CLEARWATER
GROUP, INC.
Environmental Services

Mr. Barney Chan
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

November 17, 1998

#2260

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

Still high TPHd + B in MW4 only.

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 third quarter 1998.

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

Sincerely,
CLEARWATER GROUP, INC.

Douglas C. Guenther
Project Geologist

cc: Mr. Jeff Rubin - Port of Oakland

CLEARWATER
GROUP, INC.
Environmental Services

GROUNDWATER MONITORING REPORT
THIRD QUARTER 1998

Hertz Service Center,
1 Airport Drive,
Oakland, California
November 3, 1998

BACKGROUND

The property, located adjacent to the passenger terminal at Oakland International Airport, is currently used as a rental car service facility. 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 additional USTs, located adjacent to the property, are used by the Port of Oakland and the Federal Aviation Administration for fuel storage.

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) will be monitored on a quarterly basis, and wells MW-1, MW-5, MW-7, and MW-9 will be monitored annually. The annual monitoring will occur in the third quarter.

GROUNDWATER MONITORING AND SAMPLING ACTIVITIES (THIRD QUARTER, 1998)

Date of groundwater sampling:	September 29, 1998
Wells gauged:	MW-1, MW-4 through MW-7, and MW-9
Wells purged and sampled:	MW-1, MW-4 through MW-7, and MW-9
Analytes tested:	TPHg (EPA 8015M), BTEX and MTBE Confirmation (EPA 8240B)
Laboratory:	Entech Analytical Labs, Inc. (Sunnyvale, CA)

GROUNDWATER MONITORING AND SAMPLING RESULTS

Depth to groundwater:	1.58 to 4.17 feet below top of casing
Flow direction:	Southeast/ Southwest
TPHg concentration range:	<50 µg/l (MW-1, MW-6, MW-7 and MW-9) to 14,000 µg/l (MW-4)
Benzene concentration range:	<0.5 µg/l (MW-1, MW-5, MW-6, MW-7 and MW-9) to 2,800 µg/l (MW-4)
MTBE concentration range:	<5 µg/l (MW-6, MW-7, and MW-9) to 370 µg/l (MW-4)

Remarks:
Analytical results are consistent with recent sampling events. One monitoring well (MW-4) was analyz by EPA Method 8240 for methyl-tert butyl ether (MTBE) as required by the EHS.

PROJECT STATUS

The EHS has approved the current groundwater monitoring program. The implementation of remedial activities has been postponed in response to the possible changes to rental car facility locations, which may occur during the upcoming Oakland Airport expansion.

APPENDIX

- Site Location Map (Figure 1)
- Site Plan (Figure 2)
- Groundwater Contour Map - 9/29/98 (Figure 3)
- Hydrocarbon Distribution Map - 9/29/98 (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.

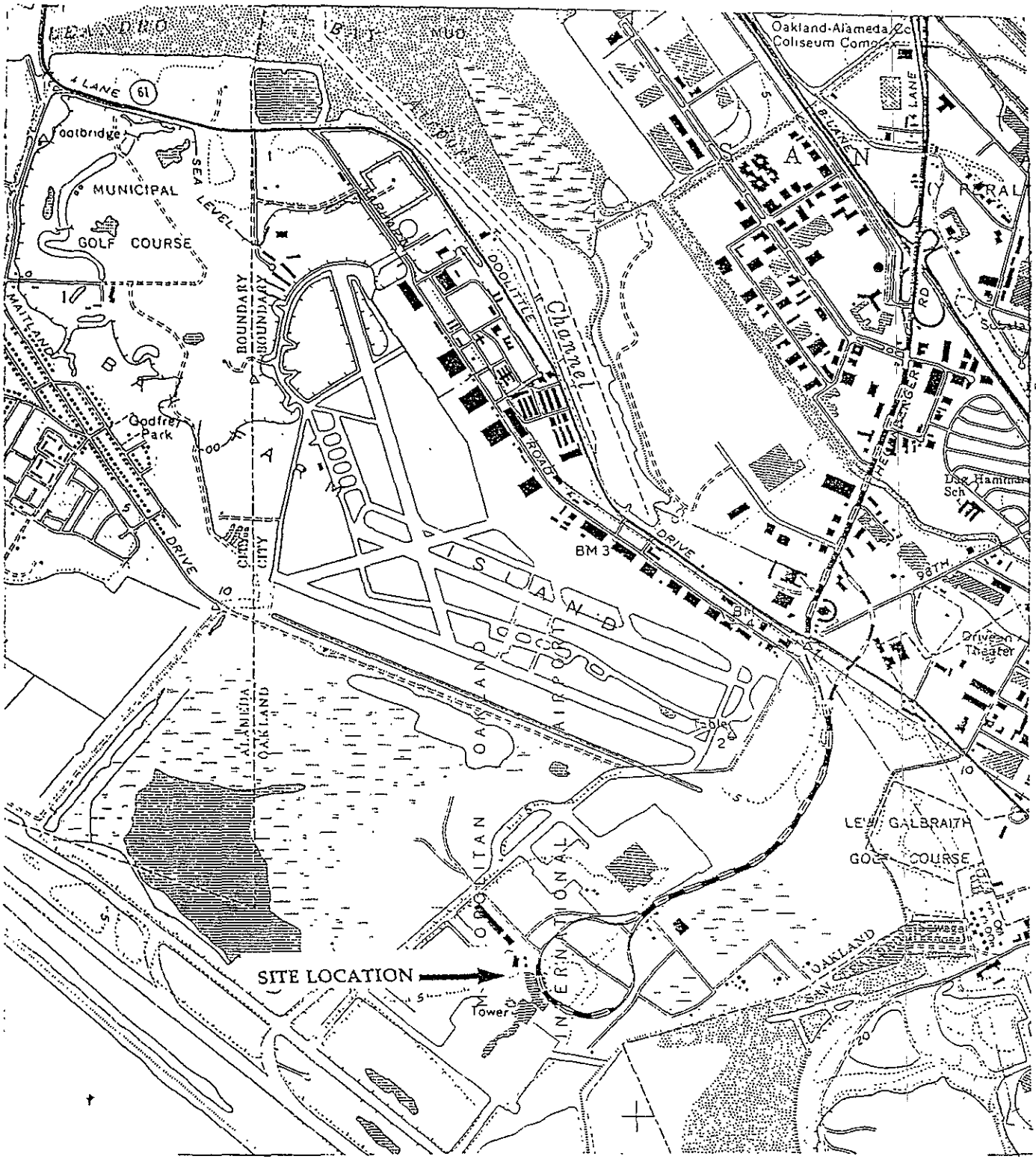
Prepared by:

Douglas C. Guenther
Project Geologist

Reviewed by:

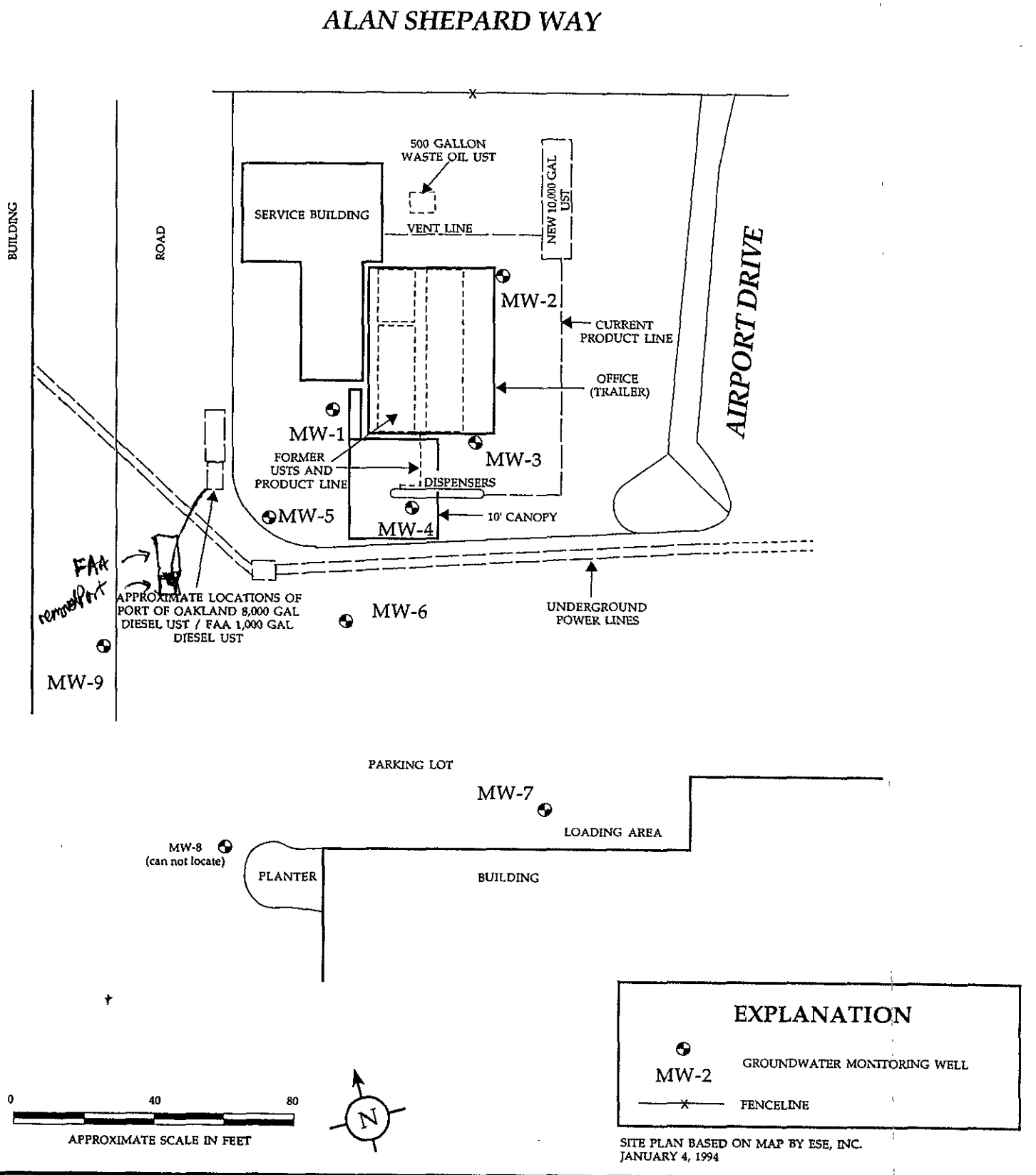
REGISTERED GEOLOGIST
BRIAN M. GWINN
No. 6505
exp. 4/30/99
STATE OF CALIFORNIA

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

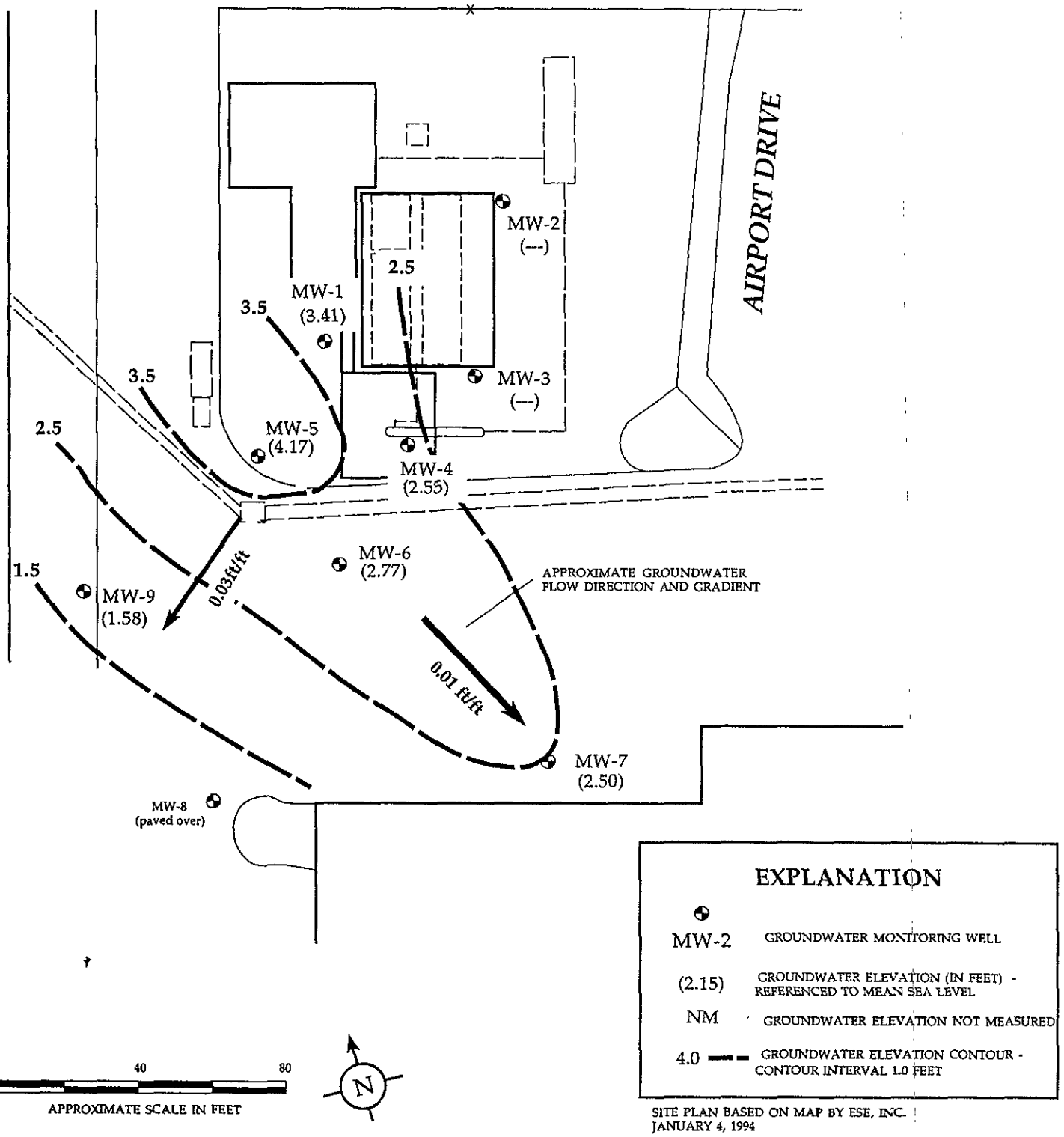


SITE PLAN

Hertz Service Center,
1 Airport Drive,
Oakland, California

CLEARWATER GROUP, INC.

Project No.	Figure Date	Figure
C-156	10/96	2



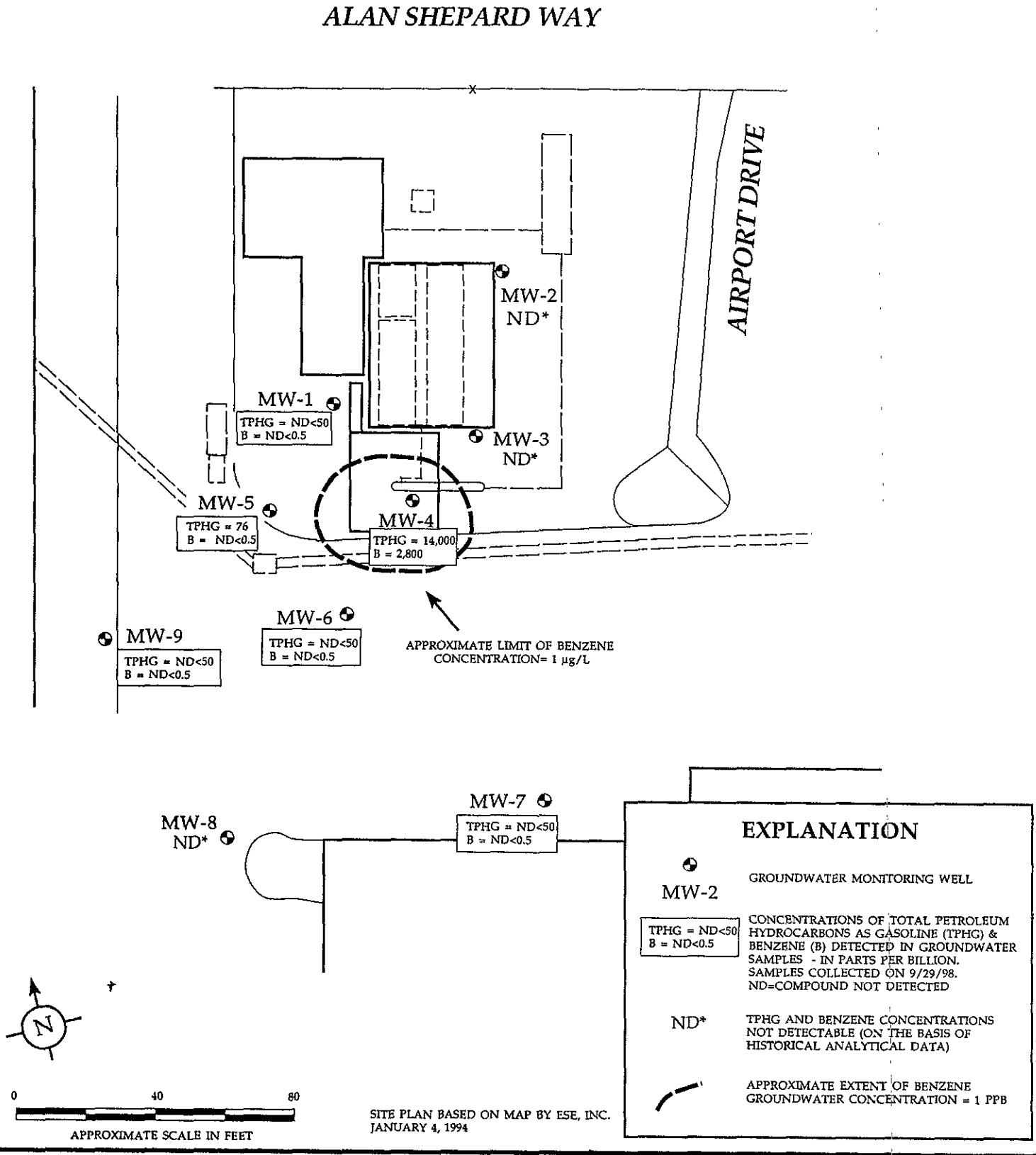
SITE PLAN BASED ON MAP BY ESE, INC.
JANUARY 4, 1994

GROUNDWATER CONTOUR MAP- 9/29/98

Hertz Service Center,
1 Airport Drive,
Oakland, California

CLEARWATER GROUP, INC.

Project No.	Figure Date	Figure
C-156	10/98	3



HYDROCARBON DISTRIBUTION MAP
9/29/98

Hertz Service Center,
1 Airport Drive,
Oakland, California

CLEARWATER GROUP, INC.

Project No.	Figure Date	Figure
C-156	10/98	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)
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	--
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	--	--	--	--	--	--	--
	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	--	--	--	--	--	--	--	--	--

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)
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	--	--	--	--	--	--	--	--	--
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	--	--
	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	--

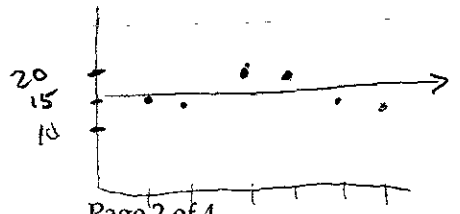


Table 1
GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS

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)
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	--
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
	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	--
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	--
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	--	--	--	--	--	--	--	--	--

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)
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
	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	--

Notes:

TOC	Elevation at the north side of the top of the well casing referenced to mean sea level (wells were surveyed by others)
DTW	Depth to water
GWE	Groundwater elevation
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 8240(B)
µg/L	Micrograms per liter
--	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 GAUGING DATA/PURGE CALCULATIONS

Job No.: C156 Location: Hertz OAKLAND Airport Date: 9/29/98 Tech(s): DG

WELL NO.	DIAM (in)	DTB (ft)	DTW (ft)	ST (ft)	CV (gal)	PV (gal)	SPL (ft)	NOTES
MW9	2	10.88	4.97	5.91	0.9	2.6		
MW7	2"	9.90	4.43	5.47	0.9	2.6		
MW-6		11.60	4.40	7.20	1.2	3.5		
MW-5		10.80	3.59	7.21	1.2	3.5		
MW-1		14.8	4.04	10.8	1.7	5.2		
MW-4	↓	9.04	4.56	3.48	0.6	1.7		

Explanation:
DIAM = Well Diameter
DTB = Depth to Bottom
DTW = Depth to Water
ST = Saturated Thickness (DTB-DTW)
CV = Casing Volume (ST x cf)
PV = Purge Volume (standard 3 x CV, well development 10 x CV)
SPL = Thickness of Separate Phase Liquid

Conversion Factors (cf)
2 inch diameter well cf = 0.16 gal/ft
4 inch diameter well cf = 0.65 gal/ft
6 inch diameter well cf = 1.44 gal/ft

CLEARWATER GROUP, INC.
520 Third St., Ste. 104
Oakland, California 94607
Phone: (510) 893-5160
Fax: (510) 893-5947

WELL PURGING DATA

SHEET 1 OF 2

Job No.: C156 Location: HERTZ OAKLAND AIRPORT Date: 9/29/98 Tech:

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH
9	1125	0	69	0.70	7.87
Calc. purge		0.8	70.4	0.69	7.89
volume		1.6	71.5	0.67	7.92
2.6		2.6	72.1	0.67	7.91

Sample time: 1155

Sample for: (circle)

(TPHg) TPHd TPHmo

(BTEX) MTBE 8010

Other:

Sampling Method:

(Dedicated) / Disposable bailer

Purging Method:

(PVC bailer) / Pump

COMMENTS: color, turbidity, recharge, etc.

Light tan - Disch ok - High turb

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH
7		0	66.4	0.95	7.69
Calc. purge		0.8	67.7	0.95	7.69
volume		1.6	68.2	1.02	7.70
2.6		2.6	68.1	1.03	7.70

Sample time: 1225

Sample for: (circle)

(TPHg) TPHd TPHmo

(BTEX) MTBE 8010

Other:

Sampling Method:

(Dedicated) / Disposable bailer

Purging Method:

(PVC bailer) / Pump

COMMENTS: color, turbidity, recharge, etc.

Clear to light tan

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH
6		0	69.5	2.70	7.44
Calc. purge		1.2	70.9	2.98	7.42
volume		2.4	72.2	3.43	7.41
3.5		3.5	72.8	3.49	7.41

Sample time: 1245

Sample for: (circle)

(TPHg) TPHd TPHmo

(BTEX) MTBE 8010

Other:

Sampling Method:

(Dedicated) / Disposable bailer

Purging Method:

(PVC bailer) / Pump

COMMENTS: color, turbidity, recharge, etc.

Gray - Green

CLEARWATER GROUP INC., 520 Third St., Ste. 104, Oakland, California 94607
Phone: (510) 893-5160 Fax: (510) 893-5947

WELL PURGING DATA

SHEET 1 OF 2

Job No.: C156 Location: Hertz @ Oakland Airport Date: 9/29/98 Tech: DCW

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH
5		0	68.5	1.29	7.68
Calc. purge		1.2	69.1	1.48	7.61
volume		2.4	69.3	1.67	7.51
3.5		3.5	69.4	1.69	7.50

Sample time: 1315

Sample for: (circle)

(TPHg) TPHd TPHmo

(BTEX) MTBE 8010

Other:

Sampling Method:

(Dedicated) / Disposable bailer

Purging Method:

(PVC bailer) / Pump

COMMENTS: color, turbidity, recharge, etc.

Gray Green low recharge

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH
1		0	67.4	0.82	7.87
Calc. purge		1.5	67.9	0.81	7.90
volume		3.0	68.4	0.82	7.92
5.2		5.2	68.5	0.82	7.93

Sample time: 1340

Sample for: (circle)

(TPHg) TPHd TPHmo

(BTEX) MTBE 8010

Other:

Sampling Method:

(Dedicated) / Disposable bailer

Purging Method:

(PVC bailer) / Pump

COMMENTS: color, turbidity, recharge, etc.

Brown gray

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH
4		0.0	66.8	1.97	7.51
Calc. purge		0.8	67.9	2.00	7.51
volume		1.2	67.9	2.03	7.53
1.7		1.7	68.1	2.06	7.55

Sample time: 1405

Sample for: (circle)

(TPHg) TPHd TPHmo

(BTEX) (MTBE) 8010

Other: MTBE 8240(B)

Sampling Method:

(Dedicated) / Disposable bailer

Purging Method:

(PVC bailer) / Pump

COMMENTS: color, turbidity, recharge, etc.

CLEARWATER GROUP INC., 520 Third St., Ste. 104, Oakland, California 94607
Phone: (510) 893-5160 Fax: (510) 893-5947

Entech Analytical Labs, Inc.

CA ELAP# 2224

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: Doug Guenther

Date: 10/19/98
Date Received: 9/30/98
Project: C-156
PO #:
Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	MW-5			MW-1			MW-4				
Sample Date	9/29/98			9/29/98			9/29/98				
Sample Time	13:15			13:40			14:05				
Lab #	E17723			E17724			E17725				
	Result	DF	DLR	Result	DF	DLR	Result	DF	DLR	PQL	Method
Results in µg/Liter:											
Analysis Date	10/4/98			10/4/98			10/4/98				
TPH-Gas	**76**	1.0	50	**ND**	1.0	50	**14,000**	40	2000	50	8015M
MTBE	**170**	1.0	5	**14**	1.0	5	**na**			5	8020
Benzene	**ND**	1.0	0.50	**ND**	1.0	0.50	**2,800**	40	20	0.50	8020
Toluene	**ND**	1.0	0.50	**ND**	1.0	0.50	**240**	40	20	0.50	8020
Ethyl Benzene	**1.7**	1.0	0.50	**ND**	1.0	0.50	**390**	40	20	0.50	8020
Xylenes	**0.55**	1.0	0.50	**ND**	1.0	0.50	**830**	40	20	0.50	8020
Analysis Date							10/7/98				
MTBE	**na**			**na**			**370**	5.0	25	5	8240

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

- Report amended 10/19/98
- na: not analyzed
- Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #2224)

Michelle L. Anderson, Lab Director

Entech Analytical Labs, Inc.

CA ELAP# 2224

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: Doug Guenther

Date: 10/15/98
Date Received: 9/30/98
Project: C-156
PO #:
Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	MW-9			MW-7			MW-6				
Sample Date	9/29/98			9/29/98			9/29/98				
Sample Time	11:55			12:25			12:45				
Lab #	E17720			E17721			E17722				
	Result	DF	DLR	Result	DF	DLR	Result	DF	DLR	PQL	Method
Results in µg/Liter:											
Analysis Date	10/3/98			10/3/98			10/3/98				
TPH-Gas	ND	1.0	50	ND	1.0	50	ND	1.0	50	50	8015M
MTBE	ND	1.0	5	ND	1.0	5	ND	1.0	5	5	8020
Benzene	ND	1.0	0.50	ND	1.0	0.50	ND	1.0	0.50	0.50	8020
Toluene	ND	1.0	0.50	ND	1.0	0.50	ND	1.0	0.50	0.50	8020
Ethyl Benzene	ND	1.0	0.50	ND	1.0	0.50	ND	1.0	0.50	0.50	8020
Xylenes	ND	1.0	0.50	ND	1.0	0.50	ND	1.0	0.50	0.50	8020

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

· Report amended 10/15/98

· Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #2224)

Michelle L. Anderson, Lab Director

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography

QC Batch #: GBG4981003
Matrix: Water
Units: ug/L

Date Analyzed: 10/03/98
Quality Control Sample: E17660

PARAMETER	Method #	MB ug/L	SA ug/L	SR ug/L	SP ug/L	SP % R	SPD ug/L	SPD %R	RPD	QC LIMITS RPD	QC LIMITS %R
Benzene	8020	<0.50	40	ND	38	95	43	108	12.8	25	77-116
Toluene	8020	<0.50	40	ND	38	95	30	76	21.7	25	75-116
Ethyl Benzene	8020	<0.50	40	ND	39	97	34	85	12.8	25	77-115
Xylenes	8020	<0.50	120	ND	116	97	101	84	13.5	25	76-118
Gasoline	8015	<50.0	1000	ND	950	95	940	94	1.1	25	65-135

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

Acceptable LCS and LCSD results are reported when matrix interferences cause MS and MSD results to fall outside established QC limits.

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

Entech Analytical Labs, Inc.

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Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Gas Chromatography

QC Batch #: GBG4981004
Matrix: Water
Units: ug/L

Date Analyzed: 10/04/98
Quality Control Sample: E17739

PARAMETER	Method #	MB ug/L	SA ug/L	SR ug/L	SP ug/L	SP % R	SPD ug/L	SPD %R	RPD	QC LIMITS RPD	QC LIMITS %R
Benzene	8020	<0.50	40	ND	38	**95**	36	**90**	4.7	25	77-116
Toluene	8020	<0.50	40	ND	35	**88**	34	**86**	2.7	25	75-116
Ethyl Benzene	8020	<0.50	40	ND	36	**89**	34	**86**	3.4	25	77-115
Xylenes	8020	<0.50	120	ND	109	**90**	104	**87**	4.0	25	76-118
Gasoline	8015	<50.0	1000	ND	1070	**107**	1060	**106**	0.9	25	65-135

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

Acceptable LCS and LCSD results are reported when matrix interferences cause MS and MSD results to fall outside established QC limits.

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

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Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

Volatile Organic Compounds

QC Batch #: 8240W981007
Matrix: Water
Units: µg/L

Date analyzed: 10/14/98
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	QC LIMITS %R
1,1- Dichloroethene	624/8240	25	ND	25	99%	26	104%	5.1	25	50-150
Methyl-tert-butyl ether	624/8240	25	ND	29	114%	30	120%	4.8	25	50-150
Benzene	624/8240	25	ND	27	106%	26	104%	1.9	25	50-150
Trichloroethene	624/8240	25	ND	25	100%	26	104%	3.5	25	50-150
Toluene	624/8240	25	ND	24	96%	25	100%	4.1	25	50-150
Chlorobenzene	624/8240	25	ND	24	95%	25	100%	4.9	25	50-150
1,2,4-Trichlorobenzene	624/8240	25	ND	25	100%	28	110%	9.1	25	50-150

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 Third St.
OAKLAND, CA 94607
Contact: Doug Gruenthen
Telephone #: 510 893 5760
Date Received: 9/30/98
Turn Around: Standard

Project ID: C-156
Purchase Order #:

Sampler/Company:	Telephone #:
DG/CGI	

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-D	BTEX&MTBE	BTEX&MTBE ONLY						
E17720	MW-9	Grab	WATER	9/29/98	1155	HCl	3-40 ml VOA	X	X							
E17721	MW-7	↓	↓	↓	1225	↓	↓	↓	↓							
E17722	MW-6				1245											
E17723	MW-5				1315											
E17724	MW-1				1340		↓									
E17725	MW-4	↓	↓	↓	1405	✓	5-40 ml VOA	↓	↓	X						

Relinq. By:	Received By:	Date 9/30/98	Time 10:00
Relinq By:	Received By: VIA FAX	Date 9/30/98	Time 5:00
Relinq/ By:	Received By:	Date	Time

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.

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 or a submersible 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. 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 dewaters. 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 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.