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Reference: 004323

February 6, 2006

Mr. Mark Verhey
Humboldt County Division of Environmental Health
100 H Street, Suite 100
Eureka, CA 95501

Subject: **Fourth Quarter 2005 Groundwater Monitoring Report, Former Rio Dell Texaco, 100 Wildwood Avenue; LOP No. 12691**

Introduction

This letter report comprises the fourth quarter 2005 groundwater monitoring report for the former Rio Dell Texaco, Rio Dell, Humboldt County, California. This report includes a brief discussion on the background of the site, field activities, groundwater monitoring results, and discussion and recommendations. This work is being performed at the request of the Humboldt County Division of Environmental Health (HCDEH).

Vicinity Information

The site is located at 100 Wildwood Avenue in Rio Dell, Humboldt County, California, at the northeast corner of the intersection of Wildwood Avenue and Edwards Drive (Figure 1). A site plan is included as Figure 2.

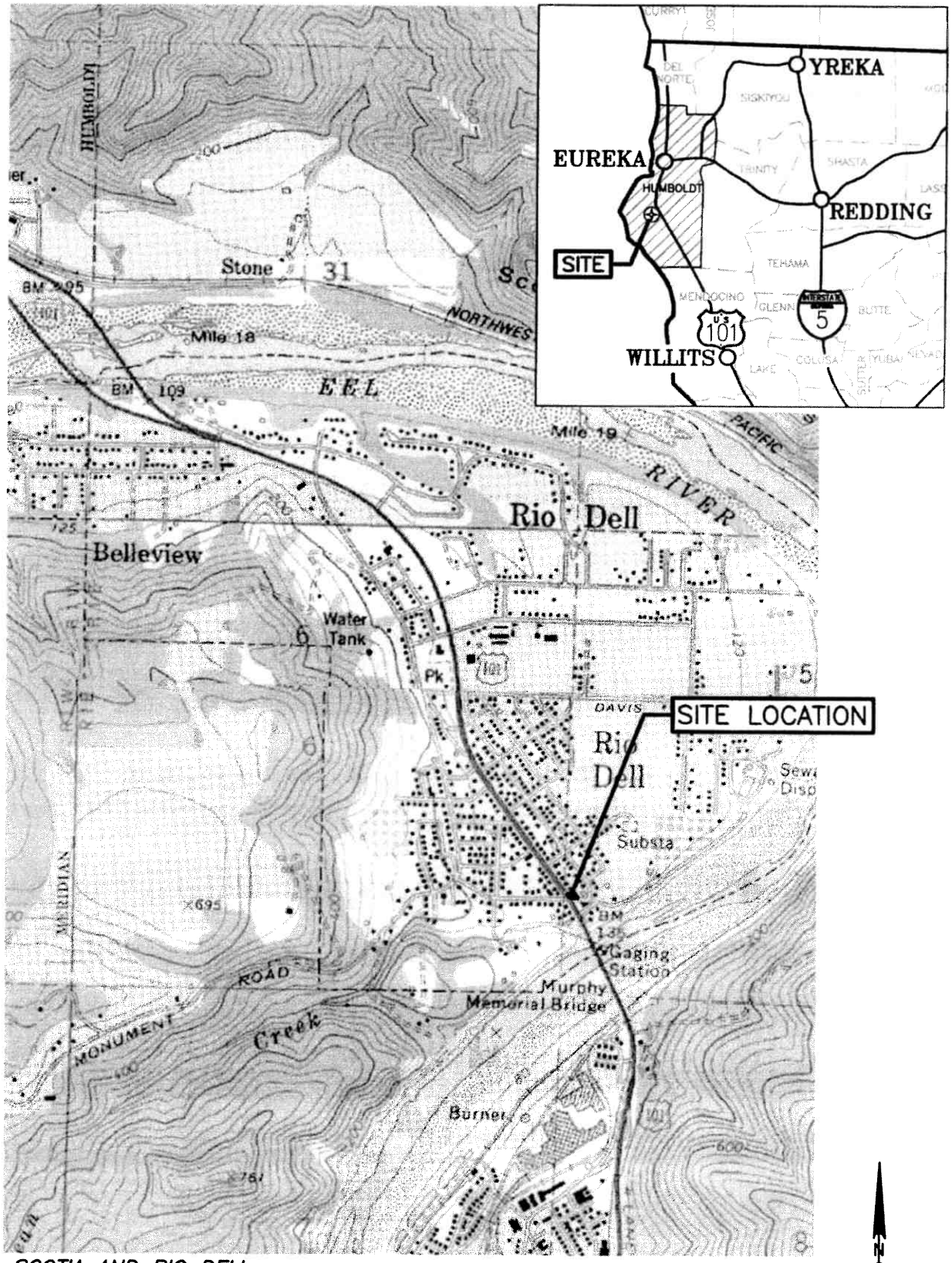
Background

In December 1990, a 200-gallon waste oil Underground Storage Tank (UST) was removed from the site. Contaminated soils were excavated from the vicinity of the waste-oil UST in August 1992. Laboratory analytical results of soil and groundwater samples collected during the overexcavation indicated the presence of petroleum hydrocarbons in soil, but not in groundwater. In November 1996, the HCDEH issued a remedial action completion certificate for the waste-oil UST (LACO, 1998).

In September and October 1998, Northcoast Environmental Construction removed 6 USTs from the site. Low concentrations of petroleum hydrocarbons were detected in several soil samples from the excavation cavities (LACO, 1998). In February 2000, LACO Associates (LACO) installed 6 soil borings (B-1 through B-6) and 4 monitoring wells (MW-1 through MW-4), and initiated quarterly groundwater monitoring and sampling (LACO, 2000).

In 2001, LACO performed a sensitive receptor survey for a 1,000-foot radius from the site. Two active wells were identified within the search area; one well was reportedly used for irrigation, the other for domestic use and irrigation. Both wells are located cross-gradient of the site (LACO, February 2002).

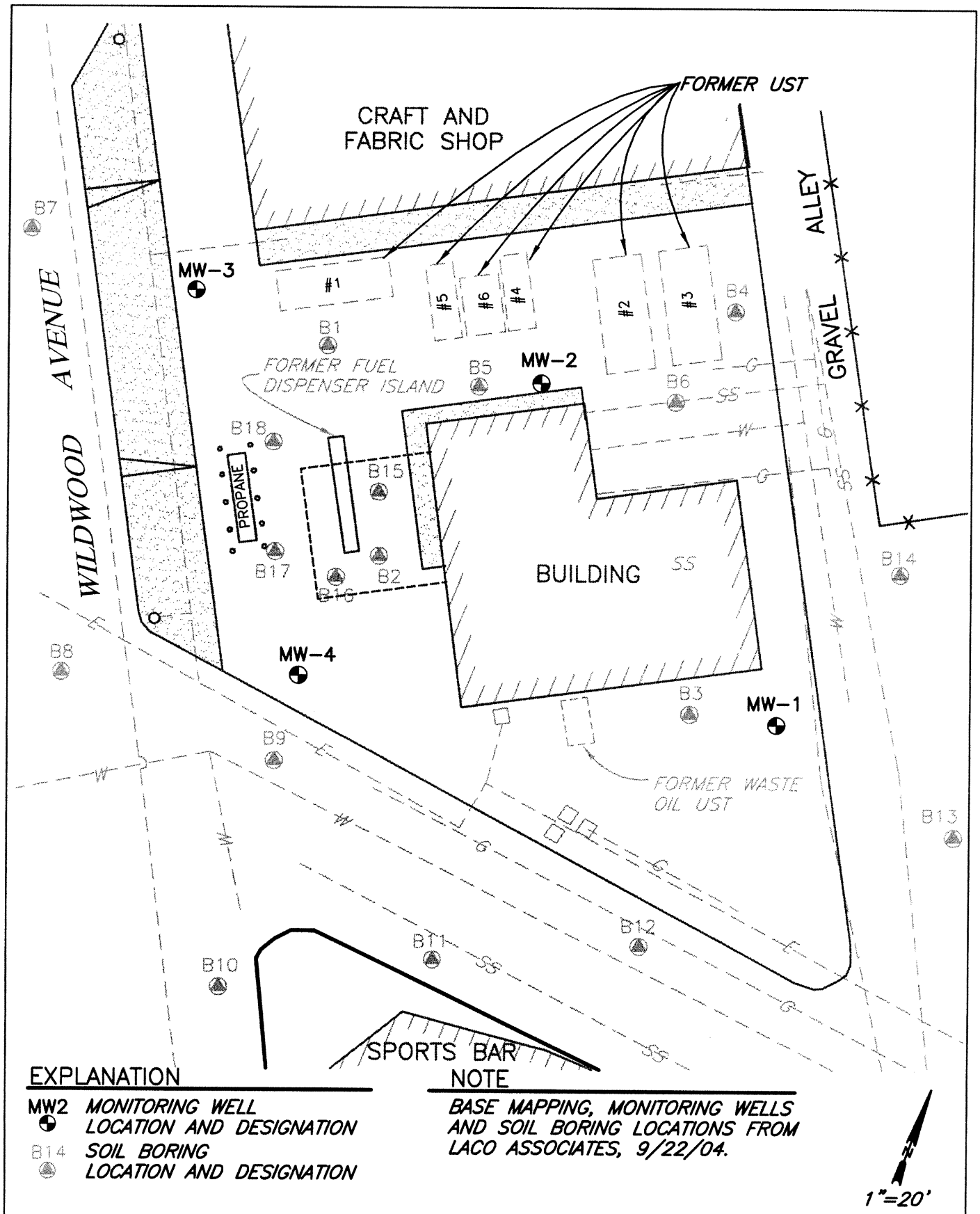
In March and April 2002, LACO installed 8 additional soil borings/temporary well points (B-7 through B-14) at the site (LACO, June 2002).



SOURCE: SCOTIA AND RIO DELL
USGS 7.5 MINUTE QUADRANGLES

1"=1,500'±

SHN Consulting Engineers & Geologists, Inc.	Former Rio Dell Texaco Rio Dell, California		Site Location Map SHN 004323
	January, 2005	004323-FIG-1	Figure 1



SHN Consulting Engineers & Geologists, Inc.	Former Rio Dell Texaco Rio Dell, California	Site Plan SHN 004323	
	January, 2005	004323-FIG-2	Figure 2

In January 2004, LACO installed 4 additional soil borings/temporary well points (B-15 through B-18) at the site (LACO, 2004).

Historic groundwater monitoring data collected by LACO are included in Attachment 1.

Field Activities

Monitoring Well Sampling

On November 4, 2005, SHN conducted quarterly groundwater monitoring of site monitoring wells MW-1 through MW-4. Prior to sample collection, each well was checked for the presence of free product (none was observed), and measured for depth to groundwater to the nearest 0.01 foot. Approximately 3 casing volumes of water were subsequently purged from each monitoring well, using a disposable bailer. Electrical conductivity, pH, and temperature were monitored periodically during purging activities using portable instrumentation. Each groundwater well was also monitored for Oxidation-Reduction Potential (ORP) and Dissolved Carbon Dioxide (DCO_2). Dissolved Oxygen (DO) measurements were not taken during this monitoring event due to a malfunctioning DO meter.

Groundwater samples were collected from each monitoring well, using disposable polyethylene bailers, and transferred into laboratory-supplied bottles. The water samples were then labeled, stored in an iced cooler, and transported to the analytical laboratory under proper chain-of-custody documentation. Groundwater monitoring data sheets are included in Attachment 2.

Laboratory Analysis

Each groundwater sample was analyzed for Total Petroleum Hydrocarbons as Gasoline (TPHG); Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX); Methyl Tertiary-Butyl Ether (MTBE); Tertiary-Butyl Alcohol (TBA); Diisopropyl Ether (DIPE); Ethyl Tertiary-Butyl Ether (ETBE); and Tertiary-Amyl Methyl Ether (TAME) in general accordance with United States Environmental Protection Agency (EPA) Method No. 8260B.

Groundwater samples were submitted to North Coast Laboratories, Inc., a State of California-certified analytical laboratory located in Arcata, California.

Equipment Decontamination Procedures

All small equipment that required on-site cleaning was cleaned using the triple-wash system. The equipment was first washed in a water solution containing Liquinox® cleaner, followed by a distilled water rinse, then by a second distilled water rinse.

Investigation-Derived Waste Management

Water used in the decontamination of equipment, tools, and all purge water was contained in Department of Transportation-approved DOT 17E/H, 55-gallon drums. The water was transported to SHN's purge water storage facility and will be discharged, under permit, to the City of Eureka wastewater collection system. A total of 20 gallons of water were generated during this monitoring event. A discharge receipt will be included in a future report.

Groundwater Monitoring Results

Hydrogeology

Depth-to-groundwater measurements were collected on November 4, 2005. The direction of groundwater flow was to the southeast with an approximate gradient of 0.09 (Figure 3). Groundwater elevations are presented in Table 1. Historic groundwater elevation data collected by SHN are included in Attachment 3.

Table 1
Groundwater Elevations, November 4, 2005
Former Rio Dell Texaco, Rio Dell, California

Sample Location	Top of Casing Elevation (feet)[1]	Depth to Water (feet)[2]	Groundwater Elevation (feet)[1]
MW-1	139.06	10.67	128.39
MW-2	139.83	6.90	132.93
MW-3	139.87	4.43	135.44
MW-4	139.00	8.92	130.08

1. Referenced to NAVD88 2. Below top of casing

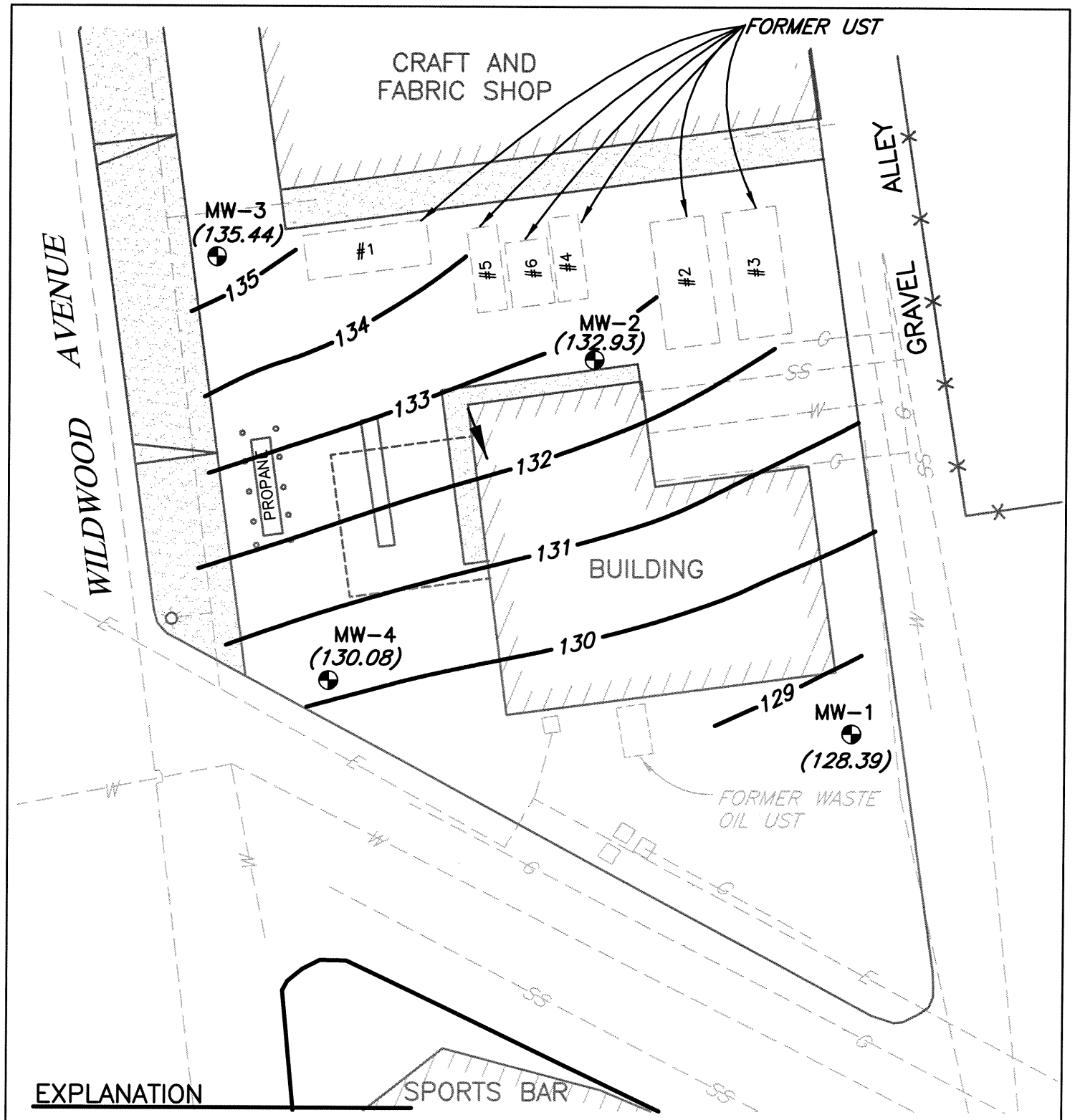
Groundwater Analytical Results

Groundwater was sampled from each well on November 4, 2005. Analytical results are presented in Table 2 and summarized on Figure 4. Historic groundwater analytical data collected by SHN are included in Attachment 3. The laboratory analytical report is presented in Attachment 4.

Table 2
Groundwater Analytical Results, November 4, 2005
Former Rio Dell Texaco; Rio Dell, California
(in ug/L)[1]

Sample Location	TPHG[2]	B[2]	T[2]	E[2]	X[2]	MTBE[2]	TBA[2]	DIPE[2]	ETBE[2]	TAME[2]
MW-1	**86**[3]	<0.50[4]	<0.50	<0.50	<0.50	**94**	<10	<1.0	<1.0	<1.0
MW-2	<50	<0.50	<0.50	<0.50	<0.50	**18**	<10	<1.0	<1.0	**1.6**
MW-3	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<10	<1.0	<1.0	<1.0
MW-4	**420**[3]	<0.50	<0.50	<0.50	<0.50	**410**	<10	<1.0	<1.0	**4.6**

1. ug/L: micrograms per Liter
2. Total Petroleum Hydrocarbons as Gasoline (TPHG), Benzene (B), Toluene (T), Ethylbenzene (E), total Xylenes (X), Methyl Tertiary-Butyl Ether (MTBE), Tertiary-Butyl Alcohol (TBA), Diisopropyl Ether (DIPE), Ethyl Tertiary-Butyl Ether (ETBE), and Tertiary-Amyl Methyl Ether (TAME) analyzed in general accordance with United States Environmental Protection Agency (EPA) Method No. 8260B
3. The reported gasoline value is primarily the result of reported gasoline additives present in the sample.
4. <: Denotes a value that is "less than" the method detection limit.



EXPLANATION

MW2 MONITORING WELL LOCATION AND DESIGNATION

(132.93) GROUNDWATER ELEVATION IN FEET (MSL)

132 GROUNDWATER CONTOUR

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

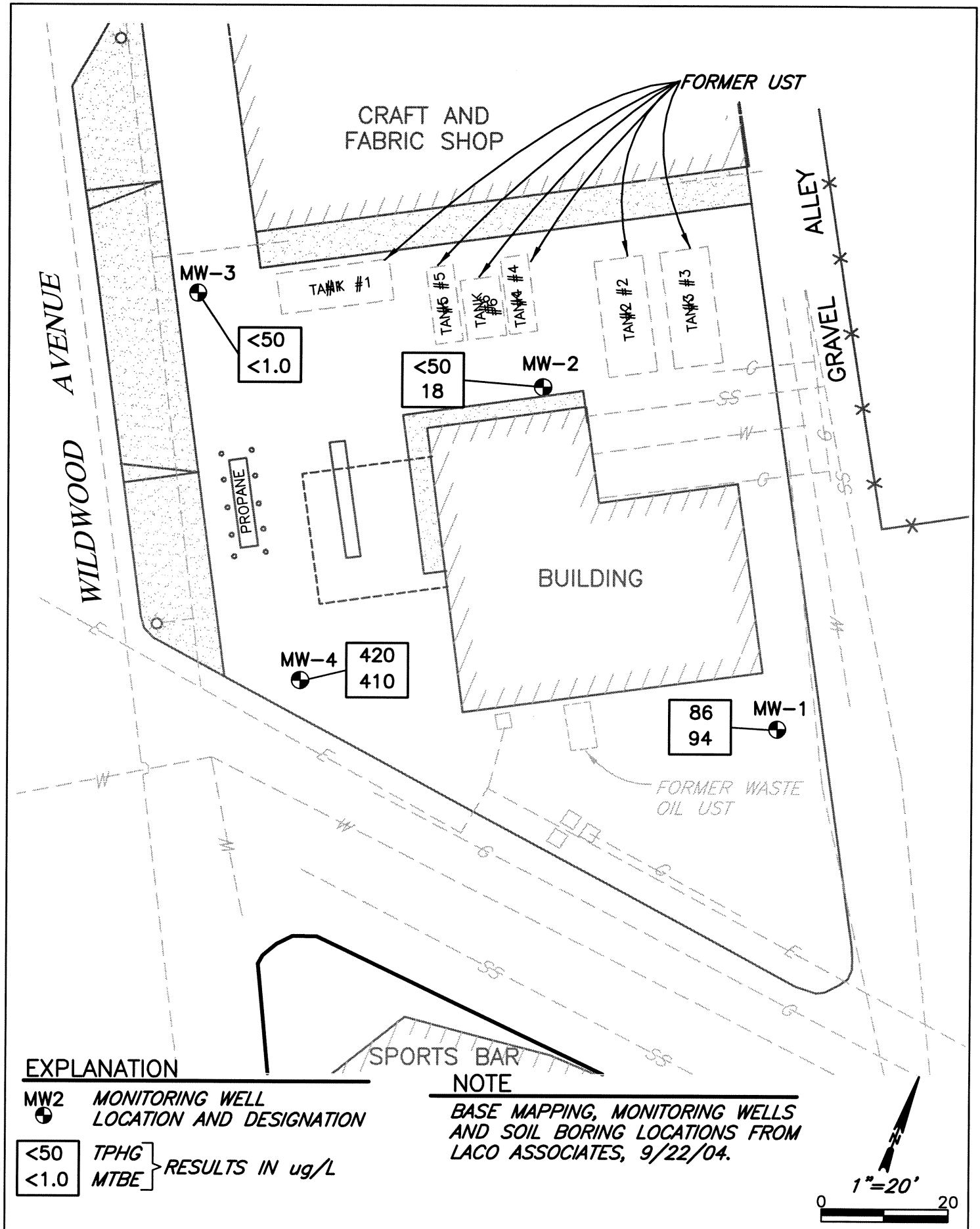
NOTE

BASE MAPPING, MONITORING WELLS AND SOIL BORING LOCATIONS FROM LACO ASSOCIATES, 9/22/04.

1"=20'

0 20

SHN Consulting Engineers & Geologists, Inc.	Former Rio Dell Texaco Rio Dell, California	Groundwater Contours on November 4, 2005 SHN 004323
	DECEMBER 2005	004323-GWC-NOV-05	Figure 3



SHN Consulting Engineers & Geologists, Inc.	Former Rio Dell Texaco Rio Dell, California		Summary of Groundwater Analytical Results, November 4, 2005 SHN 004323
	DECEMBER 2005	004323-GAR-NOV-05	Figure 4

Natural Attenuation Parameters

ORP and DCO_2 were measured in the monitoring wells prior to sampling. Results are presented in Table 3.

Table 3
DCO_2 and ORP Measurement Results, November 4, 2005
Former Rio Dell Texaco, Rio Dell, California

Sample Location	DCO_2[1] (ppm)[2]	ORP[3] (mV)[4]
MW-1	40	127
MW-2	60	146
MW-3	30	155
MW-4	100	131

1. DCO_2: Dissolved Carbon Dioxide, field measured using a field test kit.
2. ppm: parts per million.
3. ORP: Oxidation-Reduction Potential measured using portable instrumentation.
4. mV: millivolts

The DCO_2 measurements ranged from 30 ppm in well MW-3 to 100 ppm in well MW-4. ORP measurements collected from all site wells indicate that oxidizing conditions exist in groundwater beneath the site. These results indicate that biodegradation is occurring at the site. Historic DO, ORP, and DCO_2 measurement results collected by SHN are included in Attachment 3.

Discussion and Recommendations

TPHG was detected in the groundwater samples from monitoring well MW-1 and MW-4. However, the analytical laboratory noted that the reported TPHG concentration was actually fuel oxygenate constituents that eluted in the TPHG range of molecular weights. Due to the similarity in TPHG concentrations to MTBE concentrations found in site wells, it appears that petroleum hydrocarbons being reported as TPHG is actually MTBE that is eluting in the TPHG range of molecular weights.

The biodegradation indicators indicate that biodegradation of petroleum hydrocarbons is occurring.

In October 2005, SHN supervised the installation of 7 membrane interface probe borings, 5 soil borings, and 3 temporary well points. Soil and groundwater samples were collected for a chemical oxidation treatability study. SHN will prepare a report of findings once the results of the treatability study are received. This information will be used to propose and design a remediation plan for the site.

SHN will continue groundwater monitoring as required by the HCDEH. Prior to groundwater sampling, wells will be checked for depth to water, and monitored for DO, DCO_2, and ORP. Wells will be purged of approximately 3 well casing volumes prior to sampling. During well purging, groundwater will be monitored for temperature, pH, and conductivity. Groundwater samples will be analyzed for TPHG, BTEX, and fuel oxygenates.

SHN will complete and submit the next quarterly monitoring report, no later than 60 days following the quarterly sampling event. The report will include a description of the monitoring and sampling activities, a summary of results, analytical reports, groundwater elevations, and a groundwater contour map. The next quarterly groundwater-monitoring event is scheduled for February 2006.

If you have any questions regarding the work completed, please call me at 707/441-8855.

Sincerely,

SHN Consulting Engineers & Geologists, Inc.

Frans Lowman, P.G.
Project Manager

PROFESSIONAL GEOLOGIST
FRANS BARTON LOWMAN
No. 6705
CHG No. 665
Exp. 6/30/07
STATE OF CALIFORNIA

FBL/RMR:ap:med
Attachments:
1. Historic Monitoring Data Collected by LACO
2. Field Notes
3. Historic Monitoring Data Collected by SHN
4. Laboratory Analytical Report

copy w/attach: Ms. Dorothy Bianchi

References Cited

LACO Associates. (November 1998). *UST Closure Report, Rio Dell Texaco*. Eureka: LACO

---. (May 2000). *Initial Subsurface Investigation Status Report, Boring and Monitoring Well Installation, Rio Dell Texaco*. Eureka: LACO.

---. (February 2002). *Results of Sensitive Receptor Survey, Former Rio Dell Texaco*. Eureka: LACO.

---. (June 2002). *Subsurface Investigation Status Report, Report of Findings: Boring Installation, Former Rio Dell Texaco*. Eureka: LACO.

---. (February 2004). *Subsurface Investigation Status Report, Former Rio Dell Texaco*. Eureka: LACO.

Attachment 1

Historic Monitoring Data Collected by LACO

TABLE 1: WELL DATA AND GROUNDWATER ANA CAL RESULTS
Former Rio Dell Texaco, 100 Wildwood Ave, Rio Dell, Ca
LACO No. 3554.03; LOP No.12691

WELL/ Sample Date	Groundwater Measurements: Well Head Elevation (feet, NAVD88)	Ground water Elevation (feet, NAVD88)	Depth to Water (feet)	Analytical Results: TPHg (µg/L)	TPHd (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	Other Analytes (µg/L)
MW-1	139.06										
2/24/2000		132.61	6.45	ND<50	---	ND<0.50	ND<0.50	ND<0.50	1.2	4.3	ND<0.50-50
3/21/2000		132.00	7.06	---	—	—	—	—	—	—	—
4/18/2000		131.49	7.57	---	—	---	—	—	—	—	—
5/26/2000		131.19	7.87	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.5	ND<0.50-50
6/30/2000		130.52	8.54	---	—	—	—	—	—	—	—
7/31/2000		131.27	7.79	—	—	—	—	—	—	—	—
8/30/2000		128.45	10.61	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	88	1,2-Dichloroethane = 0.94
9/22/2000		128.14	10.92	---	—	—	—	—	—	—	—
10/26/2000		127.98	11.08	—	—	—	—	—	—	—	—
11/24/00		129.81	9.25	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	7.8	ND<0.50-50
12/12/2000		130.25	8.81	—	—	—	—	—	—	—	—
1/12/2001		131.44	7.62	—	—	—	—	—	—	—	—
2/22/2001		132.33	6.73	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50-50
4/5/2001		131.38	7.68	—	—	—	—	—	—	—	—
5/2/2001		131.16	7.90	—	—	—	—	—	—	—	—
5/22/2001		130.73	8.33	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	4.1	ND<0.50-50
6/11/2001		130.08	8.98	—	—	—	—	—	—	—	—
7/6/2001		129.87	9.19	—	—	—	—	—	—	—	—
9/4/2001		127.97	11.09	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	120	1,2-Dichloroethane = 1.3
11/29/2001		131.27	7.79	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	0.61	ND<0.50-50
2/28/2002		131.80	7.26	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.6	ND<0.50-50
5/20/2002		130.77	8.29	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.3	ND<0.50-50
8/8/2002		128.51	10.55	53	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	100	ND<0.50-50
				Monitoring well top of casings resurveyed 8/15/02							
12/6/2002		128.48	10.58	66	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	90	TBA=110 1,2-Dichloroethane=1.0 All others ND<1.0
2/24/2003		131.67	7.39	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50-50
5/15/2003		131.33	7.73	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	7.0	ND<0.50-20
8/11/2003		129.58	9.48	ND<50	—	ND<0.50	ND<0.50	ND<0.50	1.43	36.0	ND<1.0-20
11/11/2003		129.15	9.91	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	4.4	ND<1.0-20
2/17/2004		132.19	6.87	---	—	—	—	—	—	—	—
5/10/2004		131.48	7.58	—	—	---	—	—	---	—	—
8/17/2004		128.47	10.59	94	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	87	ND<1.0-10
MW-2	139.83										
2/24/2000		137.21	2.62	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	92	TAME = 0.66 1,2-Dichloroethane=2.8 All others ND<0.50-50
3/21/2000		137.28	2.55	—	---	—	—	—	—	—	—
4/18/2000		137.82	2.01	—	—	—	—	—	—	—	—
5/26/2000		NA	NA	330	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	33	ND<0.50 to 100
6/30/2000		NA	NA	—	—	—	—	—	—	—	—
7/31/2000		NA	NA	---	—	—	—	—	—	—	—
8/30/2000		126.18	10.63	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	100	TAME = 0.99 1,2-Dichloroethane=2.9 All others ND<0.50-50
9/22/2000		inacessible		—	—	—	—	—	—	—	—
10/26/2000		inacessible		—	—	—	—	—	—	—	—
11/24/00		134.78	5.05	100	---	ND<0.50	ND<0.50	ND<0.50	ND<0.50	37	TAME = 0.55 1,2-Dichloroethane=0.71 All others ND<0.50-50
12/12/2000		136.02	3.81	---	—	—	—	—	—	—	—
1/12/2001		136.27	3.56	—	—	—	—	—	—	—	—
2/22/2001		136.53	3.30	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	44	TAME = 0.58 1,2-Dichloroethane=2.3 All others ND<0.50-50
4/5/2001		136.50	3.33	—	—	—	—	—	—	—	—
5/2/2001		136.34	3.49	—	—	—	—	—	—	—	—
5/22/2001		135.09	4.74	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	65	1,2-Dichloroethane=2.1 All others ND<0.50-50
6/11/2001		134.38	5.45	—	—	---	---	—	—	—	—
7/6/2001		134.17	5.66	—	—	—	---	—	—	—	—
9/4/2001		132.42	7.41	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	58	TAME = 2.2 1,2-Dichloroethane=2.4 All others ND<0.50-50

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WELL/ Sample Date	Groundwater Measurements: Well Head Elevation (feet, NAVD88)	Ground water Elevation (feet, NAVD88)	Depth to Water (feet)	Analytical Results: TPHg (µg/L)	TPHd (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	Other Analytes (µg/L)
MW2 continued											
11/29/2001		136.87	2.96	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	35	TAME = 1.2 1,2-Dichloroethane=2.8 All others ND<0.50-50
2/28/2002		136.56	3.27	100	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	33	TAME = 1.2 1,2-Dichloroethane=2.2 All others ND<0.50-50
5/20/2002		134.88	4.95	57	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	37	TAME = 2.1 1,2-Dichloroethane=2.1 All others ND<0.50-50
8/8/2002		133.03	6.80	120	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	21	TAME = 1.2 1,2-Dichloroethane=1.2 All others ND<0.50-50
				Monitoring well top of casings resurveyed 8/15/02							
12/6/2002		133.04	6.79	59	ND<50	0.62	0.98	0.60	1.95	41	TAME=2.8 1,2-Dichloroethane=3.1 All others ND<1.0-20
2/24/2003		136.49	3.34	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	26	TAME=1.7 1,2-Dichloroethane=2.8 All others ND<1.0-20
5/15/2003		136.44	3.39	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	21	TAME=1.2 1,2-Dichloroethane=2.1 All others ND<1.0-20
8/11/2003		133.90	5.93	150	—	ND<0.50	ND<0.50	ND<0.50	0.70	9.5	ND<1.0-20
11/11/2003		134.11	5.72	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	18	TAME=1.2 1,2-Dichloroethane=1.3 All others ND<1.0-20
2/17/2004		136.35	2.71	—	—	—	—	—	—	—	—
5/10/2004		135.88	3.18	—	—	—	—	—	—	—	—
8/17/2004		132.28	6.78	120	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	6.9	ND<1.0-10
MW-3	139.87										
2/24/2000		138.27	1.60	ND<50	—	ND<0.50	ND<0.50	ND<0.50	1	21	ND<0.50-50
3/21/2000		137.87	2.00	—	—	—	—	—	—	—	—
4/18/2000		138.20	1.67	—	—	—	—	—	—	—	—
5/26/2000		137.51	2.36	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	9.8	ND<0.50-50
6/30/2000		136.74	3.13	—	—	—	—	—	—	—	—
7/31/2000		135.42	4.45	—	—	—	—	—	—	—	—
8/30/2000		134.37	5.50	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	17	ND<0.50-50
9/22/2000		134.34	5.53	—	—	—	—	—	—	—	—
10/26/2000		135.28	4.59	—	—	—	—	—	—	—	—
11/24/00		137.27	2.60	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	17	ND<0.50-50
12/12/2000		137.43	2.44	—	—	—	—	—	—	—	—
1/12/2001		138.06	1.81	—	—	—	—	—	—	—	—
2/22/2001		137.99	1.88	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	0.61	ND<0.50-50
4/5/2001		138.00	1.87	—	—	—	—	—	—	—	—
5/2/2001		137.76	2.11	—	—	—	—	—	—	—	—
5/22/2001		137.01	2.86	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	4.1	ND<0.50-50
6/11/2001		136.28	3.59	—	—	—	—	—	—	—	—
7/6/2001		136.15	3.72	—	—	—	—	—	—	—	—
9/4/2001		134.07	5.80	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	6.4	All ND<0.50-500
11/29/2001		137.79	2.08	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	3.8	Methanol=77 All others ND<0.50-50
2/28/2002		138.02	1.85	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.2	All ND<0.50-50
5/20/2002		137.62	2.25	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.4	All ND<0.50-50
8/8/2002		134.89	4.98	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.6	All ND<0.50-50
		139.87		Monitoring well top of casings resurveyed 8/15/02							
12/6/2002		135.38	4.49	ND<50	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	4.2	All ND<0.50-20
2/24/2003		138.03	1.84	ND<50	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.0	All ND<0.50-20
5/15/2003		138.22	1.65	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	All ND<0.50-20
8/11/2003		135.69	4.18	ND<50	—	ND<0.50	ND<0.50	ND<0.50	0.75	1.5	ND<1.0-20
11/11/2003		136.76	3.11	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.5	ND<1.0-20
2/17/2004		137.89	1.17	—	—	—	—	—	—	—	—
5/10/2004		137.58	1.48	—	—	—	—	—	—	—	—
8/17/2004		134.07	4.99	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<1.0-10
MW-4	139.00										
2/24/2000		131.12	7.88	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	350	TAME = 2.8 1,2-Dichloroethane=28 All others ND<0.50-500
3/21/2000		133.16	5.84	—	—	—	—	—	—	—	—
4/18/2000		133.40	5.60	—	—	—	—	—	—	—	—

TABLE 1: WELL DATA AND GROUNDWATER ANA CAL RESULTS
Former Rio Dell Texaco, 100 Wildwood Ave, Rio Dell, Ca
LACO No. 3554.03; LOP No.12691

WELL/ Sample Date	Groundwater Measurements: Well Head Elevation (feet, NAVD88)	Ground water Elevation (feet, NAVD88)	Depth to Water (feet)	Analytical Results: TPHg (µg/L)	TPHd (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	Other Analytes (µg/L)
MW-4 cont'd											
5/26/2000		133.30	5.70	1,000		ND<2.0	ND<2.0	6	ND<2.0	230	TAME = 2.5 TBA = 44 All others ND<2.0 to 1000
6/30/2000		132.67	6.33	—	—	—	—	—	—	—	—
7/31/2000		132.38	6.62	—	—	—	—	—	—	—	—
8/30/2000		129.45	6.52	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	220	TAME = 3.9 1,2-Dichloroethane=20 TBA = 5.6
9/22/2000		130.55	8.45	—	—	—	—	—	—	—	—
10/26/2000		130.38	8.62	—	—	—	—	—	—	—	—
11/24/00		131.82	7.18	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	620	TAME = 6.1 1,2-Dichloroethane=14 TBA = 9.6
12/12/2000		132.31	6.69	—	—	—	—	—	—	—	—
1/12/2001		132.83	6.17	—	—	—	—	—	—	—	—
2/22/2001		133.44	5.56	280	—	ND<1.0	ND<1.0	ND<1.0	ND<1.0	350	TAME = 4.1 1,2-Dichloroethane=4.5 TBA = 47
4/5/2001		133.63	5.37	—	—	—	—	—	—	—	—
5/2/2001		133.60	5.40	—	—	—	—	—	—	—	—
5/22/2001		133.35	5.65	210	—	ND<1.0	ND<1.0	ND<1.0	ND<1.0	380	TAME = 4.5 1,2-Dichloroethane=6.2 TBA = 34
6/11/2001		132.14	6.86	—	—	—	—	—	—	—	—
7/6/2001		132.01	6.99	—	—	—	—	—	—	—	—
9/4/2001		130.39	8.61	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	350	TAME = 5.4 1,2-Dichloroethane=12 All others ND<0.50-500
11/29/2001		132.58	6.42	ND<50	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	220	TAME = 1.5 1,2-Dichloroethane=3.7 Methanol 58 All others ND<0.50-50
2/28/2002		133.39	5.61	780	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	300	TAME = 3.3 1,2-Dichloroethane=2.3 TBA = 38 All others ND<0.50-50
5/20/2002		133.35	5.65	450	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	450	TAME = 4.6 1,2-Dichloroethane=6.8 TBA = 21 All others ND<0.50-50
8/8/2002		130.53	8.47	270	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	410	TAME = 4.8 1,2-Dichloroethane=6.4 TBA = 12 All others ND<0.50-50
				Monitoring well top of casings resurveyed 8/15/02							
12/6/2002		129.94	9.06	360	ND<50	ND<0.50	ND<0.50	ND<0.50	0.71	500	TBA=29 TAME=5.9 1,2-Dichloroethane=1.4 All otehrs ND<1.0
2/24/2003		133.79	5.21	270	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	360	TBA=29 TAME=3.6 1,2-Dichloroethane=7.5 All otehrs ND<1.0
5/15/2003		133.09	5.91	200	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	130	TBA=32 1,2-Dichloroethane=1.2 All others ND<1.0
8/11/2003		131.66	7.34	150	—	ND<0.50	ND<0.50	ND<0.50	0.81	190	TBA=23 TAME=1.6 1,2-Dichloroethane=2.3 All others ND<1.0
11/11/2003		130.89	8.11	170	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	250	TAME=2.4 1,2-Dichloroethane=5.8 All others ND<1.0-20
2/17/2004		132.03	6.97	360	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	440	TAME=4.2 All others ND<1.0-10
5/10/2004		133.19	5.81	250	—	1.4	ND<0.50	ND<0.50	4.3	160	TBA=47 TAME=1.5 All others ND<1.0
8/17/2004		130.57	8.43	470	—	ND<0.50	ND<0.50	ND<0.50	ND<0.50	430	TAME=4.4 All others ND<1.0-50

NOTES:
Wells re-surveyed 8/15/02 by R. Smith, LS, using Caltrans HPGN monument "D CA 01 NC" south of Rio Dell @ Jordan Road/Hwy 254 (Pepperwood) off-ramp

TABLE 2: HISTORIC GRADIENT DATA
Former Rio Dell Texaco, 100 Wildwood Ave., Rio Dell, CA
LACO No. 3554.03; LOP No. 12691

Date	North		South	
	Gradient	Slope	Gradient	Slope
6/30/2000	S68W	6.20%	---	---
7/31/2000	S78W	4.70%	---	---
8/30/2000	S33W	8.20%	---	---
9/22/2000	S52E	0.60%	---	---
10/26/2000	S40E	0.70%	---	---
11/24/2000	S34E	8.20%	S61E	6.40%
12/12/2000	S27E	8.30%	S45E	10.50%
1/12/2001	S33E	7.80%	S44E	8.80%
2/22/2001	S32E	6.70%	S40E	7.80%
4/5/2001	S30E	7.10%	S47E	8.40%
5/2/2001	S30E	6.80%	S48E	8.20%
5/22/2001	S41E	5.80%	S52E	6.20%
6/11/2001	S42E	6.20%	S46E	7.10%
7/6/2001	S34E	6.20%	S52E	7.00%
9/4/2001	S34E	5.50%	S54E	7.30%
11/29/2001	S26E	8.80%	---	---
2/28/2002	S35E	3.90%	---	---
5/20/2002	S63E	6.40%	---	---
8/8/2002	S35E	6.50%	---	---
12/6/2002	S35E	7.30%	---	---
2/24/2003	S35E	6.40%	---	---
5/15/2003	S35E	7.20%	---	---
8/11/2003	S30E	6.30%	---	---
11/11/2003	S31E	8.94%	---	---

Attachment 2

Field Notes

CONSULTING ENGINEERS & GEOLOGISTS, INC.
480 Hemsted Drive • Redding, CA 96002• Tel: 530.221.5424 • FAX: 530.221.0135 •E-mail: shninfo@shn-redding.com
812 W. Wabash • Eureka, CA 95501 • Tel: 707.441.8855 • FAX: 707.441.8877 •E-mail: shninfo@shn-engr.com

DAILY FIELD REPORT

JOB NO 004323

PROJECT NAME: Rio Dell Texaco	CLIENT/OWNER: Dorothy Bianchi	DAILY FIELD REPORT SEQUENCE NO: 1
GENERAL LOCATION OF WORK: Rio Dell, CA	OWNER/CLIENT REPRESENTATIVE: Dorothy Bianchi	DATE: 11-4-05 / DAY OF WEEK: Friday
TYPE OF WORK: Quarterly sampling	WEATHER: Overcast	PROJECT ENGINEER/ SUPERVISOR: Roland Rueber
SOURCE & DESCRIPTION OF FILL MATERIAL	KEY PERSONS CONTACTED	TECHNICIAN: David R. Paine

DESCRIBE EQUIPMENT USED FOR HAULING, SPREADING, WATERING, CONDITIONING, & COMPACTING

0859 arrived at site, Removed lids and caps on all 4 wells.
0937 I started taking water level Readings deconing the sounder after each well by scrubbing it with liquinox then Rinsing it with DI water, I can't take DO Readings as my DO meter got water inside it yesterday, Roland says I can skip it this time
0956 I started purging mw-3 with a disposable bailer purge water was caught in a graduated 4 gal. bucket, well went dry.
1025 I started purging mw-2 with a disposable bailer, purge water was caught in a graduated 4 gal. bucket.
1100 I sampled mw-3, secured well with cap and lid.
1105 I started purging mw-1 with a disposable bailer, purge water was caught in a graduated 4 gal. bucket.
1130 I sampled mw-2, secured well with cap and lid.
1139 I started purging mw-4 with a disposable bailer, purge water was caught in a graduated 4 gal. bucket.
1210 I sampled mw-1, secured well with cap and lid.
1220 I sampled mw-4, secured well with cap and lid.
1234 OFF SITE

Note: All decon water and purge water was caught in 5 gal. buckets with lids, then transported to SHN's 1,000 gal. PWST located at 812 W. Wabash Avenue Eureka, CA 20 gallons total.

COPY GIVEN TO:

REPORTED BY: David R. Paine

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Groundwater Elevations

Job No.: 004323
Name: David R. Paine
Client: Dorothy Bianchi
Date: 11-4-05
Location: Former Rio Dell Texaco
Weather: Overcast

Sample Location	Time of Reading	Top of Casing Elevation (feet)	Depth To Water (feet)	Water Surface Elevation (feet)
MW-1	0941	139.06	10.67	128.39
MW-2	0939	139.83	6.90	132.93
MW-3	0937	139.87	4.43	135.44
MW-4	0943	139.00	8.92	130.08

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EQUIPMENT CALIBRATION SHEET

Name: David R. Paine

Project Name: Rio Dell Texaco

Reference No.: 004323

Date: 11-4-05

Equipment: ☒ pH & EC ☐ PID ☐ $GTCO_2$ ☐ GTLEL
☐ Turbidity ☒ Other Dissolved Oxygen Meter YSI95

Description of Calibration Procedure and Results:

pH & Ec meter is calibrated using a 2 buffer method with 7.01 and 4.01, the Ec (conductivity) is set at 1413 µS.

DO meter is self calibrating with the Altimeter set at 1.

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Water Sampling Data Sheet

Project Name: Rio Dell Texaco
Date/Time: 11-4-05
Project No.: 004323
Sampler Name: David R. Paine
Location: Rio Dell, CA
Sample Type: Ground water
Well #: MW-3
Weather: Overcast
Hydrocarbon Thickness/Depth (feet): NA
Key Needed: YES Dolphin

Total Well Depth (feet)	-	Initial Depth to Water (feet)	=	Height of Water Column (feet)	x	0.163 gal/ft (2-inch well) / 0.653 gal/ft (4-inch well)	=	1 Casing Volume (gal)
14.96	-	4.43	=	10.53	x	0.163	=	1.72

Time	DO (ppm)	CO_2 (ppm)	ORP (mV)	EC (uS/cm)	Temp (°F)	pH	Water Removed (gal)	Comments
0954							0 gal	
0956		30	155				0.25 gal.	
1004				243	68°	6.19	1.25 gal.	
1009	No Flow			243	67.9°	6.24	3.50 gal.	
1014	thru cell			244	67.8°	6.31	5.25 gal.	
1023				245	66.9°	6.44	6.50 gal.	Dry
1040				242	66.8°	6.54	7.50 gal.	Dry
1100	Sample Time							

Purge Method: Hand Bail
Total Volume Removed: 7.50 (gal)

Laboratory Information

Sample ID	# & Type of Containers	Preservative / Type	Laboratory	Analyses
MW-3	3-40ml VOA's	YES HCL	NCL	8260 list 1

Well Condition: Good
Remarks:
Recharged to 11.25 at sampling Time

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Water Sampling Data Sheet

Project Name: Rio Dell Texaco
Date/Time: 11-4-05
Project No.: 004323
Sampler Name: David R. Paine
Location: Rio Dell, CA
Sample Type: Ground water
Well #: MW-2
Weather: Overcast
Hydrocarbon Thickness/Depth (feet): NA
Key Needed: YES Dolphin

Total Well Depth (feet)	-	Initial Depth to Water (feet)	=	Height of Water Column (feet)	x	0.163 gal/ft (2-inch well) / 0.653 gal/ft (4-inch well)	=	1 Casing Volume (gal)
15.00	-	6.90	=	8.10	x	0.163	=	1.32

Time	DO (ppm)	CO_2 (ppm)	ORP (mV)	EC (uS/cm)	Temp (°F)	pH	Water Removed (gal)	Comments
1025							0 gal	
1025		60	146				0.25 gal.	
1033				494	62.9°	6.49	1.50 gal.	
1044	No Flow			507	62.9°	6.54	2.25 gal.	
1051	thru cell			498	62.9°	6.54	4 gal.	
1130	Sample Time							

Purge Method: Hand Bail
Total Volume Removed: 4.00 (gal)

Laboratory Information

Sample ID	# & Type of Containers	Preservative / Type	Laboratory	Analyses
MW-2	3 - 40ml VOA's	YES HCL	NCL	8260 list 1

Well Condition: Good

Remarks:

Recharged to 10.28 at sampling Time

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Water Sampling Data Sheet

Project Name: Rio Dell Texaco
Date/Time: 11-4-05
Project No.: 004323
Sampler Name: David R. Paine
Location: Rio Dell, CA
Sample Type: Ground water
Well #: MW-1
Weather: Overcast
Hydrocarbon Thickness/Depth (feet): NA
Key Needed: YES Dolphin

Total Well Depth (feet)	-	Initial Depth to Water (feet)	=	Height of Water Column (feet)	x	0.163 gal/ft (2-inch well) / 0.653 gal/ft (4-inch well)	=	1 Casing Volume (gal)
15.07	-	10.67	=	4.40	x	0.163	=	0.72

Time	DO (ppm)	CO_2 (ppm)	ORP (mV)	EC (uS/cm)	Temp (°F)	pH	Water Removed (gal)	Comments
1105							0 gal	
1105		40	127				0.25 gal.	
1113				428	64.7°	6.39	0.75 gal.	
1117	No Flow			427	64.6°	6.43	1.50 gal.	
1125	thru cell			429	64.5°	6.46	2.25 gal.	
1210	Sample Time							

Purge Method: Hand Bail
Total Volume Removed: 2.25 (gal)

Laboratory Information

Sample ID	# & Type of Containers	Preservative / Type	Laboratory	Analyses
MW-1	3 - 40ml VOA's	YES HCL	NCL	8260 list 1

Well Condition: Good

Remarks:

Recharged to 11.25 at sampling Time

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Water Sampling Data Sheet

Project Name: Rio Dell Texaco
Date/Time: 11-4-05
Project No.: 004323
Sampler Name: David R. Paine
Location: Rio Dell, CA
Sample Type: Ground water
Well #: MW-4
Weather: Overcast
Hydrocarbon Thickness/Depth (feet): NA
Key Needed: YES Dolphin

Total Well Depth (feet)	-	Initial Depth to Water (feet)	=	Height of Water Column (feet)	x	0.163 gal/ft (2-inch well) / 0.653 gal/ft (4-inch well)	=	1 Casing Volume (gal)
14.92	-	8.92	=	6.00	x	0.163	=	0.98

Time	DO (ppm)	CO_2 (ppm)	ORP (mV)	EC (uS/cm)	Temp (°F)	pH	Water Removed (gal)	Comments
1139							0 gal	
1139		100	131				0.25 gal.	
1150				814	68.3°	6.45	1 gal.	
1154	No Flow			821	68.3°	6.47	2 gal.	
1200	thru cell			855	67.6°	6.54	3 gal.	
1220	Sample Time							

Purge Method: Hand Bail
Total Volume Removed: 3.00 (gal)

Laboratory Information

Sample ID	# & Type of Containers	Preservative / Type	Laboratory	Analyses
MW-4	3 - 40ml VOA's	YES HCL	NCL	8260 list 1

Well Condition: Good
Remarks:
Recharged to 13.15 at sampling Time

NORTH COAST LABORATORIES LTD.
5680 West End Road • Arcata • CA 95521-9202
707-822-4649 Fax 707-822-6831

Chain of Custody

Attention:
Results & Invoice to: Dorothy Bianchi
Address: 1155 Hilton Road
McKinleyville, CA 95517
Phone: 839-3089
Copies of Report to: SHI Roland Rueber
812 W. Wabash Ave. Eureka, CA 95501
Sampler (Sign & Print): David R. Paine David R. Paine

PROJECT INFORMATION
Project Number: 004323
Project Name: Rio Dell Texaco
Purchase Order Number:

LAB ID	SAMPLE ID	DATE	TIME	MATRIX*	ANALYSIS 8260 list 1	CONTAINER 9	PRESERVATIVE b
	MW-3	11/4/05	1100	GW	X		
	MW-2	↓	1130	↓	X		
	MW-1	↓	1210	↓	X		
	MW-4	↓	1220	↓	X		

RELINQUISHED BY (Sign & Print)	DATE/TIME	RECEIVED BY (Sign)	DATE/TIME
David R. Paine David R. Paine	11/4/05	[signature]	11/4/05 1342

LABORATORY NUMBER:

TAT: ☐ 24 Hr ☐ 48 Hr ☐ 5 Day ☐ 5–7 Day
☒ STD (2–3 Wk) ☐ Other:
PRIOR AUTHORIZATION IS REQUIRED FOR RUSHES

REPORTING REQUIREMENTS: State Forms ☐
Preliminary: FAX ☐ Verbal ☐ By: __/__/__
Final Report: FAX ☐ Verbal ☐ By: __/__/__

CONTAINER CODES: 1—½ gal. pl; 2—250 ml pl; 3—500 ml pl; 4—1 L Nalgene; 5—250 ml BG; 6—500 ml BG; 7—1 L BG; 8—1 L cg; 9—40 ml VOA; 10—125 ml VOA; 11—4 oz glass jar; 12—8 oz glass jar; 13—brass tube; 14—other

PRESERVATIVE CODES: a—HNO_3; b—HCl; c—H_2SO_4; d—$Na_2S_2O_3$; e—NaOH; f—$C_2H_3O_2Cl$; g—other

SAMPLE CONDITION/SPECIAL INSTRUCTIONS
EDF
Global ID # T0602300490
cold intact

SAMPLE DISPOSAL
☒ NCL Disposal of Non-Contaminated
☐ Return ☐ Pickup

CHAIN OF CUSTODY SEALS Y/N/NA
SHIPPED VIA: UPS Air-Ex Fed-Ex Bus Hand

***MATRIX:** DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT

Attachment 3

Historic Monitoring Data Collected by SHN

Table 3-1
Historic Groundwater Elevations
Former Rio Dell Texaco; Rio Dell, California

Sample Location	Date	Top of Casing Elevation (feet)[1]	Depth to Water (feet)[2]	Groundwater Elevation (feet)[1]
MW-1	02/11/05	139.06	7.98	131.08
	05/13/05		7.68	131.38
	08/23/05		9.36	129.70
	11/04/05		10.67	128.39
MW-2	02/11/05	139.83	4.84	134.99
	05/13/05		4.43	135.40
	08/23/05		5.77	134.06
	11/04/05		6.90	132.93
MW-3	02/11/05	139.87	2.50	137.37
	05/13/05		2.11	137.76
	08/23/05		4.71	135.16
	11/04/05		4.43	135.44
MW-4	02/11/05	139.00	8.03	130.97
	05/13/05		8.88	130.12
	08/23/05		9.66	129.34
	11/04/05		8.92	130.08

1. Referenced to NAVD88 (North American Vertical Datum 1988)
2. Below top of casing

Table 3-2
Historic Groundwater Analytical Results
Former Rio Dell Texaco; Rio Dell, California
(in ug/L)[1]

Sample Location	Date	TPHG[2]	B[2]	T[2]	E[2]	X[2]	MTBE[2]	TBA[2]	DIPE[2]	ETBE[2]	TAME[2]
MW-1	02/11/05	**57**[3]	<0.50[4]	<0.50	<0.50	<0.50	**46**	<10	<1.0	<1.0	<1.0
	05/13/05	<50	<0.50	<0.50	<0.50	<0.50	**67**	<20	<1.0	<1.0	<1.0
	08/23/05	**86**[3]	<0.50	<0.50	<0.50	<0.50	**96**	<10	<1.0	<1.0	<1.0
	11/04/05	**86**[3]	<0.50	<0.50	<0.50	<0.50	**94**	<10	<1.0	<1.0	<1.0
MW-2	02/11/05	<50	<0.50	<0.50	<0.50	<0.50	**17**	<10	<1.0	<1.0	**1.2**
	05/13/05	<50	<0.50	<0.50	<0.50	<0.50	**18**	<10	<1.0	<1.0	**2.0**
	08/23/05	**66**[3]	<0.50	<0.50	<0.50	<0.50	**60**	<10	<1.0	<1.0	**2.5**
	11/04/05	<50	<0.50	<0.50	<0.50	<0.50	**18**	<10	<1.0	<1.0	**1.6**
MW-3	02/11/05	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<10	<1.0	<1.0	<1.0
	05/13/05	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<10	<1.0	<1.0	<1.0
	08/23/05	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<10	<1.0	<1.0	<1.0
	11/04/05	<50	<0.50	<0.50	<0.50	<0.50	<1.0	<10	<1.0	<1.0	<1.0
MW-4	02/11/05	**500**[3]	<0.50	<0.50	<0.50	<0.50	**470**	**30**	<1.0	<1.0	**4.4**
	05/13/05	**570**[3]	<0.50	<0.50	<0.50	<0.50	**530**	**45**	<1.0	<1.0	**6.2**
	08/23/05	**490**[3]	<0.50	<0.50	<0.50	<0.50	**520**	<10	<1.0	<1.0	**5.6**
	11/04/05	**420**[3]	<0.50	<0.50	<0.50	<0.50	**410**	<10	<1.0	<1.0	**4.6**

1. ug/L: micrograms per Liter
2. Total Petroleum Hydrocarbons as Gasoline (TPHG), Benzene (B), Toluene (T), Ethylbenzene (E), total Xylenes (X), Methyl Tertiary-Butyl Ether (MTBE), Tertiary-Butyl Alcohol (TBA), Di-isopropyl Ether (DIPE), Ethyl Tertiary-Butyl Ether (ETBE), and Tertiary-Amyl Methyl Ether (TAME), analyzed in general accordance with United States Environmental Protection Agency (EPA) Method No. 8260B
3. The gasoline values are primarily from the reported gasoline additives.
4. <: Denotes a value that is "less than" the method detection limit.

Table 3-3
Historic DO, DCO_2, and ORP Measurement Results
Former Rio Dell Texaco; Rio Dell, California

Sample Location	Date	DO[1] (ppm)[2]	DCO_2[3] (ppm)	ORP[4] (mV)[5]
MW-1	02/11/05	0.75	50	136
	05/13/05	1.44	60	241
	08/23/05	2.04	60	199
	11/04/05	NM	40	127
MW-2	02/11/05	0.67	60	155
	05/13/05	0.60	70	226
	08/23/05	0.75	50	183
	11/04/05	NM	60	146
MW-3	02/11/05	0.76	35	167
	05/13/05	1.16	40	207
	08/23/05	0.88	35	144
	11/04/05	NM	30	155
MW-4	02/11/05	0.85	160	98
	05/13/05	0.56	180	229
	08/23/05	0.76	130	188
	11/04/05	NM	100	131

1. DO: Dissolved Oxygen, field measured using portable instrumentation
2. ppm: parts per million
3. DCO_2: Dissolved Carbon Dioxide, field measured using a field test kit
4. ORP: Oxidation-Reduction Potential measured using portable instrumentation
5. mV: millivolts

Table 3-4
Groundwater Geochemical Analytical Results, August 23, 2005
Former Rio Dell Texaco; Rio Dell, California

Sample Location	Dissolved Iron (ug/L)[1]	Dissolved Manganese (ug/L)	Nitrate (mg/L)[2]	Sulfate (mg/L)	Total Alkalinity (mg/L)
MW-1	**150**	**24**	**3.0**	**18**	**170**
MW-2	<100[3]	**1,700**	**0.15**	**34**	**250**
MW-3	<100	**51**	**0.97**	**24**	**97**
MW-4	**810**	**1,800**	<0.10	**7.5**	**460**

1. ug/L: micrograms per liter
2. mg/L: milligrams per liter
3. <: Denotes a value that is "less than" the method detection limit.

Attachment 4

Laboratory Analytical Report

NORTH COAST LABORATORIES LTD.

November 17, 2005

Pvt. cust. paying on pickup

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Attn: Dorothy Bianchi

RE: 004323, Rio Dell Texaco

Order No.: 0511098
Invoice No.: 54363
PO No.:
ELAP No. 1247-Expires July 2006

SAMPLE IDENTIFICATION

Fraction	Client Sample Description
01A	MW-3
02A	MW-2
03A	MW-1
04A	MW-4

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

REPORT CERTIFIED BY

Colleen Blackstone (for SKD)

Laboratory Supervisor(s)

QA Unit

Jesse G. Chaney, Jr.
Laboratory Director

5680 West End Road • Arcata California 95521-9202 • 707-822-4649 • FAX 707-822-6831

Printed on Recycled Paper

North Coast Laboratories, Ltd. **Date:** *17-Nov-05*

CLIENT: Pvt. cust. paying on pickup
Project: 004323, Rio Dell Texaco
Lab Order: 0511098

CASE NARRATIVE

Gasoline Components/Additives:
The gasoline values for samples MW-1 and MW-4 are primarily from the reported oxygenates.

Date: 17-Nov-05
WorkOrder: 0511098

ANALYTICAL REPORT

Client Sample ID: MW-3 **Received:** 11/4/05 **Collected:** 11/4/05 11:00
Lab ID: 0511098-01A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		11/16/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		11/16/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		11/16/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		11/16/05
Benzene	ND	0.50	µg/L	1.0		11/16/05
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		11/16/05
Toluene	ND	0.50	µg/L	1.0		11/16/05
Ethylbenzene	ND	0.50	µg/L	1.0		11/16/05
m,p-Xylene	ND	0.50	µg/L	1.0		11/16/05
o-Xylene	ND	0.50	µg/L	1.0		11/16/05
Surrogate: 1,4-Dichlorobenzene-d4	107	80.8-139	% Rec	1.0		11/16/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	50	µg/L	1.0		11/16/05

Client Sample ID: MW-2 **Received:** 11/4/05 **Collected:** 11/4/05 11:30
Lab ID: 0511098-02A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	18	1.0	µg/L	1.0		11/16/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		11/16/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		11/16/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		11/16/05
Benzene	ND	0.50	µg/L	1.0		11/16/05
Tert-amyl methyl ether (TAME)	1.6	1.0	µg/L	1.0		11/16/05
Toluene	ND	0.50	µg/L	1.0		11/16/05
Ethylbenzene	ND	0.50	µg/L	1.0		11/16/05
m,p-Xylene	ND	0.50	µg/L	1.0		11/16/05
o-Xylene	ND	0.50	µg/L	1.0		11/16/05
Surrogate: 1,4-Dichlorobenzene-d4	107	80.8-139	% Rec	1.0		11/16/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	50	µg/L	1.0		11/16/05

Date: 17-Nov-05
WorkOrder: 0511098

ANALYTICAL REPORT

Client Sample ID: MW-1 **Received:** 11/4/05 **Collected:** 11/4/05 12:10
Lab ID: 0511098-03A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	94	1.0	µg/L	1.0		11/16/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		11/16/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		11/16/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		11/16/05
Benzene	ND	0.50	µg/L	1.0		11/16/05
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		11/16/05
Toluene	ND	0.50	µg/L	1.0		11/16/05
Ethylbenzene	ND	0.50	µg/L	1.0		11/16/05
m,p-Xylene	ND	0.50	µg/L	1.0		11/16/05
o-Xylene	ND	0.50	µg/L	1.0		11/16/05
Surrogate: 1,4-Dichlorobenzene-d4	108	80.8-139	% Rec	1.0		11/16/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	86	50	µg/L	1.0		11/16/05

Client Sample ID: MW-4 **Received:** 11/4/05 **Collected:** 11/4/05 12:20
Lab ID: 0511098-04A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	410	50	µg/L	50		11/15/05
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		11/16/05
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		11/16/05
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		11/16/05
Benzene	ND	0.50	µg/L	1.0		11/16/05
Tert-amyl methyl ether (TAME)	4.6	1.0	µg/L	1.0		11/16/05
Toluene	ND	0.50	µg/L	1.0		11/16/05
Ethylbenzene	ND	0.50	µg/L	1.0		11/16/05
m,p-Xylene	ND	0.50	µg/L	1.0		11/16/05
o-Xylene	ND	0.50	µg/L	1.0		11/16/05
Surrogate: 1,4-Dichlorobenzene-d4	108	80.8-139	% Rec	1.0		11/16/05

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	420	50	µg/L	1.0		11/16/05

North Coast Laboratories, Ltd.

Date: 17-Nov-05

CLIENT: Pvt. cust. paying on pickup
Work Order: 0511098
Project: 004323, Rio Dell Texaco

QC SUMMARY REPORT

Method Blank

Sample ID: **MB 111505** Batch ID: **R38071** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **11/15/05 5:18:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS3_051115B** SeqNo: **548019**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	1.0									
Tert-butyl alcohol (TBA)	ND	10									
Di-isopropyl ether (DIPE)	ND	1.0									
Ethyl tert-butyl ether (ETBE)	ND	1.0									
Benzene	ND	0.50									
Tert-amyl methyl ether (TAME)	ND	1.0									
Toluene	ND	0.50									
Ethylbenzene	0.09259	0.50									J
m,p-Xylene	0.1851	0.50									J
o-Xylene	ND	0.50									
1,4-Dichlorobenzene-d4	1.06	0.10	1.00	0	106%	81	139	0			

Sample ID: **MB 111505** Batch ID: **R38070** Test Code: **GASW-MS** Units: **µg/L** Analysis Date: **11/15/05 5:18:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS3_051115A** SeqNo: **547995**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	20.21	50									J

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

North Coast Laboratories, Ltd.

Date: 17-Nov-05

CLIENT: Pvt. cust. paying on pickup
Work Order: 0511098
Project: 004323, Rio Dell Texaco

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID: **LCS-05730** Batch ID: **R38071** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **11/15/05 2:45:00 AM** Prep Date:

Client ID: Run ID: **ORGCMS3_051115B** SeqNo: **548017**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	18.13	1.0	20.0	0	90.6%	80	120	0			
Tert-butyl alcohol (TBA)	374.1	10	400	0	93.5%	25	162	0			
Di-isopropyl ether (DIPE)	18.24	1.0	20.0	0	91.2%	80	120	0			
Ethyl tert-butyl ether (ETBE)	18.02	1.0	20.0	0	90.1%	77	120	0			
Benzene	19.24	0.50	20.0	0	96.2%	78	117	0			
Tert-amyl methyl ether (TAME)	17.91	1.0	20.0	0	89.6%	64	136	0			
Toluene	19.67	0.50	20.0	0	98.3%	80	120	0			
Ethylbenzene	18.95	0.50	20.0	0	94.8%	80	120	0			
m,p-Xylene	38.31	0.50	40.0	0	95.8%	80	120	0			
o-Xylene	18.08	0.50	20.0	0	90.4%	80	120	0			
1,4-Dichlorobenzene-d4	1.12	0.10	1.00	0	112%	81	139	0			

Sample ID: **LCSD-05730** Batch ID: **R38071** Test Code: **8260OXYW** Units: **µg/L** Analysis Date: **11/15/05 10:27:00 AM** Prep Date:

Client ID: Run ID: **ORGCMS3_051115B** SeqNo: **548026**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	17.36	1.0	20.0	0	86.8%	80	120	18.1	4.31%	20	
Tert-butyl alcohol (TBA)	364.1	10	400	0	91.0%	25	162	374	2.70%	20	
Di-isopropyl ether (DIPE)	17.71	1.0	20.0	0	88.5%	80	120	18.2	2.95%	20	
Ethyl tert-butyl ether (ETBE)	16.75	1.0	20.0	0	83.7%	77	120	18.0	7.32%	20	
Benzene	19.09	0.50	20.0	0	95.5%	78	117	19.2	0.787%	20	
Tert-amyl methyl ether (TAME)	16.45	1.0	20.0	0	82.2%	64	136	17.9	8.54%	20	
Toluene	19.89	0.50	20.0	0	99.4%	80	120	19.7	1.13%	20	
Ethylbenzene	18.58	0.50	20.0	0	92.9%	80	120	19.0	1.97%	20	
m,p-Xylene	38.65	0.50	40.0	0	96.6%	80	120	38.3	0.903%	20	
o-Xylene	17.33	0.50	20.0	0	86.6%	80	120	18.1	4.26%	20	
1,4-Dichlorobenzene-d4	1.15	0.10	1.00	0	115%	81	139	1.12	2.65%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Pvt. cust. paying on pickup
Work Order: 0511098
Project: 004323, Rio Dell Texaco

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID: **LCS-05731** Batch ID: **R38070** Test Code: **GASW-MS** Units: **µg/L** Analysis Date: **11/15/05 4:02:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS3_051115A** SeqNo: **547993**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	913.6	50	1,000	0	91.4%	80	120	0			

Sample ID: **LCSD-05731** Batch ID: **R38070** Test Code: **GASW-MS** Units: **µg/L** Analysis Date: **11/15/05 10:52:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS3_051115A** SeqNo: **547999**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	881.7	50	1,000	0	88.2%	80	120	914	3.55%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

NORTH COAST LABORATORIES LTD.
5680 West End Road • Arcata • CA 95521-9202
707-822-4649 Fax 707-822-6831

Chain of Custody

LABORATORY NUMBER: 0511098

Attention:
Results & Invoice to: Dorothy Bianchi
Address: 1155 Hillen Road
McKinleyville, CA 95517
Phone: 839-3089
Copies of Report to: SHN Roland Rueber
812 W. Wabash Ave. Eureka, CA 95501
Sampler (Sign & Print): David R. Paine David R. Paine

TAT: ☐ 24 Hr ☐ 48 Hr ☐ 5 Day ☐ 5–7 Day
☒ STD (2–3 Wk) ☐ Other:
PRIOR AUTHORIZATION IS REQUIRED FOR RUSHES

REPORTING REQUIREMENTS: State Forms ☐
Preliminary: FAX ☐ Verbal ☐ By: __/__/__
Final Report: FAX ☐ Verbal ☐ By: __/__/__

CONTAINER CODES: 1—½ gal. pl; 2—250 ml pl; 3—500 ml pl; 4—1 L Nalgene; 5—250 ml BG; 6—500 ml BG; 7—1 L BG; 8—1 L cg; 9—40 ml VOA; 10—125 ml VOA; 11—4 oz glass jar; 12—8 oz glass jar; 13—brass tube; 14—other

PRESERVATIVE CODES: a—HNO_3; b—HCl; c—H_2SO_4; d—$Na_2S_2O_3$; e—NaOH; f—$C_2H_3O_2Cl$; g—other

PROJECT INFORMATION
Project Number: 004323
Project Name: Rio Dell Texaco
Purchase Order Number:

LAB ID	SAMPLE ID	DATE	TIME	MATRIX*	PRESERVATIVE	CONTAINER	ANALYSIS: 8260 list 1
	MW-3	11/4/05	1100	GW	b	9	X
	MW-2	↓	1130	↓			X
	MW-1	↓	1210	↓			X
	MW-4	↓	1220	↓			X

SAMPLE CONDITION/SPECIAL INSTRUCTIONS
EDF
Global ID # T0602300490
cold, intact

RELINQUISHED BY (Sign & Print)	DATE/TIME	RECEIVED BY (Sign)	DATE/TIME
David R. Paine David R. Paine	11/4/05 1300	R Thompson	11/4/05 1342

SAMPLE DISPOSAL
☒ NCL Disposal of Non-Contaminated
☐ Return ☐ Pickup

CHAIN OF CUSTODY SEALS Y/N/NA
SHIPPED VIA: UPS Air-Ex Fed-Ex Bus (Hand)

***MATRIX:** DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT