C-156 report

FILE

CLEARWATER
GROUP, INC.
Environmental Services

#2260

QUARTERLY GROUNDWATER MONITORING REPORT
FOURTH QUARTER 1997
Hertz Service Center, 1 Airport Drive, Oakland, California
January 5, 1998

No significant change in MW-4 TPHg + BTEX still high in MW-4 - slt. lower - prob due to ore added in MW-4.

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~~ one 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. 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-5, MW-7, MW-8, and MW-9 will be monitored annually during the first quarter.

GROUNDWATER MONITORING AND SAMPLING ACTIVITIES (FOURTH QUARTER, 1997)

Date of groundwater sampling:	December 3, 1997
Wells gauged:	MW-1 through MW-4, MW-6, MW-7 and MW-9
Wells purged and sampled:	MW-1, MW-4, MW-6, and MW-9
Analytes tested:	TPHg, BTEX, MTBE
Laboratory:	American Environmental Network (Pleasant Hill, CA)

GROUNDWATER MONITORING AND SAMPLING RESULTS

Depth to groundwater:	2.95 to 4.40 feet below top of casing
Flow direction:	Southwest
TPHg concentration range:	<50 µg/l (MW-1, MW-6, and MW-9) to 6,400 µg/l (MW-4)
Benzene concentration range:	<0.5 µg/l (MW-1 and MW-9) to 1,500 µg/l (MW-4)
MTBE concentration range:	<5 µg/l (MW-1, MW-6, and MW-9) to 160 µg/l (MW-4)

PROJECT STATUS

One monitoring well (MW-4) was analyzed by EPA Method 8260 for Methy-tert Butyl Ether as required by the EHS. Three monitoring wells (MW-4, MW-6, and MW-9) were analyzed for nitrates, sulfates, and ferrous iron. In addition, dissolved oxygen and oxidation -reduction potentials were recorded in each of the sampled wells. Monitoring well MW-5 was inaccessible, therefore, depth to water measurements were not collected. The EHS has approved the *Workplan for Remediation Services* dated June 13, 1997. This workplan proposes baseline groundwater sampling, the application of Oxygen Release Compound, and subsequent groundwater monitoring. Baseline data was collected during this quarterly monitoring event.

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Environmental Services

APPENDIX

- Site Location Map (Figure 1)
- Site Plan (Figure 2)
- Groundwater Contour Map - 12/3/97 (Figure 3)
- Hydrocarbon Distribution Map - 12/3/97 (Figure 4)
- Groundwater Elevations and Analytical Results (Table 1)
- Clearwater Gauging Data/Purge Calculations and Well Purging Data
- Certified Laboratory Reports, Chromatograms, 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.

It is possible that variations in the soil or groundwater conditions exist beyond the points explored in this investigation. Also, site conditions are subject to change at some time in the future due to variations in rainfall, temperature, regional water usage or other factors.

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.

Clearwater Group, Inc. includes in this report chemical analytical data from a State-certified laboratory. These analyses are performed according to procedures suggested by the U.S. EPA and the State of California. Clearwater Group, Inc. is not responsible for laboratory errors in procedure or result reporting.

Prepared by:

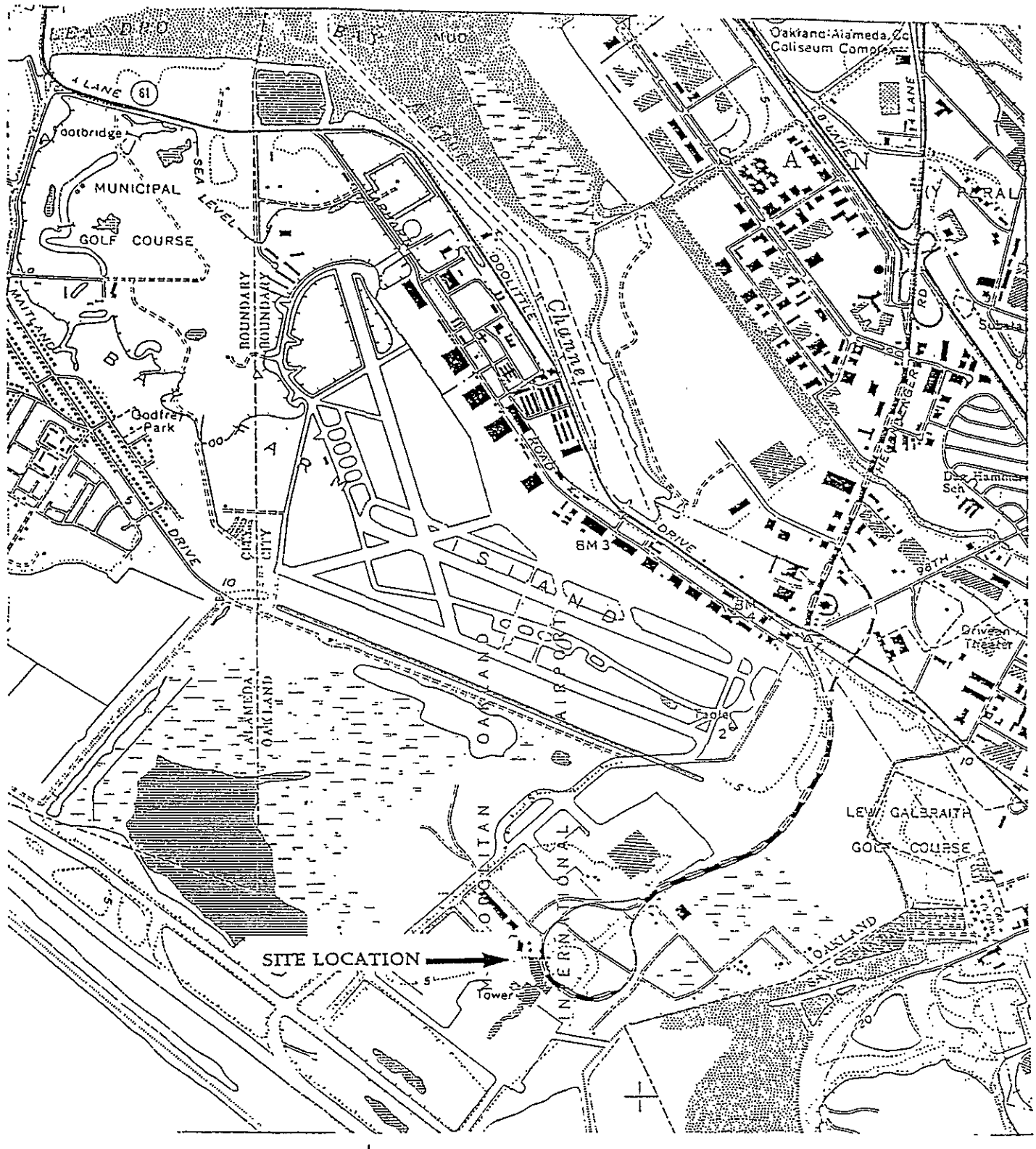
Douglas C. Guenther
Project Geologist

Reviewed by:

REGISTERED GEOLOGIST
BRIAN M. GWINN
No. 6505
4/30/98
STATE OF CALIFORNIA

Brian Gwinn, R.G.
Senior Geologist

FIGURES



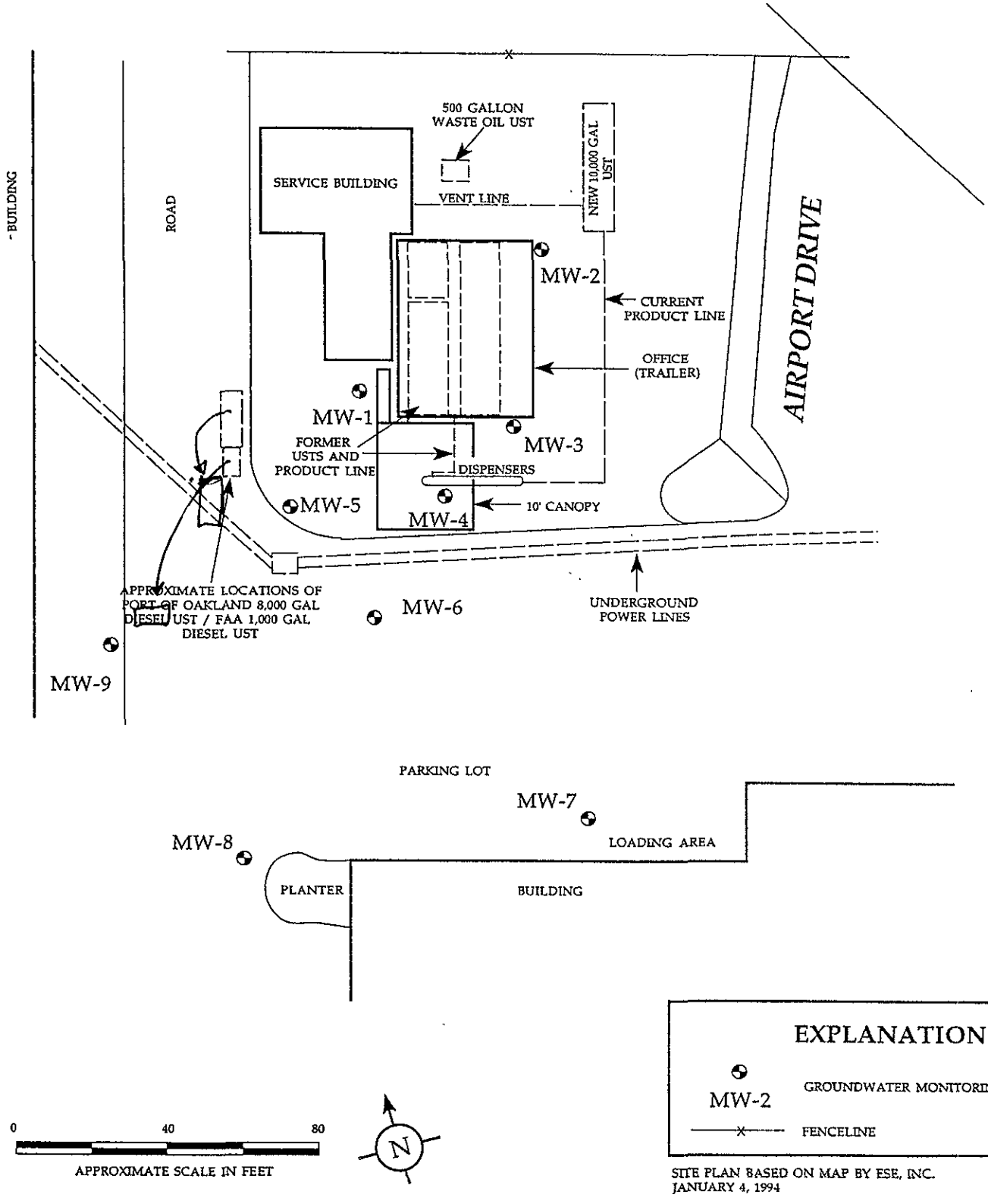
BASE MAP FROM U.S.G.S. 7.5 MINUTE SERIES: SAN LEANDRO, CALIFORNIA

SITE LOCATION MAP

Hertz Service Center,
1 Airport Drive,
Oakland, California

CLEARWATER GROUP, INC.

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



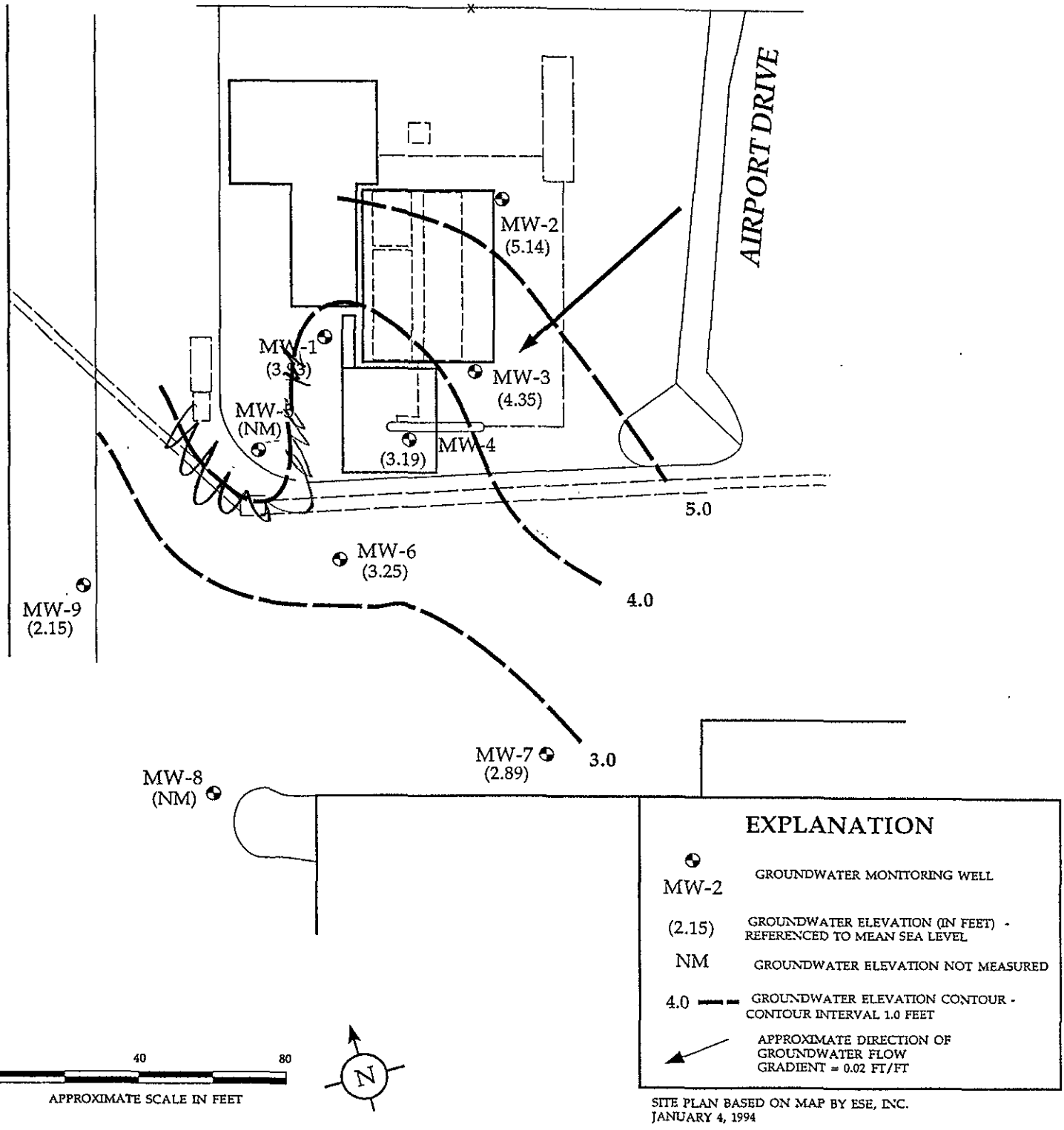
SITE PLAN BASED ON MAP BY ESE, INC.
JANUARY 4, 1994

SITE PLAN

Hertz Service Center,
1 Airport Drive,
Oakland, California

CLEARWATER GROUP, INC.

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

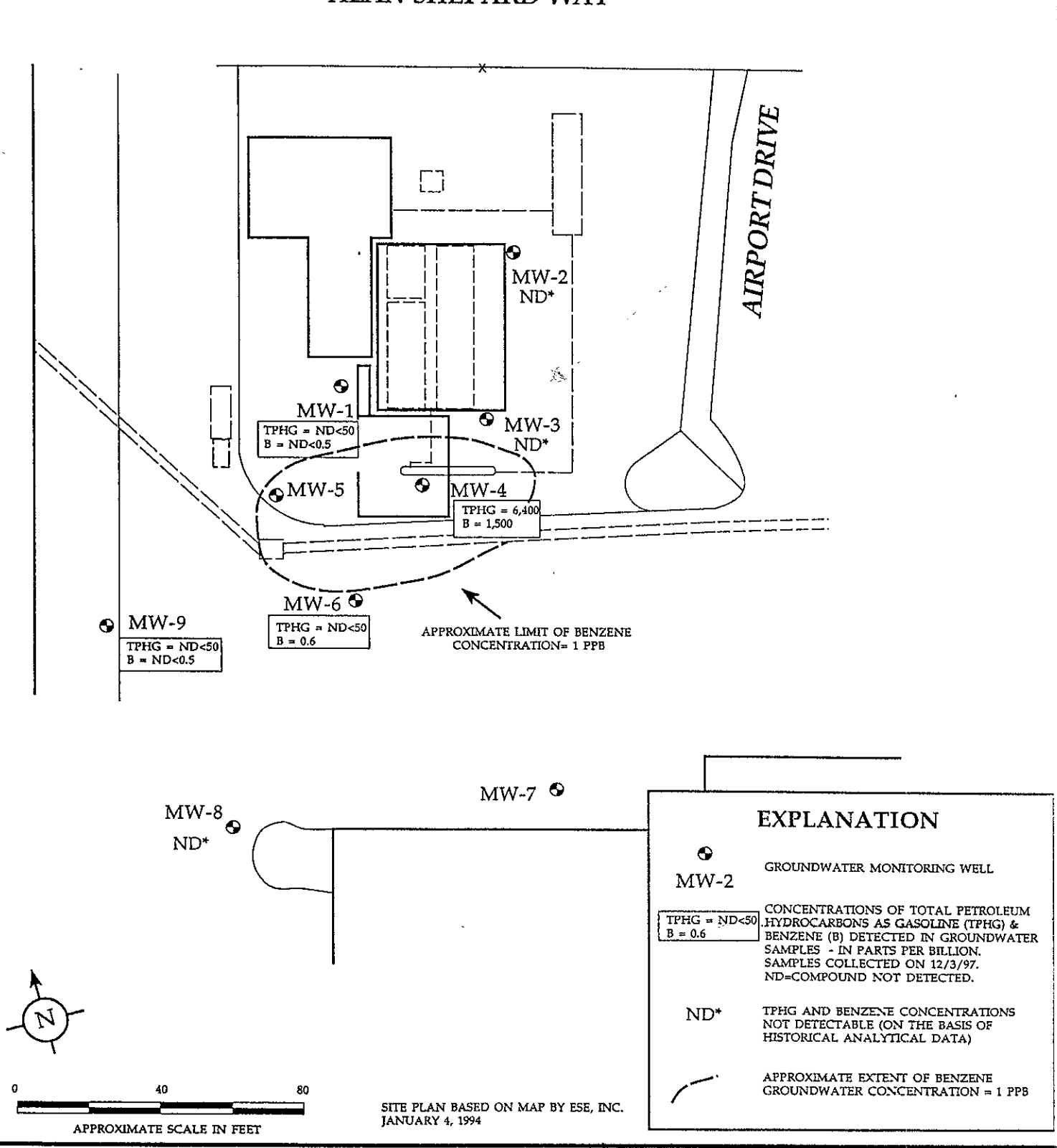


GROUNDWATER CONTOUR MAP- 12/03/97

Hertz Service Center,
1 Airport Drive,
Oakland, California

CLEARWATER GROUP, INC.

Project No.	Figure Date	Figure
C-156	12/97	3



HYDROCARBON DISTRIBUTION MAP
12/03/97

Hertz Service Center,
1 Airport Drive,
Oakland, California

CLEARWATER GROUP, INC.

Project No.	Figure Date	Figure
C-156	12/97	4

TABLES

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 (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	MTBE (ppb)	TPHd (ppb)
MW-3	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	--	--	--	--	--	--	--
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	6,400	1,500	0,640	520	0,890	160	--
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
	12/3/97	7.76	--	--	--	--	--	--	--	--	--
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 (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	MTBE (ppb)	TPHd (ppb)
MW-6	11/27/96	7.17	4.23	2.94	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<2.0	7	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	600
	12/3/97	7.17	3.92	3.25	ND<50	0.6	ND<0.5	ND<0.5	ND<2.0	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	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--
	11/27/96 (a)	6.75	--	--	--	--	--	--	--	--	--
	2/14/97 (a)	6.75	--	--	--	--	--	--	--	--	--
	Not Located										
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	--

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)
ppb	Parts per billion (micrograms per liter)

Table 1
GROUNDWATER ELEVATIONS AND ANALYTICAL RESULTS

Hertz Service Center
1 Airport Drive
Oakland, California

--	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 (well may have been 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.

APPENDIX A

WELL GAUGING DATA/PURGE CALCULATIONS

Job No.: C-156 Location: Hertz, Oakland Airport Date: 12-3-97 Tech(s): RA

WELL NO.	DIAM (in)	DTB (ft)	DTW (ft)	ST (ft)	CV (gal)	PV (gal)	SPL (ft)	NOTES
MW-1	2	14.8	3.52	11.28	1.81	5.47		
2			2.95					
3			3.31					
4		8.04	3.92	4.12	0.66	1.98		
5								
6		11.60	3.92	7.68	1.23	3.69		
7			4.04					
9		10.58	4.40	6.18	0.99	2.97		

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

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WELL PURGING DATA

SHEET 1 OF 2

Job No.: C-156 Location: Hertz, Oakland Apt Date: 12-3-97 Tech: RA

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH
MW-9	1340	0	67.5	0.39	7.11
Calc. purge		1	68.1	0.38	7.50
volume		2½	67.9	0.41	7.60
3.0	1345	3½	68.4	0.41	7.66

DO = ~~100~~ 3.2
Eh = 140

Sample time: 1400
Sample for: (circle)
(TPHg) TPHd TPHmo
(BTEX) (MTBE) 8010
Other:

Sampling Method:
(Dedicated) / Disposable bailer

COMMENTS: color, turbidity, recharge, etc.
tan, mod, fair, fine sand in p. water

Purging Method:
(PVC bailer) / Pump

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH
MW-6	1420	0	66.5	3.01	7.30
Calc. purge		1½	66.9	3.32	7.50
volume		3	68.1	3.48	7.52
3.7	1426	4	68.8	3.49	7.56

DO = 1.5
Eh = -35

Sample time: 1450
Sample for: (circle)
(TPHg) TPHd TPHmo
(BTEX) (MTBE) 8010
Other:

Sampling Method:
(Dedicated) / Disposable bailer

COMMENTS: color, turbidity, recharge, etc.
greenish-grey, high, good

Purging Method:
(PVC bailer) / Pump

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH
MW-1	1515	0	63.8	0.88	7.71
Calc. purge		2	64.5	0.99	7.77
volume		4	64.7	1.05	7.80
5.5	1523	6	65.4	1.07	7.85

DO = 3.5
Eh = 25

Sample time: 1540
Sample for: (circle)
(TPHg) TPHd TPHmo
(BTEX) (MTBE) 8010
Other:

Sampling Method:
(Dedicated) / Disposable bailer

COMMENTS: color, turbidity, recharge, etc.
grey, mod, good

Purging Method:
(PVC bailer) / Pump

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

WELL PURGING DATA

SHEET 2 OF 2

Job No.: C-156 Location: Hertz, Oakland Apt Date: 12-3-97 Tech: RA

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH
MW-4	1550	0	63.2	1.50	7.51
Calc. purge volume		Well dry after ½ gal purged.		Waited 2 min & purged 1 gal more	
2.0	1600	@ 2½	64.0	1.77	7.63

Sample time: 1615

Sample for: (circle)

(TPHg) TPHd TPHmo

(BTEX) (MTBE) 8010

Other: 8260 MTBE confirm.

Sampling Method:

(Dedicated) / Disposable bailer

Purging Method:

(PVC bailer) / Pump

DO = 1.0

Eh = -150

COMMENTS: color, turbidity, recharge, etc.

black, mod, poor.

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH
Calc. purge volume					

Sample time:

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.

WELL No.	TIME (24-hr)	VOLUME (gal)	TEMP. (deg. F.)	COND. (mS/cm)	pH
Calc. purge volume					

Sample time:

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.

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

APPENDIX B

RECEIVED DEC 22 1997

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11

CLEARWATER GROUP, INC.
520 THIRD ST., STE. 104
OAKLAND, CA 94607

ATTN: RUARY ALLAN
CLIENT PROJ. ID: C-156
CLIENT PROJ. NAME: HERTZ CAR RNTL

REPORT DATE: 12/18/97

DATE(S) SAMPLED: 12/03/97

DATE RECEIVED: 12/04/97

AEN WORK ORDER: 9712065

PROJECT SUMMARY:

On December 4, 1997, this laboratory received 4 water sample(s).

Client requested sample(s) be analyzed for chemical parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

CLEARWATER GROUP, INC.

SAMPLE ID: MW-1
AEN LAB NO: 9712065-01
AEN WORK ORDER: 9712065
CLIENT PROJ. ID: C-156

DATE SAMPLED: 12/03/97
DATE RECEIVED: 12/04/97
REPORT DATE: 12/18/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	12/09/97
Toluene	108-88-3	ND	0.5	ug/L	12/09/97
Ethylbenzene	100-41-4	ND	0.5	ug/L	12/09/97
Xylenes, Total	1330-20-7	ND	2	ug/L	12/09/97
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	12/09/97
Methyl t-Butyl Ether	1634-04-4	ND	5	ug/L	12/09/97

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

CLEARWATER GROUP, INC.

SAMPLE ID: MW-4
AEN LAB NO: 9712065-02
AEN WORK ORDER: 9712065
CLIENT PROJ. ID: C-156

DATE SAMPLED: 12/03/97
DATE RECEIVED: 12/04/97
REPORT DATE: 12/18/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	1500 *	3	ug/L	12/09/97
Toluene	108-88-3	640 *	3	ug/L	12/09/97
Ethylbenzene	100-41-4	520 *	3	ug/L	12/09/97
Xylenes, Total	1330-20-7	890 *	10	ug/L	12/09/97
Purgeable HCs as Gasoline	5030/GCFID	6.4 *	0.3	mg/L	12/09/97
Methyl t-Butyl Ether	1634-04-4	160 *	30	ug/L	12/09/97
#Digestion, Metals by ICP	EPA 3010	-		Prep Date	12/09/97
Iron	EPA 6010	0.5 *	0.1	mg/L	12/10/97
#Anion Sample Prep.		-		Prep date	12/04/97
Nitrate as Nitrogen	EPA 300	ND	0.1	mg/L	12/04/97
Sulfate	EPA 300	70 *	0.5	mg/L	12/04/97
Methyl t-Butyl Ether	GC/MS	PRESENT	50	ug/L	12/17/97

RLs for g/BTEX & MTBE elevated due to high levels of target compounds. Samples run at dilution.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

CLEARWATER GROUP, INC.

SAMPLE ID: MW-6
AEN LAB NO: 9712065-03
AEN WORK ORDER: 9712065
CLIENT PROJ. ID: C-156

DATE SAMPLED: 12/03/97
DATE RECEIVED: 12/04/97
REPORT DATE: 12/18/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	0.6 *	0.5	ug/L	12/09/97
Toluene	108-88-3	ND	0.5	ug/L	12/09/97
Ethylbenzene	100-41-4	ND	0.5	ug/L	12/09/97
Xylenes, Total	1330-20-7	ND	2	ug/L	12/09/97
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	12/09/97
Methyl t-Butyl Ether	1634-04-4	ND	5	ug/L	12/09/97
#Digestion, Metals by ICP	EPA 3010	-		Prep Date	12/09/97
Iron	EPA 6010	0.4 *	0.1	mg/L	12/10/97
#Anion Sample Prep.		-		Prep date	12/04/97
Nitrate as Nitrogen	EPA 300	ND	0.1	mg/L	12/04/97
Sulfate	EPA 300	150 *	0.5	mg/L	12/15/97

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

CLEARWATER GROUP, INC.

SAMPLE ID: MW-9
AEN LAB NO: 9712065-04
AEN WORK ORDER: 9712065
CLIENT PROJ. ID: C-156

DATE SAMPLED: 12/03/97
DATE RECEIVED: 12/04/97
REPORT DATE: 12/18/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	12/09/97
Toluene	108-88-3	ND	0.5	ug/L	12/09/97
Ethylbenzene	100-41-4	ND	0.5	ug/L	12/09/97
Xylenes, Total	1330-20-7	ND	2	ug/L	12/09/97
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	12/09/97
Methyl t-Butyl Ether	1634-04-4	ND	5	ug/L	12/09/97
#Digestion, Metals by ICP	EPA 3010	-		Prep Date	12/09/97
Iron	EPA 6010	ND	0.1	mg/L	12/10/97
#Anion Sample Prep.		-		Prep date	12/04/97
Nitrate as Nitrogen	EPA 300	ND	0.1	mg/L	12/04/97
Sulfate	EPA 300	1.0 *	0.5	mg/L	12/04/97

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9712065
CLIENT PROJECT ID: C-156

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spikes(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analyses.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behaviour, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrument performance.

D: Surrogates diluted out.

I: Interference.

!: Indicates result outside of established laboratory QC limits.

ANALYSIS: Major Anions

MATRIX: Water

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank
INSTRUMENT: Dionex ion chromatograph
UNITS: mg/L
METHOD:

LAB ID: IC_BLNK
PREPARED:
ANALYZED: 12/04/97

INSTR RUN: IC\971204000000/1/
BATCH ID: IC120497
DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW	REC LIMITS (%) HIGH	RPD (%)	RPD LIMIT
Chloride, Cl	ND		0.5						
Nitrate, NO3-N	ND		0.1						
Nitrite, NO2-N	ND		0.1						
Sulfate, SO4	ND		0.5						

SAMPLE TYPE: Blank-Method/Media blank
INSTRUMENT: Dionex ion chromatograph
UNITS: mg/L
METHOD:

LAB ID: IC_BLNK
PREPARED:
ANALYZED: 12/15/97

INSTR RUN: IC\971215000000/1/
BATCH ID: IC121597
DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW	REC LIMITS (%) HIGH	RPD (%)	RPD LIMIT
Chloride, Cl	ND		0.5						
Sulfate, SO4	ND		0.5						

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Spike-Method/Media blank
INSTRUMENT: Dionex ion chromatograph
UNITS: mg/L
METHOD:

LAB ID: IC_LCD
PREPARED:
ANALYZED: 12/04/97

INSTR RUN: IC\971204000000/3/1
BATCH ID: IC120497
DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW	REC LIMITS (%) HIGH	RPD (%)	RPD LIMIT
Chloride, Cl	9.61	ND	0.5	10.0	96.1	80	120		
Nitrate, NO3-N	2.05	ND	0.1	2.00	103	80	120		
Nitrite, NO2-N	1.96	ND	0.1	2.00	98.0	80	120		
Sulfate, SO4	9.06	ND	0.5	10.0	90.6	80	120		

SAMPLE TYPE: Spike-Method/Media blank
INSTRUMENT: Dionex ion chromatograph
UNITS: mg/L
METHOD:

LAB ID: IC_LCS
PREPARED:
ANALYZED: 12/04/97

INSTR RUN: IC\971204000000/2/1
BATCH ID: IC120497
DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW	REC LIMITS (%) HIGH	RPD (%)	RPD LIMIT
Chloride, Cl	10.0	ND	0.5	10.0	100	80	120		
Nitrate, NO3-N	2.06	ND	0.1	2.00	103	80	120		
Nitrite, NO2-N	1.96	ND	0.1	2.00	98.0	80	120		
Sulfate, SO4	9.23	ND	0.5	10.0	92.3	80	120		

SAMPLE TYPE: Spike-Method/Media blank
INSTRUMENT: Dionex ion chromatograph
UNITS: mg/L
METHOD:

LAB ID: IC_LCD
PREPARED:
ANALYZED: 12/15/97

INSTR RUN: IC\971215000000/3/1
BATCH ID: IC121597
DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW	REC LIMITS (%) HIGH	RPD (%)	RPD LIMIT
Chloride, Cl	9.71	ND	0.5	10.0	97.1	80	120		
Sulfate, SO4	9.19	ND	0.5	10.0	91.9	80	120		

SAMPLE TYPE: Spike-Method/Media blank
INSTRUMENT: Dionex ion chromatograph
UNITS: mg/L
METHOD:

LAB ID: IC_LCS
PREPARED:
ANALYZED: 12/15/97

INSTR RUN: IC\971215000000/2/1
BATCH ID: IC121597
DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW	REC LIMITS (%) HIGH	RPD (%)	RPD LIMIT
Chloride, Cl	9.68	ND	0.5	10.0	96.8	80	120		
Sulfate, SO4	9.17	ND	0.5	10.0	91.7	80	120		

ANALYSIS: Major Anions

MATRIX: Water

LABORATORY CONTROL DUPLICATES

SAMPLE TYPE: Method Spike Sample Duplicate
INSTRUMENT: Dionex ion chromatograph
UNITS: mg/L
METHOD:

LAB ID: IC_LCR
PREPARED:
ANALYZED: 12/04/97

INSTR RUN: IC\971204000000/4/2
BATCH ID: IC120497
DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW	REC LIMITS (%) HIGH	RPD (%)	RPD LIMIT (
Chloride, Cl	9.61	10.0	0.5					3.98	15
Nitrate, NO3-N	2.05	2.06	0.1					0.487	15
Nitrite, NO2-N	1.96	1.96	0.1					0	15
Sulfate, SO4	9.06	9.23	0.5					1.86	15

SAMPLE TYPE: Method Spike Sample Duplicate
INSTRUMENT: Dionex ion chromatograph
UNITS: mg/L
METHOD:

LAB ID: IC_LCR
PREPARED:
ANALYZED: 12/15/97

INSTR RUN: IC\971215000000/4/2
BATCH ID: IC121597
DILUTION: 1.000000

ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW	REC LIMITS (%) HIGH	RPD (%)	RPD LIMIT (
Chloride, Cl	9.71	9.68	0.5					0.309	15
Sulfate, SO4	9.19	9.17	0.5					0.218	15

ANALYSIS: Metals Scan by ICP

MATRIX: Water

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank
INSTRUMENT: TJA Enviro 36
UNITS: mg/L
METHOD:

LAB ID: IFW_PBW_A
PREPARED:
ANALYZED: 12/10/97

INSTR RUN: ICP\971210161900/1/
BATCH ID: IFW120997-A
DILUTION: 1.000000

ANALYTE		RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW	REC LIMITS (%) HIGH	RPD (%)	RPD LIMIT
Ag	Silver	ND		0.005						
Al	Aluminum	ND		0.1						
As	Arsenic	ND		0.04						
Ba	Barium	ND		0.01						
Be	Beryllium	ND		0.002						
Ca	Calcium	ND		0.2						
Cd	Cadmium	ND		0.005						
Co	Cobalt	ND		0.005						
Cr	Chromium	ND		0.01						
Cu	Copper	ND		0.01						
Fe	Iron	ND		0.1						
K	Potassium	ND		0.1						
Mg	Magnesium	ND		0.04						
Mn	Manganese	ND		0.005						
Mo	Molybdenum	ND		0.01						
Na	Sodium	ND		0.5						
Ni	Nickel	ND		0.01						
Pb	Lead	ND		0.04						
Sb	Antimony	ND		0.02						
Se	Selenium	ND		0.07						
Tl	Thallium	ND		0.05						
V	Vanadium	ND		0.005						
Zn	Zinc	ND		0.01						

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Spike-Method/Media blank
INSTRUMENT: TJA Enviro 36
UNITS: mg/L
METHOD:

LAB ID: IFW_LCD_A
PREPARED:
ANALYZED: 12/10/97

INSTR RUN: ICP\971210161900/3/1
BATCH ID: IFW120997-A
DILUTION: 1.000000

ANALYTE		RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW	REC LIMITS (%) HIGH	RPD (%)	RPD LIMIT
Ag	Silver	0.0245	ND	0.005	0.0250	98.0	72	127		
Al	Aluminum	1.04	ND	0.1	1.00	104	89	116		
As	Arsenic	0.443	ND	0.04	0.400	111	75	125		
Ba	Barium	1.06	ND	0.01	1.00	106	91	120		
Be	Beryllium	0.0264	ND	0.002	0.0250	106	82	119		
Ca	Calcium	10.6	ND	0.2	10.0	106	80	120		
Cd	Cadmium	0.0518	ND	0.005	0.0500	104	84	120		
Co	Cobalt	0.280	ND	0.005	0.250	112	96	120		
Cr	Chromium	0.105	ND	0.01	0.100	105	85	128		
Cu	Copper	0.130	ND	0.01	0.125	104	86	123		
Fe	Iron	0.515	ND	0.1	0.500	103	84	133		
K	Potassium	10.2	ND	0.1	10.0	102	80	120		
Mg	Magnesium	10.3	ND	0.04	10.0	103	80	120		
Mn	Manganese	0.282	ND	0.005	0.250	113	93	122		
Mo	Molybdenum	0.213	ND	0.01	0.200	107	89	117		
Na	Sodium	10.1	ND	0.5	10.0	101	80	120		
Ni	Nickel	0.263	ND	0.01	0.250	105	92	121		
Pb	Lead	0.554	ND	0.04	0.500	111	90	122		
Sb	Antimony	0.530	ND	0.02	0.500	106	82	113		
Se	Selenium	0.515	ND	0.07	0.500	103	75	125		
Tl	Thallium	0.541	ND	0.05	0.500	108	85	115		
V	Vanadium	0.270	ND	0.005	0.250	108	91	118		
Zn	Zinc	0.262	ND	0.01	0.250	105	90	121		

ANALYSIS: Metals Scan by ICP

MATRIX: Water

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Spike-Method/Media blank
INSTRUMENT: TJA Enviro 36
UNITS: mg/L
METHOD:

LAB ID: IFW_LCS_A
PREPARED:
ANALYZED: 12/10/97

INSTR RUN: ICP\971210161900/2/1
BATCH ID: IFW120997-A
DILUTION: 1.000000

ANALYTE		RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW	REC LIMITS (%) HIGH	RPD (%)	RPD LIMIT (%
Ag	Silver	0.0227	ND	0.005	0.0250	90.8	72	127		
Al	Aluminum	0.994	ND	0.1	1.00	99.4	89	116		
As	Arsenic	0.405	ND	0.04	0.400	101	75	125		
Ba	Barium	1.03	ND	0.01	1.00	103	91	120		
Be	Beryllium	0.0261	ND	0.002	0.0250	104	82	119		
Ca	Calcium	10.3	ND	0.2	10.0	103	80	120		
Cd	Cadmium	0.0488	ND	0.005	0.0500	97.6	84	120		
Co	Cobalt	0.273	ND	0.005	0.250	109	96	120		
Cr	Chromium	0.0991	ND	0.01	0.100	99.1	85	128		
Cu	Copper	0.127	ND	0.01	0.125	102	86	123		
Fe	Iron	0.494	ND	0.1	0.500	98.8	84	133		
K	Potassium	9.92	ND	0.1	10.0	99.2	80	120		
Mg	Magnesium	9.99	ND	0.04	10.0	99.9	80	120		
Mn	Manganese	0.274	ND	0.005	0.250	110	93	122		
Mo	Molybdenum	0.202	ND	0.01	0.200	101	89	117		
Na	Sodium	9.85	ND	0.5	10.0	98.5	80	120		
Ni	Nickel	0.255	ND	0.01	0.250	102	92	121		
Pb	Lead	0.534	ND	0.04	0.500	107	90	122		
Sb	Antimony	0.506	ND	0.02	0.500	101	82	113		
Se	Selenium	0.480	ND	0.07	0.500	96.0	75	125		
Tl	Thallium	0.505	ND	0.05	0.500	101	85	115		
V	Vanadium	0.264	ND	0.005	0.250	106	91	118		
Zn	Zinc	0.255	ND	0.01	0.250	102	90	121		

LABORATORY CONTROL DUPLICATES

SAMPLE TYPE: Method Spike Sample Duplicate
INSTRUMENT: TJA Enviro 36
UNITS: mg/L
METHOD:

LAB ID: IFW_LCR_A
PREPARED:
ANALYZED: 12/10/97

INSTR RUN: ICP\971210161900/4/2
BATCH ID: IFW120997-A
DILUTION: 1.000000

ANALYTE		RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%) LOW	REC LIMITS (%) HIGH	RPD (%)	RPD LIMIT
Ag	Silver	0.0245	0.0227	0.005					7.63	10
Al	Aluminum	1.04	0.994	0.1					4.52	10
As	Arsenic	0.443	0.405	0.04					8.96	15
Ba	Barium	1.06	1.03	0.01					2.87	10
Be	Beryllium	0.0264	0.0261	0.002					1.14	10
Ca	Calcium	10.6	10.3	0.2					2.87	15
Cd	Cadmium	0.0518	0.0488	0.005					5.96	10
Co	Cobalt	0.280	0.273	0.005					2.53	10
Cr	Chromium	0.105	0.0991	0.01					5.78	10
Cu	Copper	0.130	0.127	0.01					2.33	10
Fe	Iron	0.515	0.494	0.1					4.16	10
K	Potassium	10.2	9.92	0.1					2.78	10
Mg	Magnesium	10.3	9.99	0.04					3.06	10
Mn	Manganese	0.282	0.274	0.005					2.88	10
Mo	Molybdenum	0.213	0.202	0.01					5.30	10
Na	Sodium	10.1	9.85	0.5					2.51	10
Ni	Nickel	0.263	0.255	0.01					3.09	10
Pb	Lead	0.554	0.534	0.04					3.68	10
Sb	Antimony	0.530	0.506	0.02					4.63	10
Se	Selenium	0.515	0.480	0.07					7.04	15
Tl	Thallium	0.541	0.505	0.05					6.88	10
V	Vanadium	0.270	0.264	0.005					2.25	10
Zn	Zinc	0.262	0.255	0.01					2.71	10

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9712065
INSTRUMENT: E
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
12/09/97	MW-1	01	104
12/09/97	MW-4	02	101
12/09/97	MW-6	03	103
12/09/97	MW-7	04	103
QC Limits:			70-130

DATE ANALYZED: 12/09/97
SAMPLE SPIKED: 9712065-04
INSTRUMENT: E

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	100	91	6	70-130	20
Toluene	100	98	6	70-130	20
Ethylbenzene	100	101	6	70-130	20
Total Xylenes	300	97	6	70-130	20

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

Reporting Information:

1. Client: HERTZ CAR RENTAL
Address: 1 AIRPORT DRIVE OAKLAND CA
Contact:
Alt. Contact:

American Environmental Network
3440 Vincent Road, Pleasant Hill, CA 94523
Phone (510) 930-9090
FAX (510) 930-0256

AEN

Page ____ of ____

REQUEST FOR ANALYSIS / CHAIN OF CUSTODY

Lab Job Number: 9712065
Lab Destination:
Date Samples Shipped:
Lab Contact:
Date Results Required:
Date Report Required:
Client Phone No.:
Client FAX No.:

Address Report To:

2. CLEARWATER GROUP INC
520 THIRD ST #105
OAKLAND CA 94607

Send Invoice To: C-7, S-3 FNVR6 R-3, S-1

3. AS 2

Send Report To: 1 or (2) (Circle one)

Client P.O. No.: Ø Client Project I.D. No.: C-156

Sample Team Member (s)

Lab Number	Client Sample Identification	Air Volume	Date/ Time Collected	Sample Type*	Pres.	No. of Cont.	Type of Cont.	ANALYSIS: TPH g BTEX MTBE 8020	nitrate sulfate dissolved iron	MTBE 8260							Comments / Hazards
1APC	MW-1		12-3, 1540	7	HCl/None	3	var.	X	X								8260 on MW-4 for MTBE confirmation only
2A-F	MW-4		1615		HCl/None	6		X	X	X	X	X					
3A-E	MW-6		1440			3		X	X	X	X						
4A-E	MW-9		1400			3		X	X	X	X						Dissolved iron samples were filtered (0.45µm) in field.

Relinquished by: (Signature)	DATE 12-4-97	TIME 1515	Received by: (Signature) DATE 12/4/97 TIME 1155
Relinquished by: (Signature)	DATE 12/4/97	TIME 1705	Received by: (Signature) DATE 12/4/97 TIME 1705
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature) DATE TIME
Method of Shipment			Lab Comments

*Sample type (Specify): 1) 37mm 0.8 µm MCEF 2) 25mm 0.8 µm MCEF 3) 25mm 0.4 µm polycarb. filter

APPENDIX C

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.