Environmental
Science &
Engineering, Inc.
A CILCORP Company

2260

TO: Alameda County Health Care Services
Agency - Department of Environmental Health
80 Swan Way
Oakland, CA 94621

March 29, 1993

RO157

ATTN: Mr. Barney Chan

JOB NUMBER: 6-91-5228

SUBJECT: Hertz Rent-A-Car, No-1 Airport Drive, Oakland International Airport, Oakland, California

WE ARE TRANSMITTING THE FOLLOWING:

1) Report of Findings - First Quarter 1993 Ground Water Monitoring.

2) Work Plan for Additional Soil and Ground Water Investigation.

CC: Ms. Patricia A. Woods, Hertz

DIST:
LB
FILE
ORIGINATOR

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

BY Michael E. Quillin

Michael E. Quillin, RG
Senior Hydrogeologist

4090 Nelson Avenue, Suite J | Concord, CA 94520 | Phone (510) 685-4053 | Fax (510) 685-5323

REPORT OF FINDINGS
FIRST QUARTER 1993
GROUND WATER MONITORING

HERTZ SERVICE CENTER
#1 AIRPORT DRIVE
OAKLAND
ALAMEDA COUNTY
CALIFORNIA

Prepared For:

THE HERTZ CORPORATION
225 BRAE BOULEVARD
PARK RIDGE, NEW JERSEY 07656-0713

Prepared By:

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
4090 NELSON AVENUE, SUITE J
CONCORD, CALIFORNIA 94520

PROJECT NO. 6-91-5228

March 5, 1993

This report has been prepared by Environmental Science & Engineering, Inc. for the exclusive use of The Hertz Corporation as it pertains to their site located at #1 Airport Drive, Oakland, California. Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by other geologists and engineers practicing in this field. No other warranty, express or implied, is made as to professional advice in this report.

REPORT PREPARED BY:

MARCH 5, 1993

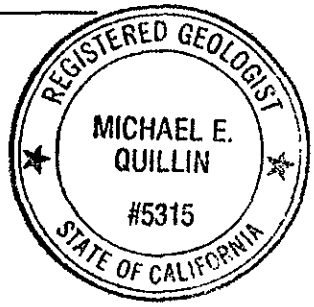
Bart S. Miller
Senior Staff Geologist

DATE

UNDER THE PRIMARY REVIEW AND SUPERVISION OF:

MARCH 5, 1993

Michael E. Quillin, RG 5315
Senior Hydrogeologist



DATE

PROJECT NO. 6-91-5228

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1.0 INTRODUCTION

This report presents the results of the First Quarter 1993 ground water monitoring activities conducted by Environmental Science & Engineering, Inc. (ESE) at the Hertz Service Center, No. 1 Airport Drive, Oakland, Alameda County, California ("site"). The site is an active rental car service and fueling facility located at the Oakland International Airport (Figure 1 - Site Plan). Ground water monitoring activities included the collection of depth to ground water measurements and ground water samples from five existing wells (MW-1, MW-2, MW-3, MW-4, and MW-6). Recent paving activities at the Hertz site covered well MW-5 making it impossible for ESE to monitor and sample the well.

ESE summarized site investigation background in the August 1991 Quarterly Monitoring Report (ESE, 1991a) and the November 1991 Quarterly Monitoring Report (ESE, 1991b). The results of additional site investigations conducted by ESE, including the installation of ground water monitoring wells MW-4, MW-5, and MW-6 at the site, have been summarized in the February 1992 Quarterly Monitoring Report (1992a) and December 1992 Quarterly Monitoring Report (ESE, 1992b), respectively. ESE has conducted quarterly monitoring activities at the site since August 1991.

2.0 GROUND WATER MONITORING

2.1 Ground Water Elevations

On February 3, 1993, ESE measured the static water levels in the five wells using an electric water level tape. Measurements were made relative to the surveyed datum for each well. ESE calculated relative ground water elevations for the purpose of preparing a ground water elevation contour map, from which ESE estimated the general direction and magnitude of the ground water gradient. No free phase product was observed in any of the wells. Field documentation for water level measurements, including well purging results, are presented in Appendix A - Well Purging and Sampling Data.

2.2 Ground Water Sampling and Analysis

Ground water samples were collected from each of the wells after they were purged of approximately four casing volumes in accordance with ESE Standard Operating Procedure (SOP) No. 3 (Appendix B). Samples were analyzed by Sequoia Analytical for Total Petroleum Hydrocarbons as Gasoline (TPH-G) and Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX) using Environmental Protection Agency (EPA) Method 5030/8015 (modified) and EPA Method 5030/8020, respectively.

As a measure of field quality assurance and quality control (QA/QC), ESE collected a duplicate sample from well MW-6 as a means of evaluating sample homogeneity and to provide a check on ESE's sample collection procedures. The duplicate sample also serves as check on analytical laboratory procedures. In addition, a laboratory-supplied trip blank consisting of deionized water was kept in the same cooler with the collected ground water samples to evaluate QA/QC for sample handling and transport.

3.0 RESULTS

3.1 Ground Water Elevations

Table 1 presents a historical summary of ground water elevation data, including that for the current monitoring event. Ground water elevations for the current monitoring event are contoured in Figure 2 - Ground Water Elevations. The estimated direction of ground water flow was observed to be to the southwest with a gradient of approximately 175 feet/mile (0.033 ft/ft), which is generally consistent with the gradient noted during September 1992 (140 feet/mile or 0.026 ft/ft) and during December, 1992 (160 feet/mile or 0.03 ft/ft).

3.2 Ground Water Chemistry

Current analytical results are summarized with historical data in Table 1 and graphically presented in Figure 3 - Concentrations of Petroleum Hydrocarbons in Ground Water. The laboratory report and chain of custody documentation are presented as Appendix C - Analytical Results for Ground Water Samples.

As presented in Table 1, the concentrations of TPH-G and BTEX in well MW-4 increased by a factor of two or more relative to December 1992 findings. Historically, petroleum hydrocarbon concentrations in ground water collected from well MW-4 have increased since monitoring was initiated in that well in February 1992, with a high observed in September 1992. TPH-G and BTEX were also detected in the samples collected from well MW-6, but were not detected in samples collected from MW-1, MW-2, and MW-3.

The findings to date continue to confirm that an origin for petroleum hydrocarbons in ground water is located at the vicinity of the Hertz fuel dispensers and former product lines. However, the detection of Total Petroleum Hydrocarbons as Diesel (TPH-D) in a sample collected from MW-5 during November 1992 suggests a relationship between the Port of Oakland diesel fuel UST and ground water near the well. The analytical results for a sample collected at MW-6 continue to confirm that petroleum hydrocarbons have migrated offsite in ground water, but are present in concentrations an order of magnitude less than detected onsite at well MW-4.

4.0 CONCLUSIONS

- The general direction of ground water flow beneath the site on February 3, 1993 was towards the southwest with a gradient of approximately 175 feet per mile, which is generally consistent with historical data.

- The continued detection of petroleum hydrocarbons in ground water from well MW-6 indicates that the plume in ground water beneath the site and its vicinity has not been completely defined.

- Monitoring well MW-5 has been paved over and is presently impossible to monitor. The past occurrence of petroleum hydrocarbons in the diesel range in ground water from well MW-5 suggests that the Port of Oakland's diesel UST may be a source of those hydrocarbons.

- Petroleum hydrocarbons in ground water appear to have migrated offsite to the south, as evidenced by the continued detection of petroleum hydrocarbons in ground water from well MW-6.

5.0 REFERENCES

Environmental Science & Engineering, Inc. (ESE), 1991a, August 1991 Quarterly Monitoring Report for Hertz Service Center, #1 Airport Drive, Oakland, Alameda County, California, September 16, 1991.

_____, 1991b, November 1991 Quarterly Monitoring Report for Hertz Service Center, #1 Airport Drive, Oakland, Alameda County, California, December 11, 1991.

_____, 1992a, February 1992 Quarterly Monitoring Report for Hertz Service Center, #1 Airport Drive, Oakland, Alameda County, California, March 24, 1992.

_____, 1992b, December 1992 Quarterly Monitoring Report for Hertz Service Center, #1 Airport Drive, Oakland, Alameda County, California, December 9, 1992.

TABLE

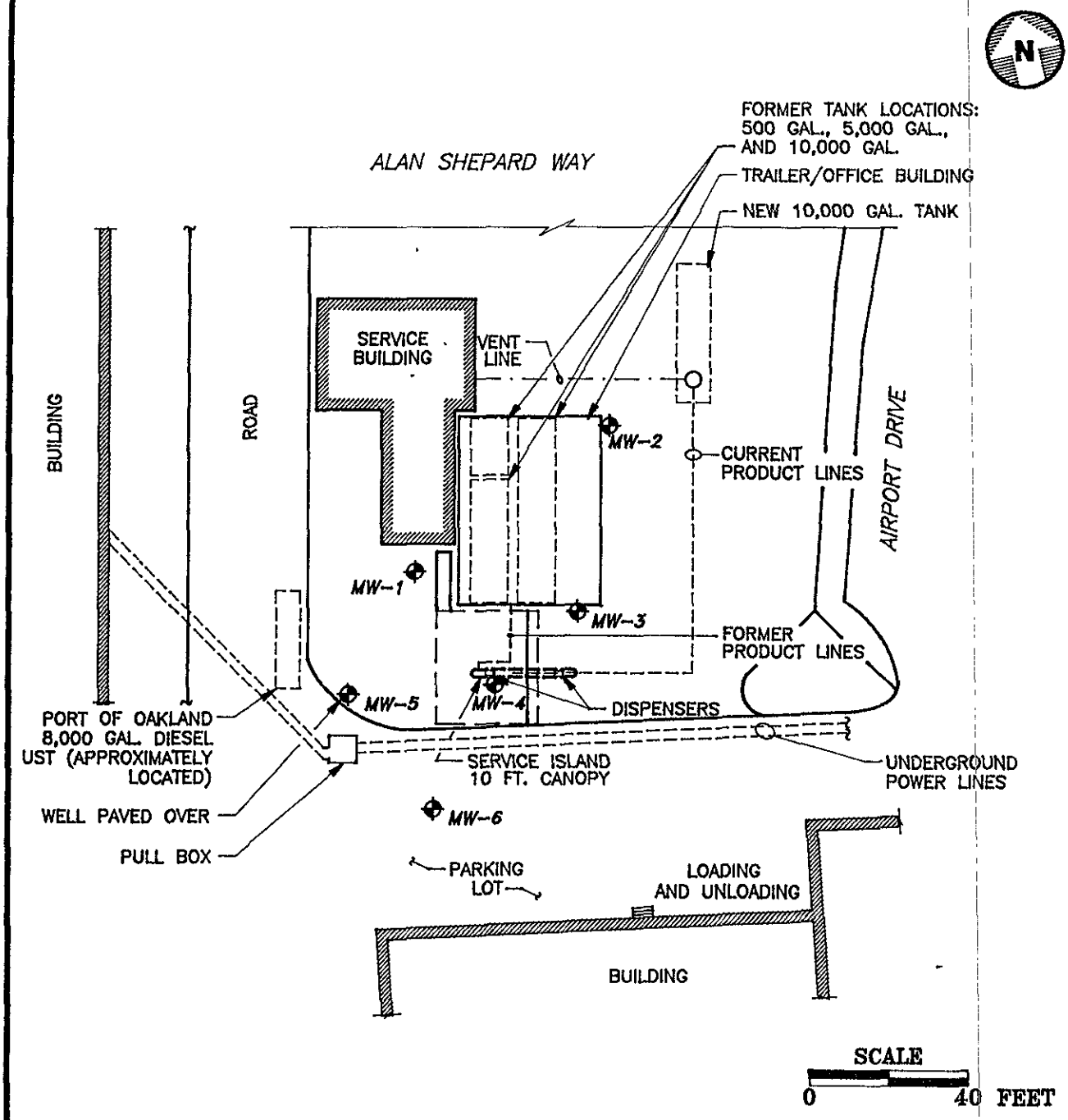
TABLE 1
SUMMARY OF GROUND WATER ELEVATION AND ANALYTICAL DATA
HERTZ/OAKLAND AIRPORT, OAKLAND, CALIFORNIA

GROUND WATER		Ground-Water Elevation (feet above MSL)	Metals (ppm)					Oil & Grease (ppm)	Total Petroleum Hydrocarbons (ppb)							Purgeable Halocarbons (EPA 8010) (ppb)	Semi-Volatile Organics (EPA 8270) (ppb)
Date	Well		Cd	Cr	Pb	Ni	Zn		as Gasoline	as Kerosene	as Diesel	B	T	E	X		
02/03/93	MW-1	3.34						--	ND	--	--	ND	ND	ND	ND	--	--
	MW-2	4.84						--	ND	--	--	ND	ND	ND	ND	--	--
	MW-3	4.03	Not Analyzed					--	ND	--	--	ND	ND	ND	ND	--	--
	MW-4	2.89						--	50,000	--	--	4700	5000	1500	6600	--	--
	MW-5	--						--	--	--	--	--	--	--	--	--	--
	MW-6	2.90						--	330	--	--	120	2.8	19	5.3	--	--
	DUP (MW-6)	--						--	2,100	--	--	110	5.2	19	14	--	--
11/05/92	MW-1	2.39						--	ND	--	--	ND	ND	ND	ND	--	--
	MW-2	4.05						--	ND	--	--	ND	ND	ND	ND	--	--
	MW-3	3.07	Not Analyzed					--	ND	--	--	ND	ND	ND	ND	--	--
	MW-4	1.88						--	24,000	--	--	2600	3300	510	2100	--	--
	MW-5	3.00						--	ND	ND	170	ND	ND	ND	ND	--	--
	MW-6	1.89						--	820	240	D	250	ND	5.9	ND	--	--
	DUP (MW-4)	--						--	14,000	--	--	2100	1400	370	1100	--	--
09/01/92	MW-1	2.55						--	ND	--	--	ND	ND	ND	ND	--	--
	MW-2	4.15						--	56	--	--	2.0	3.0	0.8	3.1	--	--
	MW-3	3.21	Not Analyzed					--	ND	--	--	1.1	1.6	ND	1.9	--	--
	MW-4	3.14						--	120,000	--	--	8800	14000	2100	11000	--	--
	DUP (MW-2)	--						--	68	--	--	2.8	4.2	1.0	4.3	--	--
05/13/92	MW-1	2.93						--	ND	--	--	ND	ND	ND	ND	--	--
	MW-2	4.66						--	ND	--	--	ND	ND	ND	ND	--	--
	MW-3	3.64	Not Analyzed					--	ND	--	--	ND	ND	ND	ND	--	--
	MW-4	3.57						--	62,000	--	--	3400	5200	990	5200	--	--
	DUP	--						--	61,000	--	--	3300	5200	920	5200	--	--
	TRIP	--						--	ND	--	--	ND	ND	ND	ND	--	--
02/18/92	MW-1	3.06						--	ND	--	ND	ND	ND	ND	ND	--	--
	MW-2	3.86	Not Analyzed					--	ND	--	ND	ND	ND	ND	ND	--	--
	MW-3	2.92						--	ND	--	ND	ND	ND	ND	ND	--	--
	MW-4	3.43						--	6,600	--	ND	910	1900	280	1700	--	--
11/12/91	MW-1	3.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	all ND	all ND
	MW-2	3.86	ND	ND	ND	ND	ND	ND	ND	ND	52 †	ND	ND	ND	ND	all ND	all ND
	MW-3	2.92	7.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	all ND	all ND
08/20/91	MW-1	2.30	all ND					ND	ND	ND	ND	ND	ND	ND	ND	all ND	all ND
	MW-2	4.09	all ND					ND	ND	ND	ND	ND	ND	ND	ND	all ND	all ND
	MW-3	3.06	all ND					ND	ND	ND	ND	ND	ND	ND	ND	all ND	all ND
12/22/89	MW-1	2.9 est.	--					--	ND	--	ND	ND	ND	ND	ND	all ND	all ND *
	MW-2	3.6 est.	--					--	ND	--	ND	ND	ND	ND	ND	all ND	all ND *
	MW-3	2.7 est.	--					--	ND	--	ND	ND	ND	ND	ND	all ND	all ND *
11/25/88	Water Sample A5 from excavation							--	7,400	--	--	63	570	250	1900	--	--

LEGEND TO TABLE 1

ND	Not detected
--	Not analyzed
ppm	parts per million
ppb	parts per billion
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total Xylenes
+	Detection limit for TPH-D is 50 ppb. Duplicate sample analyzed contained ND or <50 ppb.
*	An open scan reported two "tentatively identified compounds": (iodomethyl) benzene at 30 ppb in MW-1 and 40 ppb in MW-3; and 4-4' butylidenebis [2-(1,1-dimethyl - ethyl) 5-methyl] phenol at 20 ppb in MW-2 and MW-3. The identity and concentrations of these compounds are not considered reliable.
D	Diesel range not reported. Quantified as kerosene range.

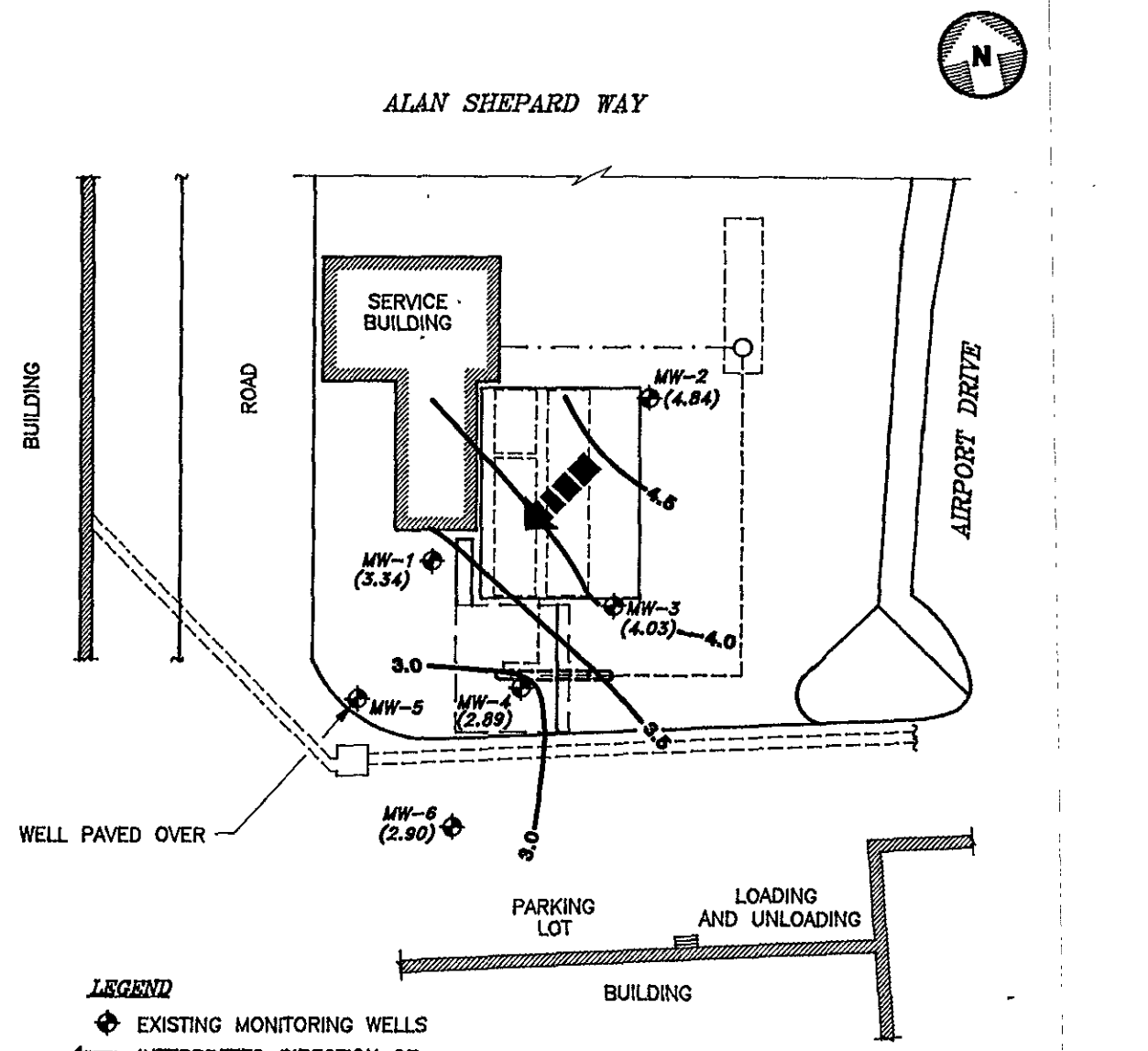
FIGURES



LEGEND

◆ EXISTING MONITORING WELLS

ESE A CILCORP Company — Environmental Science & Engineering, Inc.	DATE 8/91	PROJ. 6-91-5228	HERTZ/OAKLAND AIRPORT OAKLAND, CALIFORNIA
	DRAWN BY CVS	CAD FILE 52284001	
4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	APPROVED BY	REVISED DWR 3/93	FIGURE 1 SITE PLAN



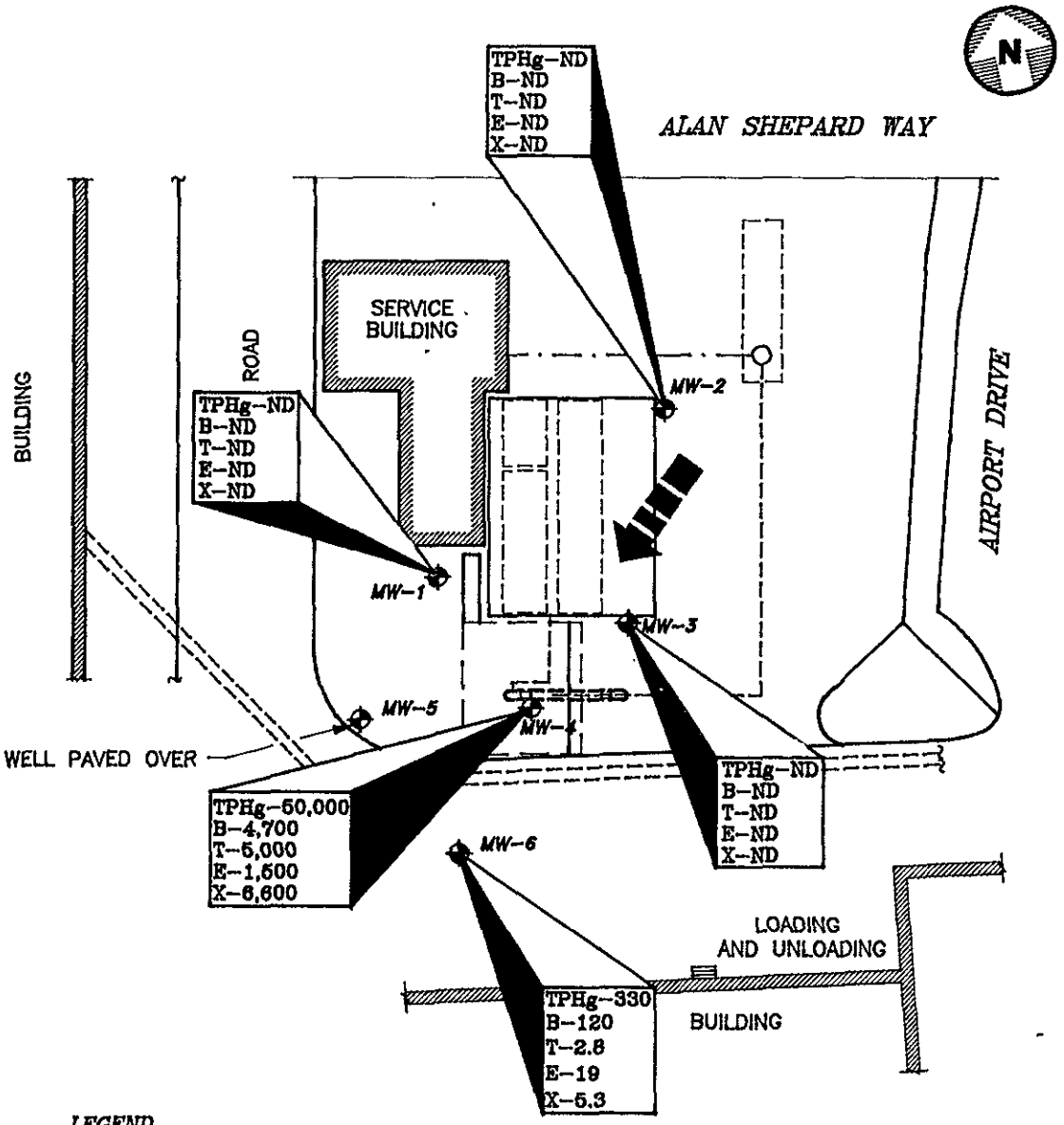
WELL	WELL ELEV(ft)	GW DEPTH(ft)	GW ELEV(ft)
MW-1	7.45	4.11	3.34
MW-2	8.09	3.25	4.84
MW-3	7.66	3.63	4.03
MW-4	7.11	4.22	2.89
MW-5	7.76	–	–
MW-6	7.17	4.27	2.90

ESE A CH2M HILL Company
Environmental Science & Engineering, Inc.
4090 NELSON AVENUE, SUITE J
CONCORD, CA 94520

DATE	PROP.
8/91	6-91-5228
DRAWN BY	CAD FILE
CVS	52284002
APPROVED BY	REVISED
	DWR 3/93

HERTZ/OAKLAND AIRPORT
OAKLAND, CALIFORNIA

FIGURE 2
GROUND WATER ELEVATIONS
FEBRUARY 3, 1993



LEGEND

- ◈ EXISTING MONITORING WELLS
- TPHg – TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (ppb)
- B – BENZENE (ppb)
- T – TOLUENE (ppb)
- E – ETHYLBENZENE (ppb)
- X – TOTAL XYLENES (ppb)

SCALE

0 40 FEET

APPROXIMATE DIRECTION OF GROUND WATER FLOW

ESE Environmental Science & Engineering, Inc. (A CILCORP Company)	DATE 8/91	PROJ/PROP 6–91–5228	HERTZ/OAKLAND AIRPORT OAKLAND, CALIFORNIA
4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	DRAWN BY CVS	CAD FILE 52284003	FIGURE 3 CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUND WATER FEBRUARY 3, 1993
	APPROVED BY	REVISED DWR 3/93	

APPENDIX A

WELL PURGING AND SAMPLING DATA

WELL SAMPLING FIELD LOG

PROJECT NAME: HERTZ - OAKLAND
PROJECT MANAGER: MEA
SAMPLER: CHRIS V.
GROUNDWATER: YES
OTHER:
DATE: 2-3-93
CLIENT: HERTZ
SAMPLE LOCATION I.D. MW-1
START TIME:

CASING ELEVATION (FT): 7.45 DATUM: CASING DIAMETER: 2" X 4" OTHER

DEPTH TO WATER (FT): 4.11 DEPTH OF WELL (FT): 14.88 DIFFERENCE (FT): 10.77

WATER ELEVATION (FT): 3.34 CALCULATED WELL VOLUME (GAL): 1.78

ACTUAL PURGE VOLUME (GAL): 10 MINIMUM PURGE VOLUME (3 x WV): 7.12

10.77 .165 5385 6462 1077 1.78705 4 7.12

FIELD MEASUREMENTS

TIME	Volume (GAL)	pH (Units)	x1000 E.C.	Temp.	Clarity & Color	Other
	2.5	8.35	1.47	57.5	GREY/MANSCENT	
	5.0	8.14	1.50	56.8	↓	
	7.5	7.98	1.90	57.1		
	10.00	7.90	2.09	57.4	"	

PURGE METHOD

__Pneumatic Displacement Pump __Other

X Bailer (~~Teflon/PVC/SS~~ DISPOSABLE) __Submersible Pump

SAMPLE METHOD

__Bailer (Teflon/PVC/SS) __Dedicated

X Bailer (Disposable) __Other

WELL INTEGRITY:

REMARKS:

SIGNATURE: CHRIS V. CHECKED BY:

SELECTED WELL CASING DIAMETERS VOLUMES PER UNIT LENGTH

WELL CASING I.D. (inches)	GAL/FT	CUBIC FT/FT
2.0	0.1632	0.0218
4.0	0.6528	0.0873
6.0	1.4690	0.1963

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY
Feet of Water	Lbs/Sq. Inch	0.4335
Lbs/Sq. Inch	Feet of Water	2.3070
Cubic Feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.3048
Inches	Centimeters	2.5400

WELL SAMPLING FIELD LOG

PROJECT NAME: HERTZ - OAKLAND
PROJECT MANAGER: MEQ
SAMPLER: CHRIS V.
GROUNDWATER: YES
OTHER:
DATE: 2-3-93
CLIENT: HERTZ
SAMPLE LOCATION I.D. MW-2
START TIME:

CASING ELEVATION (FT): 8.09 DATUM: CASING DIAMETER: 2" X 4" OTHER

DEPTH TO WATER (FT): 3.25 DEPTH OF WELL (FT): 14.12 DIFFERENCE (FT): 10.87

WATER ELEVATION (FT): 4.84 CALCULATED WELL VOLUME (GAL): 1.79

ACTUAL PURGE VOLUME (GAL): 10 MINIMUM PURGE VOLUME (3/4 x WV): 7.16

10.87
.165
4.435
3.82
10.87
1.793.55
4
7.16

FIELD MEASUREMENTS

TIME	Volume (GAL)	pH (Units)	E.C. x1000	Temp.	Clarity & Color	Other
	2.50	8.19	1.11	56.3	CLEAR	
	5.0	8.01	1.44	56.8	"	
	7.5	8.00	1.27	56.0	"	
	10	7.97	1.51	56.9	"	

PURGE METHOD

__Pneumatic Displacement Pump __Other

X Bailer (Teflon/~~PVC~~/SS) Disposable __Submersible Pump

SAMPLE METHOD

__Bailer (Teflon/PVC/SS) __Dedicated

X Bailer (Disposable) __Other

WELL INTEGRITY:

REMARKS:

SIGNATURE: Chris V.

CHECKED BY:

SELECTED WELL CASING DIAMETERS VOLUMES PER UNIT LENGTH

WELL CASING I.D. (inches)	GAL/FT	CUBIC FT/FT
2.0	0.1632	0.0218
4.0	0.6528	0.0873
6.0	1.4690	0.1963

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY
Feet of Water	Lbs/Sq. Inch	0.4335
Lbs/Sq. Inch	Feet of Water	2.3070
Cubic Feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.3048
Inches	Centimeters	2.5400

WELL SAMPLING FIELD LOG

PROJECT NAME: HERTZ - OAKLAND DATE: 2-3-93
PROJECT MANAGER: MEG CLIENT: HERTZ
SAMPLER: CHRIS V. SAMPLE LOCATION I.D. MW-3
GROUNDWATER: YES OTHER: START TIME:

CASING ELEVATION (FT): 7.66 DATUM: CASING DIAMETER: 2" X 4" OTHER

DEPTH TO WATER (FT): 3.63 DEPTH OF WELL (FT): 14.45 DIFFERENCE (FT): 10.82

WATER ELEVATION (FT): 4.03 CALCULATED WELL VOLUME (GAL): 1.79

ACTUAL PURGE VOLUME (GAL): 10 MINIMUM PURGE VOLUME (3 x WV): 7.16
4

10.82
.165
5410
6492
1082
1.78530
4
7.16

FIELD MEASUREMENTS

TIME	Volume (GAL)	pH (Units)	E.C. x1000	Temp.	Clarity & Color	Other
	2.5	8.00	2.66	59.9	CLEAR	
	5	7.70	2.63	60.4	TRANSLUCENT	
	7.5	7.77	3.99	60.9	"	
	10	7.76	4.47	61.2	"	

PURGE METHOD

__Pneumatic Displacement Pump __Other
__Bailer (Teflon/PVC/SS) __Submersible Pump

SAMPLE METHOD

__Bailer (Teflon/PVC/SS) __Dedicated
__Bailer (Disposable) __Other

WELL INTEGRITY:

REMARKS:

SIGNATURE: Chris V. Vanhall CHECKED BY:

SELECTED WELL CASING DIAMETERS VOLUMES PER UNIT LENGTH

WELL CASING I.D. (inches)	GAL/FT	CUBIC FT/FT
2.0	0.1632	0.0218
4.0	0.6528	0.0873
6.0	1.4690	0.1963

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY
Feet of Water	Lbs/Sq. Inch	0.4335
Lbs/Sq. Inch	Feet of Water	2.3070
Cubic Feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.3048
Inches	Centimeters	2.5400

WELL SAMPLING FIELD LOG

PROJECT NAME: HERTZ - OAKLAND
PROJECT MANAGER: MEO
SAMPLER: CHRIS V.
GROUNDWATER: YES
OTHER:
DATE: 2-3-93
CLIENT: HERTZ
SAMPLE LOCATION I.D. MW-4
START TIME:

CASING ELEVATION (FT): 7.11 DATUM: CASING DIAMETER: 2" X 4" OTHER

DEPTH TO WATER (FT): 4.22 DEPTH OF WELL (FT): 7.83 DIFFERENCE (FT): 3.61

WATER ELEVATION (FT): 2.89 CALCULATED WELL VOLUME (GAL): 0.596

ACTUAL PURGE VOLUME (GAL): 5 MINIMUM PURGE VOLUME (3 x WV): 1.88

3.61
.165
1805
216
361
.59665
4
188.4

FIELD MEASUREMENTS

TIME	Volume (GAL)	pH (Units)	E.C.	Temp.	Clarity & Color	Other
	1.00	8.03	2.00	59.8	GREY/SANDY	STRONG ODOR - SHEEN
	2.00	7.88	1.84	60.5	BLACK	"
	4.00	7.88	1.83	59.1		
	5.00	7.65	1.84	59.9		

PURGE METHOD

__Pneumatic Displacement Pump __Other
X Bailer (Teflon/PVC/SS) __Submersible Pump

SAMPLE METHOD

__Bailer (Teflon/PVC/SS) __Dedicated
X Bailer (Disposable) __Other

WELL INTEGRITY:

REMARKS: NO LOCK

SIGNATURE: C. H. Vahlt

CHECKED BY:

SELECTED WELL CASING DIAMETERS VOLUMES PER UNIT LENGTH

WELL CASING I.D. (inches)	GAL/FT	CUBIC FT/FT
2.0	0.1632	0.0218
4.0	0.6528	0.0873
6.0	1.4690	0.1963

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY
Feet of Water	Lbs/Sq. Inch	0.4335
Lbs/Sq. Inch	Feet of Water	2.3070
Cubic Feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.3048
Inches	Centimeters	2.5400

WELL SAMPLING FIELD LOG

PROJECT NAME: HERTZ - OAKLAND DATE: 2-3-93
PROJECT MANAGER: MEG CLIENT: HERTZ
SAMPLER: CHRIS V. SAMPLE LOCATION I.D. MW-5
GROUNDWATER: YES OTHER: START TIME:

CASING ELEVATION (FT): 7.76 DATUM: CASING DIAMETER: 2" X 4" OTHER

DEPTH TO WATER (FT): DEPTH OF WELL (FT): DIFFERENCE (FT):

WATER ELEVATION (FT): CALCULATED WELL VOLUME (GAL):

ACTUAL PURGE VOLUME (GAL): MINIMUM PURGE VOLUME (3 x WV):

FIELD MEASUREMENTS

TIME	Volume (GAL)	pH (Units)	E.C.	Temp.	Clarity & Color	Other

PURGE METHOD

__Pneumatic Displacement Pump __Other
__Bailer (Teflon/PVC/SS) __Submersible Pump

SAMPLE METHOD

__Bailer (Teflon/PVC/SS) __Dedicated
__Bailer (Disposable) __Other

WELL INTEGRITY:

REMARKS:

SEEMS TO HAVE DISAPPEARED - NEW ASPHALT AREA
COVERED UP WELL

SIGNATURE: CHRIS V. CHECKED BY:

SELECTED WELL CASING DIAMETERS VOLUMES PER UNIT LENGTH

WELL CASING I.D. (inches)	GAL/FT	CUBIC FT/FT
2.0	0.1632	0.0218
4.0	0.6528	0.0873
6.0	1.4690	0.1963

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY
Feet of Water	Lbs/Sq. Inch	0.4335
Lbs/Sq. Inch	Feet of Water	2.3070
Cubic Feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.3048
Inches	Centimeters	2.5400

WELL SAMPLING FIELD LOG

PROJECT NAME: HERTZ - OAKLAND DATE: 2-3-93
PROJECT MANAGER: MEG CLIENT: HERTZ
SAMPLER: CHRIS V. SAMPLE LOCATION I.D. MW-6
GROUNDWATER: YES OTHER: START TIME:

CASING ELEVATION (FT): 7.17 DATUM: CASING DIAMETER: 2" X 4" OTHER

DEPTH TO WATER (FT): 4.27 DEPTH OF WELL (FT): 11.85 DIFFERENCE (FT): 7.58

WATER ELEVATION (FT): 2.90 CALCULATED WELL VOLUME (GAL): 1.25

ACTUAL PURGE VOLUME (GAL): 10 MINIMUM PURGE VOLUME (3 x WV): 5.00

7.58 .165 3790 548 58 1.25070 4 5.00

FIELD MEASUREMENTS

TIME	Volume (GAL)	pH (Units)	x1000 E.C.	Temp.	Clarity & Color	Other
	2.5	6.91	5.30	61	TRANSLUCENT/SANDY	SLIGHT ODOR
	5.0	7.22	5.51	61.6	"	"
	7.5	7.62	7.07	61.2	"	"
	10.00	7.43	6.52	61.8	"	"

PURGE METHOD

__Pneumatic Displacement Pump __Other
__Bailer (Teflon/PVC/SS) __Submersible Pump

SAMPLE METHOD

__Bailer (Teflon/PVC/SS) __Dedicated
__Bailer (Disposable) __Other

WELL INTEGRITY:

REMARKS: DUPLICATE

SIGNATURE: Chris V. Vahll CHECKED BY:

SELECTED WELL CASING DIAMETERS VOLUMES PER UNIT LENGTH

WELL CASING I.D. (inches)	GAL/FT	CUBIC FT/FT
2.0	0.1632	0.0218
4.0	0.6528	0.0873
6.0	1.4690	0.1963

CONVERSION FACTORS

TO CONVERT	INTO	MULTIPLY
Feet of Water	Lbs/Sq. Inch	0.4335
Lbs/Sq. Inch	Feet of Water	2.3070
Cubic Feet	Gallons	7.4800
Gallons	Liters	3.7850
Feet	Meters	0.3048
Inches	Centimeters	2.5400

APPENDIX B

ESE STANDARD OPERATING PROCEDURES

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
CONCORD, CALIFORNIA OFFICE

STANDARD OPERATING PROCEDURE NO. 3
FOR GROUND-WATER MONITORING AND SAMPLING FROM MONITORING WELLS

Environmental Science & Engineering, Inc. (ESE) typically performs ground-water monitoring at project sites on a quarterly basis. As part of the monitoring program an ESE staff member will first gauge the depth to water and free product (if present) in each well, then collect ground-water samples from each well. Depth to water measurements are taken by lowering an electric fiberglass tape measure into the well and recording the occurrence of water in feet below a fixed datum set on the top of the well-casing. If free-phase liquid hydrocarbons (free product) are known or suspected to be present in the well, then an electric oil/water interface probe is used to determine the depth to the occurrence of ground-water and the free product in feet below the fixed datum on the top of the well-casing. Depth to water and depth to product measurements are measured and recorded within an accuracy of 0.005-foot. The electric tape and the electric oil/water interface probe are washed with an Alconox® detergent and tap water solution then rinsed with tap water between uses in different wells.

Ground-water samples are collected from a well subsequent to purging a minimum of three to four well-casing volumes of ground water from the well, if the well bails dry prior to the removal of the required minimum volume, then the samples are collected upon the recovery of the ground water in that well to 80% of its initial static level. Ground water is typically purged from monitoring wells using either a hand-operated positive displacement pump, constructed of polyvinylchloride (PVC); a new (precleaned), disposable polyethylene bailer; or, a variable-flow submersible pump, constructed of stainless steel and Teflon®. The hand pumps and the submersible pumps are cleaned between each use with an Alconox® detergent and tap water solution followed by a tap water rinse. During the well purging process the conductivity, pH and temperature of the ground water are monitored by the ESE staff member. Ground-water samples are collected from the well subsequent to the stabilization of the of the conductivity, pH and temperature of the purge water, and the removal of four well-casing volumes of ground-water (unless the well bails dry). The parameters are deemed to have stabilized when two consecutive measurements are within 10% of each other, for each respective parameter. The temperature, pH, conductivity and purge volume measurements, and observations of water clarity and sediment content will be documented by the ESE staff member on ESE Ground-Water Sampling Data Forms.

Ground-water samples are collected by lowering a new (precleaned), disposable polyethylene bailer into the well using new, disposable nylon cord. The filled bailer is retrieved, emptied, then filled again. The ground water from this bailer is decanted into appropriate laboratory supplied glassware and/or plastic containers (if sample preservatives are required, they are added to the empty containers at the laboratory prior to the sampling event). The containers are filled carefully so that no headspace is present to avoid volatilization of the sample. The filled sample containers are then labeled and placed in a cooler with ice for transport under chain of custody documentation to the designated analytical laboratory. The ESE staff member will document the time and method of sample collection, and the type of sample containers and preservatives (if any) used. These facts will appear on the ESE Ground-Water Sampling Data Forms. ESE will collect a duplicate ground-water sample from one well for every ten wells sampled at each site. The duplicate will be a blind sample (its well designation will be unknown to the laboratory). The duplicate sample is for Quality Assurance and Quality Control (QA/QC) purposes, and provides a check on ESE sampling procedures and laboratory sample handling procedures. When VOCs are included in the laboratory analyses, ESE will include a trip blank, if required, in the cooler with the ground-water samples for analysis for the identical VOCs. The trip blank is supplied by the laboratory and consists of deionized water. The trip blank is for QA/QC purposes and provides a check on both ESE and laboratory sample handling and storage procedures. Since disposable bailers are used for sample collection, and are not reused, no equipment blank (rinsate) samples are collected.

APPENDIX C

ANALYTICAL RESULTS FOR GROUND WATER SAMPLES

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Environmental Science & Engineering, Inc.	Client Project ID:	#6-91-5228/Hertz, Oakland	Sampled:	Feb 3, 1993
4090 Nelson Ave., Suite J	Sample Matrix:	Water	Received:	Feb 3, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	Feb 12, 1993
Attention: Mike Quillin	First Sample #:	302-0108		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 302-0108 MW-1	Sample I.D. 302-0109 MW-2	Sample I.D. 302-0110 MW-3	Sample I.D. 302-0111 MW-4	Sample I.D. 302-0112 MW-6	Sample I.D. 302-0113 Dup of MW-6
Purgeable Hydrocarbons	50	N.D.	N.D.	N.D.	50,000	330	2,100
Benzene	0.5	N.D.	N.D.	N.D.	4,700	120	110
Toluene	0.5	N.D.	N.D.	N.D.	5,000	2.8	5.2
Ethyl Benzene	0.5	N.D.	N.D.	N.D.	1,500	19	19
Total Xylenes	0.5	N.D.	N.D.	N.D.	6,600	5.3	14
Chromatogram Pattern:		--	--	--	Gasoline	Gasoline	Gasoline

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	400	1.0	10
Date Analyzed:	2/4/93	2/4/93	2/4/93	2/4/93	2/4/93	2/4/93
Instrument Identification:	HP-2	HP-2	HP-2	HP-2	HP-2	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	104	103	103	103	106	102

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Karen L. Enstrom
Project Manager

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Environmental Science & Engineering, Inc.	Client Project ID:	#6-91-5228/Hertz, Oakland	Sampled:	Feb 3, 1993
4090 Nelson Ave., Suite J	Sample Matrix:	Water	Received:	Feb 3, 1993
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported:	Feb 12, 1993
Attention: Mike Quillin	First Sample #:	302-0114		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 302-0114 Trip
Purgeable Hydrocarbons	50	N.D.
Benzene	0.5	N.D.
Toluene	0.5	N.D.
Ethyl Benzene	0.5	N.D.
Total Xylenes	0.5	N.D.
Chromatogram Pattern:		- -

Quality Control Data

Report Limit Multiplication Factor:	1.0
Date Analyzed:	2/4/93
Instrument Identification:	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	101

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Karen L. Enstrom
Project Manager

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Environmental Science & Engineering, Inc. Client Project ID: #6-91-5228/Hertz, Oakland
4090 Nelson Ave., Suite J
Concord, CA 94520
Attention: Mike Quillin QC Sample Group: 3020108-114 Reported: Feb 12, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020
Analyst:	A.T.	A.T.	A.T.	A.T.
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Feb 4, 1993	Feb 4, 1993	Feb 4, 1993	Feb 4, 1993
QC Sample #:	301-0808	301-0808	301-0808	301-0808
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	20	20	20	60
Conc. Matrix Spike:	19	21	22	76
Matrix Spike % Recovery:	95	105	110	126
Conc. Matrix Spike Dup.:	18	20	22	74
Matrix Spike Duplicate % Recovery:	90	100	110	123
Relative % Difference:	5.4	4.8	0.0	2.6

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Karen L. Enstrom
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

DATE FEB. 3, 1993 PAGE 1 OF 1

CHAIN OF CUSTODY RECORD

PROJECT NAME HERTZ - OAKLAND

ADDRESS OAKLAND AIRPORT
OAKLAND, CALIFORNIA

PROJECT NO. 6-91-5228

SAMPLED BY CHRIS VALCHEFF

LAB NAME SEQUOIA

ESE Environmental Science & Engineering, Inc.
4090 Nelson Avenue
Suite J
Concord, CA 94520
(415) 685-4053
Fax (415) 685-3323

SAMPLE #	DATE	TIME	LOCATION	TPH-GAS	BTEX	ANALYSES TO BE PERFORMED	MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
MW-1	2-3-93	12:30	OAKLAND	X	X	302-0108AC	WATER	3	3 VOA's
MW-2	↓	12:40	↓	X	X	109AC	↓	3	"
MW-3		12:50		X	X	110AC		3	"
MW-4		12:55		X	X	111AC		3	"
MW-6		13:10		X	X	112AC		3	"
DUP		13:10		X	X	113AC		3	"
TRIP				X	X	114	WATER	1	1 VOA

RELINQUISHED BY: (signature)	RECEIVED BY: (signature)	date	time
1. C.H. Valcheff	Channa West	2-3-93	15:15
2.			
3.			
4.			
5.			

19 TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO: MIKE QUILLIN

SPECIAL SHIPMENT REQUIREMENTS

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):

RUSH TAT (10 DAY)

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	