EXON COMPANY, U.S.A.

POST OFFICE BOX 4032 ◆ CONCORD, CA 94524-2032

ENVIRONMENTAL ENGINEERING

G. D. GIBSON SENIOR ENVIRONMENTAL ENGINEER

May 7, 1991

Exxon RAS 7-0104 1725 Park Street Alameda, California

Ms. Katherine Chesick Alameda County Health Agency Division of Hazardous Materials 80 Swan Way, Suite 200 Oakland, California 94621

Dear Ms. Chesick:

Attached for your review and comment is the letter report on Groundwater Monitoring Results, First Quarter 1991 for the above referenced Exxon Company, U.S.A. facility in the City of Alameda. This report, by Harding Lawson Associates of Novato, California, presents the results of the groundwater sampling event performed in March, 1991.

Although no observable free phase hydrocarbons were found during this monitoring event, detectable levels of dissolved hydrocarbons were detected in all wells at this site. A workplan for the installation of an interim remediation system is being finalized and will be submitted in the near future. Should you have any questions or concerns after your review, please contact me at (415) 246-8768. Thank you.

Sincerely

Gary D. Gibson

GDG:hs 0559E Attachment

c - w/attachment:

Mr. L. Feldman - San Francisco Bay Region Water Quality Control Board

w/o attachment:

Mr. D. J. Bertoch

Mr. P. J. Brininstool

81 MYK 14 EN 1: 25

Ms. J. E. Folger

Mr. J. R. Hastings

Ms. S. M. Watson - Harding Lawson Associates



April 23, 1991

4167,326.02

Exxon Company, U.S.A. Post Office Box 4032 Concord, California 94520

Attention:

Mr. Gary D. Gibson

Senior Environmental Engineer

Gentlemen:

Groundwater Monitoring Results, First Quarter 1991 Exxon Station #7-0104 Alameda, California

This letter presents the results of Harding Lawson Associates' (HLA) First Quarter of 1991 sampling of seven groundwater monitoring wells at Exxon Station #7-0104, 1725 Park Street, Alameda, California (site). The site history and detailed monitoring well sampling procedures are described in HLA's report *Phase II Evaluation of Petroleum Hydrocarbons, Exxon Service Station R/S #7-0104, 1725 Park Street, Alameda, California*, dated March 21, 1989. This sampling event was conducted on March 19, 1991, and represents HLA's fourth sampling event authorized by Work Authorization #90066058.

Groundwater-Level Monitoring and Groundwater Sampling

HLA has obtained monthly groundwater-level and free-phase hydrocarbon measurements from the monitoring wells since September 1989. All measurements were performed with an electric oil-water interface probe or a chalked steel tape. During monthly groundwater monitoring, the groundwater collected from each well was visually inspected for the presence of free-phase petroleum product using a clear Lucite bailer. No measurable free-phase petroleum product has been observed in any of the wells during the course of this investigation, with the exception of a sheen in Well MW-2 detected in 3 out of 19 monitoring events.

Prior to groundwater sample collection on March 19, 1991, the monitoring wells were purged a minimum of three well volumes with a PVC bailer or centrifugal pump. The purged water was stored onsite in 55-gallon drums. Measurements of pH, conductivity, and temperature of the purged water were monitored and recorded during purging of the wells. Copies of HLA's Groundwater Sampling Forms documenting sampling activities are attached to this letter.

April 23, 1991 4167,326.02 Exxon Company, U.S.A. Mr. Gary D. Gibson Page 2

Groundwater samples were collected from each of the monitoring wells using a stainless steel bailer and decanted into pre-acidified 40-milliliter volatile organic analysis (VOA) vials. A quality assurance/quality control (QA/QC) field blank water sample was prepared in the field by decanting deionized water into appropriate sample containers. The groundwater samples and QA/QC field blank were labeled, placed in a cooler with blue ice, and transported under chain of custody procedures to NET Pacific Laboratory (NET), Santa Rosa, California. NET is a state-certified hazardous waste laboratory.

To help prevent potential cross-contamination, all water-level measurement and sampling equipment was decontaminated prior to use by steam cleaning or washing in a low phosphorous soap solution.

Laboratory Analyses

The groundwater samples and field blank were analyzed for total petroleum hydrocarbons (TPH) calibrated as gasoline, and for benzene, toluene, ethylbenzene, and xylenes (BTEX). Groundwater analytical results are summarized in Table 1, along with analytical results from HLA's previous groundwater sampling rounds. Copies of laboratory reports from the March 19, 1991, sampling are attached to this letter.

Groundwater Gradient and Flow Direction

Potentiometric surface elevations from the March 1991 groundwater-level survey are presented in Table 2, along with previously measured potentiometric surface elevations. Potentiometric surface elevations at the site have increased over the past three months, most likely as a result of precipitation induced recharge. Plate 1 presents a generalized potentiometric surface map for the site. As shown on Plate 1, the generalized local direction of groundwater flow is toward the east at an approximate gradient of 0.025 ft/ft. This flow direction is consistent with previous potentiometric surface data obtained during this investigation.

Laboratory Analytical Results

Laboratory analytical results from the March sampling indicate that petroleum hydrocarbon constituents were detected in all seven wells onsite. Detected concentrations of TPH as gasoline ranged from 1.4 to 180 milligrams per liter (mg/l). The highest concentrations of petroleum hydrocarbon constituents were detected in groundwater samples collected from Monitoring Wells MW-2, MW-6 and MW-7, located adjacent to and downgradient of the fuel storage and distribution systems. No petroleum hydrocarbons were detected in the field blank submitted to the laboratory for analysis.

Review of chemical analyses reveals that concentrations of petroleum constituents have increased in Monitoring Wells MW-3 and MW-6 and have decreased in Well MW-7.

April 23, 1991 4167,326.02 Exxon Company, U.S.A. Mr. Gary D. Gibson Page 3

The concentrations of benzene detected in all monitoring wells at the site exceed the California State Department of Health Services (DHS) action level of 0.7 microgram per liter (μ g/l). Concentrations of toluene and total xylenes detected in all wells with the exception of MW-1 exceed DHS action levels of 100 and 620 μ g/l, respectively. Ethylbenzene concentrations detected in wells MW-2, MW-3, MW-6, and MW-7 are in excess of the DHS action level of 680 μ g/l.

HLA plans to continue quarterly sampling and monthly groundwater level monitoring and is currently developing site soil and groundwater remediation programs. The next quarterly sampling event is scheduled for June 1991.

We trust that this is the information Exxon requires at the present time. HLA recommends that copies of this report be submitted to the Regional Water Quality Control Board and the Alameda County Health Department for their review.

Please call us at 415/892-0821 if you have any questions.

Yours very truly,

HARDING LAWSON ASSOCIATES

5. Michille Watson

S. Michelle Watson Project Geologist

Attachments:

Michael L. Siembieda

Associate Geologist - RG 4007

SMW/MLS/lah/B16561-H

Table 1 - Summary of Chemical Results of Groundwater Samples

Table 2 - Potentiometric Surface Elevations and Product Thickness

No: 4007

Measurements

Plate 1 - Generalized Potentiometric Surface Contour Map,

March 19, 1991

Groundwater Sampling Forms Laboratory Analytical Reports

Table 1. Summary of Chemical Results of Groundwater Samples

Well Number	Date	TPH Gasoline mg/l ¹	Benzene μg/l ²	Toluene μg/l	Ethyl- benzene µg/l	Xylenes μg/l	Total Dissolved Solids mg/l
DHS Acti	on Levels		0.7	100	680	620	
MW-1	06/07/88	27	5,000	77	1,100	2,700	NT³
141 44 - 1	01/17/89	6.8	2,000	91	800	1,600	NT
	06/01/89	1.7	170	6.9	13	230	NT
	09/18/89	2.1	9.0	53	18	130	NT
	12/11/89	5.8	200	42	290	330	NT
	03/07/90	NT	NT	NT	NT	NT	910
	03/13/90	2.3	430	14	16	220	NT
	06/14/90	32	1,400	19	<5 ⁴	120	NT
	09/19/90	0.95	290	2.9	<0.5	27	NT
	12/17/90	2.1	550	13	350	110	NT
	03/19/91	1.4	900	45	390	150	NT
MW-2	06/07/88	110	12,000	12,000	2,100	12,000	NT
	01/17/89	30	6,600	3,300	1,600	7,700	NT
	06/01/89	8.7	330	280	680	1,200	NT
	09/18/89	17	580	280	570	220	NT
	12/11/89	32	1,000	850	310	1,200	NT
	03/13/90	39	3,500	1,500	2,100	3,900	NT
	06/14/90	34	3,800	730	1,600	3,900	NT
	09/19/90	63	670	180	390	1,000	NT
	12/17/90	140	3,700	2,500	3,000	8,300	NT
	03/19/91	48	4,500	1,600	2,100	5,500	NT
MW-3	06/07/88	28	6,000	80	940	1,900	NT
	01/17/89	5.3	2,500	230	590	1,100	NT
	06/01/89	5.4	330	300	570	680	NT
	09/18/89	12	680	170	350	860	NT
	12/11/89	14	1,100	150	670	690	NT
	03/13/90	18	6,300	200	1,100	1,100	NT
	06/14/90	9.5	1,300	880	310	1,800	NT
	09/19/90	16	5,000	65	1,500	450	NT
	12/17/90	6.7	1,500	64	650	460	NT
	03/19/91	18	4,200	2,100	1,100	1,200	NT

Table 1. Summary of Chemical Results of Groundwater Samples (continued)

Well Number	Date	TPH Gasoline mg/l	Benzene μg/l	Toluene μg/l	Ethyl- benzene μg/l	Xylenes μg/l	Total Dissolved Solids mg/l
DHS Acti	on Levels		0.7	100	680	620	
MW-4	01/17/89	19	1,000	1,500	360	2,200	NT
·	06/01/89	3.6	180	240	63	810	NT
	09/18/89	6.0	290	200	28	510	NT
	12/11/89	13	750	910	510	1,200	NT
	03/07/90	NT	NT	NT	NT	NT	370
	03/13/90	12	1,500	1,500	470	2,800	NT
	06/14/90	12	5,700	400	1,300	760	NT
	09/19/90	5.5	670	180	390	1,000	NT
	12/17/90	14	1,400	620	540	2,100	NT
	03/19/91	11	1,500	740	620	2,100	NT
MW-5	01/17/89	26	8,700	3,900	990	5,900	NT
	06/01/89	5.2	240	220	130	690	NT
	09/18/89	8.0	340	150	140	460	NT
	12/11/89	15	720	320	450	870	NT
	03/13/90	10	3,400	220	280	800	NT
	06/14/90	12	3,300	160	350	730	NT
	09/19/90	8.5	1,800	85	120	460	NT
	12/17/90	18	2,300	810	430	1,400	NT
	03/19/91	17	2,900	610	580	1,200	NT
MW-6	01/17/89	38	7,400	9,300	2,000	9,900	NT
	06/01/89	23	1,900	2,500	2,000	6,000	NT
	09/18/89	17	650	410	650	320	NT
	12/11/89	29	1,100	810	330	1,500	NT
	03/13/90	38	12,000	15,000	2,500	12,000	NT
	06/14/90		9,100	7,800	2,900	12,000	NT
	09/19/90	22	4,200	300	1,400	3,400	NT
	12/17/90		3,100	4,100	890	2,700	NT NT
	03/19/91	180	11,000	55,000	5,600	28,000	NT
MW-7	01/09/90		380	180	330	1,300	NT
	03/13/90		360	270	83	460	NT
	06/14/90		1,200	2,800	75	930	NT
	09/19/90		2,800	95	2,500	1,700	NT
	12/17/90		2,600	7,000	3,300	14,000	NT
	03/19/91	44	1,600	740	3,400	8,600	NT

Table 1. Summary of Chemical Results of Groundwater Samples (continued)

Well Number	Date	TPH Gasoline mg/l	Benzene µg/l	Toluene μg/l	Ethyl- benzene μg/l	Xylenes μg/l	Total Dissolved Solids mg/l
Field							
Blank	12/11/89	<0.05	0.88	0.95	0.62	1.7	NT
	12/17/90	< 0.05	<0.5	<0.5	< 0.5	<0.5	NT
	03/19/91	<0.05	<0.5	<0.5	<0.5	<0.5	NT
Trip							
Blank	06/14/90	< 0.05	<0.5	<0.5	<0.5	<0.5	NT
	09/19/90	< 0.05	0.8	<0.5	0.6	1.0	NT

¹ mg/l: milligrams per liter (parts per million)

 $[\]frac{2}{\mu g/l}$: micrograms per liter (parts per billion)

NT: Not tested

^{4 &}lt;: Numbers preceded by "<" indicate that sample was below the indicated detection limit.

Table 2. Potentiometric Surface and Product Thickness Measurements

Well Number	Elevation Top of Well Casing ¹	Date	Depth to Water BTOC ² (feet)	Depth to Product BTOC (feet)	Product Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
MW-1	17.35	06-10-88	6.35	NP^3	NP	11.00
		01-17-89	5.81	NP	NP	11.54
		01-24-89	5.16	NP	NP	12,19
		06-01-89	6.27	NP	Sheen	11.08
		09-18-89	7.11	NP	NP	10.24
		10-20-89	7.28	NP	NP	10.07
		11-22-89	7.02	NP	NP	10.33
		12-11-89	6.60	NP	NP	10.75
		02-13-90	6.02	NP	NP	11.33
		03-13-90	5.91	NP	NP	11.44
		04-18-90	6.18	NP	NP	11.17
		05-23-90	6.29	NP	NP	11.06
		06-14-90	6.19	NP	NP	11.28
		08-21-90	7.03	NP	NP	10.32
		09-19-90	7.26	NP	NP	10.09
		12-17-90	6.75	NP	NP	10.60
		01-31-91	6.78	NP	NP	10.57
		02-25-91	6.59	NP	NP	10.76
	-	03-19-91	5.85	NP	NP	11.50
MW-2	16.67	06-10-88	6.20	NP	NP	10.47
		01-17-89	5.96	NP	NP	10.71
		01-24-89	5.04	NP	NP	11.63
		06-01-89	6.32	NP	Sheen	10.35
		09-18-89	6.73	NP	NP	9.94
		10-20-89	6.87	NP	NP	9.80
		11-22-89	6.80	NP	NP	9.87
		12-11-89	6.57	NP	NP	10.10
		02-13-90	6.12	NP	NP	10.55
		03-13-90	6.02	NP	NP	10.65
		04-18-90	6.35	NP	NP	10.32
		05-23-90	6.28	NP	NP	10.39
		06-14-90	6.14	NP	NP	10.53
		08-21-90	6.70	NP	NP	9.97
		09-19-90	6.84	NP	NP	9.83
		12-17-90	6.46	NP	NP	10.21
		01-31-91	6.66	Sheen	Sheen	10.01
		02-25-91	6.50	NP	NP	10.17
		03-19-91	5.76	Sheen	Sheen	10.91

Table 2. Potentiometric Surface and Product Thickness Measurements (continued)

Well Number	Elevation Top of Well Casing ¹	Date	Depth to Water BTOC ² (feet)	Depth to Product BTOC (feet)	Product Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
				110000000000000000000000000000000000000		
MW-3	17.11	06-10-88	6.05	NP	NP	11.06
		01-17-89	5.49	NP	NP	11.62
		01-24-89	5.38	NP	NP	11.73
		06-01-89	5.96	NP	NP	11.15
		09-18-89	6.65	NP	NP	10.46
		10-20-89	6.88	NP	NP	10.23
		11-22-89	6.74	NP	NP	10.37
		12-11-89	6.37	NP	NP	10.74
		02-13-90	5.58	NP	NP	11.53
		03-13-90 04-18-90	5.48	NP	NP	11.63
		05-23-90	6.01 6.14	NP ND	NP NB	11.10
		06-14-90	5.83	NP NP	NP NP	10.97
		08-21-90	6.67	NP NP	NP NP	11.28 10.44
		09-19-90	6.88	NP	NP	10.23
		12-17-90	6.46	NP	NP	10.65
		01-31-91	6.24	NP	NP	10.87
		02-25-91	6.18	NP	NP	10.93
		03-19-91	5.35	NP	NP	11.76
MW-4	17.34	01-17-89	5.36	NP	NP	11.98
		01-24-89	5.46	NP	NP	11.88
		06-01-89	6.01	NP	NP	11.33
		09-18-89	6.80	NP	NP	10.54
		10-20-89	7.08	NP	NP	10.26
		11-22-89	6.82	NP	NP	10.52
		12-11-89	6.37	NP	NP	10.97
		02-13-90	5.49	NP	NP	11.85
		03-13-90	5.44	NP	NP	11.90
		04-18-90	6.14	NP	NP	11.20
		05-23-90	6.22	NP	NP	11.12
		06-14-90	5.92	NP	NP	11.42
		08-21-90	6.83	NP	NP	10.51
		09-19-90 12-17-90	7.07 6.50	NP ND	NP	10.27
		01-31-91	6.50	NP	NP	10.84
		01-31-91	6.66 6.21	NP NP	NP NP	10.68 11.13

Table 2. Potentiometric Surface and Product Thickness Measurements (continued)

Well Number	Elevation Top of Well Casing ¹	Date	Depth to Water BTOC ² (feet)	Depth to Product BTOC (feet)	Product Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
MW-5	16.71	01-17-89	5.39	NP	NP	11.32
		01-24-89	5.51	NP	NP	11.20
		06-01-89	5.83	NP	Sheen	10.88
		09-18-89	6.52	NP	NP	10.19
		10-20-89	6.72	NP	NP	9.99
		11-22-89	6.54	NP	NP	10.17
		12-11-89	6.21	NP	NP	10.50
		02-13-90	5.60	NP	NP	11.11
		03-13-90	5.54	NP	NP	11.17
		04-18-90	5.75	NP	NP	10.76
		05-23-90	5.98	NP	NP	10.73
		06-14-90	5.81	NP	NP	10.90
		08-21-90	6.51	NP	NP	10.20
		09-19-90	6.70	NP	NP	10.01
		12-17-90	6.24	NP	Sheen	10.47
		01-31-91	6.31	NP	NP	10.40
		02-25-91	6.13	NP	NΡ	10.58
		03-19-91	5.32	NP	NP	11.39
MW-6	17.56	01-17-89	5.59	NP	NP	11.97
		01-24-89	5.27	NP	NP	12.29
		06-01-89	6.25	NP	Sheen	11.31
		09-18-89	6.95	NP	NP	10.61
		10-20-89	7.24	NP	NP	10.32
		11-22-89	7.05	NP	NP	10.51
		12-11-89	6.63	NP	NP	10.93
		02-13-90	5.70	NP	NP	11.86
		03-13-90	5.63	NP	NP	11.93
		04-18-90	6.26	NP	NP	11.30
		05-23-90	6.42	NP	NP	11.14
		06-14-90	6.19	NP	NP	11.37
		08-21-90	7.01	NP	NP	10.55
		09-19-90	7.23	NP	NP	10.33
		12-17-90	6.66	NP	NP	10.90
		01-31-91	6.39	NP	NP	11.17
		02-25-91	6.39	NP	NP	11.17
		03-19-91	5.57	NP	NP	11.99

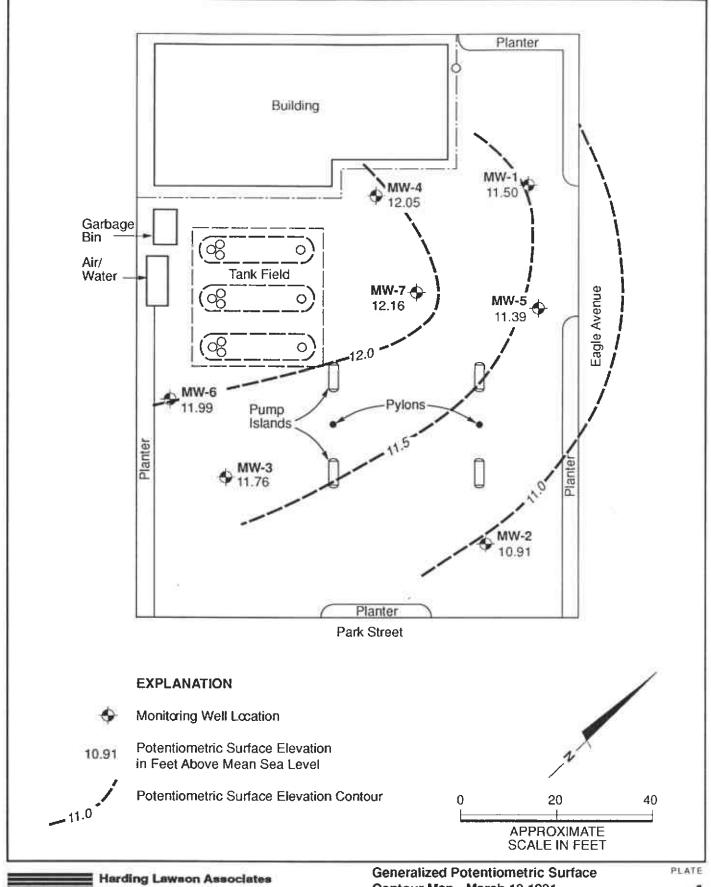
Table 2. Potentiometric Surface and Product Thickness Measurements (continued)

Well Number	Elevation Top of Well Casing ¹	Date	Depth to Water BTOC ² (feet)	Depth to Product BTOC (feet)	Product Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
MW-7	17.12	02-13-90	4.98	NP	NP	12.14
		03-13-90	4.94	NP	NP	12.18
		05-23-90	5.87	NP	NP	11.25
		06-14-90	5.55	NP	NP	11.57
		09-19- 9 0	6.79	NP	NP	10.33
		12-17-90	6.15	NP	NP	10.97
		01-31-91	6.64	NP	NP	10.48
		02-25-91	5.80	NP	NP	11.32
		03-19-91	4.96	NP	NP	12.16

¹ Elevations surveyed to mean sea level.

² BTOC - Below top of casing.

³ NP: No product.





Engineering and **Environmental Services** Contour Map - March 19,1991 Exxon Station #7-0104

Alameda, California

APPROVED

DATE 4/91

REVISED DATE

DRAWN JOB NUMBER LZc 4167,326.02

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						eel 🗆 Other		
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20	7.0 383							
29	7.1 360	-						
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Court Services of State of Service	olicate Samples	2	Bla	nk Samples	Othe	er Samples		
Du				Annual Science College				

		Contains	Campica	Other Samples		
Original Sample No.	Duplicate Sample No.	Туре	Sample No.	Туре	Sample No.	

GROUND-WATER SAMPLING FORM Harding Lawson Associates Engineers and Geoscientists MW-2 Well No. ____ Well Type: ☑Monitor ☐Extraction ☐ Other_____ JOB Name EXXON ALAMEDA Well Material: ☑PVC ☐ St. Steel ☐ Other _____ Date 3-19-91 Time 9:30 Job Number 4167, 326.02 Sampled by TSN Recorded by Thank SN. H WELL PURGING PURGE METHOD PURGE VOLUME 4 " PVC Bailer - Type: ____ Casing Diameter (D in inches): ☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: ____. ☐ 2-inch ☐ 4-inch ☐ 6-inch ☐ Other __ Total Depth of Casing (TD in feet BTOC): 16.0 ☐ Other - Type: ___ Water Level Depth (WL in feet BTOC): 5.76 PUMP INTAKE SETTING Number of Well Volumes to be purged (# Vols) ☐ Near Bottom ☐ Near Top ☐ Other __ Depth in feet (BTOC): _____ Screen Interval in feet (BTOC): ☐3 ☐4 ☐5 ☐10 ☐ Other _ from _____ to ____ PURGE VOLUME CALCULATION: 16.0 - 5.76 X 4 2 X 3 X 0.0408 = 20.1 TD (feet) WL (feet) X D (inches) # Vols Calculated Purge Volume TD (feet) ACTUAL PURGE VOLUME PURGE TIME PURGE RATE __Stop _____Elapsed Initial _____ gpm Final ____ FIELD PARAMETER MEASUREMENT Minutes Since Pumping Began Minutes Since Pumping Began Cond. (µmhos/cm) Cond. Other_ Other_ pH 12.9 Initial 7.2 345 6.8 372 379 Meter Nos. K8975290 COMBO sheen, HC adan Observations During Purging (Well Condition, Turbidity, Color, Odor): Hother IN DRUM, ONSITE Storm Sewer Discharge Water Disposal: Sanitary Sewer WELL SAMPLING SAMPLING METHOD Same As Above Baller - Type: SS Grab - Type: ___ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: ____ Other - Type:____ Sample Series: 1903 SAMPLE HISTORIE (FILE) Comments Volume/Cont. Analysis Requested Preservatives Sample No. NET PACIFIC 3 VOAC BTEX, TPH-GAS HCI 1906 QUALITY CONTROL SAMPLES Blank Samples Other Samples **Duplicate Samples** Original Sample No. Duplicate Sample No. Sample No. Sample No.

Type

Type

In Name	4117, 326 Thomas	AMEDA 5.00 S Nutto	V E	Well No			
	0.1200000000000000000000000000000000000		WELL PUP	GING		mark likely	DEDENIE -
Total Depth of Car	D in inches): och	Other		PURGE METHOD PV C Submersible Centrifugal Bladder; Pump No.:			
Water Level Depth Number of Well V	(WL in feet BTOC) plumes to be purge	:5.35 d (# Vols)		Near Bottom			
PURGE VOLU	ME CALCULATION	2			TOC):	from	to
	5-35 X WL (feet)	D (inches) X		ci.	100		
	StopSTOP	Eapsed Ir	MEGLEMATE	842	940	18.0	GE VOLUME gallons
Minutes Since Pumping Began Initial	pH (μmhos/σ G-8 573 G-7 614	12.5		Minutes Since Imping Began	pH Conc (µmhos	d. T □°C	Other
	6.9 587 6.9 582	12-7		Meter Nos.			
		condition, Turbidity, (ary Sewer		Other			
SAMPLING M Bailer - Type: Submersible [SAMPLE DIST	S S Centrifugal Bla	dder, Pump No.: —	[Same As Ab Grab - Type	ove		
Sample No. 19 04	Volume/Cont. 3 VOAs	Analysis Request	ed Pres	ervatives	NET PAG		Comments

QUALITY CONTROL SAMPLES

Duplicate Samples Blank Samples Other Samples

Original Sample No. Duplicate Sample No. Type Sample No. Type Sample No.

Harding Lawson Associates GROUND-WATER SAMPLING FORM Engineers and Geoscientists MW-4 Well No. ___ Well Type: ☑ Monitor □ Extraction □ Other _____ Job Name Exxou Alameda Well Material: MPVC ☐ St. Steel ☐ Other____ Job Number 4167 326. Date 3-19-91 Time 0810 Recorded by Down Ill Tuents Sampled by DYCE (Signature) WELL PURGING PURGE VOLUME PURGE METHOD Bailer - Type: PVC Casing Diameter (D in inches): 2-inch 4-inch 6-inch Other ☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: = Total Depth of Casing (TD in feet BTOC): 18.2 Other - Type: _ Water Level Depth (WL in feet BTOC): 5,29 PUMP INTAKE SETTING Number of Well Volumes to be purged (# Vols) Near Bottom Near Top Other 🌠 🗆 4 🔲 5 🔲 10 🗎 Other _ Depth in feet (BTOC): Screen Interval in feet (BTOC): PURGE VOLUME CALCULATION from _ ini esenins SIGE WATE Neighberheit Neibhille 07.35 Start 075 Stop _____ Elapsed opm Final gpm FIELD PARAMETER MEASUREMENT Minutes Since Pumping Began Minutes Since Pumping Began Cond. (µmhos/cm) Cond. (µmhos/cm) Other KITU Other_ 6.8 Inital 450 17.5 10 450 18.0 2100 20 450 18.0 2100 25,5 450 18,0 SOUL P45226 Coud 3385 Tw3249 Observations During Purging (Well Condition, Turbidity, Color, Odor): Clear, slight oder a a sal chadygrey Mother 55 Gallon drums ousite Discharge Water Disposal: Sanitary Sewer ☐ Storm Sewer WELL SAMPLING SAMPLING METHOD Same As Above 🗖 Bailer - Type: _____ Grab - Type: _ ☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: — Other - Type: -SAMPLE DISTRIBUTION Sample Series: 9103 Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments 1902 340A5 TPHL/BIEX NET

gallons

QUALITY CONTROL SAMPLES

Duplicate Samples	Blank S	amples	Other Samples	
Original Sample No. Duplicate Sample No.	4	Sample No.	Type	Sample No.
	Field Blank	1903		
	11			

Harding Lawson Associates GROUND-WATER SAMPLING FORM Engineers and Geoscientists XLW-5 Well No. ____ Well Type: Monitor □ Extraction □ Other _____ Job Name Exxou Alamed Well Material: ₱PVC ☐ St. Steel ☐ Other __ Job Number O4167 Date 3-19-91 Time 0905 Recorded by ______W Sampled by _____DKIE WELL PURGING **PURGE VOLUME** PURGE METHOD PYC Casing Diameter (D in inches): Bailer - Type: ____ 2-inch 4-inch 6-inch Other_ ☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: _ Total Depth of Casing (TD in feet BTOC): 19.0 Other - Type: _ Water Level Depth (WL in feet BTOC): ____ PUMP INTAKE SETTING Number of Well Volumes to be purged (# Vols) ☐ Near Bottom ☐ Mear Top Other __ ጁ 🗆 4 🔲 5 🔲 10 🔲 Other 🗕 Depth in feet (BTOC): _____ Screen Interval in feet (BTOC): PURGE VOLUME CALCULATION from _ X 0.0408 = sivide segme BURGE LINE **ACTUAL PURGE VOLUME** 0830 Start 0857 Stop _____ Elapsed gpm Final - gpm FIELD PARAMETER MEASUREMENT Minutes Since Pumping Began Cond. (µmhos/cm) Minutes Since Pumping Began Cond. Other UTU Other. (umhos/cm) Instal 7.1 370 17 31 10 68 17.5 400 200 20 10.8 405 18.0 >100 27 390 7.0 18.0 SIGO P45026 Coud3385 Few 3049 Meter Nos. Observations During Purging (Well Condition, Turbidity, Color, Odor): Clear, Supplied on the Story Sever Sever Story Sever Sev WELL SAMPLING SAMPLING METHOD ☐ Same As Above 🕅 Bailer - Type: ___ Grab - Type: _ □ Submersible □ Centrifugal □ Bladder; Pump No.: Other - Type: -

gallons

gallons

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
1905	3VOA5	TPHL BIEX	HCL	NET	

O'R PERSON WHEN BUT AND		COST OF STREET	PERSONAL PROPERTY.	STREET, SQUARE, STORY	PRINCIPAL PRINCI	The latest text to the latest text to the latest text to the latest text to the latest text text text text text text text
OLIAL	CTAC:	CONT	TOOL	OWN	APRIL 1	ma
CHEDAL	British Pro	K - 1 - 10 M	1 144 11	A D	$n \sim 1$	li Here

Duplicate Samples		Blank	Samples	Other Samples		
Original Sample No.	Duplicate Sample No.	Туре	Sample No.	Туре	Sample No.	
			-			
			 		-	
					-	

	g Lawson Associates and Geoscientists	etes		ell No	mw-6	AMPLING FOR
		LAMEDA	We	II Material:	ロデVC ロSt. Ste	el 🗆 Other
ob Number _	4167, 32	6.02 Nett	Da		19.91 TSN	
ecorded by	B	ignature)	5a	mpiea by		(Initials)
			WELL PURC	ING		
PURGE VOLUM	ME		P	15/612/1/12	HOD 4" PUC	
Casing Diameter (I	D in inches):		e	Bailer - Type	4 PUC	
]2-inch [4-in	ch 🗌 6-inch 🔲	Other		Submersible	☐ Centrifugal ☐ Blade	der; Pump No.:
Total Depth of Cas	sing (TD in feet BTC	oc): 19.0			- Control of the Cont	
		5.51	THE PARTY NAMED IN COLUMN		CE SETTING	
	olumes to be purge					her
		400	De	oth in feet (B		en Interval in feet (BTOC):
DISCUSSION OF STREET	ME CALCULATION	DECORAGE OF				to
190 -	5.57 X	_ 	_ <u>3</u> x	0.0408	= 26.4	gallo:
TD (feet)	WL (leet) /	West	encektri Senkenkenk ili keki konditerri birki Seleki Seleki			
PURGE TIME			UEGERALE		and district the metal-war	AL PURGE VOLUME
Annual Property and Personal Property and Pe	Stop	CONTRACTOR OF THE PARTY OF THE	nitial gpm	Final	gpm	<u>≥ 7.0</u> gallor
THOUGHT SHOW THE PARTY OF THE P	ETER MEASUR	THE PERSON NAMED IN COLUMN 1		. 0:		Fig.
Minutes Since Pumping Began	pH Cond. (μmhos/c	m) T目記 Oth		nutes Since ping Began	ρΗ Cond. (μmhos/cm)	T C Other
Initial !	6.6 268	11.5				
S. Co. Street	6.9 294	12.5				
A CONTRACTOR OF THE PERSON NAMED IN	6.8 296	13.0				
27gal	6.7 301	13-2				
			N	eter Nos.	8975250	
Observations Duri	ng Purging (Wetl C	ondition, Turbidity,	Color, Odor):	1410	Dum -1517	,
Discharge Water C	Disposal: Sanita	ny Sewer Sto	m Sewer 🖽 O	her IIV	RUM, ONSITE	-
	5 世生的 里科	语言 [[6] [b]	VELL SAMP	LING		
SAMPLING ME	THOD			Same As Ab	ove	
Bailer - Type:_				Grab - Type:		
		dder; Pump No.:		Other - Type		
SAMPLE DIST	The second secon	ample Series: 91				
Sample No.	Volume/Cont.	Analysis Request BTEX TPH		vatives	Lab A ICT AAC	Comments
1901	3 VOAS	DICK IPA	GAR HO	. (NETPAC	
						-
	-					

Duplicate Samples		Blank	Samples	Other 8	
Original Sample No.	Duplicate Sample No.	Туре	Sample No.	Туре	
	 		-		
	-				

Sample No.

Harding Lawson Associates Engineers and Geoscientists

RL004

GRO	UND-WATER SAMPLING FORM
Well No.	mw-7_

0746

Well Type: ☐Monitor ☐Extraction ☐ Other ___

o Name _ 🤄	CYON AL	ANDIE	PA	_ Well Material:					
Number	Number 4167,326.02 rded by Thomas Nett			Date <u>3~ I</u>	Date 3-19-91 Time 10:00				
corded by $_$	hours &	inneture)		_ Sampled by		710	(initials)		
CONSTRUCTION OF THE PARTY	(12) B		WELL	PURGING	THE CHIEF	SUA INVIT			
URGE VOLUM	date:	C SINCE THE SECOND		PURGE MET	THOD				
SO TO SECURITY SHOWING	Open.			☐ Bailer - Type	-	t"Pu) C		
asing Diameter (D	in inches): sh □ 6-inch □	Other				trifugal 🗌 Blade		No ·	
	ng (TD in feet BT)						201, 1 21119	110	
	(WL in feet BTOC)				-	and the second second			
	lumes to be purge		-		SHARING SAME	ear Top 🔲 Ot	her		
and the same of th	10 Other	- ("/				Scree			
NATIONAL PROPERTY AND ADDRESS OF THE PARTY AND	ME CALCULATION	ON:						to	
*	THE PROPERTY OF STREET AND STREET AND STREET AND ASSAULT OF STREET	e distributances.	2 v 3	Y 0.0408	=	23.6			
TD (feet)	WL (feet) X	D (inches)	- ^ 	X 0.0408		Calculated P	urge Volun	galic	
Ution VIVIE	•	, ,				value or no a respective de la compansa de la compa	anno sociologgia di Zioni andiami (mi Dell')		
	0 .	.						gallo	
A Company of the Comp	Stop		initiai	gpm Final	gpr	n		ganç	
Minutes Since	Cond.	1 -13-0		Minutes Since	all	Cond.	T Pic	Other	
umping Began	PH (μmhos/c			Pumping Began	рН	(µmhos/cm)	'□°F	Other	
	7.1 307	13.9			-			-	
	6.6 288	14.4			-			 	
16 gal	6.6 291	150							
				11					
24 gal	g Purging (Well C	condition, Tur		_ / 1417	œui	u; ONSIT	-6		
24 gal Disservations During ischarge Water Disservations ME	g Purging (Well Cisposal: Sanit	condition, Tur	bidity, Color, C	Odor): er Other A	ove				
Disservations Durin ischarge Water Di SAMPLING ME	g Purging (Well Cosposal: Sanit	condition, Tur	bidity, Color, C	odor): er Pother LAV I SAMPLING Same As Ab Grab - Type	ove				
bservations Durin ischarge Water Di AMPLING ME	g Purging (Well Clisposal: Sanit	condition, Tur ary Sewer	bidity, Color, C Storm Sew WELL No.:	odor): er Pother LAV I SAMPLING Same As Ab Grab - Type	ove				
Deservations Durin ischarge Water Di AMPLING ME DESILE - Type:	g Purging (Well Clisposal: Sanit	condition, Tur ary Sewer adder; Pump Sample Series	bidity, Color, C Storm Sew WELL No.:	odor): er Pother LAV I SAMPLING Same As Ab Grab - Type	oove :	Lab		Comments	
bservations Durin ischarge Water Di AMPLING ME	g Purging (Well Clisposal: Sanit	condition, Tur ary Sewer adder; Pump Sample Series	bidity, Color, C	Odor): er Dother LAV SAMPLING Same As Ab Grab - Type Other - Type	oove :				
bservations Durin scharge Water Di AMPLING ME Saller - Type:	g Purging (Well Clisposal: Sanit	condition, Tur ary Sewer adder; Pump Sample Series	bidity, Color, C Storm Sew WELL No.: S: 1903 Requested	odor): er Pother LAV SAMPLING Same As Ab Grab - Type Other - Type Preservatives	oove :	Lab			
Deservations Durin scharge Water Discharge Water Discharge Water Discharge Water Discharge Water Discharge Water - Type:	g Purging (Well Clisposal: Sanit	condition, Turnary Sewer adder; Pump Sample Series Analysis F	bidity, Color, C Storm Sew WELL No.: S: 1903 Requested	odor): er Pother LAV SAMPLING Same As Ab Grab - Type Other - Type Preservatives	oove :	Lab			
bservations Durin scharge Water Di AMPLING ME Saller - Type:	g Purging (Well Clisposal: Sanit	condition, Turnary Sewer adder; Pump Sample Series Analysis F	bidity, Color, C Storm Sew WELL No.: S: 1903 Requested	odor): er Pother LAV SAMPLING Same As Ab Grab - Type Other - Type Preservatives	oove :	Lab			
bservations Durin ischarge Water Di AMPLING ME Baller - Type:	g Purging (Well Clisposal: Sanit	condition, Turnary Sewer adder; Pump Sample Series Analysis F	bidity, Color, C Storm Sew WELL No.: S: 1903 Requested	odor): er Pother LAV SAMPLING Same As Ab Grab - Type Other - Type Preservatives	oove :	Lab			
bservations Durin ischarge Water Di AMPLING ME Baller - Type:	g Purging (Well Clisposal: Sanit	condition, Turnary Sewer adder; Pump Sample Series Analysis F	bidity, Color, C Storm Sew WELL No.: S: 1903 Requested	odor): er Pother LAV SAMPLING Same As Ab Grab - Type Other - Type Preservatives	oove :	Lab			
bservations Durin ischarge Water Di AMPLING ME Baller - Type:	g Purging (Well Clisposal: Sanit	condition, Turnary Sewer adder; Pump Sample Series Analysis F	bidity, Color, C Storm Sew WELL No.: S: 1903 Requested	odor): er Pother LAV SAMPLING Same As Ab Grab - Type Other - Type Preservatives	oove :	Lab			
Disservations During ischarge Water Discharge Water Discharge Water Discharge Water Discharge Water Discharge Manuel Discharge No. 1908	g Purging (Well Clisposal: Sanit	Condition, Turnary Sewer adder; Pump Sample Series Analysis F 7 PH -G B T 6	bidity, Color, C Storm Sew WELL No.: S: 1903 Requested	odor): er Pother LAV SAMPLING Same As Ab Grab - Type Other - Type Preservatives	oove :	Lab			
bservations Durin ischarge Water Di AMPLING ME Saller - Type: Submersible DISTE Sample No. 1908	g Purging (Well Cosposal: Sanitalismosal: Sani	Condition, Turnary Sewer adder; Pump Sample Series Analysis F TOH-G BT6	bidity, Color, C Storm Sew WELL No.: 1903 Requested	Odor): er Prother IN A SAMPLING Same As Ab Grab - Type Other - Type Preservatives HCJ	ove	Lab PET PAC		comments	
DUALITY CON	g Purging (Well Consposal: Sanitalist Sanita	Condition, Turnary Sewer adder; Pump Sample Series Analysis F TOH-G BT6	bidity, Color, C	Odor): er Prother IN A SAMPLING Same As Ab Grab - Type Other - Type Preservatives	ove	Lab PET PAC	C	comments	
DUALITY CON	g Purging (Well Cosposal: Sanitalismosal: Sani	Condition, Turnary Sewer adder; Pump Sample Series Analysis F TOH-G BT6	bidity, Color, C Storm Sew WELL No.: 1903 Requested	Odor): er Prother IN A SAMPLING Same As Ab Grab - Type Other - Type Preservatives HCJ	ove	Lab PET PAC	C	comments	
bservations Durin ischarge Water Di AMPLING ME Saller - Type: Submersible DISTE Sample No. 1908	g Purging (Well Cosposal: Sanitalismosal: Sani	Condition, Turnary Sewer adder; Pump Sample Series Analysis F TOH-G BT6	bidity, Color, C Storm Sew WELL No.: 1903 Requested	Odor): er Prother IN A SAMPLING Same As Ab Grab - Type Other - Type Preservatives HCJ	ove	Lab PET PAC	C	comments	
bservations Durin ischarge Water Di AMPLING ME Saller - Type: Submersible DISTE Sample No. 1908	g Purging (Well Cosposal: Sanitalismosal: Sani	Condition, Turnary Sewer adder; Pump Sample Series Analysis F TOH-G BT6	bidity, Color, C Storm Sew WELL No.: 1903 Requested	Odor): er Prother IN A SAMPLING Same As Ab Grab - Type Other - Type Preservatives HCJ	ove	Lab PET PAC	C	comments	



NET Pacific, Inc. 435 Tesconi Circle Santa Rosa, CA 95401

Tel: (707) 526-7200 Fax: (707) 526-9623

Michelle Watson Harding Lawson Associates 200 Rush Landing Novato, CA 94947

Date: 04-02-91

NET Client Acct No: 281 NET Pacific Log No: 6588 Received: 03-19-91 1353

REVISED 04-22-91

Client Reference Information

Exxon Alameda; Job: 04167,326.02

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Jules Skamarack / Laboratory Manager

JS:rct Enclosure(s)



Client No: 281

Client Name: Harding Lawson Associates

NET Log No: 6588

2 Page:

Date: 04-02-91

Ref: Exxon Alameda; Job: 04167,326.02

			91031901 03-19-91 0750	91031902 03-19-91 0810	
		Reporting			
Parameter	Method	Limit	80378	80379	Units
PETROLEUM HYDROCARBONS					
VOLATILE (WATER)					
DILUTION FACTOR *			1000	20	
DATE ANALYZED			03-26-91	03-25-91	
METHOD GC FID/5030					
as Gasoline		0.05	180	11	mg/L
METHOD 602					2.
DILUTION FACTOR *			1000	20	
DATE ANALYZED			03-26-91	03-25-91	
Benzene		0.5	11,000	1,500	ug/L
Ethylbenzene		0.5	5,600	620	ug/L
Toluene		0.5	55,000	740	ug/L
Xylenes, total		0.5	28,000	2,100	ug/L



© Client No: 281

Client Name: Harding Lawson Associates

NET Log No: 6588

Date: 04-02-91

Page:

Ref: Exxon Alameda; Job: 04167,326.02

			91031903	91031904	· · · · · · · · · · · · · · · · · · ·
			03-19-91	03-19-91	
			0825	0840	
Parameter	Method	Reporting Limit	80380	80381	Units
PETROLEUM HYDROCARBONS					
VOLATILE (WATER)					
DILUTION FACTOR *			1	50	
DATE ANALYZED			03-25-91	03-25-91	
METHOD GC FID/5030					
as Gasoline		0.05	ND	18	mg/L
METHOD 602					
DILUTION FACTOR *			1	50	
DATE ANALYZED			03-25-91	03-25-91	
Benzene		0.5	ND	4,200	ug/L
Ethylbenzene		0.5	ND	1,100	ug/L
Toluene		0.5	ND	2,100	ug/L
Xylenes, total		0.5	ND	1,200	ug/L



Client No: 281

Client Name: Harding Lawson Associates NET Log No:

Date: 04-02-91

Page:

Ref: Exxon Alameda; Job: 04167,326.02

6588

			91031905 03-19-91	91031906 03-19-91	
			0905	0930	
		Reporting			
Parameter	Method	Limit	80382	80383	Units
PETROLEUM HYDROCARBONS					
VOLATILE (WATER)					
DILUTION FACTOR *			100	200	
DATE ANALYZED			03-25-91	03-26-91	
METHOD GC FID/5030					
as Gasoline		0.05	17	48	mg/L
METHOD 602					•.
DILUTION FACTOR *			100	200	
DATE ANALYZED			03-25-91	03-26-91	
Benzene		0.5	2,900	4,500	ug/L
Ethylbenzene		0.5	580	2,100	ug/L
Toluene		0.5	610	1,600	ug/L
Xylenes, total		0.5	1,200	5,500	ug/L



® Client No: 281

Client Name: Harding Lawson Associates

NET Log No: 6588

Date: 04-02-91

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Ref: Exxon Alameda; Job: 04167,326.02

					<u>_</u>
			91031907	91031908	
			03-19-91	03-19-91	
			0940	1000	
		Reporting			
Parameter	Method	Limit	80384	80385	Units
PETROLEUM HYDROCARBONS					
VOLATILE (WATER)					
DILUTION FACTOR *			1	100	
DATE ANALYZED			03-27-91	03-26-91	
METHOD GC FID/5030					
as Gasoline		0.05	1.4	44	mg/L
METHOD 602					= -
DILUTION FACTOR *			50	100	
DATE ANALYZED			03-26-91	03-26-91	
Benzene		0.5	900	1,600	ug/L
Ethylbenzene		0.5	390	3,400	ug/L
Toluene		0.5	45	740	ug/L
Xylenes, total		0.5	150	8,600	ug/L



Client Acct: 281

Client Name: Harding Lawson Associates

NET Log No: 6588

Page: 6

Date: 04-02-91

Ref: Exxon Alameda; Job: 04167,326.02

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	0.05	mg/L	96	ND	82	73	12
Benzene	0.5	ug/L	106	ND	86	77	11
Toluene	0.5	ug/L	106	ND	93	86	8.0
Gasoline	0.05	mg/L	9 1	ND	94	87	7.7
Toluene	0.5	ug/L	120	ND	100	97	2.9
Benzene	0.5	ug/L	110	ND	105	95	9.5
Benzene	0.5	ug/L	106	ND	86	95	10
Toluene	0.5	ug/L	106	ND	93	99	6.0

COMMENT: Blank Results were ND on other analytes tested.



KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in results column indicates analyte
		not detected at the value following. This datum supercedes
		the listed Reporting Limit.

: Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated Reporting Limits by the dilution factor (but do not multiply reported values).

ICVS : Initial Calibration Verification Standard (External Standard).

mean : Average; sum of measurements divided by number of measurements.

mg/Kg (ppm): Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).

mg/L : Concentration in units of milligrams of analyte per liter of sample.

mL/L/hr : Milliliters per liter per hour.

MPN/100 mL : Most probable number of bacteria per one hundred milliliters

of sample.

N/A : Not applicable.

NA : Not analyzed.

ND : Not detected; the analyte concentration is less than applicable

listed reporting limit.

NTU : Nephelometric turbidity units.

RPD : Relative percent difference, 100 [Value 1 - Value 2]/mean value.

SNA : Standard not available.

ug/Kg (ppb) : Concentration in units of micrograms of analyte per kilogram

of sample, wet-weight basis (parts per billion).

ug/L : Concentration in units of micrograms of analyte per liter of

sample.

umhos/cm : Micromhos per centimeter.

Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev. 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

 $\underline{\mathtt{SM}}$: see "Standard Methods for the Examination of Water & Wastewater, 16th Edition, APHA, 1985.