WESTERN
GEO-ENGINEERS
CALIF. CONTRACTOR #513857
REGISTERED GEOLOGISTS

1386 EAST BEAMER STREET
WOODLAND CA 95776-6003
(530) 668-5300,
FAX (530) 662-0273
Wege@mother.com

April 22, 1998

Mr. John Rutherford
Desert Petroleum
P.O. Box 1601
Oxnard, California 93032
(805) 644-6784 FAX (805) 654-0720

Dear Mr. Rutherford:

The following report documents the First Quarter 1998 collection and certified laboratory analysis of groundwater samples from five monitoring wells and three water recovery wells associated with former Desert Petroleum Station #793.

1.0 SITE LOCATION AND DESCRIPTION

Former Desert Petroleum #793 is a non-active service station, located on the northwest corner of the intersection of Park Blvd. and Hampel Street at 4035 Park Blvd., Oakland, California (Figure 1). The site is located in projected section 32; T1S; R3W; MDB&M at an approximate elevation of 210 feet above mean sea level (Figure 2).

2.0 LOCAL GEOLOGY

2.1 Geomorphology

The site is located on the western slope of the Berkeley Hills. The Berkeley Hills are a northwest-southeast trending range within the Coastal Range Province of California. Erosion of the Coastal Ranges has filled the valleys within and bordering the Coastal Range with sequences of gravels, silts, sands, and clays.

2.2 Stratigraphy

The native soil from surface to 13 feet below ground surface (BGS) consists of dark brown silty clay. The dark brown clay is underlain by light brown stiff clay that includes surrounded to rounded metavolcanic gravel. This clay extends to approximately 23 feet BGS at the northwest corner of the site. A fine to medium sand, clayey sand, and silty sand underlies the gravel and clay.

3.0 COLLECTION AND ANALYSIS OF GROUNDWATER SAMPLES

WEGE and LTT (Lawrence Tank Testing) personnel conducted a quarterly groundwater monitoring round at the site on February 25, 1998. Water samples were collected from monitor wells MW1, RS-2, RS-5, and RS-6 located on-site and RS-7 located in the center of Brighton Avenue to the northeast of the site (Figure 3). Water samples were also collected from the three on-site water recovery wells (R1, R2 and R3. See Appendix A for QA/QC, details, methods, procedures, abbreviations, and acronyms used in sampling and analysis.

3.1 Depth to Water Measurements

Depth to water was measured at all monitor wells and the three on-site water recovery wells. The depth to water measurements were made using a product/water interface probe. Measurements were made from the surveyed elevation at the top of casing at each well. Table 1 shows the elevation of groundwater with respect to mean sea level for all monitor wells on February 25, 1998.

3.2 Purging of Monitor Wells

Lawrence Tank Testing using a truck mounted vacuum lift pump and one-inch diameter PVC tubing purged the monitor wells of three volumes of water. The specific volume of water removed from each well is recorded on the well sampling data sheets (Appendix B).

3.3 Collection and Certified Analysis of Groundwater Samples

After purging, the wells were allowed to recover to at least 80% of their original well volumes. A groundwater sample was then collected from each well with a disposable polyethylene bailer and decanted, with no headspace, into two 40 ml VOA vials containing 0.5 ml HCL acid as a preservative. North State Environmental Laboratories analyzed all water samples for concentrations of TPH-G, BTEX, and MTBE using EPA methods 5030/8015M/8020 (Appendix C). Method 8020 presence of MTBE was verified with EPA Method 8260, which showed no MTBE is associated with the site.

3.4 Disposition of Waste Water

The wastewater generated from the purging of the monitor wells during sampling was contained on-site in labeled 55 gallon DOT approved drums. The drummed wastewater was removed from the site and transported to a recycling facility by Evergreen Environmental Services on April 2, 1998, see Appendix D.

4.0 RESULTS OF QUARTERLY GROUNDWATER MONITORING

4.1 Groundwater Gradient and Flow Direction

Figure 4 shows the groundwater elevation gradients and flow direction that were derived from the depth to water measurements from on-site monitor wells on February 25, 1998. The groundwater elevation has risen by an average of 8 feet in the monitor wells since the previous quarterly monitoring round on November 24, 1997. (Table 1).

The current flow direction is to north and northwest. The hydraulic gradient averages 0.13 feet/linear foot downgradient from the overexcavated area at the site (Figure 4). The current flow direction and hydraulic gradient is consistent with previous gradient determinations by WEGE.

4.2 Results of Certified Analysis of Groundwater Samples

The results of the certified analyses of groundwater samples collected on February 25, 1998 are shown in Table 1 and Figure 5. Copies of the laboratory reports are included as Appendix C of this report.

TPH-G concentrations in water samples from the five monitor wells and three recovery wells ranged from a maximum of 160,000 ug/l at monitor well RS-5 to less than laboratory detection limits (50 ug/l) in wells MW1, RS-2 and R-3. Benzene concentrations ranged from a maximum of 4300 ug/l in monitor well RS-7 to less than laboratory detection limits (0.5 ug/l) in wells MW1, RS-2, and R-3.

MTBE was confirmed with EPA Method 8260 to be below lower laboratory detection limits of 0.5ug/l in all wells. Figure 5 shows the areal distribution of TPH-G, BTEX, and MTBE in groundwater in ug/l as determined from groundwater samples collected from the monitor wells on February 25, 1998.

5.0 LIMITATIONS

This report is based upon the following:

A. The observations of field personnel.
B. The results of laboratory analyses performed by a state certified laboratory.
C. Referenced documents.
D. Our understanding of the regulations of the State of California, Alameda County and the City of Oakland.
E. Changes in groundwater conditions can occur due to variations in rainfall, temperature, local and regional water use, and local construction practices.
F. In addition, variations in the soil and groundwater conditions could exist beyond the points explored in this investigation.

State Certified Laboratory analytical results are included in this report. This laboratory follows EPA and State of California approved procedures; however, WEGE is not responsible for errors in these laboratory results. Western Geo-Engineers is a corporation under California Registered Geologist #3037 and/or Contractors License #513857. The services performed by Western Geo-Engineers have 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 State of California and the Oakland area. Our work and/or supervision of remediation and/or abatement operations, active or preliminary, at this site is in no way meant to imply that we are owners or operators of this site. Known or suspected contamination of soil and/or groundwater must be reported to the appropriate agencies in a timely manner. No other warranty, expressed or implied, is made.

Sincerely,

George Converse
Geologist

Jack E. Napper
Ca. Reg. Geologist #3037

cc: Mr.Tom Peacock, Alameda County Health (510) 567-6774
Mr. Leroy Griffin, Oakland Fire Dept.

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level) DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)
RS-1	12/14/89	240	24.25	215.75	19000	2600	2700	200	1200	
RS-1	12/90				15000	3500	330	170	760	
RS-1	2/91				6900	910	200	39	540	
RS-1	6/91				1600	56	180.000	12	26	
RS-1	9/91				4100	730	7.6	5.1	24	
RS-1	12/91				8300	950	160	71	190	
RS-1	11/09/92	100.18	17.05	83.13	1700	730	9.6	16	14	
RS-1	04/07/94	100.18	13	87.18	860	84	12	16	110	
RS-1	06/19/94	228.15	13.37	214.78	1400	150	12	52	87	
RS-1	09/17/94	228.15	16.33	211.82	310	30	1.8	2.8	3.9	
RS-1	03/12/95	228.15	4.66	223.49	ND	ND	ND	ND	ND	
		DESTROYED BY OVER-EXCAVATION OF UST-DISPENSER AREAS (8/14/95								
		REPLACED WITH MW-1 9/5/95.								
MW-1	10/04/95	232.57	12.38	220.19	ND	ND	ND	ND	ND	
MW-1	12/21/95	232.57	13.40	219.17	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
MW-1	03/27/96	232.57	5.53	227.04	< 50	< 0.5	< 0.5	< 0.5	< 2	< 50
MW-1	06/11/96	232.57	9.02	223.55	< 50	< 0.5	< 0.5	< 0.5	< 2	< 50
MW-1	09/04/96	232.57	11.84	220.73	< 50	< 0.5	< 0.5	< 0.5	< 2	< 5
MW-1	12/11/96	232.57	12.98	219.59	< 50	< 0.5	0.9	< 0.5	< 1	< 0.5
MW-1	2/21/97	232.57	9.50	223.07	< 50	< 0.5	0.9	< 0.5	< 1	< 0.5*
MW-1	5/28/97	232.57	11.18	221.39	< 50	3	3	< 0.5	< 1	< 0.5*
MW-1	9/2/97	232.57	13.00	219.57	< 50	5	< 0.5	< 0.5	< 1	< 0.5*
MW-1	11/24/97	232.57	14.12	218.45	< 50	5	< 0.5	< 0.5	< 1	< 0.5*
MW-1	2/25/98	232.57	6.41	226.16	< 50	< 0.5	< 0.5	< 0.5	< 1	< 0.5*

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level)									
	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)
RS-2	06/19/94	227.19	10.89	216.3	140	9.2	34	4.3	24.0	
RS-2	03/12/95	227.19	5.26	221.93	ND	ND	ND	ND	ND	
RS-2	10/04/95	230.43	15.05	215.38	ND	ND	ND	ND	ND	
RS-2	12/21/95	230.43	9.95	220.48	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
RS-2	03/27/96	230.43	6.28	224.15	< 50	< 0.5	< 0.5	< 0.5	< 2	< 50
RS-2	06/11/96	230.43	8.00	222.43	< 50	1.2	2.8	< 0.5	< 2	< 50
RS-2	09/04/96	230.43	9.89	220.54	< 50	< 0.5	< 0.5	< 0.5	< 2	< 5
RS-2	12/11/96	230.43	8.38	222.05	< 50	< 0.5	< 0.5	< 0.5	< 1	6
RS-2	2/21/97	230.43	6.96	223.47	< 50	< 0.5	< 0.5	< 0.5	< 1	< 0.5*
RS-2	5/28/97	230.43	10.02	220.41	< 50	3	3	< 0.5	< 1	< 0.5*
RS-2	9/2/97	230.43	11.46	218.97	< 50	< 0.5	< 0.5	< 0.5	< 1	< 0.5*
RS-2	11/24/97	230.43	10.43	220	< 50	< 0.5	1	< 0.5	3	< 0.5*
RS-2	2/25/98	230.43	3.57	226.86	< 50	< 0.5	< 0.5	< 0.5	< 1	< 0.5*
RS-5	12/14/89	241.26	25.97	215.29	57000	3100	4300	670	3400	
RS-5	2/91				FLOATING PRODUCT					
RS-5	6/91				FLOATING PRODUCT					
RS-5	9/91				FLOATING PRODUCT					
RS-5	12/91				FLOATING PRODUCT					
RS-5	11/09/92	98.99	20.73	78.26	50000	650	4800	1100	15000	
RS-5	04/07/94	98.99	18.16	80.83	27000	5000	8700	550	2800	
RS-5	06/19/94	227.65	18.11	209.54	20000	2100	5300	470	2500	
RS-5	09/17/94	227.65	19.63	208.02	9300	230	340	110	700	
RS-5	03/12/95	227.65	14.54	213.11	93000	6400	2000	19000	10000	
RS-5	10/04/95	230.64	17.53	213.11	16000	420	2100	320	1800	
RS-5	12/21/95	230.64	17.47	213.17	48000	3500	9200	840	4800	56
RS-5	03/27/96	230.64	13.51	217.13	68000	4900	18000	1700	11000	< 3000
RS-5	06/11/96	230.64	14.25	216.39	66000	6300	20000	2100	12000	< 3000
RS-5	09/04/96	230.64	16.50	214.14	31000	2100	11000	1100	6800	400
RS-5	12/11/96	230.64	15.88	214.76	85000	7000	21000	1800	8900	570
RS-5	2/21/97	230.64	13.76	216.88	100000	5000	22000	1700	7300	<0.5*
RS-5	5/28/97	230.64	15.77	214.87	52000	4500	19000	2100	10000	<0.5*
RS-5	9/2/97	230.64	17.47	213.17	38000	2200	9400	1300	5800	<0.5*
RS-5	11/24/97	230.64	18.67	211.97	45000	4000	16000	1900	9700	<0.5*
RS-5	2/25/98	230.64	10.53	220.11	160000	9200	31000	5300	28000	<0.5*

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level)									
	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)
RS-6	12/14/89	240.23	22.52	217.71	11000	1400	1700	160	860	
RS-6	2/91				FLOATING PRODUCT					
RS-6	6/91				95000	4200	4200	650	3700	
RS-6	9/91				FLOATING PRODUCT					
RS-6	12/91				64000	3700	2300	730	4100	
RS-6	11/09/92	99.27	19.43	79.84	19000	1600	710	500	1600	
RS-6	04/07/94	99.27	14.42	84.85	16000	1200	1300	290	1100	
RS-6	06/19/94	227.22	14.45	212.77	23000	1300	2200	590	2200	
RS-6	09/17/94	227.22	19.52	207.7	24000	630	790	250	1100	
RS-6	03/12/95	227.22	8.90	218.32	3200	450	13	82	230	
RS-6	10/04/95	230.22	17.78	212.44	3700	170	250	38	290	
RS-6	12/21/95	230.22	14.98	215.24	3100	120	30	16	150	58
RS-6	03/27/96	230.22	10.00	220.22	6900	180	440	79	360	< 300
RS-6	06/11/96	230.22	12.00	218.22	7400	220	150	30	100	<1000
RS-6	09/04/96	230.22	15.00	215.22	1400	68	2.6	7.7	9.2	14
RS-6	12/11/96	230.22	12.36	217.86	1800	39	16	10	18	< 0.5
RS-6	2/21/97	230.22	10.00	220.22	2100	71	85	25	40	< 0.5*
RS-6	5/28/97	230.22	13.56	216.66	1700	34	12	11	16	< 0.5*
RS-6	9/2/97	230.22	16.35	213.87	940	34	71	9	55	< 0.5*
RS-6	11/24/97	230.22	15.72	214.5	490	9	6	1	7	< 0.5*
RS-6	2/25/98	230.22	6.26	223.96	1400	22	47	5	52	< 0.5*

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level) DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)
RS-7	7/90				5600000	24000	210000	50000	740000	
RS-7	2/91				FLOATING PRODUCT					
RS-7	6/91				FLOATING PRODUCT					
RS-7	9/91				FLOATING PRODUCT					
RS-7	12/91				270000	11000	22000	2000	13000	
RS-7	11/09/92	67.88	4.62	63.26	81000	12000	16000	1900	13000	
RS-7	04/07/94	67.88	4.03	63.85	74000	16000	16000	1400	8500	
RS-7	06/19/94	195.92	4.07	191.85	83000	22000	19000	1500	9500	
RS-7	09/17/94	195.92	4.05	191.87	270000	13000	15000	2100	1100	
RS-7	03/12/95	195.92	3.72	192.2	35000	5100	560	6300	3600	
RS-7	10/04/95	199.35	4.03	195.32	96000	14000	14000	1300	7000	
RS-7	12/21/95	199.35	3.95	195.4	70000	9300	12000	860	5600	210
RS-7	03/27/96	199.35	3.80	195.55	64000	8900	14000	1100	8300	< 3000
RS-7	06/11/96	199.35	3.79	195.56	65000	12000	17000	1600	9700	<5000
RS-7	09/04/96	199.35	3.99	195.36	20000	4900	2100	670	4400	100
RS-7	12/11/96	199.35	3.78	195.57	17000	4400	7500	570	4600	180
RS-7	2/21/97	199.35	3.82	195.53	93000	31000	47000	3800	23000	<0.5*
RS-7	5/28/97	199.35	3.82	195.53	52000	12000	8200	2000	11000	<0.5*
RS-7	9/2/97	199.35	3.96	195.39	28000	6100	2800	950	3800	<50
RS-7	11/24/97	199.35	3.76	195.59	18000	4300	5900	600	2900	<0.5*
RS-7	2/25/98	199.35	3.70	195.65	13000	4300	7100	1100	5800	<0.5*

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level) DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)
RECOVERY 1	09/04/96	230.73	15.00	215.73	1800	1100	3	29	< 10	< 30
RECOVERY 1	12/11/96	230.73	10.30	220.43	<50	<0.5	< 0.5	< 0.5	< 1	4
RECOVERY 1	2/21/97	230.73	11.88	218.85	2500	670	9	3	13	<0.5*
RECOVERY 1	5/28/97	230.73	14.03	216.7	24000	4300	36	2000	370	<0.5*
RECOVERY 1	9/2/97	230.73	14.98	215.75	4400	320	6	340	72	20
RECOVERY 1	11/24/97	230.73	14.06	216.67	100	39	1	18	10	<0.5
RECOVERY 1	2/25/98	230.73	8.93	221.8	1200	400	8	13	150	<0.5
RECOVERY 2	09/04/96	230.68	13.44	217.24	14000	7600	<10	170	190	<100
RECOVERY 2	12/11/96	230.68	12.42	218.26	488	300	1	< 0.5	30	16
RECOVERY 2	2/21/97	230.68	10.50	220.18	5700	2100	5	2	10	3*
RECOVERY 2	5/28/97	230.68	13.10	217.58	36000	14000	63	260	220	<0.5*
RECOVERY 2	9/2/97	230.68	14.16	216.52	30000	12000	330	1000	790	47
RECOVERY 2	11/24/97	230.68	14.71	215.97	41000	15000	830	1500	4200	<0.5*
RECOVERY 2	2/25/98	230.68	7.39	223.29	800	400	<0.5	<0.5	15	<0.5*
RECOVERY 3	09/04/96	230.32	9.90	220.42	<50	<0.5	<0.5	<0.5	<2	<5
RECOVERY 3	12/11/96	230.32	8.18	222.14	<50	<0.5	<0.5	<0.5	<1	5
RECOVERY 3	2/21/97	230.32	6.76	223.56	340	35	59	8	54	<0.5*
RECOVERY 3	5/28/97	230.32	9.98	220.34	<50	<0.5	<0.5	<0.5	<1	<0.5*
RECOVERY 3	9/2/97	230.32	10.86	219.46	<50	4	<0.5	<0.5	<1	<0.5*
RECOVERY 3	11/24/97	230.32	11.20	219.12	not enough water to sample. No sample					
RECOVERY 3	2/25/98	230.32	3.42	226.9	<50	<0.5	<0.5	<0.5	<1	<0.5*

ND BELOW LABORATORY DETECTION LIMITS
TPH-G TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
* MTBE results confirmed by EPA Method 8260 (GC/MS)

DESERT STATION #793
4035 Park Blvd.
Oakland, California

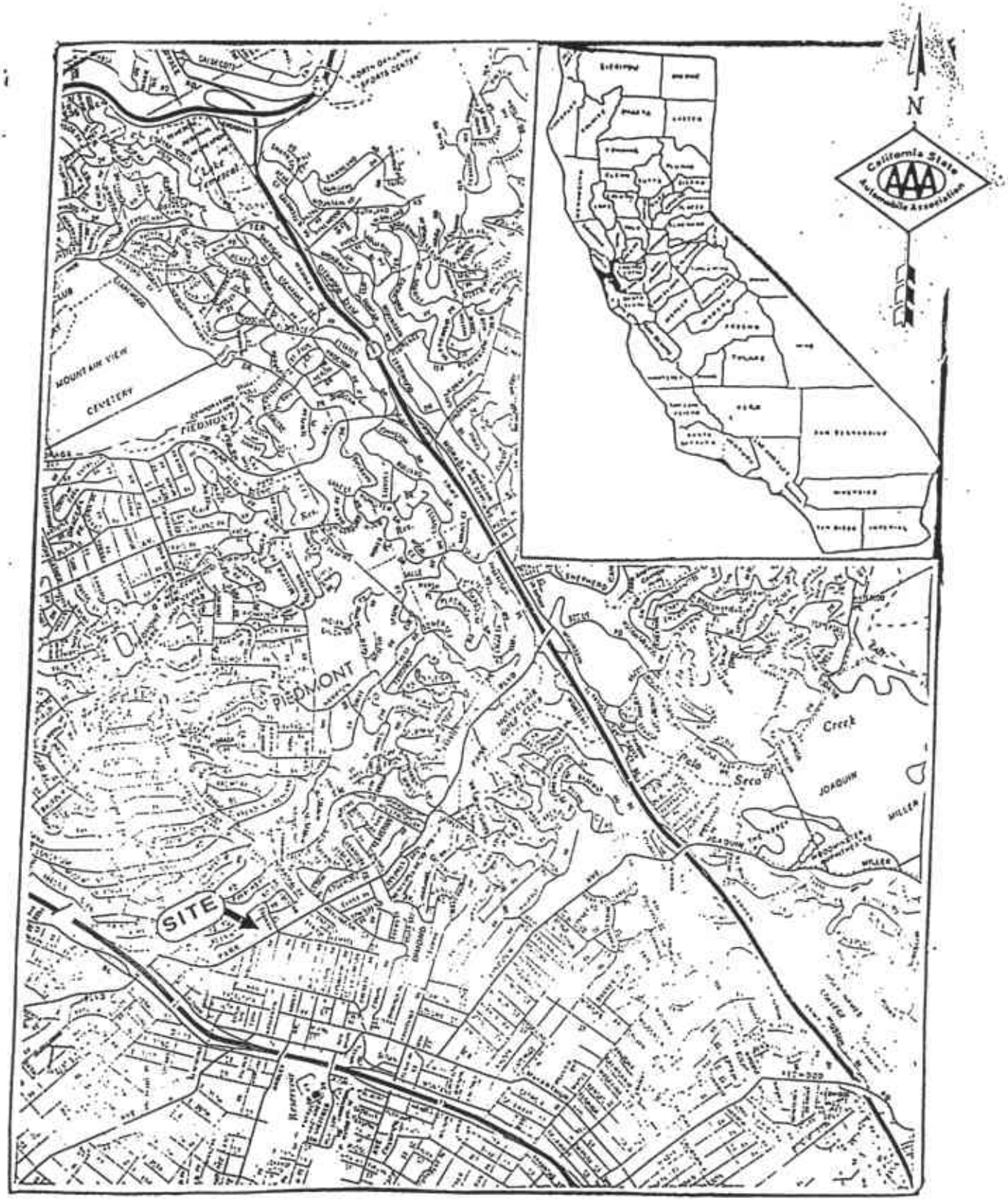

FIGURE 1

Location (AAA Map)

DESERT STATION #793
4035 Park Blvd.
Oakland, California

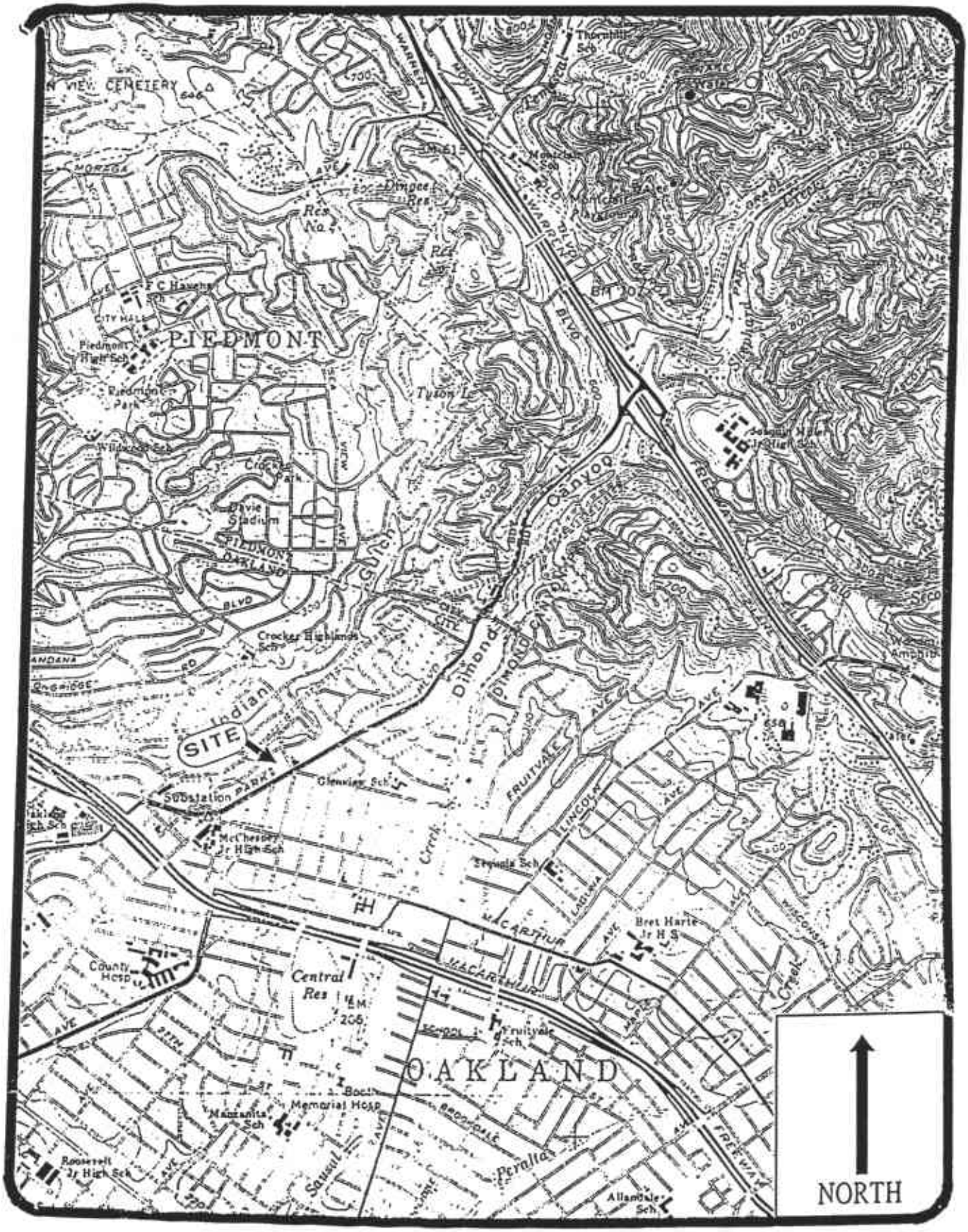

FIGURE 2,, USGS TOPOGRAPHIC MAP

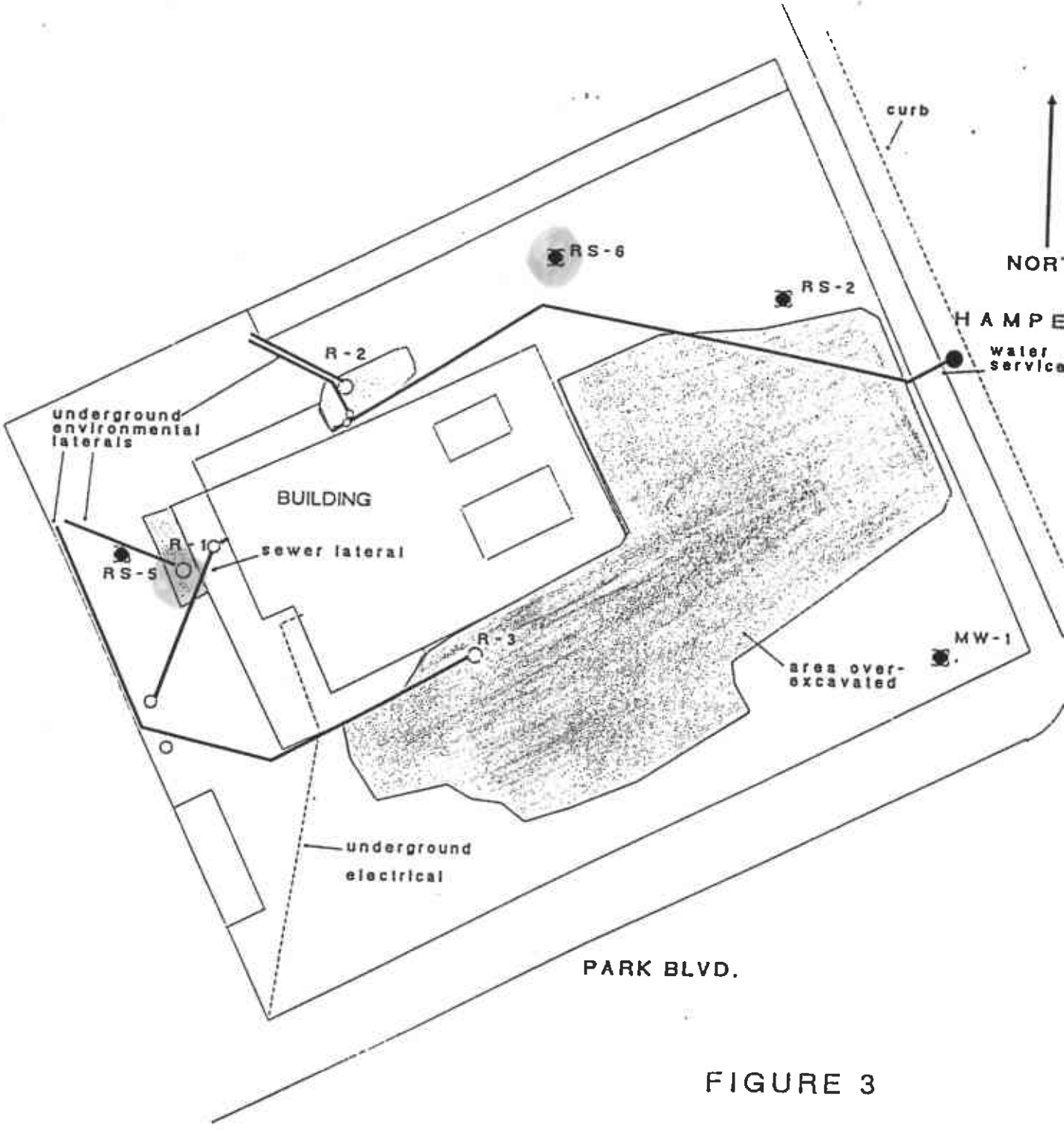

FIGURE 3

SITE BASE MAP

0' 20' 40'

SCALE: 1" = 20'.

DESERT PETROLEUM STATION #793
4035 PARK BLVD.,
OAKLAND, CALIFORNIA 94602

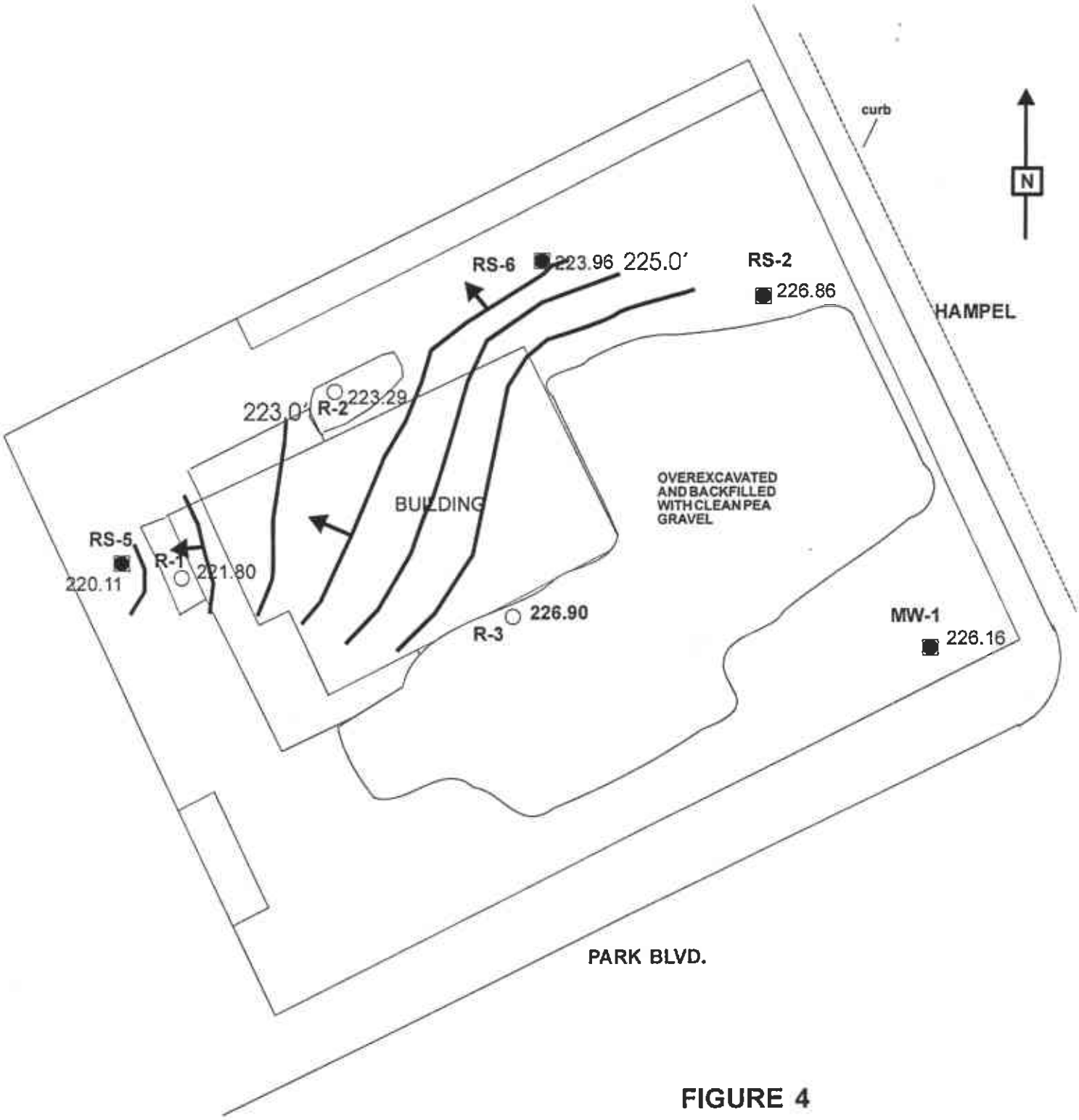

FIGURE 4

GROUNDWATER ELEVATION CONTOUR INTERVAL EQUALS ONE FOOT. ELEVATIONS ARE MEASURED IN FEET AMSL

0' 20' 40'

SCALE: 1" = 20'.

GROUNDWATER ELEVATION GRADIENTS AND FLOW DIRECTION FOR 02/25/98

DESERT PETROLEUM STATION #793
4035 PARK BLVD.
OAKLAND, CALIFORNIA 94602

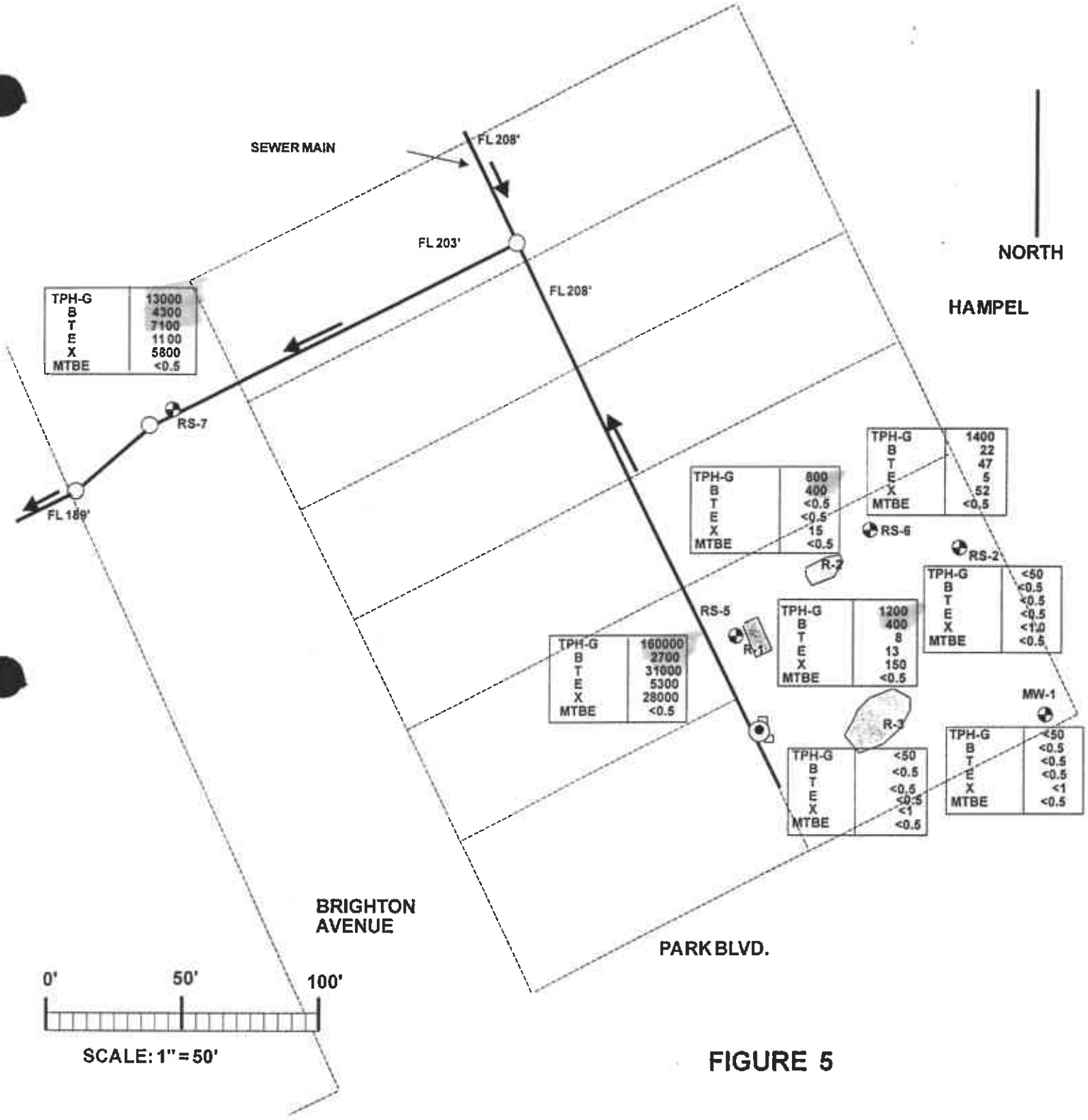

FIGURE 5

EXPLANATION

MW-1 ■ MONITOR WELL LOCATION WITH ID# AND GROUNDWATER ANALYTICAL RESULTS. ALL CONCENTRATIONS IN UG/L.

TPH-G = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
B = BENZENE
T = TOLUENE
E = ETHYLBENZENE
X = XYLENES
MTBE = METHYL tertiary-BUTYL ETHER

R-1 INJECTION/RECOVERY TRENCHES AND RECOVERY WELLS

ANALTICAL RESULTS FROM GROUNDWATER SAMPLES COLLECTED FROM MONITOR WELLS ON 2/25/98

DESERT PETROLEUM STATION #793
4035 PARK BLVD.
OAKLAND, CALIFORNIA

APPENDIX A

Appendix A
Methods and Procedures
QA/QC

This Appendix documents the specific methods, procedures, and materials used to collect and analyze groundwater samples.

Gauging and Measuring Monitor Wells

Prior to sampling a well, WEGE personnel obtain three measurements:

1. the depth to groundwater (DTW);
2. the product thickness using a battery powered depth to water-product interface probe and/or by using a specially designed bailer;
3. the total depth of casing, to calculate the total water volume in the well.

The DTW-product interface probe is lowered into the well casing until the instrument signals when the top of free phase floating product (if present) and/or the top of water is reached. The distance from the top of free phase floating product and/or water to the top of casing is read from the tape that is attached to the probe. The probe is then lowered to the bottom of the well and the tape is read again. The tape is calibrated in 0.01-foot intervals for accuracy to 0.01 foot. The measured distance is subtracted from the established elevation at the top of casing to determine the elevation of groundwater with respect to mean sea level and the difference between the top of groundwater and the base of the well is noted to establish water volume in the well. The probe and tape is washed with TSP (Tri Sodium Phosphate) and rinsed in distilled water before each measurement. WEGE has designed and built bailers that will collect a sample of the contents of a well to show the exact thickness of any floating product. Some of the abbreviations used in water sampling and or measuring or monitoring are: BGS, Below Ground Surface; DTW, Depth to Water (from surface reference i.e. usually TOC); TOC, Top of Casing; MSL, Mean Sea Level; AMSL and BMSL, Above and Below MSL; BS, Below Surface; TOW, Top of Water; TSP, Tri Sodium Phosphate.

Purging Standing Water from Monitor Wells

If no product is present, WEGE personnel purge the well by removing groundwater until the water quality parameters (temperature, pH, and conductivity) stabilize, or until the well is emptied of water. Periodic measurements of groundwater temperature, pH, and conductivity are taken with a Hydac Monitor or other meter and recorded along with the volume of groundwater removed from the well. Purging is done by one or more methods singularly or in combination. Bailers, pneumatic or electric sample pumps, or vacuum pump tanks or trucks may be used. The usual amount of water removed is three borehole volumes, unless otherwise stated.

$$BV = (7.48/4) \times (CD2+P\ (BD2-CD)\ 2) \times (WD-GW)$$

BV borehole volume (gallons)
CD casing diameter (feet)
GW depth to groundwater (feet)
BD borehole diameter (feet)
WD well depth (feet)
P porosity of the gravel pack, 25%

Table of Common Boring and Casing Diameters

Boring diameter inches	Casing diameter inches	Volume gallons/ foot	3 Volumes X (WD-GW) gallons /foot
4	1	0.042	0.126
6	1	0.082	0.246
6	2	0.173	0.519
8	2	0.277	0.831
8	4	0.671	2.013
10	2	0.572	1.716
10	4	0.844	2.532

EXAMPLE: An 8 inch boring with 2 inch casing requires removal of 0.831 gallons of water per foot of water column.

The water collected during purging is either safely stored on- site in 55 gallon DOT 17H drums for later disposition, transported to an approved on-site/off-site treatment facility or to a sewer discharge system.

Collection of Water Sample for Analysis

The groundwater in the well is allowed to recover, to at least 80% of its volume prior to purging, if practical, before the groundwater sample is collected.

$$\text{Percent Recovery} = \left(1 - \frac{\text{Residual drawdown}}{\text{Maximum drawdown}}\right) \times 100.$$

A fresh bailer is used to collect enough water for the requirements of the laboratory for the analyses needed or required. The water samples are decanted from the bailer into the appropriate number and size containers. These containers are furnished pre-cleaned to exact EPA protocols, with and without preservatives added, by the analytical laboratory or a chemical supply company. The bottles are filled, with no headspace, and then capped with plastic caps with teflon liners.

The vials or bottles containing the groundwater samples are labeled with site name, station, date, time, sampler, and analyses to be performed, and documented on a chain of custody form. They are placed in ziplock bags and stored in a chest cooled to 4 °C with ice. The preserved samples are COC (chain of custody) delivered to the chosen laboratory.

Analytical Results

TPH is the abbreviations used for Total Petroleum Hydrocarbons used by the laboratories for water and soil analyses. The letter following TPH indicates a particular distinction or grouping for the results. The letters "g", "d", "k", or "o" indicate gasoline, diesel, kerosene, or oil, respectively, i.e. TPH-d for diesel ranges TPH.

BTEX or MTBE are acronyms or abbreviations used for Benzene, Toluene, Ethylbenzene and all of the Xylenes (BTEX) and Methyl tertiary-Butyl Ether (MTBE), respectively.

MBTEX is the designation for the combination of the above five compounds.

Laboratory lower detection limits unless otherwise noted, due to matrix interference or elevated concentrations of target compounds, are as follows:

TPHg	50 ug/L	MTBE	0.5 ug/L
Benzene	0.5 ug/L	Toluene	0.5 ug/L
Ethyl Benzene	0.5 ug/L	Total Xylenes	1.0 ug/L

The less than symbol, <, used with a "parts per value" indicates the lower detection limit for a given analytical result and the level, if present, of that particular analyte is below or less than that lower detection limit.

Other abbreviations commonly used are ppm, ppb, mg/Kg, ug/Kg, ml/l and ul/l are parts per million, parts per billion, milligrams per kilogram, micrograms per kilogram, milliliters per liter, microliters per liter, respectively.

Vapor Recovery System Monitoring and Sampling

INFLUENT SAMPLE

The influent sample is obtained from a sample port located on the

Sample ports are located at the orifice plate of the well adapter-venting tree. This lateral is under vacuum. A 1-liter tedlar bag fitted with a special septum "valve" and tubing bib is placed within an air tight vacuum sample box (ATVSB). Sterile poly tubing is then used to attach the intake port of the ATVSB to the tedlar bag.

Sterile poly tubing is also used to attach the intake of the ATVSB to the sample port of the orifice plate. The exhaust port for the ATVSB is then attached to a vacuum pump, which creates a vacuum inside the ATVSB allowing the tedlar bag to pull the sample from the valved manifold sample port without the danger of cross contamination, as could occur when using an in-line pump. Once the tedlar bag is filled, its valve is closed and locked and the appropriate label is placed on the tedlar bag.

The label for the tedlar bag sample show the date, time, sample ID# and analyses to be run.

The tedlar bag sample is Chain of Custody hand delivered to WEGE's laboratory that same day.

WEGE's laboratory analyzes the vapor samples by injection into a FID (Flame Ionizing Detector) chromatograph. The resulting chromatogram is compared to standard chromatograms of known TFH (Total Fuel Hydrocarbons, gasoline) and BTEX (benzene, toluene, ethylbenzene, and xylenes) concentrations. CO2 measurement is obtained with a Draager tube.

The standards are produced by injecting measured volumes of known density gasoline or BTEX compounds into tedlar bags filled with a measured amount of air, usually one liter. Injecting 10 microliters (ul) of 0.75-mg/L gasoline makes the gasoline standard into one liter of air, the density was previously determined by weighing a know volume of gasoline. The resulting concentration is 10 ul x 0.75 mg/L / 1l = 7.5 mg/L. The BTEX standard is made by injecting 5 ul of each compound into one liter of air, and using the following densities to calculate the concentration:

- Benzene, 0.88 mg/ul;
- Toluene, 0.87 mg/ul;
- Ethylbenzene, 0.87 mg/ul
- Xylenes, 0.87 mg/ul.

The following are the resulting concentrations: Benzene, 4.4 mg/l; Toluene, 4.35 mg/l; Ethylbenzene, 4.35 mg/l; and Xylenes 4.35 mg/l.

CALCULATIONS

To calculate the pounds (lb) per day the concentration is multiplied by the volume of air produced in one day.

The lab reports the Concentrations (C) of the air sampling in ug/liter. The first step is to convert this value to lbs/cf (pounds per cubic foot). 1 ug/l x 0.000001g/ug x 0.002205l/g x 28.32l/cf = 0.0000000621lb/cf

The volume of air produced in one day, equals the flow rate (Q) x the time of flow.

$V = Q \times T$ = cf/day = cf/min x 1440min/day

The volume must be corrected to standard temperature and pressure (STP).

P = Pressure = 14.7 lb/in^2 @ STP

V = Volume cf
T = Temperature in degrees above absolute Zero = 491.58oR @ STP.

Using the Ideal Gas Law P1V1/T1 = P2V2/T2
Solving for V2 =P1V1T2/P2T1
Assuming P1 = P2 = 14.7 lb/in^2, P cancels from the equation
Leaving V2 = V1T2/T1.

V1 = Q cf/m x 1440 min/day
T2 = 491.58oR T1 = 459.58 + T^{0F} at site.
V2 = Q cf/min x 1440 min/day x 491.58oR/(459.58o + T^{0F})

X lb/day = C ug/l x 0.0000000621 lb l/ug cf x Q cf/min x
1440 min/day x 491.58oR/(459.58o + T^{0F})
Q for the Influent sample = The well flow rate.

Chain of Custody Documentation

All water samples that are collected by WEGE and transported to a certified analytical laboratory are accompanied by chain-of- custody (COC) documentation. This documentation is used to record the movement and custody of a sample from collection in the field to final analysis and storage. Samples to be analyzed at the certified laboratory were logged on the COC sheet provided by the laboratory. The same information provided on the sample labels (site name, sample location, date, time, and analysis to be performed) is also noted on the COC form. Each person relinquishing custody of the sample set signs the COC form indicating the date and time of the transfer to the recipient. A copy of the COC follows the samples or their extracts throughout the laboratory to aid the analyst in identifying the samples and to assure analysis within holding times.

Copies of the COC documentation are included with the laboratory results in Appendix C of the sampling report.

APPENDIX B

LAWRENCE TANK TESTING, INC.

PO BOX 407, DOWNIEVILLE, CALIFORNIA 95936
PHONE 916-289-3109 - FAX 916-289-3322

WELL SHEET

INVOICE NO. 985243
DATE FEB 25 1005

TECHNICIAN DAVID

SITE NAME #793 OAKLAND	CUSTOMER WESTERN SEO
ADDRESS PARK ST	ADDRESS
CITY STATE	CITY STATE
PHONE	PHONE

WELL NO.	DESCRIPTION OF WORK PERFORMED
MW1	5 GALLONS
RS2	29
RS6	50
R2	90
RS3	30
R1	95
R3	35
RS7	7

RATES
LABOR AND TRAVEL TIME $_____ PER HOUR
MILEAGE $_____ PER MILE

	HOURS	MINUTES
ARRIVAL TIME	9	00
DEPARTURE TIME	12	13
TOTAL TIME AT SITE		

MATERIALS USED	QTY	PRICE	TOTAL

TOTAL OF MATERIALS $_____

TOTAL OF LABOR $_____

TRAVEL TIME FROM _____ TO _____ TO _____ $_____

TOTAL MILEAGE _____ $_____

JOB TOTAL $_____

North State Environmental Analytical Laboratory

Phone: (415) 588-9652 Fax: (415) 588-1950

Chain of Custody / Request for Analysis

Lab Job No.: _____ Page 1 of 1

Client: Western Geo Engineers	Report to: same as	Phone:	Turnaround Time
Mailing Address: 1386 E. Beamer St. Woodland CA. 95776	Billing to: same as ←	Fax:	
		PO# / Billing Reference:	Date: 2.25.98
			Sampler: MD

Project / Site Address: DP 793 4035 Park Blvd.

Analysis Requested

Sample ID	Sample Type	Container No. / Type	Pres.	Sampling Date / Time	TPH/BTEX	MTBE						Comments/Hazards
MW 1	W	3 / VOA	HCl	2-25-98 / 09:17	✓	✓						Custom All
N1				11:11	✓	✓						MTBE with 8260
N2				10:18	✓	✓						
N3				10:32	✓	✓						
N4 2				9:09	✓	✓						
N5-5				10:11	✓	✓						
N6 6				9:55	✓	✓						
N7 7				10:50	✓	✓						

Relinquished by: Matt Pinch	Date: 2/26/98	Time: 10:05 AM	Received by: [signature] NSE LABS	Lab Comments
Relinquished by:	Date:	Time:	Received by:	
Relinquished by:	Date:	Time:	Received by:	

APPENDIX C

98-202

North State Environmental Analytical Laboratory

Phone: (415) 588-9652 Fax: (415) 588-1950

Chain of Custody / Request for Analysis

Lab Job No.: _____ Page 1 of 1

Client: Western Geo Engineers	Report to: same as	Phone:	Turnaround Time
Mailing Address: 1386 E. Beamer St. Woodland C.A. 95776	Billing to: same as ←	Fax:	
		PO# / Billing Reference:	Date: 2.25.98
			Sampler: MP

Project / Site Address: DP 793 4035 Park Blvd.

	Sample ID	Sample Type	Container No. / Type	Pres.	Sampling Date / Time	Analysis Requested: TPHG/BTEX	MTBE						Comments/Hazards
1	MW 1	H2O	2/VOAs	HCL	2-25-98/ 9:27	✓	✓						confirm All
2	R1				11:11	✓	✓						MTBE with 8260
3	R2				10:18	✓	✓						
4	R3				11:32	✓	✓						
5	RS-2				9:39	✓	✓						
6	RS-5				10:41	✓	✓						
7	RS-6				9:55	✓	✓						
8	RS-7				11:50	✓	✓						

Relinquished by: Matt Penich	Date: 2/26/98	Time: 10:05AM	Received by: NSE LABS	Lab Comments
Relinquished by:	Date:	Time:	Received by:	
Relinquished by:	Date:	Time:	Received by:	

North State Environmental
Chemical Waste Disposal · Trucking · Consulting

C E R T I F I C A T E O F A N A L Y S I S

Lab Number: 98-202
Client: Western Geo-Engineers
Project: DP 793 / 4035 Park Blvd.

Date Reported: 03/05/98

Gasoline,BTEX and MTBE by Methods 8015M and 8020

Analyte	Method	Result	Unit	Date Sampled	Date Analyzed
Sample: 98-202-01	Client ID: MW-1			02/25/98	WATER
Gasoline	8015M	ND			03/03/98
Benzene	8020	ND			
Ethylbenzene	8020	ND			
MTBE	8020	ND			
Toluene	8020	ND			
Xylenes	8020	ND			
Sample: 98-202-02	Client ID: R1			02/25/98	WATER
Gasoline	8015M	1200	ug/L		03/03/98
Benzene	8020	400	ug/L		
Ethylbenzene	8020	13	ug/L		
MTBE	8020	ND			
Toluene	8020	8	ug/L		
Xylenes	8020	150	ug/L		
Sample: 98-202-03	Client ID: R2			02/25/98	WATER
Gasoline	8015M	800	ug/L		03/03/98
Benzene	8020	400	ug/L		
Ethylbenzene	8020	ND			
MTBE	8020	ND			
Toluene	8020	ND			
Xylenes	8020	15	ug/L		

*Confirmed by GC/MS method 8260.

P. O. Box 5624 • South San Francisco, California 94083 • 650-588-2838 FAX 588-1950

North State Environmental
Chemical Waste Disposal · Trucking · Consulting

C E R T I F I C A T E O F A N A L Y S I S

Lab Number: 98-202
Client: Western Geo-Engineers
Project: DP 793 / 4035 Park Blvd.

Date Reported: 03/05/98

Gasoline,BTEX and MTBE by Methods 8015M and 8020

Analyte	Method	Result	Unit	Date Sampled	Date Analyzed
Sample: 98-202-04 Client ID: R3				02/25/98	WATER
Gasoline	8015M	ND			03/03/98
Benzene	8020	ND			
Ethylbenzene	8020	ND			
MTBE	8020	ND			
Toluene	8020	ND			
Xylenes	8020	ND			
Sample: 98-202-05 Client ID: RS-2				02/25/98	WATER
Gasoline	8015M	ND			03/03/98
Benzene	8020	ND			
Ethylbenzene	8020	ND			
MTBE	8020	ND			
Toluene	8020	ND			
Xylenes	8020	ND			
Sample: 98-202-06 Client ID: RS-5				02/25/98	WATER
Gasoline	8015M	160000	ug/L		03/03/98
Benzene	8020	2700	ug/L		
Ethylbenzene	8020	5300	ug/L		
MTBE	8020	*ND			
Toluene	8020	31000	ug/L		
Xylenes	8020	28000	ug/L		

*Confirmed by GC/MS method 8260.

P. O. Box 5624 • South San Francisco, California 94083 • 650-588-2838 FAX 588-1950

North State Environmental
Chemical Waste Disposal · Trucking · Consulting

C E R T I F I C A T E O F A N A L Y S I S

Lab Number: 98-202
Client: Western Geo-Engineers
Project: DP 793 / 4035 Park Blvd.

Date Reported: 03/05/98

Gasoline,BTEX and MTBE by Methods 8015M and 8020

Analyte	Method	Result	Unit	Date Sampled	Date Analyzed
Sample: 98-202-07	Client ID: RS-6			02/25/98	WATER
Gasoline	8015M	1400	ug/L		03/03/98
Benzene	8020	22	ug/L		
Ethylbenzene	8020	5	ug/L		
MTBE	8020	ND			
Toluene	8020	47	ug/L		
Xylenes	8020	52	ug/L		
Sample: 98-202-08	Client ID: RS-7			02/25/98	WATER
Gasoline	8015M	13000	ug/L		03/03/98
Benzene	8020	4300	ug/L		
Ethylbenzene	8020	1100	ug/L		
MTBE	8020	*ND			
Toluene	8020	7100	ug/L		
Xylenes	8020	5800	ug/L		

*Confirmed by GC/MS method 8260.

P. O. Box 5624 • South San Francisco, California 94083 • 650-588-2838 FAX 588-1950

North State Environmental
Chemical Waste Disposal · Trucking · Consulting

CERTIFICATE OF ANALYSIS

Quality Control/Quality Assurance

Lab Number: 98-202
Client: Western Geo-Engineers
Project: DP 793 / 4035 Park Blvd.

Date Reported: 03/05/98

Gasoline,BTEX and MTBE by Methods 8015M and 8020

Analyte	Method	Reporting Limit	Unit	Blank	MS/MSD Recovery	RPD
Gasoline	8015M	50	ug/L	ND	103	2
Benzene	8020	0.5	ug/L	ND	95	5
Ethylbenzene	8020	0.5	ug/L	ND	102	4
Toluene	8020	0.5	ug/L	ND	106	4
Xylenes	8020	1.0	ug/L	ND	104	2
MTBE	8020	0.5	ug/L	ND	103	2

ELAP Certificate NO:1753
Reviewed and Approved

John A.Murphy,Laboratory Director

P. O. Box 5624 • South San Francisco, California 94083 • 650-588-2838 FAX 588-1950

APPENDIX D

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. CAD982413249

2. Page 1 of 1

3. Document Number NH-No. 1184

EES 19

4. Generator's Name and Mailing Address
~~Desert Petroleum~~ Desert Petroleum
~~4035 Park Blvd~~ P.O. Box 1001
~~Oakland CA 94602~~ Oildale, CA 93312
Generator's Phone ~~9116-668-5300~~ 661-399-4481

5. Transporter Company Name
EVERGREEN ENVIRONMENTAL SERVICES

6. US EPA ID Number
CAD982413262

7. Transporter Phone
800-972-5284

8. Designated Facility Name and Site Address
Evergreen Oil, Inc.
6880 Smith Avenue
Newark, CA 94560

9. US EPA ID Number
CAD980887418

10. Facility's Phone
510-795-4401

11. Waste Shipping Name and Description	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol
a. Non-Hazardous waste, liquid Water and oil	001	TT	350	G
b.				

Handling Codes for Wastes Listed Above: 11a. | 11b.

15. Special Handling Instructions and Additional Information

Profile #
Do not ingest
Wear protective clothing
In case of emergency call: CHEMTREC 800-424-9300
DOT ERG 171

Invoice: 670159
Sales Order: 96189045

Site / 4035 Park Blvd Oakland, CA 94602

GENERATOR → TRANSPORTER → DESIGNATED FACILITY

16. GENERATOR'S CERTIFICATION

Printed/Typed Name: MATT Peoich
Signature: Matt Peoich
Month: 04 Day: 02 Year: 98

17. Transporter Acknowledgement of Receipt

Printed/Typed Name: Phillip Jimeson
Signature: Phil Jameson
Month: 04 Day: 02 Year: 98

18. Discrepancy Indication Space

19. Facility Owner or Operator

Printed/Typed Name:
Signature:
Month: Day: Year:

WHITE – ORIGINAL (Return to Generator) YELLOW – TSDF (Retain Copy) PINK – TRANSPORTER COPY GOLDENROD – GENERATOR'S COPY