Weiss Associates *Environmental and Geologic Services*

5500 Shellmound Street, Emeryville, CA 94608-2411 *Fax: 510-547-5043* *Phone:* ***510-450-6000***

August 19, 1994

Brian Oliva
Alameda County Department
of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

AUG 24 RECD

STD413

Re: Shell Service Station
WIC #204-5508-2404
2800 Telegraph Avenue
Oakland, California
WA Job #81-700-104

Dear Mr. Oliva:

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 second quarter 1994 and proposed work for the third quarter 1994.

Second Quarter 1994 Activities:

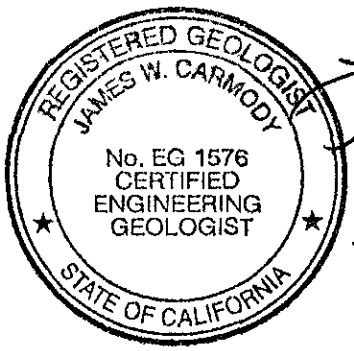
- Blaine Tech Services, Inc. (BTS) of San Jose, California measured ground water depths and collected ground water samples from the site wells. Well SR-1 is a ground water extraction well and is not sampled. BTS' report describing these activities and the analytic report for the ground water samples are included as Attachment A.
- Weiss Associates (WA) calculated ground water elevations and compiled the analytic data (Tables 1 and 2) and prepared a ground water elevation contour map (Figure 2).
- WA re-evaluated the sampling frequency of the site's monitoring wells based upon each well's location and historic analytic data. Our proposed changes are presented in Table 3.

Anticipated Third Quarter 1994 Activities:

- WA will submit a report presenting the results of the third quarter 1994 ground water sampling and ground water depth measurements. The report will include tabulated chemical analytic results, ground water elevations and a ground water elevation contour map.
- Unless we hear otherwise from the Alameda County Department of Environmental Health, WA will implement our proposed well sampling frequencies.

August 19, 1994

Please call if you have any questions.



Sincerely,
Weiss Associates

J. Michael Asport
Technical Assistant

James W. Carmody, C.E.G.
Senior Project Hydrogeologist

JMA/JWC:jma

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Attachments: A - Blaine Tech's Ground Water Monitoring Report
B - Sampling Frequency Criteria

cc: Lynn Walker, Shell Oil Company, P.O. Box 4023, Concord, California 94524
Richard Hiett, Regional Water Quality Control Board - San Francisco Bay Region, 2101 Webster Street, Suite 500, Oakland, California 94612

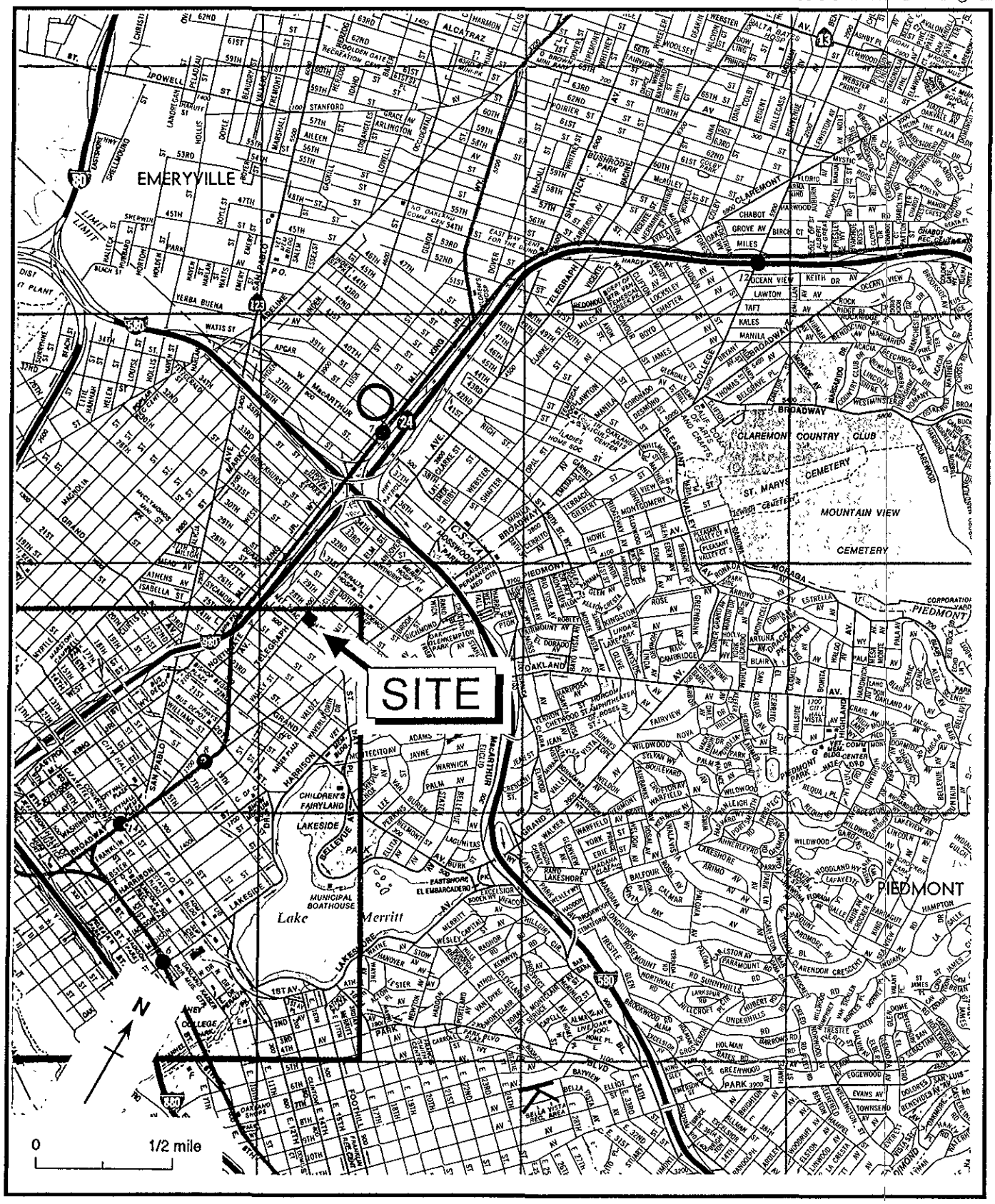


Figure 1. Site Location Map - Former Shell Service Station WIC #204-5508-2404, 2800 Telegraph Avenue, Oakland, California

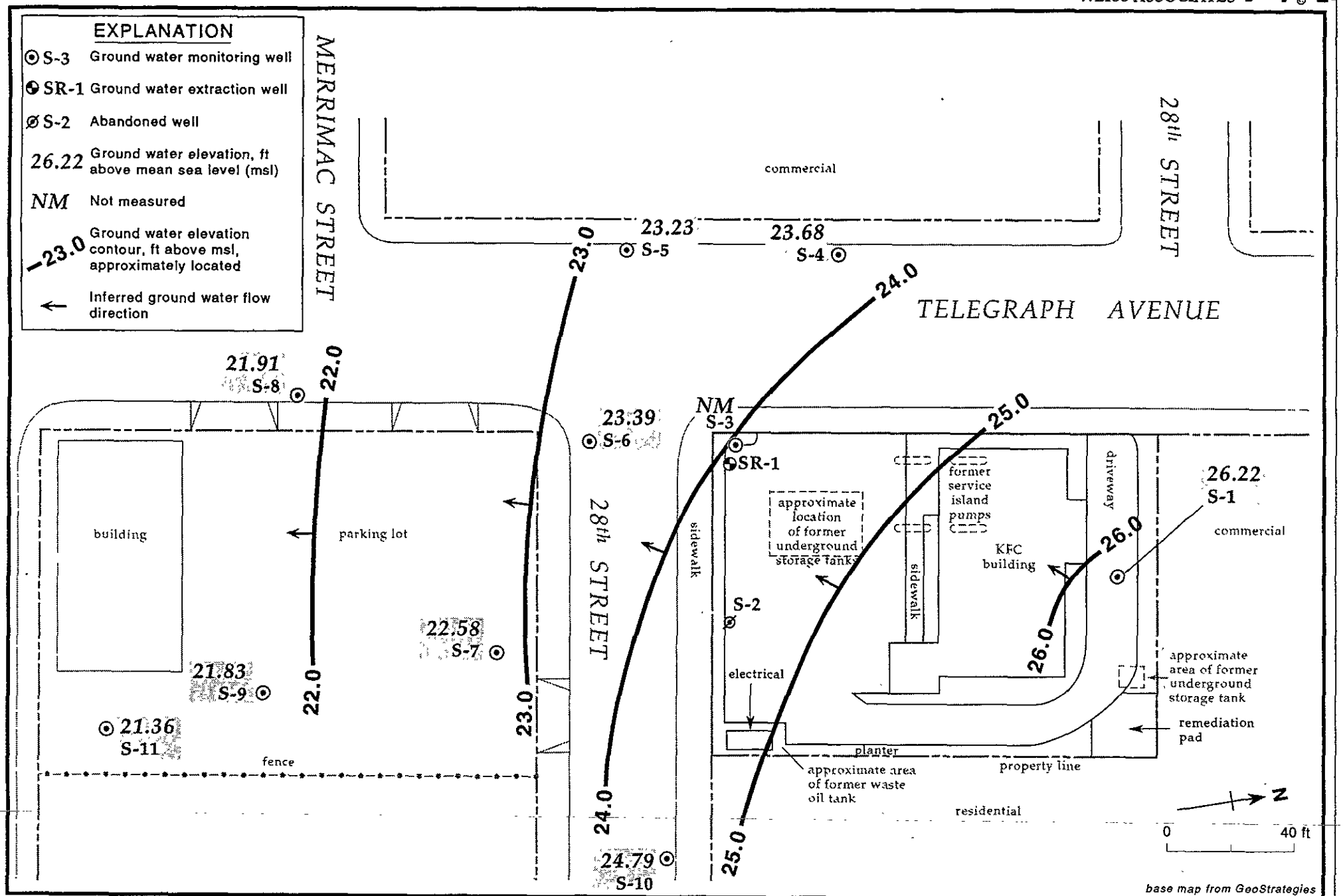


Figure 2. Monitoring Well Locations and Ground Water Elevations - May 3, 1994 - Former Shell Service Station WIC #204-5508-2404, 2800 Telegraph Avenue, Oakland, California

Table 1. Ground Water Elevations - Shell Service Station WIC #204-5508-2303, 2800 Telegraph Avenue, Oakland, California

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
S-1	05/04/92	35.31	9.50	25.81
	08/10/92		10.85	24.46
	11/09/92		10.34	24.97
	02/22/93		7.60	27.71
	06/07/93		8.63	26.68
	08/13/93		9.20	26.11
	11/18/93		10.58	24.73
	02/10/94		8.41	26.90
	05/03/94		**9.09**	**26.22**
S-2	05/04/92	33.91	9.44	24.47
	08/10/92		10.73	23.18
	11/09/92		10.29	23.62
	02/22/93[a]		9.04	24.87
S-3	05/04/92	33.56	9.22	24.34
	08/10/92[b]		---	---
S-4	05/04/92	34.08	9.96	24.12
	08/10/92		11.32	22.76
	11/09/92		11.29	22.79
	02/22/93		9.82	24.26
	06/07/93		10.51	23.57
	08/13/93		11.05	23.03
	11/18/93		11.34	22.74
	02/10/94		9.93	24.15
	05/03/94		**10.40**	**23.68**
S-5	05/04/92	33.42	10.27	23.15
	08/10/92		10.68	22.74
	11/09/92		10.69	22.73
	02/22/93		9.45	23.97
	06/07/93		10.23	23.19
	08/13/93		10.58	22.84
	11/18/93		10.70	22.72
	02/10/94		9.75	23.67
	05/03/94		**10.19**	**23.23**

-- Table 1 continues on next page --

Table 1. Ground Water Elevations - Shell Service Station WIC #204-5508-2303, 2800 Telegraph Avenue, Oakland, California (continued)

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
S-6	05/04/92	32.59	9.42	23.17
	08/10/92		10.40	22.19
	11/09/92		10.16	22.43
	02/22/93		7.60	24.99
	06/07/93		8.90	23.69
	08/13/93		9.39	23.20
	11/18/93		10.32	22.27
	02/10/94		8.68	23.91
	05/03/94		**9.20**	**23.39**
S-7	05/04/92	33.33	11.21	22.12
	08/10/92		12.28	21.05
	11/09/92		11.77	21.56
	02/22/93		8.86	24.47
	06/07/93		10.58	22.75
	08/13/93		11.34	21.99
	11/18/93		12.00	21.33
	02/10/94		9.88	23.45
	05/03/94		**10.75**	**22.58**
S-8	05/04/92	31.97	10.29	21.68
	08/10/92		11.12	20.85
	11/09/92		10.71	21.26
	02/22/93		6.04	25.93
	06/07/93		10.06	21.91
	08/13/93		10.56	21.41
	11/18/93		10.90	21.07
	02/10/94		9.53	22.44
	05/03/94		**10.06**	**21.91**
S-9	05/04/92	31.86	10.45	21.41
	08/10/92		11.52	20.34
	11/09/92		11.02	20.84
	02/22/93		8.00	23.86
	06/07/93		10.07	21.79
	08/13/93		10.92	20.94
	11/18/93		11.19	20.67
	02/10/94		9.16	22.70
	05/03/94		**10.03**	**21.83**
S-10	05/04/92	32.95	8.54	24.41
	08/10/92		10.43	22.52
	11/09/92		9.14	23.81
	02/22/93		6.72	26.23
	06/07/93		8.08	24.87

-- Table 1 continues on next page --

Table 1. Ground Water Elevations - Shell Service Station WIC #204-5508-2303, 2800 Telegraph Avenue, Oakland, California (continued)

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
	08/13/93		8.83	24.12
	11/18/93		9.46	23.49
	02/10/94		7.41	25.54
	05/03/94		**8.16**	**24.79**
S-11	05/04/92	30.78	9.99	20.79
	08/10/92		10.92	19.86
	11/09/92		10.44	20.34
	02/22/93		7.30	23.48
	06/07/93		9.51	21.27
	08/13/93		10.39	20.39
	11/18/93		10.64	20.14
	02/10/94		8.50	22.28
	05/03/94		**9.42**	**21.36**
SR-1	05/04/92[c]	---	9.02	---
	08/10/92		10.29	---
	11/09/92		10.92	---
	02/22/93		6.64	---
	06/07/93		7.36	---
	08/13/93		7.96	---
	11/18/93		10.02	---
	02/10/94		---	---
	05/03/94		**8.28**	**---**

Notes:

a = Destroyed on April 8, 1993 for onsite construction
b = Well inaccessible since August 1992
c = Top-of-Casing not surveyed

Table 2. Analytic Results for Ground Water, Former Shell Service Station, WIC #204-5508-2404, 2800 Telegraph Avenue, Oakland, California

Sample ID	Date	Depth to Water (ft)	TPH-G	B	E	T	X
			<----------parts per billion (µg/L)---------->				
WELLS							
S-1	05/04/92	9.50	<50	<0.5	<0.5	<0.5	<0.5
	08/10/92	10.85	<50	<0.5	<0.5	<0.5	<0.5
	11/09/92	10.34	<50	<0.5	<0.5	<0.5	<0.5
	02/23/93	7.60	<50	<0.5	<0.5	<0.5	<0.5
	06/07/93	8.63	<50	2.8	0.7	1.3	3.0
	08/13/93	9.20	<50	<0.5	<0.5	<0.5	<0.5
	11/18/93	10.58	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	8.41	<50	<0.5	<0.5	<0.5	<0.5
	05/03/94	**9.09**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
S-2	05/04/92	9.44	1,600	190	240	6	54
	08/10/92	10.73	<50	4.1	<0.5	<0.5	<0.5
	09/11/92	10.29	84	19	2.2	0.7	4.3
	02/23/93	9.04	16,000	1,600	850	480	1,800
	06/07/93	Well destroyed	---	---	---	---	---
S-3	05/04/92	9.22	---	---	---	---	---
	08/10/92		---	---	---	---	---
S-4	05/04/92	9.96	<50	<0.5	<0.5	<0.5	<0.5
	08/10/92	11.32	<50	<0.5	<0.5	<0.5	<0.5
	11/09/92	11.29	<50	<0.5	<0.5	<0.5	<0.5
	02/23/93	9.82	<50	<0.5	<0.5	<0.5	<0.5
	06/07/93	10.51	50	9.2	3.3	5.5	14
	08/13/93	11.05	<50	<0.5	<0.5	<0.5	<0.5
	11/18/93	11.34	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	9.93	<50	<0.5	<0.5	<0.5	<0.5
	05/03/94	**10.40**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
S-5	05/04/92	10.27	<50	<0.5	<0.5	<0.5	<0.5
	08/10/92	10.68	<50	<0.5	<0.5	<0.5	<0.5
	11/09/92	10.69	<50	<0.5	<0.5	<0.5	<0.5
	02/23/93	9.45	<50	<0.5	<0.5	<0.5	<0.5
	06/07/93	10.23	<50	<0.5	<0.5	<0.5	<0.5
	08/13/93	10.58	<50	<0.5	<0.5	<0.5	<0.5
	11/18/93	10.70	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	9.75	<50	<0.5	<0.5	<0.5	<0.5
	05/03/94	**10.19**	**<50**	**<0.5**	**<0.5**	**<0.5**	
S-6	05/04/92	9.42	3,100	640	23	22	97
	08/10/92	10.40	3,400	430	26	27	120
	11/09/92	10.16	2,000	320	15	15	100
	02/23/93	7.60	14,000	780	380	180	1,300
	06/07/93	8.90	3,900	1,400	83	56	210
	08/13/93	9.39	4,000[b]	890	<0.5	16	41

-- Table 2 continues on next page --

Table 2. Analytic Results for Ground Water, Former Shell Service Station, WIC #204-5508-2404, 2800 Telegraph Ave., Oakland, California (continued)

Sample ID	Date	Depth to Water (ft)	TPH-G	B	E	T	X
			<----------parts per billion (µg/L)---------->				
	11/18/93	10.32	80	5 0	<0 5	<0.5	<0.5
	02/10/94	8.68	4,100	370	21	23	90
	05/03/94	**9.20**	**4,700**	**550**	**85**	**28**	**340**
S-7	05/04/92	11.21	180	1.6	1.5	<0 5	3
	08/10/92	12.28	190	8	4.7	1 4	8.5
	11/09/92	11 77	280	16	7.8	4	21
	02/23/93	8.86	210	13	5.4	2 2	12
	06/07/93	10.58	90	1.2	1.0	2 5	<0.5
	08/13/93	11 34	140	4.0	<0.5	0 8	0.5
	11/18/93	12.00	440	43	0.9	4.9	4.2
	02/10/94	9.88	250[b]	<0.5	1.8	<0.5	<0.5
	05/03/94	**10.75**	**130**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
S-8	05/05/92	10.29	1,600	20	96	420	330
	08/10/92	11.12	1,500	19	60	37	250
	11/09/92	10.71	710	5 7	28	24	120
	02/23/93	6.04	3,800	40	68	54	260
	06/07/93	10.06	1,200	13	65	19	150
	08/13/93	10.56	1,300	21	49	23	250
	11/18/93	10.90	870	16	59	5.3	230
	02/10/94	9.53	2,400	11	120	55	530
	02/10/94[dup]	9.53	2,400	11	100	46	440
	05/03/94	**10.06**	**3,100**	**12**	**130**	**27**	**370**
	05/03/94[dup]	**10.06**	**3,000**	**21**	**120**	**25**	**340**
S-9	05/05/92	10.45	<50	<0.5	<0.5	<0.5	<0.5
	08/10/92	11.52	<50	<0.5	<0.5	<0.5	<0.5
	11/09/92	11.02	<50	<0.5	<0.5	<0.5	0.7
	02/23/92	8.00	<50	<0.5	<0.5	<0.5	<0.5
	06/07/93	10.07	<50	<0.5	<0.5	<0.5	<0.5
	08/13/93	10.92	140[c]	<0 5	<0.5	<0.5	<0.5
	11/18/93	11.19	170	<0.5	<0.5	<0.5	<0.5
	02/10/94	9.16	140[c]	<0.5	<0.5	<0.5	<0.5
	05/03/94	**10.03**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
S-10	05/05/92	8.54	<50	<0.5	<0.5	<0.5	<0.5
	08/10/92	10.43	<50	<0.5	<0.5	<0.5	<0 5
	11/09/92	9.14	<50	<0.5	<0.5	<0.5	<0.5
	02/22/93	6.72	<50	<0.5	<0.5	<0.5	<0.5
	06/07/93	8.08	<50	<0.5	<0.5	<0.5	<0.5
	08/13/93	8.83	<50	<0.5	<0 5	<0.5	<0.5
	11/18/93	9.46	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	7.41	<50	<0.5	<0.5	<0.5	<0.5
	05/03/94	**8.16**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**

-- Table 2 continues on next page --

Table 2 Analytic Results for Ground Water, Former Shell Service Station, WIC #204-5508-2404, 2800 Telegraph Ave., Oakland, California (continued)

Sample ID	Date	Depth to Water (ft)	TPH-G	B	E	T	X
			<----------parts per billion (µg/L)---------->				
S-11	05/04/92	9.99	1,500	55	57	32	190
	08/10/92	10.92	750	29	43	13	120
	11/09/92	10.44	4,100	32	120	62	1,100
	02/23/93	7.30	760	15	37	13	[illegible]
	06/07/93	9.51	1,700	40	100	16	360
	06/07/93[dup]	9.51	1,600	51	83	16	300
	08/13/93	10.39	60	0.9	0.8	<0.5	1.2
	08/13/93[dup]	10.39	70	2.1	0.9	<0.5	2.1
	11/18/93	10.64	150	7.8	9.0	1.0	12
	02/10/94	8.50	4,400	53	160	19	390
	05/03/94	**9.42**	**65**	**1.5**	**0.53**	**<0.5**	**0.59**
SR-1	11/18/93	10.02	<50	<0.5	<0.5	<0.5	<0.5
	11/18/93dup	10.02	<50	<0.5	<0.5	<0.5	<0.5
Trip Blank	06/04/93		<50	<0.5	<0.5	<0.5	<0.5
	08/13/93		<50	<0.5	<0.5	<0.5	<0.5
	11/18/93		<50	<0.5	<0.5	<0.5	<0.5
	02/10/94		<50	<0.5	<0.5	<0.5	<0.5
	05/03/94		**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
DTSC MCLs			NE	1.0	680	100[c]	1,750

Abbreviations:

TPH-G = Total petroleum hydrocarbons as gasoline by Modified EPA Method 8015
B = Benzene by EPA Method 8020
E = Ethylbenzene by EPA Method 8020
T = Toluene by EPA Method 8020
X = Xylenes by EPA Method 8020
--- = Not analyzed
DTSC MCLs = California Department of Toxic Substances Control maximum contaminant levels for drinking water
NE = Not established
<n = Not detected at detection limits of n ppb
dup = Duplicate sample

Notes:

a = Well paved over, inaccessible since August, 1992.
b = The concentration reported as gasoline is primarily due to the presence of a combination of gasoline and a discrete peak not indicative of gasoline.
c = The concentration reported as gasoline is primarily due to the presence of a discrete peak not indicative of gasoline.
d = DTSC recommended action level for drinking water; MCL not established

Table 3. Recommended Sampling Frequency Modifications for Ground Water Monitoring Wells Shell Service Station #WIC 204-5508-2404, 2800 Telegraph Ave, Oakland, California

Monitoring Well	Current Sampling Frequency	Recommended Sampling Frequency	Rationale for Recommended Sampling Frequency
S-1	Quarterly	Annually	Clean upgradient well, hydrocarbon concentrations below MCLs for eight of nine quarters
S-4	Quarterly	Annually	Clean crossgradient well, hydrocarbon concentrations below MCLs for eight of nine quarters
S-5	Quarterly	Biannually	Clean down and crossgradient well, hydrocarbon concentrations below MCLs for nine quarters
S-6	Quarterly	Annually	Intermediate well, stable hydrocarbon concentrations for nine quarters
S-7	Quarterly	Biannually	Intermediate well, stable hydrocarbon concentrations for nine quarters
S-8	Quarterly	Quarterly	Downgradient well, stable hydrocarbon concentrations for 10 quarters
S-9	Quarterly	Annually	Intermediate well, hydrocarbon concentrations below MCLs for nine quarters
S-10	Quarterly	Annually	Clean crossgradient well, hydrocarbon concentrations below MCLs for 10 quarters
S-11	Quarterly	Quarterly	Down and crossgradient well, stable hydrocarbon concentrations for 10 quarters

ATTACHMENT A

GROUND WATER MONITORING REPORT AND ANALYTIC REPORT

BLAINE
TECH SERVICES INC.

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

May 23, 1994

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

Attn: Lynn Walker

SITE:
Shell WIC #204-5508-2303
2800 Telegraph Avenue
Oakland, California

QUARTER:
2nd quarter of 1994

QUARTERLY GROUNDWATER SAMPLING REPORT 940503-K-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 REMOVED 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 prefrozen 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.

James Allen for:
Richard C. Blaine

RCB/lp

attachments: table of well gauging data
chain of custody
certified analytical report

cc: Weiss Associates
5500 Shellmound Street
SEmeryville, 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)
S-1	5/3/94	TOB	--	NONE	--	--	9.09	27.20
S-4	5/3/94	TOB	--	NONE	--	--	10.40	30.36
S-5	5/3/94	TOB	--	NONE	--	--	10.19	30.55
S-6	5/3/94	TOB	--	NONE	--	--	9.20	22.14
S-7	5/3/94	TOB	--	NONE	--	--	10.75	30.72
S-8 *	5/3/94	TOB	ODOR	NONE	--	--	10.06	19.15
S-9	5/3/94	TOB	--	NONE	--	--	10.03	30.00
S-10	5/3/94	TOB	--	NONE	--	--	8.16	24.24
S-11	5/3/94	TOB	--	NONE	--	--	9.42	19.12
SR-1	5/3/94	TOB	--	NONE	--	--	8.28	34.35

* Sample DUP was a duplicate sample taken from well S-8.

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: 940503-IC1

Date:
Page 1 of 2

Site Address: 2800 Telegraph Ave., Oakland
WIC#: 204-5508-2303

Shell Engineer: Lynn Walker — Phone No.: (510) 675-6169 Fax #: 675-6172
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: KCB
Printed Name: Keith Brown

LAB: Sequoia

CHECK ONE (1) BOX ONLY — C1/D1
- Quarterly Monitoring ☒ — $441
- Site Investigation ☐ — $441
- Soil Closure/Disposal ☐ — $442
- Water Closure/Disposal ☐ — $443
- Soil/Air Rem. or Sys. O & M ☐ — $442
- Water Rem. or Sys. O & M ☐ — $443
- Other ☐

TURN AROUND TIME
- 24 hours ☐
- 48 hours ☐
- 96 days ☒ (Normal)
- Other ☐ ___

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

Analysis Required: 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

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
S-1	5/3			W		3	9405278	-01
S-4				W		3		-02
S-5				W		3		-03
S-6				W		3		-04
S-7				W		3		-05
S-8				W		3		-06
S-9				W		3		-07
S-10	↓			W		3		-01

Relinquished By (Signature): — Printed Name: Keith Brown — Date: 5/4 Time: 1020
Received (Signature): — Printed Name: — Date: 5/4 Time: 1020
Relinquished By (Signature): — Printed Name: — Date: 5/4 Time: 1540
Received (Signature): — Printed Name: — Date: Time:
Relinquished By (Signature): — Printed Name: — Date: Time:
Received (Signature): — Printed Name: A. HUFANO — Date: 5/4/94 Time: 1142

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: 940503-KI

Date:

Page 2 of 2

Site Address: 2800 Telegraph Ave., Oakland

WIC#: 204-5508-2303

Shell Engineer: Lynn Walker — Phone No.: (510) 675-6169 Fax #: 675-6172

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: KCB

Printed Name: Keith C. Brown

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	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
S-11	5/3			W		3						X							9405228	-09
DUP	"			W		3						X								-10
EB	"			W		3						X								-11
TB	"			W		2						X								-12

CHECK ONE (1) BOX ONLY — GT/DT

- Quarterly Monitoring ☒ 6441
- Site Investigation ☐ 6443
- Soil Closure/Disposal ☐ 6442
- Water Closure/Disposal ☐ 6443
- Soil/Air Rem. or Sys. O & M ☐ 6442
- Water Rem. or Sys. O & M ☐ 6443
- Other ☐

TURN AROUND TIME

- 24 hours ☐
- 48 hours ☐
- 16 days ☒ (Normal)
- Other ☐

NOTE: Notify Lab as soon as possible of 24/48 hrs. TAT.

Relinquished By (signature):	Printed Name: Keith Brown	Date: 5/4 Time: 10:20	Received (signature):	Printed Name: DAN	Date: 5/4 Time: 10:20
Relinquished By (signature):	Printed Name: DAN	Date: 5/4 Time: 11:47	Received (signature):	Printed Name:	Date: Time:
Relinquished By (signature):	Printed Name:	Date: Time:	Received (signature):	Printed Name: P. HUFANO	Date: 5/4/94 Time: 1145

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

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

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

Project: 940503-K1, Shell, 2800 Telegraph Ave.

Enclosed are the results from 12 water samples received at Sequoia Analytical on May 4,1994. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
4E22801	Water, S-1	5/3/94	EPA 5030/8015 Mod./8020
4E22802	Water, S-4	5/3/94	EPA 5030/8015 Mod./8020
4E22803	Water, S-5	5/3/94	EPA 5030/8015 Mod./8020
4E22804	Water, S-6	5/3/94	EPA 5030/8015 Mod./8020
4E22805	Water, S-7	5/3/94	EPA 5030/8015 Mod./8020
4E22806	Water, S-8	5/3/94	EPA 5030/8015 Mod./8020
4E22807	Water, S-9	5/3/94	EPA 5030/8015 Mod./8020
4E22808	Water, S-10	5/3/94	EPA 5030/8015 Mod./8020
4E22809	Water, S-11	5/3/94	EPA 5030/8015 Mod./8020
4E22810	Water, DUP	5/3/94	EPA 5030/8015 Mod./8020
4E22811	Water, EB	5/3/94	EPA 5030/8015 Mod./8020
4E22812	Water, TB	5/3/94	EPA 5030/8015 Mod./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

Suzanne Chin
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Blaine Tech Services, Inc.	Client Project ID:	940503-K1, Shell, 2800 Telegraph Av	Sampled:	May 3, 1994
985 Timothy Drive	Sample Matrix:	Water	Received:	May 4, 1994
San Jose, CA 95133	Analysis Method:	EPA 5030/8015 Mod./8020	Reported:	May 13, 1994
Attention: Jim Keller	First Sample #:	4E22801		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 4E22801 S-1	Sample I.D. 4E22802 S-4	Sample I.D. 4E22803 S-5	Sample I.D. 4E22804 S-6	Sample I.D. 4E22805 S-7	Sample I.D. 4E22806 S-8
Purgeable Hydrocarbons	50	N.D.	N.D.	N.D.	4,700	130	3,100
Benzene	0.50	N.D.	N.D.	N.D.	550	N.D.	12
Toluene	0.50	N.D.	N.D.	N.D.	28	N.D.	27
Ethyl Benzene	0.50	N.D.	N.D.	N.D.	85	N.D.	130
Total Xylenes	0.50	N.D.	N.D.	N.D.	340	N.D.	370
Chromatogram Pattern:		--	--	--	C4 - C12	C8 - C12	C4 - C12

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	20	1.0	20
Date Analyzed:	5/7/94	5/7/94	5/7/94	5/7/94	5/8/94	5/7/94
Instrument Identification:	GCHP-2	GCHP-2	GCHP-2	GCHP-2	GCHP-3	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	94	97	87	100	95	107

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

SEQUOIA ANALYTICAL

Suzanne Chin
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Blaine Tech Services, Inc.	Client Project ID:	940503-K1, Shell, 2800 Telegraph Av	Sampled:	May 3, 1994
985 Timothy Drive	Sample Matrix:	Water	Received:	May 4, 1994
San Jose, CA 95133	Analysis Method:	EPA 5030/8015 Mod./8020	Reported:	May 13, 1994
Attention: Jim Keller	First Sample #:	4E22807		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 4E22807 S-9	Sample I.D. 4E22808 S-10	Sample I.D. 4E22809 S-11	Sample I.D. 4E22810 DUP	Sample I.D. 4E22811 EB	Sample I.D. 4E22812 TB
Purgeable Hydrocarbons	50	N.D.	N.D.	65	3,000	N.D.	N.D.
Benzene	0.50	N.D.	N.D.	1.5	21	N.D.	N.D.
Toluene	0.50	N.D.	N.D.	N.D.	25	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	0.53	120	N.D.	N.D.
Total Xylenes	0.50	N.D.	N.D.	0.59	340	N.D.	N.D.
Chromatogram Pattern:		--	--	C4 - C12	C4 - C12	--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	20	1.0	1.0
Date Analyzed:	5/7/94	5/7/94	5/7/94	5/6/94	5/8/94	5/6/94
Instrument Identification:	GCHP-2	GCHP-2	GCHP-2	GCHP-2	GCHP-3	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	99	97	100	108	82	88

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

SEQUOIA ANALYTICAL

Suzanne Chin
Project Manager

4E22801.BLA <2>

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

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

Client Project ID: 940503-K1, Shell, 2800 Telegraph Ave.
Matrix: Liquid

QC Sample Group: 4E22801-04, 06-10, 12

Reported: May 13, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	R. Vincent	R. Vincent	R. Vincent	R. Vincent
MS/MSD Batch#:	4E10702	4E10702	4E10702	4E10702
Date Prepared:	-	-	-	-
Date Analyzed:	5/6/94	5/6/94	5/6/94	5/6/94
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	100	100	100	103
Matrix Spike Duplicate % Recovery:	110	110	110	107
Relative % Difference:	9.5	9.5	9.5	3.8
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

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 matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL

Suzanne Chin
Project Manager

4E22801.BLA <3>

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

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

Client Project ID: 940503-K1, Shell, 2800 Telegraph Ave.
Matrix: Liquid
QC Sample Group: 4E22805, 11
Reported: May 13, 1994

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
MS/MSD Batch#:	4E22801	4E22801	4E22801	4E22801
Date Prepared:	-	-	-	-
Date Analyzed:	5/8/94	5/8/94	5/8/94	5/8/94
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	100	100	100	100
Matrix Spike Duplicate % Recovery:	94	93	92	90
Relative % Difference:	6.2	7.3	8.3	11
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

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 matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL

Suzanne Chin
Project Manager

ATTACHMENT B

SAMPLING FREQUENCY CRITERIA

SAMPLING FREQUENCY CRITERIA

Weiss Associates (WA) has developed a technical approach for determining appropriate ground water monitoring well sampling frequencies for service station monitoring programs. Ground water monitoring wells are typically sampled quarterly at service stations to monitor the concentration and extent of hydrocarbons and/or volatile organic compounds (VOCs) in ground water. This satisfies California Regional Water Quality Control Board (RWQCB) ground water monitoring guidelines which state: "Quarterly (ground water) monitoring is the maximum sampling interval typically allowed when ground water contamination is present unless other arrangements are made with Regional (Water Quality Control) Board staff"[1]. San Francisco Bay RWQCB personnel have indicated that the RWQCB will allow well sampling frequency reductions on a site specific basis if the frequency reductions are justified by site conditions. Presented below are generalized criteria we have developed for determining the appropriate well sampling frequencies based on specific site conditions.

CRITERIA FOR REDUCING SAMPLING FREQUENCY

Sampling frequency modifications may be modified either uniformly across a site, based on how site-specific data satisfies our site criteria, or by each individual well, based on how data from each well satisfies our well criteria. The criteria are presented below.

---

[1] North Coast, San Francisco Bay, Central Valley Regional Water Quality Control Boards, June 2, 1988 (revised May 18, 1989), "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks; pg. 12

Site Criteria

The following technical site criteria are assessed to determine if site-wide sampling frequency modifications are appropriate:

- Reliability of previous ground water analytic data from all site wells;
- Spatial definition of the contaminant plume and the extent to which natural or engineered processes have controlled contaminant migration; and
- The magnitude of contaminant concentrations in ground water from all the site wells.

Each of these factors is discussed below.

Reliability of Ground Water Analytic Data

The reproducibility of ground water analytic data is highly sensitive to geologic conditions, ground water elevations, field sampling procedures and laboratory analytic procedures. Of these controlling factors, ground water fluctuations usually have the greatest impact on data reproducibility. Since ground water elevations at most sites fluctuate during the course of a year, ground water should be monitored for at least one year to assess the impact of ground water fluctuations on data reproducibility. RWQCB guidelines also stipulate sampling all monitoring wells at least quarterly for one year when hydrocarbons are detected in the well. Therefore, WA recommends reducing the sampling frequency only for wells which:

- Have been sampled at least four times over a period of one year, and
- Have consistent historical analytic results allowing a reliable assessment of the representative hydrocarbon concentrations in the ground water.

If the variability of the analytic data prevents a reliable assessment of concentrations, then we recommend sampling the well(s) quarterly until a reliable assessment can be made.

Plume Definition and Migration Control

The extent of contaminants in the subsurface must be assessed and migration control of these contaminants must be attained before site-wide sampling frequency modifications can be justified. A number of natural and engineered phenomena may control the migration of contaminants in the subsurface:

- Soils with low permeabilities;
- Natural or enhanced contaminant biodegradation; and
- Remedial measures such as ground water extraction and subsurface containment walls.

If the plume is sufficiently assessed and controlled, we recommend annual sampling for all site wells, preferably in the winter or spring months when water levels are typically high and therefore dissolved contaminant concentrations may be at their maximum.

Overall Dissolved Contaminant Concentrations

If dissolved contaminant concentrations for all site wells have consistently been near or below California Department of Toxic Substances Control (DTSC) maximum contaminant levels (MCLs) for drinking water, then there probably is no significant risk to ground water quality. Therefore, we recommend annual sampling in the winter or spring for all site wells until any detectable contaminants biodegrade to concentrations acceptable for regulatory case closure.

Well Criteria

The generalized criteria we have developed for determining the sampling frequency for a given well include:

- The reliability of the ground water analytic data;
- The trend of the dissolved contaminant concentrations in samples from the well; and
- The location of the well in relation to the contaminant source.

These criteria are discussed below, expect for the reliability of the ground water analytic data, which was discussed previously.

Concentration Trends

Sampling frequency should be reduced only for wells showing stable or decreasing concentration trends. Wells showing increasing concentration trends should be sampled quarterly to monitor the trends and determine whether the hydrocarbon concentration in a particular well is approaching a threshold, such as the saturation concentration, DTSC MCL or the recommended action level.

Well Location

For most sites, four to ten ground water monitoring wells are typically required to fully define the extent of contaminants in ground water. These wells generally fall into one of four classifications relative to the contaminant source:

1) Clean upgradient and crossgradient wells;

2) Source-area wells with high contaminant concentrations;

3) Intermediate wells with low to high contaminant concentrations located between the source area wells and clean crossgradient and downgradient wells, and

4) Clean downgradient wells.

WA's recommended sampling frequency for each of these classifications is as follows:

1) If no hydrocarbons are detected in the upgradient and crossgradient wells, and if no offsite sources are suspected upgradient or crossgradient of the site, WA recommends sampling these wells annually.

2) Source area wells are used to monitor concentrations from source area releases and determine the effectiveness of natural biodegradation and/or site remediation. To ensure that increasing source area concentration trends are detected, WA recommends sampling these wells semiannually.

3) Intermediate wells are used to track dissolved hydrocarbon concentrations and the rates of natural biodegradation or the effectiveness of site remediation. However, because the number of intermediate wells and their proximity to other wells may determine the usefulness of data from these wells, WA will recommend sampling frequencies for these wells on a case by case basis.

4) Since clean downgradient wells define the "leading edge" of dissolved hydrocarbons in ground water and are used to determine hydrocarbon breakthrough, WA recommends sampling these wells quarterly. If a downgradient well is not clean, we will assess the appropriate sampling frequency on a case by case basis.

Other Considerations

Several other factors may influence our sampling frequency recommendations:

- Wells located near each other often produce redundant data and therefore we may recommend staggering samplings among these wells or ceasing sampling from some wells altogether.

- Large fluctuations in ground water depths or an inconsistent ground water flow gradient or direction may not allow us to confidently predict contaminant concentration trends. Therefore, quarterly sampling may be necessary.

- Upgradient and/or crossgradient wells may contain detectable contaminant concentrations. These wells should be sampled semiannually to assess if an offsite source is contributing contaminants to the site.

A decision flow chart graphically presenting the recommended sampling frequency based on these criteria is included. Although there may be wells that do not fall into the location and concentration classifications listed in the flow chart, the generalized criteria may be used to evaluate the appropriate sampling frequency on a case by case basis.

SUMMARY

In summary, WA recommends site-wide sampling modifications for sites with reliable ground water analytic data from all ground water monitoring wells and that have:

- Fully defined plumes and contaminant migration control; or
- Contaminant concentrations near or below DTSC MCLs in all site wells.

Sampling frequency modifications are appropriate for an individual site well if:

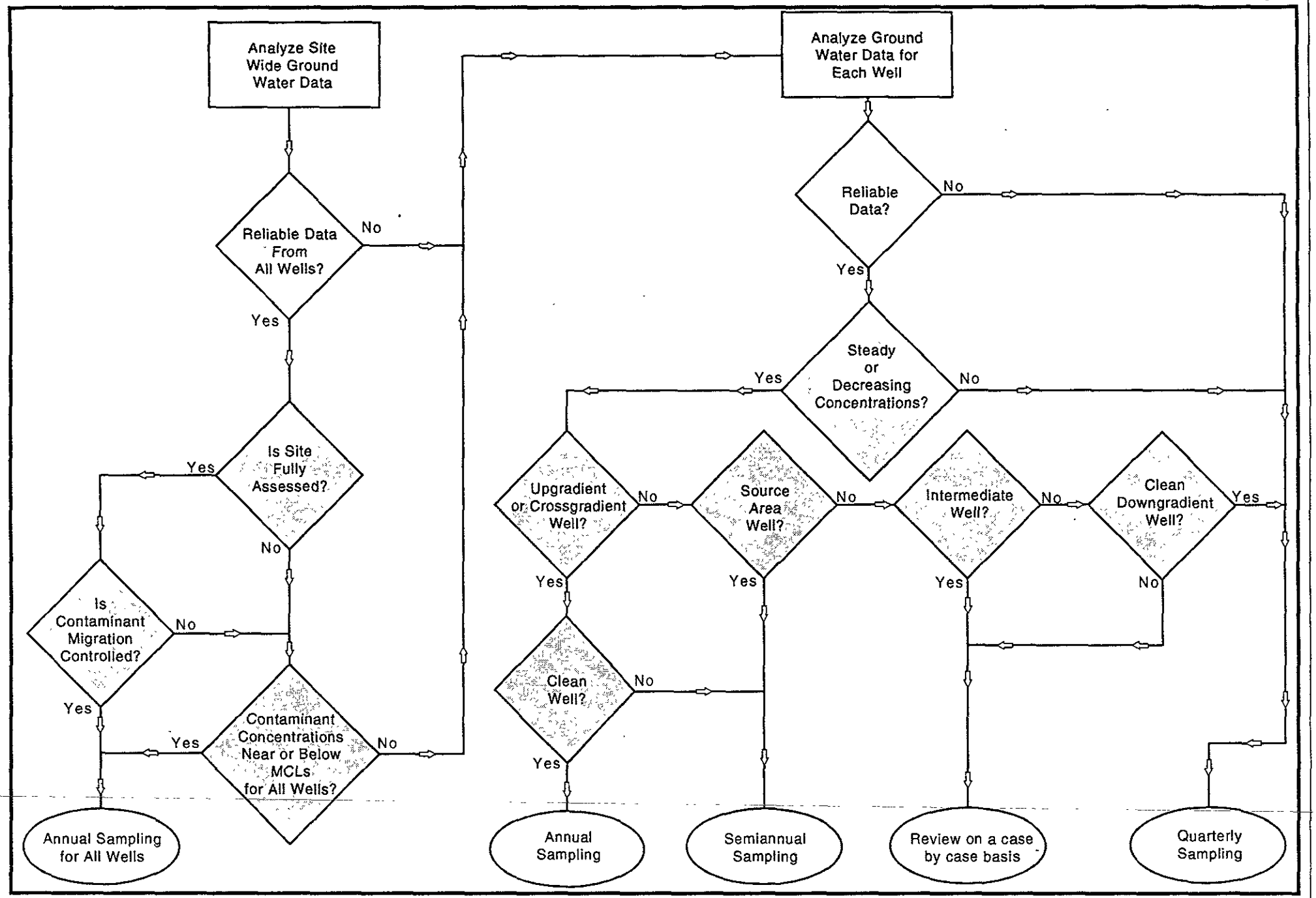
- Ground water analytic data from the well is reliable;

- Data from the well shows that contaminant concentrations in ground water from the well are stable and decreasing.

The sampling frequency for individual wells should be modified based on the well location relative to the contaminant source, as follows:

- Annually for clean upgradient and crossgradient wells,

- Semiannually for upgradient and crossgradient wells containing hydrocarbons or other contaminants from an offsite, upgradient source,
- Semiannually for high concentration source-area wells,
- On a case by case basis for intermediate wells, and
- Quarterly for clean downgradient wells.



Ground Water Sampling Frequency Determination Chart