGWOOD AND WERDITH, P.C. LIMITED TOPOGRAPHIC INFORMATION COLLECTED BY ENMAN ENGINEERING THROUGH USE OF GPS SURVEY AND STADIA WITHIN AREA OF EXISTING PARKING AREA.

- LEGEND**
- MW MONITOR WELL
 - 80.00' GROUNDWATER ELEVATION CONTOUR (3/19/99)
 - 80.00' GROUNDWATER ELEVATION CONTOUR (4/16/99)
 - GROUNDWATER FLOW DIRECTION
 - BM BENCHMARK
 - FENCE
 - RYEGRASS WEEDY LINES
 - BURIED UTILITY LINES
 - APPROX. LOCATION OF PROPERTY LINE
 - TREE LINE
 - TREES
 - IRON PIN
 - UTILITY POLE
 - WATER SHUTOFF
 - GROUNDWATER MONITOR MANHOLE
 - LIGHT POLE
 - C.I. CAST IRON
 - C.M. COPPER



APPENDIX A
Standard Operating Protocols

Soil Borings and Monitoring Wells

1. All drilling is inspected continuously by a staff geologist or inspector. The geologist or inspector is familiar with the particular drilling program, and is responsible for ensuring that established procedures are followed. The geologist or inspector has the authority to modify the program and/or procedures when warranted by unanticipated field conditions.
2. The geologist or inspector is responsible for maintaining field notes and for keeping a well log independent of the driller.
3. All drilling equipment is steam-cleaned prior to each use. Steam cleaning is performed on the augers and/or casing, drilling rods, samplers, auger forks, lifting hooks, and other equipment needed for establishing the well. The working end of the drill rig is steam-cleaned, and the rig is generally inspected by the geologist or inspector for evidence of leaks (i.e., gasoline or diesel fuel and hydraulic fluid). Finally, well construction materials, including casing, screens, protective risers, and/or road boxes, are also steam-cleaned prior to use.
4. Soil samples are collected at five-foot intervals unless otherwise specified, and/or at changes in strata, utilizing a clean split- spoon sampler. These soil samples are used for characterizing the physical nature of the subsurface sediments and may be collected for laboratory analyses. Similarly, spoon samples may be screened in the field for contamination utilizing appropriate field analytical devices.
5. Sediments collected from the sampler or brought to the surface by the drilling process are left on-site, unless there are specific instructions to the contrary. Sediments will be screened using a photoionization detector (PID) or a flame ionization detector (FID), and the results of that screening will be used to determine the disposal method for the soil. Soils exhibiting detector responses of greater than 10 ppm will be placed in drums or will be stockpiled on and covered with polyethylene sheeting. Soils exhibiting responses of less than 10 ppm will be placed in an unlined stockpile on the site.
6. When installing a groundwater monitoring well, the well screen is set at a depth whereby it intercepts the surface of the water table, unless otherwise specified. The screen is set to extend above the highest anticipated groundwater levels to a maximum of within two feet of the land surface. The annular space between the wall of the bore hole and the screen is then packed with clean silica sand to a level one foot above the screen (to allow for settling), and then with a minimum one-foot bentonite seal. The method of backfilling the bore hole above the bentonite seal will be left to the discretion of the site geologist or inspector. If the bore hole creates the potential for migration of contaminants into previously uncontaminated deposits, the bore hole will be filled with a portland cement and bentonite slurry. If migration of contaminants is not a concern, then the well will be backfilled with the drill cuttings if detector responses are less than 10 ppm, or with clean backfill material if detector responses are greater than 10 ppm. The final one foot is filled with cement, into which is set a protective riser with locking cap or a road box.

Jar Headspace Screening

The following procedures will be used to screen soil samples for volatile organic compounds with a portable photoionization detector (PID) or a flame ionization detector (FID).

1. Half-fill a clean glass 8-ounce jar with the sample to be analyzed. Quickly cover the open top with a sheet of clean aluminum foil and apply the screw cap to tightly seal the jar.
2. Vigorously shake the jar for 10 seconds both at the beginning and end of the headspace development period. Allow the jar to stand 10 minutes for headspace development. When ambient temperatures are below 32°F (0°C), allow the samples to stand in a heated vehicle or building.
3. After the headspace development period, remove screw lid to expose the foil seal. Puncture the foil seal with an instrument sampling probe, to a point about one-half of the headspace depth. Do not allow water droplets or soil particulates to touch the instrument probe.
4. Observe the instrument response and record the highest meter response as the jar headspace concentration. The maximum response should occur from two to five seconds after the probe is inserted into the jar. The meter response may be erratic when the concentration of organic vapor is high or if there is excessive moisture in the sample. The experience and judgement of the instrument operator must be used to determine the validity of the headspace measurement.
5. Benzene or an equivalent compound will be used to calibrate the field screening instrument. Jar headspace sample results will be reported as "total organic vapors" in ppm (v/v). Instruments will be operated, maintained, and calibrated in accordance with the manufacturer's specifications. A calibration and maintenance log is kept at Coler & Colantonio' office for each instrument. The daily calibration data are transcribed to the field log for each day that the instrument is used. Some samples may be collected and analyzed in duplicate to measure sample variability.

Sampling Monitoring Wells

Discussion

To obtain a representative sample of groundwater, it must be understood that the water within the well casing and in close proximity to the well is generally not representative of the groundwater quality at that sampling site. Therefore, the well will be pumped or bailed until it is thoroughly flushed of standing water and contains water from the aquifer. Wells may be purged and sampled with a pump from the ground surface, with a submersible pump or with a bailer, depending on the specific needs of the sampling program. Bailers are generally preferred for collecting samples where volatile stripping is of concern. Pumps are useful for purging large volumes of water from deep wells or when a sample from a discrete depth below the water surface is desired. Refer to DEP Policy #WSC-310-91 to choose the appropriate method for purging and sampling a well and operate sampling equipment according to manufacturer's directions.

Procedures for Purging and Sampling

1. Using clean, non-contaminating equipment (i.e., an electronic level indicator), determine and record in the field logbook the water level in the well, then calculate the fluid volume in the casing.

The volume of water in the well can be calculated using the following equation:

$$v = \frac{(\pi r^2 h)}{c}$$

where:

v = one well volume of water (gallons)

$\pi = 3.14$

r = the radius of the well or one half of the diameter (inches)

h = the height of the water column in the well (inches)

c = 231 cubic inches per gallon; constant to convert cubic inches to gallons

2. Use a pump or bailer to begin flushing the well. Periodically during the purging of the well, measure and record the pH, temperature, and specific conductivity of the water being removed.
3. Avoid contamination and do not allow sampling equipment or the bailer line to contact the ground while sampling.
4. Continue purging the well until the following is achieved:
 - a. a minimum of three casing volumes have been removed from the well, and pH, temperature, and conductivity have stabilized; or

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Standard Protocols

- b. five well volumes have been removed; or
- c. the well is evacuated to dryness

Three times the well volume (gallons) in a 2-inch-diameter well is approximately one half the height of the water column measured in feet.

5. After water pH, temperature, and specific conductance have stabilized, allow the water level to return to a sufficient level to collect a complete sample and proceed with the sample collection as described below.
6. Select sample bottles and preservative as required by the analysis. Sample bottles containing preservative may be obtained from the laboratory, or samples may be preserved in the field. Samples for metals analysis that require field filtering will be collected in a transfer vessel and then filtered into a preserved container.
7. When transferring the sample in the bailer to the sample container, tip the bailer to allow a slow discharge from the bailer top to flow gently down the side of the sample bottle with minimum entry turbulence.
8. When collecting a sample with a pump, the flow rate of the pump should be low so as to minimize disturbing the sample.
9. In order to compare analytical data for a given well over time, the same purging and sampling method should be used consistently at a given well.
10. Check that a teflon liner is present in the cap, if required. Secure the cap tightly.
11. Label the sample bottle with an appropriate label and waterproof ink. Record the sample number, location, well purging information, the temperature, pH, specific conductivity, and deviations from protocol and relevant observations, such as colors, odors, or sheens, in the field logbook. Complete the chain of custody. Samples will be stored in a cooler until they are delivered to the laboratory.
12. Discard disposable bailers after use in one well. If reusable bailers are used, clean and store each bailer according to the *Standard Operating Protocol for Decontaminating Sampling Equipment*.
13. Tubing used with a pump may be discarded after each well or cleaned by pumping the decontamination fluids through the tubing according to the Standard Operating Procedure for Decontaminating Field Equipment.

Adapted from:

Standard References for Monitoring Wells, The Massachusetts Department of Environmental Protection #WSC-310-91.

Coler & Colantonio, Inc.
Standard Protocols

APPENDIX B

Boring Logs and Groundwater Sampling Log

COLER & COLANTONIO

ENGINEERS AND SCIENTISTS

PROJECT: 61-17.02 Hemming's Sunoco
 LOCATION: 216 W. Main Street, Bennington
 FILE NO.:
 BORING NO.: CC-5
 SHEET NO.: 1 of 1
 DATE: 3/8/99
 Drilling Co.: T & K Drilling
 ENGINEER: DKM

GROUNDWATER READINGS			CASING	SAMPLER	CORE BARREL	G.S. ELEVATION:
DATE	TIME	DEPTH	Rotary Drilling	SS/1.38"		DATUM:
3/8/99	3:30 PM	15'	HAMMER WT.	140#	BIT	LOCATION:
			HAMMER FALL	30"		

DEPTH	C.B.S.I.W.N.S.G.	SAMPLE COLLECTION DATA					SAMPLE DESCRIPTION	WELL CONSTRUCTION	STRATUM DESCRIPTION
		NO.	TYPE	PEN/REC	DEPTH	BLOWS/6"			
							orange/brown fine sand and gravel		fine sand and gravel
							brown fine sand and gravel		5.7 ppm
5		1				4/4/7/8	2" brown fine sand and pebbles		silt and clay
							7" moist gray silt and clay with swirled orange mottles		0.3 ppm
10		2				3/3/4/5	1.5' wet light brown silt		silt
15		3				7/8/10/14	wet light brown silt with some sand, gravel, and pieces of gray shale		silt, sand, and gravel
20									
25									
30									
35									

LEGEND

- 2" PVC WELL SCREEN - 0.01" SLOTS
- SILICA SAND FILTER PACK
- BENTONITE SEAL
- CONCRETE SEAL

REMARKS:

CC-5

COLER & COLANTONIO

ENGINEERS AND SCIENTISTS

PROJECT: 61-17.02 Hemming's Sunoco
 LOCATION: 216 W. Main Street, Bennington
 FILE NO.:

BORING NO.: CC-6
 SHEET NO.: 1 of 1
 DATE: 3/8/99

Drilling Co.: T & K Drilling
 CASING: Rotary Drilling
 SAMPLER: SS/1.38"
 CORE BARREL: BIT
 HAMMER WT. 140#
 HAMMER FALL 30"

ENGINEER: DKM
 G.S. ELEVATION:
 DATUM:
 LOCATION:

GROUNDWATER READINGS		
DATE	TIME	DEPTH
3/8/99	12:30 PM	17'

DEPTH	CBAL SO I W N S G	SAMPLE COLLECTION DATA					SAMPLE DESCRIPTION	WELL CONSTRUCTION	STRATUM DESCRIPTION
		NO.	TYPE	PEN / REC.	DEPTH	BLOWS/6"			
5		1				8/7/6/4	dark brown fine sand and some gravel orange /brown sand and gravel		fine sand and gravel 1.0 ppm
							2" brown and orange sand 2" dark brown sand and siltwith chunks of black shale		sand 0.3 ppm
							7"dark brown sand		
10		2				7/6/6/5	2" gray silt with black swirls 12" gray silt and clay with swirled orange mottles		silt 3.4 ppm
15		3				6/5/18/21	4" light brown fine sand and silt with swirled orange mottles 2" fragments of broken gray rock orange and brown sand		sand 0.2 ppm 8.O.B. 17'
20									
25									
30									
35									

LEGEND
 2" PVC WELL SCREEN - 0.01" SLOTS
 SILICA SAND FILTER PACK
 BENTONITE SEAL
 CONCRETE SEAL

REMARKS:

CC-6

COLER & COLANTONIO

PROJECT: 61-17.02 Hemming's Sunoco
 LOCATION: 216 W. Main Street, Bennington
 FILE NO.:

BORING NO.: CC-7
 SHEET NO.: 1 of 1
 DATE: 3/8/99

ENGINEERS AND SCIENTISTS

Drilling Co.: T & K Drilling

ENGINEER: DKM

GROUNDWATER READINGS		
DATE	TIME	DEPTH
3/8/99	8:30 AM	Approx. 17.5'

CASING	SAMPLER	CORE BARREL
Rotary Drilling	SS/1.38"	
HAMMER WT.	140#	BIT
HAMMER FALL	30"	

G.S. ELEVATION:
 DATUM:
 LOCATION:

DEPTH	C.B.S.I.W.N.S.G.	SAMPLE COLLECTION DATA					SAMPLE DESCRIPTION	WELL CONSTRUCTION	STRATUM DESCRIPTION
		NO.	TYPE	PEN./REC.	DEPTH	BLOWS/6"			
5		1				12/38/28/3	6" brown sand and silt with rock fragments		sand and silt 0.1 ppm
									sand and silt with rock 0.2 ppm
10		2				4/4/7/5	5" moist light brown fine sand and silt 2" pebbles coated with black mucky material 3" light brown fine sand and silt 2" dark brown and black silty/mucky material		fine sand and silt 0.6 ppm
									silt and muck
15						1/2/3/5	coarse brown sand with pebbles		sand and pebbles
20								B.O.B. 17.5'	
25									
30									
35									

LEGEND

- 2" PVC WELL SCREEN - 0.01" SLOTS
- SILICA SAND FILTER PACK
- BENTONITE SEAL
- CONCRETE SEAL

REMARKS:

CC-7

COLER & COLANTONIO

PROJECT: 61-17.02 Hemming's Sunoco
 LOCATION: 216 W. Main Street, Bennington
 FILE NO.:

BORING NO.: CC-8
 SHEET NO.: 1 of 1
 DATE: 3/8/99

ENGINEERS AND SCIENTISTS

Drilling Co.: T & K Drilling

ENGINEER: DKM

GROUNDWATER READINGS		
DATE	TIME	DEPTH
3/8/99		

CASING	SAMPLER	CORE BARREL
Rotary Drilling	SS/1.38"	
HAMMER WT.	140#	BIT
HAMMER FALL	30"	

G.S. ELEVATION:
 DATUM:
 LOCATION:

DEPTH	CBALSO I W N S G	SAMPLE COLLECTION DATA					SAMPLE DESCRIPTION	WELL CONSTRUCTION	STRATUM DESCRIPTION
		NO.	TYPE	PEN/REC.	DEPTH	BLOWS/6"			
5		1				4/4/6/13	black fine sand with petroleum odor		fine sand 23.6 ppm
							2" light brown fine sand and silt		fine sand, sand and silt 0.2 ppm
							2" coarse black sand		
							2" light brown very fine sand and silt		
							4" black/red sand with slight odor		
10		2				11/5/2/3	light brown fine sand and silt		
							1" moist brown sand and silt		sand and silt
							8" coarse sand coated with black goeey material with petroeum odor and slight sheen		coarse sand 5.0 ppm
							3" brown/black silt and fine sand		silt and fine sand
15		3				1/3/2/5	dark brown sand and coarse sand		sand and coarse sand
20									
25									
30									
35									

LEGEND

- 2" PVC WELL SCREEN - 0.01" SLOTS
- SILICA SAND FILTER PACK
- BENTONITE SEAL
- CONCRETE SEAL

REMARKS:

CC-8



1 Sugarloaf Street
 South Deerfield, MA 01373-1119
 (413) 665-5300 Telephone
 (413) 665-5390 Fax

GROUNDWATER SAMPLING LOG

Sheet 1 of 1

DATE: 4/18/99
 JOB No: 61-17.02
 CLIENT: Hemmings Sunoco
 LOCATION: Bennington, VT
 SAMPLER (S): WLW
 SAMPLING EQUIPMENT: No Samples Collected
 WEATHER CONDITIONS: Drizzle, ~50° F
 PURGING EQUIPMENT: ---

WELL I.D.	REF. POINT (PVC, PROT. CASING, ETC.)	TOTAL DEPTH OF WELL FT.	DEPTH TO WATER FL.	STANDING WATER HEIGHT FL.	STATIC VOLUME Gal.	VOLUME PURGED Gal.	ODORS / V E Y / N	PRODUCT THICKNESS FL.	TEMP °F	SPECIFIC CONDUCT umho/cm @ 25 °C	pH	NOTES: OVM Screening Resulting
CC(MW)-1	Protective Casing	14.0	5.89				N					---
CC(MW)-2	Protective Casing	15.0	8.10				Y					8 ppm
CC(MW)-3	Protective Casing	10.0	5.59				N					---
CC(MW)-4	Protective Casing	15.0	8.08				Y					2 ppm
CC(MW)-5	Protective Casing	15.0	7.24				N					---
CC(MW)-6	Protective Casing	17.0	8.03				Y					3 ppm
CC(MW)-7	Protective Casing	17.5	8.61				N					---
CC(MW)-8	Protective Casing	17.0	9.24				N					---
ARS-1	Protective Casing	10.0										
ARS-2	Protective Casing	10.0										
ARS-3	Protective Casing	10.0										
ARS-4	Protective Casing	10.0										

FIELD INSTRUMENTATION: INSTRUMENT:	MANUFACTURER / MODEL:	C&C IDENTIFICATION I.D. NUMBER:	CALIBRATION:
P. I. D	THERMO OVM 580B		4/18/99 WLW
Steel Tape & Chalk			

NOTES: (CHARACTERIZATION OF ODORS, PRODUCTS, ETC.) All wells are 2" PVC.	* STATIC VOLUME = (Vst)=(0.163) r ² H WHERE: Vst = VOLUME Gal. r = INSIDE WELL RADIUS (inches) H = STANDING WATER HEIGHT (feet)
---	---

APPENDIX C
Chemical Laboratory Data Sheets



39 Spruce Street • 2nd Floor • East Longmeadow, MA 01028 • FAX 413/525-6405 • TEL. 413/525-2332

COLER & COLANTONIO
ONE SUGARLOAF STREET
SOUTH DEERFIELD, MA 01373
ATTN: DARIA/LYONS

REPORT DATE: 03/29/99

PURCHASE ORDER NUMBER: 61-17.02-AP-14-1
PROJECT NUMBER: 61-17.02-AP-14-1

ANALYTICAL SUMMARY

LIMS BAT #: LIMS-40998
JOB NUMBER: -

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report

PROJECT LOCATION: HEMMING'S SUNOCO

FIELD SAMPLE #	LAB ID	MATRIX	SAMPLE DESCRIPTION	TEST
CC(MW)-5	99B05931	GRND WATER	NOT SPECIFIED	602/8020 water
CC(MW)-5	99B05935	GRND WATER	NOT SPECIFIED	tph gc h2o 8100m
CC(MW)-6	99B05932	GRND WATER	NOT SPECIFIED	602/8020 water
CC(MW)-6	99B05936	GRND WATER	NOT SPECIFIED	tph gc h2o 8100m
CC(MW)-7	99B05933	GRND WATER	NOT SPECIFIED	602/8020 water
CC(MW)-7	99B05937	GRND WATER	NOT SPECIFIED	tph gc h2o 8100m
CC(MW)-8	99B05934	GRND WATER	NOT SPECIFIED	602/8020 water
CC(MW)-8	99B05938	GRND WATER	NOT SPECIFIED	tph gc h2o 8100m

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

AIHA 308	AIHA ELLAP (LEAD) 6838
MASSACHUSETTS MA100	NEW HAMPSHIRE 2516
CONNECTICUT PH-0567	VERMONT DOH (LEAD) No. 15036
NEW YORK ELAP 10899	RHODE ISLAND (LIC. No. 112)

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Edward Denson 3/29/99
SIGNATURE DATE

Tod Kopyscinski
Director of Operations

Edward Denson
Technical Director

DARIA/LYONS 39 Spruce Street • 2nd Floor • East Longmeadow, MA 01028 • FAX 413/525-6405 • TEL 413/525-2332

COLER & COLANTONIO

ONE SUGARLOAF STREET

SOUTH DEERFIELD, MA 01373

Purchase Order Number: 61-17.02-AP-14-1

Project Number: 61-17.02-AP-14-1

03/29/99
page 1 of 5

Project Location: HEMMING'S SUNOCO

Date Received: 03/22/99

LIMS-BAT #: LIMS-40998

Job Number: -

Sample Matrix: GRND WATER

Sampled: 03/19/99

NOT SPECIFIED

CC(MW)-5

	Units	99805931	Date Analyzed	Analyst	MDL	SPEC LIMIT	P/F
Benzene	ug/l	ND	03/26/99	MFF	0.2	-----	---
Chlorobenzene	ug/l	ND	03/26/99	MFF	0.5	-----	---
1,2-Dichlorobenzene	ug/l	ND	03/26/99	MFF	0.5	-----	---
1,3-Dichlorobenzene	ug/l	ND	03/26/99	MFF	0.5	-----	---
1,4-Dichlorobenzene	ug/l	ND	03/26/99	MFF	0.5	-----	---
Ethyl Benzene	ug/l	ND	03/26/99	MFF	0.5	-----	---
MTBE	ug/l	ND	03/26/99	MFF	0.5	-----	---
Toluene	ug/l	ND	03/26/99	MFF	1.0	-----	---
m/p-Xylene	ug/l	ND	03/26/99	MFF	1.0	-----	---
o-Xylene	ug/l	ND	03/26/99	MFF	0.5	-----	---

Sampled: 03/19/99

NOT SPECIFIED

CC(MW)-6

	Units	99805932	Date Analyzed	Analyst	MDL	SPEC LIMIT	P/F
Benzene	ug/l	6.0	03/26/99	MFF	0.2	-----	---
Chlorobenzene	ug/l	ND	03/26/99	MFF	0.5	-----	---
1,2-Dichlorobenzene	ug/l	ND	03/26/99	MFF	0.5	-----	---
1,3-Dichlorobenzene	ug/l	ND	03/26/99	MFF	0.5	-----	---
1,4-Dichlorobenzene	ug/l	ND	03/26/99	MFF	0.5	-----	---
Ethyl Benzene	ug/l	7.9	03/26/99	MFF	0.5	-----	---
MTBE	ug/l	ND	03/26/99	MFF	0.5	-----	---
Toluene	ug/l	1.7	03/26/99	MFF	1.0	-----	---
m/p-Xylene	ug/l	184	03/26/99	MFF	1.0	-----	---
o-Xylene	ug/l	2.0	03/26/99	MFF	0.5	-----	---

MDL = Method Detection Limit

ND = Not Detected

BDL = Below Detection Limit

NM = Not Measured

SPEC LIMIT = a client specified, recommended, or regulatory level for comparison with data to determine PASS (P) or FAIL (F) condition of results.

Purchase Order Number: 61-17.02-AP-14-1
Project Number: 61-17.02-AP-14-1

LIMS-BAT #: LIMS-40998
Job Number: -
Sample Matrix: GRND WATER

Sampled: 03/19/99
NOT SPECIFIED
CC(MW)-7

	Units	99805933	Date Analyzed	Analyst	MDL	SPEC LIMIT	P/F
Benzene	ug/l	ND	03/26/99	MFF	0.2		
Chlorobenzene	ug/l	ND	03/26/99	MFF	0.5		
1,2-Dichlorobenzene	ug/l	ND	03/26/99	MFF	0.5		
1,3-Dichlorobenzene	ug/l	ND	03/26/99	MFF	0.5		
1,4-Dichlorobenzene	ug/l	ND	03/26/99	MFF	0.5		
Ethyl Benzene	ug/l	ND	03/26/99	MFF	0.5		
MTBE	ug/l	ND	03/26/99	MFF	0.5		
Toluene	ug/l	ND	03/26/99	MFF	1.0		
m/p-Xylene	ug/l	ND	03/26/99	MFF	1.0		
o-Xylene	ug/l	ND	03/26/99	MFF	0.5		

Sampled: 03/19/99
NOT SPECIFIED
CC(MW)-8

	Units	99805934	Date Analyzed	Analyst	MDL	SPEC LIMIT	P/F
Benzene	ug/l	ND	03/26/99	MFF	0.2		
Chlorobenzene	ug/l	ND	03/26/99	MFF	0.5		
1,2-Dichlorobenzene	ug/l	ND	03/26/99	MFF	0.5		
1,3-Dichlorobenzene	ug/l	ND	03/26/99	MFF	0.5		
1,4-Dichlorobenzene	ug/l	ND	03/26/99	MFF	0.5		
Ethyl Benzene	ug/l	ND	03/26/99	MFF	0.5		
MTBE	ug/l	ND	03/26/99	MFF	0.5		
Toluene	ug/l	ND	03/26/99	MFF	1.0		
m/p-Xylene	ug/l	ND	03/26/99	MFF	1.0		
o-Xylene	ug/l	ND	03/26/99	MFF	0.5		

MDL = Method Detection Limit
ND = Not Detected
BDL = Below Detection Limit
NM = Not Measured

SPEC LIMIT = a client specified, recommended, or regulatory level for comparison with data to determine PASS (P) or FAIL (F) condition of results.

Analytical Method(s):

602/8020

SAMPLES ARE CONCENTRATED BY PURGE AND TRAP FOLLOWED BY GAS CHROMATOGRAPHIC ANALYSIS WITH PHOTOIONIZATION DETECTION (PID).

MDL = Method Detection Limit
ND = Not Detected
BDL = Below Detection Limit
NM = Not Measured

SPEC LIMIT = a client specified, recommended, or regulatory level for comparison with data to determine PASS (P) or FAIL (F) condition of results.

Purchase Order Number: 61-17.02-AP-14-1
 Project Number: 61-17.02-AP-14-1

LIMS-BAT #: LIMS-40998
 Job Number: -
 Sample Matrix: GRND WATER

Sampled: 03/19/99
 NOT SPECIFIED
 CC(MW)-5

	Units	99805935	Date Analyzed	Analyst	MDL	SPEC LIMIT	P/F
Unknown Hydrocarbons	MG/L	BDL	03/23/99	MFF	0.25	----	---

Sampled: 03/19/99
 NOT SPECIFIED
 CC(MW)-6

	Units	99805936	Date Analyzed	Analyst	MDL	SPEC LIMIT	P/F
Unknown Hydrocarbons	MG/L	1.07	03/23/99	MFF	0.25	----	---

Sampled: 03/19/99
 NOT SPECIFIED
 CC(MW)-7

	Units	99805937	Date Analyzed	Analyst	MDL	SPEC LIMIT	P/F
Unknown Hydrocarbons	MG/L	BDL	03/23/99	MFF	0.25	----	---

Sampled: 03/19/99
 NOT SPECIFIED
 CC(MW)-8

	Units	99805938	Date Analyzed	Analyst	MDL	SPEC LIMIT	P/F
Unknown Hydrocarbons	MG/L	0.34	03/23/99	MFF	0.25	----	---

MDL = Method Detection Limit
 ND = Not Detected
 BDL = Below Detection Limit
 NM = Not Measured

SPEC LIMIT = a client specified, recommended, or regulatory level for comparison with data to determine PASS (P) or FAIL (F) condition of results.

Analytical Method(s):

MODIFIED SW846 8100

SAMPLES ARE EXTRACTED INTO METHYLENE CHLORIDE AND ANALYZED BY GAS CHROMATOGRAPHY WITH FLAME IONIZATION DETECTION (FID). ALL PEAKS ELUTING IN THE PETROLEUM FUEL REGION ARE QUANTITATED AS #2 FUEL OIL.

MDL = Method Detection Limit
ND = Not Detected
BDL = Below Detection Limit
NM = Not Measured

SPEC LIMIT = a client specified, recommended, or regulatory level for comparison with data to determine PASS (P) or FAIL (F) condition of results.



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QC SUMMARY REPORT

SAMPLE QC: Sample Results with Duplicates
Sample Matrix Spikes and Matrix Spike Duplicates

BATCH QC: Lab Fortified Blanks and Duplicates
Standard Reference Materials and Duplicates
Method Blanks

Report Date: 03/29/99

Lims Bat #: LIMS-40998

Page 1 of 4

QC Batch Number: GC/FID-2339

Sample Id	Analysis	QC Analysis	Values	Units	Limits
BLANK-18132	Unknown Hydrocarbons	Blank	<0.25	MG/L	
LFBLANK-07992	Unknown Hydrocarbons	Lab Fort Blank Amt.	1.00	MG/L	
		Lab Fort Blk. Found	0.78	MG/L	
		Lab Fort Blk. % Rec.	78.00	%	

QC SUMMARY REPORT

SAMPLE QC: Sample Results with Duplicates
Sample Matrix Spikes and Matrix Spike Duplicates

BATCH QC: Lab Fortified Blanks and Duplicates
Standard Reference Materials and Duplicates
Method Blanks

Report Date: 03/29/99

Lims Bat #: LIMS-40998

Page 2 of 4

QC Batch Number: GC/PID-2924

Sample Id	Analysis	QC Analysis	Values	Units	Limits	
99805931	Benzene	Sample Amount	<0.2	ug/l		
		Matrix Spk Amt Added	10.0	ug/l		
		MS Amt Measured	10.3	ug/l		
			Matrix Spike % Rec.	102.7	%	
			Duplicate Sample Amt	<0.2	ug/l	
			MSD Amount Added	10.0	ug/l	
			MSD Amt Measured	9.9	ug/l	
			MSD % Recovery	98.6	%	
			MSD Range	4.1	units	
		1,4-Dichlorobenzene	Sample Amount	<0.5	ug/l	
			Matrix Spk Amt Added	10.0	ug/l	
			MS Amt Measured	10.9	ug/l	
			Matrix Spike % Rec.	109.4	%	
			Duplicate Sample Amt	<0.5	ug/l	
			MSD Amount Added	10.0	ug/l	
			MSD Amt Measured	10.5	ug/l	
			MSD % Recovery	105.0	%	
			MSD Range	4.4	units	
		Ethyl Benzene	Sample Amount	<0.5	ug/l	
			Matrix Spk Amt Added	10.0	ug/l	
			MS Amt Measured	10.2	ug/l	
			Matrix Spike % Rec.	102.1	%	
			Duplicate Sample Amt	<0.5	ug/l	
			MSD Amount Added	10.0	ug/l	
			MSD Amt Measured	9.8	ug/l	
			MSD % Recovery	97.5	%	
			MSD Range	4.6	units	
		Toluene	Sample Amount	<1.0	ug/l	
			Matrix Spk Amt Added	10.0	ug/l	
			MS Amt Measured	10.4	ug/l	
			Matrix Spike % Rec.	104.0	%	
			Duplicate Sample Amt	<1.0	ug/l	
			MSD Amount Added	10.0	ug/l	
		MSD Amt Measured	9.9	ug/l		
		MSD % Recovery	99.2	%		
		MSD Range	4.8	units		
	o-Xylene	Sample Amount	<0.5	ug/l		
		Matrix Spk Amt Added	10.0	ug/l		
		MS Amt Measured	10.4	ug/l		

QC SUMMARY REPORT

SAMPLE QC: Sample Results with Duplicates
Sample Matrix Spikes and Matrix Spike Duplicates

BATCH QC: Lab Fortified Blanks and Duplicates
Standard Reference Materials and Duplicates
Method Blanks

Report Date: 03/29/99

Lims Bat #: LIMS-40998

Page 3 of 4

QC Batch Number: GC/PID-2924

Sample Id	Analysis	QC Analysis	Values	Units	Limits
		Matrix Spike % Rec.	104.4	%	
		Duplicate Sample Amt	<0.5	ug/l	
		MSD Amount Added	10.0	ug/l	
		MSD Amt Measured	10.0	ug/l	
		MSD % Recovery	99.9	%	
		MSD Range	4.5	units	
	m/p-Xylene	Sample Amount	<1.0	ug/l	
		Matrix Spk Amt Added	20.0	ug/l	
		MS Amt Measured	20.7	ug/l	
		Matrix Spike % Rec.	103.4	%	
		Duplicate Sample Amt	<1.0	ug/l	
		MSD Amount Added	20.0	ug/l	
		MSD Amt Measured	19.8	ug/l	
		MSD % Recovery	98.8	%	
		MSD Range	4.7	units	
	1,2-Dichlorobenzene	Sample Amount	<0.5	ug/l	
		Matrix Spk Amt Added	10.0	ug/l	
		MS Amt Measured	10.9	ug/l	
		Matrix Spike % Rec.	109.2	%	
		Duplicate Sample Amt	<0.5	ug/l	
		MSD Amount Added	10.0	ug/l	
		MSD Amt Measured	10.6	ug/l	
		MSD % Recovery	105.8	%	
		MSD Range	3.4	units	
	1,3-Dichlorobenzene	Sample Amount	<0.5	ug/l	
		Matrix Spk Amt Added	10.0	ug/l	
		MS Amt Measured	10.8	ug/l	
		Matrix Spike % Rec.	108.4	%	
		Duplicate Sample Amt	<0.5	ug/l	
		MSD Amount Added	10.0	ug/l	
		MSD Amt Measured	10.4	ug/l	
		MSD % Recovery	104.0	%	
		MSD Range	4.4	units	
	MTBE	Sample Amount	<0.5	ug/l	
		Matrix Spk Amt Added	10.0	ug/l	
		MS Amt Measured	11.8	ug/l	
		Matrix Spike % Rec.	118.4	%	
		Duplicate Sample Amt	<0.5	ug/l	
		MSD Amount Added	10.0	ug/l	

SAMPLE QC: Sample Results with Duplicates
 Sample Matrix Spikes and Matrix Spike Duplicates

BATCH QC: Lab Fortified Blanks and Duplicates
 Standard Reference Materials and Duplicates
 Method Blanks

Report Date: 03/29/99

Lims Bat #: LIMS-40998

Page 4 of 4

QC Batch Number: GC/PID-2924

Sample Id	Analysis	QC Analysis	Values	Units	Limits
		MSD Amt Measured	11.2	ug/l	
		MSD % Recovery	111.7	%	
		MSD Range	6.7	units	
	Chlorobenzene	Sample Amount	<0.5	ug/l	
		Matrix Spk Amt Added	10.0	ug/l	
		MS Amt Measured	10.8	ug/l	
		Matrix Spike % Rec.	108.0	%	
		Duplicate Sample Amt	<0.5	ug/l	
		MSD Amount Added	10.0	ug/l	
		MSD Amt Measured	10.4	ug/l	
		MSD % Recovery	103.6	%	
		MSD Range	4.4	units	
	1-Chloro-2-Fluoroben	Sur. Recovery (PID)	90.7	%	83.2-111.6
99805932	1-Chloro-2-Fluoroben	Sur. Recovery (PID)	93.4	%	83.2-111.6
99805933	1-Chloro-2-Fluoroben	Sur. Recovery (PID)	90.0	%	83.2-111.6
99805934	1-Chloro-2-Fluoroben	Sur. Recovery (PID)	93.4	%	83.2-111.6
BLANK-18218	Benzene	Blank	<0.2	ug/l	
	1,4-Dichlorobenzene	Blank	<0.5	ug/l	
	Ethyl Benzene	Blank	<0.5	ug/l	
	Toluene	Blank	<1.0	ug/l	
	o-Xylene	Blank	<0.5	ug/l	
	m/p-Xylene	Blank	<1.0	ug/l	
	1,2-Dichlorobenzene	Blank	<0.5	ug/l	
	1,3-Dichlorobenzene	Blank	<0.5	ug/l	
	MTBE	Blank	<0.5	ug/l	
	Chlorobenzene	Blank	<0.5	ug/l	

APPENDIX D

Proposal for On-Site Groundwater Monitoring

April 20, 1999

Ms. Janet Thompson
Facilities Manager/Filling Station Manager
Hemming's Motor News
222 West Main Street
P.O. Box 256
Bennington, VT 05201-0256

**Re: Quarterly Groundwater Quality Monitoring Proposal
Hemming's Sunoco
216 West Main Street
Bennington, Vermont**

DEC Site #97-2195

Dear Ms. Thompson:

Coler & Colantonio Inc., (C&C) is pleased to submit this proposal for professional services associated with the quarterly sampling of the eight on-site groundwater monitoring wells at Hemming's Sunoco located at 216 West Main Street in Bennington, Vermont (the Site). The objective of this scope of work will be to monitor on-site groundwater quality as a result of the release of oil or hazardous materials at the Site as defined under the Vermont Hazardous Waste Management Regulations (VHWMR).

1.0 INTRODUCTION

C&C's *Site Investigation Report* dated April 20, 1999 indicated elevated total organic vapor (TOV) readings in drill cuttings from the newly installed on-site monitoring wells, and low levels of selected volatile organic compounds (VOCs) in several of the groundwater monitoring wells on Site. The Vermont Primary Groundwater Enforcement Standard for benzene was exceeded in some of these wells, however, benzene levels were not detected in the downgradient monitoring wells. Total petroleum hydrocarbons (TPH) were also detected in several on-site groundwater samples. No standard has been set by the DEC for TPH in groundwater. The *Site Investigation Report* recommended quarterly monitoring of TOVs from the drill cuttings and quarterly groundwater sampling of the eight monitoring wells for the period of a year, at which time, the monitoring program would be reassessed and ammended as necessary.

This proposal includes a description of the Scope of Services; a Schedule of Services; a Fee Schedule, and Fee and Payment Terms. This proposal is valid for a period not to exceed 30 calendar days after the above date.

2.0 SCOPE OF SERVICES

Task 1 Quarterly Groundwater Sampling. Groundwater samples will be collected quarterly (Spring, Summer, Fall, Winter) from the eight on-site monitoring wells, and be submitted for laboratory analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl-t-butyl ether (MTBE) by EPA method 8020 as required in the VT-DEC September 9, 1997 correspondence. Due to historic and present storage of diesel fuel at the Site, samples will also be analyzed for the presence of petroleum hydrocarbons by EPA method 8100M.

Photoionization detector (PID) field screening results of the well headspace will be recorded prior to well guaging, purging and sampling. Depth to the water table will be measured in each well to determine the water table elevation, and static volume of water in each well. A minimum of three well volumes of water will be purged from each well prior to groundwater sample collection. The pH and specific conductance of each sample will be measured at the time of sample collection. It is anticipated that the laboratory analysis results will be available approximately seven to ten working days from submittal.

Task 2 Stockpiled Soil Monitoring. The contaminated soil drill cuttings from the well installations will be stockpiled on, and covered with plastic, and subject to jar headspace screening with a PID on a quarterly basis in conjunction with the groundwater sampling events. These drill cuttings are currently stored in a 55-gallon drum.

Task 3 Report Preparation. Three copies of a report summarizing the conduct and findings of the quarterly monitoring will be prepared and submitted to the Client and the Vermont DEC. Additional copies of the report can be provided and distributed to other parties; however, costs for preparation and distribution of additional reports is not included in this budget.

3.0 ACTIVITIES NOT INCLUDED

The scope of work does not include investigations beyond that mentioned. This scope of work can be amended, if required.

4.0 SCHEDULE OF SERVICES

C&C is prepared to commence work immediately upon receipt of written approval to proceed and site access authorization. The first sampling event will be conducted in June 1999. Quarterly monitoring reports will be submitted to the Client and the Vermont DEC within 45 days of the completion of each sampling event.

5.0 FEE

This project will be billed on a time and materials basis. The estimated fee for performing the Groundwater Monitoring services listed in the scope of services, above is \$8,400. The estimated fee for each round of sampling is \$2,100 as detailed in the attached Budget Summary Sheet. This is based on anticipated time, materials, and expenses expended toward the project.

6.0 PAYMENT

Invoices for services will be submitted monthly. By the signing of this proposal, it is agreed and understood that payment will be made upon receipt of the invoice. Coler & Colantonio, Inc. reserves the right to stop work on all projects for a client in the event that one or more of the client's accounts is in arrears in excess of 30 days. If Coler & Colantonio, Inc. has stopped work on a project for this reason, we will not be held responsible for consequences, financial or otherwise associated with project delays or final completion thereof. It is further understood that any balances on this account remaining unpaid for a period of 30 days will incur a service charge of 1-1/2% per month (expressed as an annual percentage rate, the charge is 18%). It is further agreed that if said account is turned over for collection, reasonable attorney's fees and costs of collection shall be added to the unpaid balances, whether or not legal action is instituted.

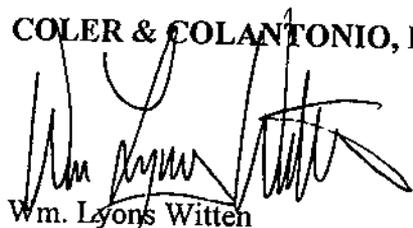
The owner/client agrees to limit the liability of Coler & Colantonio, Inc., to the owner/client and to all construction contractors and subcontractors on the project arising from Coler & Colantonio, Inc.'s negligent acts, errors and omissions such that the total aggregate liability of Coler & Colantonio, Inc. will not exceed the contract amount or \$25,000, which ever is greater. The standard limitations governing the work to be conducted are provided in Attachment 1, which is hereby made part of this Proposal.

The parties to this contract specifically agree that Coler & Colantonio, Inc., has no obligation to release drawings or other documents until the final bill for services associated with the production of those documents has been paid. Prior to the final execution of this proposal, Coler & Colantonio, Inc. reserves the right to take those measures necessary to evaluate the credit history of the client and subsequently, cancel or modify this proposal as deemed necessary. Prior to doing any work on the property, we reserve the right to post a notice of contract.

Coler & Colantonio, Inc. looks forward to working with you on this project. Please execute this document in the space provided below and return it to Coler & Colantonio, Inc. A fully executed copy will be returned to you for your files. By the signing of the copy of this letter, you will indicate your acceptance of our terms and give us the authorization to proceed. If you have any questions or comments, please contact me at (413) 665-5330.

Sincerely,

COLER & COLANTONIO, INC.



Wm. Lyons Witten
Project Manager/Hydrogeologist

APPROVED BY:

James R. Borrebach, P.E., L.S.P.
Environmental Services Manager

Date

AGREED TO AND ACCEPTED BY:

Janet Thompson, Facilities Manager
Hemming's Motor News

Date

Attachment 1

STANDARD LIMITATIONS

Coler & Colantonio, Inc. is not responsible for the accuracy and veracity of information provided to us by outside parties with respect to the project Site and adjacent properties.

The data presented in this report and our opinions based on this data are provided in accordance with our Proposal for Professional Services, which is incorporated by reference.

This report is for the sole use of Hemming's Sunoco/Watering, Inc., their legal counsel, and lending institution. Any reuse or reliance on this report by third parties is prohibited and shall only be done with the prior written consent of Coler & Colantonio, Inc.

This report is valid for a period not to exceed twelve months from the date of the report. Any use beyond this time period will require that the report be updated.

This report presents the opinions of Coler & Colantonio, Inc. with respect to the environmental conditions of the subject property. The actual determination of compliance of present or former operators of the Site with federal or state regulations can only be made by the appropriate regulatory agencies.

The opinions rendered herein are not intended to imply a warrantee or a guarantee and are based solely upon the Site conditions at the time of our investigation.

Chemical analyses may be performed for certain parameters during this assessment. However, additional chemical constituents not searched for during the study may be present in soil and/or groundwater at the Site.

Chemical conditions reported reflect conditions only at the locations tested at the time of testing and within the limitations of the methods used. Such conditions can vary rapidly from area to area and from time to time. No warrantee is expressed or implied that chemical conditions other than those reported do not exist within the Site.

BUDGET SUMMARY SHEET

Site Address: Hemmings Sunoco, Bennington, VT

Date: April 20, 1999

LABOR	CLASS	RATE	SCOPE ITEM/TASK												Line Total	
			1		2		3		4		5		6		Hrs	Cost
			Hrs	Cost	Hrs	Cost	Hrs	Cost	Hrs	Cost	Hrs	Cost	Hrs	Cost		
Principal		120	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0	\$ -	
LSP/PE		113	\$ -	\$ -	0.5	\$ 57	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0.5	\$ 57	
Project Manager		82	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0	\$ -	
Senior Scientist		72	\$ -	\$ -	1.5	\$ 108	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	1.5	\$ 108	
Project Scientist		65	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0	\$ -	
Staff Scientist II		50	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	0	\$ -	
Staff Scientist I		40	11	\$ 440	0.5	\$ 20	8	\$ 320	\$ -	\$ -	\$ -	\$ -	\$ -	0	\$ -	
Drafting		28	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	20	\$ 780	
Clerical Assistant		30	\$ -	\$ -	1	\$ 30	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	1	\$ 30	
Subtotal-Labor			11	\$ 440	0.5	\$ 20	11	\$ 515	0	\$ -	0	\$ -	0	\$ -	23	\$ 975
DIRECT EXPENSES																
Travel			61.6													61.6
Reproduction						29										29
Postage & Delivery						6.40										6.4
Miscellaneous																0
Subtotal-Direct Expenses			61.6		0	35.4		0		0		0		0		97
SUBCONTRACTORS																
Drilling- T&K Drilling																0
Laboratory - Soil *																0
Laboratory - GW **			836													836
																0
																0
Others																0
Subtotal-Subcontractor			836		0	0		0		0		0		0		836
OTHER EXPENSES																
Equip. Rental			192.5													192.5
Subtotal-Other Expenses			192.5		0	0				0		0		0		192.5
TOTALS			\$ 1,530	\$ 20	\$ 550	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,100

Laboratory - Soil *
 Laboratory - GW **

TOTAL PER EVENT: \$ 2,100
ANNUAL TOTAL: \$ 8,400
 Eight GW samples analyzed by EPA Method 8020+MTBE and EPA Method 8100M during each round.

APPENDIX E

Attachment 1- Statement of Limitations

Attachment 1

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