PACIFIC
ENVIRONMENTAL
GROUP, INC.

Noted E. P. SO. DEC 18 1991

12/16 WZR + QR.
• RemGW in operation

December 16, 1991
Project 330-06.13

Mr. Charles Carmel
ARCO Products Company
P. O. Box 5811
San Mateo, California 94402

Re: ARCO Service Station 0608
17601 Hesperian Boulevard at Hacienda Avenue
San Lorenzo, California

Dear Mr. Carmel:

This letter presents the results of a groundwater investigation performed by Pacific Environmental Group, Inc. (PACIFIC), on behalf of ARCO Products Company (ARCO), to further define the off-site extent of gasoline hydrocarbons in groundwater downgradient of the ARCO service station referenced above (Figure 1). The investigation follows a Work Plan dated February 13, 1991, a progress letter dated August 15, 1991, and a supplemental letter dated September 12, 1991. These documents were prepared in response to a letter to ARCO from Alameda County Health Agency, dated January 8, 1991.

This report includes a discussion of the Scope of Work performed including field and laboratory procedures, and investigative findings and conclusions. In addition, this report documents quarterly groundwater monitoring results and reports remedial activities performed by PACIFIC for the third quarter of 1991. A discussion of site background information was presented in the January 2, 1991 site assessment report.

SCOPE OF WORK

The February 1991 Work Plan, August 1991 progress letter, and September 1991 supplemental letter proposed the installation of a total of 13 additional groundwater monitoring wells. Based on data gathered during field activities, only 11 wells were installed to define the downgradient (western) extent of hydrocarbons. The two additional wells proposed in the September 1991 supplement letter were not installed.

1601 Civic Center Drive, Suite 202, Santa Clara, California 95050 (408) 984-6536 FAX: (408) 243-3911
620 Contra Costa Boulevard, Suite 209, Pleasant Hill, California 94523 (510) 825-0855 FAX: (510) 825-0882

In order to document the downgradient extent of hydrocarbons in the groundwater, Wells MW-13 through MW-17 were installed in the residential area west of the site, on June 25, 1991. Preliminary results from these wells were reported in the August 15, 1991 progress letter. To further define the extent of hydrocarbons in groundwater, Wells MW-18 through MW-23 were installed downgradient of the site on October 2 and 3, 1991. Wells MW-18 and MW-19 were installed on Via Magdalena Avenue, Well MW-20 on Potrero Court, Wells MW-21 and MW-22 on Via Flores Avenue, and Well MW-23 on Via Encinas Court (Figure 2). PACIFIC sampled all site monitoring wells on either September 24, 1991, (Wells MW-7 through MW-17) as part of routine quarterly sampling or October 4, 1991, (Wells MW-18 through MW-23) subsequent to the well installation. Drilling and sampling procedures are described in Attachment A. The locations of these wells are presented on Figure 3.

Groundwater from all sampled wells were analyzed for total petroleum hydrocarbons calculated as gasoline (TPH-g) and benzene, toluene, ethylbenzene, and xylenes (BTEX compounds). The analytical method for determining the presence of TPH-g is taken from EPA Methods 8015, 8020, and 5030 using the purge-and-trap technique, with final detection by gas chromatography using a flame-ionization detector and a photo-ionization detector (PID). The certified analytical reports are presented in Attachment B.

As proposed in the February 1991 Work Plan and the August 1991 progress letter, ARCO has performed a well canvass in the area downgradient of the site, and has sampled selected domestic irrigation wells. These activities will be reported in a separate document. The locations of the domestic irrigation wells sampled are shown on Figure 2.

FINDINGS

Subsurface Conditions

Soils encountered in Borings MW-13 through MW-17, installed on June 25, 1991, and Borings MW-18 through MW-23, installed on October 2 and 3, 1991, consisted predominantly of clays to the maximum explored depth of 25 feet. A clayey to silty sand unit was noted at depths ranging from 8 to 14 feet in Borings MW-13, MW-15, MW-17, and MW-22. A silty sand unit was also noted at similar depths from Borings MW-8 through MW-11 in previous investigations. This unit may represent a channel deposit. These coarser grained units trend in an east-west direction. Cross-sections A-A' and B-B', showing generalized subsurface conditions, are presented on Figures 3 and 4. (Figure 3 is reproduced from a previous site assessment report dated January 2, 1991). Boring logs are presented in Attachment A.

Groundwater was encountered in the lower portions of the clayey to silty sand units in the wells containing them. Groundwater in the borings was first encountered between the depths of 13 to 14 feet, and stabilized between approximately 12-1/2 and 14-1/2 feet below grade.

Organic Vapor Analysis

The concentrations of organic vapors, measured with the PID during the June 1991 drilling, were found to range from non-detectable levels to 50 parts per million (ppm) in borings for Wells MW-13 through MW-17. Concentrations during the October 1991 drilling were found to range from non-detectable levels to 1 ppm in soil samples collected during this investigation (Borings MW-18 through MW-23). All organic vapors were noted at the 14 to 15-1/2-foot depth interval. PID measurements of hydrocarbon levels are useful for indicating relative levels of contamination, but cannot be used to evaluate hydrocarbon levels with the confidence of laboratory analysis. The results of the PID field analyses are noted on the attached boring logs.

Groundwater Monitoring

Water level data collected on October 4, 1991, were used to construct the groundwater contour map presented on Figure 5. Depth to groundwater was found to range between approximately 12 to 15-1/2 feet. Groundwater flow during this investigation was to the west with an approximate gradient of 0.002. These findings are consistent with groundwater data from previous quarters.

Groundwater Analytical Results

During the September and October 1991 sampling events, groundwater samples from all wells sampled were found to contain non-detectable levels of gasoline and BTEX compounds, with the exception of Wells MW-8, MW-10, MW-16, and MW-17 which contained TPH-g concentrations ranging from 150 ppb (MW-17) to 430 ppb (MW-16). BTEX compounds were detected in these wells ranging from non-detectable levels of xylenes in Well MW-8 to 51 ppb benzene in Well MW-8. No separate-phase hydrocarbons were noted in any wells this quarter. This quarter, TPH-g and benzene concentrations declined by approximately 1 order of magnitude in Wells MW-10, MW-15, MW-16, and MW-17.

The present extent of hydrocarbons seems to be confined to wells that are within the boundary of the apparent channel deposit; however, not all wells within the channel contain detectable levels of hydrocarbons. A dissolved gasoline and benzene concentration map is presented as Figure 6.

REMEDIAL ACTIVITIES

PACIFIC completed construction of a groundwater treatment system at the site on September 25, 1991. Following a start-up and testing period, the treatment system became fully operational on October 15, 1991. The treatment system effluent is discharged into the sanitary sewer under permit from the Oro Loma Sanitary District obtained on April 4, 1991 (Attachment C). Future plans may include discharge to the storm drain under an NPDES permit.

The groundwater treatment system consists of three aqueous phase carbon units connected in series. The primary and secondary vessels are equipped with valving to allow the order of the vessels to be rotated in the process flow (i.e., the secondary vessel, after replacement of the primary vessel, becomes the primary vessel and newly replaced vessel becomes the secondary). The third vessel is connected so that the option exists for its use as a polishing filter for the treatment system effluent, though the present influent concentrations and discharge limits of the Oro Loma Sanitary District do not warrant its use at the present time. A Process and Instrumentation Diagram for the treatment system is shown on Figure 7.

Groundwater is presently extracted from Extraction Well E-1A which produces less than 5 gallons per minute (gpm), which is well within the designed flow for the treatment system. Table 2 contains metered flow volumes for the treatment system. Analytical results for samples taken during the start-up and testing period are summarized in Table 3.

During the start-up and testing period, the treatment system effluent contained levels of arsenic which were above the discharge limits of the Oro Loma Sanitary District. The Oro Loma Sanitary District limits arsenic to 0.1 micrograms per liter. Subsequent investigations by PACIFIC concluded that the activated carbon was the source of the arsenic detected in the treatment system effluent. Arsenic was not detected in the treatment system influent. The carbon was changed in all vessels. Analytical results of effluent samples taken after changing the carbon yielded arsenic levels within discharge permit limitations. During the entire start-up and testing period all effluent from the treatment system was pumped into a tank located at the site. The effluent water contained in the tank and the activated carbon removed from the site were disposed of as non-hazardous waste at appropriate, certified facilities. All related documentation for transportation and disposal are retained by ARCO. Certified analytical reports and chain-of-custody documentation are found in Attachment B.

SUMMARY OF FINDINGS

A summary of the findings and conclusions of this investigation follows:

- Soils encountered during drilling of the borings for Wells MW-13 through MW-23 consisted primarily of clays, clayey sands, and sands to the maximum explored depth of 25 feet. A clayey to silty sand unit was noted in Borings MW-13, MW-15, MW-17, and MW-22 between the depths of approximately 8 and 14 feet, possibly representing a channel deposit.
- During drilling, groundwater was encountered and stabilized at depths between 12-1/2 and 14-1/2 feet. Water level data collected on October 4, 1991 indicates a westerly groundwater flow direction at an approximate gradient of 0.002.
- No separate-phase hydrocarbons were detected in any on- or off-site wells during the September 24 and October 4, 1991 sampling events.
- In September 1991, TPH-g and BTEX compound concentrations in groundwater samples collected from all wells sampled were at non-detectable levels, except for Wells MW-8, MW-10, MW-16, and MW-17, which contained TPH-g concentrations ranging from 150 ppb (MW-17) to 430 ppb (MW-16). BTEX compounds were found in these wells at concentrations ranging from non-detectable levels of xylenes in Well MW-8 to 51 ppb benzene in Well MW-8.
- In October 1991, groundwater samples collected from the newly installed off-site wells (MW-18 through MW-23) contained non-detectable concentrations of TPH-g and BTEX compounds.

CONCLUSIONS

Based on the findings of the June and October 1991 investigative activities, petroleum hydrocarbons have been noted to extend off site in a westerly direction (downgradient). Hydrocarbons have appeared to preferentially migrate off site along an apparent subsurface channel, which trends in an east-west direction.

The nearest documented water-supply wells downgradient of the site, Wells E, F, G, and H (Figure 1), are located beyond the maximum extent of hydrocarbons.

Based on the results of the recent quarterly monitoring event, the extent of hydrocarbons in groundwater is currently fully defined to non-detectable levels of TPH-g and BTEX compounds.

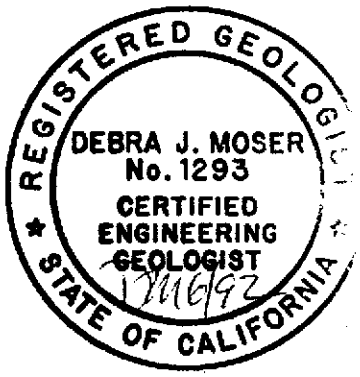
If you have any questions concerning the contents of this report, please call.

Sincerely,

Pacific Environmental Group, Inc.

Terry Gyrion
Staff Geologist

Debra J. Moser
Senior Geologist
CEG 1293



Attachments:
Table 1 - Summary of Groundwater Analytical Results
Table 2 - Treatment System Metered Flow Volume
Table 3 - Treatment System Analytical Results
Figure 1 - Site Location Map
Figure 2 - Extended Site Map
Figure 3 - Cross Section A-A'
Figure 4 - Cross Section B-B'
Figure 5 - Groundwater Contour Map
Figure 6 - Dissolved Gasoline and Benzene Concentration Map
Figure 7 - Process and Instrumentation Diagram
Attachment A - Drilling, Groundwater Sampling, Analytical Procedures, and Boring Logs MW-13 through MW-23
Attachment B - Certified Analytical Reports, Chain-of-Custody Documentation, and Field Data Sheets
Attachment C - Wastewater Discharge Permit

cc: Chris Winsor, ARCO Products Company
Pamela Evans, Alameda County Health Agency-Hazardous Materials Division
Richard Hiett, Regional Water Quality Control Board - S.F. Bay Region

3300613\REPORT

Table 1
Summary of Groundwater Analytical Results

Low-Boiling Hydrocarbons

ARCO Service Station 0608
17601 Hesperian Boulevard at Hacienda Avenue
San Lorenzo, California

Well Number (Elev.)	Sample Date	Groundwater Elevation (feet, MSL)	Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylenes (ppb)
MW-1	01/11/88	NA	300	20	10	50	80
			Well Destroyed				
MW-2	07/05/85	NA	32,000	1,000	690	NA*	1,500*
	01/11/88	NA	3,300	804	115	168	166
			Well Destroyed				
MW-3	01/11/88	NA	1,800	20	20	80	60
(33.27)	03/07/89	21.31	150,000	4,600	5,200	5,600	13,000
	06/21/89	20.42	63,000	2,700	5,800	3,300	12,000
	12/12/89	19.81	Not Sampled--Insufficient Water Volume				
	03/29/90	20.06	1,100,000**	13,000	60,000	17,000	91,000
	05/08/90	20.04	NS	NS	NS	NS	NS
	06/22/90	NA	Not Sampled--Insufficient Water Volume				
	07/18/90		Well Destroyed				
MW-4	01/11/88	NA	62,000	2,700	7,900	850	5,200
(32.43)	09/12/88	NA	Not Sampled--Separate-Phase Hydrocarbon				
	03/07/89	21.67	84,000	2,400	3,400	2,500	7,600
	06/21/89	20.47	31,000	400	800	200	1,500
	12/12/89	NA	Not Sampled--Well Dry				
	03/29/90	20.71	Not Sampled-0.01 foot Separate-Phase Hydrocarbon				
	05/08/90	20.24	NS	NS	NS	NS	NS
	06/22/90	NA	Not Sampled--Well Dry				
	07/18/90	NA	Well Destroyed				
MW-5	01/11/88	NA	31,000	4,000	2,700	3,800	5,500
(33.99)	03/07/89	21.25	1,300	340	ND	140	50
	06/21/89	20.73	1,100	200	ND	130	40
	12/12/89	NA	Not Sampled--Well Dry				
	03/29/90	20.69	Not Sampled--Insufficient Water Volume				
	05/08/90	NA	NS	NS	NS	NS	NS
	06/22/90	20.47	Not Sampled--Insufficient Water Volume				
	09/19/90	20.00	Not Sampled--Well Dry				
	12/27/90	NA	Not Sampled--Well Dry				
	03/21/91	20.99	Not Sampled--Well Dry				
	06/26/91	20.74	Not Sampled--Well Dry				
	07/03/91	20.66	NS				
NS	NS	NS	NS				
	09/24/91	NA	Not Sampled--Well Dry				
	10/04/91	NA	Not Sampled--Well Dry				

Table 1 (continued)
Summary of Groundwater Analytical Results

Low-Boiling Hydrocarbons

ARCO Service Station 0608
17601 Hesperian Boulevard at Hacienda Avenue
San Lorenzo, California

Well Number (Elev)	Sample Date	Groundwater Elevation (feet, MSL)	Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylenes (ppb)
MW-6	06/21/89	20.47	1,700	170	170	85	290
(E-1)	12/12/89	19.79	500	26	7	8	18
(32.95)	03/29/90	20.56	130	14	9	4	11
	05/08/90	20.02	NS	NS	NS	NS	NS
	06/22/90	20.01	150	15	5	4	13
	07/18/90		---------- Well Destroyed ----------				
MW-7	04/13/90	NA	<50	<0.3	<0.3	<0.3	<0.3
(34.40)	05/08/90	20.42	NS	NS	NS	NS	NS
	06/22/90	20.49	<50	0.5	1	0.6	3
	09/19/90	19.31	<50	<0.3	<0.3	<0.3	<0.3
	12/27/90	19.73	69	<0.3	0.3	0.4	2
	03/21/91	21.52	<30	<0.30	<0.30	<0.30	<0.30
	06/26/91	20.55	<30	<0.30	<0.30	<0.30	<0.30
	07/03/91	20.45	NS	NS	NS	NS	NS
	09/24/91	18.86	<30	<0.30	<0.30	<0.30	<0.30
	10/04/91	18.80	NS	NS	NS	NS	NS
MW-8	04/13/90	NA	4,900	350	16	450	33
(32.79)	05/08/90	20.02	ND	NS	NS	NS	NS
	06/22/90	20.06	3,700	370	12	330	28
	09/19/90	18.84	140	4	3	3	3
	12/27/90	19.23	1,200	7	0.3	53	<0.3
	03/21/91	21.01	540	8.8	<6.0	21	9.6
	06/26/91	20.13	2,100	290	<6.0	56	<6.0
	07/03/91	20.04	NS	NS	NS	NS	NS
	09/24/91	18.82	260	51	0.34	7.9	<0.30
	10/04/91	18.78	NS	NS	NS	NS	NS
MW-9	04/13/90	NA	<50	<0.3	<0.3	<0.3	2
(32.11)	05/08/90	20.09	NS	NS	NS	NS	NS
	06/22/90	20.18	12,000	200	3	250	180
	09/19/90	18.93	<50	<0.3	<0.3	<0.3	0.6
	12/27/90	19.34	<50	<0.3	<0.3	<0.3	<0.3
	03/21/91	21.17	<30	<0.30	<0.30	<0.30	<0.30
	06/26/91	20.19	<30	<0.30	<0.30	<0.30	<0.30
	07/03/91	20.09	NS	NS	NS	NS	NS
	09/24/91	18.84	<30	<0.30	<0.30	<0.30	<0.30
	10/04/91	18.82	NS	NS	NS	NS	NS

Table 1 (continued)
Summary of Groundwater Analytical Results

Low-Boiling Hydrocarbons

ARCO Service Station 0608
17601 Hesperian Boulevard at Hacienda Avenue
San Lorenzo, California

Well Number (Elev)	Sample Date	Groundwater Elevation (feet, MSL)	Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylenes (ppb)
MW-10	04/13/90	NA	10,000	150	4	280	200
(31.67)	05/08/90	19.51	NS	NS	NS	NS	NS
	06/22/90	19.57	9,700	28	<0.3	131	210
	09/19/90	18.26	1,800	<0.3	4	0.8	10
	12/27/90	18.00	5,700	7	3	95	61
	03/21/91	20.56	6,900	22	<15	92	33
	06/26/91	19.67	9,300	51	<0.30	59	34
	07/03/91	19.51	NS	NS	NS	NS	NS
	09/24/91	18.27	360	8.6	5.2	14	6.2
	10/04/91	18.17	NS	NS	NS	NS	NS
MW-11	04/13/90	NA	<50	<0.3	<0.3	<0.3	<0.3
(32.54)	05/08/90	19.70	NS	NS	NS	NS	NS
	06/22/90	19.72	63	0.4	0.9	0.7	3
	09/19/90	18.45	<50	<0.3	<0.3	<0.3	<0.3
	12/27/90	18.88	<50	<0.3	<0.3	<0.3	<0.3
	03/21/91	20.69	<30	<0.30	<0.30	<0.30	<0.30
	06/26/91	19.85	<30	<0.30	<0.30	<0.30	<0.30
	07/03/91	19.73	NS	NS	NS	NS	NS
	09/24/91	18.51	<30	<0.30	<0.30	<0.30	<0.30
	10/04/91	18.36	NS	NS	NS	NS	NS
E-1A	09/19/90	18.75	<50	7	0.9	1	2
(MW-12)	12/27/90	19.09	<50	3	0.5	1	1
(33.06)	03/21/91	20.95	<30	4.2	<0.30	1.1	0.89
	06/26/91	20.16	41	6.3	<0.30	1.2	0.59
	07/03/91	20.06	NS	NS	NS	NS	NS
	09/24/91	NA	NS	NS	NS	NS	NS
MW-13	07/03/91	20.23	<30	<0.30	<0.30	<0.30	<0.30
(35.42)	09/24/91	18.97	<30	<0.30	<0.30	<0.30	<0.30
MW-14	07/03/91	19.41	<30	<0.30	<0.30	<0.30	<0.30
(30.46)	09/24/91	18.16	<30	<0.30	<0.30	<0.30	<0.30
	10/04/91	18.08	NS	NS	NS	NS	NS
MW-15	07/03/91	18.98	570	1.8	1.0	1.0	2.2
(31.41)	09/24/91	17.72	<30	<0.30	<0.30	<0.30	<0.30
	10/04/91	17.61	NS	NS	NS	NS	NS
MW-16	07/03/91	18.47	2,700	31	6.9	4.6	3.1
(31.39)	09/24/91	17.29	430	1.8	1.3	1.9	1.5
	10/04/91	17.19	NS	NS	NS	NS	NS

Table 1 (continued)
Summary of Groundwater Analytical Results

Low-Boiling Hydrocarbons

ARCO Service Station 0608
17601 Hesperian Boulevard at Hacienda Avenue
San Lorenzo, California

Well Number (Elev)	Sample Date	Groundwater Elevation (feet, MSL)	Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylenes (ppb)
MW-17	07/03/91	18.68	1,200	12	1.9	28	40
(32.43)	09/24/91	17.45	150	2.7	0.50	3.9	0.59
	10/04/91	17.23	NS	NS	NS	NS	NS
MW-18 (29.70)	10/04/91	16.70	<30	<0.30	<0.30	<0.30	<0.30
MW-19 (29.02)	10/04/91	16.59	<30	<0.30	<0.30	<0.30	<0.30
MW-20 (29.54)	10/04/91	16.98	<30	<0.30	<0.30	<0.30	<0.30
MW-21 (28.72)	10/04/91	15.84	<30	<0.30	<0.30	<0.30	<0.30
MW-22 (29.29)	10/04/91	15.92	<30	<0.30	<0.30	<0.30	<0.30
MW-23 (30.99)	10/04/91	16.49	<30	<0.30	<0.30	<0.30	<0.30

NA = Not available
ppb = Parts per billion
NS = Not sampled
* = Ethylbenzene and xylenes given as a combined value.
** = Well contained slight product sheen.

MW-1 and MW-2 destroyed prior to March 7, 1989 sampling event.
MW-3, MW-4, and MW-6 (E-1) destroyed June 18, 1990.

Table 2
Treatment System Metered Flow Volume

ARCO Service Station 0608
17601 Hesperian Boulevard
San Lorenzo, California

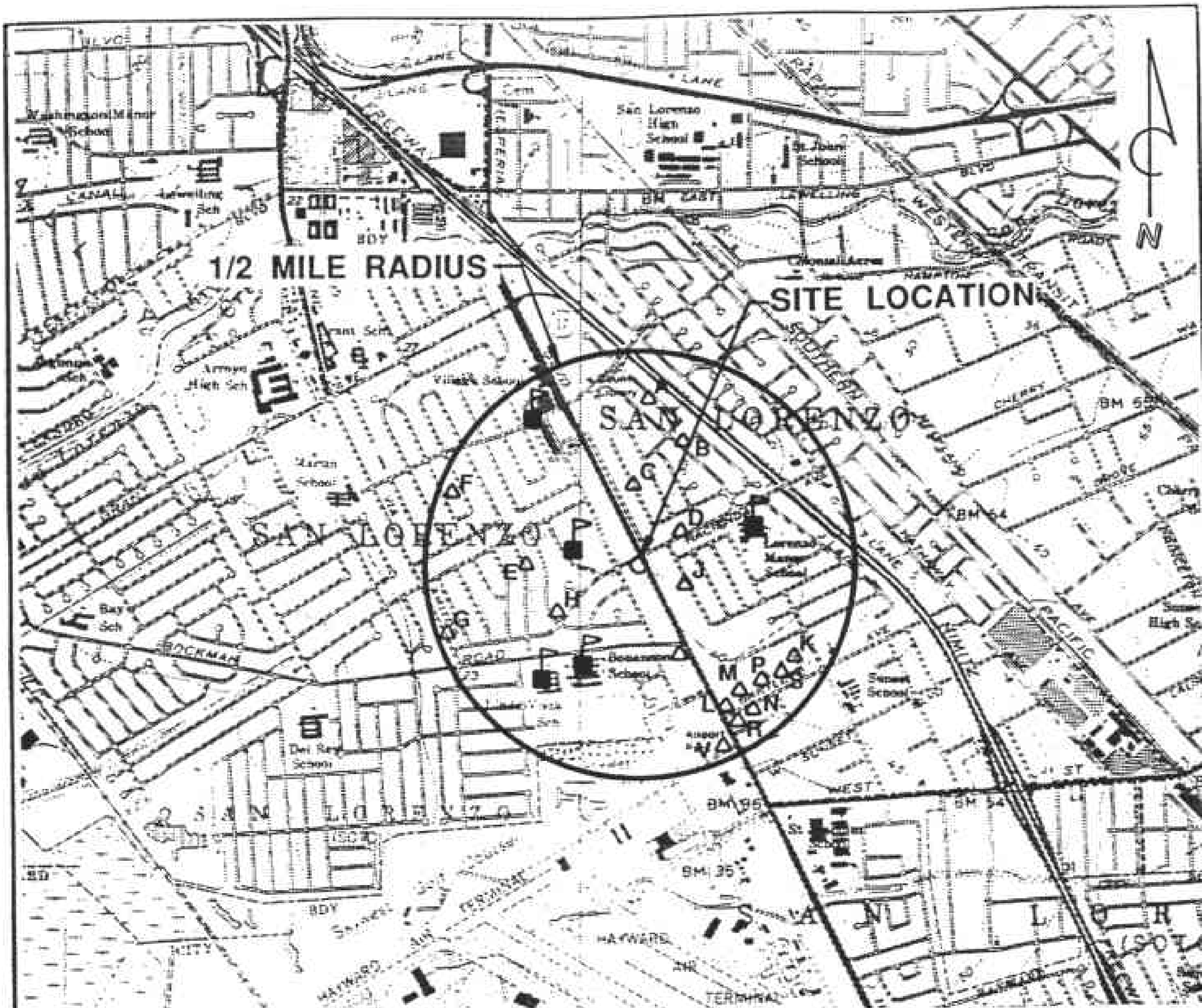
Meter Reading Date	Meter Reading (gallons)	Volume Since Previous Reading (gallons)	Volume Since Start-up (gallons)	Approximate Flow Rate (gpm)
09/25/91	0	0	0	NA*
09/26/91	1144	1,144	1144	0.8
10/15/91	5146	4,002	5146	0.1
10/22/91	12,844	7,698	12,844	0.9

gpm = Gallons per minute
* = Startup

Table 3
Treatment System Analytical Results

ARCO Service Station 0608
17601 Hesperian Boulevard
San Lorenzo, California

Sample Date	Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylenes (ppb)
INFL (influent to primary carbon)					
09/26/91	38	4.8	0.60	1.6	1.1
10/22/91	<30	<0.30	<0.30	<0.30	<0.30
MID-1 (between carbons)					
09/25/91	<30	<0.30	<0.30	<0.30	<0.30
10/22/91	<30	<0.30	<0.30	<0.30	<0.30
EFFL (effluent to sewer)					
09/25/91	<30	<0.30	<0.30	<0.30	<0.30
10/22/91	<30	<0.30	<0.30	<0.30	<0.30
ppb = Parts per billion					



QUADRANGLE LOCATIONS

LEGEND:

SCHOOL

A △ WATER SUPPLY WELL DESIGNATION AND APPROXIMATE LOCATION

REFERENCE:
USGS 7.5 MIN. TOPOGRAPHIC MAP
TITLED: HAYWARD, CALIFORNIA
DATED: 1959 REVISED: 1980
TITLED: SAN LEANDRO, CALIFORNIA
DATED: 1959 REVISED: 1980

SCALE

2000 0 2000 FEET

PACIFIC ENVIRONMENTAL GROUP, INC.	ARCO SERVICE STATION #0608 17601 Hesperian Boulevard San Lorenzo, California	FIGURE: 1
	SITE LOCATION MAP	PROJECT: 330-06.13

N

VIA MANZANAS

RESIDENTIAL

MW-20

POTRERO COURT

APARTMENTS

APARTMENTS

VIA ARRIBA

SHOPS

HESPERIAN BOULEVARD

MW-19

VIA MAGDALENA

VIA FLORES

B

CHURCH AND SCHOOL

RESTAURANT

MW-21

MW-18

MW-17

MW-14

RESIDENTIAL

RESTAURANT

MW-9

VIA MEDIA

A

E-1A

MW-8

MW-5

A'

MW-16

MW-10

MW-7

VALLEY

RESIDENTIAL

MW-15

MW-11

MW-22

MW-13

VIA ENCINAS COURT

RESIDENTIAL

SHOPS

B'

HACIENDA AVENUE

MW-23

RESIDENTIAL

VIA ALAMO

LEGEND

MW-7 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

E-1A ◔ GROUNDWATER EXTRACTION WELL LOCATION AND DESIGNATION

■ APPROXIMATE LOCATION OF DOMESTIC IRRIGATION WELL

A — A' LINE OF GEOLOGIC CROSS-SECTION (SEE FIGURES 3 & 4)

PACIFIC ENVIRONMENTAL GROUP, INC.

APPROXIMATE SCALE

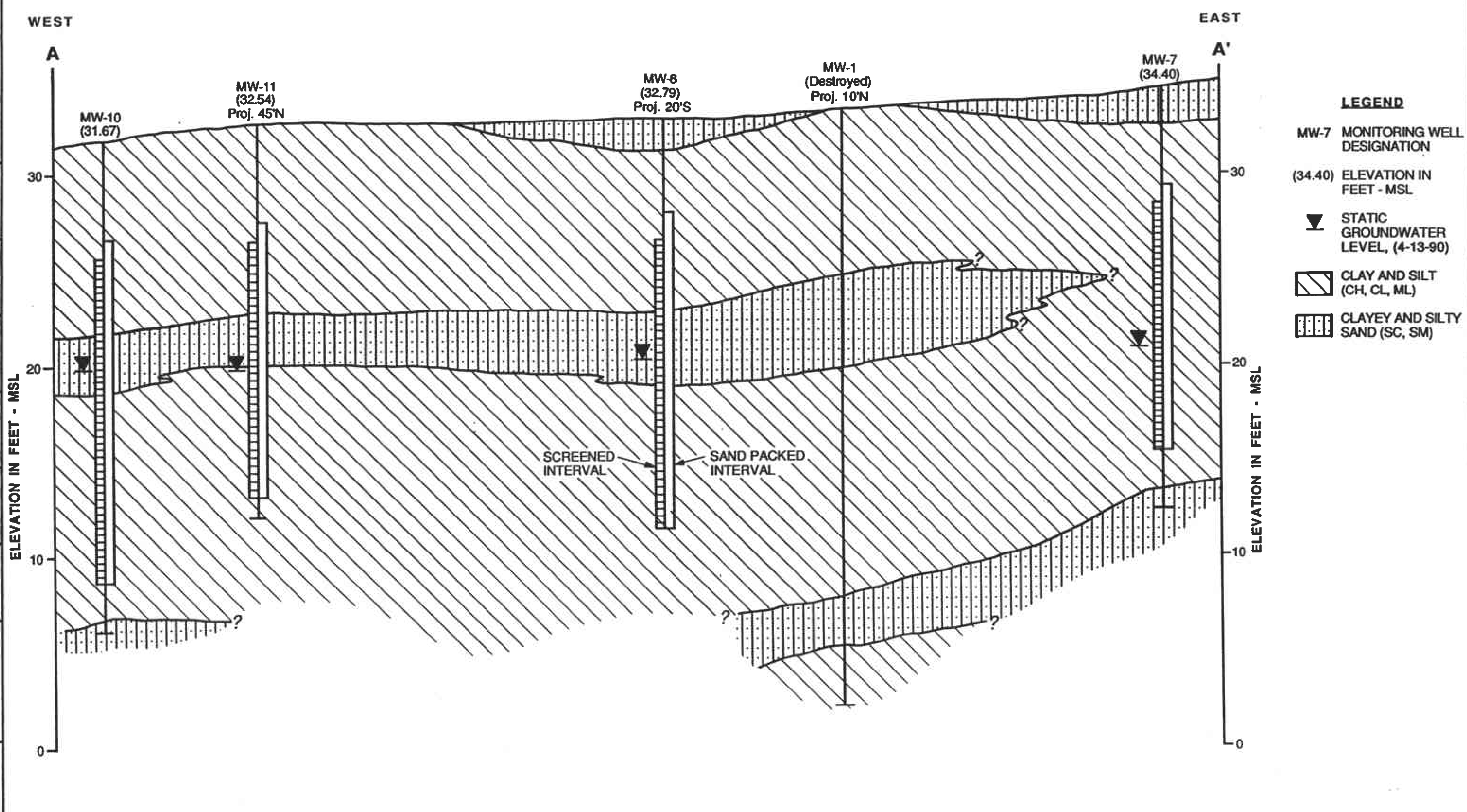
0 150 300 FEET

ARCO SERVICE STATION #0608
17601 Hesperian Boulevard at Hacienda Avenue
San Lorenzo, California

EXTENDED SITE MAP

FIGURE: **2**
PROJECT: 330-06.13

12/16/91



PROJECT NUMBER
DRAWN BY
DATE/NUMBER
REVISIONS

PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE

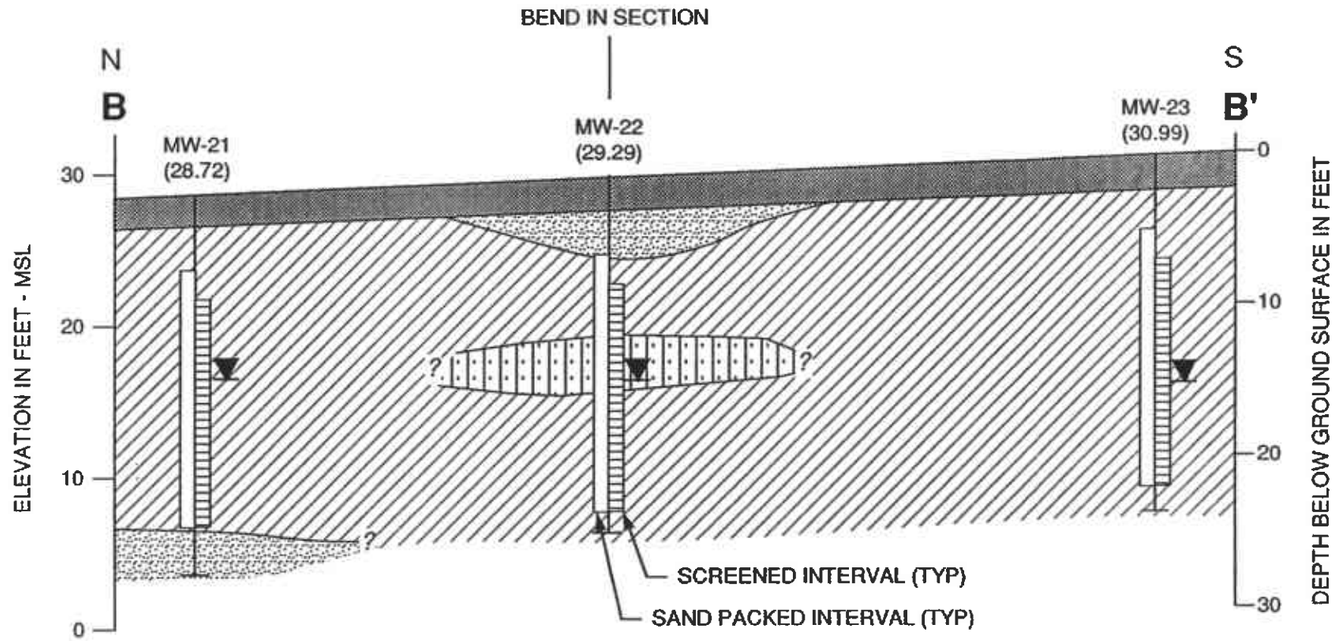
HORIZONTAL 1" = 30'
VERTICAL 1" = 5'

ARCO SERVICE STATION #0608
17601 Hesperian Boulevard
San Lorenzo, California

CROSS SECTION A-A'

FIGURE: 3

PROJECT: 330-06.13



LEGEND

- FILL
- CLAY (CL, CH)
- CLAYEY SAND (SC)
- SAND (SP)
- MW-22 GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- (30.99) WELL ELEVATION IN FEET - MSL
- STATIC WATER LEVEL, 10-4-91

PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
HORIZONTAL : 1" = 100'
VERTICAL : 1" = 10'

ARCO SERVICE STATION #0608
17601 Hesperian Boulevard at Hacienda Avenue
San Lorenzo, California

GEOLOGIC CROSS-SECTION B-B'

FIGURE:
4
PROJECT:
330-06.13

12/16/91

N

VIA MANZANAS

RESIDENTIAL

MW-20 (16.98)

POTRERO COURT

APARTMENTS

APARTMENTS

VIA ARRIBA

SHOPS

HESPERIAN BOULEVARD

RESTAURANT

MW-19 (16.59)

VIA MAGDALENA

CHURCH AND SCHOOL

MW-21 (15.84)

MW-18 (16.70)

MW-17 (17.23)

MW-14 (18.08)

RESIDENTIAL

RESTAURANT

MW-9 (18.82)

VIA MEDIA

VIA FLORES

RESIDENTIAL

MW-16 (17.19)

MW-10 (18.17)

E-1A (NA)

MW-8 (18.78)

MW-5 (DRY)

ALLEY

MW-7 (18.80)

MW-22 (15.92)

MW-15 (17.61)

MW-11 (18.36)

VIA ENCINAS COURT

16.0

HACIENDA AVENUE

18.0

18.5

RESIDENTIAL

MW-13 (NA)

SHOPS

MW-23 (16.49)

17.5

17.0

16.5

RESIDENTIAL

VIA ALAMO

LEGEND

MW-7 — GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

E-1A — GROUNDWATER EXTRACTION WELL LOCATION AND DESIGNATION

(18.82) — GROUNDWATER ELEVATION IN FEET - MSL, 10-4-91

16.0 — GROUNDWATER ELEVATION CONTOUR IN FEET - MSL, 10-4-91

(NA) — DATA NOT AVAILABLE

(DRY) — WELL DRY ON SAMPLE DATE

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

APPROXIMATE GRADIENT= 0.002

PACIFIC ENVIRONMENTAL GROUP, INC.

APPROXIMATE SCALE

0 150 300 FEET

ARCO SERVICE STATION #0608
17601 Hesperian Boulevard at Hacienda Avenue
San Lorenzo, California

GROUNDWATER CONTOUR MAP

FIGURE: **5**

PROJECT: 330-06.13

12/16/91

N

VIA MANZANAS
RESIDENTIAL
* MW-20
ND/ND
POTRERO COURT
APARTMENTS
APARTMENTS
VIA ARRIBA
SHOPS
HESPERIAN BOULEVARD
RESTAURANT
* MW-19
ND/ND
VIA MAGDALENA
CHURCH
AND SCHOOL
* MW-18
ND/ND
400/2.7
MW-17
150/2.7
MW-14
ND/ND
RESIDENTIAL
RESTAURANT
* MW-21
ND/ND
VIA MEDIA
VIA FLORES
ND/ND
ND/ND
72/0.64
100
MW-9
ND/ND
300/5.5
NS: E1-A
10
MW-8
260/51
MW-5
(DRY)
MW-16
430/1.8
MW-10
360/8.6
RESIDENTIAL
10
780/13
870/9.0
31/ND
MW-15
ND/ND
MW-11
ND/ND
ND/ND
MW-7
ND/ND
* MW-22
ND/ND
VIA ENCINAS COURT
HACIENDA AVENUE
ND/ND
RESIDENTIAL
MW-13
ND/NDSHOPS
* MW-23
ND/ND
RESIDENTIAL
VIA ALAMO

LEGEND

- MW-7 — GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- E-1A — GROUNDWATER EXTRACTION WELL LOCATION AND DESIGNATION
- ■ — APPROXIMATE LOCATION OF DOMESTIC IRRIGATION WELL
- 150/2.7 — MONITORING WELL DISSOLVED GASOLINE/BENZENE CONCENTRATION IN PARTS PER BILLION (ppb), 9-24-91 AND 10-4-91
- * — WELL SAMPLED ON 10-4-91
- 400/2.7 — DOMESTIC WELL DISSOLVED GASOLINE/BENZENE CONCENTRATION IN ppb, 9-91, 10-91, or 11-91
- 10 — BENZENE ISOCONCENTRATION CONTOUR IN ppb
- 100 — GASOLINE ISOCONCENTRATION CONTOUR IN ppb
- ND — NONE DETECTED
- NS — NOT SAMPLED
- (DRY) — WELL DRY ON SAMPLE DATE

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

PACIFIC ENVIRONMENTAL GROUP, INC.

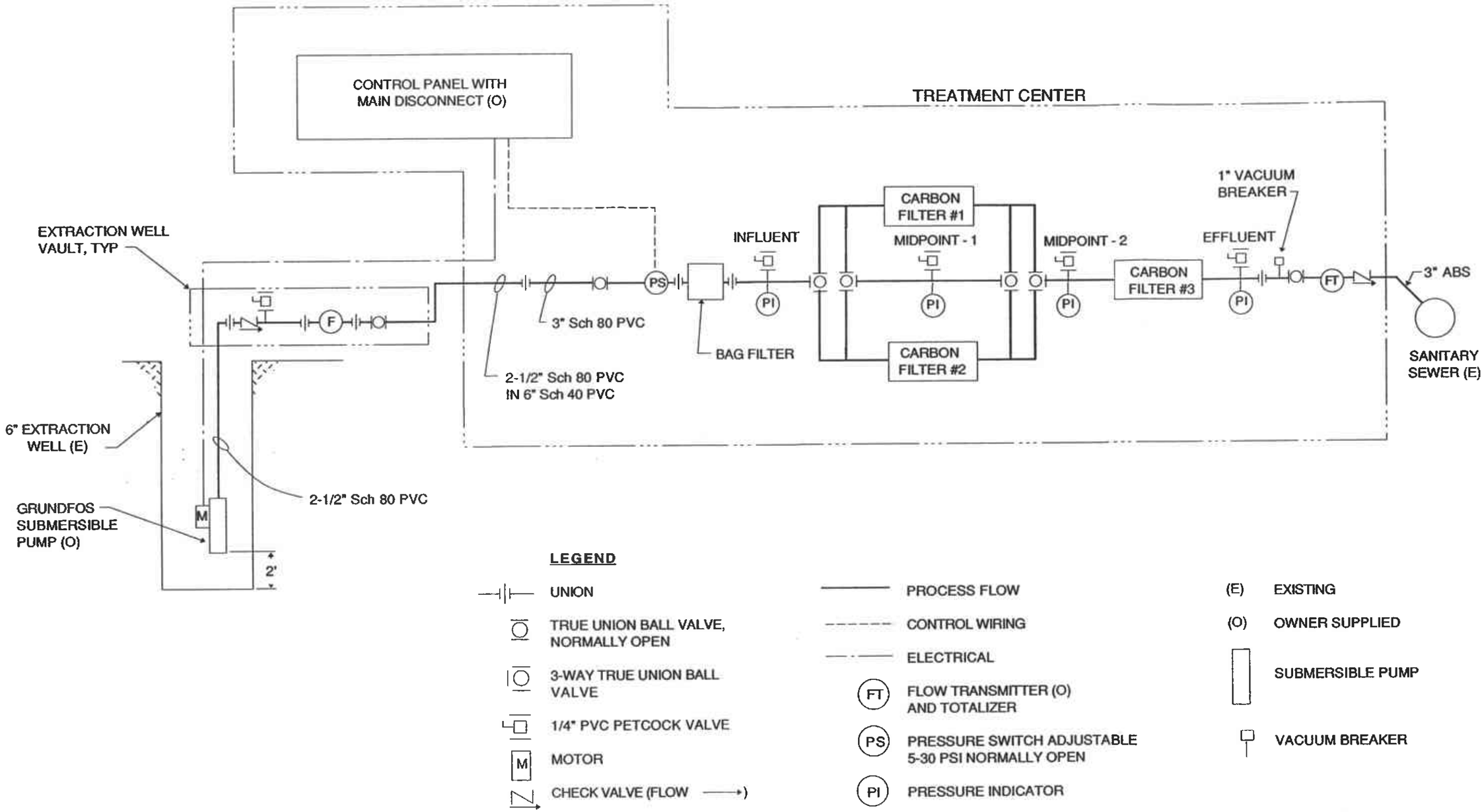
APPROXIMATE SCALE
0 150 300 FEET

ARCO SERVICE STATION #0608
17601 Hesperian Boulevard at Hacienda Avenue
San Lorenzo, California

DISSOLVED GASOLINE AND BENZENE ISOCONCENTRATION MAP

FIGURE: 6
PROJECT: 330-06.13

12/16/91



PACIFIC ENVIRONMENTAL GROUP, INC.

NOT TO SCALE

ARCO SERVICE STATION #608
17601 Hesperian Boulevard at Hacienda Boulevard
San Lorenzo, California

PROCESS AND INSTRUMENTATION DIAGRAM - GROUNDWATER TREATMENT SYSTEM

FIGURE:
7
PROJECT:
330-06.13

12/16/91

ATTACHMENT A

DRILLING, GROUNDWATER SAMPLING, ANALYTICAL PROCEDURES, AND BORING LOGS MW-13 THROUGH MW-18

ATTACHMENT A
DRILLING, GROUNDWATER SAMPLING, AND ANALYTICAL PROCEDURES

Drilling and Well Construction Procedures

The borings for the groundwater monitoring wells were drilled according to Alameda County guidelines using an 8-inch diameter, hollow-stem auger drilling equipment. The borings were logged by a PACIFIC geologist using the Unified Soil Classification System and standard geologic techniques. Soil samples for logging and chemical analysis were collected at 5-foot depth intervals by advancing a California-modified split-spoon sampler with brass liners into undisturbed soil beyond the tip of the auger. The sampler was driven a maximum of 18 inches, using a 140-pound hammer with a 30-inch drop. The hollow-stem augers and down-hole sampling equipment were steam cleaned between borings. All soil samples were contained in brass liners, capped with aluminum foil and plastic end caps, sealed in clean glass jars, labeled, and logged onto chain-of-custody documents. The samples were placed on ice for storage in the event that soil analysis was performed. No field evidence for hydrocarbons was noted; therefore, no soil samples were submitted to the laboratory for analysis.

Soil samples collected at 5-foot intervals during drilling were analyzed in the field for ionizable organic compounds using the HNU Model PI-101 (or equivalent) photo-ionization detector (PID) with a 10.2 eV lamp. The test procedure involved measuring approximately 30 grams from an undisturbed soil sample, placing this sub-sample in a clean glass jar, and sealing the jar with aluminum foil secured under a ring-type threaded lid. The jar was warmed for approximately 20 minutes (in the sun), then the foil was pierced and the head-space within the jar was tested for total organic vapor, measured in ppm (volume/volume). The instrument was calibrated prior to drilling using a 100-ppm isobutylene standard (in air) and a sensitivity factor of 5.5 which relates the photo-ionization potential of isobutylene at 10 ppm. The PID readings are noted on the attached boring logs.

All residual soils obtained from drilling operations were stockpiled on site (on plastic sheeting) until laboratory analyses were completed and the results evaluated.

Arrangements were then made for disposal to an appropriate landfill based on the detected gasoline concentrations.

While drilling the borings for the monitoring wells, groundwater was encountered between approximately 13 and 14 feet below grade. The borings were then advanced a maximum of 11 feet into the water-bearing zone. The borings were converted to groundwater monitoring wells with the installation of 3-inch diameter, Schedule 40 PVC casing and 0.020-inch factory-slotted screen. Screen was installed through the entire saturated section, extending a minimum of 5 feet above the static water level. Graded 12 x 20 Monterey sand pack was placed in the annular space across the screened interval, and extends approximately 1 to 2 feet above the screen. A bentonite and concrete seal was placed from the top of the sand pack to the ground surface. A locking cap and protective vault box was then installed on the top of each well. All wells were surveyed for elevation based on mean sea level by a licensed surveyor. Well construction details are included on the attached boring logs.

This Attachment contains boring logs for Wells MW-13 through MW-17, which were not submitted with the August 15, 1991 progress letter.

Well Development and Sampling Procedures

Well development consisted of surging and bailing the well until it produced clear water while attempting to remove 10 casing volumes of water. The sampling procedure for each well consists first of measuring the water level and checking for the presence of separate-phase hydrocarbons using either an electronic indicator and a clear Teflon bailer or an oil-water interface probe. Wells not containing separate-phase hydrocarbons are then purged of approximately four casing volumes (or to dryness) using a centrifugal pump, gas displacement pump, or bailer. Equipment used for the current sampling event is noted on the attached field data sheets. During purging, temperature, pH, and electrical conductivity are monitored in order to document that these parameters are stable prior to collecting samples. After purging, water levels are allowed to partially recover. Groundwater samples are collected using a Teflon bailer, placed into appropriate EPA-approved containers, labeled, logged onto chain-of-custody documents, and transported on ice to a California State-certified laboratory.

Water generated during well installation, development, and sampling, was stored on site in 55-gallon drums until analytical results were evaluated, at which point appropriate disposal activities were implemented, including the removal of purged water by a licensed hauler. The water was delivered to a site permitted to accept such wastes.

Laboratory Analyses

The groundwater samples were analyzed for the presence of total petroleum hydrocarbons (calculated as gasoline), and BTEX compounds. The analyses were performed according to modified EPA Methods 8015, 8020, and 5030 utilizing a purge-and-trap extraction technique. Final detection was by gas chromatography using a flame-ionization detector and photo-ionization detector. The methods of analyses for the groundwater samples are documented in the certified analytical reports. The certified analytical reports, chain-of-custody documents, and field data sheets are attached to this report.

WELL LOG
KEY TO ABBREVIATIONS

Drilling Method

HSA - Hollow stem auger
CFA - Continous flight auger
Air - Reverse air circulation

Gravel Pack

CA - Coarse aquarium sand

Sampling Method

Cal. Mod. - California modified split-spoon sampler (2" inner diameter) driven 18" by a 140-pound hammer having a 30" drop. Where penetration resistance is designated "P", sampler was instead pushed by drill rig.
Disturbed - Sample taken from drill-return materials as they surfaced.
Shelby - Shelby Tube thin-walled sampler (3" diameter), where sampler is pushed by drill-rig.

Moisture Content

Dry - Dry
Dp - Damp
Mst - Moist
Wt - Wet
Sat - Saturated

Sorting

PS - Poorly sorted
MS - Moderately sorted
WS - Well sorted

Plasticity

L - Low
M - Moderate
H - High

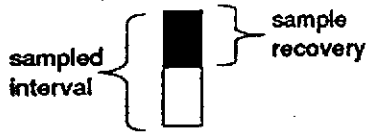
H-NU (ppm)

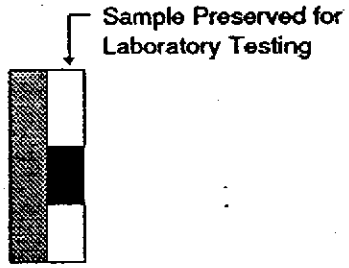
ND - No detection

Symbols

▽ - First encountered ground water

▼ - Static ground water level





Density (Blows/Foot - Cal Mod Sampler)

Sands and gravels

0 - 5	- Very Loose
5 - 13	- Loose
13 - 38	- Medium dense
38 - 63	- Dense
over 63	- Very dense

Silts and Clays

0 - 2.1	- Very Soft
2.1 - 4.3	- Soft
4.3 - 8.6	- Firm
8.6-17	- Stiff
17 - 37	- Very Stiff
37 - 72	- Hard
over 72	- Very Hard

GRAIN - SIZE SCALE

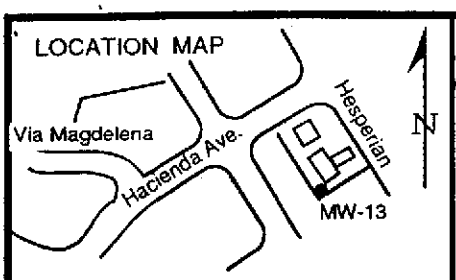
GRADE LIMITS U.S. Standard inch	sieve size	GRADE NAME
12.0		Boulders
3.0	3.0 in.	Cobbles
0.19	No. 4	Gravels
0.08	No. 10	coarse
	No. 40	medium Sand
	No. 200	fine
		Silt
		Clay Size

PACIFIC ENVIRONMENTAL GROUP, INC.

Unified Soil Classification System

Primary Divisions			Group Symbol/Graphic	Typical Names
COARSE GRAINED SOILS more than half is larger than #200 sieve	GRAVELS half of coarse fraction larger than #4 sieve	CLEAN GRAVELS (less than 5% fines)	G W	Well graded gravels, gravel-sand mixtures; little or no fines
			G P	Poorly graded gravels or gravel-sand mixtures; little or no fines
		GRAVEL WITH FINES	G M	Silty gravels, gravel-sand-silt mixtures
			G C	Clayey gravels, gravel-sand-clay mixtures
	SANDS half of coarse fraction smaller than #4 sieve	CLEAN SANDS (less than 5% fines)	S W	Well graded sands, gravelly sands, little or no fines
			S P	Poorly graded sands or gravelly sands, little or no fines
		SANDS WITH FINES	S M	Silty sands, sand-silt mixtures
			S C	Clayey sands, sand-clay mixtures, plastic fines
FINE GRAINED SOILS more than half is smaller than #200 sieve	SILTS AND CLAYS liquid limit less than 50%		M L	Inorganic silts and very fine sand, rock flour, silty or clayey fine sands or clayey silts, with slight plasticity
			C L	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			O L	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS liquid limit more than 50%		M H	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
			C H	Inorganic clays of high plasticity, fat clays
			O H	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS			P t	Peat and other highly organic soils

Pacific Environmental Group, Inc.



PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. MW-13
PAGE 1 OF 1

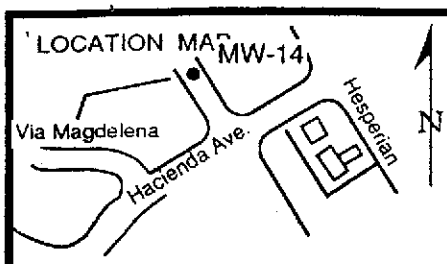
NORTHING	EASTING	ELEVATION
995.09	893.02	35.42 (TOB)

PROJECT NO. 330-06.11
LOGGED BY: JC
DRILLER: WHM
DRILLING METHOD: HSA
SAMPLING METHOD: CAL MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: 2 x 12

CLIENT: ARCO
DATE DRILLED: 06/25/91
LOCATION: 17601 Hesperian
HOLE DIAMETER: 8"
HOLE DEPTH: 25 1/2'
WELL DIAMETER: 3"
WELL DEPTH: 23'
CASING STICKUP: N/A

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT				2				ASPHALT - FILL; road base very dense
	Mst	-	35	4			CL	CLAY; dark brown; low plasticity 10-15% fine to coarse sand; very stiff; no product odor.
				6				
				8				
	Mst	0	32	10			SC	CLAYEY SAND; medium brown; 35-45% clayey fines; fine sand; dense; no product odor.
BENTONITE				12			CL	CLAY; grayish brown; moderate plasticity; 10-15% fine sand; trace medium sand; trace coarse sand; very stiff; no product odor.
	V. Mst	0	26	14				
				16				
				18				
SAND	V. Mst	0	16	20				@19': clay medium gray; low plasticity; iron oxide; very stiff; no product odor.
				22				
Native Soil	V. Mst	0	26	24				@24': as above; very stiff; no product odor.
				26				BOTTOM OF BORING AT 25 1/2'
				28				
				30				
				32				
				34				
				36				
				38				
				40				
				42				
				44				

LOCATION MAP



NORTHING EASTING ELEVATION
1390.95 708.71 30.46 (TOB)

PACIFIC ENVIRONMENTAL GROUP, INC.

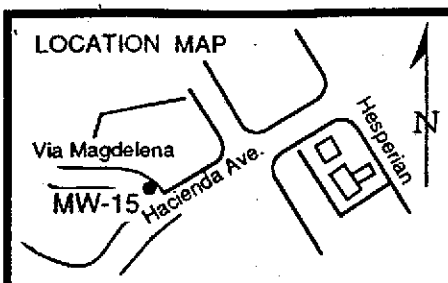
WELL NO. MW-14
PAGE 1 OF 1

PROJECT NO. 330-06.11
LOGGED BY: JC
DRILLER: WHM
DRILLING METHOD: HSA
SAMPLING METHOD: CAL MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: 2 x 12

CLIENT: ARCO
DATE DRILLED: 06/25/91
LOCATION: Via Arriba San Loreno
HOLE DIAMETER: 8"
HOLE DEPTH: 24 1/2'
WELL DIAMETER: 3"
WELL DEPTH: 23'
CASING STICKUP: N/A

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	SOIL TYPE	LITHOLOGY / REMARKS
GROUT				2		ASPHALT - FILL
	V. Mst	0	push	4	CL	CLAY; dark grayish brown; low plasticity; 10-15% fine sand; trace medium to coarse sand; soft; no product odor.
				6		
				8		
	Mst	0	17	10		@9': as above with organic matter; weak paty; structure stiff; faint product odor.
				12		
	V. Mst	10	33	14		@14': as above with maganese oxide.
				16		
				18		
	V. Mst	0	28	20		@19': medium brown; moderate plasticity; 10-20% silt and very fine sand; very stiff; no product odor.
				22		
SAND / BENTONITE				24		@23': very stiff; no product odor.
Native Soil	V. Mst.	0	22			BOTTOM OF BORING AT 24 1/2'
				26		
				28		
				30		
				32		
				34		
				36		
				38		
				40		
				42		
				44		

LOCATION MAP



NORTHING	EASTING	ELEVATION
1224.65	471.07	31.39 (TOB)

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. MW-15
PAGE 1 OF 1

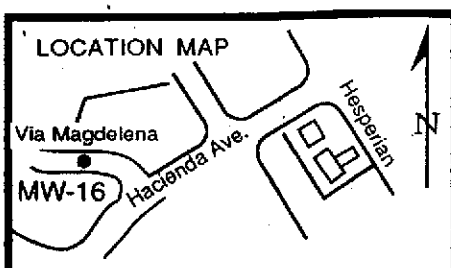
PROJECT NO. 330-06.11
LOGGED BY: JC
DRILLER: WHM
DRILLING METHOD: HSA
SAMPLING METHOD: CAL MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: 2 x 12

CLIENT: ARCO
DATE DRILLED: 06/25/91
LOCATION: Via Magdelena
HOLE DIAMETER: 8"
HOLE DEPTH: 24 1/2
WELL DIAMETER: 3"
WELL DEPTH: 23
CASING STICKUP: N/A

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT				0				ASPHALT - FILL; road base
				2			CL	CLAY; strong brown; low plasticity; 20-30% silt; very fine sand; weak platy structure; stiff; no product odor.
	Mst	0	push	4				
				6				
				8				
	Mst	0	18	10			SM	SILTY SAND; strong brown; 20-25% silty fines; some clay; medium dense; no product odor.
				12			CL	CLAY; medium grayish brown; moderate plasticity; 15-20% silt; very fine sand; blue mottling; very stiff; moderate product odor.
	V. Mst	35	24	14				
				16				
	V. Mst	0	31	18				
				20				@19': as above without blue mottling; very stiff; no product odor.
				22				
	V. Mst	0	21	24				@23': as above; very stiff; no product odor.
				26				BOTTOM OF BORING AT 24 1/2'
				28				
				30				
				32				
				34				
				36				
				38				
				40				
				42				
				44				

SAND
BENTONITE
Native Soil

LOCATION MAP



NORTHING	EASTING	ELEVATION
1357.73	371.65	31.39 (TOB)

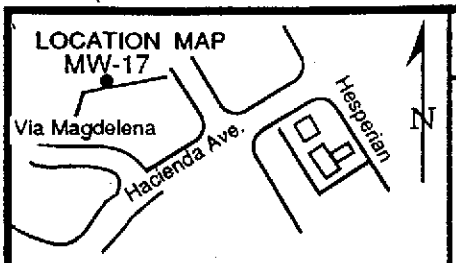
PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. MW-16
PAGE 1 OF 1

PROJECT NO. 330-06.11
LOGGED BY: JC
DRILLER: WHM
DRILLING METHOD: HSA
SAMPLING METHOD: CAL MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: 2 x 12

CLIENT: ARCO
DATE DRILLED: 06/25/91
LOCATION: Via Magdelena
HOLE DIAMETER: 8"
HOLE DEPTH: 24'
WELL DIAMETER: 2"
WELL DEPTH: 23'
CASING STICKUP: N/A

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	SOIL TYPE	LITHOLOGY / REMARKS
GROUT				0		ASPHALT - FILL
				2	SC	CLAYEY SAND; 30-35% clayey fines; fine sand.
	Mst	0	push	6		
				8	CL	CLAY; medium brown; moderate plasticity; 10-15% fine to coarse sand.
BENTONITE	Mst	0	23	10		
				12		
	V. Mst	10	29	14		@13.5': moderate product odor; blue mottling; very stiff; faint product odor.
				16		
				18		
SAND	V. Mst	0	33	20		@20': as above without blue mottling; very stiff; no product odor.
				22		
	V. Mst	0		24		@23-24': as above; no product odor.
				26		BOTTOM OF BORING AT 24 1/2'
				28		
				30		
				32		
				34		
				36		
				38		
				40		
				42		
				44		



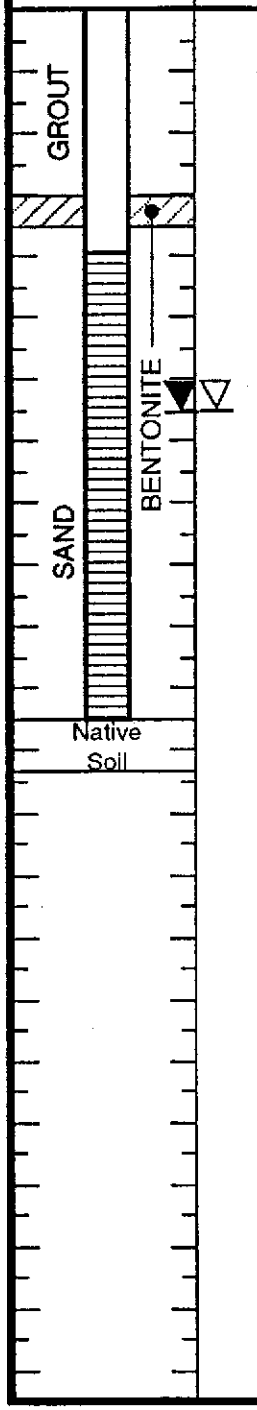
PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. MW-17
PAGE 1 OF 1

PROJECT NO. 330-06.11
LOGGED BY: JC
DRILLER: WHM
DRILLING METHOD: HSA
SAMPLING METHOD: CAL MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: 2 x 12

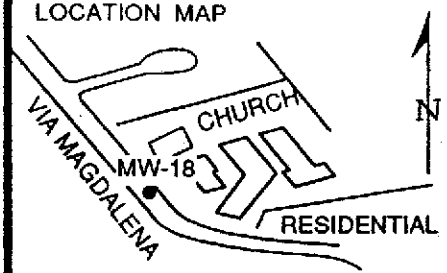
CLIENT: ARCO
DATE DRILLED: 06/25/91
LOCATION: Via Madgelena
HOLE DIAMETER: 8"
HOLE DEPTH: 24 1/2'
WELL DIAMETER: 2"
WELL DEPTH: 23'
CASING STICKUP: N/A

NORTHING	EASTING	ELEVATION
1470.84	457.05	32.43 (TOB)



DEPTH (FEET)	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	SOIL TYPE	LITHOLOGY / REMARKS
0					ASPHALT - FILL, CLAYEY SAND
2				CL	CLAY; black; low plasticity; 30-35% silt ; very fine sand; firm; no product odor.
4					
6	Mst	0	push		
8				SC	CLAYEY SAND; yellowish brown; 20-25% clayey fines; some silt; iron oxide; medium dense; no product odor; odor reported at 13'.
10	Mst	0	23		
12					
14	V. Mst	50	19	CL	CLAY; yellowish brown (extensive blue discoloration along vertical zones); moderate plasticity; 10-15% fine to coarse sand; very stiff; moderate product odor.
16					
18	V. Mst	0	23		@19': clay light yellowish brown; moderate plasticity; 5-10% fine to coarse sand; iron oxide; magnesium oxide; very stiff; no product odor.
20					
22	V. Mst	0	16		@23': stiff; no product odor.
24					BOTTOM OF BORING AT 24 1/2'
26					
28					
30					
32					
34					
36					
38					
40					
42					
44					

LOCATION MAP



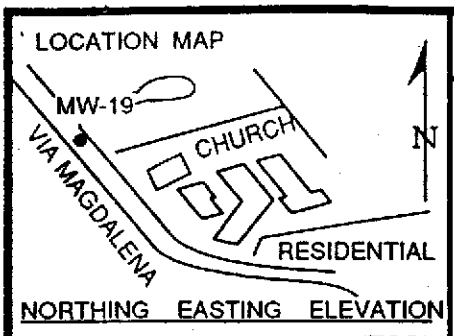
NORTHING	EASTING	ELEVATION
1604.14	235.37	29.70 (TOB)

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. MW-18
PAGE 1 OF 1

PROJECT NO. 330-06.13	CLIENT: ARCO
LOGGED BY: JC	DATE DRILLED: 10-3-91
DRILLER: Baylands	LOCATION: 17200 Magdalena
DRILLING METHOD: HSA	HOLE DIAMETER: 8"
SAMPLING METHOD: STD PCU MOD	HOLE DEPTH: 24.5'
CASING TYPE: Sch 40 PVC	WELL DIAMETER: 3"
SLOT SIZE: 0.020"	WELL DEPTH: 22'
GRAVEL PACK: 2 x 12 SAND	CASING STICKUP:

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT; SOLID CASING; BENTONITE; SAND; NATIVE SOIL	Mst		push	2				ASPHALT; FILL
	Mst		push	4			CL	CLAY; very dark gray; low plasticity; 10-15% silt and fine sand; firm; no product odor. @5': color change to yellowish brown; rootholes; caliche.
	V. Mst Sat		5	6				@9': 25-35% silt and fine sand; firm; no product odor.
	V. Mst Sat		7	8				@14': saturated; stiff; no product odor.
			5	10			CH	CLAY; very pale brown; high plasticity; 10-15% silt and fine sand; trace mud sand; iron oxide mottling; firm; no product odor.
				12				@23': color change to strong brown.
				14				BOTTOM OF BORING AT 24.5'
				16				
				18				
				20				
				22				
				24				
				26				
				28				
				30				
				32				
				34				
				36				
				38				
				40				
				42				
				44				



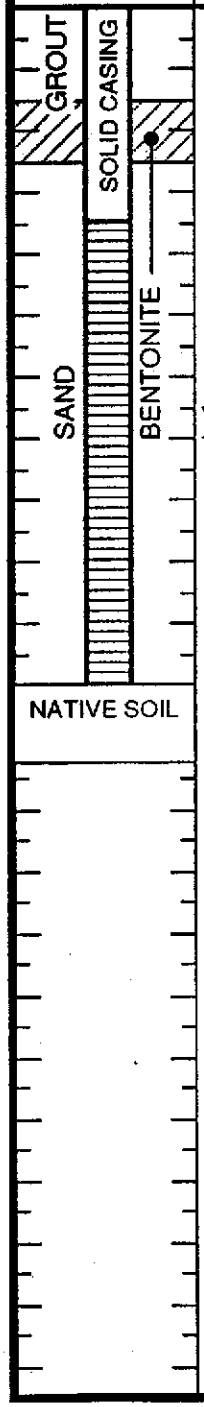
NORTHING EASTING ELEVATION
1798.26 235.49 29.02 (TOB)

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. MW-19
PAGE 1 OF 1

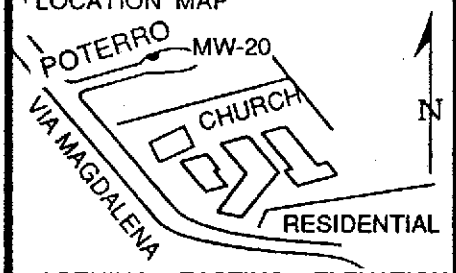
PROJECT NO. 330-06.13
LOGGED BY: JC
DRILLER: Baylands
DRILLING METHOD: HSA
SAMPLING METHOD: STD PCU MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: 2 x 12 SAND

CLIENT: ARCO
DATE DRILLED: 10-3-91
LOCATION: 17105 Magdalena
HOLE DIAMETER: 8"
HOLE DEPTH: 24.5'
WELL DIAMETER: 3"
WELL DEPTH: 22'
CASING STICKUP:



DEPTH (FEET)	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	SOIL TYPE	LITHOLOGY / REMARKS
0					ASPHALT; fill
2				CL	CLAY; very dark gray; low plasticity; 15-20% fine sand and silt; firm; no product odor.
4	Mst	0	push		@5': color change to yellowish brown; firm; rootholes with roots; no product odor.
6					
8					
10	Mst	0	push		@9-10': firm; no product odor.
12					@12': dark grayish brown; 5-15% silt and fine sand; trace coarse sand; stiff; no product odor.
14	V. Mst Sat	0	14		
16					
18					@17': very pale brown; moderate to high plasticity; 5-10% fine sand; trace medium to coarse sand; iron oxide; slight mottling; very stiff; no product odor.
20	V. Mst	0	11		
22					@22': color change to yellowish brown; stiff; no product odor.
24	V. Mst	0	12		
26					BOTTOM OF BORING AT 24.5'
28					
30					
32					
34					
36					
38					
40					
42					
44					

LOCATION MAP



NORTHING	EASTING	ELEVATION
1869.52	358.86	29.54 (TOB)

PACIFIC ENVIRONMENTAL GROUP, INC.

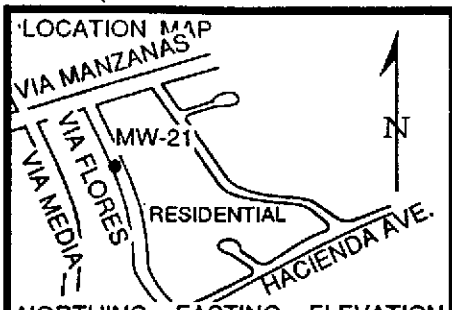
WELL NO. MW-20
PAGE 1 OF 1

PROJECT NO. 330-06.13
LOGGED BY: JC
DRILLER: Baylands
DRILLING METHOD: HSA
SAMPLING METHOD: STD PCU MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: 2 x 12 SAND

CLIENT: ARCO
DATE DRILLED: 10-3-91
LOCATION: 649 POTERRO
HOLE DIAMETER: 8"
HOLE DEPTH: 23.5'
WELL DIAMETER: 3"
WELL DEPTH: 22'
CASING STICKUP:

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT				0				ASPHALT; fill
SOLID CASING				2			CL	CLAY; very dark gray; moderate plasticity; 10-15% fine sand; rootlets; firm; no product odor.
	Mst	0	push 200	4				@8': light olive brown; low plasticity; some silt; 5-10% fine sand; rootholes; caliche; firm; no product odor.
				6				
				8				
BENTONITE	Mst	0	push	10				@9-10': firm; no product odor.
				12				
SAND	V. Mst Sat	0	6	14				@14': firm; no product odor.
				16				
	Sat	0	14	18				@17': very pale brown; moderate to low plasticity; some silt; 5-10% fine sand; trace coarse sand; stiff; no product odor.
				20				
NATIVE SOIL	Sat	0	6	22				@21.5': yellowish brown; moderate plasticity; some silt; 20-30% fine sand; firm; no product odor.
				24				BOTTOM OF BORING AT 23.5'
				26				
				28				
				30				
				32				
				34				
				36				
				38				
				40				
				42				
				44				

LOCATION MAP



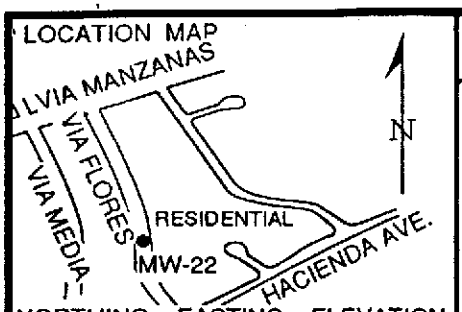
NORTHING	EASTING	ELEVATION
1764.48	-34.22	28.72 (TOB)

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. MW-21
PAGE 1 OF 1

PROJECT NO. 330-06.13	CLIENT: ARCO
LOGGED BY: JC	DATE DRILLED: 10-2-91
DRILLER: Baylands	LOCATION: 17127 VIA FLORES
DRILLING METHOD: HSA	HOLE DIAMETER: 8"
SAMPLING METHOD: STD PCU MOD	HOLE DEPTH: 25'
CASING TYPE: Sch 40 PVC	WELL DIAMETER: 3"
SLOT SIZE: 0.020"	WELL DEPTH: 22'
GRAVEL PACK: 2 x 12 SAND	CASING STICKUP:

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT; SOLID CASING; BENTONITE; SAND; NATIVE SOIL	Mst		push 300 PSI	2				ASPHALT; fill
				4			CL	CLAY; very dark gray; low plasticity; 10-20% fine sand; stiff; no product odor.
				6				@5.5': color change to yellowish brown; caliche.
	Mst		push	8				
				10				@9-10.5': stiff; no product odor.
	V. Mst		6	12				
				14				@14': firm; no product odor.
			5	16				
				18				
				20				@19': very pale brown; 0-5% sand; calcium carbonate; soft; no product odor.
			14	22			SP	SAND; yellowish brown; 0-5% silt and clay; fine sand; medium dense; no product odor.
				24				BOTTOM OF BORING AT 25'
				26				
				28				
				30				
				32				
				34				
				36				
				38				
				40				
				42				
				44				



NORTHING 1869.52 EASTING 358.86 ELEVATION 29.54 (TOB)

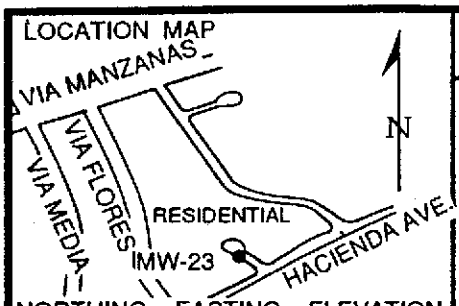
PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. MW-22
PAGE 1 OF 1

PROJECT NO. 330-06.13
LOGGED BY: JC
DRILLER: Baylands
DRILLING METHOD: HSA
SAMPLING METHOD: STD PCU MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: 2 x 12 SAND

CLIENT: ARCO
DATE DRILLED: 10-2-91
LOCATION: 17238 VIA FLORES
HOLE DIAMETER: 8"
HOLE DEPTH: 23.5'
WELL DIAMETER: 3"
WELL DEPTH: 22'
CASING STICKUP:

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT				0				ASPHALT; fill.
				2			SP	SAND; yellowish brown; 5-10% clayey fines; fine sand; medium dense; no product odor.
SOLID CASING	Mst	0	push	4			CL	CLAY; dark yellowish brown; low plasticity; 15-20% fine sand; trace medium to coarse sand; firm; no product odor.
	Mst	0	push	8				
BENTONITE				10			SC	CLAYEY SAND; yellowish brown; 25-30% clayey fines; fine sand; medium dense; no product odor.
SAND	V. Mst	0	8	12				
				14			CH	CLAY; yellowish brown; moderate to high plasticity; 10-15% fine sand; firm; no product odor.
	V. Mst	0	11	16				
				18				
				20			CL	CLAY; very pale brown; moderate plasticity; 10-15% fine sand; calcium carbonate; stiff; no product odor.
NATIVE SOIL				22				@22-23': stiff; rare iron oxide; some silt.
	V. Mst	0	11	24				BOTTOM OF BORING AT 23.5'
				26				
				28				
				30				
				32				
				34				
				36				
				38				
				40				
				42				
				44				



NORTHING 1184.49 | EASTING 120.41 | ELEVATION 30.99 (TOB)

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. MW-23
PAGE 1 OF 1

PROJECT NO. 330-06.13
LOGGED BY: JC
DRILLER: Baylands
DRILLING METHOD: HSA
SAMPLING METHOD: STD PCU MOD
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: 2 x 12 SAND

CLIENT: ARCO
DATE DRILLED: 10-2-91
LOCATION: 17347 VIA MEDIA
HOLE DIAMETER: 8"
HOLE DEPTH: 23.5'
WELL DIAMETER: 3"
WELL DEPTH: 22'
CASING STICKUP:

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	SOIL TYPE	LITHOLOGY / REMARKS
GROUT / SOLID CASING				0		ASPHALT; fill.
				2	SC	CLAYEY SAND; yellowish brown; 15-20% clay and silt.
	Mst	0	push	4	CL	CLAY; strong brown; low plasticity; 20-25% silt and fine sand; iron oxide; no product odor.
	Mst	0	push	8		@9': firm; no product odor.
BENTONITE / SAND	V. Mst	1	10	12		@14': firm; no product odor.
	V. Mst	0	7	16	CH	CLAY; very pale brown; high plasticity; 5-10% fine sand; trace medium to coarse sand; calcium carbonate; firm; no product odor.
NATIVE SOIL	V. Mst		5	20		@22.5': as above.
				24		BOTTOM OF BORING AT 23.5'
				26		
				28		
				30		
				32		
				34		
				36		
				38		
				40		
				42		
				44		

ATTACHMENT B

CERTIFIED ANALYTICAL RESULTS, CHAIN-OF-CUSTODY DOCUMENTATION, AND FIELD DATA SHEETS

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Deb Moser

Project: 330-06.05, Arco 0608, San Lorenzo

Enclosed are the results from 11 water samples received at Sequoia Analytical on September 25,1991. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
1094094	Water, TB-1	9/24/91	EPA 5030/8015/8020
1094098	Water, MW-7	9/24/91	EPA 5030/8015/8020
1094099	Water, MW-8	9/24/91	EPA 5030/8015/8020
1094100	Water, MW-9	9/24/91	EPA 5030/8015/8020
1094101	Water, MW-10	9/24/91	EPA 5030/8015/8020
1094102	Water, MW-11	9/24/91	EPA 5030/8015/8020
1094103	Water, MW-13	9/24/91	EPA 5030/8015/8020
1094104	Water, MW-14	9/24/91	EPA 5030/8015/8020
1094105	Water, MW-15	9/24/91	EPA 5030/8015/8020
1094106	Water, MW-16	9/24/91	EPA 5030/8015/8020
1094107	Water, MW-17	9/24/91	EPA 5030/8015/8020

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

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	330-06.05, Arco 0608, San Lorenzo	Sampled: Sep 24, 1991
1601 Civic Center Drive, Suite 202	Matrix Descript:	Water	Received: Sep 25, 1991
Santa Clara, CA 95050	Analysis Method:	EPA 5030/8015/8020	Analyzed: Oct 4-9, 1991
Attention: Deb Moser	First Sample #:	109-4094	Reported: Oct 10, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
109-4094	TB-1	N.D.	N.D.	N.D.	N.D.	N.D.
109-4098	MW-7	N.D.	N.D.	N.D.	N.D.	N.D.
109-4099	MW-8	260	51	0.34	7.9	N.D.
109-4100	MW-9	N.D.	N.D.	N.D.	N.D.	N.D.
109-4101	MW-10	360	8.6	5.2	14	6.2
109-4102	MW-11	N.D.	N.D.	N.D.	N.D.	N.D.
109-4103	MW-13	N.D.	N.D.	N.D.	N.D.	N.D.
109-4104	MW-14	N.D.	N.D.	N.D.	N.D.	N.D.
109-4105	MW-15	N.D.	N.D.	N.D.	N.D.	N.D.
109-4106	MW-16	430	1.8	1.3	1.9	1.5
109-4107	MW-17	150	2.7	0.50	3.9	0.59
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Deb Moser

Client Project ID: 330-06.05, Arco 0608, San Lorenzo

QC Sample Group: 1094098-4100, 4102-7

Reported: Oct 10, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J. Jencks	J. Jencks	J. Jencks	J. Jencks
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 4, 1991	Oct 4, 1991	Oct 4, 1991	Oct 4, 1991
QC Sample #:	GBLK100491	GBLK100491	GBLK100491	GBLK100491
Sample Conc.:	N.D.	N.D.	N..D	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.4	9.6	9.5	28
Matrix Spike % Recovery:	94	96	95	93
Conc. Matrix Spike Dup.:	9.8	10	9.9	30
Matrix Spike Duplicate % Recovery:	98	100	99	100
Relative % Difference:	4.2	4.1	4.1	6.9

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Deb Moser

Client Project ID: 330-06.05, Arco 0608, San Lorenzo

QC Sample Group: 109-4101

Reported: Oct 10, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	L. Laikhtman	L. Laikhtman	L. Laikhtman	L. Laikhtman
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 7, 1991	Oct 7, 1991	Oct 7, 1991	Oct 7, 1991
QC Sample #:	GBLK100791	GBLK100791	GBLK100791	GBLK100791
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.7	10	9.7	29
Matrix Spike % Recovery:	97	100	97	97
Conc. Matrix Spike Dup.:	10	10	10	30
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	3.0	0.0	3.0	3.4

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Deb Moser

Client Project ID: 330-06.05, Arco 0608, San Lorenzo
QC Sample Group: 109-4094
Reported: Oct 10, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	L. Laikhtman	L. Laikhtman	L. Laikhtman	L. Laikhtman
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 9, 1991	Oct 9, 1991	Oct 9, 1991	Oct 9, 1991
QC Sample #:	GBLK100991	GBLK100991	GBLK100991	GBLK100991
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.8	9.8	9.7	30
Matrix Spike % Recovery:	98	98	97	100
Conc. Matrix Spike Dup.:	10	10	10	31
Matrix Spike Duplicate % Recovery:	100	100	100	103
Relative % Difference:	2.0	2.0	3.0	3.3

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL SAMPLE RECEIPT LOG

CLIENT NAME: PEG
REC. BY (PRINT): SP
MASTER LOG NO. / PAGE:
DATE OF LOG-IN: AN

CIRCLE THE APPROPRIATE RESPONSE	LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION (ETC)
1. Custody Seal(s): Present / (Absent) Intact / Broken*	1094094	A-B	TB-1	2 VOA	W	9/24	
2. Custody Seal Nos.:	098	A-C	MW-7	3 VOA			
	099		MW-8				
	100		MW-9				
3. Chain-of-Custody Records: (Present) / Absent*	101		MW-10				
	102		MW-11				
	103		MW-13				
4. Traffic Reports or Packing List: Present / (Absent)	104		MW-14				
	105		MW-15				
	106		MW-16				
5. Airbill: Airbill / Sticker Present / (Absent)	107		MW-17				
6. Airbill No.:							
7. Sample Tags: (Present) / Absent*							
Sample Tag Nos.: (Listed) / Not Listed on Chain-of-Custody							
8. Sample Condition: (Intact)/Broken*/Leaking*							
9. Does information on custody reports, traffic reports and sample tags agree? (Yes) / No*						–	
10. Proper Preservatives Used: (Yes) / No*							
11. Date Rec. at Lab: 9/25							
12. Time Rec. at Lab: 10:55							

* If Circled, contact Project Manager and attach record of resolution

ARCO Products Company
Division of AtlanticRichfieldCompany

330-0605 **Task Order No.** 601-91-5A

Chain of Custody

ARCO Facility no. 0608	City (Facility) San Lorenzo	Project manager (Consultant) Deb Moser	Laboratory name Sequoia
ARCO engineer Chuck Carmel	Telephone no. (ARCO)	Telephone no. (Consultant) 408 9846536 / Fax no. (Consultant) 408 2433911	Contract number 07-073
Consultant name Pacific Environmental Grp.	Address (Consultant) 1601 Civic Ctr. Santa Clara		Method of shipment Sequoia courier

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH Gas EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
TB-1		2		X		X	Hcl	9/24/91	—		X	1	0	9	4	0	9	4				
MW-7		3		↓		↓	↓	↓	1430		↓		↓			0	9	8				
MW-8		↓		↓		↓	↓	↓	1224		↓		↓			0	9	9				
MW-9		↓		↓		↓	↓	↓	1156		↓		↓			1	0	0				
MW-10		↓		↓		↓	↓	↓	1245		↓		↓			1	0	1				
MW-11		↓		↓		↓	↓	↓	1311		↓		↓			1	0	2				
MW-13		↓		↓		↓	↓	↓	1455		↓		↓			1	0	3				
MW-14		↓		↓		↓	↓	↓	1335		↓		↓			1	0	4				
MW-15		↓		↓		↓	↓	↓	1530		↓		↓			1	0	5				
MW-16		↓		↓		↓	↓	↓	1615		↓		↓			1	0	6				
MW-17		↓		↓		↓	↓	↓	1508		↓		↓			1	0	7				

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number 1094094

Turnaround time
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample: GOOD

Temperature received: COOL

Relinquished by sampler	Date	Time	Received by
[signature]	9-25-91	10:25	Kim Follett
Relinquished by	**Date**	**Time**	**Received by**
Kim Follett	9-25-91	10:55	
Relinquished by	**Date**	**Time**	**Received by laboratory** [signature] — Date 9/25 — Time 10:55

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APPC-3292 (2-91)

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Deb Moser

Project: ARCO 0608, 17601 Hesperian, San Lorenzo

Enclosed are the results from 7 water samples received at Sequoia Analytical on October 4,1991. The requested analyses are listed below:

1100644	Water, Trip Blank	10/4/91	EPA 5030/8015/8020
1100645	Water, MW-18	10/4/91	EPA 5030/8015/8020
1100646	Water, MW-19	10/4/91	EPA 5030/8015/8020
1100647	Water, MW-20	10/4/91	EPA 5030/8015/8020
1100648	Water, MW-21	10/4/91	EPA 5030/8015/8020
1100649	Water, MW-22	10/4/91	EPA 5030/8015/8020
1100650	Water, MW-23	10/4/91	EPA 5030/8015/8020

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

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	ARCO 0608, 17601 Hesperian, San Lorenzo	Sampled:	Oct 4, 1991
1601 Civic Center Drive, Suite 202	Matrix Descript:	Water	Received:	Oct 4, 1991
Santa Clara, CA 95050	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Oct 8, 1991
Attention: Deb Moser	First Sample #:	110-0644	Reported:	Oct 9, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
110-0644	Trip Blank	N.D.	N.D.	N.D.	N.D.	N.D.
110-0645	MW-18	N.D.	N.D.	N.D.	N.D.	N.D.
110-0646	MW-19	N.D.	N.D.	N.D.	N.D.	N.D.
110-0647	MW-20	N.D.	N.D.	N.D.	N.D.	N.D.
110-0648	MW-21	N.D.	N.D.	N.D.	N.D.	N.D.
110-0649	MW-22	N.D.	N.D.	N.D.	N.D.	N.D.
110-0650	MW-23	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Deb Moser

Client Project ID: ARCO 0608, 17601 Hesperian, San Lorenzo

QC Sample Group: 1100644-50

Reported: Oct 9, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylene
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	L. Laikhtman	L. Laikhtman	L. Laikhtman	L. Laikhtman
Reporting Units:	ug/l	ug/l	ug/l	ug/l
Date Analyzed:	Oct 8, 1991	Oct 8, 1991	Oct 8, 1991	Oct 8, 1991
QC Sample #:	BLK100891	BLK100891	BLK100891	BLK100891
Sample Conc.:	ND	ND	ND	ND
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.6	9.7	9.6	29
Matrix Spike % Recovery:	96	97	96	97
Conc. Matrix Spike Dup.:	10	10	10	30
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	4.1	3.0	4.1	3.4

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

[redacted] SEC[redacted]A A[redacted]YTI[redacted] SAM[redacted]LE RECEIPT [redacted]LOG

CLIENT NAME: Pacific Environmental
REC. BY (PRINT): FL

MASTER LOG NO. / PAGE: X
DATE OF LOG-IN: 10-4

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present / ~~Absent~~
   Intact / Broken*
2. Custody Seal Nos.:
3. Chain-of-Custody Records: ~~Present~~ / Absent*
4. Traffic Reports or Packing List: Present / ~~Absent~~
5. Airbill: Airbill / Sticker
   Present / ~~Absent~~
6. Airbill No.:
7. Sample Tags: ~~Present~~ / Absent*
   Sample Tag Nos.: ~~Listed~~ / Not Listed on Chain-of-Custody
8. Sample Condition: ~~Intact~~/Broken*/Leaking*
9. Does information on custody reports, traffic reports and sample tags agree? ~~Yes~~ / No*
10. Proper Preservatives Used: ~~Yes~~ / No*
11. Date Rec. at Lab: 10-4
12. Time Rec. at Lab: 1517

LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION (ETC)
100644	A/B	TB	2 VOAs	W	10-4	
45	A-C	MW-18	3 VOAs			
46		19				
47		20				
48		21				
49		22				
50		23				

* If Circled, contact Project Manager and attach record of resolution

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 330613 608-91-2E

ARCO Facility no. 0608	City (Facility) 17601 Hesperian San Lorenzo	Project manager (Consultant) Deb Moser / Tina Berry	Laboratory name Sequoia
ARCO engineer Carmel	Telephone no. (ARCO)	Telephone no. (Consultant) 408-984-6536	Fax no. (Consultant) 243-3911
Consultant name Pacific ENV. Group	Address (Consultant) 1601 Civic Center Dr. #202 Santa Clara.		Contract number 07-073

Method of shipment: PEGTech Delivered

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐
TRIP BLANK		2		X		X		10-4-91			X									
MW-18		3		↓		↓		↓			↓									
MW-19		3																		
MW-20		3																		
MW-21		3																		
MW-22		3																		
MW-23		3																		

Special detection Limit/reporting:

Special QA/QC:

Remarks: TRIP Blank from Sequoia Delivered on 10-3-91

Lab number: 91006644

Turnaround time:
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days X
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☐

Condition of sample: good		Temperature received: cool	
Relinquished by sampler	Date 10-4-91 Time 14:06	Received by T. Walsh	14:06 10.4.91
Relinquished by	Date Time	Received by	
Relinquished by T. Walsh 1133 1-	Date 10.4.91 Time 1517	Received by laboratory	Date 10-2-91 Time 16:17

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APPO-3292 (2-91)

FILE COPY

SAMPLE REQUEST FORM

COMPLETE
TBS 9/24/91

330-06-05
John Covanaugh
GR: Deb Moser
TYPE: H2O
K. NO:
ATE NEEDED: Quarterly 3Q91

CLIENT: ARCO
ADDRESS: 17601 Hesperian Blvd
San Lorenzo
PHONE:
CLIENT CONTACT: Chuck Carmel

LOCATION OR I.D.	DEPTH AND DIAMETER	ANALYSIS	SPECIAL INFO—SAMPLE ORDER, SPECIAL LAB, RUSH, ETC.
MW-5	14/4 DW	gas/BTEX	
MW-7	19/3		
MW-8	22/3		
MW-9	19/3		
MW-10	23/3		Notify permit
MW-11	20/3		Agencies - 48 hrs
MW-13	24/3		Notice.
MW-14	23/3		
MW-15	23½/3		
MW-16	23/3		
MW-17	24/3		
E-1-A	25/6		
E-1	destroyed		

PACIFIC ENVIRONMENTAL GROUP, INC.
Engineering • Hydrogeology • Chemistry

1 D

ARCO Products Company
Division of AtlanticRichfieldCompany

330.0665 **Task Order No.** 601-91-SA

Chain of Custody

ARCO Facility no. 0608	City (Facility) San Lorenzo	Project manager (Consultant) Deb Moser	Laboratory name Sequoia
ARCO engineer Chuck Carmel	Telephone no. (ARCO)	Telephone no. (Consultant) 408 984 6536	Fax no. (Consultant) 408 243 3911
Consultant name Pacific Environmental Grp.	Address (Consultant) 1601 Civic Ctr. Santa Clara		Contract number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH (GCS) EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
TB-1		2		X		X	HCl	9/24/91	—		X											
MW-7		3							1430													
MW-8									1224													
MW-9									1152													
MW-10									1245													
MW-11									1311													
MW-13									1433													
MW-14									1321													
MW-15									1521													
MW-16									1615													
MW 17									1508													

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

Turnaround time

Priority Rush 1 Business Day ☐

Rush 2 Business Days ☐

Expedited 5 Business Days ☐

Standard 10 Business Days ☑

Condition of sample:		Temperature received:
Relinquished by sampler	Date / Time	Received by
Relinquished by	Date / Time	Received by
Relinquished by	Date / Time	Received by laboratory / Date / Time

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

APPC-3292 (2-91)

Monitoring Well Field Sheet

Client: Arco Sampler: TBS
Project No.: 330-06.05 Field Dates: 9/24/91
Location: 17601 Hesperian Well I.D.: MW-5

Well Information

Total Depth: 14 Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: TOC 13.74 TOB Product: ☐ Yes ☒ No
Depth to Liquid: TOC TOB Thickness (feet): ___
Date: 9/24/91 Color: ___
Time: 9:31 Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 9/ /91 Purge Method: ☐ Bailer ☐ Positive Displacement
Calculated Purge: ___ (gal) ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: ___ (gal) ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: TBS
Sample I.D: MW-5
Date Sampled: 9/24/91
Time Sampled: :

No. Containers	Size/Type	Pres.	Analysis
3	40mlVOA	HCl	G, BTEX

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

Monitoring Well Field Sheet

Client: Arco Sampler: TBS
Project No.: 330-06.05 Field Dates: 9/24/91
Location: 17601 Hesperian Well I.D.: MW-7

Well Information

Total Depth: 19 Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: TOC 15.13 TOB Product: ☐ Yes ☒ No
Depth to Liquid: TOC TOB Thickness (feet): ___
Date: 9/24/91 Color: ___
Time: 15:26 Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 9/24/91 Purge Method: ☒ Bailer ☐ Positive Displacement
Calculated Purge: 6 (gal) ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 6 (gal) ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
2	1410	7.35	1414	81.3	Clear	more
4	1414	7.17	1329	75.4	↓	↓
6	1417	7.38	1324	74.8	↓	↓

Comments:

Sample Information

Sampler: TBS
Sample I.D.: MW-7
Date Sampled: 9/24/91
Time Sampled: 14:30

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

No. Containers	Size/Type	Pres.	Analysis
3	40mlVOA	HCl	G, Btex

Mon. oring Well Field She(

Client: Arco Sampler: TBS
Project No.: 330-06.05 Field Dates: 9/24/91
Location: 17601 Hesperian Well I.D.: MW-F

Well Information

Total Depth: 22 Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: TOC 13.97 TOB Product: ☐ Yes ☒ No
Depth to Liquid: TOC TOB Thickness (feet): ___
Date: 9/24/91 Color: ___
Time: 9:54 Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 9/24/91 Purge Method: ☐ Bailer ☐ Positive Displacement
Calculated Purge: 12 (gal) ☒ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 12 (gal) ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (umhos)	Temp (°F)	Color	Odor
4	12:10	7.53	1348	74.2	clear	none
8	12:12	7.16	1349	74.4	↓	↓
12	12:14				↓	↓

Comments:

Sample Information

Sampler: TBS
Sample I.D: MW-F
Date Sampled: 9/24/91
Time Sampled: 12:24

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

No. Containers	Size/Type	Pres.	Analysis
3	40mlVOA	HCl	G, BTEX

Monitoring Well Field Sheet

Client: Arco Sampler: TBS
Project No.: 330-06.05 Field Dates: 9/24/91
Location: 17601 Hesperian Well I.D.: MW-9

Well Information

Total Depth: 19 Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: TOC 13.27 TOB Product: ☐ Yes ☒ No
Depth to Liquid: TOC TOB Thickness (feet): ___
Date: 9/24/91 Color: ___
Time: 9:59 Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 9/24/91 Purge Method: ☐ Bailer ☐ Positive Displacement
Calculated Purge: 9 (gal) ☒ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 9 (gal) ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
3	11:40	7.33	1464	78.2	clear	none
6	11:42	7.26	1395	75.8	↓	↓
9	11:43	7.20	1412	77.1		

Comments:

Sample Information

Sampler: TBS
Sample I.D.: MW-4
Date Sampled: 9/24/91
Time Sampled: 11:56

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___

No. Containers	Size/Type	Pres.	Analysis
3	40mlVOA	HCl	G,BTEX

Comments:

9/24/91 - TB- Sequoia - TB-1

Mon. oring Well Field She

Client: Arco
Project No.: 330-06.05
Location: 17601 Hesperian
Sampler: TBS
Field Dates: 9/24/91
Well I.D.: MW-10

Well Information

Total Depth: 23
Depth to Water: TOC 13.40 TOB
Depth to Liquid: TOC TOB
Date: 9/24/91
Time: 10:04
Diameter: 2" (3") 4" 5" 6" —
Product: ☐ Yes ☒ No
Thickness (feet):
Color:
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 9/24/91
Calculated Purge: 15 (gal)
Actual Purge: 15 (gal)
Purge Method: ☐ Bailer ☐ Positive Displacement ☒ Centrifugal ☐ Dedicated ☐ Gas Displacement ☐ Other

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
5	12:31	6.97	1427	76.3	clear	none
10	12:36	6.89	1428	77.5	↓	↓
15	12:42	6.88	1420	76.6		

Comments:

Sample Information

Sampler: TBS
Sample I.D.: MW-10
Date Sampled: 9/24/91
Time Sampled: 12:45

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other

No. Containers	Size/Type	Pres.	Analysis
3	40mlVOA	HCl	G, Btex

Comments:

Monitoring Well Field Sheet

Client: Arco | Sampler: TBS
Project No.: 330-06.05 | Field Dates: 9/24/91
Location: 17601 Hesperian | Well I.D.: MW-11

Well Information

Total Depth: 19 | Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: TOC 14.03 TOB | Product: ☐ Yes ☒ No
Depth to Liquid: TOC TOB | Thickness (feet): ___
Date: 9/24/91 | Color: ___
Time: 11:01 | Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 9/24/91 | Purge Method: ☒ Bailer ☐ Positive Displacement
Calculated Purge: 7 (gal) ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 7 (gal) ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
2.5	12:52	7.09	1315	72.1	clear	none
5	12:55	7.19	1285	69.9	↓	↓
7	12:59	7.09	1268	68.8	↓	↓

Comments:

Sample Information

Sampler: TBS
Sample I.D: MW-11
Date Sampled: 9/24/91
Time Sampled: 13:11

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

No. Containers	Size/Type	Pres.	Analysis
3	40mlVOA	HCl	G, BTEX

Mon oring Well Field She :

Client: Arco Sampler: TBS
Project No.: 330-06.05 Field Dates: 9/24/91
Location: 17601 Hesperian Well I.D.: MW-13

Well Information

Total Depth: 23 Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: TOC 16.45 TOB Product: ☐ Yes ☒ No
Depth to Liquid: TOC TOB Thickness (feet): ___
Date: 9/24/91 Color: ___
Time: 11:15 Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 9/24/91 Purge Method: ☒ Bailer ☐ Positive Displacement
Calculated Purge: 9 (gal) ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 9 (gal) ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
3	14.47	6.98	1381	77.5	Clear	none
6	14:49	7.11	1334	74.4	↓	↓
9	14:53	7.34	1324	74.0	↓	↓

Comments:

Sample Information

Sampler: TBS
Sample I.D: MW-13
Date Sampled: 9/24/91
Time Sampled: 14:55

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

No. Containers	Size/Type	Pres.	Analysis
3	40mlVOA	HCl	G, BTEX

Mor oring Well Field She :

Client: Arco Sampler: TBS
Project No.: 330-06.05 Field Dates: 9/24/91
Location: 17601 Hesperian Well I.D.: MW-14

Well Information

Total Depth: 23 Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: TOC 12.3 TOB Product: ☐ Yes ☒ No
Depth to Liquid: TOC TOB Thickness (feet): ___
Date: 9/24/91 Color: ___
Time: 10:55 Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 9/24/91 Purge Method: ☐ Bailer ☐ Positive Displacement
Calculated Purge: 15 (gal) ☒ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 15 (gal) ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
5	13:21	7.38	1276	77.6	brown	none
10	13:23	7.37	1233	75.9	↓	↓
15	13:29	7.34	1233	74.9	↓	↓

Comments:

Sample Information

Sampler: TBS
Sample I.D: MW-14
Date Sampled: 9/24/91
Time Sampled: 13:35

No. Containers	Size/Type	Pres.	Analysis
3	40mlVOA	HCl	G, BTEX

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

Monitoring Well Field Sheet

Client: Arco Sampler: TBS
Project No.: 330-06.05 Field Dates: 9/24/91
Location: 17601 Hesperian Well I.D.: MW-15

Well Information

Total Depth: 23.5 Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: TOC 13.69 TOB Product: ☐ Yes ☒ No
Depth to Liquid: TOC TOB Thickness (feet): ___
Date: 9/24/91 Color: ___
Time: 10:19 Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 9/24/91 Purge Method: ☐ Bailer ☐ Positive Displacement
Calculated Purge: 15 (gal) ☒ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 15 (gal) ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
5	15:10	6.92	1464	74.8	clear	some
10	15:12	6.91	1482	74.2	↓	↓
15	15:14	6.94	1401	71.9	↓	↓

Comments:

Sample Information

Sampler: TBS
Sample I.D.: MW-15
Date Sampled: 9/24/91
Time Sampled: 15:30

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

No. Containers	Size/Type	Pres.	Analysis
3	40mlVOA	HCl	G, Btex

Pacific Environmental Group, Inc.

Monitoring Well Field Sheet

Client: Arco | Sampler: TBS
Project No.: 330-06.05 | Field Dates: 9/24/91
Location: 17601 Hesperian | Well I.D.: MW-16

Well Information

Total Depth: 23.5 | Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: TOC 14.90 TOB | Product: ☐ Yes ☒ No
Depth to Liquid: TOC TOB | Thickness (feet): ___
Date: 9/24/91 | Color: ___
Time: 10:21 | Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bail Sounder

Purge Information

Date Purged: 9/24/91 | Purge Method: ☒ Bailer ☐ Positive Displacement
Calculated Purge: 12 (gal) | ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 12 (gal) | ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
4	15:49	7.27	1145	75.9	brown	none
8	15:52	7.11	1039	74.1	↓	↓
12	15:59	7.24	1039	74.9	↓	↓

Comments:

Sample Information

Sampler: TBS
Sample I.D.: MW-16
Date Sampled: 9/24/91
Time Sampled: 16:15

No. Containers	Size/Type	Pres.	Analysis
3	40mlVOA	HCl	G, Btex

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

Monitoring Well Field Sheet

Client: Arco | Sampler: TBS
Project No.: 330-06.05 | Field Dates: 9/24/91
Location: 17601 Hesperian | Well I.D.: MW-17

Well Information

Total Depth: 23 | Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: TOC 14.98 TOB | Product: ☐ Yes ☒ No
Depth to Liquid: TOC TOB | Thickness (feet): ___
Date: 9/24/91 | Color: ___
Time: 10:26 | Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 9/24/91 | Purge Method: ☒ Bailer ☐ Positive Displacement
Calculated Purge: 12 (gal) ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 12 (gal) ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
4	1445	7.25	1161	72.6	clear	none
8	1449	7.27	1216	73.2	↓	↓
12	1459	7.25	1219	73.0	↓	↓

Comments:

Sample Information

Sampler: TBS
Sample I.D.: MW-17
Date Sampled: 9/24/91
Time Sampled: 15:08

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

No. Containers	Size/Type	Pres.	Analysis
3	40mlVOA	HCl	G, Btex

Pacific Environmental Group, Inc.

WELL SAMPLING REQUEST

SITE INFORMATION FORM

Identification

oject # 330-06.13

Station # 0608

Site Address: 17601 Hesperian Blvd.

County: _____

Project Manager: Deb Moser

Requestor: John Cavanaugh

Client: ARCO

Client P.O.C.: _____

Date of request: _____

Project Type

- ☐ 1st Time visit
- ☐ Quarterly
  - ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th
- ☐ Monthly
- ☐ Semi-Monthly
- ☐ Weekly
- ☐ One time event
- ☒ Other: Well Development

Ideal field date(s): 10-4-91

Prefield Contacts/Permits

- ☐ Cal Trans _____
- ☐ County Alameda County
- ☐ City San Lorenzo
- ☐ Private _____
- ☐ Multi-Consultant Scheduling

Date(s): _____

Purge Water Containment:

- ☒ Drums
- ☐ Treatment System
- ☐ Other Describe: _____

Field Tasks

- ☒ ~~H_2O~~ levels
- ☒ H_2O Sampling
- ☒ Well Development MW-18 MW-19 MW-20 MW-21 MW-22 MW-23
- ☐ Other: _____

Describe task (i.e: Well groups and analytical params):

Activities occuring on site
(ie; remedial system construction, ongoing projects, etc.)

(Please attach: Site Map, Well Information Data, Site Safety Plan, Well logs as appropriate)

geted hours: _____

Actual hours; On-Site: _____

Mob-de-Mob: _____

Site Safety

Wells	Concerns

- ☐ Flash Safety
- ☐ Flagman
- ☐ Cones
- ☐ Barricades
- ☐ No Turn/Lane Closed sign

Other:

Comments, remarks, etc. from Field Staff
(include problems encountered and out-of-scope work)

☐ All Wells secured

PACIFIC ENVIRONMENTAL GROUP, INC.

Completed by: SP Date: 10-4-91

Checked by: LD PITS Update: ✓

Monitoring Well Field Sheet

Client: Arco
Project No.: 330-06.13
Location: San Lorenzo

Sampler: SP
Field Dates: 10-4-91
Well I.D.: MW-5

Well Information

Total Depth: —
Depth to Water: — TOC Dry TOB
Depth to Liquid: — TOC — TOB
Date: 10-4-91
Time: 7:45

Diameter: 2" 3" 4" 5" 6" —
Product: ☐ Yes ☒ No
Thickness (feet): —
Color: —
Comments: Dry Well.

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: _____
Calculated Purge: _____ (gal)
Actual Purge: _____ (gal)

Purge Method: ☐ Bailer ☐ Positive Displacement ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement ☐ Other _____

Vol (gal)	Time	pH (std. units)	EC (umhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: _____
Sample I.D: _____
Date Sampled: _____
Time Sampled: _____

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other _____

Comments:

No. Containers	Size/Type	Pres.	Analysis

Monitoring Well Field Sheet

Client: Arco
Sampler: SP
Project No.: 330-06.13
Field Dates: 10-4-91
Location: San Lorenzo
Well I.D.: MW-7

Well Information

Total Depth: —
Diameter: 2" 3" 4" 5" 6" —
Depth to Water: — TOC 15.19 TOB
Product: ☐ Yes ☒ No
Depth to Liquid: — TOC — TOB
Thickness (feet): —
Date: 10-4-91
Color: —
Time: 7:39
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: _____
Purge Method: ☐ Bailer ☐ Positive Displacement
Calculated Purge: _____ (gal) ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: _____ (gal) ☐ Other _____

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: _____
Sample I.D: _____
Date Sampled: _____
Time Sampled: _____

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other _____

No. Containers	Size/Type	Pres.	Analysis

Comments:

Not Sampled this session

Monitoring Well Field Sheet

Client: Arco
Project No.: 330-06.13
Location: San Lorenzo

Sampler: SP
Field Dates: 10-4-91
Well I.D.: MW-8

Well Information

Total Depth: —
Depth to Water: — TOC 14.01 TOB
Depth to Liquid: — TOC — TOB
Date: 10-4-91
Time: 7:49

Diameter: 2" 3" 4" 5" 6" —
Product: ☐ Yes ☒ No
Thickness (feet): —
Color: —
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: _____
Calculated Purge: _____ (gal)
Actual Purge: _____ (gal)

Purge Method: ☐ Bailer ☐ Positive Displacement ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement ☐ Other _____

Vol (gal)	Time	pH (std. units)	EC (umhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: _____
Sample I.D: _____
Date Sampled: _____
Time Sampled: _____

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other _____

Comments:

No. Containers	Size/Type	Pres.	Analysis

Not sampled this session

Monitoring Well Field Sheet

Client: Arco
Project No.: 330-06.13
Location: San Lorenzo

Sampler: SP
Field Dates: 10-4-91
Well I.D.: MW-9

Well Information

Total Depth: —
Depth to Water: — TOC 13.29 TOB
Depth to Liquid: — TOC — TOB
Date: 10-4-91
Time: 7:51

Diameter: 2" 3" 4" 5" 6" —
Product: ☐ Yes ☒ No
Thickness (feet): —
Color: —
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: _____
Calculated Purge: _____ (gal)
Actual Purge: _____ (gal)

Purge Method: ☐ Bailer ☐ Positive Displacement ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement ☐ Other _____

Vol (gal)	Time	pH (std. units)	EC (umhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: _____
Sample I.D: _____
Date Sampled: _____
Time Sampled: _____

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other _____

No. Containers	Size/Type	Pres.	Analysis

Comments:

Not sampled.

Monitoring Well Field Sheet

Client: Arco
Project No.: 330-06.13
Location: San Lorenzo

Sampler: SP
Field Dates: 10-4-91
Well I.D.: MW-10

Well Information

Total Depth: —
Depth to Water: — TOC 13.50 TOB
Depth to Liquid: — TOC — TOB
Date: 10-4-91
Time: 8:06

Diameter: 2" 3" 4" 5" 6" —
Product: ☐ Yes ☒ No
Thickness (feet): —
Color: —
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: _____
Calculated Purge: _____ (gal)
Actual Purge: _____ (gal)

Purge Method: ☐ Bailer ☐ Positive Displacement ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement ☐ Other _____

Vol (gal)	Time	pH (std. units)	EC (umhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: _____
Sample I.D: _____
Date Sampled: _____
Time Sampled: _____

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other _____

No. Containers	Size/Type	Pres.	Analysis

Comments:

Not sampled this request

Monitoring Well Field Sheet

Client: Arco
Project No.: 330-06.13
Location: San Lorenzo

Sampler: SP
Field Dates: 10-4-91
Well I.D.: MW-11

Well Information

Total Depth: —
Depth to Water: — TOC 14.18 TOB
Depth to Liquid: — TOC — TOB
Date: 10-4-91
Time: 8:09

Diameter: 2" 3" 4" 5" 6" —
Product: ☐ Yes ☒ No
Thickness (feet): —
Color: —
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: _____
Calculated Purge: _____ (gal)
Actual Purge: _____ (gal)

Purge Method: ☐ Bailer ☐ Positive Displacement ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement ☐ Other _____

Vol (gal)	Time	pH (std. units)	EC (umhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: _____
Sample I.D: _____
Date Sampled: _____
Time Sampled: _____

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other _____

No. Containers	Size/Type	Pres.	Analysis

Comments:

Not sampled this request.

Pacific Environmental Group, Inc.

Monitoring Well Field Sheet

Client: Arco
Project No.: 330-06.13
Location: San Lorenzo

Sampler: SP
Field Dates: 10-4-91
Well I.D.: MW-13

Well Information

Total Depth: —
Depth to Water: — TOC TOB
Depth to Liquid: — TOC — TOB
Date: 16.54
Time: 7:42

Diameter: 2" 3" 4" 5" 6" —
Product: ☐ Yes ☒ No
Thickness (feet): —
Color: —
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: _____
Calculated Purge: _____ (gal)
Actual Purge: _____ (gal)

Purge Method: ☐ Bailer ☐ Positive Displacement ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement ☐ Other _____

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: _____
Sample I.D: _____
Date Sampled: _____
Time Sampled: _____

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other _____

Comments:

No. Containers	Size/Type	Pres.	Analysis

Not sampled this request

Pacific Environmental Group, Inc.

Monitoring Well Field Sheet

Client: Arco
Project No.: 330-06.13
Location: San Lorenzo

Sampler: SP
Field Dates: 10-4-91
Well I.D.: MW-14

Well Information

Total Depth: —
Depth to Water: — TOC 12.38 TOB
Depth to Liquid: — TOC — TOB
Date: 10-4-91
Time: 7:56

Diameter: 2" 3" 4" 5" 6" —
Product: ☐ Yes ☒ No
Thickness (feet): —
Color: —
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: _____
Calculated Purge: _____ (gal)
Actual Purge: _____ (gal)

Purge Method: ☐ Bailer ☐ Positive Displacement ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement ☐ Other _____

Vol (gal)	Time	pH (std. units)	EC (umhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: _____
Sample I.D: _____
Date Sampled: _____
Time Sampled: _____

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other _____

Comments:

No. Containers	Size/Type	Pres.	Analysis

Not sampled this request

Pacific Environmental Group, Inc.

Monitoring Well Field Sheet

Client: Arco
Project No.: 330-06.13
Location: San Lorenzo

Sampler: SP
Field Dates: 10-4-91
Well I.D.: MW-15

Well Information

Total Depth: —
Depth to Water: — TOC 13.80 TOB
Depth to Liquid: — TOC — TOB
Date: 10-4-91
Time: 8:13

Diameter: 2" 3" 4" 5" 6" —
Product: ☐ Yes ☒ No
Thickness (feet): —
Color: —
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: _____
Calculated Purge: _____ (gal)
Actual Purge: _____ (gal)

Purge Method: ☐ Bailer ☐ Positive Displacement ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement ☐ Other _____

Vol (gal)	Time	pH (std. units)	EC (umhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: _____
Sample I.D: _____
Date Sampled: _____
Time Sampled: _____

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other _____

No. Containers	Size/Type	Pres.	Analysis

Comments:

Not sampled this request.

Pacific Environmental Group, Inc.

Monitoring Well Field Sheet

Client: Arco
Project No.: 330-06.13
Location: San Lorenzo

Sampler: SP
Field Dates: 10-4-91
Well I.D.: MW-16

Well Information

Total Depth: —
Depth to Water: — TOC @14.20TOB
Depth to Liquid: — TOC — TOB
Date: 10-4-91
Time: 8:14

Diameter: 2" 3" 4" 5" 6" —
Product: ☐ Yes ☒ No
Thickness (feet): —
Color: —
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: _____
Calculated Purge: _____ (gal)
Actual Purge: _____ (gal)

Purge Method: ☐ Bailer ☐ Positive Displacement ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement ☐ Other _____

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: _____
Sample I.D.: _____
Date Sampled: _____
Time Sampled: _____

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other _____

Comments:

No. Containers	Size/Type	Pres.	Analysis

Not sampled this request

Pacific Environmental Group, Inc.

Monitoring Well Field Sheet

Client: Arco
Project No.: 330-06.13
Location: San Lorenzo

Sampler: SP
Field Dates: 10-4-91
Well I.D.: MW-17

Well Information

Total Depth: ~~—~~
Depth to Water: TOC 15.20 TOB
Depth to Liquid: TOC TOB
Date: 10-4-91
Time: 8:22

Diameter: 2" 3" 4" 5" 6" —
Product: ☐ Yes ☒ No
Thickness (feet): _____
Color: _____
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: _____
Calculated Purge: _____ (gal)
Actual Purge: _____ (gal)

Purge Method: ☐ Bailer ☐ Positive Displacement
☐ Centrifugal ☐ Dedicated ☐ Gas Displacement
☐ Other _____

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: _____
Sample I.D: _____
Date Sampled: _____
Time Sampled: _____

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other _____
Comments:

No. Containers	Size/Type	Pres.	Analysis

Not sampled this request.

Monitoring Well Field Sheet

Client: ARCO
Sampler: SP
Project No.: 330-06.13
Field Dates: 10-4-91
Location: San Lorenzo
Well I.D.: MW-18

Well Information

Total Depth: 21.5
Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: ___ TOC 13.00 TOB
Product: ☐ Yes ☒ No
Depth to Liquid: ___ TOC ___ TOB
Thickness (feet): ___
Date: 10-4-91
Color: ___
Time: 8:18
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 10-4-91
Purge Method: ☐ Bailer ☐ Positive Displacement
Calculated Purge: (10cv) 32 (gal) ☒ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 32 (gal) ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
11	13:02	7.10	720	67.6	Brown	NO
22	13:05	6.99	742	67.2	↓	↓
32	13:08	7.01	700	67.1		

Comments: Well was developed prior to purging

Sample Information

Sampler: SP
Sample I.D.: MW-18
Date Sampled: 10-4-91
Time Sampled: 13:40

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

No. Containers	Size/Type	Pres.	Analysis
3	40ml VOA	HCl	Gas/BTEX

WELL DEVELOPMENT DATA SHEET

Project#: 330-06.13 Well #: MW-18 Development Method Used: 3" Surge Block

Site Address: 1760 Hesperian Blvd. DTW (feet): — (TOC) 13.00 (TOB) followed by Centrifugal Pump

San Lorenzo DTL (feet): — (TOC) — (TOB) Evacuation.

Purge Vol (10 Casings): 32 (gal)

Time		Depth		Gallons		Measurements				Comments: (odor, clarity, grain size, etc.) activity
begin	end	to water	to bottom	pumped	total	pH	cond	temp	turbity	
12:56		13.00	21.5							
13:02				11		7.10	720	67.6	Heavy	Fine Silt/Sands/No Odor
13:05				11	22	6.99	742	67.2	↓	↓ ↓ ↓
	13:08			10	32	7.01	700	67.1	↓	
		13.08	21.8							
		Sampled at 13:40								

Completed by: [signature] date: 10-4-91

Monitoring Well Field Sheet

Client: ARCO
Project No.: 330-06.13
Location: San Lorenzo
Sampler: SP
Field Dates: 10-4-91
Well I.D.: MW-19

Well Information

Total Depth: 21.5
Depth to Water: — TOC 12.43 TOB
Depth to Liquid: — TOC — TOB
Date: 10-4-91
Time: 8:28
Diameter: 2" (3") 4" 5" 6" ___
Product: ☐ Yes ☒ No
Thickness (feet): ___
Color: ___
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 10-4-91
Calculated Purge: 34 (gal)
Actual Purge: 34 (gal)
Purge Method: ☐ Bailer ☐ Positive Displacement ☒ Centrifugal ☐ Dedicated ☐ Gas Displacement ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor

Comments: See attached development sheet.

Sample Information

Sampler: SP
Sample I.D.: MW-19
Date Sampled: 10-4-91
Time Sampled: 13:30

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

No. Containers	Size/Type	Pres.	Analysis
3	40 ml VOA	HCl	Gas/BTEX

WELL DEVELOPMENT DATA SHEET

Project#: 330-06.13 Well #: MW-19 Development Method Used: 3" Surge Block followed by Centrifugal Pump Evacuation.

Site Address: 17601 Hesperian Blvd. San Lorenzo

DTW (feet): — (TOC) 12.43 (TOB)

DTL (feet): — (TOC) — (TOB)

Purge Vol (10 Casings): 34 (gal)

Time		Depth		Gallons		Measurements				Comments: (odor, clarity, grain size, etc.) activity
begin	end	to water	to bottom	pumped	total	pH	cond	temp	turbity	
12:30		12.43	21.5							
12:38				12		7.03	716	67.7	Heavy	Fine Silt No Odor
12:42				11	23	6.95	675	66.9	cloudy	↓ ↓
12:45	12:45			11	34	6.95	727	66.2	cloudy	
		12.46	21.6							
		Sampled	13:30							

Completed by: [signature] date: 10-4-91

Monitoring Well Field Sheet

Client: Arco
Project No.: 330-06.13
Location: San Lorenzo
Sampler: SP
Field Dates: 10-4-91
Well I.D.: MW-20

Well Information

Total Depth: 21.5
Depth to Water: TOC 12.5 TOB
Depth to Liquid: TOC — TOB
Date: 10-4-91
Time: 8:31
Diameter: 2" (3") 4" 5" 6" —
Product: ☐ Yes ☒ No
Thickness (feet): —
Color: —
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 10-4-91
Calculated Purge: 33.5 (gal)
Actual Purge: 33.5 (gal)
Purge Method: ☐ Bailer ☐ Positive Displacement ☒ Centrifugal ☐ Dedicated ☐ Gas Displacement ☐ Other

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
11	12:06	7.05	678	69.1	Brown	NO
22	12:11	6.98	635	67.9	"	"
33.5	12:14	7.00	683	66.7	"	"

Comments:

Sample Information

Sampler: SP
Sample I.D: MW-20
Date Sampled: 10-4-91
Time Sampled: 13:20

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other
Comments:

No. Containers	Size/Type	Pres.	Analysis
3	40 VOA	HCl	Gas / BTEX

WELL DEVELOPMENT DATA SHEET

Project#: 330-06.13 Well #: MW-20 Development Method Used: 3" Surge block followed by Centrifugal Pump Evacuation

Site Address: 17601 Hesperian Blvd. San Lorenzo DTW (feet): — (TOC) 12.56 (TOB) DTL (feet): — (TOC) — (TOB) Purge Vol (10 Casings): 33.5 (gal)

Time		Depth		Gallons		Measurements				Comments: (odor, clarity, grain size, etc.) activity
begin	end	to water	to bottom	pumped	total	pH	cond	temp	turbity	
12—		12.56	21.5							
	1206			11		7.05	6.78	69.1	Heavy	No Odor - Heavy Fine Silt
	1211			11	22	6.98	6.35	67.9	"	" " " " "
	1214			11.5	33.5	7.00	6.83	66.7	"	" " " " "
		12.62	21.9							
		~~13.20~~								
		Sampled at 1320								

Completed by: [signature] date: 10-4-91

Monitoring Well Field Sheet

Client: ARCO
Sampler: SP
Project No.: 330-06.13
Field Dates: 10-4-91
Location: San Lorenzo
Well I.D.: MW-21

Well Information

Total Depth: 22
Diameter: 2" (3") 4" 5" 6" ____
Depth to Water: ~~TOC~~ 12.88 TOB
Product: ☐ Yes ☒ No
Depth to Liquid: ~~TOC~~ ~~TOB~~
Thickness (feet): ____
Date: 10-4-91
Color: ____
Time: 8:34
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 10-4-91
Purge Method: ☐ Bailer ☐ Positive Displacement
Calculated Purge: 34.5 (gal) ☒ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 34.5 (gal) ☐ Other ____

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
11	9:29	6.96	629	65.4	Brown	NO
23	9:34	6.89	598	64.7	Cloudy	↓
34.5	9:38	6.92	588	64.2	Brown	

Comments:

Sample Information

Sampler: SP
Sample I.D.: MW-21
Date Sampled: 10-4-91
Time Sampled: 11:40

No. Containers	Size/Type	Pres.	Analysis
3	40 ml VOA	HCl	Gas/BTEX

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ____
Comments:

WELL DEVELOPMENT DATA SHEET

Project#: 330-06.13 Well #: MW-21 Development Method Used: 3" Surge block followed by Centrifugal Evacuation

Site Address: 17601 Hesperian Blvd. San Lorenzo

DTW (feet): — (TOC) 12.88 (TOB)

DTL (feet): — (TOC) — (TOB)

Purge Vol (10 Casings): 34.5 (gal)

Time		Depth		Gallons		Measurements				Comments: (odor, clarity, grain size, etc.) activity
begin	end	to water	to bottom	pumped	total	pH	cond	temp	turbity	
9:23		12.88	22.10							
9:29				11		6.96	629	65.4	Heavy	Fine Silts No Odor
9:34				12	23	6.89	598	64.7	Cloudy	Finer Silts
9:38	9:38			11.5	34.5	6.92	588	64.2	Heavy	Fine Silts
		12.93	22							
		Sampled 11:40								

Completed by: Scott Peck date: 10-4-91

Monitoring Well Field Sheet

Client: ARCO
Sampler: SP
Project No.: 330-06.13
Field Dates: 10-4-91
Location: San Lorenzo
Well I.D.: MW-22

Well Information

Total Depth: 21.7
Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: TOC 13.37 TOB
Product: ☐ Yes ☒ No
Depth to Liquid: TOC — TOB
Thickness (feet): ___
Date: 10-4-91
Color: ___
Time: 8:40
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 10-4-91
Purge Method: ☐ Bailer ☐ Positive Displacement
Calculated Purge: 31.5 (gal)
☒ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 31.5 (gal)
☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
10.5	10:04	6.92	544	63.7	Brown	NO
21	10:07	6.88	592	63.3	Brown	↓
31.5	10:10	6.82	578	63.7	cloudy	↓

Comments:

Sample Information

Sampler: SP
Sample I.D.: MW-22
Date Sampled: 10-4-91
Time Sampled: 11:30

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

No. Containers	Size/Type	Pres.	Analysis
3	40ml VOA	HCl	6&S / BTEX

Pacific Environmental Group, Inc.

WELL DEVELOPMENT DATA SHEET

Project#: 330-06.13
Site Address: 17601 Hesperian Blvd. San Lorenzo
Well #: MW-22
DTW (feet): ____ (TOC) 13.37 (TOB)
DTL (feet): ____ (TOC) ____ (TOB)
Purge Vol (10 Casings): 31.5 (gal)
Development Method Used: 3' Surge block followed by (centrifugal) pump evacuation

Time		Depth		Gallons		Measurements				Comments: (odor, clarity, grain size, etc.) activity
begin	end	to water	to bottom	pumped	total	pH	cond	temp	turbity	
9:59		13.37	21.70							
10:04				10.5		6.92	594	63.7	Heavy	Fine Sit / No Odor
10:07				10.5	21	6.88	592	63.3	Heavy	↓ ↓
10:10	10:10			10.5	31.5	6.82	578	63.7	cloudy	
		13.38	21.75							
	Sampled		11:30							

Completed by: Tom Early date: 10-4-91

Monitoring Well Field Sheet

Client: ARCO
Sampler: SP
Project No.: 330-06.13
Field Dates: 10-4-91
Location: San Lorenzo
Well I.D.: MW-23

Well Information

Total Depth: 22
Diameter: 2" (3") 4" 5" 6" ___
Depth to Water: — TOC 14.50 TOB
Product: ☐ Yes ☒ No
Depth to Liquid: — TOC — TOB
Thickness (feet): ___
Date: 10-4-91
Color: ___
Time: 8:43
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☒ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: 10-4-91
Purge Method: ☐ Bailer ☐ Positive Displacement
Calculated Purge: 28 (gal) ☒ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: 21 (gal) ☐ Other ___

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor
9	10:53	6.96	658	65.6	Brown	NO
19	10:57	6.99	616	65.0	↓	↓
21	11:00	6.93	655	66.3	↓	↓

Comments: well dry at 21 gallons.

Sample Information

Sampler: SP
Sample I.D.: MW-23
Date Sampled: 10-4-91
Time Sampled: 13:50

Sample Method:
☒ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other ___
Comments:

No. Containers	Size/Type	Pres.	Analysis
3	40ml VOA	HCl	Gas/BTEX

Pacific Environmental Group, Inc.

WELL DEVELOPMENT DATA SHEET

Project#: 330-06.13 Well #: MW-23 Development Method Used: 3" Surge block followed by Centrifugal pump evacuation

Site Address: 17601 Hesperian Blvd. San Lorenzo DTW (feet): — (TOC) 14.50 (TOB) DTL (feet): — (TOC) — (TOB) Purge Vol (10 Casings): 28 (gal)

Time		Depth		Gallons		Measurements				Comments: (odor, clarity, grain size, etc.) activity
begin	end	to water	to bottom	pumped	total	pH	cond	temp	turblty	
10:46		14.50	22.00							
10:53				9		6.96	6.58	65.6	Heavy	Fine Silts No odor
10:57				10	19	6.99	6.16	65.0	Heavy	Fine Silts No odor
11—	11—			2	21	6.93	6.55	66.3	Heavy	Fine Silts No odor
				Well went dry AT 21 gals						
		14.63	21.9							
		Sampled at 13:50								

Completed by: Scott Fields date: 10-4-91

Monitoring Well Field Sheet

Client: Arco
Sampler: SP
Project No.: 330-06.13
Field Dates: 10-4-91
Location: San Lorenzo
Well I.D.: —

Well Information

Total Depth: _____
Diameter: 2" 3" 4" 5" 6" —
Depth to Water: _____ TOC _____ TOB
Product: ☐ Yes ☐ No
Depth to Liquid: _____ TOC _____ TOB
Thickness (feet): _____
Date: _____
Color: _____
Time: _____
Comments:

Probe Type: ☐ Oil/Water Interface ☐ Other ☐ Electronic Indicator ☐ Bell Sounder

Purge Information

Date Purged: _____
Purge Method: ☐ Bailer ☐ Positive Displacement
Calculated Purge: _____ (gal) ☐ Centrifugal ☐ Dedicated ☐ Gas Displacement
Actual Purge: _____ (gal) ☐ Other _____

Vol (gal)	Time	pH (std. units)	EC (µmhos)	Temp (°F)	Color	Odor

Comments:

Sample Information

Sampler: SP
Sample I.D.: Trip Blank
Date Sampled: 10-4-91
Time Sampled: —

Sample Method:
☐ Bailer ☐ Positive Displacement
☐ Dedicated ☐ Other _____
Comments:

No. Containers	Size/Type	Pres.	Analysis
2	40ml VOA	HCl	Gas/BTEX
Sequoia	trip	black	delivered
on	10-3-91		

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Dan Landry

Project: #330-06.12, Arco 0608, San Lorenzo

Enclosed are the results from 4 water samples received at Sequoia Analytical on September 26,1991. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
1094396	Water, Influent	9/29/91	Miscellaneous Metals Cyanide EPA 5030/8015/8020 pH Phenols
1094397	Water, Effluent	9/29/91	Miscellaneous Metals Cyanide EPA 5030/8015/8020 pH Phenols
1094398	Water, Tank	9/29/91	Miscellaneous Metals Cyanide EPA 5030/8015/8020 pH Phenols
1094399	Water, Mid 1	9/26/91	EPA 5030/8015/8020

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

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	#330-06.12, Arco 0608, San Lorenzo	Sampled:	Sep 26, 1991
1601 Civic Center Drive, Suite 202	Sample Descript:	Water	Received:	Sep 26, 1991
Santa Clara, CA 95050	Analysis for:	pH		
Attention: Dan Landry	First Sample #:	109-4396	Analyzed:	Sep 27, 1991
			Reported:	Sep 30, 1991

LABORATORY ANALYSIS FOR: pH

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L
109-4396	Influent	N.A.	7.0
109-4397	Effluent	N.A.	8.8
109-4398	Tank	N.A.	8.9

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	#330-06.12, Arco 0608, San Lorenzo	Sampled:	Sep 26, 1991
1601 Civic Center Drive, Suite 202	Sample Descript:	Water	Received:	Sep 26, 1991
Santa Clara, CA 95050	Analysis for:	Phenols	Extracted:	Sep 27, 1991
Attention: Dan Landry	First Sample #:	109-4396	Analyzed:	Sep 27, 1991
			Reported:	Sep 30, 1991

LABORATORY ANALYSIS FOR: Phenols

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L
109-4396	Influent	0.050	N.D.
109-4397	Effluent	0.050	N.D.
109-4398	Tank	0.050	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	#330-06.12, Arco 0608, San Lorenzo	Sampled:	Sep 26, 1991
1601 Civic Center Drive, Suite 202	Sample Descript:	Water	Received:	Sep 26, 1991
Santa Clara, CA 95050	Analysis for:	Cyanide	Extracted:	Sep 27, 1991
Attention: Dan Landry	First Sample #:	109-4396	Analyzed:	Sep 27, 1991
			Reported:	Sep 30, 1991

LABORATORY ANALYSIS FOR: Cyanide

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L
109-4396	Influent	0.020	N.D.
109-4397	Effluent	0.020	N.D.
109-4398	Tank	0.020	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

VM Tague

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	#330-06.12, Arco 0608, San Lorenzo	Sampled:	Sep 26, 1991
1601 Civic Center Drive, Suite 202	Matrix Descript:	Water	Received:	Sep 26, 1991
Santa Clara, CA 95050	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Sep 27, 1991
Attention: Dan Landry	First Sample #:	109-4396	Reported:	Sep 30, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
109-4396	Influent	38	4.8	0.60	1.6	1.1
109-4397	Effluent	N.D.	N.D.	N.D.	N.D.	N.D.
109-4398	Tank	63	N.D.	0.89	N.D.	2.3
109-4399	Mid 1	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	#330-06.12, Arco 0608, San Lorenzo	Sampled:	Sep 26, 1991
1601 Civic Center Drive, Suite 202	Sample Descript:	Water, Influent	Received:	Sep 26, 1991
Santa Clara, CA 95050			Analyzed:	Sep 27-30, 1991
Attention: Dan Landry	Lab Number:	109-4396	Reported:	Sep 30, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Arsenic	0.050	N.D.
Cadmium	0.010	N.D.
Chromium	0.010	N.D.
Copper	0.010	N.D.
Lead	0.0050	N.D.
Mercury	0.00020	N.D.
Nickel	0.050	N.D.
Silver	0.010	N.D.
Zinc	**0.010**	**0.033**

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
Amended report dated: 9/30/91

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	#330-06.12, Arco 0608, San Lorenzo	Sampled:	Sep 26, 1991
1601 Civic Center Drive, Suite 202	Sample Descript:	Water, Effluent	Received:	Sep 26, 1991
Santa Clara, CA 95050			Analyzed:	Sep 27-30, 1991
Attention: Dan Landry	Lab Number:	109-4397	Reported:	Sep 30, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Arsenic	0.050	0.29
Cadmium	0.010	N.D.
Chromium	0.010	N.D.
Copper	0.010	N.D.
Lead	0.0050	N.D.
Mercury	0.00020	N.D.
Nickel	0.050	N.D.
Silver	0.010	N.D.
Zinc	0.010	0.022

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

VM Tague

Vickie Tague
Project Manager

Please Note:
Amended report dated: 9/30/91

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	#330-06.12, Arco 0608, San Lorenzo	Sampled:	Sep 26, 1991
1601 Civic Center Drive, Suite 202	Sample Descript:	Water, Tank	Received:	Sep 26, 1991
Santa Clara, CA 95050			Analyzed:	Sep 27-30, 1991
Attention: Dan Landry	Lab Number:	109-4398	Reported:	Sep 30, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Arsenic	0.050	N.D.
Cadmium	0.010	N.D.
Chromium	0.010	N.D.
Copper	0.010	N.D.
Lead	**0.0050**	**0.0067**
Mercury	0.00020	N.D..
Nickel	0.050	N.D.
Silver	0.010	N.D.
Zinc	**0.010**	**0.047**

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Dan Landry

Client Project ID: #330-06.12, Arco 0608, San Lorenzo

QC Sample Group: 1094396-98

Reported: Sep 30, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Phenol	pH
Method:	EPA 420.1	EPA 9040
Analyst:	P. Penner	J. Martinez
Reporting Units:	mg/L	N.A.
Date Analyzed:	Sep 27, 1991	Sep 27, 1991
QC Sample #:	109-4398	109-4398
Sample Conc.:	N.D.	8.9
Spike Conc. Added:	0.50	N.A.
Conc. Matrix Spike:	0.49	N.A.
Matrix Spike % Recovery:	98	N.A.
Conc. Matrix Spike Dup.:	0.47	8.9
Matrix Spike Duplicate % Recovery:	94	N.A.
Relative % Difference:	4.2	0.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Dan Landry

Client Project ID: #330-06.12, Arco 0608, San Lorenzo

QC Sample Group: 1094396-99

Reported: Sep 30, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	L. Laikhtman	L. Laikhtman	L. Laikhtman	L. Laikhtman
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Sep 27, 1991	Sep 27, 1991	Sep 27, 1991	Sep 27, 1991
QC Sample #:	GBLK092791	GBLK092791	GBLK092791	GBLK092791
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	8.9	9.0	9.2	27
Matrix Spike % Recovery:	89	90	92	89
Conc. Matrix Spike Dup.:	9.6	9.7	9.7	29
Matrix Spike Duplicate % Recovery:	96	97	97	95
Relative % Difference:	7.6	7.5	5.3	6.9

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL SAMPLE RECEIPT LOG

CLIENT NAME: Pacific Environ
REC. BY (PRINT): KC
MASTER LOG NO. / PAGE: X
DATE OF LOG-IN: 9/26/91

CIRCLE THE APPROPRIATE RESPONSE	LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION (ETC)
1. Custody Seal(s): Present / (Absent) Intact / Broken*	109439[6]	A-C	influent	VOAs	W	9/26	
2. Custody Seal Nos.: X		D		cyanide			
3. Chain-of-Custody Records: (Present) / Absent*		E		metals			
		F		liter pl.			
		G		phenol			
4. Traffic Reports or Packing List: Present / (Absent)	1094399	A-C	mid-1	VOAs			
	1094397	A-G	Effluent	same as influent			
5. Airbill: Airbill / Sticker Present / (Absent)	1094398	A-G	Tank	same as influent			
6. Airbill No.: X							
7. Sample Tags: (Present) / Absent* Sample Tag Nos.: (Listed) / Not Listed on Chain-of-Custody							
8. Sample Condition: (Intact)/Broken*/Leaking*							
9. Does information on custody reports, traffic reports and sample tags agree? (Yes) / No*							
10. Proper Preservatives Used: (Yes) / No*							
11. Date Rec. at Lab: 9/26/91							
12. Time Rec. at Lab: 1330							

* If Circled, contact Project Manager and attach record of resolution

ARCO Products Company — Division of AtlanticRichfieldCompany

330-06.12 **Task Order No.** TBD

Chain of Custody

ARCO Facility no. 0608	City (Facility) 17601 HESPERIAN BLVD SAN LORENZO	Project manager (Consultant) DAN Landey	Laboratory name Sequoia
ARCO engineer Kyle Christie	Telephone no. (ARCO)	Telephone no. (Consultant) 408 984 6536	Fax no. (Consultant) 243-3911
Consultant name Pacific Environmental Group, Inc	Address (Consultant) 1601 Civic Center Dr. Santa Clara 95051		Contract number 07-023

Method of shipment:

Special detection Limit/reporting: 1094396 4399 4397 4398

Special QA/QC:

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	Metals* EPA 6010/7000	EPA 624/8240	EPA 625/8270 PAH	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	Phenol	Cyanide
INFL		7		X		X		9.26.91	1140	TPH	✓				✓		✓				✓	✓
Mid 1		3		X		X		9.26.91	1145	TPH	✓											
EFFL		7		X		X		9.26.91	1150	TPH	✓				✓		✓				✓	✓
TANK		7		X		X		9.26.91	1155	TPH	✓				✓		✓				✓	✓

Remarks: * As, Cd, Cu, Pb, Hg, Ni, Ag, Cu, Zn

Lab number: 1094396

Turnaround time

- Priority Rush 1 Business Day if possible ☒
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☐

Condition of sample: good

Temperature received: cool

	Date	Time	Received by	Date	Time
Relinquished by sampler					
Relinquished by			Received by		
Relinquished by T. Wolan 1133	9.26.91	1330	Received by laboratory K. Davis	9/26	1330

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

APPC-3292 (2-91)

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	#330-06.12, Arco, San Lorenzo	Sampled:	Sep 30, 1991
1601 Civic Center Drive, Suite 202	Sample Descript:	Water	Received:	Sep 30, 1991
Santa Clara, CA 95050	Analysis for:	Arsenic		
Attention: Dan Landry	First Sample #:	109-5249	Analyzed:	Oct 1, 1991
			Reported:	Oct 1, 1991

LABORATORY ANALYSIS FOR: Arsenic

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L
109-5249	Influent	0.0050	N.D.
109-5250	Mid-1	0.0050	0.17
109-5251	Effluent	0.0050	0.39

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Dan Landry

Client Project ID: #330-06.12, Arco, San Lorenzo

QC Sample Group: 1095249-51

Reported: Oct 1, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Arsenic
Method:	EPA 206.2
Analyst:	R. Sharma
Reporting Units:	mg/L
Date Analyzed:	Oct 1, 1991
QC Sample #:	109-2659
Sample Conc.:	N.D.
Spike Conc. Added:	1.0
Conc. Matrix Spike:	1.0
Matrix Spike % Recovery:	100
Conc. Matrix Spike Dup.:	1.1
Matrix Spike Duplicate % Recovery:	110
Relative % Difference:	9.5

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

ARCO Products Company
Division of AtlanticRichfieldCompany

330-06.12 17601 Hesperian Blvd
Task Order No.

Chain of Custody

ARCO Facility no.	City (Facility) San Lorenzo	Project manager (Consultant) Dan Landry	Laboratory name Sequoia
ARCO engineer Kyle Christie	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 984-6536	Fax no. (Consultant) 243-3911
Consultant name PEG	Address (Consultant) 1601 Civic Center #202 Santa Clara		Contract number 07-075

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	Arsenic
ENFL		1		✓		✓		9/30/91	1700												✓
MID-1		1		✓		✓		↓	1700												✓
FFFL		1		✓		✓		↓	1700												✓

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

Turnaround time

Priority Rush 1 Business Day ☒

Rush 2 Business Days ☐

Expedited 5 Business Days ☐

Standard 10 Business Days ☐

Method of shipment

Condition of sample:		Temperature received:	
Relinquished by sampler	Date 9/30/91 Time 1810	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date 7/1/91 Time 1510

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APPC-3292 (2-91)

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Brian Frus

Project: 330-06.09, Arco 0608, San Lorenzo

Enclosed are the results from 1 water sample received at Sequoia Analytical on October 7,1991. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
1101167	Water, Effluent	10/7/91	Arsenic

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

Vickie Tague

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	330-06.09, Arco 0608, San Lorenzo	Sampled:	Oct 7, 1991
1601 Civic Center Drive, Suite 202	Sample Descript:	Water, Effluent	Received:	Oct 7, 1991
Santa Clara, CA 95050			Analyzed:	Oct 7, 1991
Attention: Brian Frus	Lab Number:	110-1167	Reported:	Oct 8, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Arsenic	0.050	0.18

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

1101167.PPP <1>

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Brian Frus

Client Project ID: 330-06.09, Arco 0608, San Lorenzo

QC Sample Group: 110-1167

Reported: Oct 8, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Arsenic

Method:	EPA 200.7
Analyst:	C. Medefesser
Reporting Units:	mg/L
Date Analyzed:	Oct 7, 1991
QC Sample #:	110-1061

Sample Conc.:	N.D.
Spike Conc. Added:	1.0
Conc. Matrix Spike:	1.0
Matrix Spike % Recovery:	100
Conc. Matrix Spike Dup.:	0.92
Matrix Spike Duplicate % Recovery:	92
Relative % Difference:	8.3

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

CLIENT NAME: Pacific Env Group
REC. BY (PRINT): FL
MASTER LOG NO. / PAGE: X
DATE OF LOG-IN: 10-7

CIRCLE THE APPROPRIATE RESPONSE	LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION (ETC)
1. Custody Seal(s): Present / (Absent) Intact / Broken*	110167	N/A	Effluent	plastic	W	10-7	
2. Custody Seal Nos.:							
3. Chain-of-Custody Records: (Present) / Absent*							
4. Traffic Reports or Packing List: Present / (Absent)							
5. Airbill: Airbill / Sticker Present / Absent							
6. Airbill No.:							
7. Sample Tags: (Present) / Absent*							
Sample Tag Nos.: (Listed) / Not Listed on Chain-of-Custody							
8. Sample Condition: (Intact)/Broken*/Leaking*							
9. Does information on custody reports, traffic reports and sample tags agree? (Yes) / No*							
10. Proper Preservatives Used: (Yes) / No*							
11. Date Rec. at Lab: 10-7							
12. Time Rec. at Lab: 1522							

* If Circled, contact Project Manager and attach record of resolution

Form SC001

Page____of____

ARCO Products Company
Division of AtlanticRichfieldCompany

330-06.09 Task Order No. 601-91-5A

Chain of Custody

ARCO Facility no. 0608	City (Facility) San Lorenzo	Project manager (Consultant) Brian Frous	Laboratory name Sequoia
ARCO engineer CC	Telephone no. (ARCO)	Telephone no. (Consultant) 408 984-6536	Fax no. (Consultant) 243-3911
Consultant name Pac. Env. Group	Address (Consultant)		Contract number 07-073

Method of shipment: Pacific env.

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	Metals, Arsenic
Effluent	110167	1		X			HNO_3	10-7-91	14:45												

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number 07-073

Turnaround time

Priority Rush 1 Business Day: Same day X

Rush 2 Business Days: ☐

Expedited 5 Business Days: ☐

Standard 10 Business Days: ☐

Condition of sample: good		Temperature received: cool	
Relinquished by sampler	Date 10-7-91 Time 15:22	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date 10/7/91 Time 1522

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	330-06.09, Arco 0608, San Lorenzo	Sampled:	Oct 13, 1991
1601 Civic Center Drive, Suite 202	Sample Descript:	Water, Midpoint 2	Received:	Oct 14, 1991
Santa Clara, CA 95050			Analyzed:	Oct 14, 1991
Attention: Brian Frus	Lab Number:	110-2356	Reported:	Oct 14, 1991

LABORATORY ANALYSIS

Analyte	Detection Limit mg/L	Sample Results mg/L
Arsenic	0.0050	0.095
Suspended Solids	1.0	4.0
Chemical Oxygen Demand	20	29

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

ARCO Products Company
Division of AtlanticRichfieldCompany

330-06.09 **Task Order No.** 601-91-5A

Chain of Custody

ARCO Facility no. 0608	City (Facility) San Lorenzo	Project manager (Consultant) Brian Frous	Laboratory name SEQUOIA
ARCO engineer CC	Telephone no. (ARCO)	Telephone no. (Consultant) 408 734-6536	Fax no. (Consultant) 243-3911
Consultant name Pac. E.N.V. Group	Address (Consultant) 1601 Civic Center Dr. #202 Santa Clara		Contract number 07-073

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	Metals: Arsenic
Effluent		1		X			HNO3	10-7-91	14:45												

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

Turnaround time
Priority Rush 1 Business Day ☒
Rush 2 Business Days ☐
Expedited 5 Business Days ☐
Standard 10 Business Days ☐

Method of shipment

Condition of sample: good

Temperature received: cool

Relinquished by sampler	Date 10-7-91	Time 15:22	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory: [signature] Date 10/7/91 Time 1522

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APPC-3292 (2-91)

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Dan Landry

Project: 330-06.12, Arco 0608, San Lorenzo

Enclosed are the results from 3 water samples received at Sequoia Analytical on October 22,1991. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
1104074	Water, Influent	10/22/91	EPA 5030/8015/8020
1104075	Water, Mid - 1	10/22/91	EPA 5030/8015/8020
1104076	Water, Effluent	10/22/91	EPA 5030/8015/8020

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

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	330-06.12, Arco 0608, San Lorenzo	Sampled:	Oct 22, 1991
1601 Civic Center Drive, Suite 202	Matrix Descript:	Water	Received:	Oct 22, 1991
Santa Clara, CA 95050	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Oct 24, 1991
Attention: Dan Landry	First Sample #:	110-4074	Reported:	Nov 5, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
110-4074	Influent	N.D.	N.D.	N.D.	N.D.	N.D.
110-4075	Mid - 1	N.D.	N.D.	N.D.	N.D.	N.D.
110-4076	Effluent	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

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

Pacific Environmental Group
1601 Civic Center Drive, Suite 202
Santa Clara, CA 95050
Attention: Dan Landry

Client Project ID: 330-06.12, Arco 0608, San Lorenzo
QC Sample Group: 1104074-76
Reported: Nov 5, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J. Jencks	J. Jencks	J. Jencks	J. Jencks
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 24, 1991	Oct 24, 1991	Oct 24, 1991	Oct 24, 1991
QC Sample #:	BLK102491	BLK102491	BLK102491	BLK102491
Sample Conc.:	N.D.	N.D.	N..D	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.6	9.7	9.7	29
Matrix Spike % Recovery:	96	97	97	97
Conc. Matrix Spike Dup.:	10	10	10	31
Matrix Spike Duplicate % Recovery:	100	100	100	103
Relative % Difference:	4.1	3.1	3.1	6.7

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

$$\%\ \text{Recovery:} = \frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$$

$$\text{Relative \% Difference:} = \frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$$

SEQUOIA ANALYTICAL — SAMPLE RECEIPT LOG

CLIENT NAME: PEG
REC. BY (PRINT): KD

MASTER LOG NO. / PAGE: X
DATE OF LOG-IN: 10/23/91

CIRCLE THE APPROPRIATE RESPONSE		LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION (ETC)
1. Custody Seal(s):	Present / (Absent)	110404	AC	INFLUENT	VOAs	W	10/22	
2. Custody Seal Nos.:	Intact / Broken* X	405	↓	MID-1	↓	↓	↓	
3. Chain-of-Custody Records:	(Present) / Absent*	406	↓	EFF				
4. Traffic Reports or Packing List:	Present / (Absent)							
5. Airbill:	Airbill / Sticker Present / (Absent)							
6. Airbill No.:	X							
7. Sample Tags:	(Present) / Absent*							
Sample Tag Nos.:	(Listed) / Not Listed on Chain-of-Custody							
8. Sample Condition:	(Intact)/Broken*/Leaking*							
9. Does information on custody reports, traffic reports and sample tags agree?	(Yes) / No*							
10. Proper Preservatives Used:	(Yes) / No*							
11. Date Rec. at Lab:	10/23/91							
12. Time Rec. at Lab:	530pm							

* If Circled, contact Project Manager and attach record of resolution

ARCO Products Company Division of AtlanticRichfieldCompany — **Chain of Custody**

Task Order No. 330-06.1 / 608-91-2B

ARCO Facility no. 0608	City (Facility) San Lorenzo	Project manager (Consultant) Dan Landry	Laboratory name Sequoia
ARCO engineer Chuck Carmel	Telephone no. (ARCO)	Telephone no. (Consultant) 984-6536	Fax no. (Consultant) 243-3911
Consultant name Pacific Environmental	Address (Consultant) 1601 Civic Center SC 95051		Contract number 07-073

Method of shipment: Sequoia courier

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH Gas EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
TOFL		3		X		X	HCL	10-22-91			X				1104074						
MW-1		3		X		X	↓	↓			↓				1104075						
FFL		3		X		X	↓	↓			↓				1104076						

Special detection Limit/reporting

Special QA/QC

Remarks

Mark Gubrud

Lab number 1104074

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample: good		Temperature received: COOL	
Relinquished by sampler	Date 10/22/91	Time 15:37	Received by Ben Follett
Relinquished by Ben Follett	Date 10/23/91	Time 16:45	Received by
Relinquished by	Date	Time	Received by laboratory: Date 10/23 Time 930

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

ATTACHMENT C

WASTE WATER DISCHARGE PERMIT

ORO LOMA SANITARY DISTRICT

WASTEWATER DISCHARGE PERMIT

COMPANY NAME Arco Products Company

MAILING ADDRESS P.O. Box 5811,
2000 Alameda de las Pulgas
San Mateo, CA 94402

FACILITY ADDRESS: 17601 Hesperian Blvd
San Lorenzo, CA 94580

The above named company is authorized to discharge wastewater to the Oro Loma Sanitary District sewerage system subject to compliance with the District's Ordinance No. 39 (as amended) titled:

> "AN ORDINANCE REGULATING THE USE OF PUBLIC AND PRIVATE SEWERS AND DRAINS. REGULATING THE DISCHARGE OF WATERS AND WASTE INTO THE PUBLIC SEWER SYSTEM. PROVIDING FOR WASTEWATER DISCHARGE PERMITS AND FIXING PERMIT AND MONITORING FEES, AND PROVIDING FOR LIABILITIES AND PENALTIES FOR THE VIOLATION OF THE PROVISIONS THEREOF."

and subject to compliance with any Federal or State regulations that apply, all permit conditions set forth in this permit, and payment, of fees and charges when billed.

This permit is granted in accordance with the application filed on February 1, 1991 in the office of the Oro Loma Sanitary District and in conformity with specifications and information submitted to the District in support of the above referenced application.

PERMIT NO 90-073-91 EFFECTIVE DATE: April 4, 1991

EXPIRATION DATE: April 4, 1991

APPROVED Douglas C. Humphrey for MC 4-4-91
GENERAL MANAGER DATE

SK/WTRDISCH.ARCO/LR

PERMIT CONDITIONS

PART I - GENERAL

1. Definitions. See Section 1.2, Ordinance 39-3, attached.

2. General.

   The User shall comply with all the general prohibitive discharge standards in Article II: Regulations, of Ordinance No. 39-3.

3. Right of Entry

   Ready and immediate access to the facility, the pretreatment area and the sampling points, shall be provided to District personnel at all times.

4. Records Retention.

   The User shall retain and preserve for no less than three (3) years any records, books, documents, memoranda, reports, correspondence and any and all summaries thereof, relating to monitoring, sampling and chemical analyses made by or on behalf of the user in connection with its discharge. Records shall be made available for inspection and copying by representatives of the District, the California Regional Water Quality Control Board or the Environmental Protection Agency. All records that pertain to matters that are the subject of special orders or any other enforcement or litigation activities brought by the District shall be retained and preserved by the User until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

5. Confidential Information.

   Except for data determined to be confidential under the provisions of Ordinance No. 39-3, all reports required by this permit shall be available for public inspection at the District Office, 2600 Grant Avenue, San Lorenzo, California.

6. Time Schedules

   Time schedules for achieving compliance which are required through a notice of violation, administrative or judicial order, or any other written correspondence from the District are deemed to be a condition of the permit.

PERMIT CONDITIONS

PART I - GENERAL

7. Signatory Requirement.

All reports required by this permit shall be signed by an Authorized Representative of the permittee or his designee, as defined in ordinance 39-3, 1.2(b).

8. Revocation of Permit.

The permit issued to the User by the District may be revoked when, after inspection, monitoring or analysis it is determined that the discharge of wastewater to the sanitary sewer is in violation of Federal, State or Local laws, ordinances, or regulations. Additionally, falsification or intentional misrepresentation of data or statements pertaining to the permit application or any other required reporting form shall be cause for permit revocation.

9. Limitation on Permit Transfer.

Wastewater Discharge permits are issued to a specific user for a specific operation and are not assignable to another user or transferable to any other location without the prior written approval of the District. Sale by a User shall obligate the purchaser to seek prior written approval of the District for continued discharge to the sewerage system and issuance of new permit.

10. Falsifying Information or Tampering with Monitoring Equipment.

Knowingly making any false statement on any report or other document required by this permit or knowingly rendering any monitoring device or method inaccurate may result in punishment in accordance with District Ordinance or other applicable laws.

11. Modifications or Revision of the Permit.

The terms and conditions of this permit may be subject to modification by the District at any time as limitations or requirements as identified in the District Ordinance No. 39 (as amended) are modified, or if other just cause exists.

This permit may also be modified to incorporate special conditions resulting from the issuance of a special order by an agency which regulates the Districts's discharge.

PERMIT CONDITIONS

PART I - GENERAL

The terms and conditions may be modified as a result of Environmental Protection Agency promulgating a new federal pretreatment standard.

Any permit modifications which result in new conditions in the permit shall include a reasonable time schedule for compliance if necessary.

12. Duty to Reapply.

Within thirty (30) days of the notification, the User shall reapply for reissuance of the permit on a form provided by the District.

13. Severability.

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provisions to other circumstances and the remainder of this permit shall not be affected thereby.

14. Property Rights.

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any invasion of personal rights, nor any infringement of Federal, State or Local regulations.

15. Permit Duration.

The wastewater discharge permit will remain in effect for one year from the effective date of the permit. Users who are issued a wastewater discharge permit or renew a wastewater discharge permit shall pay the permit fee set forth in the current schedule of fees as adopted in the most current amendment to Ordinance No. 39.

PERMIT CONDITIONS
PART 2 - DISCHARGE REQUIREMENTS

1. Maintenance of Pretreatment Equipment and Monitoring Systems

   a. The waste treatment system shall be kept in a fully operational condition at all times. This includes maintaining adequate chemical supplies for treating wastewater, proper calibrations of all instrumentation (pH meters, etc.) and proper removal of sludges and unacceptable wastes. A qualified operator of the system shall be available to maintain the pretreatment system during all discharge periods.

   b. The District shall be notified immediately if there are problems with the pretreatment system. Any proposed modifications to the system or the processes for pretreating the wastewater must be reviewed with the District's Source Control Staff prior to implementation.

2. Discharge Limitations.

Parameter	Symbol	Limit for any one Sample
Arsenic	As	0.1 mg/L
Cadmium	Cd	0.2 mg/L
Copper	Cu	2.0 mg/L
Cyanide	Cn	1.0 mg/L
Lead	Pb	1.0 mg/L
Mercury	Hg	0.01 mg/L
Nickel	Ni	1.0 mg/L
Silver	Ag	0.2 mg/L
Total Chromium	Cr	0.5 mg/L
Zinc	Zn	3.0 mg/L
T.I.C.H.*		0.02 mg/L
Phenolic compounds		1.0 mg/L
Oil and Grease (Mineral)		100 mg/L
Oil and Grease (Animal/Vegetable)		300 mg/L
pH		No lower than 5.5 units
Temperature		No higher than 150' F

*(T.I.C.H.: Total Identifiable Chlorinated Hydrocarbons)

The permittee shall comply with all limits, prohibitions and requirements set forth in this permit and in Ordinance No 39-3.

Should Federal Categorical Standards for a particular industrial category be more stringent than the limits set forth in this permit or ordinance, the more stringent Federal limits shall apply.

PERMIT CONDITIONS

PART 2 - DISCHARGE REQUIREMENTS

3. Dilution or Bypassing

No User shall increase the use of potable or process water or, in any way, attempt to dilute a discharge as a partial or complete substitute for adequate treatment to achieve compliance with the limitations contained in this permit. User shall not divert their wastestreams from the pretreatment systems.

4. Proper Disposal of Pretreatment Sludges and Spent Chemicals

The disposal of sludges and spent chemicals generated shall be done in accordance with all applicable State and Federal regulations. Copies of all Hazardous Wastes Manifests shall be maintained as part of the Records Retention Requirement Section 4.8 of Ordinance 39-3.

PERMIT CONDITIONS

PART 3 - REPORTING REQUIREMENTS

1. Notice to Employees

In order that employees of user be informed of District requirements, users shall make available to their employees, copies of the Districts Discharge Regulations together with other wastewater information and notices which may be furnished by the District. User shall permanently post a notice advising employees whom to call in case of spill or accidental discharge. This notice shall be posted in a prominent place.

2. Accidental Spills or Slug Discharge

The user shall notify the District immediately upon any accidental or slug discharge to the sanitary sewers as outlined in Ordinance 39-3 Section 2.12. Formal written notification discussing circumstances and remedies shall be submitted to the District within five days of the occurrence. The user shall work with the District to resolve any problems caused by such accidental or slug discharge. The District will evaluate the need for a spill prevention plan for all significant industrial users no less than once every two years. Should the District determine there is a need for spill prevention plan, the industrial user will be notified and required to submit such a plan to the District.

3. Notification of Changed Discharge.

The user shall notify the District of any changes (permanent or temporary) to the premises, operation of the firm, quality or volume of wastewater, water usage, process, installation or removal of tanks or equipment prior to implementation.

4. Notification of Upset.

Any upset experienced by the user of any of its treatment processes that places the user in a temporary state of noncompliance with the wastewater discharge limitations contained in this permit or other limitations specified in the District's Ordinance shall be reported to the District within 24 hours of first awareness of the commencement of the upset. A detailed report shall be filed with the District within five days of the start of the upset.

5. Periodic Reports of Compliance

As required by 40 CFR 403.12, all significant industrial users, both categorical and non-categorical, must submit periodic reports of continued compliance to the District. These reports are due by June 30 and December 31 of each year. The content and format of these reports must be in compliance with EPA and District requirements.

PERMIT CONDITIONS

PART 3 - REPORTING REQUIREMENTS

6. Self Monitoring, Reporting and Recordkeeping Requirements.

In addition to self monitoring required elsewhere in this permit, the following conditions must be met:

a. All samples and measurements must be representative of the wastestream and taken under normal discharging conditions when monitored pollutants are likely to be present. Samples collected to determine compliance with Federal point Source Wastewater Discharge limitations must be taken immediately downstream from the pretreatment facilities. If no pretreatment is performed the samples must be taken immediately downstream from the regulated process, before the process wastewater combines with sanitary or other diluting waterstreams (non-contact cooling water, boiler blowdown, etc.)

b. Sampling performed for periodic reports of continued compliance must be collected,processed, stored, analyzed and reported in compliance with EPA and District requirements.

c. All monitoring information and records must be retained for at least three years from the date of the sample, measurement, or report. This information must be made available for inspection and copying by District personnel or a District authorized representative upon request.

d. If self monitoring indicates a violation, the permittee must notify the District within 24 hours of becoming aware of the violation and must resample immediately. The results of the resample must be submitted to the District within 30 days after becoming aware of the violation. (40 CFR 403.12(g)(2)

e. Self monitoring required through a Notice of Violation, Administrative Order, or any other written correspondence from the District is deemed to be a condition of this permit.

f. If any pollutant is monitored more frequently than required by the District or Federal Regulation, the results of this additional sampling must also be included in the Periodic Reports of Continued Compliance.

7. Hazardous Materials Notification

a. The permittee shall notify the District, the E.P.A., Regional Waste Management Division Director and the California Department of Health Services in writing, of any intentional or accidental discharge of a RCRA characteristic or listed hazardous waste or material. Notification must be made within 180 days after the discharge, and must include the name and E.P.A. hazardous waste number of the material, the type of discharge, (continuous, batch or other), an identification of the hazardous constituents of the waste, an estimate of the mass and concentration in the wastestream discharge during that calendar month.

b. The Notification Requirement does not apply to pollutants already reported in periodic self-monitoring reports.

PERMIT CONDITIONS

PART 4 - PENALTIES AND FEES

1. SIGNIFICANT NON-COMPLIANCE

Should the District determine that the permittee is in significant non-compliance with applicable pretreatment requirements, the District will list the facility in the **PUBLIC NOTICE OF SIGNIFICANT WASTEWATER VIOLATIONS** in the largest daily newspaper in the area. This list will be published annually, but may be published more frequently at the discretion of the District.

An industrial user is in significant non-compliance if one or more of the following violations occurs:

a. Chronic violations of wastewater discharge limits, defined as those in which 66 percent or more of all of the measurements taken during a six month period exceed (by any magnitude) the daily maximum limit or the average limit for the same pollutant parameter.

b. Technical Review Criteria (TRC) violations, defined as those in which 33 percent or more of all of the measurements for each pollutant parameter taken during a six month period equal or exceed the product of the daily maximum limit or the average limit multiplied by the applicable TRC (TRC=1.4 for BOD, TSS, fats, oil, and grease, and 1.2 for all other pollutants except pH.)

c. Any other violation of a pretreatment effluent limit (daily maximum or longer-term average) that the District determines has caused, alone or in combination with other discharges, interference or pass through (including endangering the health of District personnel or the general public).

d. Any discharge of a pollutant that has caused imminent endangerment to human health, welfare or to the environment or has resulted in the District's exercise of its emergency authority to halt or prevent such a discharge.

e. Failure to meet, within 90 days after the schedule date, a compliance schedule milestone contained in a permit or enforcement order for starting construction, completing construction, or attaining final compliance.

f. Failure to provide, within 30 days after the due date, required reports such as baseline monitoring reports, 90 day compliance reports, periodic self monitoring reports, and reports on compliance with compliance schedules.

1. Significant Non-Compliance (continued)

   g. Failure to accurately report non-compliance.

   h. Any other violation deemed significant by the District.

2. Civil and Criminal Liability

   Any person who intentionally or negligently violates any requirements or conditions of this permit, Ordinance 39-3, an order of the District, or violates any cease and desist order, prohibition, effluent limitation, National Standard of Performance, pretreatment or toxicity standard shall be liable civilly for a penalty not to exceed $6,000.00 for each day in which such violation occurs or continues. In addition to penalties, the District may recover reasonable attorney's fees and other expenses of litigation.

   Any person who commits such violations is guilty of a misdemeanor and upon conviction is subject to criminal penalties of not more than $1,000.00 and or imprisonment for not more than 30 days in the county jail.

   Nothing in this permit relieves the permittee from civil and or criminal penalties for non-compliance under state or federal laws or regulations.

3. Wastewater Charges and Fees.

   The User shall pay to the District all sewer service charges, permit fees, monitoring charges and laboratory analysis charges levied in accordance with current District Ordinances. All charges are due and payable upon receipt of statement of charges. Failure to pay fees within 30 days may result in revocation of wastewater discharge permit and termination of service. Overdue fees shall be assessed a 10 percent penalty plus interest of 1.5 percent per month until fees have been paid.

PERMIT CONDITIONS
PART 5
Special Conditions - Groundwater Discharges

GENERAL

The permittee shall provide easily accessible sampling points for both pre and post-treatment samples. The District reserves the right to sample at will for any constituents it deems necessary on groundwater samples collected from either pre or post-treatment locations.

There shall be no bypassing of any treatment process or unit or direct discharge into the sewer system at any time.

The permittee assumes full responsibility for any and all damages to the collection system or to the Oro Loma/Castro Valley Treatment Plant, that can be directly attributed to the discharge of treated groundwater from the operation at the site.

The permittee shall notify the District's Industrial Wastewater Inspector at 278-1747, no less than 2 hours prior to commencement of any pumping activity and request an inspection of the site. No pumping shall occur until District staff have inspected the site, piping, pumping set-up, metering and discharge points.

PRE-PUMPING AND EMERGENCY NOTIFICATION

In the event of any explosive condition or other potentially harmful situation which may affect either the collection system or the Treatment Plant, the permittee shall contact the District at 278-1747 immediately (operators are on duty 24 hours per day).

The Eden Regional Fire Department shall be notified of the clean-up operation.

If air stripping is part of the treatment process, the Bay Area Air Quality Control Board shall be notified of the process. If a permit is issued by the Air Board, a copy of that permit and subsequent extensions shall be submitted to the District.

INITIAL SAMPLING

During the initial three hour start-up pumping period, the effluent discharge from the treatment process shall not be sewered. The total volume shall be contained in a tank. The system will be shut down. A representative groundwater sample shall be collected and analyzed for the constituents listed below. Further processing of the groundwater will be allowed only after laboratory analysis demonstrate that the contents of the tank meet all of the limitations set forth in this permit.

PARAMETER	O.L.S.D. LIMIT
Metals	
Arsenic	0.1 mg/L
Cadmium	0.2 mg/L
Copper	2.0 mg/L
Lead	1.0 mg/L
Mercury	0.01 mg/L
Nickel	1.0 mg/L
Silver	0.2 mg/L
Total Chromium	0.5 mg/L
Zinc	3.0 mg/L
GENERAL ANALYSIS	
COD	N/A
Suspended Solids	N/A
pH	No lower than 5.5 units.
Total Petroleum Hydrocarbons (EPA8015)	15 mg/L
B.T.E.X. (EPA 8020)	Non-detectable
Phenols	1.0 mg/L
Cyanide	1.0 mg/L

PERMIT CONDITIONS
Part 5

Special Discharge - Groundwater Discharges

PROPOSED SAMPLING AFTER INITIAL TESTING

One week after discharge begins, a representative sample shall be collected and analyzed for total Petroleum Hydrocarbons (TPH).

If laboratory analysis show the TPH level is below 15 mg/L, discharge may proceed. Monthly samples will be collected and analyzed for TPH, BTEX, and one General Analysis (COD, SS, pH).

If laboratory analysis show the TPH levels are above 15 mg/L on the first week's sample, another sample will be collected for TPH immediately upon receipt of the laboratory results of the first sample.

When the District is convinced that the TPH levels have stabilized, monthly sampling for TPH, BTEX and one General Analysis (COD, SS, pH) shall be performed for the duration of the pumping operation.

During the entire treatment process, the TPH concentration shall not exceed 15 mg/L. Sampling frequency will be increased if test results show discharge levels are bordering or exceed 15 mg/L for TPH.

The results of all laboratory analysis shall be transmitted to the District within three days of receipt of the Laboratory Report.

METERING

The permittee shall submit specifications of the proposed flow meter to the District for approval. The meter must be appropriate for all anticipated conditions of flow and pressure, and must include a non-resetable totalizer and fittings to allow for a "fill-up" test to verify the accuracy of the meter. This can also serve as the sampling point for discharge.

Monthly flow data will be transmitted to the District no later than the 10th day of the following month.

BILLING AND PERMIT EXTENSIONS

The permittee shall pay all District fees for sampling, monitoring inspections, loading charges, as well as any other related District expenses billed prior to the expiration of this permit.

The District will not consider an extension of this permit until all fees and reimbursable costs have been paid to the permittee.

FEES

An annual permit fee of $400 is charged with the issuance and any subsequent renewals of this discharge permit.

Sewer service and use charges will be $1.472/hcf or $1.97 per thousand gallons of water discharged.