Weiss Associates Environmental and Geologic Services

5500 Shellmound Street. Emeryville, CA 94608-2411 Fax: 510-547-5043 Phone: **510-547-5420**

January 14, 1994

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ALCO HAZMAT

1107

Jennifer Eberle
Alameda County Department
of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621-1426

Re: ACDEH STID #1107
Shell Service Station
WIC #204-6001-0109
29 Wildwood Avenue
Piedmont, California
WA Job #81-463-203

Dear Ms. Eberle:

This letter describes recently completed and anticipated activities at the Shell service station referenced above (Figure 1). This status report satisfies the quarterly reporting requirements prescribed by California Administrative Code Title 23 Waters, Chapter 3, Subchapter 16, Article 5, Section 265.d. Included below are descriptions and results of activities performed in the fourth quarter 1993 and proposed work for the first quarter 1994.

Fourth Quarter 1993 Activities:

- Blaine Tech Services, Inc. (BTS) San Jose, California measured ground water depths in five of the six wells and collected water samples from all six wells. The ground water depth was not measured in well E-4 since it is a flowing artesian well. BTS' report describing these activities and the analytic report for the ground water samples are included as Attachment A.

- Weiss Associates (WA) compiled the ground water elevation and analytic data (Tables 1 and 2, respectively) and prepared a ground water elevation contour map (Figure 2).

- BTS measured dissolved oxygen concentrations in ground water in all site wells (Table 2). The dissolved oxygen concentrations are similar to last quarter and are more than sufficient to support natural hydrocarbon biodegradion. BTS will continue to be measure dissolved oxygen concentrations.

Anticipated First Quarter 1994 Activities:

- WA will submit a report presenting the results of first quarter 1994 ground water sampling and ground water depth measurements. The report will include tabulated ground water elevation and analytic data, dissolved oxygen concentrations and a ground water elevation contour map.

Conclusions and Recommendations

The dissolved oxygen concentrations appear adequate for biochemical oxidation. According to Barker et al,[1] approximately 20 μg dissolved oxygen are required for complete biochemical oxidization of 1 μg BETX in naturally occuring ground water. Based on the 3,820 to 5,750 $\mu g/\ell$ dissolved oxygen measured in ground water beneath the site, biochemical oxidation of about 170 to 290 $\mu g/\ell$ BETX is possible. Since BETX concentrations in ground water from all site wells fall within this range, there appears to be more than sufficient dissolved oxygen for biochemical oxidation of the hydrocarbons. Therefore, as we discussed in previoius reports, WA recommends continued measurement of dissolved oxygen concentrations in ground water to monitor the progress of hydrocarbon biodegradation by naturally occurring microorganisms.

[1] Barker, J.F., et al, 1987, Natural Attenuation of Aromation Hydrocarbons in a Shallow Sand Aquifer, Ground Water Monitoring Review, (7(1):64-71.

Please call if you have any questions.

Sincerely,
Weiss Associates

J. Michael Asport
Technical Assistant

N. Scott MacLeod, R.G.
Project Geologist

JMA/NSM:jma

J:\SHELL\450\QMRPTS\463QMDE3.WP

Attachments: Figures
Tables
A - BTS' Ground Water Monitoring Report

cc: Dan Kirk, Shell Oil Company, P.O. Box 5278, Concord, California 94520-9998
John Jang, Regional Water Quality Control Board - San Francisco Bay, 2101 Webster Street, Suite 500, Oakland, California 94612

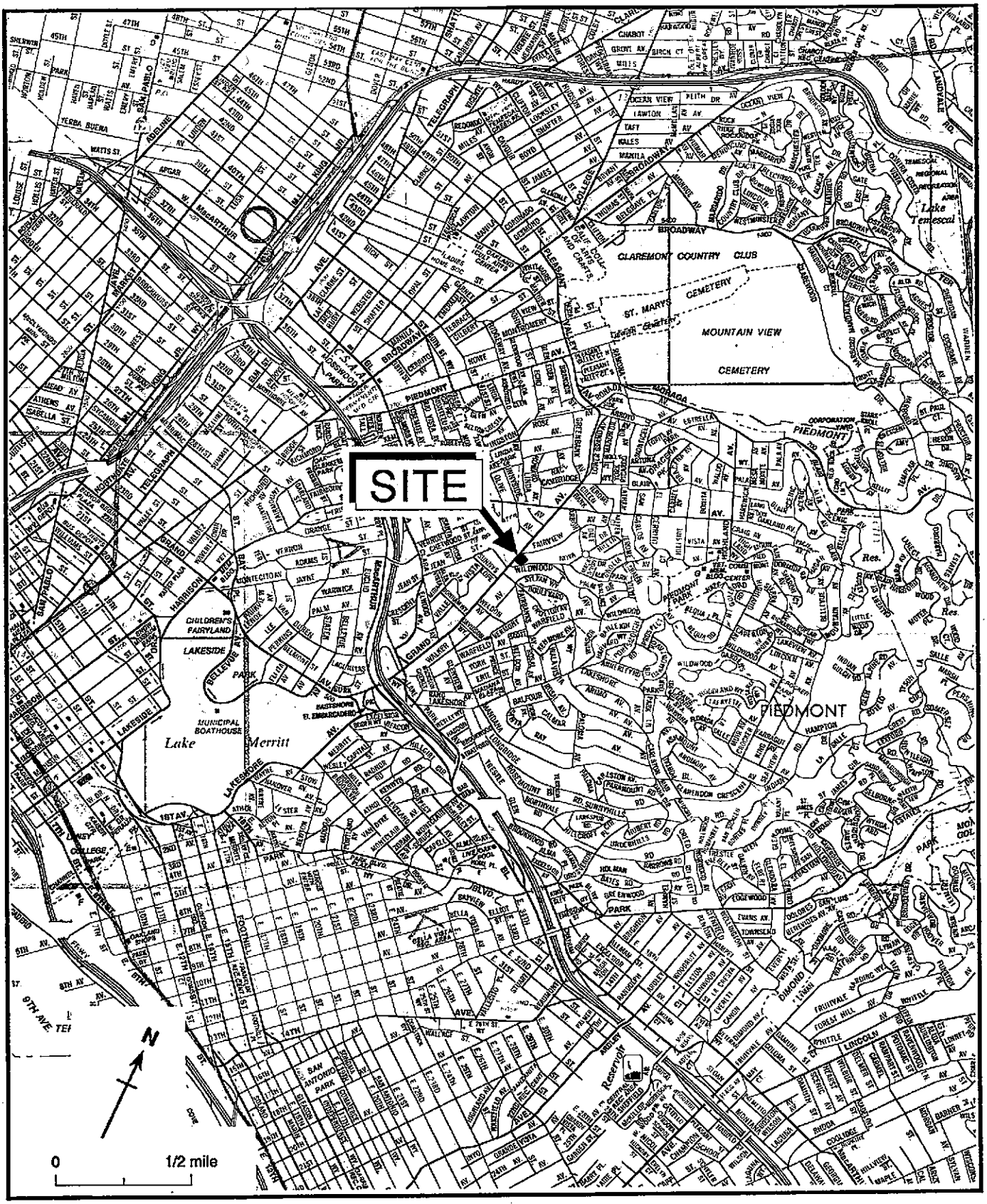

Figure 1. Site Location Map - Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

6/6/90

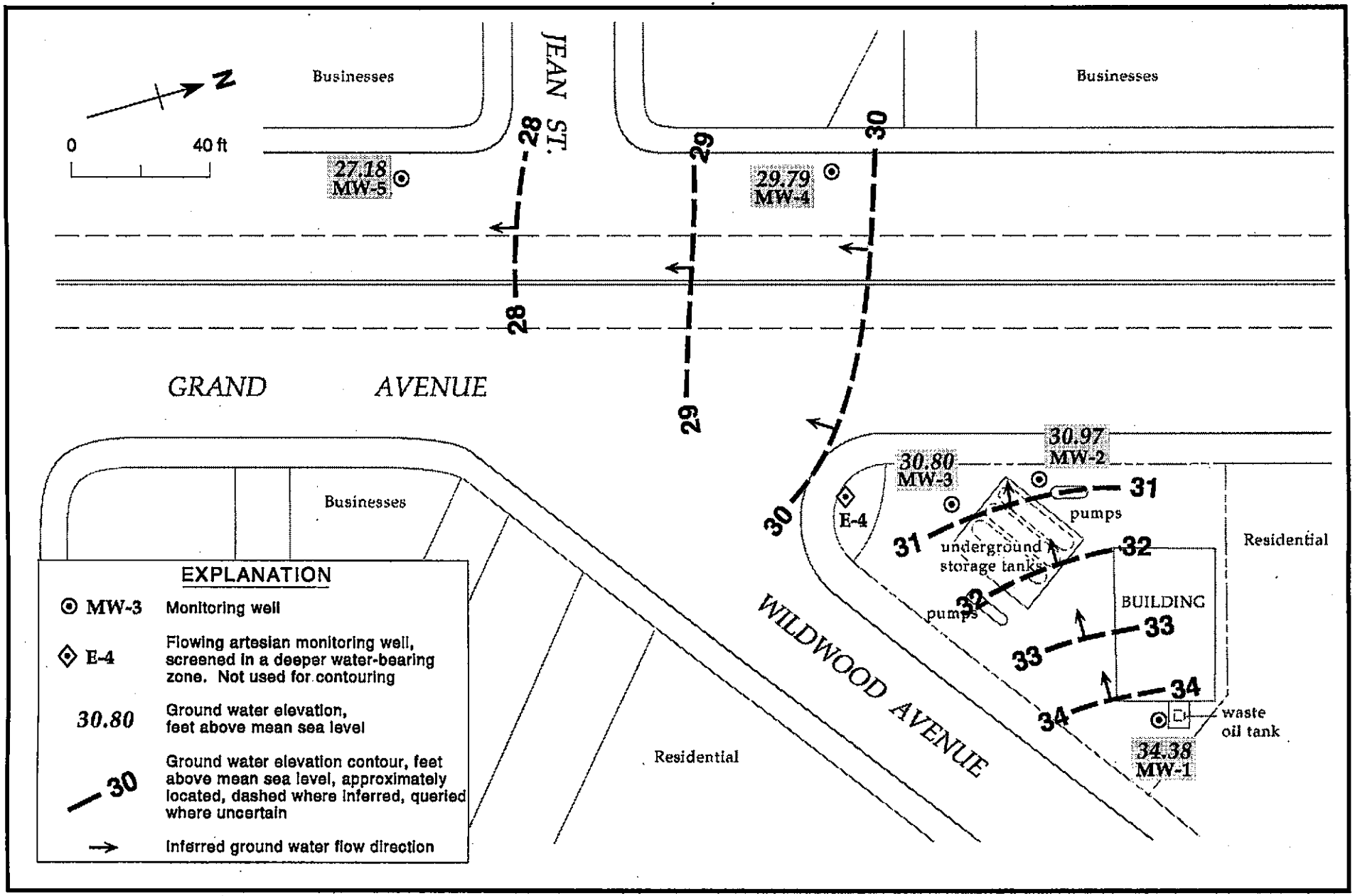

Figure 2. Monitoring Well Locations and Ground Water Elevation Contours - October 19, 1993 - Shell Service Station, WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

TABLE 1. Ground Water Elevations - Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
MW-1	07/12/89	37.96	2.76	35.20
	01/30/90		3.10	34.86
	04/27/90		3.24	34.72
	07/31/90		4.26	33.70
	10/30/90		4.25	33.71
	01/31/91		3.66	34.30
	04/30/91		3.46	34.50
	07/30/91		4.14	33.82
	10/29/91		3.96	34.00
	01/20/92		3.59	34.37
	04/14/92		3.18	31.71
	07/21/92		4.17	33.79
	10/02/92		4.29	33.67
	01/20/93		2.32	35.64
	05/03/93		3.50	34.46
	06/28/93		3.76	34.20
	07/21/93		4.09	33.87
	10/19/93		3.58	34.38
MW-2	07/12/89	34.89	3.66	31.23
	01/30/90		3.49	31.40
	04/27/90		3.79	31.10
	07/31/90		4.03	30.86
	10/30/90		4.21	30.68
	01/31/91		4.09	30.80
	04/30/91		3.95	30.94
	07/30/91		4.07	30.82
	10/29/91		4.11	30.78
	01/20/92		3.86	31.03
	04/14/92		3.66	34.30
	07/21/92		3.92	30.97
	10/02/92		4.45	30.44
	01/20/93		3.74	31.15
	05/03/93		3.77	31.12
	06/28/93		3.96	30.93
	07/21/93		4.39	30.50
	10/19/93		3.92	30.97
MW-3	07/12/89	35.00	3.83	31.17
	01/30/90		3.24	31.76

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TABLE 1. Ground Water Elevations - Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California (continued)

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
	04/27/90		4.02	30.98
	07/31/90		4.31	30.69
	10/30/90		4.52	30.48
	01/31/91		4.33	30.67
	04/30/91		3.79	31.21
	07/30/91		4.37	30.63
	10/29/91		4.00	31.00
	01/20/92		3.87	31.13
	04/14/92		3.15	31.85
	07/21/92		4.17	30.83
	10/02/92		4.43	30.57
	01/20/93		2.20	32.80
	05/03/93		3.50	31.50
	06/28/93		4.08	30.92
	07/21/93		4.12	30.88
	10/19/93		**4.20**	**30.80**
MW-4	01/30/90	33.73	4.50	29.23
	04/27/90		3.62	30.11
	07/31/90		4.19	29.54
	10/30/90		4.19	29.54
	01/31/91		4.49	29.24
	04/30/91		4.02	29.71
	07/30/91		4.39	29.34
	10/29/91		3.75	29.98
	01/20/92		3.94	29.79
	04/14/92		3.71	30.02
	07/21/92		4.02	29.71
	10/02/92		4.13	29.60
	01/20/93		3.10	30.63
	05/03/93		3.70	30.03
	06/28/93		3.81	29.92
	07/21/93		3.81	29.92
	10/19/93		**3.94**	**29.79**
MW-5	01/30/90	31.38	7.12	24.26
	04/27/90		4.19	27.19
	07/31/90		4.09	27.29
	10/30/90		4.39	26.99
	01/31/91		4.49	26.89

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TABLE 1. Ground Water Elevations - Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California (continued)

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
	04/30/91		4.27	27.11
	07/30/91		4.32	27.06
	10/29/91		3.79	27.59
	01/20/92		4.09	27.29
	04/14/92		4.12	27.26
	07/21/92		4.13	27.25
	10/02/92		4.30	27.08
	01/20/93		3.12	28.26
	05/03/93		4.07	27.31
	06/28/93		4.08	27.30
	07/21/93		4.05	27.33
	10/19/93		**4.20**	**27.18**
E-4	07/12/89	34.63	a	>39.13
	01/30/90		b	>34.63
	04/27/90		b	>34.63
	07/31/90		b	>34.63
	10/30/90		b	>34.63
	01/31/91		b	>34.63
	04/30/91		b	>34.63
	07/30/91		b	>34.63
	10/29/91		b	>34.63
	01/20/92		b	>34.63
	04/14/92		b	>34.63
	07/21/92		b	>34.63
	10/02/92		b	>34.63
	01/20/93		b	>34.63
	05/03/93		b	>34.63
	06/28/93		b	>34.63
	07/21/93		b	>34.63
	10/19/93		**b**	**>34.63**

a = Well E-4 is a flowing artesian well. The potentiometric surface was greater than 4.5 ft above the top of the well casing.

b = Well E-4 potentiometric surface was higher than the top of the well casing.

Table 2. Analytic Results for Ground Water, Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	B	E	T	X	HVOCs	Dissolved Oxygen[a]
			<----------parts per billion (ug/L)---------->						
MW-1	07/12/89	2.76	<50	<0.5	<1	<1	<3	b	---
	01/30/90	3.10	<50	<0.5	<0.5	<0.5	<0.5	---	---
	04/27/90	3.24	<50	<0.5	<0.5	<0.5	<0.5	---	---
	07/31/90	4.26	<50	<0.5	<0.5	<0.5	<0.5	---	---
	10/30/90	4.25	<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/31/91	3.66	<50	<0.5	<0.5	<0.5	<0.5	---	---
	04/30/91	3.46	<50	0.8	0.6	<0.5	1.2	---	---
	07/30/91	4.14	<50	<0.5	<0.5	<0.5	<0.5	---	---
	10/29/91	3.96	<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/20/92	3.59	<30	<0.3	<0.3	<0.3	<0.3	---	---
	04/14/92	3.18	<50	<0.5	<0.5	<0.5	<0.5	---	---
	07/21/92	4.17	<50	<0.5	<0.5	<0.5	<0.5	---	---
	10/02/92	4.29	<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/20/93	2.32	<50	<0.5	<0.5	<0.5	<0.5	---	---
	05/04/93	3.50	<50	<0.5	<0.5	<0.5	<0.5	---	1,930
	07/21/93	4.09	<50	<0.5	<0.5	<0.5	<0.5	---	4,640
	10/19/93	3.58	50	<0.5	<0.5	<0.5	<0.5	---	4,310
MW-2	07/12/89	3.66	60	2.7	<1	<1	<3	b	---
	01/30/90	3.49	<50	6.6	0.54	<0.5	0.93	---	---
	04/27/90	3.79	60	2.1	<0.5	<0.5	<0.5	---	---
	07/31/90	4.03	70	1.5	<0.5	<0.5	<0.5	---	---
	10/30/90	4.21	70	<0.5	<0.5	0.7	1.6	---	---
	01/31/91	4.09	80	<0.5	0.9	<0.5	1.9	---	---
	04/30/91	3.95	100	5.9	0.7	0.6	2.0	---	---
	07/30/91	4.07	<50	<0.5	<0.5	<0.7	<0.5	---	---
	10/29/91	4.11	<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/20/92	3.86	<30	0.84	<0.41	<0.3	<0.48	---	---
	04/14/92	3.66	70	16	3.1	<0.5	2.1	---	---
	07/21/92	3.92	<50	<0.5	<0.5	<0.5	<0.5	---	---
	10/02/92	4.45	<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/20/93	3.74	<50	3.8	0.52	<0.5	<0.5	---	---
	05/04/93	3.77	680[c]	2.8	<0.5	<0.5	<0.5	---	900
	07/21/93	4.39	<50	8.0	1.8	1.2	7.9	---	5,880
	10/19/93	3.92	<50	<0.5	<0.5	<0.5	<0.5	---	5,700
MW-3	07/12/89	3.83	3,900	380	99	41	30	d	---
	01/30/90	3.24	5,500	440	79	35	130	---	---
	04/27/90	4.02	4,500	310	37	26	110	---	---
	07/31/90	4.31	3,500	210	8.4	17	62	---	---
	10/30/90	4.52	2,300	610	<0.5	<0.5	28	---	---
	01/31/91	4.33	4,100	300	19	20	81	---	---
	04/30/91	3.79	3,800	370	8.6	19	60	---	---

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Table 2. Analytic Results for Ground Water, Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California (continued)

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	B	E	T	X	HVOCs	Dissolved Oxygen[a]
			<----------parts per billion (ug/L)---------->						
	07/30/91	4.37	3,300	160	15	13	87	---	---
	10/29/91	4.00	1,000	35	2.9	2.8	8.1	---	---
	01/20/92	3.87	6,900	380	47	18	48	---	---
	04/14/92	3.15	6,000	480	41	38	55	---	---
	07/21/92	4.17	3,700	330	30	13	23	---	---
	10/02/92	4.43	4,200	260	13	10	12	---	---
	01/20/93	2.20	4,200	360	32	15	26	---	---
	01/20/93[dup]	2.20	3,900	370	32	15	26	---	---
	05/04/93	3.50	12,000	290	120	520	620	---	630
	07/21/93	4.12	2,000	170	<10	12	11	---	4,340
	07/21/93[dup]	4.12	2,000	170	<10	10	14	---	---
	10/19/93	4.20	2,000	240	<0.5	<0.5	<0.5	---	5,740
MW-4	01/31/90	4.50	<50	<0.5	<0.5	<0.5	<0.5	---	---
	04/27/90	3.62	130[c]	<0.5	<0.5	<0.5	<0.5	---	---
	07/31/90	4.19	<50	<0.5	<0.5	<0.5	<0.5	---	---
	10/30/90	4.19	<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/31/91	4.49	50[c]	<0.5	<0.5	<0.5	<0.5	---	---
	04/30/91	4.02	<50	<0.5	<0.5	<0.5	<0.5	e	---
	07/30/91	4.39	<50	<0.5	<0.5	<0.5	<0.5	---	---
	10/29/91	3.75	<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/20/92	3.94	<30	<0.3	<0.3	<0.3	<0.3	---	---
	04/14/92	3.71	<50	<0.5	<0.5	<0.5	<0.5	---	---
	07/21/92	4.02	<50	<0.5	<0.5	<0.5	<0.5	---	---
	10/02/92	4.13	<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/20/93	3.10	<50	<0.5	<0.5	<0.5	<0.5	---	---
	05/04/93	3.70	<50	<0.5	<0.5	<0.5	<0.5	---	1,740
	07/21/93	3.81	<50	0.56	<0.50	<0.50	<0.50	---	4,510
	10/10/93	3.94	<50	<0.5	<0.5	<0.5	<0.5	---	5,750
MW-5	01/31/90	7.12	<50	<0.5	<0.5	<0.5	<0.5	---	---
	04/27/90	4.19	210[c]	<0.5	<0.5	<0.5	<0.5	---	---
	07/31/90	4.09	90	<0.5	<0.5	<0.5	<0.5	---	---
	10/30/90	4.39	100	0.8	0.6	0.7	1.4	---	---
	01/31/91	4.49	80[c]	<0.5	<0.5	<0.5	<0.5	---	---
	04/30/91	4.27	90	<0.5	<0.5	<0.5	<0.5	f	---
	07/30/91	4.37	90	<0.5	<0.5	<0.5	<0.5	---	---
	10/29/91	3.79	<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/20/92	4.09	<30	<0.3	<0.3	<0.3	<0.3	---	---
	04/14/92	4.12	<50[c]	<0.5	<0.5	<0.5	<0.5	---	---
	07/21/92	4.13	74[c]	<0.5	<0.5	<0.5	<0.5	---	---
	10/02/92	4.30	76[c]	<0.5	<0.5	<0.5	<0.5	---	---

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Table 2. Analytic Results for Ground Water, Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California (continued)

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	B	E	T	X	HVOCs	Dissolved Oxygen[a]
			<----------parts per billion (ug/L)---------->						
	01/20/93	3.12	72[c]	<0.5	<0.5	<0.5	<0.5	---	---
	05/04/93	4.07	70[c]	<0.5	<0.5	<0.5	<0.5	---	1620
	05/04/93[dup]	4.07	80[c]	<0.5	<0.5	<0.5	<0.5	---	---
	07/21/93	4.05	<50	<0.50	<0.50	<0.50	<0.50	---	3,460
	10/19/93	4.20	51	<0.5	<0.5	<0.5	<0.5	---	3,820
E-4	07/12/89	g	<50	<0.5	<1	<1	<3	---	---
	01/31/90	g	<50	<0.5	<0.5	<0.5	<0.5	---	---
	04/27/90	g	120[c]	<0.5	<0.5	<0.5	<0.5	---	---
	07/31/90	g	<50	<0.5	<0.5	<0.5	<0.5	---	---
	10/30/90	g	<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/31/91	g	<50	<0.5	<0.5	<0.5	<0.5	---	---
	04/30/91	g	<50	<0.5	<0.5	<0.5	<0.5	b	---
	07/30/91	g	<50	<0.5	<0.5	0.6	<0.5	---	---
	10/29/91	g	<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/20/92	g	<30	<0.3	<0.3	<0.3	<0.3	---	---
	04/14/92	g	<50	<0.5	<0.5	<0.5	<0.5	---	---
	07/21/92	g	<50	<0.5	<0.5	<0.5	<0.5	---	---
	10/02/92	g	<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/20/93	g	<50	<0.5	<0.5	<0.5	<0.5	---	---
	05/04/93	g	<50	<0.5	<0.5	<0.5	<0.5	---	630
	07/21/93	g	<50	5.4	1.0	0.72	4.4	---	5,440
	10/19/93	g	<50	<0.5	<0.5	<0.5	<0.5	---	5,630
Trip Blank	07/12/89		<50	<0.5	<1	<1	<3	---	---
	01/31/90		<50	<0.5	<.5	<0.5	<0.5	---	---
	04/27/90		<50	<0.5	<0.5	<0.5	<0.5	---	---
	07/31/90		<50	<0.5	<0.5	<0.5	<0.5	---	---
	10/30/90		<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/31/91		<50	<0.5	<0.5	<0.5	<0.5	---	---
	04/30/91		<50	<0.5	<0.5	<0.5	<0.5	---	---
	07/30/91		<50	<0.5	<0.5	<0.5	<0.5	---	---
	10/29/91		<50	<0.5	<0.5	<0.5	<0.5	---	---
	10/02/92		<50	<0.5	<0.5	<0.5	<0.5	---	---
	01/20/93		<50	<0.5	<0.5	<0.5	<0.5	---	---
	05/03/93		<50	<0.5	<0.5	<0.5	<0.5	---	---
	07/21/93		<50	<0.50	<0.50	<0.50	<0.50	---	---
	10/19/93		<50	<0.5	<0.5	<0.5	<0.5	---	---
Bailer Blank	04/27/90		110[c]	<0.5	<0.5	<0.5	<0.5	---	---
	01/31/91		<5	<0.5	<0.5	<0.5	<0.5	---	---
	10/02/92		ND	ND	ND	ND	ND	---	---

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Table 2. Analytic Results for Ground Water, Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California (continued)

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	B	E	T	X	HVOCs	Dissolved Oxygen[a]
			<----------parts per billion (ug/L)---------->						
DTSC MCLs			NE	1	680	100[h]	1750	i	NA

Abbreviations:

TPH-G = Total Petroleum Hydrocarbons as Gasoline by Modified EPA Method 8015
B = Benzene by EPA Method 602 or 8020
E = Ethylbenzene by EPA Method 602 or 8020
T = Toluene by EPA Method 602 or 8020
X = Xylenes by EPA Method 602 or 8020
HVOCs = Halogenated volatile organic compounds by EPA Method 601 or 624
--- = Not analyzed
NE = Not established
DTSC MCLs = California Department of Toxic Substances Control maximum contaminant levels for drinking water
<n = Not detected above detection limit of n ppb

Notes:

a = Field measurement of dissolved oxygen concentration (ppb)
b = No HVOCs detected.
c = Chromatogram contained discrete peaks; not representative of gasoline
d = BETX detected at 0.41, 0.097, 0.036 and 0.30 ppm, respectively, by EPA Method 624.
e = 0.015 ppm tetrachloroethene (PCE), 0.0041 ppm trichloroethene (TCE) and 0.0034 ppm trans-1,2-dichloroethene (DCE) detected
f = 0.22 ppm PCE, 0.022 ppm TCE and 0.017 ppm DCE detected
g = Artesian well; potentiometric surface above top-of-casing elevation.
h = DTSC recommended action level for drinking water; MCL not established.
i = DTSC MCLs for PCE = 0.005 ppm; TCE = 0.005 ppm; DCE = 0.01 ppm.

ATTACHMENT A

BLAINE TECH'S GROUND WATER MONITORING REPORT

BLAINE
TECH SERVICES INC.

985 TIMOTHY DRIVE
SAN JOSE, CA 95133
(408) 995-5535
FAX (408) 293-8773

November 9, 1993

Shell Oil Company
P.O. Box 5278
Concord, CA 94520-9998

Attn: Mr. Daniel T. Kirk

SITE:
Shell WIC #204-6001-0109
29 Wildwood Avenue
Piedmont, California

QUARTER:
4th Quarter of 1993

QUARTERLY GROUNDWATER SAMPLING REPORT 931019-L-1

This report contains data collected during routine inspection, gauging and sampling of groundwater monitoring wells performed by Blaine Tech Services, Inc. in response to the request of the consultant who is overseeing work at this site on behalf of our mutual client, Shell Oil Company. Data collected in the course of our field work is presented in a TABLE OF WELL GAUGING DATA. The field information was collected during our preliminary gauging and inspection of the wells, the subsequent evacuation of each well prior to sampling, and at the time of sampling.

Measurements taken include the total depth of the well and the depth to water. The surface of water was further inspected for the presence of immiscibles which may be present as a thin film (a sheen on the surface of the water) or as a measurable free product zone (FPZ). At intervals during the evacuation phase, the purge water was monitored with instruments that measure electrical conductivity (EC), potential hydrogen (pH), temperature (degrees Fahrenheit), and turbidity (NTU). In the interest of simplicity, fundamental information is tabulated here, while the bulk of the information is turned over directly to the consultant who is making professional interpretations and evaluations of the conditions at the site.

STANDARD PROCEDURES

Evacuation

Groundwater wells are thoroughly purged before sampling to insure that the sample is collected from water that has been newly drawn into the well from the surrounding geologic formation. The selection of equipment to evacuate each well is based on the physical characteristics of the well and what is known about the performance of the formation in which the well has been installed. There are several suitable devices which can be used for evacuation. The most commonly employed devices are air or gas actuated pumps, electric submersible pumps, and hand or mechanically actuated bailers. Our personnel frequently employ USGS/Middleburg positive displacement pumps or similar air actuated pumps which do not agitate the water standing in the well.

Normal evacuation removes three-case volumes of water from the well. More than three-case volumes of water are removed in cases where more evacuation is needed to achieve stabilization of water parameters and when requested by the local implementing agency. Less water may be removed in cases where the well dewaters and does not recharge to 80% of its original volume within two hours and any additional time our personnel have reason to remain at the site. In such cases, our personnel return to the site within twenty four hours and collect sample material from the water which has recharged into the well case.

Decontamination

All apparatus is brought to the site in clean and serviceable condition. The equipment is decontaminated after each use and before leaving the site. Effluent water from purging and on-site equipment cleaning is collected and transported to Shell's Martinez Manufacturing Complex in Martinez, California.

Free Product Skimmer

The column headed VOLUME OF IMMISCIBLES REMOVED (ml) is included in the TABLE OF WELL GAUGING DATA to cover situations where a free product skimming device must be removed from the well prior to gauging. Skimmers are installed in wells with a free product zone on the surface of the water. The skimmer is a free product recovery device which often prevents normal well gauging and free product zone measurements. The 2.0" and 3.0" PetroTraps fall into the category of devices that obstruct normal gauging In cases where the consultant elects to have our personnel pull the skimmers out of the well and gauge the well, our personnel perform the additional task of draining the accumulated free product out of the PetroTrap before putting it back in the well. This

recovered free product is measured and logged in the VOLUME OF IMMISCIBLES REMOVE column. Gauging at such sites is performed in accordance with specific directions from the professional consulting firm overseeing work at the site on Shell's behalf.

Sample Containers

Sample material is collected in specially prepared containers which are provided by the laboratory that performs the analyses.

Sampling

Sample material is collected in stainless steel bailer type devices normally fitted with both a top and a bottom check valve. Water is promptly decanted into new sample containers in a manner which reduces the loss of volatile constituents and follows the applicable EPA standard for handling volatile organic and semi-volatile compounds.

Following collection, samples are promptly placed in an ice chest containing pre-frozen blocks of an inert ice substitute such as Blue Ice or Super Ice. The samples are maintained in either an ice chest or a refrigerator until delivered into the custody of the laboratory.

Sample Designations

All sample containers are identified with a site designation and a discrete sample identification number specific to that particular groundwater well. Additional standard notations (e.g. time, date, sampler) are also made on the label.

Chain of Custody

Samples are continuously maintained in an appropriate cooled container while in our custody and until delivered to the laboratory under a standard Shell Oil Company Chain of Custody. If the samples are taken charge of by a different party (such as another person from our office, a courier, etc.) prior to being delivered to the laboratory, appropriate release and acceptance records are made on the Chain of Custody (time, date, and signature of the person releasing the samples followed by the time, date and signature of the person accepting custody of the samples).

Hazardous Materials Testing Laboratory

The samples obtained at this site were delivered to Sequoia Analytical Laboratory in Redwood City, California. Sequoia Analytical Laboratory is a California Department of Health Services certified Hazardous Materials Testing Laboratory and is listed as DOHS HMTL #1210.

Objective Information Collection

Blaine Tech Services, Inc. performs specialized environmental sampling and documentation as an independent third party. In order to avoid compromising the objectivity necessary for the proper and disinterested performance of this work, Blaine Tech Services, Inc. performs no consulting and does not become involved in the marketing or installation of remedial systems of any kind. Blaine Tech Services, Inc. is concerned only with the generation of objective information, not with the use of that information to support evaluations and recommendations concerning the environmental condition of the site. Even the straightforward interpretation of objective analytical data is better performed by interested regulatory agencies and those engineers and geologists who are engaged in the work of providing professional opinions about the site and proposals to perform additional investigation or design remedial systems.

Reportage

Submission of this report and the attached laboratory report to interested regulatory agencies is handled by the consultant in charge of the project. Any professional evaluations or recommendations will be made by the consultant under separate cover.

Please call if we can be of any further assistance.

Richard C. Blaine

RCB/cf

Attachments: Table of Well Guauging Data
Chain of Custody
Certified Analytical Report

cc: Weiss Associates
5500 Shellmound Street
Emeryville, CA 94608-2411
ATTN: Michael Asport

TABLE OF WELL GAUGING DATA

WELL I.D.	DATA COLLECTION DATE	MEASUREMENT REFERENCED TO	QUALITATIVE OBSERVATIONS (sheen)	DEPTH TO FIRST IMMISCIBLES LIQUID (FPZ) (feet)	THICKNESS OF IMMISCIBLES LIQUID ZONE (feet)	VOLUME OF IMMISCIBLES REMOVED (ml)	DEPTH TO WATER (feet)	DEPTH TO WELL BOTTOM (feet)
MW-1	10/19/93	TOC	--	NONE	--	--	3.58	13.12
MW-2	10/19/93	TOC	--	NONE	--	--	3.92	11.52
MW-3	10/19/93	TOC	--	NONE	--	--	4.20	9.00
MW-4	10/19/93	TOC	--	NONE	--	--	3.94	12.66
MW-5	10/19/93	TOC	--	NONE	--	--	4.20	15.96
EW-4	10/19/93	**	--	NONE	--	--	--	34.21

* Sample DUP was a duplicate sample taken from well MW-3.

** Water was flowing out of the well pipe opening.

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: _____

Date: 10/19/93
Page 1 of 2

Site Address: 29 Wildwood Avenue, Piedmont

WIC#: 204-6001-0109

Shell Engineer: Dan Kirk — Phone No.: (510) 675-6168 Fax #: 675-6160

Consultant Name & Address: Blaine Tech Services, Inc. 985 Timothy Drive San Jose, CA 95133

Consultant Contact: Jim Keller — Phone No.: (408) 995-5535 Fax #: 293-8773

Comments:

Sampled by: Zach Baker

Printed Name: ZACH BAKER

LAB: Sequoia

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	TPH (EPA 8015 Mod. Gas)	TPH (EPA 8015 Mod. Diesel)	BTEX (EPA 8020/602)	Volatile Organics (EPA 8240)	Test for Disposal	Combination TPH 8015 & BTEX 8020	Asbestos	Container Size	Preservation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
MW-1	10/19			X		3						X		40 ML	HCL		9310B11	-01
MW-2	10/19			X		3						X						-02
MW-3	10/19			X		3						X						-03
MW-4	10/19			X		3						X						-04
MW-5	10/19			X		3						X						-05
E-4	10/19			X		3						X						-06
DUP	10/19			X		3						X						-07
EB	10/19			X		3						X		↓	↓			-08

CHECK ONE (1) BOX ONLY — CT/DT — TURN AROUND TIME

- Quarterly Monitoring [X] 8441 — 24 hour [ ]
- Site Investigation [ ] 8441 — 48 hour [ ]
- Soil Closure/Disposal [ ] 8442 — 15 days [X] (Normal)
- Water Closure/Disposal [ ] 8443 — Other [ ]
- Soil/Air Rem. or Sys. O & M [ ] 8452
- Water Rem. or Sys. O & M [ ] 8453
- Other [ ]

NOTE: Notify lab as soon as possible of 24/48 hr. TAT.

Relinquished By (signature)	Printed Name	Date	Time	Received (signature)	Printed Name	Date	Time
[signature]	ZACH BAKER	10/20/93	1112	[signature]	S. O'Donnell	10/20/93	1113
[signature]	S. O'Donnell	10/20/93	1144				
				[signature]	P. HUPANO	10-20-93	1144

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN-OF-CUSTODY WITH INVOICE AND RESULTS

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: _____

Date: 10/11/93
Page 2 of 2

Site Address: 29 Wildwood Avenue, Piedmont

WIC#: 204-6001-0109

Shell Engineer: Dan Kirk — Phone No.: (510) 675-6168 Fax #: 675-6160

Consultant Name & Address: Blaine Tech Services, Inc. 985 Timothy Drive San Jose, CA 95133

Consultant Contact: Jim Keller — Phone No.: (408) 995-5535 Fax #: 293-8773

Comments:

Sampled by: Z A Baker

Printed Name: LAD B OLVER

LAB: Sequoia

CHECK ONE (1) BOX ONLY — C1/D1

- Quarterly Monitoring [X] 6441
- Site Investigation [ ] 6441
- Soil Closure/Disposal [ ] 6442
- Water Closure/Disposal [ ] 6443
- Soil/Air Rem. or Sys. O & M [ ] 6452
- Water Rem. or Sys. O & M [ ] 6453
- Other [ ]

TURN AROUND TIME

- 24 hours [ ]
- 48 hours [ ]
- 15 days [X] (Normal)
- Other [ ] _____

NOTE: Notify Lab as soon as Possible of 24/48 hr. TAT.

Analysis Required

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	TPH (EPA 8015 Mod. Gas)	TPH (EPA 8015 Mod. Diesel)	BTEX (EPA 8020/602)	Volatile Organics (EPA 8240)	Test for Disposal	Combination TPH 8015 & BTEX 8020	Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
TB.	10/19			X		2						X		40 ML	HCl		9310811-09	

Relinquished By (Signature)	Printed Name	Date	Time	Received (Signature)	Printed Name	Date	Time
Z A Baker	LAD BOLVER	10/20/93	1112	[illegible]	S. O'Donnell	10/20/93	1112
[illegible]	S. O'Donnell	10/20/93	1144	[illegible]			

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN-OF-CUSTODY WITH INVOICE AND RESULTS

2nd Copy of Custody

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Blaine Tech Services, Inc.
985 Timothy Drive
San Jose, CA 95133
Attention: Jim Keller

Project: Shell, 29 Wildwood Ave.

Enclosed are the results from 9 water samples received at Sequoia Analytical on October 20,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3JB1101	Water, MW-1	10/19/93	EPA 5030/8015/8020
3JB1102	Water, MW-2	10/19/93	EPA 5030/8015/8020
3JB1103	Water, MW-3	10/19/93	EPA 5030/8015/8020
3JB1104	Water, MW-4	10/19/93	EPA 5030/8015/8020
3JB1105	Water, MW-5	10/19/93	EPA 5030/8015/8020
3JB1106	Water, E-4	10/19/93	EPA 5030/8015/8020
3JB1107	Water, DUP	10/19/93	EPA 5030/8015/8020
3JB1108	Water, EB	10/19/93	EPA 5030/8015/8020
3JB1109	Water, Trip Blank	10/19/93	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Peggy A. Penner
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Blaine Tech Services, Inc.	Client Project ID:	Shell, 29 Wildwood Ave.	Sampled:	Oct 19, 1993
985 Timothy Drive	Sample Matrix:	Water	Received:	Oct 20, 1993
San Jose, CA 95133	Analysis Method:	EPA 5030/8015/8020	Reported:	Oct 28, 1993
Attention: Jim Keller	First Sample #:	3JB1101		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3JB1101 MW-1	Sample I.D. 3JB1102 MW-2	Sample I.D. 3JB1103 MW-3	Sample I.D. 3JB1104 MW-4	Sample I.D. 3JB1105 MW-5	Sample I.D. 3JB1106 E-4
Purgeable Hydrocarbons	50	N.D.	N.D.	2,000	N.D.	51	N.D.
Benzene	0.50	N.D.	N.D.	240	N.D.	N.D.	N.D.
Toluene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Total Xylenes	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chromatogram Pattern:		--	--	Gas + Discrete Peak	--	Discrete Peak	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	20	1.0	1.0	1.0
Date Analyzed:	10/22/93	10/22/93	10/22/93	10/22/93	10/22/93	10/22/93
Instrument Identification:	GCHP-2	GCHP-2	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	78	84	86	85	91	83

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

SEQUOIA ANALYTICAL

Peggy A. Penner
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Blaine Tech Services, Inc.	Client Project ID:	Shell, 29 Wildwood Ave.	Sampled:	Oct 19, 1993
985 Timothy Drive	Sample Matrix:	Water	Received:	Oct 20, 1993
San Jose, CA 95133	Analysis Method:	EPA 5030/8015/8020	Reported:	Oct 28, 1993
Attention: Jim Keller	First Sample #:	3JB1107		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3JB1107 DUP	Sample I.D. 3JB1108 EB	Sample I.D. 3JB1109 Trip Blank
Purgeable Hydrocarbons	50	2,100	N.D.	N.D.
Benzene	0.50	250	N.D.	N.D.
Toluene	0.50	13	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	N.D.
Total Xylenes	0.50	N.D.	N.D.	N.D.
Chromatogram Pattern:		Gas + Discrete Peak	--	--

Quality Control Data

Report Limit Multiplication Factor:	20	1.0	1.0
Date Analyzed:	10/22/93	10/22/93	10/22/93
Instrument Identification:	GCHP-2	GCHP-2	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	91	93	80

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

SEQUOIA ANALYTICAL

Peggy A. Penner
Project Manager

SEQUOIA ANALYTICAL
680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Blaine Tech Services, Inc.	Client Project ID:	Shell, 29 Wildwood Ave.
985 Timothy Drive	Matrix:	Water
San Jose, CA 95133		
Attention: Jim Keller	QC Sample Group: 3JB1101-09	Reported: Oct 28, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Miraftab	A. Miraftab	A. Miraftab	A. Miraftab
Conc. Spiked:	10	10	10	30
Units:	µg/L	µg/L	µg/L	µg/L
LCS Batch#:	BLK102293	BLK102293	BLK102293	BLK102293
Date Prepared:	-	-	-	-
Date Analyzed:	10/22/93	10/22/93	10/22/93	10/22/93
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
LCS % Recovery:	94	94	95	93
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	3JA3902	3JA3902	3JA3902	3JA3902
Date Prepared:	-	-	-	-
Date Analyzed:	10/22/93	10/22/93	10/22/93	10/22/93
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Matrix Spike % Recovery:	100	99	100	100
Matrix Spike Duplicate % Recovery:	100	97	98	97
Relative % Difference:	0.0	2.0	2.0	3.4

SEQUOIA ANALYTICAL

Peggy A. Penner
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.