SEP 09 1991

(91-1070)

GRIFFIN INTERNATIONAL INC

September 6, 1991

Ms. Susan Laware
47 Burt Sreet
Bellows Falls, VT 05101

Dear Ms. Laware:

Enclosed is the report on the investigation of subsurface petroleum contamination at Laware Sunoco. Please call me with any questions which you may have regarding the report.

Sincerely,

Peter M. Murray
Project Hydrogeologist

cc: Chuck Schwer

2B Dorset Lane • Williston, VT 05495 • 802-879-7708

SEP 09 1991

REPORT ON THE INVESTIGATION OF SUBSURFACE PETROLEUM CONTAMINATION LAWARE SUNOCO BELLOWS FALLS, VERMONT

August, 1991

Prepared for:

Susan Laware
47 Burt Street
Bellows Falls, Vermont 05101

Prepared by:

Griffin International
2B Dorset Lane
Williston, Vermont 05495
(802) 879-7708

TABLE OF CONTENTS

1.0 INTRODUCTION

This report details the investigation of subsurface petroleum contamination at Laware Sunoco, in Bellow Falls, Vermont. The investigation has been conducted by Griffin International (Griffin), for Susan Laware, the current owner of the property. The Vermont Department of Environmental Conservation (VTDEC) requested that this investigation be conducted in response to the discovery of subsurface petroleum contamination during the removal of underground storage tanks at Laware Sunoco, in June, 1991. The investigation has been conducted to determine the degree and extent of the residual subsurface petroleum contamination and, to assess the risks which the contamination poses to local sensitive receptors.

2.0 SITE BACKGROUND

2.1 Site History

On June 17, 1991, The Johnson Company conducted a Level I Environmental Site Assessment at Laware Sunoco which included the inspection of the removal of five (5) underground storage tanks. The assessment was conducted as per the conditions of a pending real estate transfer. Three of the tanks were used to store gasoline and had 4,000 gallon capacities. Soils surrounding the gasoline tanks contained concentrations of hydrocarbon vapors up to 600 parts per million (ppm), as measured in the field with an OVM. One of the three gasoline tanks appeared to contain a small hole in its bottom, through which, gasoline was leaking to the subsurface. All contaminated soils which were excavated during removal of the tanks were placed back into the tank pit pending the outcome of a more detailed subsurface investigation.

Inspection of the removal of the remaining two underground storage tanks, a 500 gallon waste oil tank and a 500 gallon heating oil tank, revealed no indications of releases from those tanks.

The Johnson Company prepared a report on the Level I Site Assessment which is currently on file with the VTDEC.

The five tanks were not replaced and, at present, there are no plans to install additional underground storage tanks on this property. There are currently no known existing tanks on the property.

In response to the discovery of soil contamination at this site, the VTDEC requested that Ms. Laware hire a consultant to conduct a subsurface investigation. Ms. Laware contracted Griffin to conduct the investigation on August 6th, 1991.

2.2 Site Description

The Laware Sunoco Station is located on the northeast corner of the intersection of Atkinson and Henry Streets, in the Village of Bellow Falls (see Site Location Map, in Appendix A). The immediate vicinity of Laware Sunoco consists of mostly residential land uses. The closest residence to the site is located approximatley sixteen (16) feet east of the gasoline tank pit (see Site Map, in Appendix A). There are several other commercial establishments, including a few gasoline stations, within a half mile radius of the Sunoco Station.

The area around the gasoline tank pit is currently unpaved, allowing precipitation to percolate, unimpeded, through the contaminated soil.

Most homes and businesses in the village are served by the Bellows Falls Village Corporation Municipal Water Supply. The system obtains its water from Minards Pond, which is located approximately 1.2 miles northwest of the village. There are approximately five homes in the village which obtain their water from drilled supply wells. These wells are located approximately two thirds of a mile to the west of and, 400 feet in elevation above, Laware Sunoco, on Oak Hill. There are no other known water wells in the village.

Bellows Falls is situated on a terrace overlooking the Connecticut River. The river forms the eastern boundary of the village and flows within approximately 1,500 feet of Laware Sunoco. The river is approximately 100 feet lower than Laware Sunoco in elevation. According to the Surficial Geologic Map of Vermont, the overburden deposits beneath the village consist of fluvial and littoral sediments. These sediments were likely deposited in the glacial Connecticut Valley Lake. The overburden deposits are likely greater than 100 feet thick and are underlain by gneiss bedrock. It is likely that the river is the regional groundwater discharge point, resulting in a eastern groundwater flow direction beneath the Village.

3.0 INVESTIGATIVE PROCEDURES

3.1 Monitoring Well Installation/Soil Sampling

On August 13th, 1991, Griffin installed three (3) groundwater monitoring wells in the vicinity of the former location of the three gasoline storage tanks (see Site Map, in Appendix A, for monitoring well locations). The wells were drilled using a hollow stem auger drill rig, under the direct supervision of the Griffin hydrogeologist. Undisturbed soil samples were collected from each borehole, at five (5) foot intervals, using a split spoon sampler. Split spoon samples and drill cuttings, collected directly from the augers, were logged by the hydrogeologist and screened for volatile organic compounds (VOC's), using a portable photoionization device (PID). VOC concentrations and soil characteristics are listed on the detailed well logs in Appendix B.

The wells are constructed of two inch diameter, PVC well screen and casing. The annulus between the borehole wall and the screened section of each well contains a silica gravel pack to filter fine sediments from the well. The annulus in each well also contains a bentonite seal, to prevent surface water from infiltrating the borehole. Each well is protected at the surface with a flush mounted, bolt-down manhole cover, clearly marked "MONITORING WELL". Well construction details are listed on the well logs, in Appendix B.

Monitoring Well #1 (MW-1 on the Site Map) was installed as an upgradient well to the gasoline tank pit. The borehole for this well was extended to a depth of 30 feet below grade, with a split spoon sample collected from a depth of 30 to 32 feet. Soils retrieved from the borehole for this well consisted of very fine to coarse sand, with varying concentrations of silt. A perched water table was encountered at a depth of approximateltly 20 feet. Apparently, the water table at that depth is perched on an aquitard of tight sand and silt. The top of this aquitard is located at a depth of approximately 26 feet. VOC concentrations in soils immediately above this aquitard were measured at up to 200 ppm, while concentrations in the aquitard ranged from 0.5 ppm to 25 ppm. Apparently, the aquitard is impeding the vertical migration of petroleum contamination.

To obtain groundwater samples from this perched water table, the screened section of MW-1 extends from 20 feet to 30 feet below grade. The static water level in this well is approximately 29 feet below grade.

MW-2 was installed as a downgradient well to the gasoline tank pit. The borehole for this well extends to a depth 45 feet below grade. As in MW-1, a perched water table was encountered in the borehole for this well at a depth of approximately 20 feet below grade. As in MW-1, the perched water table is confined by a layer of tight sand and silt. VOC concentrations above the aquitard were measured up to 30 ppm. VOC concentrations within and below the aquitard were measured up to 3 ppm. What is assumed to be the regional water table was encountered at a depth of 41 feet below grade. There were no VOC's, detected by PID, in the saturated soils at that depth.

MW-2 is constructed of ten feet of screen and 34.5 feet of casing. A bentonite seal was installed in the annulus at a depth of 30 to 33 feet to prevent cross contamination from the perched water table. The well was constructed in this fashion to enable collection of a water sample from the regional water table.

MW-3 was also installed as a down gradient well to the gasoline tank pit. The borehole for this well was extended to a depth of 45 feet below grade. As in the first two wells, a perched water table was encountered in this borehole at a depth of approximately 20 feet below grade. The aquitard in this well also appeared to be composed of the same types of sediments found in the aquitards in MW-1 and MW-2. Unlike the first two wells, however, VOC concentrations in the soils retrieved from MW-3 were higher in samples collected from beneath the aquitard.

MW-3 is constructed similar to MW-2 in order to obtain representative groundwater samples from the regional water table.

Once the wells were installed, the Griffin Hydrogeologist develpoed them by purging and bailing with a clean, teflon bailer.

3.2 Determination of Groundwater Flow Direction and Gradient

On August 20th, 1991, Griffin measured the relative water table elevations in each of the three, on-site monitoring wells. This was accomplished by surveying the top of casing elevations of each well, relative to a benchmark (TOC MW-2) which has been assigned an arbitrary elevation of 100 feet. The depth to water from the top of casing of each well was then measured and subtracted from the top of casing elevation to calculate water table elevations.

Calculated water table elevations from three points, arranged in a triangle, are necessary to determine groundwater gradient and flow direction. Due to the fact that, at Laware Sunoco, one of the three points is in a perched water table, while the other two points are in the regional water table aquifer, it is impossible to accurately determine groundwater flow direction at this site. Based on the overlying topography, however, it is assumed that groundwater in the regional water table aquifer, in the vicnity of Laware Sunoco, flows to the east/southeast at a slight gradient. Groundwater flow direction in the perched water table can not be estimated at this time, due to the lack of data. It is assumed that groundwater contained in this perched aquifer has a relatively low horizontal flow rate, with most of the water slowly percolating through the aquitard, vertically, to the regional water table aquifer. The horizontal extent of this perched water table is also unknown at this time, due to the lack of data.

3.3 Groundwater Sampling and Analysis

On August 20th, 1991, Griffin collected groundwater samples from each of the three on-site monitoring wells for analysis for BTEX and MTBE, using EPA Method 602. In addition, Griffin collected a trip blank, an equipment blank and a QA/QC duplicate for analysis, as per the requirements of the VTDEC. Results of the laboratory analyses are conatined in Appendix D. Please note that MW-4 is the QA/QC duplicate of MW-2.

The lab results indicate that the three wells contain varying concentrations of the five compounds tested for in the EPA Method 602 analysis. The sample collected from MW-1, which is a sample of the perched water table, contained a total concentration of BTEX and MTBE of 1.3 ppm. Samples collected from MW-2 and MW-3 contained total concentrations of BTEX and MTBE of 0.11 and 0.08 ppm respectively. These two samples were collected from the regional water table aquifer. There was no free product discovered in the three wells during sampling. Table 1 lists individual contaminant concentrations in each well.

TABLE 1.

BTEX AND MTBE CONCENTRATIONS IN GROUNDWATER
LAWARE SUNOCO
AUGUST 20, 1991

	Concentrations in Groundwater, ppb				
Well	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
MW-1	16.10	11.60	255.00	988.00	~~1.30~~ 24
MW-2	45.20	46.40	1.18	18.30	19.20
MW-3	25.50	32.30	3.71	19.30	18.00

The results indicate that total contamination concentrations are higher in the perched water table. A breakdown of the data does indicate, however, that concentrations of benzene and toluene in the perched water table are lower than in the regional water table aquifer. Concentrations of benzene in all three wells are slightly higher than the VTDEC Enforcement Standard of 5.0 ppb. Concentrations of toluene in the three wells are significantly lower that the VTDEC Enforcement Standard of 2.42 ppm. Concentrations of Ethylbenzene in all three wells are lower than the VTDEC Enforcement Standard of 680 ppb. Concentrations of xylenes in MW-1 are higher than the VTDEC Enforcement Standard of 400 ppb, while concentrations of that compound in MW-2 and MW-3 are significantly lower. At present, there is no established Enforcement Standard for MTBE.

3.4 Receptor Identification

As part of this investigation, Griffin conducted a survey of sensitive receptors in the vicinity of Laware Sunoco so that a limited risk assessment could be conducted. Potential sensitive receptors in this area would include public water supplies, domestic supply wells, surface water bodies, storm sewers, wetlands and basements. This section of the report identifies the potential receptors in this area and assesses the risk that the contamination poses to them.

Public Water Supplies

Except for several homes on the west side of the village, all homes and businesses in Bellow Falls are served by the municipal water system. The system draws water from a reservoir, Minards Pond, which is located approximately 1.2 miles northwest of Laware Sunoco. Since the level of the reservoir is approximately 380 feet in elevation above Laware Sunoco, it is extremely unlikely that the

subsurface contamination could migrate to the reservoir. In addition, since all homes and businesses in the village are served by the municipal water system through closed pipes, it is extremely unlikely that the subsurface contamination at Laware Sunoco would impact the water supply.

Water Supply Wells

As previously mentioned, the nearest known water supply wells to Laware Sunoco are located approximately two thirds of a mile to the west of the site. These wells are drilled into bedrock. Since they are located in the assumed upgradient direction of the site and are 400 feet in elevation above the site, the risk that they will become contaminated as a result of the release(s) at Laware Sunoco is minimal.

Surface Water

The nearest surface water to Laware Sunoco is the Connecticut River, which flows approximately 1,500 feet east of the site. The river is likely the regional groundwater discharge point and, therefore, is the eventual discharge point for contaminated groundwater beneath Laware Sunoco. It is likely that, as contaminated groundwater migrates from the vicinity of Laware Sunoco to the river, the contamination is diluted and degraded to below detectable concentrations before it enters the river.

Wetlands

There were no wetlands observed in the field survey conducted in the vicinity of Laware Sunoco. Wetland maps were not reviewed for the purposes of this investigation. It is anticipated that any wetlands in the Village would be located along the banks of the river. If any wetlands do exist along the river, they would likely not be impacted by the contamination due to dilution.

Storm Sewers

In some instances, subsurface petroleum contamination has been known to migrate into local storm sewers through leaks in the system or through open bottom catch basins. Once petroleum contamination enters a storm sewer system, it can flow to the discharge point for the system, possibly causing environmental damage. There is an extensive storm sewer system in the Village of Bellows Falls and, there are several catch basins in the immediate vicinity of Laware Sunoco. Since the storm sewer lines

and catch basins are well above the water table, however, it is not likely that the storm sewer system will pick up any petroleum contamination from Laware Sunoco.

Basements

It is common for vapors eminating from free floating petroleum product to migrate into buildings via cracks or openings in the foundations and basement floors. It is uncommon for vapors to enter buildings in this fashion as a result of dissolved hydrocarbon contamination beneath them. A visual survey of buildings in the vicinity of Laware Sunoco revealed that most contain full basements. It is not likely, however, that hydrocarbon vapors will enter these basements because the subsurface contamination is mostly in the dissolved phase. In addition, the relatively deep water table provides a wide buffer zone between the bottom of the basements and the dissolved contamination. To date, there have been no reports of gasoline odors in basements in the vicinity of Laware Sunoco. It is possible that petroleum vapors contained in the contaminated soils above the water table may enter the basement of the house immediately adjacent to the tank pit. The contamination has likely been in the ground for several years and, no petroleum odors have been reported in the house to date.

4.0 CONCLUSIONS

Based on the above investigation of subsurface petroleum contamination and potential receptors in the vicinity of Laware Sunoco, we have arrived at the following conclusions:

1. There was likely a release of petroleum product to the subsurface from one of the three, former, underground gasoline storage tanks. The amount and duration of the release is unknown. The likely source of the contamination has since been removed although, none of the contamination has been actively removed or remediated.

2. The subsurface beneath Laware Sunoco consists of fluvial and littoral sands and silts overlying gneiss bedrock. It is assumed that the overburden thickness is greater than 100 feet. The regional water table is at a depth of approximately 40 feet below Laware Sunoco. There is also a perched water table beneath the site. It is located at a depth of approximately 20 feet below grade and, appears to be confined by a layer of tight, silty sand at a depth of approximately 26 to 32 feet.

3. Groundwater contained in the regional aquifer likely flows to the east, toward the Connecticut River, at a relatively slow rate, due to the expected slight gradient and to the expected low permeability of the tight, silty sand.

4. The release of gasoline to the subsurface has resulted in adsorbed contamination in the soils above the water table and in dissolved contamination in both the regional water table aquifer and in the perched aquifer. There has been no free floating contamination detected during this investigation. Adsorbed contamination has been measured in the tank pit in concentrations of up to 600 parts per million. Total BTEX and MTBE concentrations of up to 1.3 ppm have been measured in groundwater in the vicinity of the tank pit. The perched aquifer appears to contain slightly higher concentrations of dissolved contamination than does the regional aquifer.

5. Potential sensitive receptors of the contamination include the village reservoir, the Connecticut River, several supply wells, local wetlands, the storm sewer system and local buildings. Due to the relatively low concentrations of the contamination and the relatively long distances between the contamination and most of the potential receptors, it is not likely that they will be negatively impacted.

6. If the contamination remains in the subsurface, and no active remediation is undertaken, contamination concentrations should decrease, over time, due to the natural processes of dilution, dispersion and bio-degradation.

5.0 RECOMMENDATIONS

Based on the above conclusions, we present the following recommendations regarding subsurface petroleum contamination at Laware Sunoco:

1. To prevent percolation of precipitation into the contaminated soils in the vicinity of the gasoline tank pit, we recommend that the area be repaved as soon as possible. This will slow the rate of contaminant migration to the water table.

2. To adequately monitor the expected natural reduction in subsurface contamination concentrations, we recommend that the three on-site monitoring wells be sampled annually, for

analysis for BTEX and MTBE using EPA Method 602.

3. To determine if petroleum vapors are entering the house which is situated immediately adjacent to the gasoline tank pit, we recommend that ambiant air inside the building be screened for VOC's using a PID. This should be done once during the winter of 1992, once the ground has frozen, and once during the next scheduled collection of water samples.

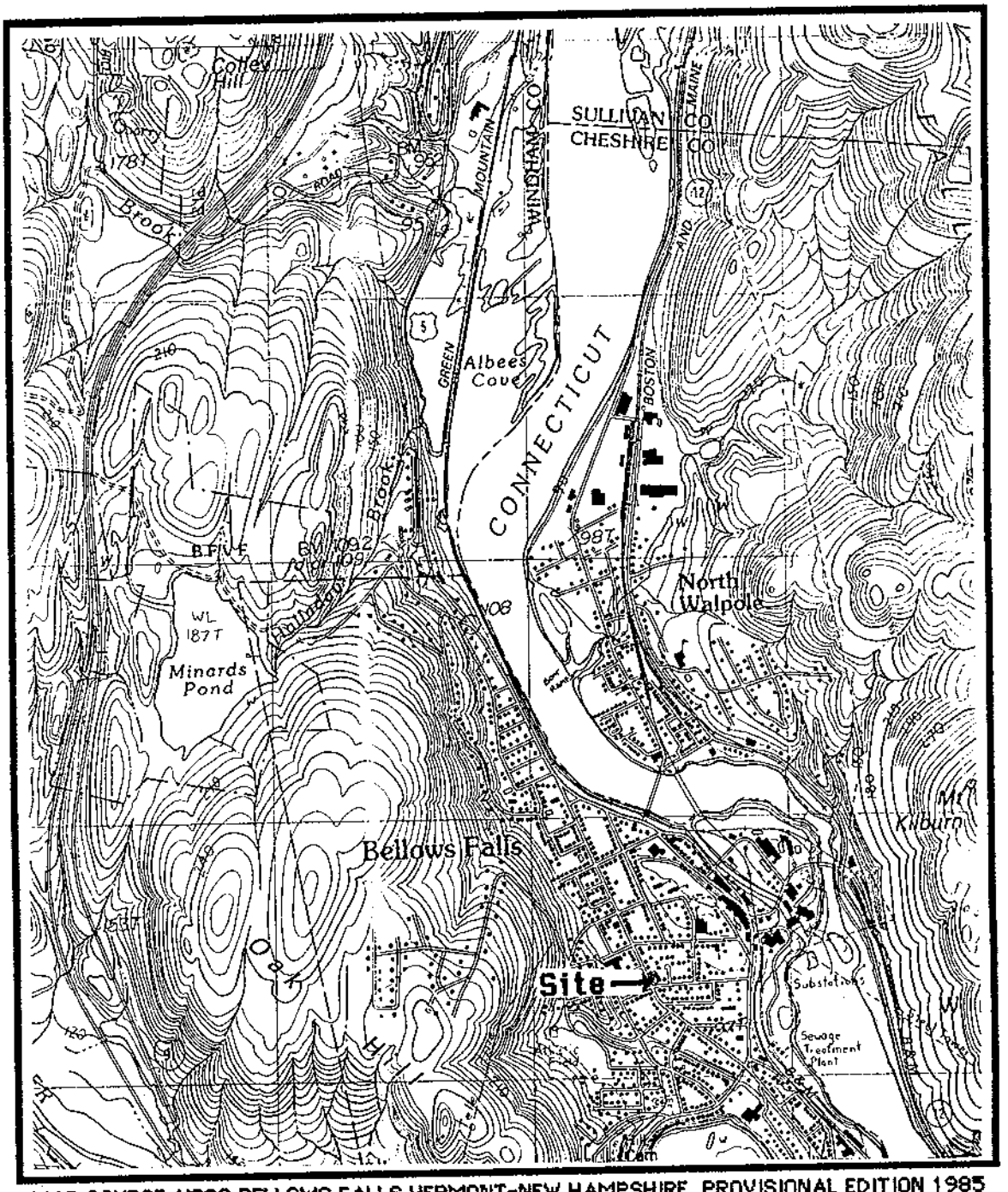
4. If subsurface contamination concentrations are significantly reduced at the end of two years, we recommend that no further investigation be conducted.

APPENDIX A

Site Maps

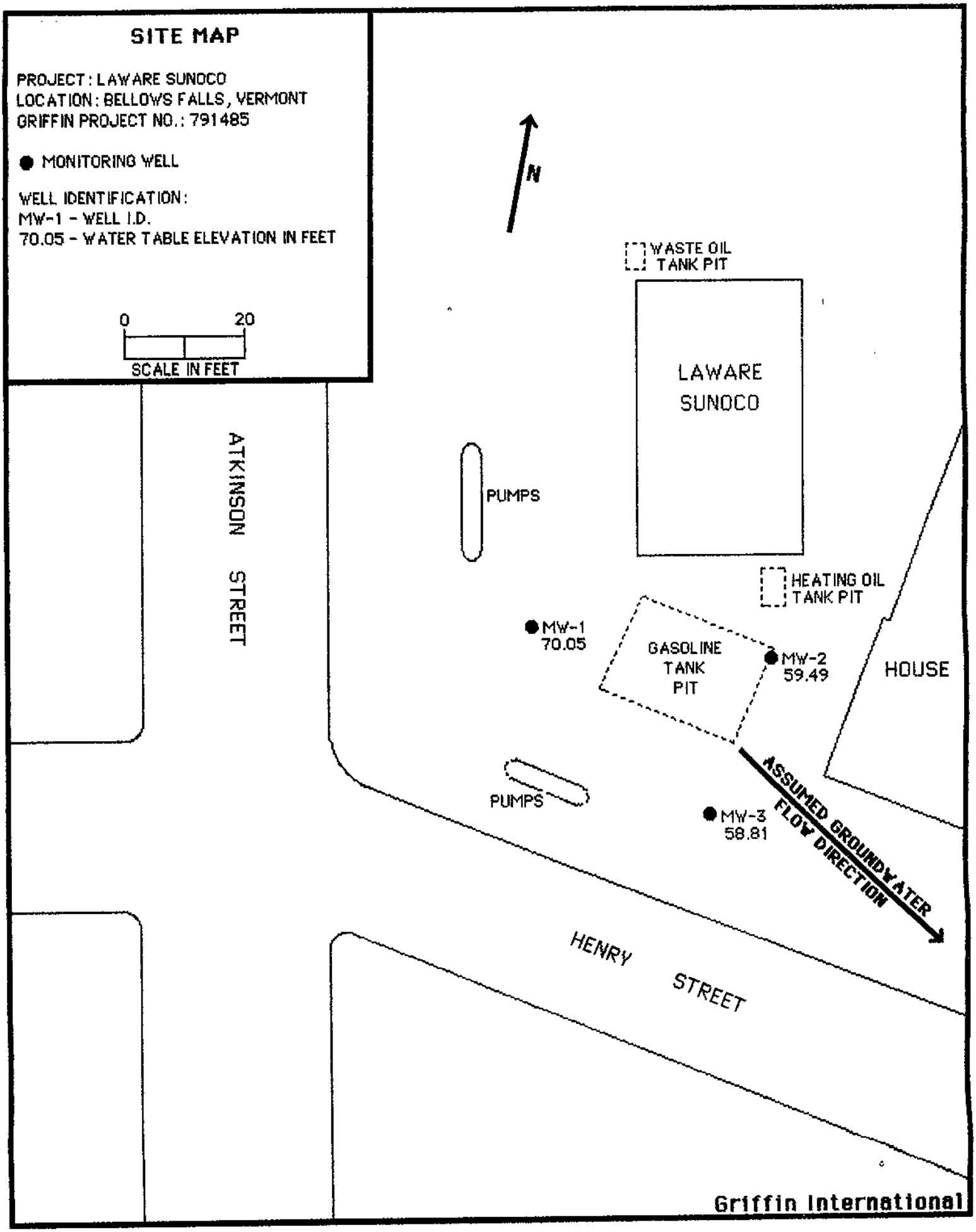
SITE LOCATION MAP

PROJECT: LAWARE SUNOCO
LOCATION: BELLOWS FALLS, VT



MAP SOURCE: USGS BELLOWS FALLS VERMONT-NEW HAMPSHIRE PROVISIONAL EDITION 1985

SCALE: 1:25,000


SITE MAP
PROJECT: LAWARE SUNOCO
LOCATION: BELLOWS FALLS, VERMONT
GRIFFIN PROJECT NO.: 791485
MONITORING WELL
WELL IDENTIFICATION:
MW-1 - WELL I.D.
70.05 - WATER TABLE ELEVATION IN FEET
0
20
SCALE IN FEET
N
WASTE OIL TANK PIT
LAWARE SUNOCO
PUMPS
ATKINSON STREET
HEATING OIL TANK PIT
MW-1 70.05
GASOLINE TANK PIT
MW-2 59.49
HOUSE
PUMPS
MW-3 58.81
ASSUMED GROUNDWATER FLOW DIRECTION
HENRY STREET
Griffin International

APPENDIX B

Well Logs

PROJECT LAWARE SUNOCO

LOCATION BELLOWS FALLS, VERMONT

DATE DRILLED 8/13/91 TOTAL DEPTH OF HOLE 30'

DIAMETER 6"

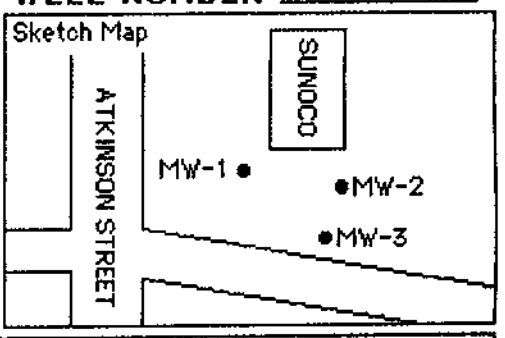
SCREEN DIA. 2" LENGTH 10' SLOT SIZE .010"

CASING DIA. 2" LENGTH 19.5' TYPE PVC

DRILLING CO. GRN. MT. BORING DRILLING METHOD HOLLOW STEM AUGER

DRILLER STEVE LAWRENCE LOG BY P. MURRAY

WELL NUMBER MW-1



DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		ROAD BOX		
		CAP		
		CONCRETE		Crushed stone, fine SAND, (fill material) 0 ppm
2		BENTONITE		
4			14,11,17,20	
6				Brown, very fine, silty SAND 0 ppm
8		WELL CASING		
10		NATIVE BACKFILL	10,9,11,15	Moist, brown, fine, silty SAND 0 ppm
12				
14			12,14,14,19	Stratified, poorly sorted, fine to coarse SAND, few pebbles, slight gasoline odor 200 ppm
16				
18				
20			8,7,9,9	Wet, tight, very fine SAND and SILT heavy petroleum odor 200 ppm
22		GRAVEL PACK		
24		WELL SCREEN	8,7,9,10	Wet, fine, silty SAND 25' - 25.75' Moist, tight, fine, silty SAND 25.75' - 27'25 ppm
26				
28				WATER TABLE ▼
30		BOTTOM PLUG	11,14,16,13	Moist, tight, very fine, silty SAND 0.5 ppm
32				BASE OF EXPLORATION AT 32'
34				
36				
38				
40				
42				
44				
46				
48				
50				
52				

Griffin International

PROJECT LAWARE SUNOCO

LOCATION BELLOWS FALLS, VERMONT

DATE DRILLED 8/13/91 TOTAL DEPTH OF HOLE 35'

DIAMETER 6"

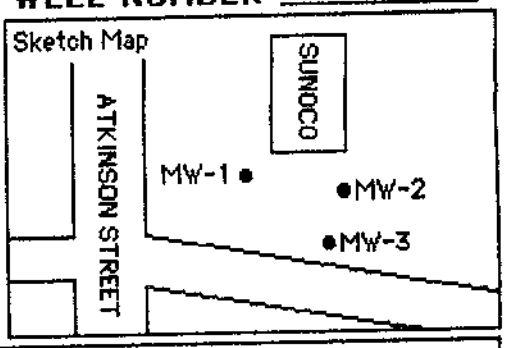
SCREEN DIA. 2" LENGTH 10' SLOT SIZE .010"

CASING DIA. 2" LENGTH 34.5' TYPE PVC

DRILLING CO. GRN. MT. BORING DRILLING METHOD HOLLOW STEM AUGER

DRILLER STEVE LAWRENCE LOG BY P. MURRAY

WELL NUMBER MW-2



DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		ROAD BOX		
		CAP		
		CONCRETE		
2		BENTONITE		
4			10,13,13,17	Light brown, fine silty SAND 0 ppm
6				
8		WELL CASING		
10		NATIVE BACKFILL	7,26,37,34	Medium SAND, some rounded gravel 4 ppm
12				
14			11,16,12,9	Medium to coarse, poorly sorted SAND, few pebbles, 8 ppm
16				
18				
20			5,6,8,11	Wet, very fine SAND and SILT 30 ppm
22				
24			5,8,9,15	Wet SILT and very fine SAND 25'-26' 30 ppm Tight, moist, very fine SAND and SILT 26'-27' 3 ppm
26				
28				
30		BENTONITE	14,16,17,19	Tight, damp, very fine SAND and SILT 1.5 ppm
32				
34			17,23,21,23	Damp, very fine SAND 0 ppm
36		GRAVEL PACK		
38				
40		WELL SCREEN	13,16,18,20	WATER TABLE ▼ Wet, fine, silty SAND 0 ppm
42				
44		BOTTOM PLUG		BASE OF EXPLORATION AT 45'
46				
48				
50				
52				

Griffin International

PROJECT LAWARE SUNOCO

LOCATION BELLOWS FALLS, VERMONT

WELL NUMBER MW-3

DATE DRILLED 8/13/91 TOTAL DEPTH OF HOLE 45'

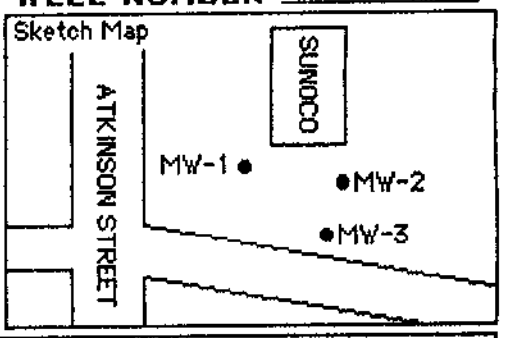
DIAMETER 6"

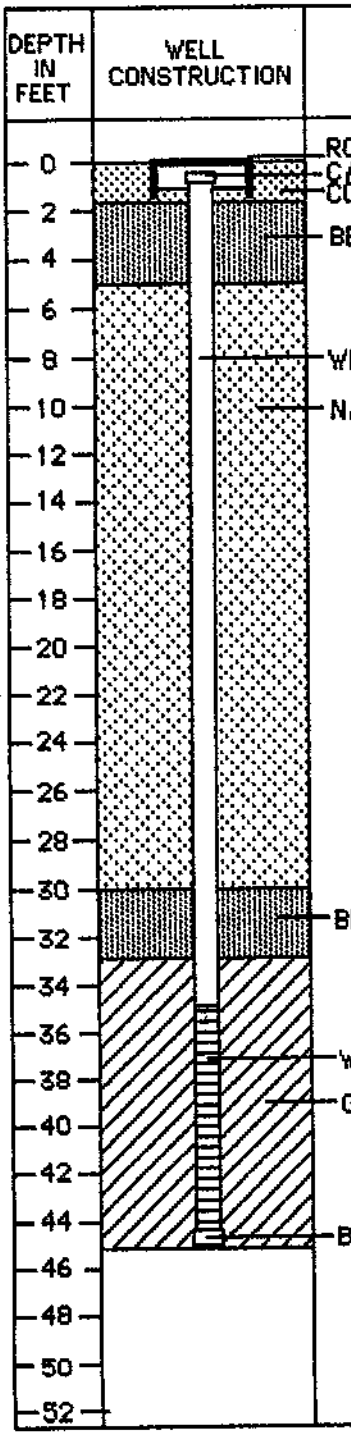
SCREEN DIA. 2" LENGTH 10' SLOT SIZE .010"

CASING DIA. 2" LENGTH 34.5' TYPE PVC

DRILLING CO. GRN. MT. BORING DRILLING METHOD HOLLOW STEM AUGER

DRILLER STEVE LAWRENCE LOG BY P. MURRAY





DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON	DESCRIPTION / SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
0		ROAD BOX		
2		CAP		
4		CONCRETE		
6		BENTONITE	10,17,19,16	Light brown, fine, silty SAND 0 ppm
8		WELL CASING		
10		NATIVE BACKFILL	21,25,31,30	Medium to coarse SAND, some coarse gravel 3 ppm
12				
14			5,8,10,10	Poorly sorted, medium to coarse SAND, few pebbles 6 ppm
16				
18				
20			7,7,8,10	Moist, very fine SAND and SILT, trace clay gasoline odor 65 ppm
22				
24			3,6,8,9	Wet SILT and very fine SAND 25'-26' 3 ppm
26				Moist, very fine SAND and SILT 26'-27' 30 ppm
28				
30		BENTONITE	10,16,16,17	Damp, finely laminated, very fine SAND, some silt 1 ppm
32				
34			17,18,17,17	Dry, fine SAND, trace silt 35.5'-36' 40 ppm
36		WELL SCREEN		Damp, very fine SAND and SILT 36'-37' 0.5 ppm
38				
40		GRAVEL PACK	10,12,15,17	WATER TABLE ▼
42				Wet, fine SAND, some silt 0.1 ppm
44		BOTTOM PLUG		BASE OF EXPLORATION AT 45'
46				
48				
50				
52				

Griffin International

APPENDIX C

Liquid Level Data

LIQUID LEVEL MONITORING DATA

PROJECT: Lawate Sunoco

LOCATION: Bellows Falls, VT

DATE: 8/20/90

WELL I.D.	WELL DEPTH	TOP OF CASING ELEVATION	DEPTH TO PRODUCT	DEPTH TO WATER	PRODUCT THICKNESS	SPECIFIC GRAVITY OF PRODUCT	HYDRO EQUIVALENT	CORRECTED DEPTH TO WATER	CORRECTED WATER TABLE ELEVATION
MW1	30'	98.95'		28.90'					70.05'
MW2	45'	100.00'		40.51'					59.49'
MW3	45'	99.17'		40.36'					58.81'

COMMENTS:

Griffin International

APPENDIX D

Laboratory Results

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

RECEIVED SEP 0 5 1991

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Sue Laware
REPORT DATE: September 4, 1991 ANALYSIS DATE: September 3, 1991
SAMPLER: Don Tourangeau STATION: MW #1
DATE SAMPLED: August 20, 1991 REF.#: 22,910
DATE RECEIVED: August 21, 1991 TIME SAMPLED: 15:18

Parameter	Minimum Detection Limit	Concentration (ug/L)
Benzene	2.	1,610.
Chlorobenzene	1.	ND [1]
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	255.
Toluene	1.	1,160.
Xylenes	5.	988.
MTBE	1.	23.9

4,013

NUMBER OF UNIDENTIFIED PEAKS FOUND: 28

NOTES:

1 None detected

Reviewed by _____

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

RECEIVED SEP 0 5 1991

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

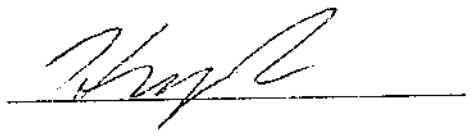
CLIENT: Griffin International
PROJECT NAME: Sue Laware
REPORT DATE: September 4, 1991
SAMPLER: Don Tourangeau
DATE SAMPLED: August 20, 1991
DATE RECEIVED: August 21, 1991
ANALYSIS DATE: September 3, 1991
STATION: MW #2
REF.#: 22,911
TIME SAMPLED: 15:26

Parameter	Minimum Detection Limit	Concentration (ug/L)
Benzene	2.	45.1
Chlorobenzene	1.	ND [1]
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	1.18
Toluene	1.	46.4
Xylenes	5.	18.3
MTBE	1.	19.2

NUMBER OF UNIDENTIFIED PEAKS FOUND: 6

NOTES:

1 None detected

Reviewed by 

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ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
FAX 879-7103

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Sue Laware
REPORT DATE: September 4, 1991
SAMPLER: Don Tourangeau
DATE SAMPLED: August 20, 1991
DATE RECEIVED: August 21, 1991
ANALYSIS DATE: September 3, 1991
STATION: MW #3
REF.#: 22,912
TIME SAMPLED: 15:40

Parameter	Minimum Detection Limit	Concentration (ug/L)
Benzene	2.	25.5
Chlorobenzene	1.	ND [1]
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	3.71
Toluene	1.	32.3
Xylenes	5.	19.3
MTBE	1.	18.0

NUMBER OF UNIDENTIFIED PEAKS FOUND: 3

NOTES:

1 None detected

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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Sue Laware
REPORT DATE: September 4, 1991
SAMPLER: Don Tourangeau
DATE SAMPLED: August 20, 1991
DATE RECEIVED: August 21, 1991
ANALYSIS DATE: September 3, 1991
STATION: MW #4
REF.#: 22,913
TIME SAMPLED: Not Indicated

Parameter	Minimum Detection Limit	Concentration (ug/L)
Benzene	2.	30.6
Chlorobenzene	1.	ND [1]
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	ND
Toluene	1.	29.5
Xylenes	5.	11.6
MTBE	1.	44.0

NUMBER OF UNIDENTIFIED PEAKS FOUND: 3

NOTES:

1 None detected

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FAX 879-7103

LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Sue Laware
REPORT DATE: September 4, 1991
SAMPLER: Don Tourangeau
DATE SAMPLED: August 20, 1991
DATE RECEIVED: August 21, 1991
ANALYSIS DATE: September 3, 1991
STATION: Site Blank
REF.#: 22,914
TIME SAMPLED: 15:50

Parameter	Minimum Detection Limit	Concentration (ug/L)
Benzene	2.	ND[1]
Chlorobenzene	1.	ND
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	ND
Toluene	1.	TBQ[2]
Xylenes	5.	ND
MTBE	1.	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected
2 Trace below quantitation limit

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LABORATORY REPORT

EPA METHOD 602 -- PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Sue Laware
REPORT DATE: September 4, 1991
SAMPLER: Don Tourangeau
DATE SAMPLED: August 20, 1991
DATE RECEIVED: August 21, 1991
ANALYSIS DATE: September 3, 1991
STATION: Trip Blank
REF.#: 22,909
TIME SAMPLED: 07:00

Parameter	Minimum Detection Limit	Concentration (ug/L)
Benzene	2.	ND[1]
Chlorobenzene	1.	ND
1,2-Dichlorobenzene	2.	ND
1,3-Dichlorobenzene	2.	ND
1,4-Dichlorobenzene	2.	ND
Ethylbenzene	1.	ND
Toluene	1.	TBQ[2]
Xylenes	5.	ND
MTBE	1.	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

NOTES:

1 None detected
2 Trace below quantitation limit

Reviewed by _____