

CLEARWATER
GROUP, INC.
Environmental Services

ENVIRONMENTAL
PROTECTION

99 AUG -6 PM 3:02

Mr. Barney Chan
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94052-6577

Thursday August, 8, 1999

**Re: Quarterly Groundwater Monitoring Report
Hertz Service Center
1 Airport Drive, Oakland, California**

#2260

*MW-4 only GW impacted -
probably could remove problem by
purging large volumes of water &
adding ORC. Using ORC socks currently.*

Dear Mr. Chan,

Enclosed is a copy of the *Quarterly Groundwater Monitoring Report* for the Hertz Property at the International Airport in Oakland, California. This report presents groundwater monitoring and sampling data for the second quarter 1999.

Please feel free to call me at (510) 893-5160 ext. 15 if you have any questions regarding this report or other project matters.

Sincerely,
Clearwater Group, Inc.



Andrew M. Galleni
Project Geologist

cc: Roland Costanzo, Hertz Corporation, Park Ridge, New Jersey

CLEARWATER

G R O U P, I N C.

Environmental Services

GROUNDWATER MONITORING REPORT SECOND QUARTER 1999

Hertz Service Center,
1 Airport Drive,
Oakland, California
July 20, 1999

BACKGROUND

The property, located adjacent to the passenger terminal at Oakland International Airport, is currently used as a rental car service facility (Figure 1). Reports previously submitted by Environmental Science & Engineering, Inc. (ESE) indicate that one underground storage tank (UST) is present at the site, and that three USTs have been removed from the facility. Two USTs, previously located adjacent to the property (Figure 2), were used by the Federal Aviation Administration (FAA) and the Port of Oakland (Port) for fuel storage. According to Dale Klettke of the Port of Oakland, the two USTs were removed in early 1998 (FAA tank) and September 1998 (Port) and replaced with above ground storage tanks.

Nine monitoring wells were installed as part of the site investigation; groundwater monitoring has been conducted since December, 1993. MW-8 has not been located since 1996 and is believed to have been paved over. In accordance with a directive from the Alameda County Environmental Health Services (EHS), a minimum of two monitoring wells (MW-4 and MW-6) are being monitored on a quarterly basis, and wells MW-1, MW-5, MW-7, and MW-9 are being monitored annually. The annual monitoring will occur in the third quarter.

This quarter, dissolved oxygen (DO) readings were collected from each well in the field to determine background concentrations. Four ORC (Oxygen Release Compound) socks were then placed within MW-4 to facilitate biodegradation of fuel compounds. Dissolved oxygen measurements are to be used for comparison with future monitoring events, and to examine biodegradation feasibility at the site.

GROUNDWATER MONITORING AND SAMPLING ACTIVITIES (SECOND QUARTER, 1999)

Date of groundwater sampling:	June 23, 1999
Wells gauged:	MW-1 through MW-7, and MW-9
Field Measurement of Dissolved Oxygen:	MW-1 through MW-7, and MW-9
Wells purged and sampled:	MW-4 and MW-6
Analytes tested:	TPHg (EPA 8015M), BTEX (EPA 8020), and MTBE Confirmation (EPA 8260)
Laboratory:	Entech Analytical Labs, Inc. (Sunnyvale, CA)

GROUNDWATER MONITORING AND SAMPLING RESULTS

Depth to groundwater:	2.99 to 4.44 feet below top of casing
Flow direction:	Southeast/ Southwest
TPHg concentration range:	530 µg/l (MW-6) to 29,000 µg/l (MW-4)
Benzene concentration range:	<1.0 µg/l (MW-6) to 4,900 µg/l (MW-4)
MTBE concentration range:	590 µg/l (MW-4)
Dissolved Oxygen:	0.12 mg/l (MW-6) to 3.76 mg/l (MW-2)

Remarks:

Analytical results are consistent with recent sampling events.

PROJECT STATUS

The EHS has approved the current groundwater monitoring program. Remedial activities currently include the placement of ORC socks in MW-4. Additional remediation has been postponed in response to the possible changes to rental car facility locations which will occur during the upcoming Oakland Airport expansion.

APPENDIX

- Site Location Map (Figure 1)
- Site Plan (Figure 2)
- Groundwater Contour Map - 6/23/99(Figure 3)
- Hydrocarbon Distribution Map - 6/23/99 (Figure 4)
- Groundwater Elevations and Analytical Results (Table 1)
- Clearwater Gauging Data/Purge Calculations and Well Purging Data
- Certified Laboratory Reports and Chain-of-Custody Form
- Clearwater Groundwater Monitoring and Sampling Protocols

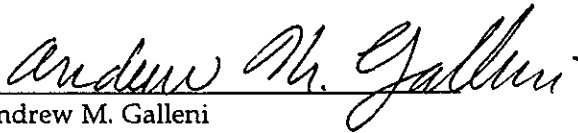
CERTIFICATION

This report was prepared under the supervision of a professional registered geologist at Clearwater Group, Inc. All statements, conclusions, and recommendations are based solely upon field observations by Clearwater Group, Inc. and analyses performed by a state-certified laboratory related to the work performed by Clearwater Group, Inc.

Information and interpretation presented herein are for the sole use of the client and regulating agency. The information and interpretation contained in this document should not be relied upon by a third party.


The service performed by Clearwater Group, Inc. has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

Prepared by:



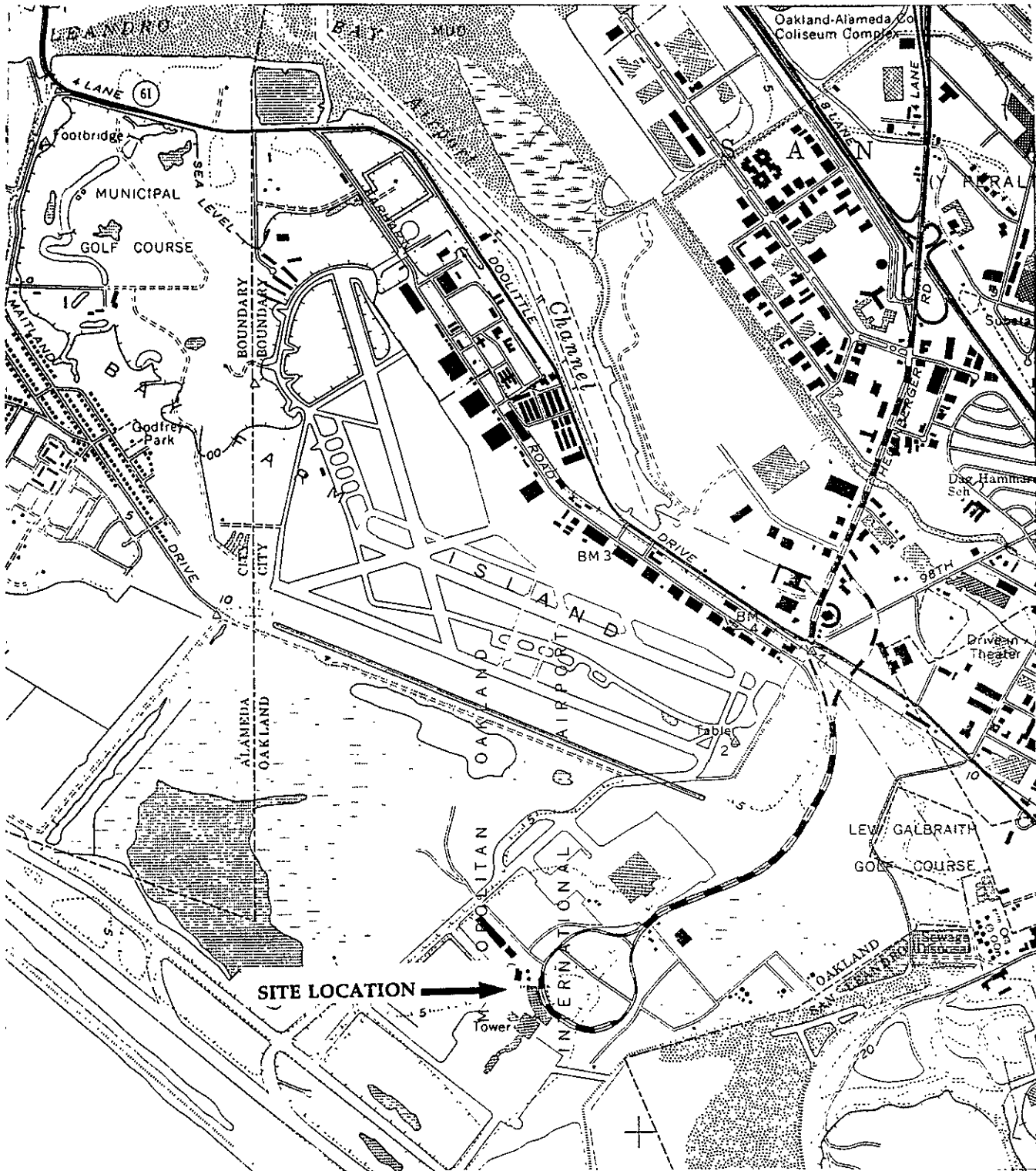
Andrew M. Galleri
Project Geologist

Reviewed by:



Brian Gwinn, R.G.
Senior Geologist





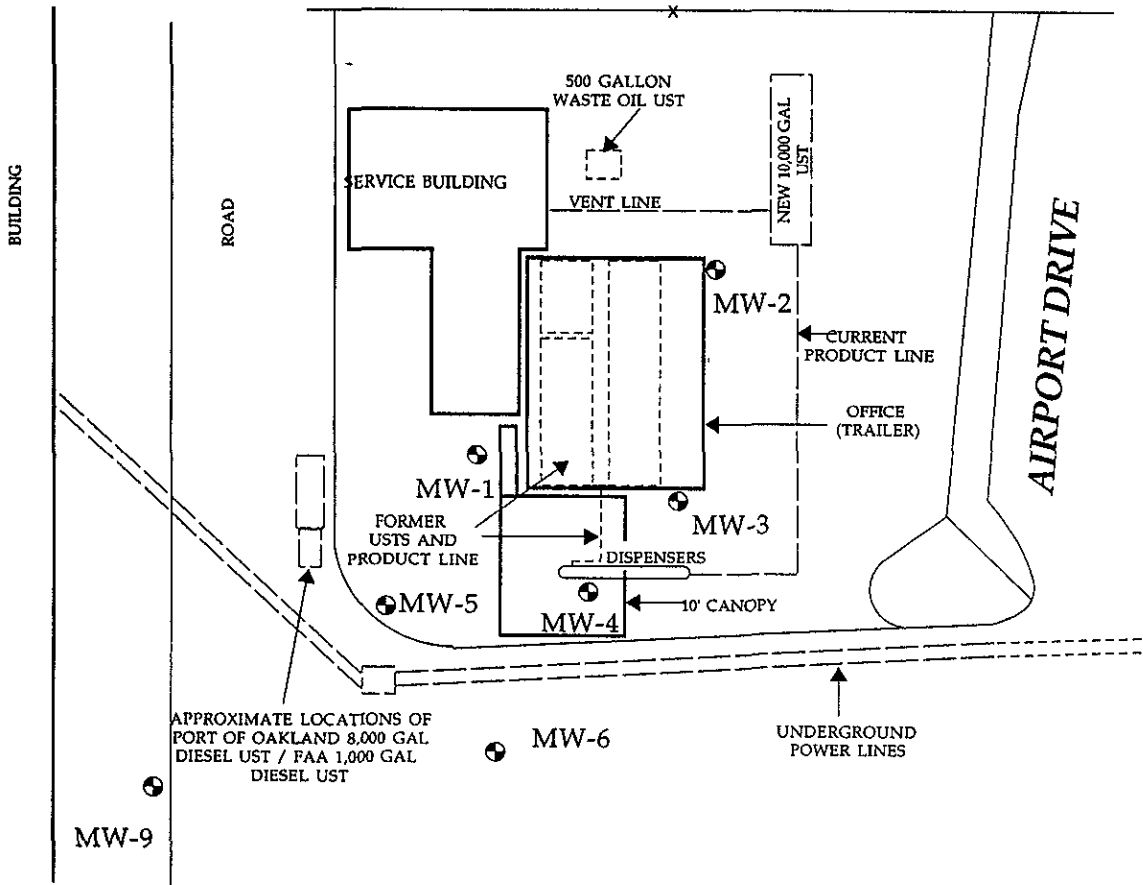
BASE MAP FROM U.S.G.S. 7.5 MINUTE SERIES: SAN LEANDRO, CALIFORNIA

SITE LOCATION MAP
 Hertz Service Center,
 1 Airport Drive,
 Oakland, California

CLEARWATER GROUP, INC.

Project No. C-156	Figure Date 10/96	Figure 1
----------------------	----------------------	-------------

ALAN SHEPARD WAY



APPROXIMATE LOCATIONS OF
PORT OF OAKLAND 8,000 GAL
DIESEL UST / FAA 1,000 GAL
DIESEL UST

PARKING LOT

MW-8
(can not locate)



PLANTER

BUILDING

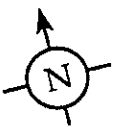
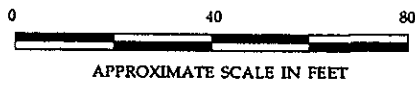
MW-7

LOADING AREA

EXPLANATION

-  GROUNDWATER MONITORING WELL
- MW-2
-  FENCELINE

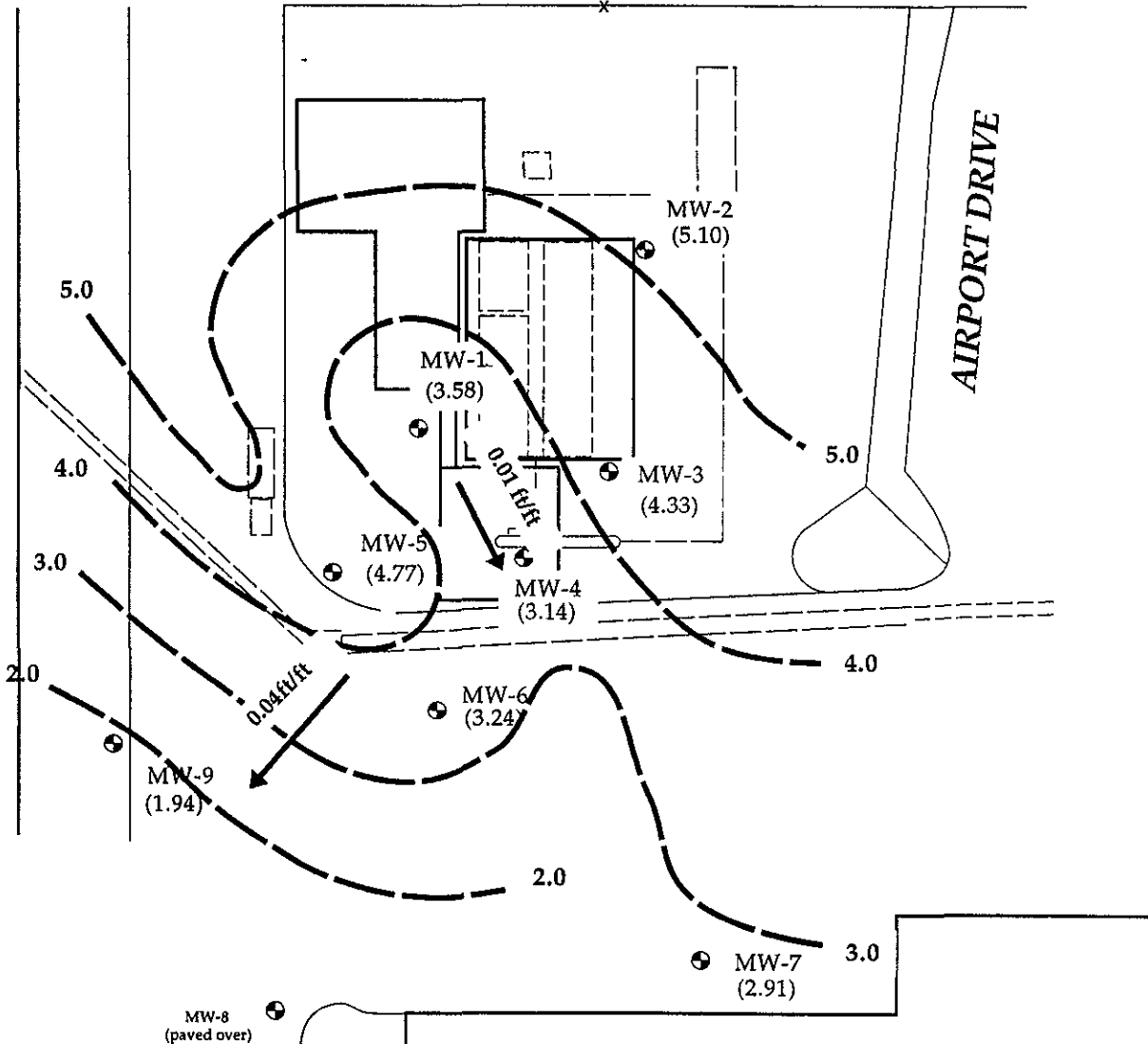
SITE PLAN BASED ON MAP BY ESE, INC.
JANUARY 4, 1994



SITE PLAN
Hertz Service Center,
1 Airport Drive,
Oakland, California

CLEARWATER GROUP, INC.		
Project No. C-156	Figure Date 6/99	Figure 2

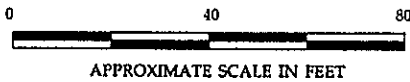
ALAN SHEPARD WAY



EXPLANATION

- MW-2 GROUNDWATER MONITORING WELL
- (2.60) GROUNDWATER ELEVATION (IN FEET) - REFERENCED TO MEAN SEA LEVEL
- NM GROUNDWATER ELEVATION NOT MEASURED
- 4.0 GROUNDWATER ELEVATION CONTOUR - CONTOUR INTERVAL 1.0 FEET

SITE PLAN BASED ON MAP BY ESE, INC.
JANUARY 4, 1994



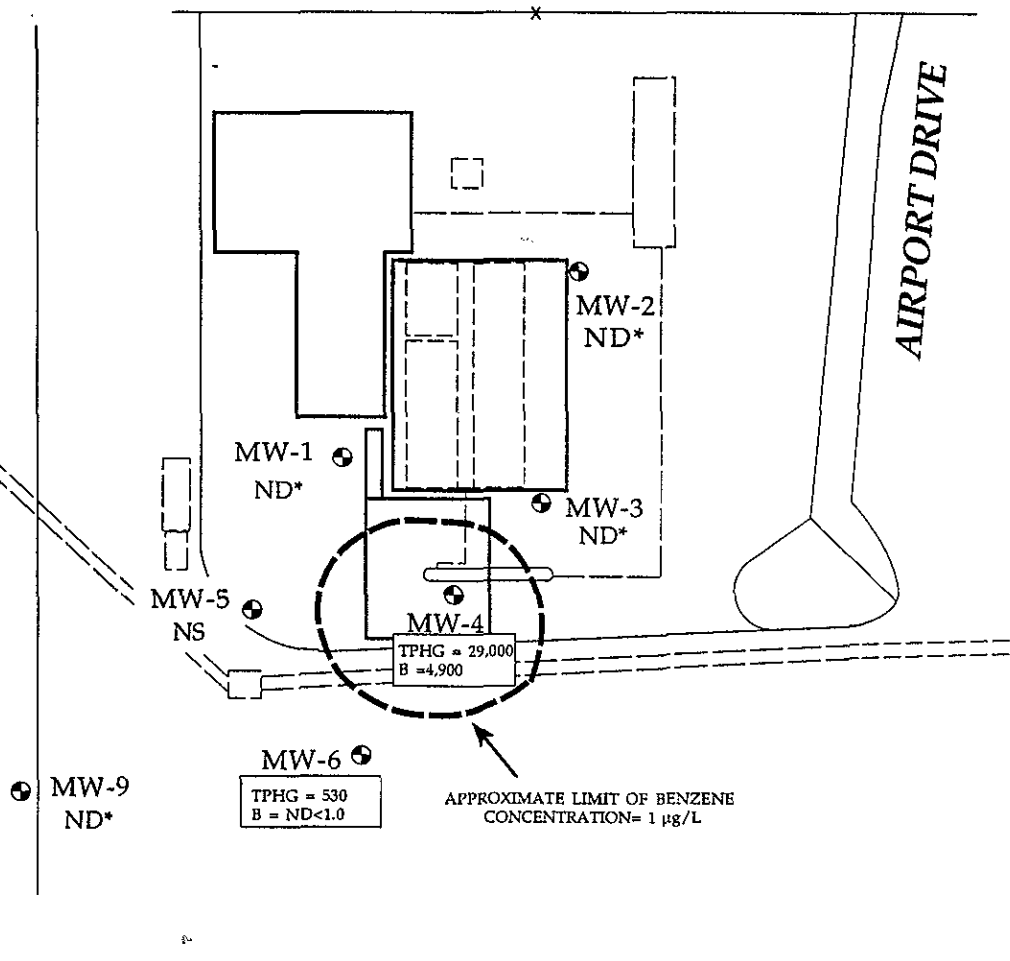
GROUNDWATER CONTOUR MAP- 6/23/99
Hertz Service Center,
1 Airport Drive,
Oakland, California

CLEARWATER GROUP, INC.

Project No. C-156	Figure Date 6/99	Figure 3
----------------------	---------------------	-------------

ALAN SHEPARD WAY

AIRPORT DRIVE



EXPLANATION

⊕
MW-2
GROUNDWATER MONITORING WELL

TPHG = ND < 50
B = ND < 0.5
CONCENTRATIONS OF TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (TPHG) & BENZENE (B) DETECTED IN GROUNDWATER SAMPLES - IN PARTS PER BILLION. SAMPLES COLLECTED ON 6/23/99. ND=COMPOUND NOT DETECTED.

ND*
TPHG AND BENZENE CONCENTRATIONS NOT DETECTABLE (ON THE BASIS OF HISTORICAL ANALYTICAL DATA)

NS
NOT SAMPLED

—
APPROXIMATE EXTENT OF BENZENE GROUNDWATER CONCENTRATION = 1 PPB



APPROXIMATE SCALE IN FEET

SITE PLAN BASED ON MAP BY ESE, INC. JANUARY 4, 1994

HYDROCARBON DISTRIBUTION MAP

6/23/99

Hertz Service Center,
1 Airport Drive,
Oakland, California

CLEARWATER GROUP, INC.

Project No.
C-156

Figure Date
6/99

Figure
4

Table 1
GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS
Hertz Service Center
1 Airport Drive
Oakland, California

MW-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TPHd (µg/L)	DO (µg/L)
MW-1	8/20/91	7.45	5.15	2.30	ND	ND	ND	ND	ND	--	ND	--
	11/12/91	7.45	4.39	3.06	ND	ND	ND	ND	ND	--	ND	--
	2/18/92	7.45	4.39	3.06	ND	ND	ND	ND	ND	--	ND	--
	5/13/92	7.45	4.52	2.93	ND	ND	ND	ND	ND	--	--	--
	9/1/92	7.45	4.90	2.55	ND	ND	ND	ND	ND	--	--	--
	11/5/92	7.45	5.06	2.39	ND	ND	ND	ND	ND	--	--	--
	2/3/93	7.45	4.11	3.34	ND	ND	ND	ND	ND	--	--	--
	5/27/93	7.45	4.14	3.31	ND	ND	ND	ND	ND	--	ND	--
	12/2/93	7.45	4.54	2.91	ND	ND	ND	ND	ND	--	ND	--
	9/17/96	7.45	4.09	3.36	--	--	--	--	--	--	--	--
	11/27/96	7.45	3.82	3.63	--	--	--	--	--	--	--	--
	2/14/97	7.45	3.29	4.16	--	--	--	--	--	--	--	--
	12/3/97	7.45	3.52	3.93	--	--	--	--	--	--	--	--
	3/10/98	7.45	2.68	4.77	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2.0	ND<5.0	--	--
	9/29/98	7.45	4.04	3.41	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	14	--	--
12/9/98	7.45	3.44	4.01	--	--	--	--	--	--	--	--	
6/23/99	7.45	3.87	3.58	--	--	--	--	--	--	--	0.48	
MW-2	8/20/91	8.09	4.00	4.09	ND	ND	ND	ND	ND	--	ND	--
	11/12/91	8.09	4.23	3.86	ND	ND	ND	ND	ND	--	52	--
	2/18/92	8.09	4.23	3.86	ND	ND	ND	ND	ND	--	ND	--
	5/13/92	8.09	3.43	4.66	ND	ND	ND	ND	ND	--	--	--
	9/1/92	8.09	3.94	4.15	56	2.0	3.0	0.8	3.1	--	--	--
	11/5/92	8.09	4.04	4.05	ND	ND	ND	ND	ND	--	--	--
	2/3/93	8.09	3.25	4.84	ND	ND	ND	ND	ND	--	--	--
	5/27/93	8.09	3.27	4.82	ND	ND	ND	ND	ND	--	ND	--
	12/2/93	8.09	3.65	4.44	ND	ND	ND	ND	ND	--	ND	--
	9/17/96	8.09	3.35	4.74	--	--	--	--	--	--	--	--
	11/27/96	8.09	3.18	4.91	--	--	--	--	--	--	--	--

Table 1
GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS
Hertz Service Center
1 Airport Drive
Oakland, California

MW-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TPHd (µg/L)	DO (µg/L)
MW-2 con't.	2/14/97	8.09	2.65	5.44	--	--	--	--	--	--	--	--
	12/3/97	8.09	2.95	5.14	--	--	--	--	--	--	--	--
	3/10/98	8.09	2.11	5.98	--	--	--	--	--	--	--	--
	9/29/98	8.09	--	--	--	--	--	--	--	--	--	--
	12/9/98	8.09	2.95	5.14	--	--	--	--	--	--	--	--
	6/23/99	8.09	2.99	5.10	--	--	--	--	--	--	--	3.76
MW-3	8/20/91	7.66	4.60	3.06	ND	ND	ND	ND	ND	--	ND	--
	11/12/91	7.66	4.74	2.92	ND	ND	ND	ND	ND	--	ND	--
	2/18/92	7.66	4.74	2.92	ND	ND	ND	ND	ND	--	ND	--
	5/13/92	7.66	4.02	3.64	ND	ND	ND	ND	ND	--	--	--
	9/1/92	7.66	4.45	3.21	ND	1.1	1.6	ND	1.9	--	--	--
	11/5/92	7.66	4.59	3.07	ND	ND	ND	ND	ND	--	--	--
	2/3/93	7.66	3.63	4.03	ND	ND	ND	ND	ND	--	--	--
	5/27/93	7.66	3.82	3.84	ND	ND	ND	ND	ND	--	55	--
	12/2/93	7.66	4.06	3.60	ND	ND	ND	ND	ND	--	ND	--
	9/17/96	7.66	3.76	3.90	--	--	--	--	--	--	--	--
	11/27/96	7.66	3.58	4.08	--	--	--	--	--	--	--	--
	2/14/97	7.66	3.01	4.65	--	--	--	--	--	--	--	--
	12/3/97	7.66	3.31	4.35	--	--	--	--	--	--	--	--
	3/10/98	7.66	2.41	5.25	--	--	--	--	--	--	--	--
	9/29/98	7.66	--	--	--	--	--	--	--	--	--	--
	12/9/98	7.66	3.44	4.22	--	--	--	--	--	--	--	--
6/23/99	7.66	3.33	4.33	--	--	--	--	--	--	--	0.17	
MW-4	2/18/92	7.11	3.68	3.43	6,600	910	1,900	280	1,700	--	ND	--
	5/13/92	7.11	3.54	3.57	62,000	3,400	5,200	990	5,200	--	--	--
	9/1/92	7.11	3.97	3.14	120,000	8,800	14,000	2,100	11,000	--	--	--
	11/5/92	7.11	5.23	1.88	24,000	2,600	3,300	510	2,100	--	--	--

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)

Table 1
GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS
Hertz Service Center
1 Airport Drive
Oakland, California

MW-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TPHd (µg/L)	DO (µg/L)
MW-4 con't.	2/3/93	7.11	4.22	2.89	50,000	4,700	5,000	1,500	6,600	—	—	—
	5/27/93	7.11	4.33	2.78	48,000	6,300	7,200	1,600	6,800	—	4,900	—
	12/2/93	7.11	4.72	2.39	21,000	3,500	3,800	640	2,000	—	770	—
	9/17/96	7.11	4.38	2.73	16,000	4,300	1,900	750	1,900	100	220	—
	11/27/96	7.11	4.20	2.91	14,000	5,100	2,600	1,300	2,500	ND<300	ND<200	—
	2/14/97 (b,c)	7.11	3.58	3.53	19,000	3,300	3,100	980	2,600	150	210	—
	12/3/97	7.11	3.92	3.19	19,000	3,300	3,100	980	2,600	150	210	—
	3/10/98	7.11	2.90	4.21	15,000	2,500	2,600	80	3,900	400	—	—
	9/29/98	7.11	4.56	2.55	14,000	2,800	240	390	830	--/370	—	—
	12/9/98	7.11	3.78	3.33	7,400	1,100	510	340	1,200	330/360	—	—
	6/23/99	7.11	3.97	3.14	29,000	4,900	1,900	1,400	3,600	540/590	—	0.19
MW-5	11/5/92	7.76	4.76	3.00	ND	ND	ND	ND	ND	—	170	—
	2/3/93	7.76	—	—	—	—	—	—	—	—	—	—
	5/27/93	7.76	3.88	3.88	ND	ND	ND	ND	ND	—	75	—
	12/2/93	7.76	4.36	3.40	ND	ND	ND	ND	ND	—	60	—
	9/17/96	7.76	3.99	3.77	—	—	—	—	—	—	—	—
	11/27/96	7.76	3.80	3.96	—	—	—	—	—	—	—	—
	2/14/97 (b)	7.76	3.16	4.60	100	1.2	ND<0.5	0.8	ND<2	95	860	—
	3/10/98	7.76	2.52	5.24	—	—	—	—	—	—	—	—
	9/29/98	7.76	3.59	4.17	76	ND<0.5	ND<0.5	1.7	0.55	170	—	—
	12/9/98	7.76	3.35	4.41	—	—	—	—	—	—	—	—
6/23/99	7.76	2.99	4.77	—	—	—	—	—	—	—	0.26	
MW-6	11/5/92	7.17	5.28	1.89	820	250	ND	5.9	ND	—	—	—
	2/3/93	7.17	4.27	2.90	330	120	2.8	19	5.3	—	—	—
	5/27/93	7.17	4.35	2.82	1,300	370	ND	87	19	—	960	—
	12/2/93	7.17	4.81	2.36	280	11	1.0	65	3.0	—	700	—
	9/17/96	7.17	4.39	2.78	ND<50	1.0	0.5	ND<0.5	ND<2.0	ND<5	270	—

Table 1
GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS
Hertz Service Center
1 Airport Drive
Oakland, California

MW-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TPHd (µg/L)	DO (µg/L)
MW-6 con't.	11/27/96	7.17	4.23	2.94	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2.0	7.0	ND<50	--
	2/14/97 (b)	7.17	3.57	3.60	50	0.9	ND<0.5	ND<0.5	ND<2.0	9.0	600	--
	12/3/97	7.17	3.92	3.25	50	0.9	ND<0.5	ND<0.5	ND<2.0	9.0	600	--
	3/10/98	7.17	2.88	4.29	ND<50	ND<0.5	ND<0.5	0.6	ND<2.0	7.0	--	--
	9/29/98	7.17	4.40	2.77	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--
	12/9/98	7.17	3.88	3.29	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--
	6/23/99	7.17	3.93	3.24	530	ND<1.0	ND<1.0	90.0	2.3	ND<10	--	0.12
MW-7	5/27/93	6.93	4.58	2.35	ND	ND	ND	ND	ND	--	76	--
	12/2/93	6.93	4.78	2.15	ND	ND	ND	ND	ND	--	ND	--
	9/17/96	6.93	4.52	2.41	--	--	--	--	--	--	--	--
	11/27/96	6.93	4.35	2.58	--	--	--	--	--	--	--	--
	2/14/97 (b)	6.93	3.70	3.23	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<5	140	--
	12/3/97	6.93	4.04	2.89	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<5	140	--
	3/10/98	6.93	2.98	3.95	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<5	--	--
	9/29/98	6.93	4.43	2.50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--
	12/9/98	6.93	4.33	2.60	--	--	--	--	--	--	--	--
	6/23/99	6.93	4.02	2.91	--	--	--	--	--	--	--	1.38
MW-8	5/27/93	6.75	4.84	1.91	ND	ND	ND	ND	ND	--	91	--
	12/2/93	6.75	5.44	1.31	ND	ND	ND	ND	ND	--	54	--
	9/17/96 (a)	6.75	--	--	--	--	--	--	--	--	--	--
MW-9	5/27/93	6.55	4.97	1.58	ND	ND	ND	ND	ND	--	72	--
	12/2/93	6.55	5.53	1.02	ND	ND	ND	ND	ND	--	72	--
	9/17/96	6.55	4.95	1.60	--	--	--	--	--	--	--	--
	11/27/96	6.55	--	--	--	--	--	--	--	--	--	--
	2/14/97 (b)	6.55	4.16	2.39	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<5	130	--
12/3/97	6.55	4.40	2.15	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<5	130	--	

Table 1
GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS
Hertz Service Center
1 Airport Drive
Oakland, California

MW-No.	Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TPHd (µg/L)	DO (µg/L)
MW-9 con't.	3/10/98	6.55	3.50	3.05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2	ND<5	--	--
	9/29/98	6.55	4.97	1.58	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5	--	--
	12/9/98	6.55	4.44	2.11	--	--	--	--	--	--	--	--
	6/23/99	6.55	4.61	1.94	--	--	--	--	--	--	--	0.25

Notes:

- TOC Elevation at the north side of the top of the well casing referenced to mean sea level (wells surveyed by others)
- DTW Depth to water
- GWE Groundwater elevation: GWE = TOC - DTW
- TPHg Total petroleum hydrocarbons as gasoline using EPA Method 8015 (modified)
- TPHd Total petroleum hydrocarbons as diesel fuel using EPA Method 8015 (modified)
- BTEX Benzene, toluene, ethylbenzene and total xylenes using EPA Method 8020 (modified)
- MTBE Methyl tert butyl ether using EPA Method 8020 (modified)/using EPA Method 8260
- DO Dissolved Oxygen measured with a YSI 51B field instrument
- µg/L Micrograms per liter: approximately equal to one part per billion
- mg /L Milligrams per liter: approximately equal to one part per million
- Not tested, not measured
- ND Not detected in concentrations at or above laboratory reporting limit (indicated if available).
- (a) MW-8 could not be located (paved over)
- (b) Laboratory chromatograms indicate that samples may contain weathered diesel fuel or a light oil
- (c) Reporting limits elevated because of high levels of target compounds; MTBE included in gasoline result

Analytical results prior to September 17, 1996 were taken from the *Report of Findings, Fourth Quarter 1993 Ground Water Monitoring* by Environmental Science & Engineering (January 4, 1994). Analytical results for metals, oil and grease, halogenated volatile compounds, and semi-volatile organics are not included in this table.

WELL PURGING DATA

SHEET OF

Job No.: C-156 Location: 1 Airport way Hertz, Oakland Date: 6-23-99 Tech: JT

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH	Sample time: <u>1400</u>	Sample for: (circle)		
<u>MW-6</u>	<u>1342</u>	<u>1</u>	<u>71.7</u>	<u>2000</u>	<u>7.12</u>		<input checked="" type="checkbox"/> TPHg	<input type="checkbox"/> TPHd	<input type="checkbox"/> TPHmo
Calc. purge	<u>1344</u>	<u>2</u>	<u>71.7</u>	<u>2,490</u>	<u>7.41</u>		<input checked="" type="checkbox"/> BTEX	<input checked="" type="checkbox"/> MTBE	<input type="checkbox"/> 8010
volume	<u>1346</u>	<u>3</u>	<u>71.7</u>	<u>2,380</u>	<u>7.36</u>		Other:		
<u>3.69 gal</u>	<u>1346</u>	<u>4</u>	<u>70.8</u>	<u>2,578</u>	<u>7.48</u>		Sampling Method:		
							<input checked="" type="checkbox"/> Dedicated	<input type="checkbox"/> Disposable bailer	
COMMENTS: color, turbidity, recharge, etc.							Purging Method:		
<u>Olive, Low, good, slight fuel odor</u>							<input checked="" type="checkbox"/> PVC bailer	<input type="checkbox"/> Pump	

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH	Sample time: <u>1515</u>	Sample for: (circle)		
<u>MW-4</u>	<u>1500</u>	<u>.5</u>	<u>69.4</u>	<u>1,800</u>	<u>7.82</u>		<input checked="" type="checkbox"/> TPHg	<input type="checkbox"/> TPHd	<input type="checkbox"/> TPHmo
Calc. purge	<u>1502</u>	<u>1</u>	<u>68.0</u>	<u>1,740</u>	<u>7.61</u>		<input checked="" type="checkbox"/> BTEX	<input checked="" type="checkbox"/> MTBE	<input type="checkbox"/> 8010
volume	<u>1503</u>	<u>1.5</u>	<u>67.3</u>	<u>1,750</u>	<u>7.57</u>		Other: <u>MTBE by 8260</u>		
<u>2 gal</u>	<u>1505</u>	<u>2</u>	<u>66.9</u>	<u>1,730</u>	<u>7.91</u>		Sampling Method:		
							<input checked="" type="checkbox"/> Dedicated	<input type="checkbox"/> Disposable bailer	
COMMENTS: color, turbidity, recharge, etc.							Purging Method:		
<u>Grey, Low, good, strong fuel odor</u>							<input checked="" type="checkbox"/> PVC bailer	<input type="checkbox"/> Pump	

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH	Sample time:	Sample for: (circle)		
							<input type="checkbox"/> TPHg	<input type="checkbox"/> TPHd	<input type="checkbox"/> TPHmo
Calc. purge							<input type="checkbox"/> BTEX	<input type="checkbox"/> MTBE	<input type="checkbox"/> 8010
volume							Other:		
							Sampling Method:		
							<input type="checkbox"/> Dedicated / <input type="checkbox"/> Disposable bailer		
COMMENTS: color, turbidity, recharge, etc.							Purging Method:		
							<input type="checkbox"/> PVC bailer / <input type="checkbox"/> Pump		

C-156

6-23-99

TOA - 1300

Announced my presence
@ office

3 Drums on Site

Calib. D.O. & Temp = 28.4°C

DO = 7.75 mg/L

OK. ✓

Gauge / Sample order

MW-7, 6, 9, 1, 2, 3, 5, 4

1330 - 3 pt Calib for pH on
Hydac = O.K.

1340 Start purge on MW-6
→ MW-6 Sampled @ 1400
→ Replaced Disposable bailer

1500 Start purge on MW-4
Sampled MW-4 @ 1515

Install 4 ORC socks in
MW-4 (4' water column)

TOD = 1550

how is D.O.
MW-6 SW
manured &
sampled?

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Clearwater Group, Inc.
520 Third Street, Suite 104
Oakland, CA 94607
Attn: Marcus Niebanck

Date: 7/1/99
 Date Received: 6/24/99
 Project: C-156
 PO #:
 Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	MW-6			MW-4						
Sample Date	6/23/99			6/23/99						
Sample Time	14:00			15:15						
Lab #	G13997			G13998						
	Result	DF	DLR	Result	DF	DLR			PQL	Method
Results in µg/Liter:										
Analysis Date	6/28/99			6/26/99						
TPH-Gas	530 ^x	2.0	100	29,000	50	2500			50	8015M
MTBE	120	2.0	10	540	50	250			5.0	8020
Benzene	ND	2.0	1	4,900	50	25			0.50	8020
Toluene	ND	2.0	1	1,900	50	25			0.50	8020
Ethyl Benzene	90	2.0	1	1,400	50	25			0.50	8020
Xylenes (total)	2.3	2.0	1	3,600	50	25			0.50	8020
Analysis Date				6/30/99						
MTBE	na			590	50	250			5.0	8260

DF=Dilution Factor ND= None Detected above DLR PQL=Practical Quantitation Limit DLR=Detection Reporting Limit

· na = not analyzed

· Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #I-2346)


 Michelle L. Anderson, Lab Director

STANDARD LAB QUALIFIERS

July, 1998

All Entech lab reports now reference standard lab qualifiers. These qualifiers are noted in the adjacent column to the analytical result and are adapted from the U.S. EPA CLP program. The current qualifier list is as follows:

Qualifier	Description
U	Compound was analyzed for but not detected
J	Estimated valued for tentatively identified compounds or if result is below PQL but above MDL
N	Presumptive evidence of a compound (for Tentatively Identified Compounds)
B	Analyte is found in the associated Method Blank
E	Compounds whose concentrations exceed the upper level of the calibration range
D	Multiple dilutions reported for analysis; discrepancies between analytes may be due to dilution
X	Results within quantitation range; chromatographic pattern not typical of fuel

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography

QC Batch #: GBG2990625

Matrix: Water

Units: µg/L

Date Analyzed: 06/25/99

Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/L	SA µg/L	SR µg/L	SP µg/L	SP % R	SPD µg/L	SPD %R	RPD	QC LIMITS	
										RPD	%R
Benzene	8020	<0.50	5.0	ND	4.9	98	4.1	81	18.8	25	71-117
Toluene	8020	<0.50	25.0	ND	29	116	27	107	8.6	25	79-121
Ethyl Benzene	8020	<0.50	5.0	ND	5.8	115	5.3	105	9.1	25	77-114
Xylenes	8020	<0.50	25.0	ND	31	122	28	113	7.6	25	79-127
Gasoline	8015	<50.0	500	ND	484	97	462	92	4.6	25	75-125
aaa-TFT(S.S.)-PID	8020			102%	100%			100%			65-135
aaa-TFT(S.S.)-FID	8015			106%	101%			103%			65-135

Note: LCS and LCSD results reported for the following Parameters:

All

Definition of Terms:

- na: Not Analyzed in QC batch
- MB: Method Blank
- SA: Spike Added
- SR: Sample Result
- RPD(%): Duplicate Analysis - Relative Percent Difference
- SP: Spike Result
- SP (%R): Spike % Recovery
- SPD: Spike Duplicate Result
- SPD (%R): Spike % Recovery
- NC: Not Calculated

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography

QC Batch #: GBG2990628

Matrix: Water

Units: µg/L

Date Analyzed: 06/28/99

Quality Control Sample: Blank Spike

PARAMETER	Method #	MB µg/L	SA µg/L	SR µg/L	SP µg/L	SP % R	SPD µg/L	SPD %R	RPD	QC LIMITS	
										RPD	%R
Benzene	8020	<0.50	5.0	ND	4.6	92	4.1	81	12.7	25	71-117
Toluene	8020	<0.50	25.0	ND	28	111	27	107	4.0	25	79-121
Ethyl Benzene	8020	<0.50	5.0	ND	5.4	107	5.3	105	2.1	25	77-114
Xylenes	8020	<0.50	25.0	ND	29	116	28	113	2.7	25	79-127
Gasoline	8015	<50.0	500	ND	479	96	462	92	3.7	25	75-125
aaa-TFT(S.S.)-PID	8020			102%	102%		101%				65-135
aaa-TFT(S.S.)-FID	8015			106%	104%		103%				65-135

Note: LCS and LCSD results reported for the following Parameters:

All

Definition of Terms:

- na: Not Analyzed in QC batch
- MB: Method Blank
- SA: Spike Added
- SR: Sample Result
- RPD(%): Duplicate Analysis - Relative Percent Difference
- SP: Spike Result
- SP (%R): Spike % Recovery
- SPD: Spike Duplicate Result
- SPD (%R): Spike % Recovery
- NC: Not Calculated

QUALITY CONTROL RESULTS SUMMARY

Volatile Organic Compounds

QC Batch #: WGCMS990628

Matrix: Water

Units: µg/L

Date analyzed:

06/29/99

Spiked Sample:

Blank Spike

PARAMETER	Method #	SA µg/L	SR µg/L	SP µg/L	SP %R	SPD µg/L	SPD %R	RPD	QC LIMITS	
									RPD	%R
1,1- Dichloroethene	8240/8260	25	ND	22	88	22	88	0.5	25	50-150
Methyl-tert-butyl ether	8240/8260	25	ND	30	118	30	120	1.3	25	50-150
Benzene	8240/8260	25	ND	25	100	25	102	1.2	25	50-150
Trichloroethene	8240/8260	25	ND	27	110	28	110	0.7	25	50-150
Toluene	8240/8260	25	ND	26	106	27	106	0.4	25	50-150
Chlorobenzene	8240/8260	25	ND	28	112	29	114	2.1	25	50-150
<i>Surrogates</i>										
Dibromofluoromethane	8240/8260		106%	109%		108%				65-135
1,2-Dichloroethane	8240/8260		117%	126%		125%				65-135
Toluene -d8	8240/8260		105%	95%		96%				65-135
4-Bromofluorobenzene	8240/8260		97%	94%		93%				65-135

Definition of Terms:

na: Not Analyzed in QC batch

SA: Spike Added

SR: Sample Result

RPD(%): Duplicate Analysis - Relative Percent Difference

SP Spike Result

SP (%R) Spike % Recovery

SPD: Spike Duplicate Result

SPD (%R) Spike Duplicate % Recovery

NC: Not Calculated

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • Telephone: (408) 735-1550 (800) 287-1799 • Fax: (408) 735-1554

Chain of Custody/Analysis Work Order

Client: Clearwater Group, Inc
 Address: 520 3rd St, Ste. 104
Oakland, CA 94607
 Contact: Marcus Niembank
 Telephone #: (510) 893-5160
 Date Received: _____
 Turn Around: Standard

Project ID: C-156
 Purchase Order #: _____

Sampler/Company: <u>Loren Taylor / CCEL</u>	Telephone #: <u>(510) 893-5160</u>
Special Instructions/Comments	

LAB USE ONLY

Samples arrived chilled and intact:

Yes No

Notes: _____

Sample Information								Requested Analysis							
Lab #	Sample ID	Grab/Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	TPH	STEX	MTBE (3020)	MTBE (5260)				
Q13917	MW-6	Grab	H ₂ O	1400	6-23-99	HCl	3x VOA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Q13918	MW-4	Grab	H ₂ O	1515	6-23-99	HCl	3x VOA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Relinq. By: <u>[Signature]</u>				Received By: <u>[Signature]</u>				Date: <u>6-23-99</u>		Time: <u>1615</u>					
Relinq. By: <u>C</u>				Received By: <u>CAW # SOS WORLD</u>				Date: <u>6-24-99</u>		Time: <u>1045</u>					
Relinq. By: <u>CAW # SOS WORLD</u>				Received By: <u>Jennifer Durbin</u>				Date: <u>6/24/99</u>		Time: <u>1200</u>					

CLEARWATER GROUP, INC.

Groundwater Monitoring and Sampling Field Procedures

Groundwater Monitoring

Prior to beginning, a decontamination area is established. Decontamination procedures consist of scrubbing downhole equipment in an Alconox® solution wash (wash solution is pumped through any purging pumps used), and rinsing in a first rinse of potable water and a second rinse of potable water or deionized water if the latter is required. Any non-dedicated down hole equipment is decontaminated prior to use. When using a peristaltic pump, new or dedicated silicon head tube and polyethylene tubing is used.

Prior to purging and sampling a well, the static water level is measured to the nearest 0.01 feet with an electronic water sounder. Depth to bottom is typically measured once per year, at the request of the project manager, and during Clearwater's first visit to a site. If historical analytical data are not available, with which to establish a reliable order of increasing well contamination, the water sounder and tape will be decontaminated between each well. If floating separate-phase hydrocarbons (SPH) are suspected or observed, SPH is collected using a clear, open-ended product bailer, and the thickness is measured to the nearest 0.01 feet in the bailer. SPH may alternatively be measured with an electronic interface probe. Any monitoring well containing a measurable thickness of SPH before or during purging is not additionally purged and no sample is collected from that well. Wells containing a hydrocarbon sheen are sampled unless otherwise specified by the project manager. Field observations such as well integrity as well as water level measurements and floating product thicknesses are noted on the Gauging Data/Purge Calculations form.

Well Purging

Each monitoring well to be sampled is purged using either a PVC bailer, submersible pump or a peristaltic pump. Physical parameters (pH, temperature and conductivity) of the purge water are monitored during purging activities to assess if the water sample collected is representative of the aquifer. If required, parameters such as dissolved oxygen, turbidity, salinity etc. are also measured. Samples are considered representative if parameter stability is achieved. Stability is defined as a change of less than 0.25 pH units, less than 10% change in conductivity in micro mhos, and less than 1.0 degree centigrade (1.8 degrees Fahrenheit) change in temperature. Parameters are measured in a discreet sample decanted from the bailer separately from the rest of the purge water or in a in-line flowthrough cell. Parameters are measured at least four times during purging; initially, and at volume intervals of one well volume. Purging continues until three well casing volumes have been removed or until the well completely dewatered. Wells which dewater or demonstrate a slow recharge, may be sampled after fewer than three well volumes have been removed. Well purging information is recorded on the Purge Data sheet. All meters used to measure parameters are calibrated daily. Purge water is sealed, labeled, and stored on site in D.O.T.-approved 55-gallon drums. After being chemically profiled, the water is removed to an appropriate disposal facility by a licensed waste hauler.

Groundwater Sample Collection

Groundwater samples are collected immediately after purging or, if purging rate exceeds well recharge rate, when the well has recharged to at least 80% of its static water level. If recharge is extremely slow, the well is allowed to recharge for at least two hours, if practicable, or until sufficient volume has accumulated for sampling. The well is sampled within 24 hours of purging or repurged. Samples are collected using polyethylene bailers, either disposable or dedicated to the well. Samples may also be collected from the peristaltic pump tubing. Samples being analyzed for compounds most sensitive to volatilization are collected first. Water samples are placed in appropriate laboratory-supplied containers, labeled, documented on a chain of custody form and placed on ice in a cooler for transport to a state-certified analytical laboratory. Analytical detection limits match or surpass standards required by relevant local or regional guidelines.

Quality Assurance Procedures

To prevent contamination of the samples, CGI personnel adhere to the following procedures in the field:

- A new, clean pair of latex gloves are put on prior to sampling each well.
- Wells are gauged, purged and groundwater samples are collected in the expected order of increasing degree of contamination based on historical analytical results.
- All purging equipment will be thoroughly decontaminated between each well, using the procedures previously described at the beginning of this section.
- During sample collection for volatile organic analysis, the amount of air passing through the sample is minimized. This helps prevent the air from stripping the volatiles from the water. Sample bottles are filled by slowly running the sample down the side of the bottle until there is a convex meniscus over the mouth of the bottle. The lid is carefully screwed onto the bottle such that no air bubbles are present within the bottle. If a bubble is present, the cap is removed

and additional water is added to the sample container. After resealing the sample container, if bubbles still are present inside, the sample container is discarded and the procedure is repeated with a new container.

Laboratory and field handling procedures may be monitored, if required by the client or regulators, by including quality control (QC) samples for analysis with the groundwater samples. Examples of different types of QC samples are as follows:

- Trip blanks are prepared at the analytical laboratory by laboratory personnel to check field handling procedures. Trip blanks are transported to the project site in the same manner as the laboratory-supplied sample containers to be filled. They are not opened, and are returned to the laboratory with the samples collected. Trip blanks are analyzed for purgable organic compounds.
- Equipment blanks are prepared in the field to determine if decontamination of field sampling equipment has been effective. The sampling equipment used to collect the groundwater samples is rinsed with distilled water which is then decanted into laboratory-supplied containers. The equipment blanks are transported to the laboratory, and are analyzed for the same chemical constituents as the samples collected at the site.
- Duplicates are collected at the same time that the standard groundwater samples are being collected and are analyzed for the same compounds in order to check the reproducibility of laboratory data. They are typically only collected from one well per sampling event. The duplicate is assigned an identification number that will not associate it with the source well.

Generally, trip blanks and field blanks check field handling and transportation procedures. Duplicates check laboratory procedures. The configuration of QC samples is determined by CGI depending on site conditions and regulatory requirements.