GRIFFIN INTERNATIONAL INC

MAY 15 10 13 AM '97

May 15, 1997

Mr. Andrew Shively
Vermont ANR/DEC
Waste Management Division
103 South Main St. /West Building
Waterbury, VT 05671-0404

RE: Initial Investigation of Subsurface Petroleum Contamination at Richford Texaco
Richford, Vermont (VTDEC Site #96-2084)

Dear Mr. Shively:

Enclosed please find the summary report for the site investigation conducted at the Richford Texaco. Griffin is recommending that the Richford Texaco site be considered for closure and removed from the VTDEC Active Hazardous Waste Sites List.

Please contact me if you have any questions or comments.

Sincerely,

Christine Ward

Christine Ward
Hydrogeologist

Enclosure

c.: Mr. Keith Corkins
GI#9964907

MAY 16 10:33 AM '97

INITIAL INVESTIGATION OF SUBSURFACE PETROLEUM CONTAMINATION REPORT

RICHFORD TEXACO
301 S. MAIN ST.
RICHFORD, VERMONT

(VTDEC SITE #96-2084)
GI #9964907

April 1997

Prepared for

MR. KEITH CORKINS
BAY OIL COMPANY
RD 2, BOX 4520
BRISTOL, VERMONT 05443

Prepared by

GRIFFIN INTERNATIONAL INC

P.O. Box 943
Williston, Vermont 05495
(802) 865-4288

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I. INTRODUCTION

This report summarizes the investigation of subsurface petroleum contamination at Richford Texaco on South Main Street in Richford, Vermont. This work was requested by Mr. Chuck Schwer of the Vermont Department of Environmental Conservation (VTDEC) in a letter to Mr. Keith Corkins of the Bay Oil Company dated November 27, 1996. This work was performed in accordance with the December 11, 1996, *Preliminary Work Plan and Cost Estimate for Subsurface Investigation of Suspected Petroleum Contamination* for the site prepared by Griffin, and approved by Mr. Andrew Shively (VTDEC) in a letter to Mr. Keith Corkins on January 3, 1997.

II. SITE BACKGROUND

A. Site History

On September 24, 1996, petroleum contamination was detected at Richford Texaco during soil field screening at a routine removal of an underground storage tank (UST). The former UST had a capacity of 4,000 gallons and was constructed of single wall steel. The existence of the UST at the site was unknown to the owner until just prior to the tank closure when it began to float and buckle the pavement. The UST was estimated to be approximately 25 to 35 years old. The UST was reported to be in poor condition with rust and pitting, however no holes or leaks were observed in the tank.

Soil samples collected during the UST removal were screened for volatile organic compounds (VOCs) using an HNu™ systems Model PI 101 photo ionizing detector (PID). VOC concentrations in the soils ranged 0.0 to 220 parts per million (ppm). The highest VOC concentrations (220 ppm) were detected on the southwest end of the UST, nearly adjacent to the dispenser island. VOC concentrations detected in the wet sand fill surrounding the UST ranged from 56 to 180 ppm. No VOCs were detected in the native silt at the northwest end of the excavation. Low VOC concentrations (1.0 ppm) were detected in the native silt below the UST. Groundwater was encountered at approximately five feet below grade.

As a result of the petroleum contamination detected in the subsurface beneath the former UST, the VTDEC requested that additional work be conducted at the site in order to determine the extent and degree of petroleum contamination.

B. Site Description

The Richford Texaco consists of one building which houses a convenience store, two service bays, and an apartment on the second floor. The current USTs are located approximately 20 feet south-southwest of the subject building, and the pump island is adjacent to Main Street, northwest of the building.

The property is bounded on the west-northwest by VT Route 105 (Main Street) and on the east-northeast by Noyes Street. The west side of Main Street is primarily private residences, with another service station approximately 500 feet south of the subject property. The corner property on the north side of Noyes Street is occupied by a small IGA grocery store. Other properties to the east on Noyes Street include a seasonal fast food stand and private residences. South of the subject property is a private residence and a field that is zoned for commercial development. The entire area is served by public water and septic systems. The surface topography in the area slopes toward the west.

The nearest surface water is the Missisquoi River, which bends around the town of Richford, and is approximately 1700 feet from the site at the closest point.

C. Site Geology

Soil in the vicinity of the UST pit during the removal inspection consisted primarily of brown silt. According to the Surficial Geologic Map of Vermont (Ref. 1), the site is underlain by glaciolacustrine lake bottom sediments consisting of silt, silty clay and clay. Bedrock below the site is mapped as the Underhill Formation consisting of silvery, gray-green quartz-sericite-albite-chlorite-biotite schist (Ref. 2).

III. INVESTIGATIVE PROCEDURES

To further define the extent of subsurface petroleum contamination in the area of the former UST, the following investigative tasks were undertaken: soil borings; monitoring well installation; and soil and groundwater sample collection and analyses for petroleum related constituents.

A. Monitoring Well Installation

One monitoring well was installed on March 19, 1997, by Tri State Drilling and Boring of West Burke, Vermont, under the direct supervision of a Griffin hydrogeologist. The well was installed using a truck mounted 4 1/4" hollow stem auger. The soil boring log

and monitoring well as-built specifications are presented in Appendix B. The monitoring well location is indicated as MW1 on the Site Map (Appendix A).

Undisturbed soil samples, collected from the boring with a split spoon sampler, were logged by the supervising hydrogeologist and screened for the presence of volatile organic compounds (VOCs) using an HNu™ systems Model PI 101 photo ionizing detector (PID). Prior to screening, the PID was calibrated with isobutylene with reference made to benzene. Soils were screened using the Griffin Jar/Polyethylene Bag Headspace Screening Protocol, which conforms to state and industry standards.

Soils encountered in the boring for MW1 consisted primarily of brown silt with some sand and gravel. There were some very thin interbedded layers of gray clay and indications of mottling at 10 to 11 feet below grade. The end of the split spoon sampler at 15 feet, contained rock fragments suggesting bedrock was nearby. The water table was estimated at approximately 5 feet below grade during drilling, and observed to be approximately 3 feet below grade later in the day. VOCs from the soil samples ranged from 40 ppm at 5 to 7 feet below grade, which is adjacent to the location of the former UST, to 3 ppm at 13 to 15 feet below grade.

The monitoring well is constructed of two inch diameter, 0.010" slot, PVC well screen and attached solid PVC riser. The annulus between the borehole wall and the screened section of each well was filled with sand pack to filter fine sediments in groundwater from entering the well. Above the screened section of the well, the annulus between the borehole wall and the riser was filled with a bentonite clay seal to prevent surface water from entering the borehole. The well is protected at the surface by a flush mounted steel well head protective casing and a bolt down cover. The well head protection casing is set in cement. Well construction details are listed on the well log in Appendix B.

B. Soil Borings

Four other attempts were made to install monitoring wells, however refusal was encountered at shallow depths with no evidence of groundwater. Soil boring SB2 is located on the southern side of the pump island, approximately 50 feet south-southwest of the former UST pit. Soil boring SB3 is located approximately 30 feet east of the former UST pit and north of the building. Soil boring SB4 is located approximately 90 feet south-southwest of the former UST pit, and soil boring SB5 is located approximately 180 feet south-southwest of the former UST pit. The soil boring locations are indicated on the Site Map (Appendix A). The soil borings were backfilled with native material.

Soils encountered in the four borings consisted of dry to slightly damp, gray-brown silt and sand with little gravel and rock fragments. Refusal was encountered at 6 feet below grade in SB2, at 2.5 feet in SB3, at 6 feet in SB4, and at 5 feet in SB5. Highly weathered rock was encountered in SB5 from 4 to 5 feet below grade. Also of note, the water line to

the building which runs from Route 105 under the pump island, is only buried 2.5 feet below grade due to the shallow bedrock.

Soil from the upper few feet of SB2, located near the pump island, had VOC concentrations of 10.4 ppm. VOC concentrations detected in soil samples from SB2 and SB4, collected with the split spoon sampler from 5 to 6 feet below grade, were 5 ppm and 4 ppm, respectively. A soil sample from the bottom of the boring for SB5, collected from the augers, had a VOC concentration of 3 ppm.

When shallow bedrock was encountered in SB3 at 2.5 feet below grade, an attempt was made to sample with the split spoon sampler, however the sampler would not penetrate the rock. A VOC concentration of 1 ppm was detected in the soil sample collected from the bottom of the augers. A very slight trickle of water was observed flowing across the top surface of exposed bedrock in the boring.

C. Soil Collection and Analysis

Soil samples collected on March 19, 1997, from the bottom of the four borings were placed in 250 ml brown glass jars and kept cool until delivered to laboratory. The soil samples from SB2 and SB4 were collected with the split spoon sampler, the soil samples from SB3 and SB5 were collected from the bottom of the augers. The soil samples were analyzed by Endyne, Inc. of Williston, Vermont, for EPA Method 8020 compounds (benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tertiary butyl ether (MTBE)) by EPA Method 8260. Additionally, the samples were analyzed by modified EPA Method 8100 for total petroleum hydrocarbons (TPH) as requested by Mr. Andrew Shively (VTDEC) in a letter to Mr. Keith Corkins dated January 3, 1997. Results of the laboratory analyses for the soil borings are summarized in Appendix C. The laboratory analysis report is also in Appendix C.

No petroleum compounds were detected in the soil samples, except for 41.5 ppm of TPH in SB3.

D. Groundwater Flow Direction and Gradient

The depth to water in monitoring well MW1 was measured at approximately 2.5 feet below ground surface on March 25, 1997. Since only one monitoring well was able to be installed in the overburden, there was insufficient data to calculate the groundwater flow direction and gradient. Based on the surficial topography, the regional groundwater flow is estimated to be toward the south-southwest. Local groundwater flow at the site is likely controlled by the irregular bedrock surface.

A storm drain culvert and a fourteen inch diameter water line are buried along the east side of Route 105. It is likely that some groundwater flow across the site is intercepted and follows these utility trenches southward. Reportably no blasting was required when these utilities were installed. The town sewer line runs along the west side of Route 105.

E. Groundwater Sampling and Analyses

Griffin collected a groundwater sample from MW1 during the site visit on March 25, 1997. The groundwater sample was analyzed by Endyne, Inc., by EPA Method 602 for the presence of BTEX and MTBE. Additionally, the sample was analyzed by modified EPA Method 8100 for TPH. Results of the laboratory analysis for monitoring well MW1 is summarized in Appendix D. The laboratory analysis report is also in Appendix D.

Analysis of the groundwater sample collected from MW1 indicates very low BTEX concentrations, all below their respective groundwater standards. MTBE and TPH were not detected in the groundwater sample from MW1.

F. Sensitive Receptor Survey

A receptor risk assessment was conducted to identify known and potential receptors of the contamination detected at Richford Texaco. A visual survey was conducted at the time of the UST removal inspection, as well as during the soil borings and monitoring well installation. Based on these observations, a determination of the potential risk to identified receptors was conducted.

The Richford Texaco is slab on grade construction and the area surrounding the former UST is paved, thus the risk due to vapors is minimal.

The entire area is served by municipal water and sewer systems. No in-use public or private water supply wells were identified in the vicinity of the site, based on visual observation and interviews with site representatives. The nearest surface water is the Missisquoi River, which flows around the town of Richford, and is approximately 1700 feet from the site at the closest point.

The soil and groundwater in the immediate vicinity of the former UST are potential sensitive receptors. The risk to these sensitive receptors is minimal, based on the very low to non-detect BTEX and TPH concentrations in the groundwater and soil samples collected at the site.

There are no receptors along the utility corridor that appear to be at significant risk of petroleum contamination from the subsurface petroleum contamination detected at the site.

IV. CONCLUSIONS

Based on the results of this sampling event, and on observations made during previous site visits, Griffin presents the following conclusions:

1) There was likely a release(s) of petroleum to the subsurface from an abandoned UST. The total volume of the release(s) is unknown.

2) The source of the petroleum contamination (i.e., the UST) was removed in September 1996. With the source UST removed, it is expected that adsorbed petroleum compound concentrations will decrease over time with the progressive action of natural mitigative processes, including biodegradation, volatilization, and diffusion.

3) On March 25, 1997, the depth to groundwater was approximately 2.5 feet below grade in MW1.

4) Very low BTEX concentrations, all below their respective groundwater standards, were detected in the groundwater sample collected from monitoring well MW1. Petroleum concentrations in the groundwater should decrease over time due to natural mitigative processes including dilution, dispersion, and biodegradation.

5) No petroleum compounds were detected in the soil samples collected from the soil borings, except for 41.5 ppm TPH in SB3.

6) Based on a survey of known potential sensitive receptors in the vicinity of the site, the soil and groundwater in the immediate vicinity are the only receptors potentially at risk. The risk to these receptors is likely minimal based on the very low concentration of petroleum contamination detected at the site. There are no other receptors in the area that appear to be at significant risk of petroleum contamination from the subsurface petroleum contamination detected at the site.

V. RECOMMENDATIONS

Based on the soil and groundwater sample analyses and on the soil screening results during the UST closure and during the soil borings, Griffin recommends that the Richford Texaco, Richford, Vermont site be considered for closure and be removed from the VTDEC Active Hazardous Waste Sites List. This recommendation is offered based upon achievement of the following closure criteria, as per the VTDEC Site Management Activity Completed (SMAC) Checklist:

1) The source(s), nature, and extent of the petroleum contamination at the site has been adequately defined.

   The source of petroleum contamination detected in soils at the Richford Texaco was a former UST at the property.

   VOC readings up to 220 ppm were detected in soils during the tank closure on September 24, 1996. The highest VOC concentrations (220 ppm) were detected on the southwest end of the UST, nearly adjacent to the dispenser island. On March 19, 1997, VOC readings of 0 to 40 ppm were detected from the soil boring for MW1 located immediately west of the former UST pit, with the readings decreasing with depth. Very low dissolved petroleum contamination, below applicable groundwater standards, was detected in the groundwater sample collected from monitoring well MW1 on March 25, 1997. Low VOC concentrations (1.0 ppm) were detected in the native silt below the UST during the UST closure.

   No VOCs were detected in the native silt at the northwest end of the excavation during the UST closure. VOC readings up to 10.4 ppm were detected from the soils in the soil borings located east and south-southwest of the former UST pit. No BTEX or TPH compounds were detected in the soil samples collected from the soil borings located south-southwest of the former UST pit. A very low concentration of TPH was detected in the soil sample collected from the soil boring located east of the former UST pit.

   Based on the VOC readings and the soil and groundwater analyses, the extent of the petroleum contamination at the site appears to be confined to the immediate vicinity of the former UST pit.

2) Source(s) has been removed, remediated, or adequately contained.

   The former UST was removed from the Richford Texaco in September 1996.

The area surrounding the UST is paved thus containing any residual vapors. Additionally, the paving deters the infiltration of rain water that might dissolve and transport residual adsorbed petroleum to the groundwater.

Remaining adsorbed petroleum concentrations in the soil will continue to decrease over time with the progressive action of natural mitigative processes.

3) Levels of contaminants in soil and groundwater shall be stable, falling, or non-detectable.

Very low concentrations of BTEX, all below their respective groundwater standards, were detected in the groundwater sample collected from monitoring well MW1.

Petroleum contamination was not detected in the soil samples collected from the soil borings on March 19, 1997, except for a very low concentration of TPH in SB3.

4) Groundwater enforcement standards are met on entire property.

Petroleum contamination was not detected above the groundwater standards in the groundwater sample collected from monitoring well MW1.

5) Soil guideline levels are met. If not, engineering or institutional controls are in place.

The area surrounding the USTs is contained by paving on the surface. Petroleum contamination was not detected in the soil samples, except for a very low concentration of TPH in SB3.

6) No unacceptable threat to human health or the environment exists on site.

The entire area is served by municipal water and sewer systems. No in-use public or private water supply wells were identified in the vicinity of the site. No sensitive receptors have been identified as being impacted.

7) Site meets RCRA requirements.

Available records indicate that the Richford Texaco site is not in violation of the Resource Conservation and Recovery Act (RCRA) as defined in 40 CFR 264.

8) Site meets CERCLA requirements.

Available records indicate that the Richford Texaco site is not in violation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as defined in 40 CFR 300.

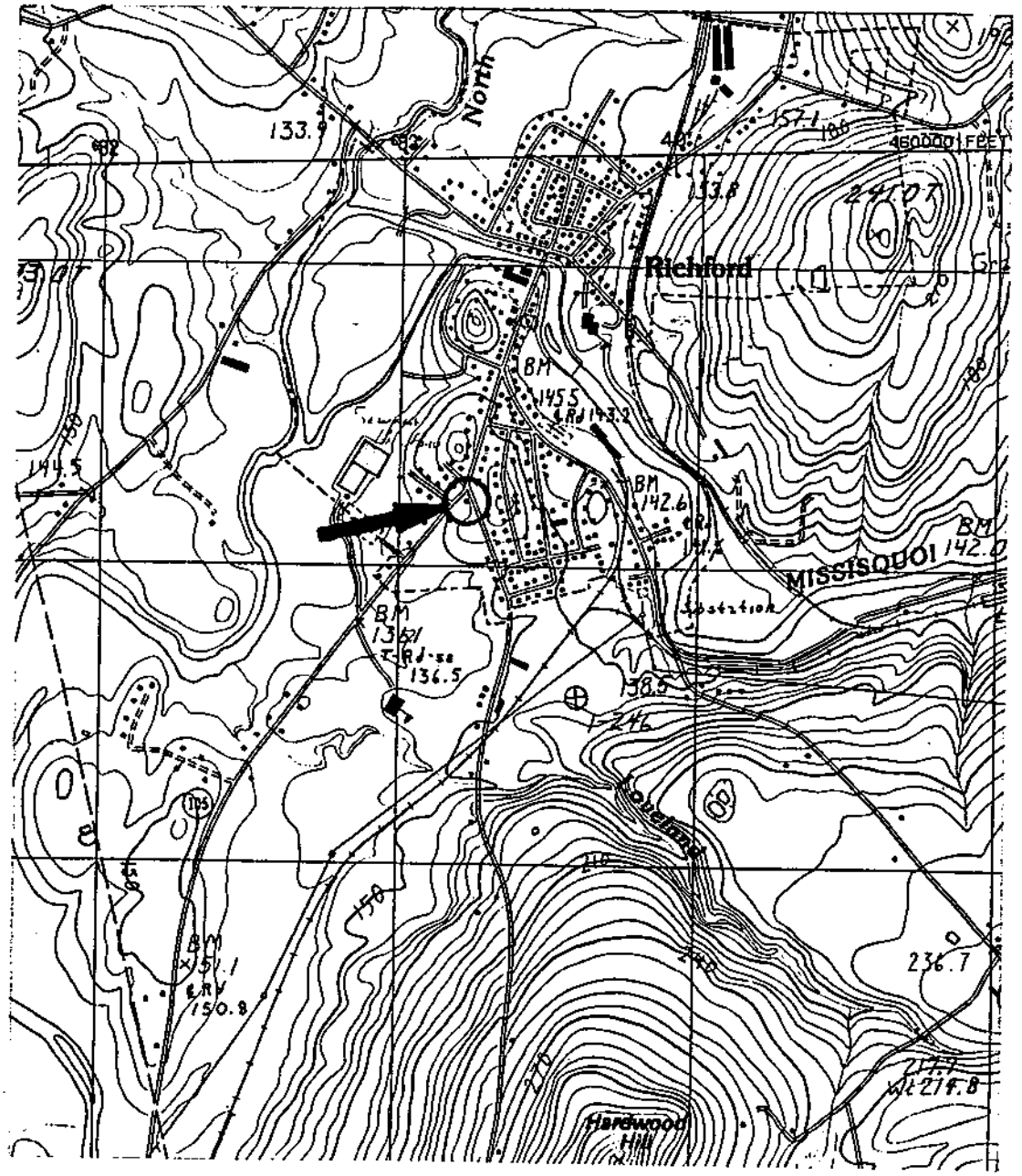
REFERENCES

1. Doll, Charles G., ed., 1970, *Surficial Geologic Map of Vermont*, State of Vermont

2. Doll, Charles G., ed., 1961, *Centennial Geologic Map of Vermont*, State of Vermont

APPENDIX A

Site Location Map
Site Sketch



JOB #: 9964907
SOURCE: USGS- RICHFORD, VERMONT QUADRANGLE

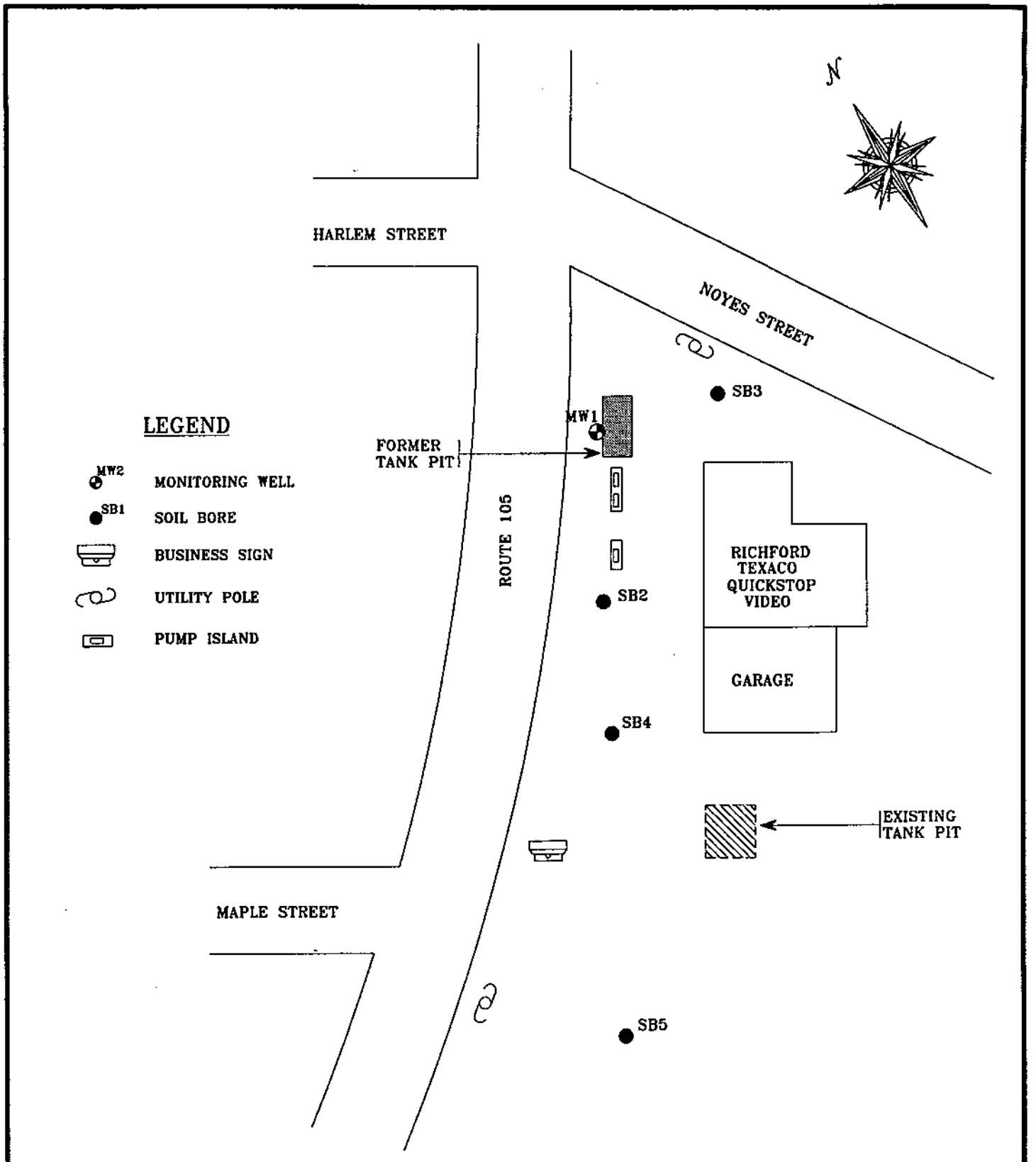
GRIFFIN INTERNATIONAL INC

RICHFORD TEXACO

RICHFORD, VERMONT

SITE LOCATION MAP

DATE: 3/27/97	DWG.#:1	SCALE: 1:24000	DRN.:SB	APP.:CW



JOB #: 9964907

GRIFFIN INTERNATIONAL INC

RICHFORD TEXACO

RICHFORD, VERMONT

SITE SKETCH

DATE: 3/27/97	DWG.#:2	SCALE: 1"=40'	DRN.:SB	APP.:CW

APPENDIX B

Soil Log and Monitoring Well Specifications

PROJECT RICHFORD TEXACO

LOCATION RICHFORD, VERMONT

DATE DRILLED 3/19/97 TOTAL DEPTH OF HOLE 15.0'

DIAMETER 4.25"

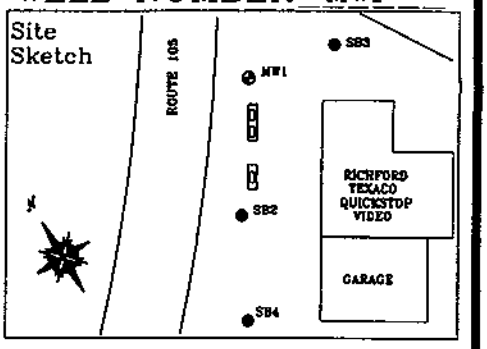
SCREEN DIA. 2" LENGTH 10.0' SLOT SIZE 0.010"

CASING DIA. 2" LENGTH 2.5' TYPE sch 40 pvc

DRILLING CO. TRI-STATE DRILLING METHOD HSA

DRILLER NEAL FAULKNER LOG BY C. WARD

WELL NUMBER MW1



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DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		ROAD BOX			0
		LOCKING WELL CAP			
		CONCRETE			
1		NATIVE BACKFILL			1
2		BENTONITE			2
3		WELL RISER			3
4					4
5				5.0' WATER TABLE ▼	5
6		SAND PACK	5'–7' 40 ppm	Brown SILT and SAND, little fine gravel, wet, (fill).	6
7					7
8					8
9		WELL SCREEN			9
10			10'–11' 7.5 ppm	Brown SILT with some thin gray clay layers, mottling, saturated.	10
11			11'–12' 5.3 ppm	Brown SILT, saturated.	11
12		BOTTOM CAP			12
13					13
14		UNDISTURBED NATIVE SOIL	13'–15' 0 ppm	Brown SILT and GRAVEL, trace clay, saturated, rock fragments.	14
15				BASE OF WELL AT 13' END OF EXPLORATION AT 15'	15
16					16
17					17
18					18
19					19
20					20
21					21
22					22
23					23
24					24
25					25

APPENDIX C

Soil Quality Data

SOIL SAMPLE SUMMARY

RICHFORD TEXACO
RICHFORD, VERMONT

Sample Date: 3/19/97

PARAMETER	SAMPLE LOCATION SB-2	SB-3	SB-4	SB-5	Applicable Standard (ppb)	
Benzene	ND>10	ND>10	ND>10	ND>10	5.	a
Chlorobenzene	ND>10	ND>10	ND>10	ND>10	100.	a
1,2-DCB	ND>10	ND>10	ND>10	ND>10	600.	b
1,3-DCB	ND>10	ND>10	ND>10	ND>10	600.	c
1,4-DCB	ND>10	ND>10	ND>10	ND>10	75.	a
Ethylbenzene	ND>10	ND>10	ND>10	ND>10	680.	d
Toluene	ND>10	ND>10	ND>10	ND>10	1,000.	b
Xylenes	ND>20	ND>20	ND>20	ND>20	400.	d
Total BTEX	ND	ND	ND	ND	-	
MTBE	ND>20	ND>20	ND>20	ND>20	40.	c
BTEX+MTBE	ND	ND	ND	ND	-	
TPH (mg/kg)	ND>5	41.5	ND>5	ND>5		

BTEX Analysis by EPA Method 8020 Compounds by EPA Method 8260, values reported in ug/kg (ppb)
TPH Analysis by Modified EPA Method 8100, values reported in mg/kg (ppm)

ND>1 - None Detected above Detection Limit
TBQ<1 - Trace Below Quantitation Limit

MCL - E.P.A. Maximum Contaminant Level
HAL - Health Advisory Level
VGES - Vermont Groundwater Enforcement Standard
a - MCL and VGES
b - MCL
c - HAL
d - VGES

ENDYNE, INC.

Laboratory Services

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

REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Richford Texaco
DATE REPORTED: April 8, 1997
DATE SAMPLED: March 19, 1997

PROJECT CODE: GIRT1443
REF. #: 101,121 - 101,124

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody did not indicate sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

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(802) 879-4333
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LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8100

DATE: April 8, 1997
CLIENT: Griffin International
PROJECT: Richford Texaco
PROJECT CODE: GIRT1443
COLLECTED BY: Chris Ward
DATE SAMPLED: March 19, 1997
DATE RECEIVED: March 21, 1997

Reference #	Sample ID	Concentration (mg/kg)[1]
101,121	SB-3; 12:00	41.5
101,122	SB-2; 12:30	ND[2]
101,123	SB-4; 1:00	ND
101,124	SB-5; 1:45	ND

Notes:

1 Method detection limit is 5.0 mg/kg.
2 None detected

ENDYNE, INC.

Laboratory Services

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REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Richford Texaco
DATE REPORTED: April 3, 1997
DATE SAMPLED: March 19, 1997

PROJECT CODE: GIRT1442
REF. #: 101,117 - 101,120

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated no sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate data was determined to be within Laboratory QA/QC quidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

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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 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Griffin International
PROJECT NAME: Richford Texaco
REPORT DATE: April 3, 1997
SAMPLER: Chris Ward
DATE SAMPLED: March 19, 1997
DATE RECEIVED: March 21, 1997

PROJECT CODE: GIRT1442
ANALYSIS DATE: March 31, 1997
STATION: SB-2
REF.#: 101,118
TIME SAMPLED: 12:30

Parameter	Detection Limit As Received (ug/kg)	Concentration As Received (ug/kg)
Benzene	10	ND[1]
Chlorobenzene	10	ND
1,2-Dichlorobenzene	10	ND
1,3-Dichlorobenzene	10	ND
1,4-Dichlorobenzene	10	ND
Ethylbenzene	10	ND
Toluene	10	ND
Xylene	20	ND
MTBE	20	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	89.%
Toluene-d8:	97.%
4-Bromofluorobenzene:	100.%

PERCENT SOLIDS: 91.%

NOTES:

1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
(802) 879-4333
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LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Griffin International
PROJECT NAME: Richford Texaco
REPORT DATE: April 3, 1997
SAMPLER: Chris Ward
DATE SAMPLED: March 19, 1997
DATE RECEIVED: March 21, 1997

PROJECT CODE: GIRT1442
ANALYSIS DATE: March 31, 1997
STATION: SB-3
REF.#: 101,117
TIME SAMPLED: 12:00

Parameter	Detection Limit As Received (ug/kg)	Concentration As Received (ug/kg)
Benzene	10	ND[1]
Chlorobenzene	10	ND
1,2-Dichlorobenzene	10	ND
1,3-Dichlorobenzene	10	ND
1,4-Dichlorobenzene	10	ND
Ethylbenzene	10	ND
Toluene	10	ND
Xylene	20	ND
MTBE	20	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	83.%
Toluene-d8:	91.%
4-Bromofluorobenzene:	102.%

PERCENT SOLIDS: 92.%

NOTES:
1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
Williston, Vermont 05495
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FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Griffin International
PROJECT NAME: Richford Texaco
REPORT DATE: April 3, 1997
SAMPLER: Chris Ward
DATE SAMPLED: March 19, 1997
DATE RECEIVED: March 21, 1997

PROJECT CODE: GIRT1442
ANALYSIS DATE: March 31, 1997
STATION: SB-4
REF.#: 101,119
TIME SAMPLED: 1:00

Parameter	Detection Limit As Received (ug/kg)	Concentration As Received (ug/kg)
Benzene	10	ND[1]
Chlorobenzene	10	ND
1,2-Dichlorobenzene	10	ND
1,3-Dichlorobenzene	10	ND
1,4-Dichlorobenzene	10	ND
Ethylbenzene	10	ND
Toluene	10	ND
Xylene	20	ND
MTBE	20	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	82.%
Toluene-d8:	97.%
4-Bromofluorobenzene:	100.%

PERCENT SOLIDS: 88.%

NOTES:
1 None detected

ENDYNE, INC.

Laboratory Services

32 James Brown Drive
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FAX 879-7103

LABORATORY REPORT

EPA METHOD 8020 COMPOUNDS BY EPA METHOD 8260

CLIENT: Griffin International
PROJECT NAME: Richford Texaco
REPORT DATE: April 3, 1997
SAMPLER: Chris Ward
DATE SAMPLED: March 19, 1997
DATE RECEIVED: March 21, 1997

PROJECT CODE: GIRT1442
ANALYSIS DATE: March 31, 1997
STATION: SB-5
REF.#: 101,120
TIME SAMPLED: 1:45

Parameter	Detection Limit As Received (ug/kg)	Concentration As Received (ug/kg)
Benzene	10	ND[1]
Chlorobenzene	10	ND
1,2-Dichlorobenzene	10	ND
1,3-Dichlorobenzene	10	ND
1,4-Dichlorobenzene	10	ND
Ethylbenzene	10	ND
Toluene	10	ND
Xylene	20	ND
MTBE	20	ND

NUMBER OF UNIDENTIFIED PEAKS FOUND: 0

ANALYTICAL SURROGATE RECOVERY:

Dibromofluoromethane:	90.%
Toluene-d8:	95.%
4-Bromofluorobenzene:	103.%

PERCENT SOLIDS: 87.%

NOTES:
1 None detected

101117 - 101124
GIRT1443

ENDYNE, INC.
32 James Brown Drive
Williston, Vermont 05495
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CHAIN-OF-CUSTODY RECORD

GI# 996907

21064

Project Name: Richford Texaco Site Location: Richford	Reporting Address: Griffin	Billing Address: Griffin
Endyne Project Number: GIRT1442	Company: Griffin Contact Name/Phone #: Chris Ward 865-4258	Sampler Name: Chris Ward Phone #:

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
101117	SB-3	SOIL			3/19/97 12:00	1	250ml		EPA 8020 and modified EPA 8100 for TPH	none	
101118	SB-2	"			12:30	1	"	split spoon 5'-7'	"	"	
101119	SB-4	"			1:00	1	"	split spoon 5'-7'	"	"	
101120	SB-5	"			1:45	1	"	from augers @ 5'	"	"	

Relinquished by: Signature Christ Ward	Received by: Signature Tonia M. Chambers	Date/Time 3-20-97 10:10
Relinquished by: Signature Angela Lacey 3/21 9:30	Received by: Signature Tonia M. Chambers	Date/Time 3-21-97 10:10

New York State Project: Yes ___ No X

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify):										

APPENDIX D

Water Quality Data

GROUNDWATER QUALITY SUMMARY

RICHFORD TEXACO
RICHFORD, VERMONT

MW-1

PARAMETER	Date of Sample Collection 3/25/97				Applicable Standard (ppb)	
Benzene	**TBQ<1**				5.	a
Chlorobenzene	ND>1				100.	a
1,2-DCB	ND>1				600.	b
1,3-DCB	ND>1				600.	c
1,4-DCB	ND>1				75.	a
Ethylbenzene	**5.7**				680.	d
Toluene	**1.4**				1,000.	b
Xylenes	**7.3**				400.	d
Total BTEX	**14.4**				-	
MTBE	ND>10				40.	c
BTEX+MTBE	**14.4**				-	
TPH (mg/L)	ND>0.8					

BTEX Analysis by EPA 602, TPH Analysis by Modified EPA 8100

All Values Reported in ug/L (ppb) except TPH in mg/L (ppm)
ND>1 - None Detected above Detection Limit
TBQ<1 - Trace Below Quantitation Limit

MCL - E.P.A. Maximum Contaminant Level
HAL - Health Advisory Level
VGES - Vermont Groundwater Enforcement Standard
a - MCL and VGES
b - MCL
c - HAL
d - VGES

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Laboratory Services

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REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Richford Texaco
REPORT DATE: April 2, 1997
DATE SAMPLED: March 25, 1997

PROJECT CODE: GIRT1484
REF.#: 101,266

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. Chain of custody indicated sample preservation with HCl.

All samples were prepared and analyzed by requirements outlined in the referenced method and within the specified holding times. All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced method. Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy was monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Individual sample performance was monitored by the addition of surrogate analytes to each sample. All surrogate recovery data was determined to be within laboratory QA/QC guidelines unless otherwise noted.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

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EPA METHOD 602--PURGEABLE AROMATICS

CLIENT: Griffin International
PROJECT NAME: Richford Texaco
CLIENT PROJ. #: 9964907

DATE RECEIVED: March 26, 1997
REPORT DATE: April 2, 1997
PROJECT CODE: GIRT1484

Ref. #:	101,266				
Site:	MW #1				
Date Sampled:	3/25/97				
Time Sampled:	12:20				
Sampler:	D. Tourangeau				
Date Analyzed:	4/2/97				
UIP Count:	>10				
Dil. Factor (%):	100				
Surr % Rec. (%):	96				
Parameter	Conc. (ug/L)				
Benzene	TBQ <1				
Chlorobenzene	<1				
1,2-Dichlorobenzene	<1				
1,3-Dichlorobenzene	<1				
1,4-Dichlorobenzene	<1				
Ethylbenzene	5.7				
Toluene	1.4				
Xylenes	7.3				
MTBE	<10				

Note: UIP = Unidentified Peaks TBQ = Trace Below Quantitation NI = Not Indicated

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REPORT OF LABORATORY ANALYSIS

CLIENT: Griffin International
PROJECT NAME: Richford Texaco
DATE REPORTED: April 8, 1997
DATE SAMPLED: March 25, 1997

PROJECT CODE: GIRT1485
REF. #: 101,267

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody record.

Chain of custody indicated proper sample preservation.

All samples were prepared and analyzed by requirements outlined in the referenced methods and within the specified holding times.

All instrumentation was calibrated with the appropriate frequency and verified by the requirements outlined in the referenced methods.

Blank contamination was not observed at levels affecting the analytical results.

Analytical method precision and accuracy were monitored by laboratory control standards which included matrix spike, duplicate and quality control analyses. These standards were determined to be within established laboratory method acceptance limits.

Reviewed by,

Harry B. Locker, Ph.D.
Laboratory Director

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LABORATORY REPORT

TOTAL PETROLEUM HYDROCARBONS (TPH) BY MODIFIED EPA METHOD 8100

DATE: April 8, 1997
CLIENT: Griffin International
PROJECT: Richford Texaco
PROJECT CODE: GIRT1485
COLLECTED BY: Don Tourangeau
DATE SAMPLED: March 25, 1997
DATE RECEIVED: March 26, 1997

Reference #	Sample ID	Concentration (mg/L)[1]
101,267	MW#1; 12:20	ND[2]

Notes:

1 Method detection limit is 0.8 mg/L.
2 None detected

101261 GRI 1484

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

9964907

20602

CHAIN-OF-CUSTODY RECORD

Project Name: RICHFORD TEXACO Site Location: RICHFORD	Reporting Address: GRIFFIN	Billing Address: GRIFFIN
Endyne Project Number: GIRT1484	Company: Contact Name/Phone #: CHRIS WARD	Sampler Name: DON TOURANGEAU Phone #:

Lab #	Sample Location	Matrix	GRAB	COMP	Date/Time 3-25-97	Sample Containers No.	Sample Containers Type/Size	Field Results/Remarks	Analysis Required	Sample Preservation	Rush
D1266	MW#1	H_2O	✓		12:20	2	40ml		20	HCl	
	MW#1	H_2O	✓		12:20	2	40ml		30	HCl	

Relinquished by: Signature Don Tourangeau	Received by: Signature Angela Lacey	Date/Time 3/26 10:00am
Relinquished by: Signature Angela Lacey	Received by: Signature M Faust	Date/Time 3/26/97 10:40am

New York State Project: Yes ____ No X

Requested Analyses

1	pH	6	TKN	11	Total Solids	16	Metals (Specify)	21	EPA 624	26	EPA 8270 B/N or Acid
2	Chloride	7	Total P	12	TSS	17	Coliform (Specify)	22	EPA 625 B/N or A	27	EPA 8010/8020
3	Ammonia N	8	Total Diss. P	13	TDS	18	COD	23	EPA 418.1	28	EPA 8080 Pest/PCB
4	Nitrite N	9	BOD_5	14	Turbidity	19	BTEX	24	EPA 608 Pest/PCB		
5	Nitrate N	10	Alkalinity	15	Conductivity	20	EPA 601/602	25	EPA 8240		
29	TCLP (Specify: volatiles, semi-volatiles, metals, pesticides, herbicides)										
30	Other (Specify): MODIFIED 8100										