

February 8, 1994

12-012

Mr. Dan Kirk  
Shell Oil Company  
P. O. Box 5278  
Concord, California 94520

Re: Shell Service Station, 3790 Hopyard Road, Pleasanton, California  
WIC# 204-6138-0501

Dear Mr. Kirk,

Hydro-Environmental Technologies, Inc. (HETI) is pleased to present a copy of this report concerning the fourth 1993 quarterly ground water sampling event at the referenced location (Figure 1). Information presented in this report is based on the results of laboratory analysis of ground water samples collected by the Shell sampling contractor, Blaine Tech Services, Inc. (Blaine), on December 9, 1993. A copy of this report has been forwarded to the Pleasanton Fire Department and to the Regional Board.

#### Site Description

Project history and background information has been presented in investigative reports prepared during the site characterization phase of this project. There are currently twelve ground water monitoring wells present on-site (Figure 2).

#### Results of the Fourth Quarter, 1993 Ground Water Sampling

##### Ground Water Gradient:

The depth to ground water in all monitoring wells was measured by Blaine, on December 9, 1993. These measurements were combined with previously established well head elevations to yield a ground water contour map (Figure 3). Water table elevations are recorded in Table 1.

As shown on Figure 3, the ground water is predominantly moving towards the southeast at a gradient of approximately 1.2%.

##### Ground Water Analytical Data:

Analytical results indicate that no concentrations of petroleum hydrocarbons exceeding method detection limits were detected in monitoring wells S-2 or S-9. Blaine sampling and analytical data is presented as an attachment to this report. Current and historical analytical results are presented in Table 1.

All information and interpretation in this report is presented in accordance with currently accepted professional practices. This report has been prepared for the sole use of Shell Oil Company. Any reliance on the information presented herein by third parties will be at such parties' sole risk. HETI is pleased to be of continued service to Shell. If you have any questions or comments regarding this report, please do not hesitate to call.

Very truly yours,  
HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC

John H. Turney, P.E.  
Registered Engineer

cc. Inspector Ted Klenk, Pleasanton Fire Department  
Mr. Rich Hiatt, SF Bay RWQCB.



**Table 1**

**GROUND WATER ELEVATIONS**

Shell Service Station  
3790 Hopyard Road  
Pleasanton, California  
WIC#204-8064-0604

<b>Well Number</b>	<b>Gauging Date</b>	<b>TOB (feet)</b>	<b>DTW (feet)</b>	<b>GWE (feet)</b>
S-2	12/9/93	329.21	14.70	314.51
S-3	12/9/93	327.67	NM	NM
S-4	12/9/93	328.53	14.16	314.37
S-5	12/9/93	329.66	16.26	313.40
S-6	12/9/93	327.62	14.68	312.94
S-7	12/9/93	328.67	NM	NM
S-8	12/9/93	327.00	NM	NM
S-9	12/9/93	328.24	16.89	311.35
S-10	12/9/93	326.55	NM	NM
SR-1	12/9/93	329.78	16.19	313.59
SR-2	12/9/93	328.35	14.34	314.01
SR-3	12/9/93	329.11	14.62	314.49

**Notes :**

TOB : Top of well box referenced to mean sea level  
DTW : Depth to water  
GWE : Ground water elevation. Ground water elevation data available for certain dates only.  
NM : Not measured

Table 2

## GROUND WATER SAMPLE ANALYTICAL RESULTS

Shell Service Station  
 3790 Hopyard Road  
 Pleasanton, California  
 WIC#204-6138-0501

Well Number	Sampling Date	TPHg (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)
S-1	11/6/87	920	230	<5.0	150	150
	2/14/88	3,500	1,300	<40	500	500
	8/8/88	Well destroyed				
S-2	11/6/87	18,000	870	100	2,700	2,700
	2/14/88	1,800	440	<10	140	140
	10/13/88	550	110	1.0	45	15
	1/31/89	250	170	2.0	62	14
	3/7/89	1,900	260	270	130	260
	6/26/89	320	88	1.0	32	10
	9/8/89	230	80	1.0	30	15
	12/14/89	160	56	0.5	21	3.0
	3/5/90	710	57	<0.5	<0.5	88
	6/14/90	110	39	0.5	11	2.0
	10/2/90	290	84	1.7	160	8.1
	12/18/90	61	18	1.4	2.2	2.4
	3/20/91	110	30	2.2	10	7.0
	6/26/91	50*	6.3	<0.5	3.3	1.9
	9/5/91	90	12	3.2	2.5	2.3
	12/13/91	<50	12	<0.5	<0.5	<0.5
	3/11/92	<30	<0.3	<0.3	<0.3	<0.3
	6/15/92	<50	0.9	<0.5	<0.5	<0.5
	9/17/92	78	2.6	<0.5	1.3	0.9
	12/11/92	<50	0.8	<0.5	<0.5	<0.5
2/4/93	55	1.3	<0.5	0.7	<0.5	
6/3/93	<50	0.7	<0.5	<0.5	<0.5	
9/15/93	<50	<0.5	<0.5	<0.5	<0.5	
12/9/93	<50	<0.5	<0.5	<0.5	<0.5	
S-3	2/14/88	<50	<0.5	<1.0	<4.0	<4.0
	10/13/88	<50	<0.5	<1.0	<1.0	<3.0
	1/31/89	<50	<0.5	<1.0	<1.0	<3.0
	3/7/89	<50	<0.5	<1.0	<1.0	<3.0
	6/26/89	<50	<0.5	<1.0	<1.0	<3.0
	9/8/89	<50	<0.5	<1.0	<1.0	<3.0
	12/14/89	<50	<0.5	<0.5	<0.5	<1.0
	3/5/90	<50	<0.5	<0.5	<0.5	<1.0
6/14/90	<500	<0.5	<0.5	<0.5	<1.0	
10/2/90	<50	<0.5	<0.5	<0.5	1	

Table 2

GROUND WATER SAMPLE ANALYTICAL RESULTS

Shell Service Station  
 3790 Hopyard Road  
 Pleasanton, California  
 WIC#204-6138-0501

Well Number	Sampling Date	TPHg (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)
S-3	12/18/90	<50	<0.5	1.5	<0.5	2.0
	3/20/91	70	2.3	8.9	4.0	23
	6/26/91	<50	<0.5	<0.5	<0.5	<0.5
	9/5/91	<50	<0.5	<0.5	<0.5	<0.5
	12/13/91	<50	<0.5	<0.5	<0.5	<0.5
	3/11/92	<30	<0.5	<0.5	<0.5	<0.5
	6/15/92	<50	<0.5	<0.5	<0.5	<0.5
	9/17/92	<50	<0.5	<0.5	<0.5	<0.5
	12/11/92	<50	<0.5	<0.5	<0.5	<0.5
	2/4/93	<50	<0.5	<0.5	<0.5	<0.5
	6/3/93	<50	<0.5	<0.5	<0.5	<0.5
	9/15/93	NA	NA	NA	NA	NA
	12/9/93	NA	NA	NA	NA	NA
	S-4	2/14/88	5,100	160	8.0	730
10/13/88		530	24	1.0	25	16
1/31/89		1,100	33	2.0	20	24
3/7/89		650	37	1.0	35	27
6/26/89		670	110	<1.0	85	71
9/8/89		380	32	<1.0	36	26
12/14/89		210	21	<0.5	30	23
3/5/90		350	43	<0.6	24	47
6/14/90		430	74	<0.5	71	46
10/2/90		700	74	2.2	100	55
12/18/90		1400	180	2.9	280	230
3/20/91		1200	100	<2.0	210	130
6/26/91		220	14	<0.5	34	17
9/5/91		580	31	0.8	53	26
12/13/91		370	24	0.9	1.3	46
3/11/92		1,600	23	1.2	12	20
6/16/92		480	48	<1.0	95	22
9/17/92		260	35	1.2	51	7.8
12/11/92		270	34	0.8	28	4.5
2/5/93		1,100	12	<5.0	89	100
6/3/93	210	48	1.1	42	4.0	
9/15/93	700	21	<1.0	110	91	
12/9/93	250	39	<0.5	3.8	2.6	

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Well Number	Sampling Date	TPHg (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)
S-5	2/14/88	1,000	40	86	180	180
	10/13/88	560	66	20	18	36
	1/31/89	180	27	8.0	9.0	13
	3/7/89	3,800	520	530	260	570
	6/26/89	<50	3.8	<1.0	2.0	<3.0
	9/8/89	110	25	2.0	2.0	12
	12/14/89	1,700	300	86	67	140
	3/5/90	1,100	100	110	79	240
	6/14/90	600	94	36	40	52
	10/2/90	4,500	1,400	160	260	300
	11/20/90	16,000	4,800	720	790	1,000
	12/18/90	25,000	7,800	1,100	1,300	2,300
	3/20/91	310	39	12	18	30
	6/26/91	1,300	250	62	120	180
	9/5/91	4,700	660	150	170	280
	12/13/91	1,400	580	19	110	80
	3/11/92	<30	<0.3	<0.3	<0.3	<0.3
	6/16/92	1,800	380	52	120	180
	9/17/92	2,200	750	91	170	170
	12/11/92	8,700	1,600	66	48	340
2/4/93	150	156	0.7	4.7	4.0	
6/3/93	480	140	3.4	17	14	
9/15/93	80	2.4	0.5	1.4	2.9	
12/9/93	120	0.56	<0.5	2.2	1.2	
S-6	10/13/88	1,100	13	1.0	42	33
	1/31/89	340	3.8	<1.0	8.0	3.0
	3/7/89	190	3.8	<1.0	7.0	3.0
	6/26/89	480	15	<1.0	5.0	<3.0
	9/8/89	270	1.3	1.0	7.0	<3.0
	12/15/89	320	1.0	<0.5	2.6	<1.0
	3/5/90	420	3.1	<0.5	14	<1.0
	6/14/90	370	3.7	0.9	4.8	3.0
	10/2/90	190	6.6	1.6	1.9	2.8
	12/18/90	430	10	0.7	1.6	1.5
3/20/91	130*	6.6	0.6	0.7	3.0	
6/26/91	120*	3.8	0.8	<0.5	1.7	

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Well Number	Sampling Date	TPHg (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)
S-6	9/5/91	60	<0.5	0.8	<0.5	0.5
	12/13/91	150	2.3	<0.5	<0.5	150
	3/11/92	<30	<0.3	<0.3	<0.3	<0.3
	6/15/92	170	<0.5	<0.5	<0.5	<0.5
	9/17/92	190	<0.5	1.6	<0.5	1.2
	12/11/92	180	<0.5	0.8	<0.5	0.7
	2/5/93	290	<0.5	<0.5	<0.5	0.7
	6/3/93	100	1.2	<0.5	<0.5	<0.5
	9/15/93	160	1.4	<0.5	0.9	2.0
	12/9/93	130	2.3	2.6	5.1	6.2
	<del>S-7</del>	10/13/88	<50	0.6	1.0	<1.0
1/31/89		<50	<0.5	<1.0	<1.0	<3.0
3/7/89		<50	<0.5	<1.0	<1.0	<3.0
6/26/89		<50	<0.5	<1.0	<1.0	<3.0
9/8/89		<50	<0.5	<1.0	<1.0	<3.0
12/15/89		<50	<0.5	<0.5	<0.5	<1.0
3/5/90		<50	<0.5	<0.5	<0.5	<1.0
6/14/90		<50	<0.5	<0.5	<0.5	<1.0
10/2/90		<50	<0.5	0.6	<0.5	0.9
12/18/90		<50	0.5	<0.5	<0.5	0.8
3/20/91		<50	<0.5	<0.5	<0.5	<0.5
6/26/91		<50	<0.5	<0.5	<0.5	<0.5
9/5/91		<50	<0.5	0.6	<0.5	<0.5
12/13/91		<50	<0.6	<0.5	<0.5	<0.5
3/11/92		<30	<0.3	<0.3	<0.3	<0.3
6/15/92		<50	<0.5	<0.5	<0.5	<0.5
9/17/92		<50	0.6	0.6	<0.5	<0.5
12/11/92		<50	<0.5	<0.5	<0.5	<0.5
2/5/93		<50	<0.5	<0.5	<0.5	<0.5
6/3/93		<50	<0.5	<0.5	<0.5	<0.5
9/15/93	NA	NA	NA	NA	NA	
12/9/93	NA	NA	NA	NA	NA	
S-8	3/7/89	<50	1.2	1.0	<1.0	<3.0
	6/26/89	<50	0.8	1.0	<1.0	<3.0
	9/8/89	<50	<0.5	<1.0	<1.0	<3.0

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Well Number	Sampling Date	TPHg (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)
S-8	12/14/89	<50	<0.5	<0.5	<0.5	<1.0
	3/5/90	<50	<0.5	0.5	<0.5	<1.0
	6/14/90	<50	<0.5	<0.5	<0.5	<1.0
	10/2/90	<50	<0.5	<0.5	<0.5	<0.5
	12/18/90	<50	2.9	0.7	1.0	6.4
	3/20/91	<50*	0.8	1.8	2.6	5.2
	6/26/91	<50	<0.5	<0.5	<0.5	<0.5
	9/5/91	<50	<0.5	<0.5	<0.5	<0.5
	12/13/91	<50	<0.5	<0.5	<0.5	<0.5
	3/11/92	<30	<0.3	<0.3	<0.3	<0.3
	6/15/92	<50	1.4	1.9	<0.5	<0.5
	9/17/92	<50	<0.5	<0.5	<0.5	<0.5
	12/11/92	<50	<0.5	<0.5	<0.5	<0.5
	2/4/93	<50	<0.5	<0.5	<0.5	<0.5
	6/3/93	<50	<0.5	<0.5	<0.5	<0.5
	9/15/93	NA	NA	NA	NA	NA
	12/9/93	NA	NA	NA	NA	NA
S-9	3/7/89	<50	<0.5	<1.0	<1.0	<3.0
	6/26/89	<50	<0.5	<1.0	<1.0	<3.0
	9/8/89	<50	1.7	2.0	<1.0	<3.0
	12/14/89	<50	0.5	<0.5	<0.5	<1.0
	3/5/90	<50	<0.5	<0.5	<0.5	<1.0
	6/14/90	<50	<0.5	<0.5	<0.5	<1.0
	10/2/90	<50	<0.5	<0.5	<0.5	<0.5
	12/18/90	<50	20	27	7.1	35
	3/20/91	70*	0.7	0.7	<0.5	1.0
	6/26/91	<50	<0.5	<0.5	<0.5	<0.5
	9/5/91	<50	<0.5	0.8	<0.5	<0.5
	12/13/91	<50	<0.5	<0.5	<0.5	<0.5
	3/11/92	<30	<0.3	<0.3	<0.3	<0.3
	6/15/92	<50	<0.5	<0.5	<0.5	<0.5
	9/17/92	<50	<0.5	<0.5	<0.5	<0.5
	12/11/92	<50	<0.5	<0.5	<0.5	<0.5
	2/4/93	<50	<0.5	<0.5	<0.5	<0.5
6/3/93	<50	<0.5	<0.5	<0.5	<0.5	
9/15/93	NA	NA	NA	NA	NA	
12/9/93	<50	<0.5	<0.5	<0.5	<0.5	



Table 2

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Well Number	Sampling Date	TPHg (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)
S-10	8/11/89	<50	<0.5	<1.0	<1.0	<3.0
	9/8/89	<50	<0.5	<1.0	<1.0	<3.0
	12/14/89	<50	<0.5	<0.5	<0.5	<1.0
	3/5/90	<50	<0.5	<0.5	<0.5	<1.0
	6/14/90	<50	<0.5	<0.5	<0.5	<1.0
	10/2/90	<50	<0.5	<0.5	<0.5	1.0
	12/18/90	<50	<0.5	<0.5	<0.5	1.4
	3/20/91	<50	<0.5	<0.5	<0.5	<0.5
	6/26/91	50	1.8	5.8	1.9	13
	9/5/91	<50	<0.5	<0.5	<0.5	<0.5
	12/13/91	<50	<0.5	<0.5	<0.5	<0.5
	3/11/92	<30	<0.3	<0.3	<0.3	<0.3
	6/15/92	<50	<0.5	<0.5	<0.5	<0.5
	9/17/92	<50	<0.5	<0.5	<0.5	<0.5
	12/11/92	<50	<0.5	<0.5	<0.5	<0.5
	2/4/93	<50	<0.5	<0.5	<0.5	<0.5
	6/3/93	<50	<0.5	<0.5	<0.5	<0.5
9/15/93	NA	NA	NA	NA	NA	
12/9/93	NA	NA	NA	NA	NA	
SR-1	10/11/89	200	100	<1.0	10	10
	12/14/89	500	210	<0.5	18	16
	3/5/90	64	20	<0.5	1.5	4.0
	6/14/90	60	17	<0.5	1.9	1.0
	10/2/90	<50	5.0	<0.5	<0.5	<0.5
	12/18/90	<50	28	5.5	4.5	4.5
	3/20/91	<50*	4.2	<0.5	1.4	0.5
	6/26/91	<50	5.0	<0.5	0.5	<0.5
	9/5/91	<50	8.6	<0.5	0.7	<0.5
	12/13/91	70	8.4	7.1	6.6	22
	3/11/92	<30	<0.3	<0.3	<0.3	<0.3
	6/15/92	<50	<0.5	<0.5	<0.5	<0.5
9/17/92	61	1.4	<0.5	<0.5	<0.5	
SR-2	10/11/89	880	<10	1.0	28	33
	12/14/89	1,100	17	<0.5	100	67
	3/5/90	140	3	<0.5	12	7.0
	6/14/90	<50	<0.5	<0.5	2.6	<1.0
	10/2/90	<50	<0.5	<0.5	0.5	<0.5

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Well Number	Sampling Date	TPHg (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)
SR-2	12/18/90	<50	1.6	1.4	1.6	2.7
	3/20/91	90	1.3	<0.5	6.1	1.4
	6/26/91	<50	0.8	<0.5	1.7	<0.5
	9/5/91	<50	1.2	<0.5	1.2	<0.5
	12/13/91	<50	<0.5	<0.5	<0.5	<0.5
	3/11/92	<30	0.5	<0.3	<0.3	<0.3
	6/15/92	120	8.0	1.0	0.7	2.1
	9/17/92	140	8.3	0.6	0.9	0.7
SR-3	10/11/89	500	92	10	43	100
	12/14/89	2,400	310	27	170	340
	3/5/90	70	15	0.8	6.8	10
	6/14/90	470	59	2.3	35	50
	10/2/90	1,700	91	6.2	7.0	100
	12/18/90	140	10	0.8	7.5	14
	3/20/91	1,350	970	3.6	84	79
	6/26/91	240	48	4.2	15	20
	9/5/91	160	19	<0.5	8	5.9
	12/13/91	50	13	<0.5	3.1	4.7
	3/11/92	410	28	1.6	22	24
	6/15/92	600	55	2.1	2.8	33
	9/17/92	210	25	1.8	17	20

Notes :

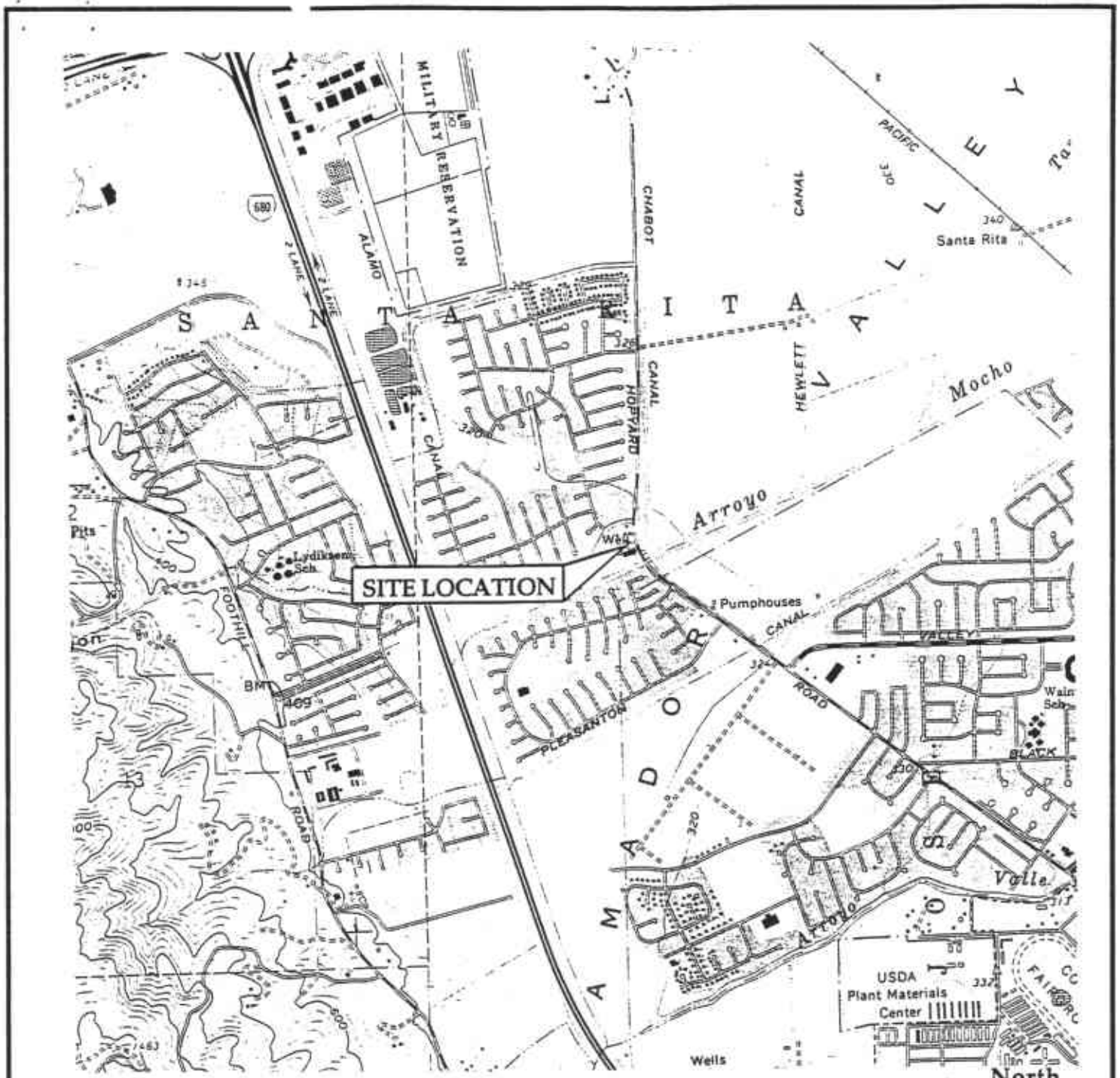
TPHg : Total petroleum hydrocarbons as gasoline by EPA Method 8015 (modified)

BTEX : Benzene, toluene, ethylbenzene and total xylenes by EPA Method 8020

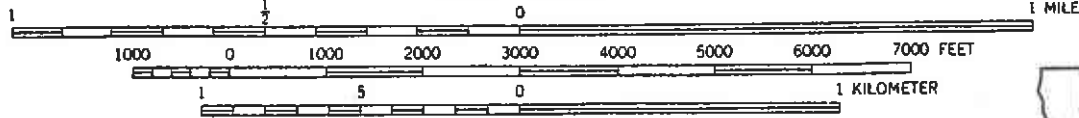
NA : Not analyzed

NS : Not Sampled

\* Compounds detected within the chromatographic range of gasoline but not characteristic of the standard gasoline pattern.



SCALE 1:24,000



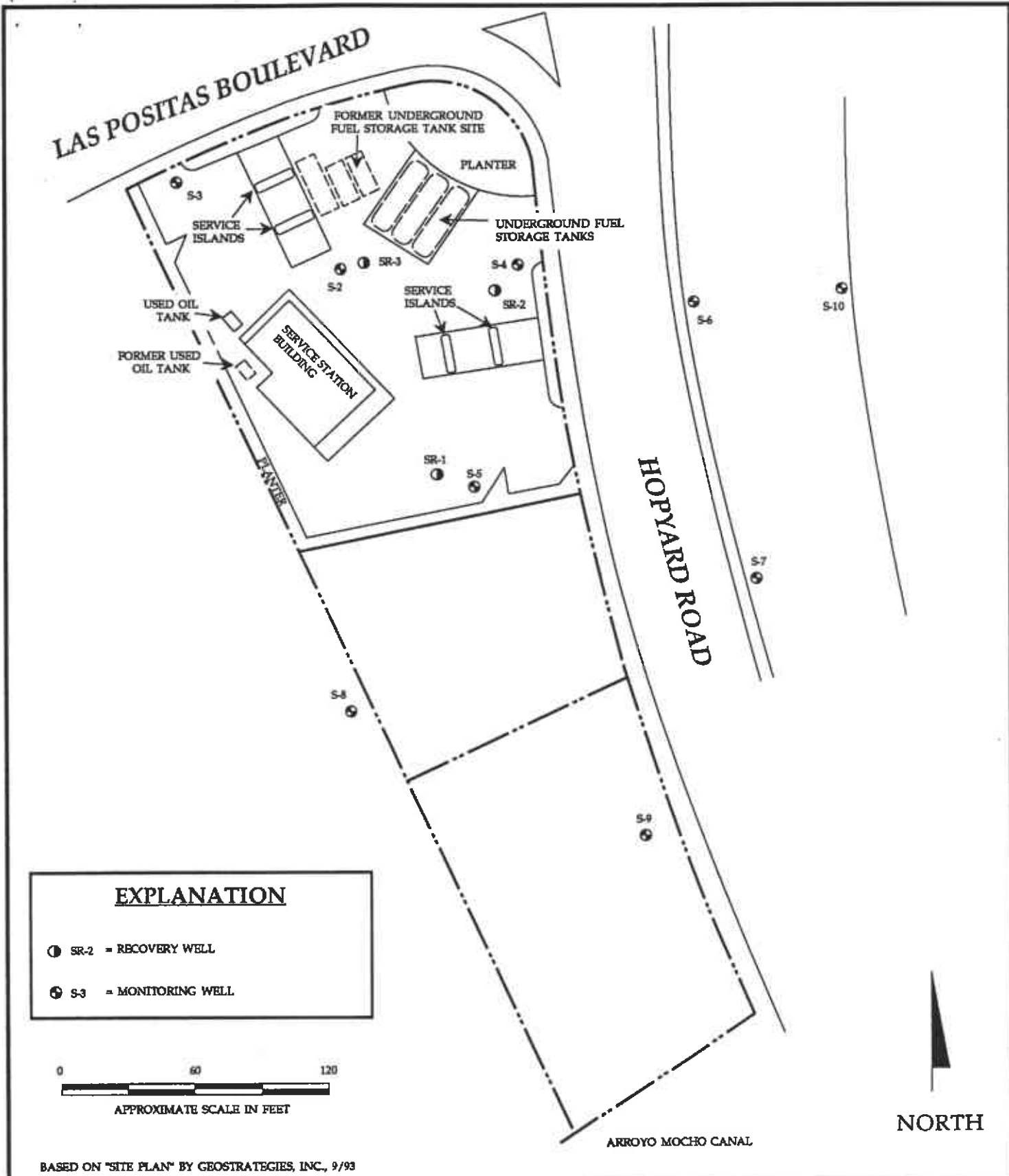
QUADRANGLE LOCATION

SOURCE:  
 U. S. GEOLOGICAL SURVEY 7.5 MINUTE TOPOGRAPHIC MAP  
 TITLED "DUBLIN, CALIFORNIA"  
 PHOTOREVISED 1980

**HYDR -  
 ENVIR NMENTAL  
 TECHN OLOGIES, INC.**

**SITE LOCATION MAP**  
 Shell Service Station  
 5251 Hopyard Road  
 Pleasanton, California  
 WIC #204-6138-0907

Figure  
**1**  
 12-012 1/94



**EXPLANATION**

● SR-2 = RECOVERY WELL

⊙ S-3 = MONITORING WELL

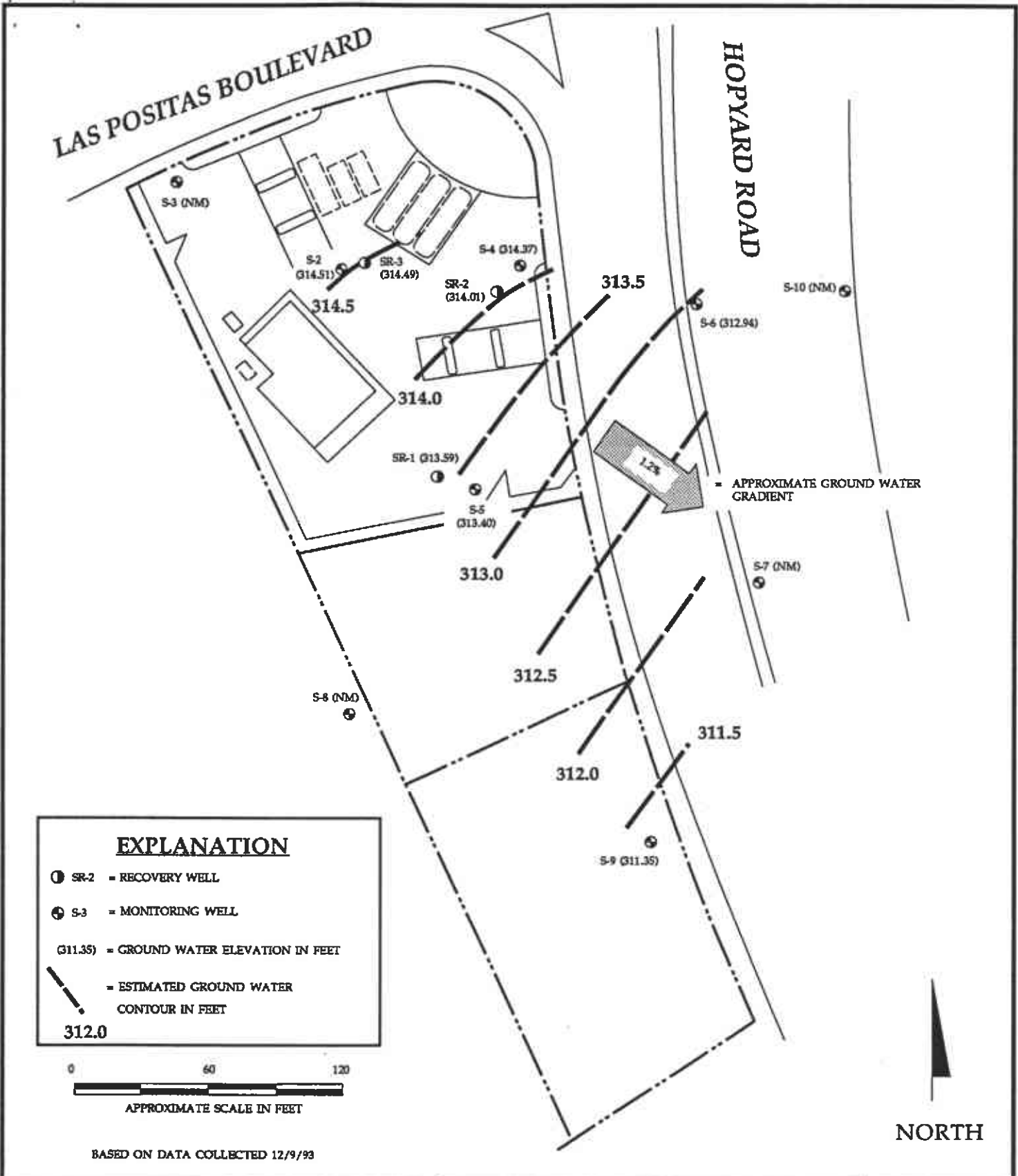
0 60 120  
 APPROXIMATE SCALE IN FEET

BASED ON "SITE PLAN" BY GEOSTRATEGIES, INC., 9/93

**HYDR** -  
**ENVIR** -  
**TECHN** -  
**LOGIES, INC.**

**SITE PLAN**  
 Shell Service Station  
 WIC# 204-6138-0501  
 3790 Hopyard Road  
 Pleasanton, California

Figure  
 2  
 12-012 1/94

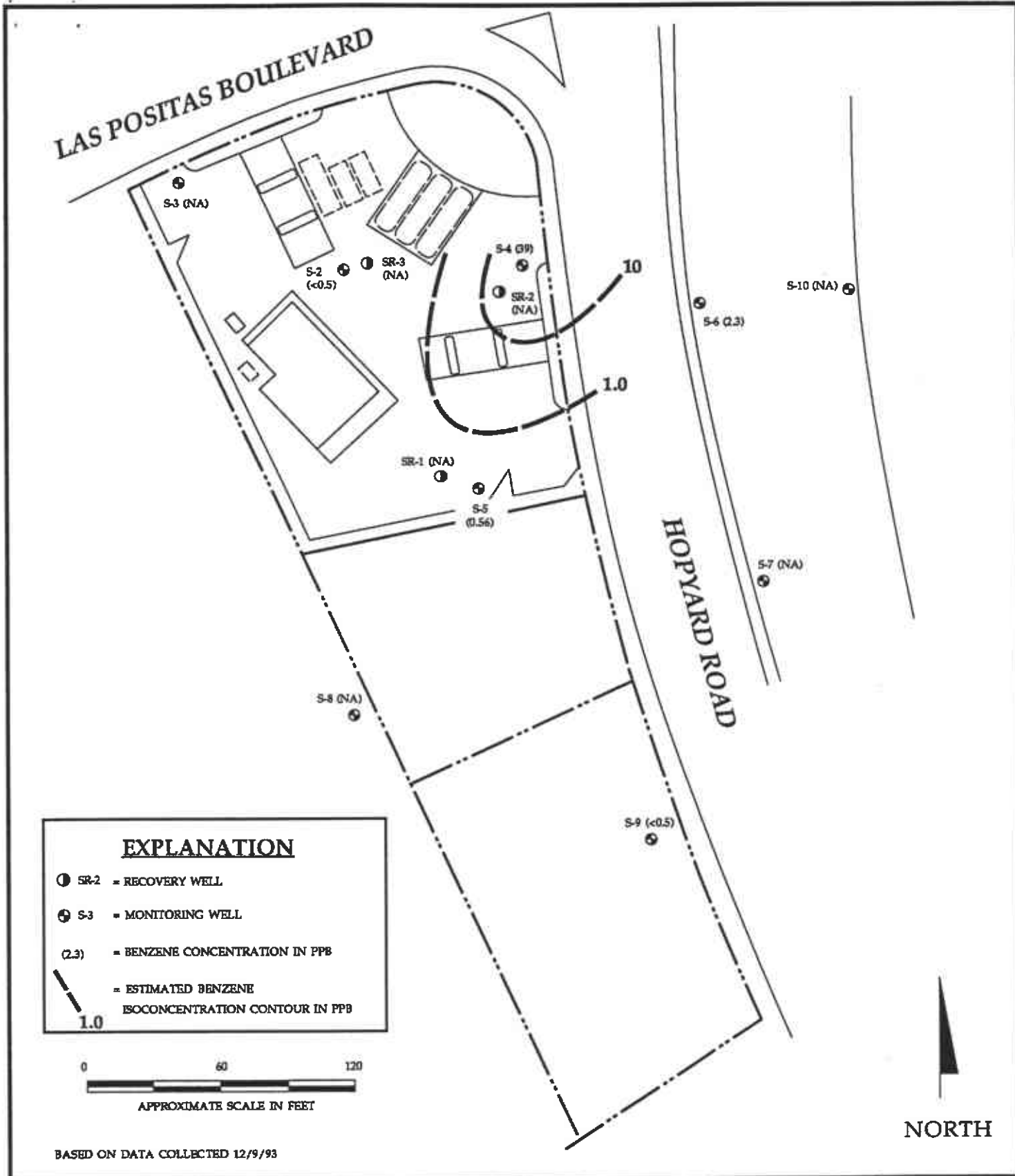


**HYDR** -  
**ENVIR** **NMENTAL**  
**TECHN** **LOGIES, INC.**

**GROUND WATER  
CONTOUR MAP**  
Shell Service Station  
WIC# 204-6138-0501  
3790 Hopyard Road  
Pleasanton, California

Figure  
**3**

12-012 1/94



**EXPLANATION**

- SR-2 = RECOVERY WELL
- ⊕ S-3 = MONITORING WELL
- (2.3) = BENZENE CONCENTRATION IN PPB
- = ESTIMATED BENZENE ISOCONCENTRATION CONTOUR IN PPB



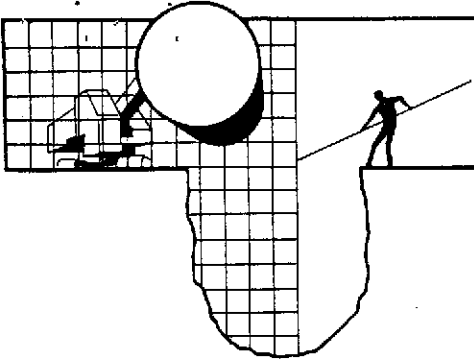
BASED ON DATA COLLECTED 12/9/93



**HYDR** -  
**ENVIR** -  
**TECHN** -  
**LOGIES, INC.**

**BENZENE**  
**ISOCONCENTRATION MAP**  
 Shell Service Station  
 WIC# 204-6138-0501  
 3790 Hopyard Road  
 Pleasanton, California

Figure  
**4**  
 12-012 1/94



# BLAINE TECH SERVICES INC.

985 TIMOTHY DRIVE  
SAN JOSE, CA 95130  
(408) 995-5535  
FAX (408) 293-8775

RECEIVED JAN 10 1994

December 31, 1993

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

Attn: Daniel T. Kirk

SITE:  
Shell WIC #204-6138-0501  
3790 Hopyard Road  
Pleasanton, California

QUARTER:  
4th quarter of 1993

## QUARTERLY GROUNDWATER SAMPLING REPORT 931209-K-1

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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

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### 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 dewateres 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 Anametrix, Inc. in San Jose, California. Anametrix, Inc. is a California Department of Health Services certified Hazardous Materials Testing Laboratory and is listed as DOHS HMTL #1234.

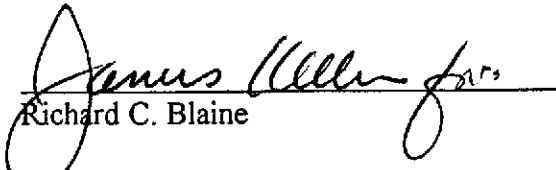
## Objective Information Collection

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/mla

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

cc: Hydro Environmental Technologies, Inc.  
2363 Mariner Square Drive, Suite 243  
Alameda, CA 94501  
ATTN: Markus Niebanck

## 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-2	12/9/93	TOB	ODOR	NONE	--	--	14.70	35.01
S-4 *	12/9/93	TOB	ODOR	NONE	--	--	14.16	35.94
S-5	12/9/93	TOB	ODOR	NONE	--	--	16.26	35.92
S-6	12/9/93	TOB	ODOR	NONE	--	--	14.68	34.64
S-9	12/9/93	TOB	ODOR	NONE	--	--	16.89	34.72
SR-1	12/9/93	TOB	--	NONE	--	--	16.19	35.00
SR-2	12/9/93	TOB	--	NONE	--	--	14.34	35.15
SR-3	12/9/93	TOB	--	NONE	--	--	14.62	39.94

\* Sample DUP was a duplicate sample taken from well S-4.



# WELL MONITORING DATA SHEET

Project #: <u>931209-K1</u>	Client: <u>Shell</u>
Sampler: <u>KCB</u>	Date Sampled: <u>12/9</u>
Well I.D.: <u>S-2</u>	Well Diameter: (circle one) 2 <u>(3)</u> 4 6
Total Well Depth: Before <u>3501</u> After	Depth to Water: Before <u>1420</u> After
Depth to Free Product: _____	Thickness of Free Product (feet): _____
Measurements referenced to:	PVC <input type="checkbox"/> <u>Grade</u> <input checked="" type="checkbox"/> Other -- <input type="checkbox"/>

Volume Conversion Factor (VCF):  

$$VCF = \frac{(d^2/4) \times \pi \times h}{231}$$
 where:  
 d = diameter (in.)  
 h = height (in.)  
 231 = gal/cu ft

Well Dia.	VCF
2"	0.24
3"	0.37
4"	0.68
6"	1.47
8"	2.04
12"	1.17

<u>7.5</u>	x	<u>3</u>	=	<u>22.5</u>
1 Case Volume		Specified Volumes		gallons

Purging: Bailer   
 Middleburg   
 Electric Submersible   
 Suction Pump   
 Type of Installed Pump \_\_\_\_\_

Sampling: Bailer   
 Middleburg   
 Electric Submersible   
 Suction Pump   
 Installed Pump

TIME	TEMP. (F)	pH	COND.	TURBIDITY:	VOLUME REMOVED:	OBSERVATIONS:
<u>942</u>	<u>67.9</u>	<u>7.6</u>	<u>2600</u>	<u>180.3</u>	<u>8</u>	<u>wells did</u>
<u>944</u>	<u>69.3</u>	<u>7.6</u>	<u>2600</u>	<u>2200</u>	<u>16</u>	<u>not keep up</u>
<u>947</u>	<u>68.8</u>	<u>7.6</u>	<u>2600</u>	<u>2200</u>	<u>24</u>	<u>for cont</u>
						<u>pumpings</u>

Did Well Dewater? \_\_\_\_\_ If yes, gals.

Gallons Actually Evacuated: 24

Sampling Time: 955

Sample I.D.: S-2

Laboratory: Anametic's

Analyzed for: TPH, BTEX

Duplicate I.D.:

Cleaning Blank I.D.:

Analyzed for:

Shipping Notations:

Additional Notations:

# WELL MONITORING DATA SHEET

Project #: <u>931209-K1</u>	Client: <u>Shell</u>
Sampler: <u>KCB</u>	Date Sampled: <u>12/9</u>
Well I.D.: <u>5-4</u>	Well Diameter: (circle one) 2 <u>3</u> 4 6
Total Well Depth: Before <u>35.94</u> After	Depth to Water: Before <u>14.16</u> After
Depth to Free Product:	Thickness of Free Product (feet):
Measurements referenced to: PVC <u>Grade</u> Other --	

Volume Conversion Factor (VCF):  
 $VCF = (d^2/4) \times \pi / 2.31$   
 Where:  
 d = dia. (in.)  
 π = 3.1416  
 2.31 = ft/2.31

Well Dia.	VCF
2"	0.14
3"	0.35
4"	0.58
5"	0.92
6"	1.36
8"	2.31
10"	3.79

8 x 3 = 24  
 1 Case Volume                      Specified Volumes                      =                      gallons

Purging: Bailer <input type="checkbox"/> Middleburg <input type="checkbox"/> Electric Submersible <input checked="" type="checkbox"/> Suction Pump <input type="checkbox"/> Type of Installed Pump _____	Sampling: Bailer <input checked="" type="checkbox"/> Middleburg <input type="checkbox"/> Electric Submersible <input type="checkbox"/> Suction Pump <input type="checkbox"/> Installed Pump <input type="checkbox"/>
--	--

TIME	TEMP. (F)	pH	COND.	TURBIDITY:	VOLUME REMOVED:	OBSERVATIONS:
<u>1224</u>	<u>68.2</u>	<u>8.0</u>	<u>2000</u>	<u>7200</u>	<u>8</u>	<u>Did not keep</u>
<u>1127</u>	<u>69.7</u>	<u>8.2</u>	<u>2000</u>	<u>7200</u>	<u>16</u>	<u>20 ft cont.</u>
<u>1121</u>	<u>69.1</u>	<u>8.1</u>	<u>2000</u>	<u>7200</u>	<u>24</u>	<u>pumping</u>

Did Well Dewater?    If yes, gals.                      Gallons Actually Evacuated: 24

Sampling Time: 1135

Sample I.D.: S-4                      Laboratory: Anametric

Analyzed for: TPH, BTEX

Duplicate I.D.: DUP                      Cleaning Blank I.D.: \_\_\_\_\_

Analyzed for: TPH, BTEX

Shipping Notations: \_\_\_\_\_

Additional Notations: Case/pipe is broken at/below ground level, may allow surface runoff to enter well

# WELL MONITORING DATA SHEET

Project #: <u>93209-K1</u>	Client: <u>Shell</u>
Sampler: <u>KCB</u>	Date Sampled: <u>12/9</u>
Well I.D.: <u>5-5</u>	Well Diameter: (circle one) 2 <u>3</u> 4 6
Total Well Depth: Before <u>35.92</u> After	Depth to Water: Before <u>1626</u> After
Depth to Free Product: _____	Thickness of Free Product (feet): _____
Measurements referenced to:	PVC <input type="checkbox"/> <u>Grade</u> <input checked="" type="checkbox"/> Other -- <input type="checkbox"/>

Volume Conversion Factor (VCF):  
 $VCF = (d^2/n) \times \pi / 2.31$   
 where  
 $d = \text{in./ft.}$   
 $d = \text{diameter (in.)}$   
 $n = 2.31 \text{ ft.}$   
 $\pi = 3.1416$

Well dia.	VCF
2"	0.21
3"	0.37
4"	0.48
6"	1.07
8"	1.94
10"	3.07

<u>2.3</u>	$\times$	<u>3</u>	$=$	<u>26.9</u>
1 Case Volume		Specified Volumes		gallons

Purging: Bailer  Middleburg  Electric Submersible  Suction Pump  Type of Installed Pump \_\_\_\_\_

Sampling: Bailer  Middleburg  Electric Submersible  Suction Pump  Installed Pump

TIME	TEMP. (F)	pH	COND.	TURBIDITY:	VOLUME REMOVED:	OBSERVATIONS:
<u>1054</u>	<u>68.4</u>	<u>8.4</u>	<u>2000</u>	<u>7200</u>	<u>8.0</u>	<u>wells did</u>
<u>1056</u>	<u>68.6</u>	<u>8.4</u>	<u>2100</u>	<u>7200</u>	<u>15.0</u>	<u>not keep up</u>
<u>1059</u>	<u>68.0</u>	<u>8.3</u>	<u>2000</u>	<u>7200</u>	<u>22.0</u>	<u>for cont. purging</u>

Did Well Dewater? \_\_\_\_\_ If yes, gals.      Gallons Actually Evacuated: 22

Sampling Time: 1105

Sample I.D.: S-5      Laboratory: Anamethys

Analyzed for: TPH, BTEX

Duplicate I.D.: \_\_\_\_\_      Cleaning Blank I.D.: \_\_\_\_\_

Analyzed for: \_\_\_\_\_

Shipping Notations: \_\_\_\_\_

Additional Notations: \_\_\_\_\_

# WELL MONITORING DATA SHEET

Project #: <b>931R09-K1</b>	Client: <b>Shell</b>
Sampler: <b>KCB</b>	Date Sampled: <b>12/9</b>
Well I.D.: <b>S-6</b>	Well Diameter: (circle one) 2 <b>(3)</b> 4 6
Total Well Depth: Before <b>3464</b> After	Depth to Water: Before <b>1468</b> After
Depth to Free Product:	Thickness of Free Product (feet):
Measurements referenced to:	PVC <input type="checkbox"/> <b>Grade</b> <input checked="" type="checkbox"/> Other -- <input type="checkbox"/>

Volume Conversion Factor (VCF):  
 $VCF = (d^2/4) \times \pi \times H$   
 Where:  
 $d = \text{in./foot}$   
 $d = \text{diameter (in.)}$   
 $\pi = 3.1416$   
 $H = \text{in./gal}$

Well Dia.	VCF
2"	0.56
3"	0.77
4"	0.98
6"	1.47
8"	1.96
10"	2.45
12"	2.94

<u>7.4</u>	x	<u>3</u>	=	<u>22.2</u>
1 Case Volume		Specified Volumes		gallons

Purging: Bailer  Middleburg  Electric Submersible  Suction Pump  Type of Installed Pump \_\_\_\_\_

Sampling: Bailer  Middleburg  Electric Submersible  Suction Pump  Installed Pump

TIME	TEMP. (F)	pH	COND.	TURBIDITY:	VOLUME REMOVED:	OBSERVATIONS:
1018	68.2	7.9	900	>200	8	Didn't Keep
1020	66.8	7.8	900	>200	16	up for cont
1023	67.9	7.8	900	>200	24	pumping

Did Well Dewater?  If yes, gals. \_\_\_\_\_ Gallons Actually Evacuated: **24**

Sampling Time: **1027**

Sample I.D.: **S-6** Laboratory: **Anamatrix**

Analyzed for: **TPH, BTEX**

Duplicate I.D.: \_\_\_\_\_ Cleaning Blank I.D.: \_\_\_\_\_

Analyzed for: \_\_\_\_\_

Shipping Notations: \_\_\_\_\_

Additional Notations: \_\_\_\_\_



# WELL MONITORING DATA SHEET

Project #: <u>931209-K1</u>	Client: <u>Shell</u>
Sampler: <u>KCB</u>	Date Sampled: <u>12/9</u>
Well I.D.: <u>5-9</u>	Well Diameter: (circle one) 2 <input checked="" type="radio"/> 4 <input type="radio"/> 6 <input type="radio"/>
Total Well Depth: Before <u>34.72</u> After	Depth to Water: Before <u>1689</u> After
Depth to Free Product:	Thickness of Free Product (feet):
Measurements referenced to:	PVC <input type="checkbox"/> <u>Grade</u> <input checked="" type="checkbox"/> Other -- <input type="checkbox"/>

Volume Conversion Factor (VCF):  
 $VCF = (d^2/4) \times \pi / 2.31$   
 where  
 $d = \text{in./ft.}$   
 $d = \text{diameter (in.)}$   
 $\pi = 3.1416$   
 $2.31 = \text{ft./gal.}$

Well dia.	VCF
2"	0.26
3"	0.27
4"	0.46
5"	0.47
6"	0.66
8"	0.87

$\frac{6.6}{1 \text{ Case Volume}} \times \frac{3}{\text{Specified Volumes}} = \frac{19.8}{\text{gallons}}$

Purging: Bailer  Middleburg  Electric Submersible  Suction Pump  Type of Installed Pump \_\_\_\_\_

Sampling: Bailer  Middleburg  Electric Submersible  Suction Pump  Installed Pump

TIME	TEMP. (F)	pH	COND.	TURBIDITY:	VOLUME REMOVED:	OBSERVATIONS:
902	67.9	7.5	3000	7200	7	<del>Water</del>
904	67.9	7.3	3100	7200	14	<del>Water</del> Well
906	67.7	7.2	3200	7200	21	did keep up for cont purging

Did Well Dewater? — If yes, gals.      Gallons Actually Evacuated: 21

Sampling Time: 910

Sample I.D.: 5-9      Laboratory: \_\_\_\_\_

Analyzed for: TPHG, BTEX

Duplicate I.D.: \_\_\_\_\_      Cleaning Blank I.D.: EB

Analyzed for: TPHG, BTEX

Shipping Notations: \_\_\_\_\_

Additional Notations: \_\_\_\_\_





# Inchcape Testing Services

## Anametrix Laboratories

1961 Concourse Drive  
Suite E  
San Jose, CA 95131  
Tel: 408-432-8192  
Fax: 408-432-8198

MR. JIM KELLER  
BLAINE TECH  
985 TIMOTHY DRIVE  
SAN JOSE, CA 95133

Workorder # : 9312140  
Date Received : 12/10/93  
Project ID : 204-6138-0501  
Purchase Order: MOH-B813

The following samples were received at Anametrix, Inc. for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9312140- 1	S-2
9312140- 2	S-4
9312140- 3	S-5
9312140- 4	S-6
9312140- 5	S-9
9312140- 6	DUP
9312140- 7	EB
9312140- 8	TB

This report consists of 8 pages not including the cover letter, and is organized in sections according to the specific Anametrix laboratory group or section which performed the analysis(es) and generated the data. The Report Summary that precedes each section will help you determine which Anametrix group is responsible for those test results, and will bear the signatures of the department supervisor and the chemist who have reviewed the analytical data. Please refer all questions to the department supervisor who signed the form.

Anametrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234. A detailed list of the approved fields of testing can be obtained by calling our office, or the DHS Environmental Laboratory Accreditation Program at (415)540-2800.

If you have any further questions or comments on this report, please give us a call as soon as possible. Thank you for using Anametrix.

  
\_\_\_\_\_  
Sarah Schoen, Ph.D.  
Laboratory Director

12-23-93  
\_\_\_\_\_  
Date

**Organic Analysis Data Sheet**  
**Total Petroleum Hydrocarbons as Gasoline with BTEX**  
**ITS - Anametrix Laboratories - (408)432-8192**

Lab Workorder : 9312140  
 Matrix : WATER

Client Project ID : 204-6138-0501  
 Units : ug/L

Compound Name	Method Reporting Limit*	Client ID	Client ID	Client ID	Client ID	Client ID
		S-2	S-4	S-5	S-6	S-9
		Lab ID	Lab ID	Lab ID	Lab ID	Lab ID
		9312140-01	9312140-02	9312140-03	9312140-04	9312140-05
Benzene	0.50	ND	39	0.56	2.3	ND
Toluene	0.50	ND	ND	ND	2.6	ND
Ethylbenzene	0.50	ND	3.8	2.2	5.1	ND
Total Xylenes	0.50	ND	2.6	1.2	6.2	ND
TPH as Gasoline	50	ND	250	120	130	ND
Surrogate Recovery		113%	126%	111%	109%	110%
Instrument ID		HP12	HP12	HP12	HP12	HP12
Date Sampled		12/09/93	12/09/93	12/09/93	12/09/93	12/09/93
Date Analyzed		12/15/93	12/17/93	12/15/93	12/15/93	12/15/93
RLMF		1	1	1	1	1
Filename Reference		FPD14001.D	FRD14002.D	FPD14003.D	FPD14004.D	FPD14005.D

\* The Method Reporting Limit must be multiplied by the Reporting Limit Multiplication Factor (RLMF) to achieve the compound's reporting limit in the analysis.

ND : Not detected at or above the reporting limit for the analysis as performed.

TPHg : Determined by GC/FID following sample purge & trap by EPA Method 5030.

BTEX : Determined by modified EPA Method 8020 following sample purge & trap by EPA Method 5030.

Lab Control Limits for surrogate compound p-Bromofluorobenzene are 61-139%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Doshi 12/23/93  
 Analyst Date

Dina Sher 12/23/93  
 Supervisor Date





**Laboratory Control Spike Report**  
**Total Petroleum Hydrocarbons as BTEX**  
**ITS - Anamatrix Laboratories - (408)432-8192**

Instrument ID : HP12  
 Matrix : LIQUID

Analyst : KK  
 Supervisor : CD  
 Units : ug/L

COMPOUND NAME	SPIKE AMOUNT	LCS RECOVERY	RECOVERY LIMITS
Benzene	20	80%	52-133
Toluene	20	85%	57-136
Ethylbenzene	20	95%	56-139
Total Xylenes	20	85%	56-141
Surrogate Recovery		102%	61-139
Date Analyzed		12/15/93	
Multiplier		1	
Filename Reference		MD1501E1.D	

\* Limits established by Incheape Testing Services, Anamatrix Laboratories.

**Laboratory Control Spike Report**  
**Total Petroleum Hydrocarbons as Gasoline**  
**ITS - Anametrix Laboratories - (408)432-8192**

Instrument ID : HP12  
 Matrix : LIQUID

Analyst : *FD*  
 Supervisor : *IS*  
 Units : ug/L

COMPOUND NAME	SPIKE AMOUNT	LCS RECOVERY	RECOVERY LIMITS
Gasoline	500	80%	56-141
Surrogate Recovery		79%	61-139
Date Analyzed		12/16/93	
Multiplier		1	
Filename Reference		MD1601E1.D	

\* Limits established by Inchcape Testing Services, Anametrix Laboratories.



**Laboratory Control Spike Report**  
**Total Petroleum Hydrocarbons as BTEX**  
**ITS - Anametrix Laboratories - (408)432-8192**

Instrument ID : HP12  
 Matrix : LIQUID

Analyst : KK  
 Supervisor : CP  
 Units : ug/L

COMPOUND NAME	SPIKE AMOUNT	LCS RECOVERY	RECOVERY LIMITS
Benzene	20	95%	52-133
Toluene	20	100%	57-136
Ethylbenzene	20	105%	56-139
Total Xylenes	20	95%	56-141
Surrogate Recovery		115%	61-139
Date Analyzed		12/17/93	
Multiplier		1	
Filename Reference		MD1701E1.D	

\* Limits established by Incheape Testing Services, Anametrix Laboratories.

REPORT SUMMARY  
ANAMETRIX, INC. (408)432-8192

MR. JIM KELLER  
BLAINE TECH  
985 TIMOTHY DRIVE  
SAN JOSE, CA 95133

Workorder # : 9312140  
Date Received : 12/10/93  
Project ID : 204-6138-0501  
Purchase Order: MOH-B813  
Department : GC  
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9312140- 1	S-2	WATER	12/09/93	TPHgBTEX
9312140- 2	S-4	WATER	12/09/93	TPHgBTEX
9312140- 3	S-5	WATER	12/09/93	TPHgBTEX
9312140- 4	S-6	WATER	12/09/93	TPHgBTEX
9312140- 5	S-9	WATER	12/09/93	TPHgBTEX
9312140- 6	DUP	WATER	12/09/93	TPHgBTEX
9312140- 7	EB	WATER	12/09/93	TPHgBTEX
9312140- 8	TB	WATER	12/09/93	TPHgBTEX

REPORT SUMMARY  
ANAMETRIX, INC. (408)432-8192

MR. JIM KELLER  
BLAINE TECH  
985 TIMOTHY DRIVE  
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Workorder # : 9312140  
Date Received : 12/10/93  
Project ID : 204-6138-0501  
Purchase Order: MOH-B813  
Department : GC  
Sub-Department: TPH

QA/QC SUMMARY :

- No QA/QC problems encountered for these samples.

Corinne Blain  
Department Supervisor

12/22/93  
Date

Kamel G. Kamel 12/22/93  
Chemist Date