

Site# 922

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ENVIRONMENTAL
 PROTECTION
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GROUNDWATER MONITORING REPORT
June 1997

1107 Fifth Street
 Oakland, California
 94607

August 8, 1997
 W.A. Craig, Inc.
 Project No. 3628

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3628

Project No.

Mr. Reed Rinehart
Rino Pacific, Inc.
Ukiah, California 95482

Subject: REPORT - Groundwater Monitoring
June 1997
1107 Fifth Street
Oakland, California

Dear Mr. Rinehart:

W. A. Craig, Inc. (WAC), is pleased to submit this Groundwater Monitoring Report for sampling conducted on June 12, 1997 at 1107 Fifth Street in Oakland, California. The site location is shown on **Figure 1**. This work was performed in accordance with the scope of work presented in WAC's Work Plan dated September 16, 1996.

This report includes groundwater quality and elevation data for three groundwater monitoring wells, and two recovery wells at the site. Details of the installation of the monitoring wells are presented in WAC's "Subsurface Investigation Report," dated January 17, 1997.

Scope of Work

The scope of work performed by WAC during this period included the following tasks:

- Measuring static water levels in the monitoring wells;
- Purging and sampling groundwater from the monitoring wells and recovery wells at the site;
- Surveying of recovery well casing elevations;
- Analyzing groundwater samples for total petroleum hydrocarbons as diesel (TPH-d), total petroleum hydrocarbons as gasoline (TPH-g), benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl tert-butyl ether (MTBE); and
- Preparation of this Report.

Groundwater Elevations

On June 12 and June 14, 1997, WAC technical staff measured the water levels in the monitoring wells using an electronic water level indicator. The surveyed elevations and the field water level measurements were used to calculate the groundwater surface elevations at the site. The calculated groundwater gradient and flow direction for June 12, 1997 was 0.020 ft/ft, southwest. The calculated groundwater gradient and flow direction for July 14, 1997 was 0.042 ft/ft, southeast. Groundwater elevations for this and previous monitoring events are presented in **Table 1**. The locations of the monitoring wells and a depiction of the site groundwater elevation contours are shown in **Figure 2**.

Groundwater flow directions have ranged from southwest to southeast. The groundwater direction is largely dependent upon the groundwater elevation in monitoring well MW-3. Depth-to-water measurements have ranged from -3.15 feet to 6.57 feet, MSL. Monitoring well MW-3 has also been identified as being very slow to recover. Monitoring wells MW-1 and MW-2 have displayed a much narrower range of depths, -1.24 feet to 1.56 feet msl, and -0.18 feet to 0.80 msl, respectively.

The monitoring wells have also been noted to release pressure when opened. As a result of this condition, WAC personnel expose the wells to atmospheric conditions and allow water levels to stabilize before measurements are made.

On June 13, 1997, W.A. Craig, Inc. surveyed the top-of-casing elevations for recovery wells RW-W and RW-E. A reference elevation was established on the north side of the PVC casings of both recovery wells. Recovery well elevations were referenced to previously surveyed elevations established for monitoring wells MW-1 and MW-2. The recovery well water elevations were measured on June 13 and July 14, 1997. On both occasions the elevations measured in RW-W were slightly lower than those measured in RW-E.

Water levels in the recovery wells were consistently measured at an approximate depth of approximately 3 feet below grade. The water level in the wells was consistently higher than the elevations measured in the monitoring wells at the site. It appears that the UST area is slightly lower than the surrounding areas and that the surface pavement, concrete and asphalt, is in poor to very poor condition. It appears the mounding effect observed in the recovery wells may be from surface water infiltration in the UST area.

Groundwater Sampling

Three to four well casing volumes were purged from the monitoring wells on June 12, 1997. Because the wells are slow to recover, the wells were purged in the morning and groundwater samples were collected later in the afternoon. Field parameters including temperature, pH, conductivity, and turbidity were intermittently monitored during purging of the well. Groundwater samples were collected using disposable polyethylene bailers. Copies of the field monitoring well sampling logs are included in **Attachment A**. The samples were submitted under chain-of-custody control to McCampbell Analytical, Inc. (MAI), of Pacheco, California. The purged well-water is currently stored on-site in a sealed, DOT approved, 55-

gallon steel drum.

Grab water samples were collected from the recovery wells, RW-E (East) and RW-W (West). A temporary casing was placed into RW-W, through the floating product, in an effort to collect representative samples of the dissolved petroleum hydrocarbon constituent.

Analytical Results

The groundwater samples were analyzed by MAI for gasoline and diesel using EPA Method 8015 (modified) and purgeable aromatic hydrocarbons (BTEX) and MTBE using EPA Method 8020. MAI is certified by the State of California to perform these analyses. The analytical laboratory results are summarized in **Table 2**. Copies of the analytical laboratory report and chain-of-custody documents are in **Attachment B**.

Monitoring Wells

Diesel was detected at concentrations of 290 micrograms per liter (ug/l) in MW-1, 2400 ug/l in MW-2, and 94 ug/l in MW-3. The reported diesel concentrations for samples from monitoring wells MW-1 and MW-2 were slightly higher than previously reported. Diesel was detected at concentrations of 31,000 ug/l in RW-E, and 51,000 ug/l in RW-W.

Gasoline and BTEX were not detected in the samples collected from monitoring wells MW-1 and MW-3 during this round of sampling. These results are consistent with the previous monitoring results. The analytical results of samples collected from monitoring well MW-2 indicate a gasoline concentration of 3,600 ug/l, which is lower than previously detected. Benzene was detected in the samples from monitoring well MW-2 at a concentration of 1,200 ug/l, a decrease since the previous reporting. Toluene, ethylbenzene, and xylene concentrations reported for MW-2 were detected at concentrations slightly lower than previously reported, and remain below California Maximum Contaminant Levels (MCLs) for drinking water.

MTBE was not detected in the sample from monitoring well MW-1 during this and the previous quarter. MTBE concentrations in MW-2 increased this quarter from 760,000 ug/l to 840,000 ug/l. MTBE was detected in groundwater samples from monitoring well MW-3 at a concentration of 17 ug/l, which is an increase from last quarter (13 ug/l).

Free Product Recovery

WAC personnel have intermittently monitored free product in the recovery wells. Product has been recovered from a skimmer placed in recovery well RW-W. The results of the monitoring of the recovery wells is presented in **Table 3**. The recovered product is currently stored in a 55-gallon drum in a secure area of the site. Approximately 3.12 gallons of product has been collected since the installation of the skimmer. Previous product thickness measurements in recovery well RW-W have been relatively consistent, approximately 1/4 inch. Measurements taken in July indicate a slight decrease in product thickness to approximately 0.1 inches.

Conclusions and Recommendations

The groundwater flow direction is generally southerly, but ranges from southwest to southeast. The gradient interpretation assumes hydrologic continuity in the subsurface between the three wells at the site. Groundwater gradient and flow direction on this site appear to be significantly influenced by water levels reported for monitoring well MW-3, and thus have been observed to vary. Monitoring well MW-3 is very slow to recover after purging, indicating the water bearing soil at this location is of low permeability. Additionally, it has been reported that water levels at the site respond to tidal fluctuations. Groundwater elevation data from the recovery wells suggests groundwater mounding in the UST area. The mounding may be from surface water infiltration in this area.

Diesel concentrations in groundwater has remained relatively consistent. High concentrations of gasoline, MTBE, and benzene continue in monitoring well MW-2. High concentrations of the petroleum hydrocarbons in the recovery wells were also noted.

Petroleum hydrocarbons and BTEX concentrations are an order-of-magnitude higher in the recovery wells than has been observed in monitoring well MW-2. Conversely, MTBE concentrations in monitoring well MW-2 are an order of magnitude higher than MTBE concentrations reported in the recovery wells. MTBE has been identified in samples from the recovery wells and monitoring well MW-2 at concentrations higher than have been reported for gasoline.

Observations during drilling indicated generally clayey soil with interbedded sand and silty sand. There may be shallow perched water zones at depths shallower than five feet below the ground surface. The soil boring logs for the site indicate that this interval may be impacted with diesel or gasoline. Static groundwater levels in the recovery wells has generally been shallower than three feet below the ground surface.

Containers located on the south side of the site, east and west of the building at the site, have been removed. The containers were in areas more directly downgradient of the UST area than the existing monitoring wells. Further investigation of the dispenser island area and the former container areas is recommended.

Professional Certification

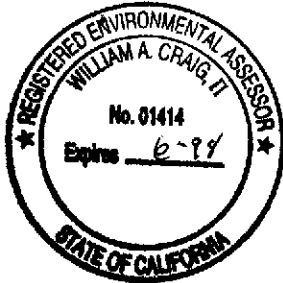
This report has been prepared by the staff of W.A. Craig, Inc., under the professional supervision of the persons whose seals and signatures appear hereon. No warranty, either expressed or implied, is made as to the professional advice presented herein. The analysis, conclusions and recommendations contained in this report are based upon site conditions as they existed at the time of quarterly monitoring and sampling and they are subject to change.


The conclusions presented in this report are professional opinions based solely upon visual observations of the site and vicinity, and interpretation of available information as described in this report. W.A. Craig, Inc., recognizes that the limited scope of services performed in execution of this scope of work may not be appropriate to satisfy the needs, or requirements of other state agencies, or of other users. Any use or reuse of this document or its

findings, conclusions or recommendations presented herein is at the sole risk of the user. There is no other warranty, either expressed or implied.


The next quarterly sampling event is scheduled for September, 1997. We appreciate this opportunity to be of service to you on this project. Should you have any questions regarding this report please call us at (707) 252-3353.

Sincerely,
W.A. Craig, Inc.,




William A. Craig, II, R.E.A. 01414
Principal




Geoffery A. Fiedler, R.G.
Principal Geologist

WAC/ GAF:gaf

Attachments: Table 1 - Groundwater Elevations
Table 2 - Groundwater Sample Analytical Results
Table 3 - Product Recovery Summary
Figure 1 - Site Location Map
Figure 2 - Groundwater Elevation Contour Map for 6/12/97
Figure 3 - Groundwater Elevation Contour Map for 7/14/97
A - Groundwater Sampling Logs
B - Laboratory Analytical Reports

cc: Jennifer Eberle, Alameda County Department of Environmental Health

TABLE 1
Groundwater Elevations
1107 5th Street, Oakland, CA

Well Number	Date	Top of Casing* (ft)	Depth to Water (ft)	Static Water Elevation (ft)
MW-1	10-21-96	3.84	5.08	-1.24
	11-04-96		3.02	0.82
	3-04-97		2.28	1.56
	6-12-97		4.80	-0.96
	7-14-97		2.66	1.18
MW-2	10-21-96	4.48	4.66	-0.18
	11-04-96		4.60	-0.12
	3-04-97		3.68	0.80
	6-12-97		3.70	0.78
	7-14-97		4.16	0.32
MW-3	10-21-96	4.81	7.66	-2.85
	11-04-96		5.70	-0.89
	3-04-97		11.38	-6.57
	6-12-97		5.18	-0.37
	7-14-97		7.96	-3.15
RW-E**	6-13-97	5.26	3.11	2.15
	7-14-97		3.43	1.83
RW-W**	6-13-97	4.65	2.88	1.77
	7-14-97		3.08	1.57

Notes: * Elevations are based upon the City of Oakland Datum #16NW15.

** Elevations surveyed by W.A.Craig, 6-12-97. Referenced to monitoring wells MW-1 and MW-2.

TABLE 2
Groundwater Sample Analytical Results
1107 5th Street, Oakland, California
Analytical Results in micrograms per liter

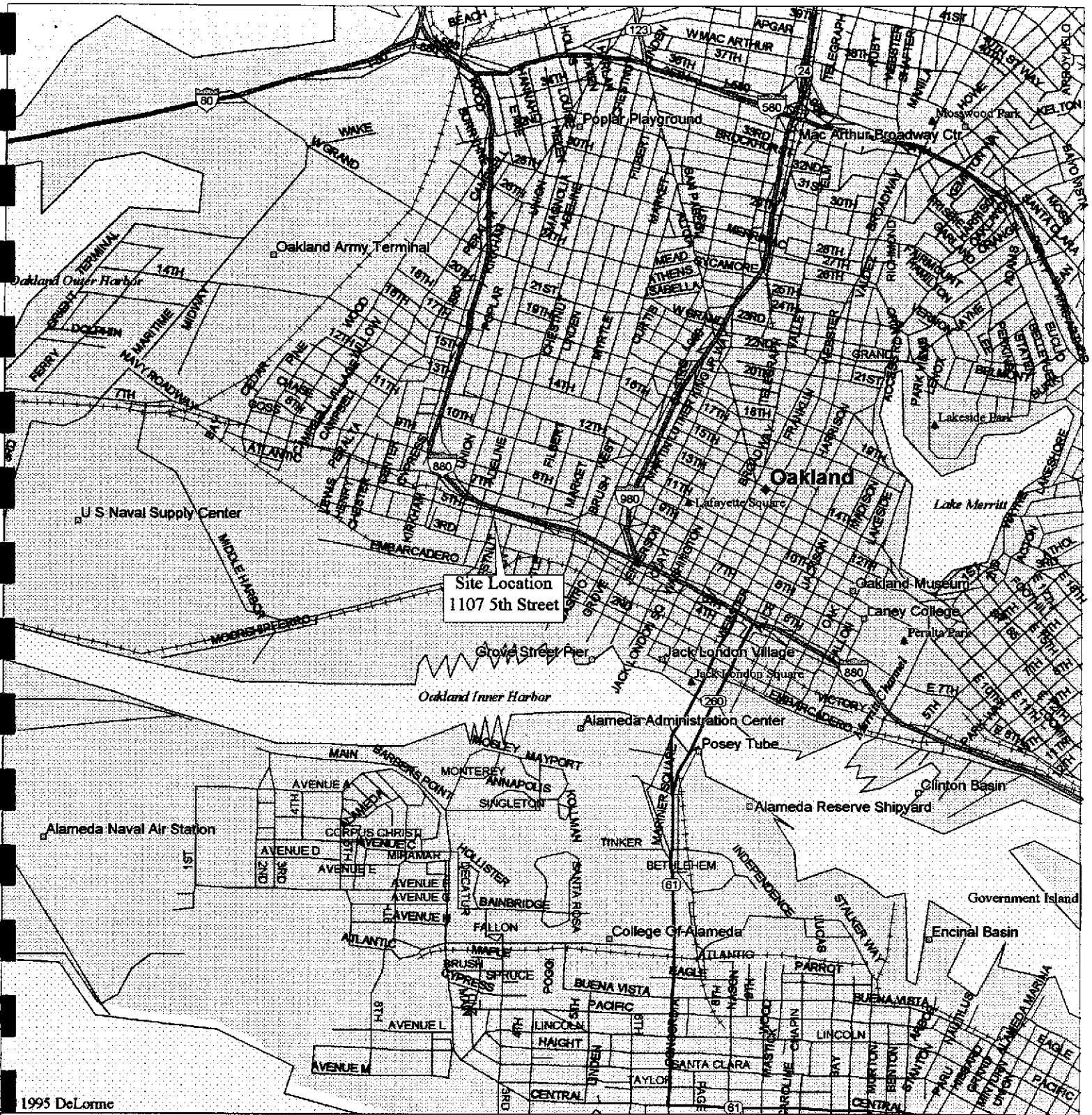
Sample	Date	ANALYTES (ug/l)						
		Diesel	TPH-g	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes
MW-1	11-04-96	220	ND	ND	ND	ND	ND	ND
	3-05-97	230	ND	ND	ND	ND	ND	ND
	6-12-97	290	ND	ND	ND	ND	ND	ND
MW-2	11-04-96	2,700	910	470,000	120	23	3.5	51
	3-05-97	2,300	4,400	760,000	1,500	51	24	100
	6-12-97	2,400	3,600	840,000	1,200	14	12	40
MW-3	11-04-96	310	ND	1,000	ND	ND	ND	ND
	3-05-97	210	ND	13	ND	ND	ND	ND
	6-12-97	94	ND	17	ND	ND	ND	ND
RW-W	6-12-97	51,000	27,000	58,000	4,000	360	860	7,200
RW-E	6-12-97	31,000	31,000	32,000	1,900	3,100	250	12,000
California MCL		None Listed	None Listed	40*	1	150	680	1,750

Notes:

ND = Not detected at the laboratory reported limit of detection.

MCL = Maximum Contaminant Level, Drinking Water Standards and Health Advisories Table, EPA document dated August, 1995.

*California Water Quality Goals-Organic Constituents, Human Health and Welfare, Marshak, September 1991.



1995 DeLorme

Mag 14.00

ue Nov 26 16:02 1996

Scale 1:31,250 (at center)

2000 Feet



Project No: 3628

Date: June 1997

Site Location Map
 Rino Pacific
 1107 5th Street
 Oakland, California

Figure 1

Checked by *SPE/SLP*



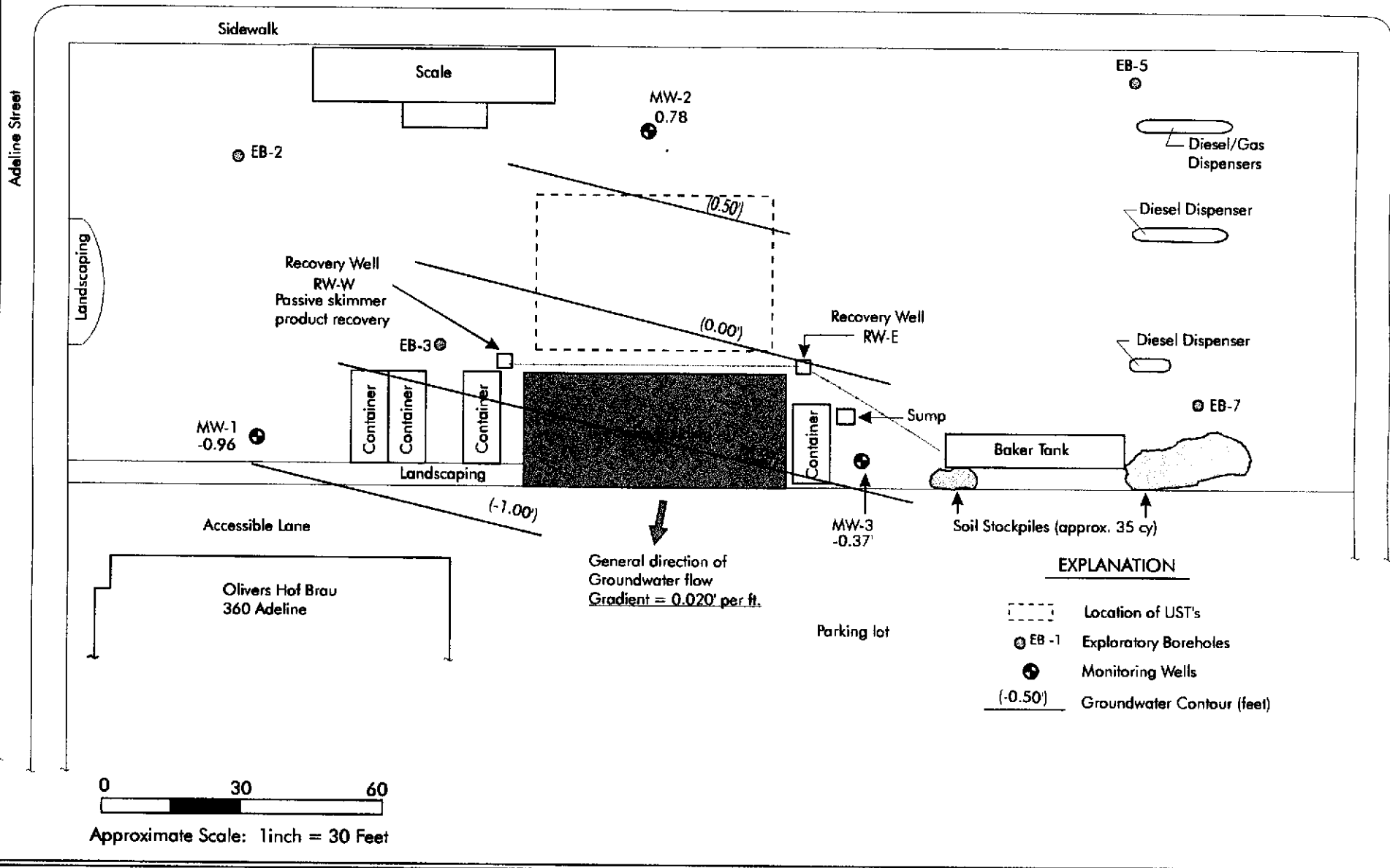
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5th Street



Checked by: GAF e/8/97

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Project No. 3628.2
March 1997

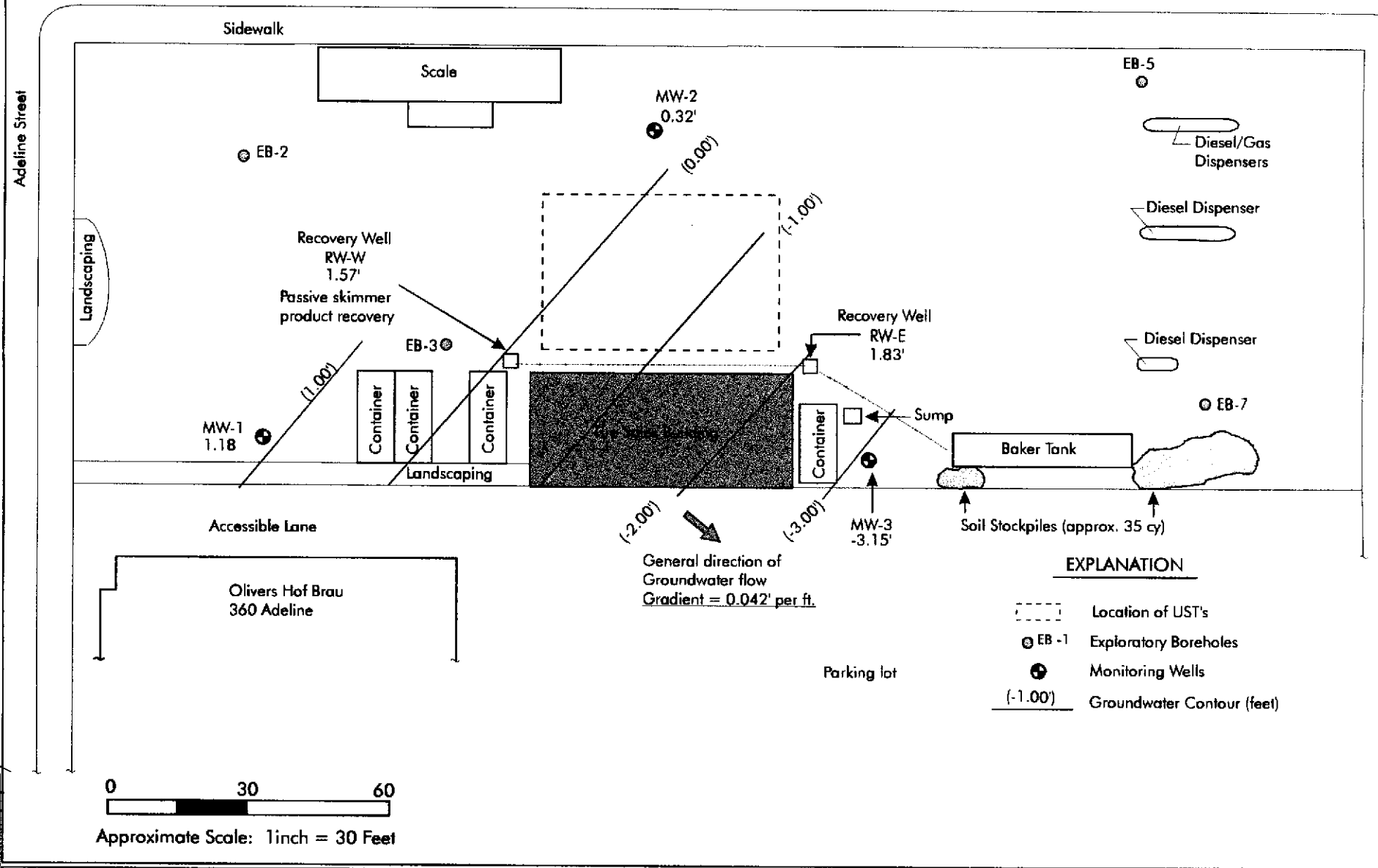
Groundwater Contour 06/12/97

Rino Pacific
1107 5th Street
Oakland, CA

Figure 2



5th Street



Checked by: GAF/BJL/57

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Groundwater Contour 07/14/97
Rino Pacific
1107 5th Street
Oakland, CA

Project No. 3628.2
March 1997

Figure 3

ATTACHMENT A
MONITORING WELL SAMPLING LOGS

**GROUNDWATER SAMPLING
WELL DEVELOPMENT LOG**

WELL NUMBER: RW-W FIELD PERSON(S): GAF
 DATE STARTED: 6/12/97
 TIME STARTED: _____
 DATE COMPLETED: _____
 TIME COMPLETED: _____

Recovery Well Log

JOB NUMBER: 3620
 JOB NAME: Richeart

Russell Gentry

DEPTH TO BOTTOM OR CASING LENGTH		WELL INSIDE DIAMETER	
TOTAL DEPTH TO BOTTOM _____	DEPTH TO WATER _____	Δ (FT) _____	
Δ H (FT) _____	X (V.F.) _____	WELL CASING VOLUME (GAL) _____	
DATE(S) PURGED: _____		WELL DEWATERED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
PURGE METHOD: _____		DATE SAMPLED: <u>6/12/97</u>	
INITIAL DEPTH TO WATER: _____		TIME SAMPLED: <u>19:05</u>	
TOTAL VOLUME REMOVED (GAL): _____		SAMPLING METHOD: <u>Barter</u>	
CASING VOLUMES REMOVED: _____		WEATHER CONDITIONS: <u>Sun, warm</u>	
PURGE RATE (GPM): _____		PURGES/SAMPLED BY: <u>RJ</u>	
DEPTH TO WATER AFTER RECOVERY <u>2.00</u> @ <u>5.55</u> (FT) = _____		% RECOVERED PRIOR TO SAMPLING _____	

FIELD PARAMETERS:

TIME (24 HR CLOCK)	VOLUME REMOVED (GAL)	TEMPERATURE	ELECTRICAL CONDUCTIVITY	PH	TURBIDITY (NTU)

COMMENTS: Product in well ≈ 1" thick (+/- 1/8")
Install 2" PVC (through product w/ cap) for sampling
point in water.
≈ 30" of water in well.

**GROUNDWATER SAMPLING
WELL DEVELOPMENT LOG**

WELL NUMBER: RW-AE
 DATE STARTED: 6/12/97
 TIME STARTED: _____
 DATE COMPLETED: _____
 TIME COMPLETED: _____

FIELD PERSON(S): GAF
Russell Gentry
 JOB NUMBER: 3628
 JOB NAME: Richeart

DEPTH TO BOTTOM OR CASING LENGTH		WELL INSIDE DIAMETER	
TOTAL DEPTH TO BOTTOM _____	DEPTH TO WATER = <u>3.</u> = Δ(FT)	VOLUME FACTOR V.F. = GAL/FT	1"=0.041 4"=0.653 1-1/2"=0.092 6"=1.469 2"=0.163 8"=2.611 3"=0.367 12"=5.875
ΔH (FT) _____	X (V.F.) = _____ = WELL CASING VOLUME (GAL)		
DATE(S) PURGED: _____	PURGE METHOD: _____	WELL DEWATERED	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
INITIAL DEPTH TO WATER: _____	TOTAL VOLUME REMOVED (GAL): _____	DATE SAMPLED:	<u>6/12/97</u>
CASING VOLUMES REMOVED: _____	PURGE RATE (GPM): _____	TIME SAMPLED:	<u>18:52</u>
		SAMPLING METHOD:	<u>Bailey</u>
		WEATHER CONDITIONS:	<u>Sun, warm</u>
		PURGES/SAMPLED BY:	<u>RG</u>
DEPTH TO WATER AFTER RECOVERY <u>3.11 @ 9:50 PM</u> (FT) = _____		% RECOVERED PRIOR TO SAMPLING _____	

FIELD PARAMETERS:

TIME (24 HR CLOCK)	VOLUME REMOVED (GAL)	TEMPERATURE	ELECTRICAL CONDUCTIVITY	PH	TURBIDITY (NTU)

COMMENTS: Sheen on water in well ~ 8" at water level.

GROUNDWATER SAMPLING WELL DEVELOPMENT LOG

WELL NUMBER: MW-3 FIELD PERSON(S): Russell Gentry
 DATE STARTED: 6/12/97
 TIME STARTED: _____ JOB NUMBER: 3628
 DATE COMPLETED: _____ JOB NAME: Riehart
 TIME COMPLETED: _____

DEPTH TO BOTTOM OR CASING LENGTH				WELL INSIDE DIAMETER	
TOTAL DEPTH TO BOTTOM	<u>14.72'</u>	DEPTH TO WATER	<u>5.18'</u>	Δ (FT)	<u>9.54'</u>
Δ H (FT)	<u>9.54</u>	X (V.F.)	<u>0.167</u>	WELL CASING VOLUME (GAL)	<u>1.67</u>
				VOLUME FACTOR	1"=0.041 4"=0.653 1-1/2"=0.092 6"=1.469 2"=0.163 8"=2.611 3"=0.367 12"=5.875
DATE(S) PURGED:					WELL DEWATERED
PURGE METHOD:	<u>Dip. hand barker</u>				<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
INITIAL DEPTH TO WATER:					DATE SAMPLED:
TOTAL VOLUME REMOVED (GAL):	<u>3.0</u>				TIME SAMPLED:
CASING VOLUMES REMOVED:	<u>2</u>				SAMPLING METHOD:
PURGE RATE (GPM):					WEATHER CONDITIONS:
				<u>Sun, warm</u>	
				PURGES/SAMPLED BY:	
				<u>RJ</u>	
DEPTH TO WATER AFTER RECOVERY <u>11.33</u> (FT) = _____ % RECOVERED PRIOR TO SAMPLING					

FIELD PARAMETERS:

TIME (24 HR CLOCK)	VOLUME REMOVED (GAL)	TEMPERATURE	X1000 ELECTRICAL CONDUCTIVITY	PH	TURBIDITY (NTU)
<u>13:05</u>	<u>1.5</u>	<u>76.0</u>	<u>2.49</u>	<u>6.70</u>	<u>Slight</u>
<u>13:10</u>	<u>3.0</u>	<u>70.0</u>	<u>2.39</u>	<u>6.56</u>	<u>Heavy</u>
<u>Well</u>	<u>Dewatered</u>				

COMMENTS: Water, yellow in color, with sulfur odor. Well dewatered at the end of the second casing volume.

GROUNDWATER SAMPLING WELL DEVELOPMENT LOG

WELL NUMBER: MW-2 FIELD PERSON(S): Russell Gentry
 DATE STARTED: 6/12/97
 TIME STARTED: _____ JOB NUMBER: 3628
 DATE COMPLETED: _____ JOB NAME: Rechart
 TIME COMPLETED: _____

DEPTH TO BOTTOM OR CASING LENGTH

TOTAL DEPTH TO BOTTOM 12.86' DEPTH TO WATER 3.70' = Δ(FT) 9.16
 ΔH (FT) 9.16 X (V.F.) = 0.163 WELL CASING VOLUME (GAL) 1.5

WELL INSIDE DIAMETER

VOLUME FACTOR	1"=0.041	4"=0.653
V.F.= GAL/FT	1-1/2"=0.092	6"=1.469
	2"=0.163	8"=2.611
	3"=0.367	12"=5.875

DATE(S) PURGED: _____

PURGE METHOD: Disp. Hand bailer

INITIAL DEPTH TO WATER: _____

TOTAL VOLUME REMOVED (GAL): 4.5

CASING VOLUMES REMOVED: 3*

PURGE RATE (GPM): _____

WELL DEWATERED YES NO

DATE SAMPLED: 6/12/97

TIME SAMPLED: 10:34

SAMPLING METHOD: Bailer

WEATHER CONDITIONS: Sun, warm

PURGES/SAMPLED BY: R.G.

DEPTH TO WATER AFTER RECOVERY 4.29 (FT) = _____ % RECOVERED PRIOR TO SAMPLING

FIELD PARAMETERS:

TIME (24 HR CLOCK)	VOLUME REMOVED (GAL)	TEMPERATURE	X1000 ELECTRICAL CONDUCTIVITY	PH	TURBIDITY (NTU)
12:28	1.5	75.3	3.56	6.66	Medium
12:32	3.0	74.9	3.63	6.51	"
12:36	4.5	73.0	3.69	6.53	Medium

COMMENTS: Sulfur / urine odor, a slight hydrocarbon possibly.
Water is yellow/green color, no sheen.

GROUNDWATER SAMPLING WELL DEVELOPMENT LOG

WELL NUMBER: MW-1 FIELD PERSON(S): Russell Gentry
 DATE STARTED: 6/12/98
 TIME STARTED: _____ JOB NUMBER: 3620
 DATE COMPLETED: _____ JOB NAME: Ribeart
 TIME COMPLETED: _____

DEPTH TO BOTTOM OR CASING LENGTH			WELL INSIDE DIAMETER		
TOTAL DEPTH TO BOTTOM	<u>19.10'</u>	DEPTH TO WATER	<u>4.80'</u>	Δ (FT)	<u>14.30'</u>
Δ H (FT)	<u>14.30'</u>	X (V.F.)	<u>0.163</u>	WELL CASING VOLUME (GAL)	<u>2.3</u>
DATE(S) PURGED: _____			WELL DEWATERED <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
PURGE METHOD: <u>Dis hand bailer</u>			DATE SAMPLED: <u>6/12/98</u>		
INITIAL DEPTH TO WATER: _____			TIME SAMPLED: <u>6:22</u>		
TOTAL VOLUME REMOVED (GAL): <u>6.9</u>			SAMPLING METHOD: <u>Bailer</u>		
CASING VOLUMES REMOVED: <u>3</u>			WEATHER CONDITIONS: <u>Sun, warm</u>		
PURGE RATE (GPM): _____			PURGES/SAMPLED BY: <u>RG</u>		
DEPTH TO WATER AFTER RECOVERY <u>2.32</u> (FT) = _____			% RECOVERED PRIOR TO SAMPLING _____		

FIELD PARAMETERS:

TIME (24 HR CLOCK)	VOLUME REMOVED (GAL)	TEMPERATURE	X1000 ELECTRICAL CONDUCTIVITY	PH	TURBIDITY (NTU)
<u>12:04</u>	<u>2.3</u>	<u>69.5</u>	<u>7.48</u>	<u>6.54</u>	<u>Slight</u>
<u>12:09</u>	<u>4.6</u>	<u>69.8</u>	<u>7.84</u>	<u>6.69</u>	<u>Slight</u>
<u>12:16</u>	<u>6.9</u>	<u>68.8</u>	<u>11.23</u>	<u>6.49</u>	<u>Med-heavy</u>

COMMENTS: Bailer became slippery after dipped in well.
No hydrocarbon odor detected. Water color slightly yellow
Slight odor, possibly sulfur odor detected.
The last bailer of the last well volume turned to heavy turbidity.
 Note: There is a void in the bottom of the well cover
around the casing down to 2' bsg.

QC REPORT FOR HYDROCARBON ANALYSES

Date: 06/17/97

Matrix: Water

Analyte	Concentration (mg/L)			Amount Spiked	% Recovery		RPD
	Sample # (77427)	MS	MSD		MS	MSD	
TPH (gas)	0.0	93.4	95.8	100.0	93.4	95.8	2.5
Benzene	0.0	9.4	9.6	10.0	94.0	96.0	2.1
Toluene	0.0	9.9	9.9	10.0	99.0	99.0	0.0
Ethyl Benzene	0.0	9.8	10.2	10.0	98.0	102.0	4.0
Xylenes	0.0	29.8	30.7	30.0	99.3	102.3	3.0
TPH (diesel)	0	146	144	150	97	96	1.5
TRPH (oil & grease)	0	25900	26500	23700	109	112	2.3

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

QC REPORT FOR HYDROCARBON ANALYSES

Date: 06/16/97

Matrix: Water

Analyte	Concentration (mg/L)			Amount Spiked	% Recovery		RPD
	Sample # (77427)	MS	MSD		MS	MSD	
TPH (gas)	0.0	93.4	95.8	100.0	93.4	95.8	2.5
Benzene	0.0	9.4	9.6	10.0	94.0	96.0	2.1
Toluene	0.0	9.9	9.9	10.0	99.0	99.0	0.0
Ethyl Benzene	0.0	9.8	10.2	10.0	98.0	102.0	4.0
Xylenes	0.0	29.8	30.7	30.0	99.3	102.3	3.0
TPH (diesel)	0	146	144	150	97	96	1.5
TRPH (oil & grease)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$



McCAMPBELL ANALYTICAL INC.

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W. A. Craig, Inc. P.O. Box 448 Napa, CA 94559-0448	Client Project ID: #3628; Rinehart	Date Sampled: 06/12/97
		Date Received: 06/12/97
	Client Contact: Geoff Feidler	Date Extracted: 06/16-06/17/97
	Client P.O:	Date Analyzed: 06/16-06/18/97

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel *

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d) [†]	% Recovery Surrogate
77471	MW-1	W	290,b	106
77472	MW-2	W	2400,b,d	102
77473	MW-3	W	94,b	104
77474	RW-E	W	31,000,d,a,h	104
77475	RW-W	W	51,000,a,d,h	102
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	
	S		1.0 mg/kg	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/L

* cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

*The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant; d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.



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Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*
 EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)*	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Recovery Surrogate
77471	MW-1	W	ND	ND	ND	ND	ND	ND	104
77472	MW-2	W	3600,c,a	840,000	1200	14	12	40	102
77473	MW-3	W	ND	17	ND	ND	ND	ND	103
77474	RW-E	W	43,000,a,h	32,000	1900	3100	250	12,000	101
77475	RW-W	W	27,000,a,h	58,000	4000	360	860	7200	102
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		50 ug/L	5.0	0.5	0.5	0.5	0.5	
	S		1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

* cluttered chromatogram; sample peak coelutes with surrogate peak

*The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.