Ultramar

Ultramar Inc.
P.O. Box 466
525 W. Third Street
Hanford, CA 93232-0466
(209) 582-0241

Telecopy: 209-584-6113 Credit & Wholesale
209-583-3330 Administrative
209-583-3302 Information Services
209-583-3358 Accounting

April 2, 1992

Ms. Pamela Evans
Hazardous Materials Program
Department of Environmental Health
Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, CA 94612

SUBJECT: BEACON STATION NO. 721, 44 LEWELLING BLVD., SAN LORENZO, CALIFORNIA

Dear Ms. Evans:

Enclosed is a copy of the Additional Site Investigation and Groundwater Monitoring and Sampling Report for the above-referenced Ultramar facility. Also included is a copy of the Quarterly Status Report which describes the work performed this quarter and the work anticipated to be completed next quarter.

The remedial action plan is being prepared and will be forwarded to Alameda County once it is finalized by the consultant.

Please call if you have any questions regarding the information included in this report.

Sincerely,

ULTRAMAR INC.

Terrence A. Fox
Senior Project Manager
Marketing Environmental Department

Enclosures

cc w/encl: Mr. Steven Ritchie, San Francisco Bay Region, RWQCB

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ENVIRONMENTAL PROJECT QUARTERLY STATUS REPORT

DATE REPORT SUBMITTED: March 26, 1992
QUARTER ENDING: December 31, 1991

SERVICE STATION NO.: 721
ADDRESS: 44 Lewelling Blvd., San Lorenzo, CA
COUNTY: Alameda

ULTRAMAR CONTACT: Terrence A. Fox **TEL. NO:** 209-583-5545

BACKGROUND:

In April 1987, three underground gasoline storage tanks were excavated and removed. Samples collected from beneath the former tanks indicated that hydrocarbons were present in the soil. In May 1987, three monitoring wells (MW-1 through MW-3) were installed by Conoco. Hydrocarbons were detected in soil and ground-water samples collected from the wells. In December 1988, four additional wells (MW-4 through MW-7) were installed. Dissolved-phase hydrocarbons were detected in the new wells. In September 1989, two additional wells (MW-8 and MW-9) were installed. The site has been on a monitoring program since May 1987.

In July 1990, the site was purchased by Ultramar Inc. from Conoco. The monitoring program has continued. Submitted work plan for additional assessment on March 14, 1991.

SUMMARY OF THIS QUARTER'S ACTIVITIES:

On October 17, 1991, drilled two additional offsite wells (MW-10 and MW-11) southwest of the site and one onsite recovery well (RW-1). Performed quarterly monitoring on November 5 and 13, 1991. Manual bailing of free product was performed on October 7 and 24 and December 12, 1991.

Performed a ground-water extraction test on November 11, 1991.

RESULT OF QUARTERLY MONITORING:

Hydrocarbons were detected in soil samples collected during the drilling of the recovery well RW-1. Hydrocarbons were not detected in samples collected from the drilling of MW-10 and MW-11.

Monitoring data indicates that the free product thickness has decreased in MW-3 from 0.44' to a sheen. No free product was detected in MW-1. Benzene concentrations decreased in MW-1 from 490 ppb to 420 ppb and in MW-7 from 79 ppb to 52 ppb. Benzene concentrations detected in MW-10, MW-11 and RW-1 were 29 ppb, not detected, and 74 ppb, respectively. Benzene concentrations remained not detected in wells MW-2, MW-4, MW-5, MW-6, MW-8, and MW-9.

PROPOSED ACTIVITY OR WORK FOR NEXT QUARTER:

ACTIVITY	ESTIMATED COMPLETION DATE
Perform vapor extraction test water extraction tests	January 20, 1992
Submit report on additional well installation	March 26, 1992
Prepare interim remedial action plan	In progress

ADDITIONAL SITE INVESTIGATION AND GROUNDWATER MONITORING AND SAMPLING REPORT FOURTH QUARTER 1991 AT BEACON GAS STATION NO. 721 44 LEWELLING BOULEVARD SAN LORENZO, CALIFORNIA

FEB 1992

FOR

ULTRAMAR, INC.
525 WEST THIRD STREET
HANDFORD, CALIFORNIA 93230

Prepared by

RESNA Industries Inc.
42501 Albrae Street
Fremont, California

Project No. 3-30092-32
February 1992

RESNA
42501 Albrae Street
Fremont, California 94538
(510) 440-3300

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RESNA
Working to Restore Nature

42501 Albrae Street
Fremont, California 94538
Phone: (510) 651-1906
FAX: (510) 651-8647

February 28, 1992
Project No. 3-30092-32

Ultramar Inc.
525 West Third Street
Hanford, CA 93230-0466

Attention: Mr. Terrence A. Fox

Subject: Additional Site Investigation and
Groundwater Monitoring and Sampling Report
Fourth Quarter of 1991, Beacon Gas Station No. 721
44 Lewelling Boulevard, San Lorenzo, California

Dear Mr. Fox:

This report presents the results of groundwater sampling and analyses for the fourth quarter of 1991, conducted by RESNA Industries Inc. (formerly Exceltech, Inc.) for Beacon Gas Station No. 721 in the City of San Lorenzo, Alameda County, California. The purpose of this sampling program is to monitor and evaluate the extent of hydrocarbons dissolved in the groundwater underlying the subject property.

Site Description and Background

Beacon Service Station No. 721 is located at 44 Lewelling Boulevard in San Lorenzo, California about 200 feet east of the intersection of Lewelling Boulevard and Via Granada (Figure 1). Residential dwellings are located south and east of the site, commercial properties are located west of the site and Lewelling Boulevard is located north of the site. The site elevation is approximately 40 feet above mean sea level. San Lorenzo Creek, located approximately 200 feet south of the site, flows westward and discharges to San Francisco Bay.

On April 28, 1987, two 10,000-gallon tanks and one 7,500-gallon tank were excavated and removed during an upgrading of the site. Volatile hydrocarbons were found during analysis of soil samples collected from the bottom of the tank pit from the depth of approximately 16 feet. Three new 10,000-gallon underground storage tanks were installed in the western portion of the site in 1987. Subsequent to the underground tank replacement in April-May 1987, Applied GeoSystems (AGS) installed groundwater monitoring wells MW-1, MW-2, and MW-3 near the underground fuel tanks. Hydrocarbon-impacted soil and water were encountered in the three borings and monitoring wells. AGS described the results of their subsurface investigation in a report prepared for Kayo Oil Company, dated June 23, 1987, AGS Job No. 87044-3.

In December 1988, DuPont Environmental Services (DuPont) installed monitoring wells MW-4 through MW-7, and drilled soil boring B-1 to a depth of 37 feet. In September 1989, DuPont installed monitoring wells MW-8 and MW-9, located south and west of the site. Hydrocarbons were indicated in soil from B-1, located approximately 20 feet southwest of the tank pit. Results of the subsurface investigations were summarized in a Problem Assessment Report prepared by DuPont for Conoco, Inc., dated November 22, 1989.

Quarterly groundwater monitoring and sampling was performed by AGS or DuPont during the period between May 29, 1987 and December 18, 1990. Results of their work were summarized in the

quarterly report dated January 25, 1991 prepared by DuPont for Ultramar Inc. Groundwater Technology, Inc. performed three groundwater monitoring and sampling rounds on March 28, 1991, June 25, 1991, and September 17, 1991.

Exploratory Drilling and Soil Sampling

RESNA drilled exploratory borings MW-10, MW-11 and RW-1 in the site vicinity on October 17, 1991, at the locations shown on Figure 2. The borings for MW-10 and MW-11 were drilled with a truck-mounted Mobile B-34 drill rig, and the boring for RW-1 was drilled with a Mobile B-61 drill rig. Continuous flight, hollow-stem auger of 4-1/4- and 8-1/4-inch-inside diameters were used, respectively. The augers and other tools were steam cleaned before drilling each boring to minimize the possibility of cross-contamination.

The borings were drilled in the following manner: the drill rig was situated over the boring location, and the hollow-stem auger was used to advance the hole to the desired sampling depth. Relatively undisturbed soil samples were collected at approximately 5-foot depth intervals to the bottom of the boring. The samples were collected using a pre-cleaned modified California split-spoon sampler which contained 2-inch-diameter by 6-inch-long brass liners. When the boring was advanced to the desired sampling depth, the sampler was lowered to the bottom of the hole. The sampler was driven 1-1/2 feet ahead of the auger into native soil with a 140-pound, rig-operated hammer. The sampler was then removed and disassembled into its component parts.

The lowermost brass liner from the sampler was sealed with aluminum foil, capped, labeled, logged on a chain-of-custody form, and placed in a chilled ice chest for transport to a state-certified laboratory. The samples were field checked for hydrocarbon vapors using a portable photoionization detector (PID) and the readings were recorded on the boring log. Earth materials were characterized using the Unified Soil Classification System. Boring logs and well construction details for each well are in Appendix A. A description of the RESNA soil sampling protocol is in Appendix B, results of the soil analyses are presented in Table 1, and certified laboratory results are located in Appendix C.

Table 1

Summary of Soil Analyses

Date	Boring Number	Sample Number	Sample Depth (feet)	Benzene ppm	Ethyl Toluene ppm	Benzene ppm	Xylenes ppm	TPHG ppm
10/17/91	B-10	S-6-B10	6	ND	ND	ND	ND	ND
10/17/91	B-10	S-11-B10	11	ND	ND	ND	ND	ND
10/17/91	B-10	S-16-B10	16	ND	ND	ND	ND	ND
10/17/91	B-11	S-6-B11	6	ND	ND	ND	ND	ND
10/17/91	B-11	S-11-B11	11	ND	ND	ND	ND	ND
10/17/91	B-11	S-16-B11	16	ND	ND	ND	ND	ND
10/17/91	RW-1	RW-5	5	ND	ND	ND	ND	ND
10/17/91	RW-1	RW-10	10	0.009	0.025	0.018	0.11	1.5
10/17/91	RW-1	RW-15	15	7.9	29	28	160	1,900

TPHG - Total petroleum hydrocarbons as gasoline
ppm - Parts per million = mg/kg — milligrams per kilogram

Note: B10 = MW-10; B11 = MW-11

RESNA

Groundwater Monitoring Well Construction and Location

After each borehole was drilled to its final depth, it was completed as either a groundwater monitoring or recovery well.

Monitoring wells MW-10 and MW-11 were constructed of 2-inch-diameter, and well RW-1 of 6-inch-diameter, Schedule 40 flush-threaded polyvinyl chloride (PVC) casing. A 0.020-inch slotted casing was used for well screen. No glues or solvents were used in the well construction. After drilling the boring to the desired depth, the PVC casing was installed through the hollow-stem auger. Vertical placement of the screened interval was determined in the field. The sand pack (No. 2/12 sand) was installed in the borehole annulus to approximately 2 feet above the slotted screen section. Approximately 1 foot of bentonite pellets was placed above the sand pack and hydrated. The well was sealed to within 1 foot of the surface with neat cement. The top of the well was set approximately 0.5-inch above grade in watertight, traffic-rated concrete vault box set in concrete. Details of the monitoring well construction are in Appendix A.

Groundwater monitoring wells MW-10 and MW-11 were installed hydraulically downgradient of the site, to the southwest (see Figure 3). The third well, RW-1, is located on-site in the vicinity of the underground tanks.

Ron Archer Civil Engineer, Inc., surveyed the well heads elevations to mean sea level on November 6, 1991.

November 1991 Monitoring Round

RESNA sampled 10 on- and off-site groundwater monitoring wells on November 5, 1991. Well MW-3 was not sampled because sheen was present in the well. RW-1 was sampled approximately one week later, on November 13, 1991, because a pumping test was being performed in it on November 5, 1991.

Groundwater Sampling

RESNA measured the depth to groundwater and collected groundwater samples from 10 monitoring wells in accordance with the RESNA groundwater sampling protocol (Appendix D). The equipment rinse water and groundwater purged from the wells were placed in drums approved by the California Department of Transportation and left on-site pending laboratory analytical results. Groundwater monitoring data is presented in Table 2. RESNA prepared a groundwater surface contour map (Figure 2) from the measured depths to groundwater and the elevations of the tops of the well casings. A summary of groundwater elevation data up to date are presented in Table 3.

Summary of Analytical Results

Only samples collected from the depth of 10 and 15 feet from boring for RW-1 indicated concentrations of Total Petroleum Hydrocarbons as Gasoline (TPHG) and benzene, toluene, ethylbenzene, and total xylenes (BTEX).

Applied Analytical Environmental Laboratories, a state-certified laboratory in Fremont, California, analyzed the groundwater samples for total petroleum hydrocarbons as gasoline (TPHG) with benzene, toluene, ethyl benzene, and total xylenes (BTEX).

Analytical results for the groundwater samples collected in November 1991 from wells MW-5 and MW-9 were below detection limits. Benzene concentrations varied from below the detection limit to 420 ppb. Summary of groundwater analyses and monitoring data for November 1991 monitoring round is presented in Table 2. A summary of cumulative groundwater analytical results is presented in Table 4.

RESNA

Hydrogeology

Groundwater elevations at the site on November 5, 1991 were lower than on September 17, 1991. The decrease varied from 0.18 feet in well MW-6 to 0.43 feet in well MW-3. The apparent general groundwater flow direction observed in November 1991 was to the southwest. The groundwater surface gradient calculated for November 1991 varied from approximately 0.0004 to 0.0049 (Figure 3).

Discussion

Concentrations of benzene in groundwater samples collected from wells MW-1 and MW-7 decreased if compared to data from previous sampling round in September 1991. Benzene was not detected in wells MW-2, MW-4, MW-5, MW-6, MW-8, MW-9, and MW-11. The concentration of benzene in well RW-1, MW-1, MW-7, and MW-10 was 74 ppb, 420 ppb, 52 ppb, and 29 ppb, respectively. The benzene constituent plume appears to be defined in the downgradient direction as indicated by results from well MW-11.

Reporting Requirements

Ultramar Inc. should forward a copy of this report to the following agencies in a timely manner.

California Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, California 94612

Alameda County Health Care Services
Department of Environmental Health
Hazardous Materials Division
80 Swan Way Center, Suite 200
Oakland, California 946211-1439

If you have any questions or comments concerning this report, or if we may be of further service to Ultramar, please call us at (510) 440-3300.

Sincerely,
RESNA Industries Inc.

Zbigniew Ignatowicz
Staff Geologist

Dan Wynne, C.E.G. 1569
Senior Geologist

Douglas T. Young
Senior Project Hydrogeologist

REGISTERED GEOLOGIST
DANIEL B. WYNNE
6/92
STATE OF CALIFORNIA

ZI/DW/DTY/sr
Attachments

TABLE 2

SUMMARY OF GROUNDWATER ANALYSES AND MONITORING DATA
(November 1991)

Sample Number	Date Collected	TPHG ppb	Benzene ppb	Toluene ppb	Ethyl Benzene ppb	Total Xylenes ppb	Well Elevation famsl	DTW feet	Water Elevation famsl
MW-1	11/5/91	35,000	[redacted]	45	410	780	43.67	20.40	23.27
MW-2	11/5/91	700	ND	ND	1.1	ND	43.09	19.73	23.36
MW-3	11/5/91	NS	NS	NS	NS	NS	43.10	19.98	23.12
MW-4	11/5/91	3,500	ND	ND	3.2	1.1	44.66	21.41	23.25
MW-5	11/5/91	ND	ND	ND	ND	ND	43.79	20.43	23.36
MW-6	11/5/91	130	ND	ND	ND	ND	42.47	19.07	23.40
MW-7	11/5/91	1,100	[redacted]	ND	76	58	41.54	18.33	23.21
MW-8	11/5/91	1,400	ND	ND	15	ND	42.26	19.14	23.12
MW-9	11/5/91	ND	ND	ND	ND	ND	44.94	21.75	23.19
MW-10	11/5/91	27,000	[redacted]	140	500	320	42.34	19.28	23.06
MW-11	11/5/91	890	ND	ND	ND	ND	45.00	22.11	22.89
BB-1	11/5/91	ND	ND	ND	ND	ND	---	---	---
RW-1	11/13/91	1,600	74	68	7	99	43.17	---	---

ppb Parts per billion
famsl Feet above mean sea level
ND None detected
DTW Depth to water
--- No data available

TABLE 3

SUMMARY OF GROUNDWATER ELEVATION DATA

Well Number	Top of Well Casing (famsl)	Date Sampled	Depth to Water (feet)	Groundwater Surface Elevation (famsl)	Elevation Change Since Previous Measurement (feet)
MW-1	43.67	03/10/88	17.12	26.55	---
		06/14/88	18.05	25.62	-0.93
		12/05/88	19.48	24.19	-1.43
		03/08/89	18.07	25.60	1.41
		06/22/89	18.60	25.07	-0.53
		09/27/89	19.98	23.69	-1.38
		12/29/89	20.45	23.22	-0.47
		03/29/90	19.31	24.36	1.14
		06/21/90	19.69	23.98	-0.38
		09/25/90*	21.88	22.51	-1.47
		12/18/90*	20.89	23.12	0.61
		03/28/91	17.77	25.90	2.78
		06/25/91	18.60	25.07	-0.83
		09/17/91	20.14	23.53	-1.54
		11/05/91	20.40	23.27	-0.26
MW-2	43.09	03/10/88	16.43	26.66	---
		06/14/88	17.35	25.74	-0.92
		12/05/88	18.79	24.30	-1.44
		03/08/89	17.31	25.78	1.48
		06/22/89	17.92	25.17	-0.61
		09/27/89	19.27	23.82	-1.35
		12/29/89	19.75	23.34	-0.48
		03/29/90	18.62	24.47	1.13
		06/21/90	19.12	23.97	-0.50
		09/25/90	20.54	22.55	-1.42
		12/18/90	20.30	22.79	0.24
		03/28/91	16.94	26.15	3.36
		06/25/91	17.95	25.14	-1.01
		09/17/91	19.50	23.59	-1.55
		11/05/91	19.73	23.36	-0.23
MW-3	43.10	03/10/88	16.68	26.42	---
		06/14/88	17.59	25.51	-0.91
		12/05/88	18.96	24.14	-1.37
		03/08/89	17.60	25.50	1.36
		06/22/89	18.11	24.99	-0.51

TABLE 3

SUMMARY OF GROUNDWATER ELEVATION DATA

Well Number	Top of Well Casing (famsl)	Date Sampled	Depth to Water (feet)	Groundwater Surface Elevation (famsl)	Elevation Change Since Previous Measurement (feet)
MW-3		09/27/89	19.47	23.63	-1.36
Cont'd		12/29/89*	19.97	23.13	-0.50
		3/29/90*	17.60	25.53	2.40
		06/21/90	19.35	23.75	-1.78
		9/25/90*	20.72	22.41	-1.34
		12/18/90*	21.42	22.00	-0.41
		03/28/91	17.45	25.85	3.85
		06/25/91	18.12	25.01	-0.84
		9/17/91*	19.55	23.55	-1.46
		11/05/91	19.98	23.12	-0.43
MW-4	44.66	12/05/88	20.47	24.19	---
		03/08/89	19.03	25.63	1.44
		06/22/89	19.57	25.09	-0.54
		09/27/89	20.98	23.68	-1.41
		12/29/89	21.43	23.23	-0.45
		03/29/90	20.29	24.37	1.14
		06/21/90	20.78	23.88	-0.49
		09/25/90	22.24	22.42	-1.46
		12/18/90	22.18	22.48	0.06
		03/28/91	18.79	25.87	3.39
		06/25/91	19.59	25.07	-0.80
		09/17/91	21.15	23.51	-1.56
		11/05/91	21.41	23.25	-0.26
MW-5	43.79	12/05/88	19.48	24.31	---
		03/08/89	18.00	25.79	1.48
		06/22/89	18.60	25.19	-0.60
		09/27/89	20.00	23.79	-1.40
		12/29/89	20.43	23.36	-0.43
		03/29/90	19.24	24.55	1.19
		06/21/90	19.82	23.97	-0.58
		09/25/90	21.23	22.56	-1.41
		12/18/90	21.04	22.75	0.19
		03/28/91	17.69	26.10	3.35
		06/25/91	18.62	25.17	-0.93
		09/17/91	20.23	23.56	-1.61
		11/05/91	20.43	23.36	-0.20

TABLE 3

SUMMARY OF GROUNDWATER ELEVATION DATA

Well Number	Top of Well Casing (famsl)	Date Sampled	Depth to Water (feet)	Groundwater Surface Elevation (famsl)	Elevation Change Since Previous Measurement (feet)
MW-6	42.47	12/05/88	17.99	24.48	---
		03/08/89	16.75	25.72	-1.24
		06/22/89	17.30	25.17	-0.55
		09/27/89	18.64	23.83	-1.34
		12/29/89	19.16	23.31	-0.52
		03/29/90	18.04	24.43	1.12
		06/21/90	18.53	23.94	-0.49
		09/25/90	19.91	22.56	-1.38
		12/18/90	20.61	21.86	-0.70
		03/28/91	16.29	26.18	4.32
		06/25/91	17.36	25.11	-1.07
		09/17/91	18.89	23.58	-1.53
		11/05/91	19.07	23.40	-0.18
MW-7	41.54	12/05/88	17.61	23.93	---
		03/08/89	16.27	25.27	1.34
		06/22/89	16.72	24.82	-0.45
		09/27/89	17.99	23.55	-1.27
		12/29/89	18.54	23.00	-0.55
		03/29/90	17.43	24.11	1.11
		06/21/90	17.88	23.66	-0.45
		09/25/90	19.12	22.42	-1.24
		12/18/90	19.16	22.38	-0.04
		03/28/91	16.04	25.50	3.12
		06/25/91	16.66	24.88	-0.62
		09/17/91	17.99	23.55	-1.33
		11/05/91	18.33	23.21	-0.34
MW-8	42.26	09/27/89	18.89	23.37	---
		12/29/89	19.45	22.81	-0.56
		03/29/90	18.39	23.87	1.06
		06/21/90	18.80	23.46	-0.41
		09/25/90	20.10	22.16	-1.30
		12/18/90	20.13	22.13	-0.03
		03/28/91	17.14	25.12	2.99
		06/25/91	17.45	24.81	-0.31
		09/17/91	18.81	23.45	-1.36
		11/05/91	19.14	23.12	-0.33

TABLE 3

SUMMARY OF GROUNDWATER ELEVATION DATA

Well Number	Top of Well Casing (famsl)	Date Sampled	Depth to Water (feet)	Groundwater Surface Elevation (famsl)	Elevation Change Since Previous Measurement (feet)
MW-9	44.94	09/27/89	21.38	23.56	---
		12/29/89	21.76	23.18	-0.38
		03/29/90	20.58	24.36	1.18
		06/21/90	21.11	23.83	-0.53
		09/25/90	22.60	22.34	-1.49
		12/18/90	22.56	22.38	0.04
		03/28/91	19.13	25.81	3.43
		06/25/91	19.90	25.04	-0.77
		09/17/91	21.49	23.45	-1.59
		11/05/91	21.75	23.19	-0.26
MW-10	42.34	11/05/91	19.28	23.06	---
MW-11	45.00	11/05/91	22.11	22.89	---

NOTE: All available water elevation data were recalculated to present wellhead elevations as reported by Ronald R. Archer, Surveryor, on November 6, 1991

1. famsl = feet above mean sea level
2. * = groundwater elevations for these quarters were corrected for the presence of floating gasoline product using the equation:
   GWE = WE -[DTW-(PT x 0.8)]

Where:
- GWE = Groundwater elevation in feet above mean sea level
- WE = Well elevation at top of casing
- DTW = Depth to water from top of casing in feet
- PT = Product thickness in feet
- 0.8 = Assumed difference in specific gravities between water and gasoline

TABLE 4

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well No.	Date Sampled	Benzene (ppb)	Toluene (ppb)	Ethyl Benzene (ppb)	Xylenes (ppb)	TPHG (ppb)	Comments
MW-1	05/29/87	490	150	930	3,790	18,050	
	07/14/87	560	120	950	3,270	14,750	
	08/17/87	630	40	320	1,130	12,860	
	09/01/87	558	84	562	1,942	14,269	
	12/10/87	200	138	273	777	14,000	
	03/10/88	70	40	340	940	7,300	
	06/14/88	290	ND	330	790	34,000	
	12/05/88	100	16	140	310	4,000	
	03/08/89	670	20	580	1,200	9,100	sheen
	06/22/89	1,000	20	1,200	2,200	12,000	sheen
	09/27/89	960	9	260	360	6,800	
	12/29/89	210	33	1,200	250	4,800	
	03/29/90	1,100	42	510	1,800	14,000	
	06/21/90	1,400	ND	160	130	7,900	
	09/25/90	NS	NS	NS	NS	NS	0.9 ft free-product
	12/18/90	NS	NS	NS	NS	NS	0.4 ft free-product
	03/28/91	230	75	570	2,000	26,000	Sheen
	06/25/91	970	35	300	610	22,000	
	09/17/91	490	150	250	370	16,000	
	11/05/91	420	45	410	780	35,000	
MW-2	05/29/87	113	14	46	58	4,870	
	07/14/87	103	25	34	48	2,207	
	08/17/87	37.6	10.9	8.2	11.1	756	
	09/01/87	75.3	14.2	16.4	27.6	1,482	
	12/10/87	28	40.6	38.1	100.3	1,800	
	03/10/88	9.2	3.1	7.3	2.6	1,200	
	06/14/88	ND	ND	2.2	5.7	500	
	12/05/88	ND	1.3	5.6	3.6	500	
	03/08/89	ND	1.3	3.5	3.7	730	
	06/22/89	ND	ND	ND	ND	570	
	09/27/89	3.8	0.64	2.9	54	420	
	12/29/89	6.7	2	5.7	2.9	270	
	03/29/90	10	0.88	10	3.3	420	
	06/21/90	ND	ND	4	ND	650	
	09/25/90	ND	1.5	3.5	1.5	680	
	12/18/90	ND	1.7	2.2	0.6	500	

TABLE 4

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well No.	Date Sampled	Benzene (ppb)	Toluene (ppb)	Ethyl Benzene (ppb)	Xylenes (ppb)	TPHG (ppb)	Comments
MW-2	03/28/91	ND	2.2	2.7	1.1	730	
(cont)	06/25/91	ND	ND	ND	1.2	610	
	09/17/91	ND	ND	2.5	1.2	820	
	11/05/91	ND	ND	1.1	ND	700	
MW-3	05/29/87	5,400	3,900	1,700	5,200	40,300	
	07/14/87	6,880	7,080	1,580	4,770	30,320	
	08/17/87	5,930	4,180	1,240	3,370	25,620	
	09/01/87	8,540	6,660	1,020	3,740	38,210	
	12/10/87	4,240	2,350	890	1,860	25,000	
	03/10/88	3,210	950	940	950	13,400	
	06/14/88	5,900	7,600	450	4,600	54,000	
	12/05/88	4,200	2,400	1,000	3,100	19,000	
	03/08/89	11,000	9,400	2,300	9,900	53,000	sheen
	06/22/89	16,000	5,900	2,100	6,600	60,000	sheen
	09/27/89	8,100	2,800	1,200	4,300	34,000	
	12/29/89	NS	NS	NS	NS	NS	0.02 ft free-product
	03/29/90	NS	NS	NS	NS	NS	0.04 ft free-product
	06/21/90	19,000	22,000	22,000	120,000	2,100,000	
	09/25/90	NS	NS	NS	NS	NS	0.04 ft free-product
	12/18/90	NS	NS	NS	NS	NS	0.42 ft free-product
	03/28/91	NS	NS	NS	NS	NS	0.25 ft free-product
	06/25/91	NS	NS	NS	NS	NS	0.02 ft free-product
	09/17/91	NS	NS	NS	NS	NS	0.44 ft free-product
	11/05/91	NS	NS	NS	NS	NS	sheen
MW-4	12/05/88	ND	ND	2.3	6.5	4,500	
	03/08/89	ND	ND	ND	ND	3,900	
	06/22/89	ND	ND	ND	ND	1,500	
	09/27/89	11	ND	ND	ND	1,200	
	12/29/89	ND	2.1	2.3	ND	920	
	03/29/90	ND	ND	8	ND	870	
	06/21/90	ND	ND	ND	ND	1,500	
	09/25/90	ND	11	4.6	6	3,100	
	12/18/90	ND	4.4	15	6.3	3,600	
	03/28/91	8.9	4.4	4.4	2.2	2,000	
	06/25/91	ND	5.4	1.7	ND	2,000	
	09/17/91	ND	ND	0.8	ND	2,300	
	11/05/91	ND	ND	3.2	1.1	3,500	

TABLE 4

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

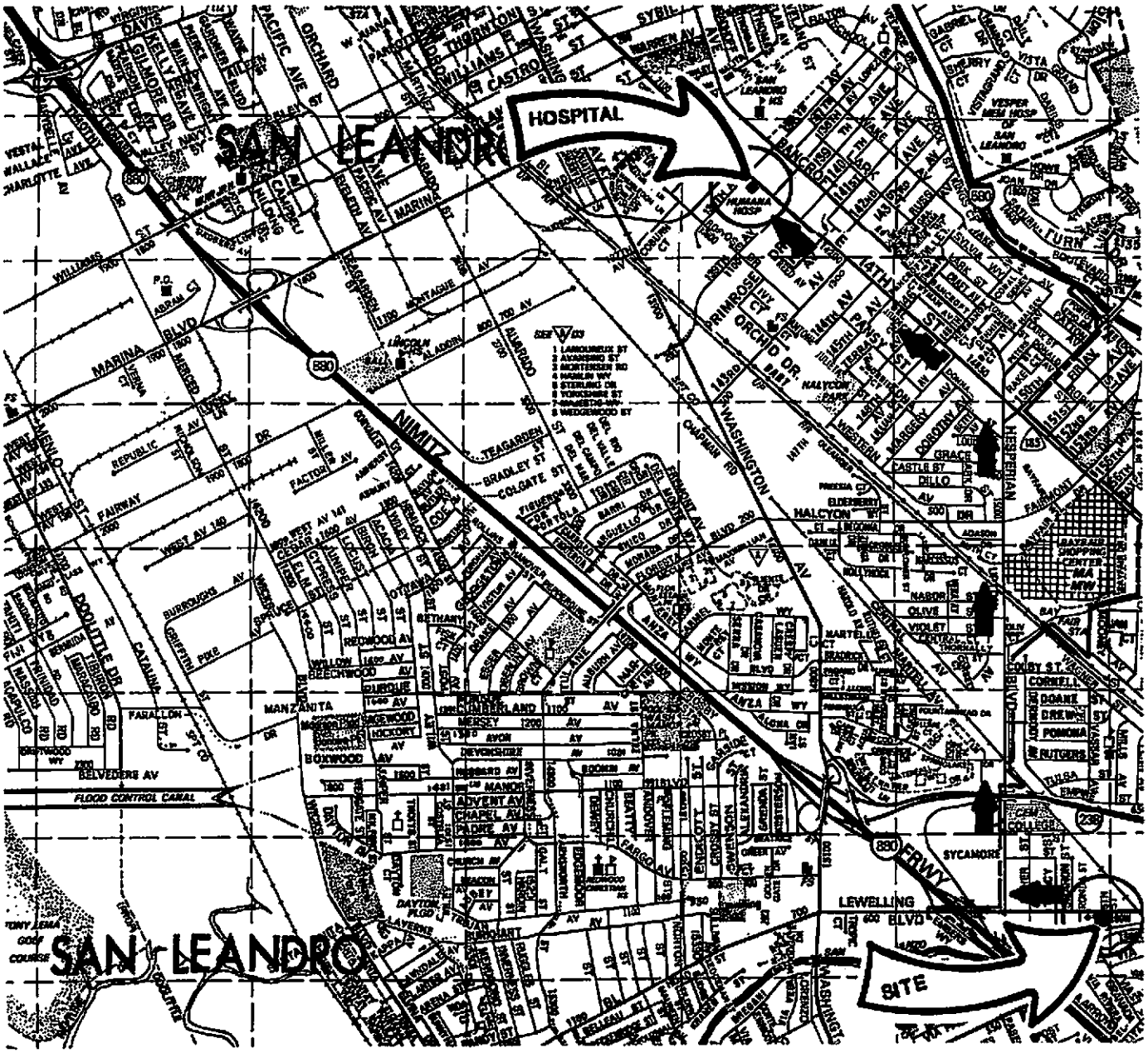
Well No.	Date Sampled	Benzene (ppb)	Toluene (ppb)	Ethyl Benzene (ppb)	Xylenes (ppb)	TPHG (ppb)	Comments
MW-5	12/05/88	ND	0.78	0.23	0.92	3.9	
	03/08/89	2.7	6.7	2.7	15	58	
	06/22/89	0.91	ND	ND	ND	5	
	09/27/89	1.3	ND	ND	ND	5.3	
	12/29/89	ND	ND	ND	ND	ND	
	03/29/90	ND	ND	ND	ND	ND	
	06/21/90	ND	ND	ND	ND	12	
	09/25/90	ND	ND	ND	ND	ND	
	12/18/90	ND	ND	ND	ND	ND	
	03/28/91	ND	ND	ND	ND	ND	
	06/25/91	ND	ND	ND	ND	ND	
	09/17/91	ND	ND	ND	ND	ND	
	11/05/91	ND	ND	ND	ND	ND	
MW-6	12/05/88	4	1.3	0.63	1.3	190	
	03/08/89	2.2	ND	ND	1.1	23	
	06/22/89	0.82	2.6	0.18	1.2	57	
	09/27/89	0.2	0.24	ND	ND	2.1	
	12/29/89	ND	ND	ND	ND	ND	
	03/29/90	2.1	ND	ND	ND	12	
	06/21/90	ND	ND	ND	ND	ND	
	09/25/90	1.4	ND	ND	ND	98	
	12/18/90	2.2	ND	ND	ND	200	
	03/28/91	3.5	ND	ND	ND	140	
	06/25/91	ND	ND	ND	ND	95	
	09/17/91	ND	ND	ND	ND	ND	
	11/05/91	ND	ND	ND	ND	130	
MW-7	12/05/88	140	150	40	370	1,500	
	03/08/89	730	72	180	370	2,400	
	06/22/89	570	43	180	220	2,000	
	09/27/89	420	5.9	140	28	1,400	
	12/29/89	87	3.5	18	15	150	
	03/29/90	110	40	53	150	530	
	06/21/90	620	34	290	400	4,100	
	09/25/90	49	2.4	30	42	750	
	12/18/90	74	4.5	25	69	510	

TABLE 4

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Well No.	Date Sampled	Benzene (ppb)	Toluene (ppb)	Ethyl Benzene (ppb)	Xylenes (ppb)	TPHG (ppb)	Comments
MW-7	03/28/91	53	0.8	24	24	500	
(cont)	06/25/91	23	ND	32	37	570	
	09/17/91	79	1	89	100	1,400	
	11/05/91	52	ND	76	58	1,100	
MW-8	09/27/89	ND	ND	16	ND	4,200	
	12/29/89	ND	3.2	18	ND	2,800	
	03/29/90	ND	ND	19	ND	2,600	
	06/21/90	ND	ND	13	ND	4,600	
	09/25/90	2.3	22	16	26	4,500	
	12/18/90	0.7	6	9.7	2.3	1,100	
	03/28/91	2.6	4.6	3.2	3.1	1,600	
	06/25/91	ND	ND	2.5	1.3	760	
	09/17/91	ND	ND	13	3.9	1,900	
	11/05/91	ND	ND	15	ND	1,400	
MW-9	09/27/89	ND	ND	ND	ND	25	
	12/29/89	ND	ND	ND	2.5	11	
	03/29/90	ND	ND	ND	ND	ND	
	06/21/90	ND	ND	ND	ND	ND	
	09/25/90	ND	ND	ND	ND	ND	
	12/18/90	ND	ND	ND	ND	100	
	03/28/91	ND	ND	ND	ND	ND	
	06/25/91	ND	ND	ND	ND	ND	
	09/17/91	ND	ND	ND	ND	ND	
	11/05/91	ND	ND	ND	ND	ND	
MW-10	11/05/91	29	140	500	320	27,000	
MW-11	11/05/91	ND	ND	ND	ND	890	
RW-1	11/13/91	74	68	7	99	1,600	

1. TPHG Total petroleum hydrocarbons as gasoline
2. ND - Not detected
3. NS - Not sampled
4. Samples prior to December 1988 collected by Applied GeoSystems
5. Sample from December 1988 through December 1990 collected by DuPont Environmental
6. Sample from March 1991 through June 1991 collected by Groundwater Technology



BASE MAP: THOMAS BROS. GUIDE ALAMEDA CO. 1991

LEGEND

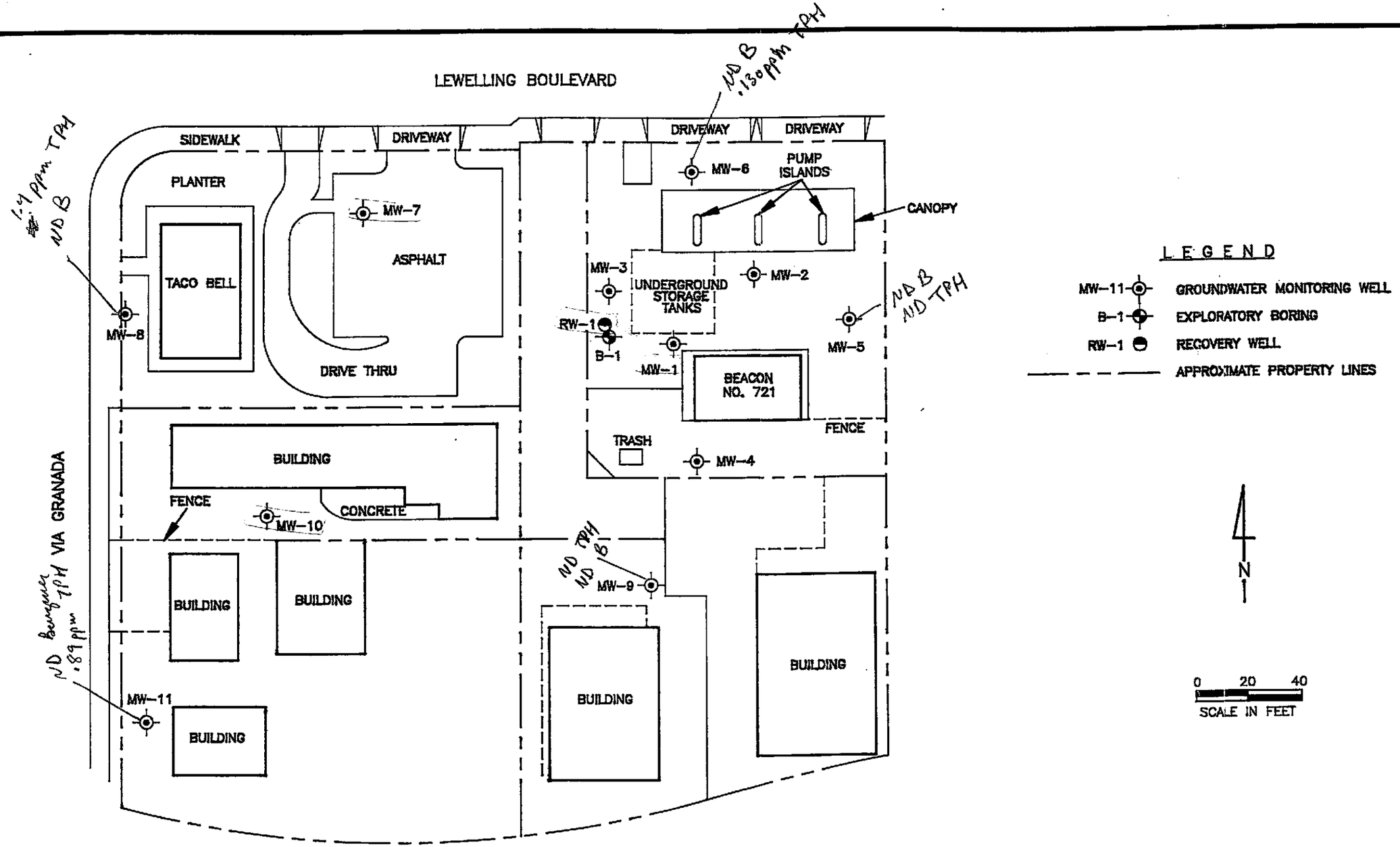
SITE LOCATION

0 1100 2200

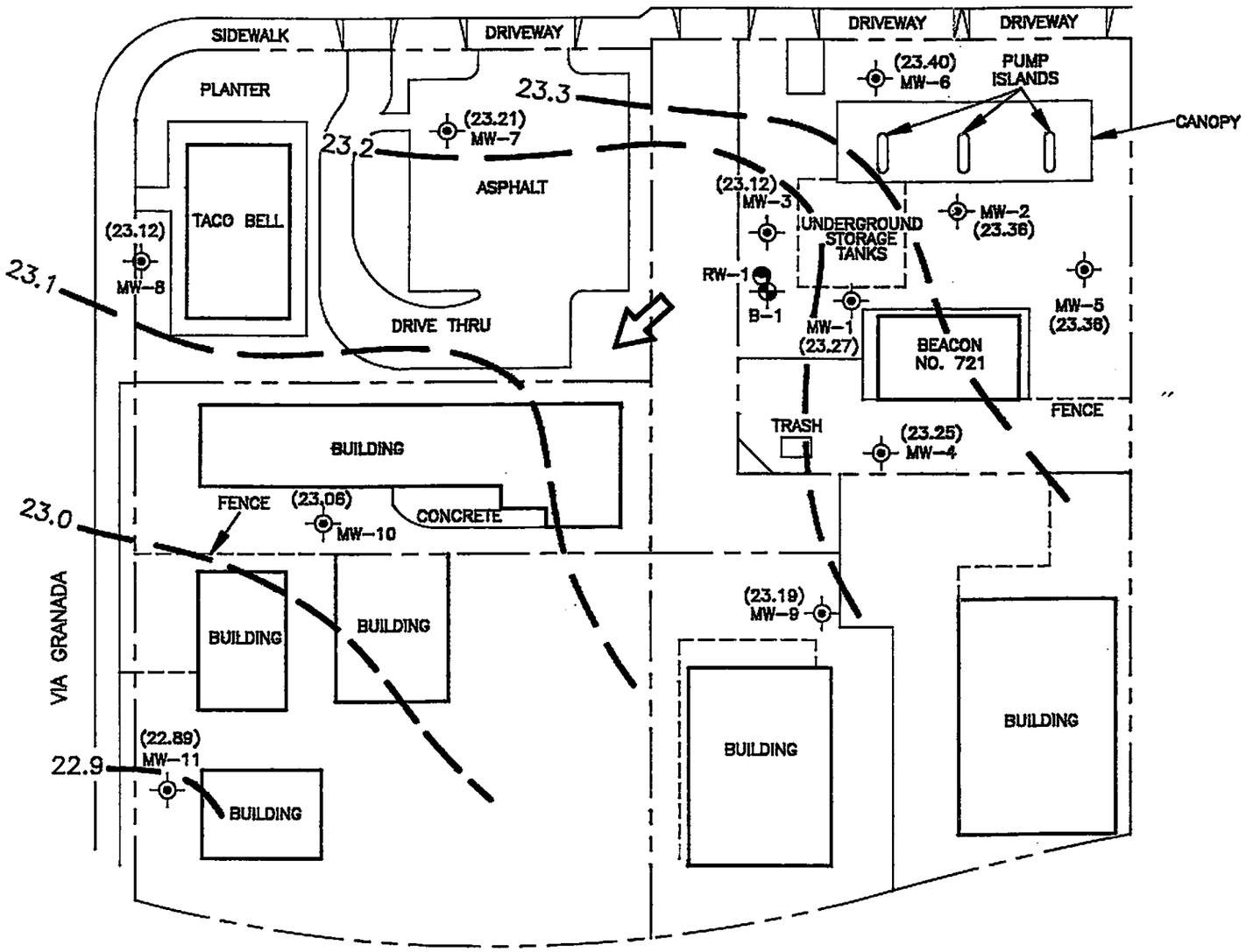
SCALE IN FEET

N

REVIEWED BY:	SITE AND HOSPITAL LOCATION MAP	RESNA	
	ULTRAMAR BEACON STATION NO. 721		
APPROVED BY:	44 LEWELLING BOULEVARD	JOB #: 330092-32	DRAWN BY: J.D.S.
	SAN LORENZO, CALIFORNIA	DATE: 1/8/92	DRAWING #: FIG. 1



REVIEWED BY:	SITE PLAN	RESNA
APPROVED BY:	ULTRAMAR/BEACON STATION NO. 721	
	44 LEWELLING BOULEVARD	JOB #: 3-30092-32 / DRAWN BY: E.C.
	SAN LORENZO, CALIFORNIA	DATE: 1/9/92 / DRAWING #: FIG. 2



LEGEND

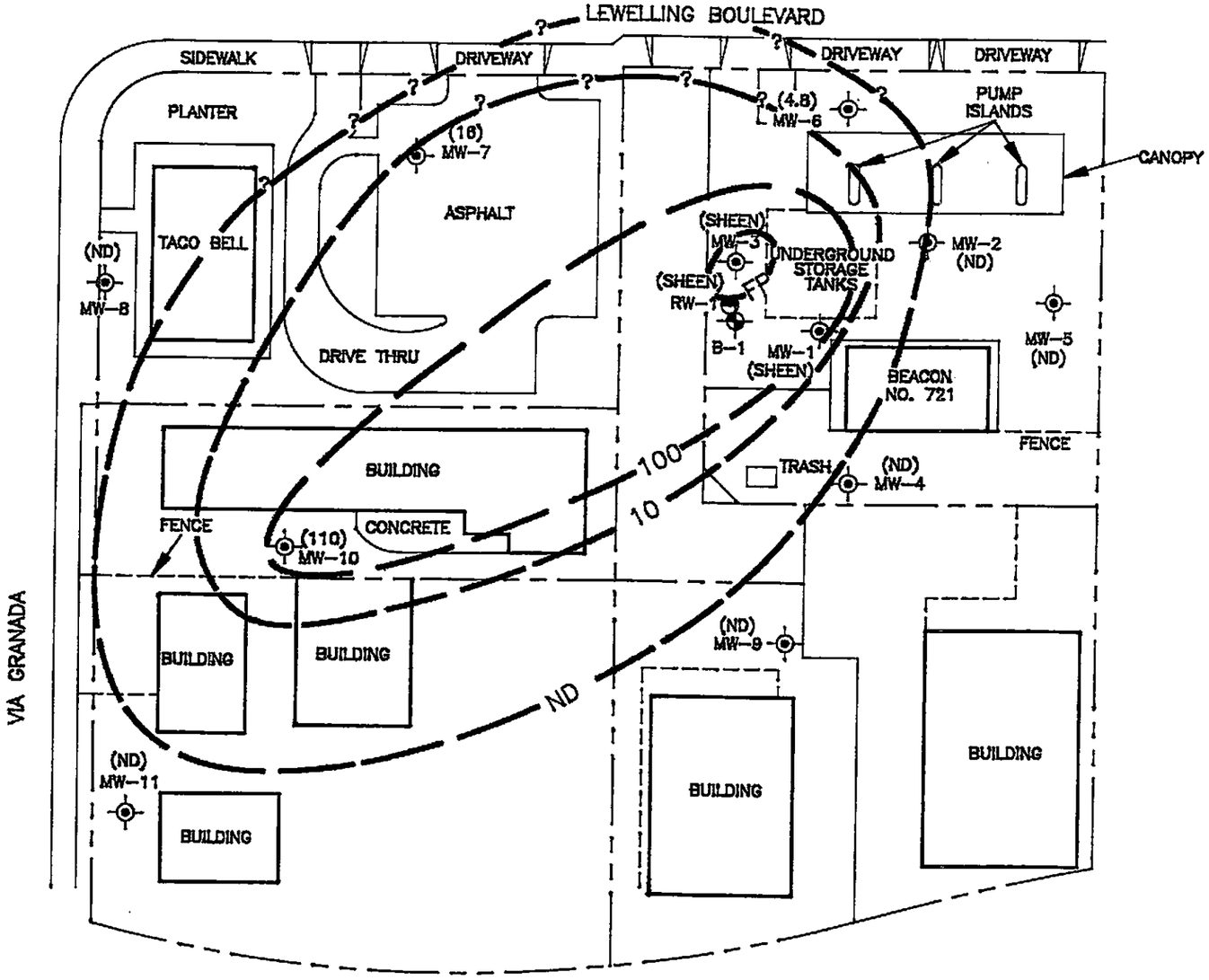
- MW-11 — GROUNDWATER MONITORING WELL
- B-1 — EXPLORATORY BORING
- RW-1 — RECOVERY WELL
- APPROXIMATE PROPERTY LINES
- (23.40) — GROUNDWATER ELEVATION IN FEET (DATUM: MS.L.)
- 23.3 — GROUNDWATER ELEVATION CONTOUR LINE IN FEET (DATUM: MS.L.)
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- CONTOUR INTERVAL = 0.1 FEET

N

0 20 40
SCALE IN FEET

NOTE: CONTOURS ARE BASED ON INTERPRETATION OF AVAILABLE DATA, AND ARE NOT INTENDED TO IMPLY CERTAINTY.

REVIEWED BY:	GROUNDWATER ELEVATION CONTOUR MAP (11-5-91)	RESNA
APPROVED BY:	ULTRAMAR/BEACON STATION NO. 721	
	44 LEWELLING BOULEVARD	JOB #: 3-30092-32 / DRAWN BY: E.C.
	SAN LORENZO, CALIFORNIA	DATE: 2/28/92 / DRAWING #: FIG. 3



LEGEND

MW-11	GROUNDWATER MONITORING WELL
B-1	EXPLORATORY BORING
RW-1	RECOVERY WELL
	APPROXIMATE PROPERTY LINES
(420)	BENZENE CONCENTRATION IN PPB
ND	NONE DETECTED
NS	NOT SAMPLED
FP	FREE PRODUCT AREA
100	BENZENE CONCENTRATION CONTOUR LINE IN PPB

N

0 20 40
SCALE IN FEET

NOTE: CONTOURS ARE BASED ON INTERPRETATION OF AVAILABLE DATA, AND ARE NOT INTENDED TO IMPLY CERTAINTY.

REVIEWED BY:

APPROVED BY:

BENZENE CONCENTRATION MAP (2/18/92)

ULTRAMAR/BEACON STATION NO. 721

44 LEWELLING BOULEVARD

SAN LORENZO, CALIFORNIA

RESNA

JOB #: 3-30092-32	DRAWN BY: E.C.
DATE: 3/18/92	DRAWING #: FIG. 4

APPENDIX A

BORING LOGS,
WELL CONSTRUCTION DETAILS,
AND
WELLHEAD ELEVATION SURVEY DATA

RESNA EXPLORATORY BORING LOG

Project Name: Ultramar/Beacon No. 721
44 Lewelling Boulevard
San Lorenzo, California

Project Number: 3-30092-32

Boring No. MW-10
Date Drilled: 10-17-91
Logged By: K. McVicker

Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	OVM Reading (ppm)
				Asphalt over baserock		
1			SM	SILTY SAND, brown, medium dense, damp, (some gravel)		
2						
3						
4						
5			ML	SANDY SILT, grey brown, low plasticity, very stiff, damp (some clay)		
6	S-6-B10	21				0
7						
8						
9						
10						
11	S-11-B10	11		CLAYEY SILT, low plasticity, stiff, moist (with lenses of fine sand)		0
12						
13						
14						
15				SANDY SILT, grey brown, low plasticity, very moist (with fine sand and clay)		
16	S-16-B10	17	SM	SAND, light grey brown, medium dense, very moist (fine to medium sand)		0
17						
18				Encountered water at approximately 18 feet	▽	
19						
20				with clay lenses, wet		
21	S-21-B10	38	GW	SANDY GRAVEL, grey with green streaks, dense, wet (some clay)		0

REVIEWED BY R.G./C.E.G. s/k

RESNA EXPLORATORY BORING LOG

Project Name: Ultramar/Beacon No. 721
44 Lewelling Boulevard
San Lorenzo, California

Project Number: 3-30092-32

Boring No. MW-10

Date Drilled: 10-17-91

Logged By: K. McVicker

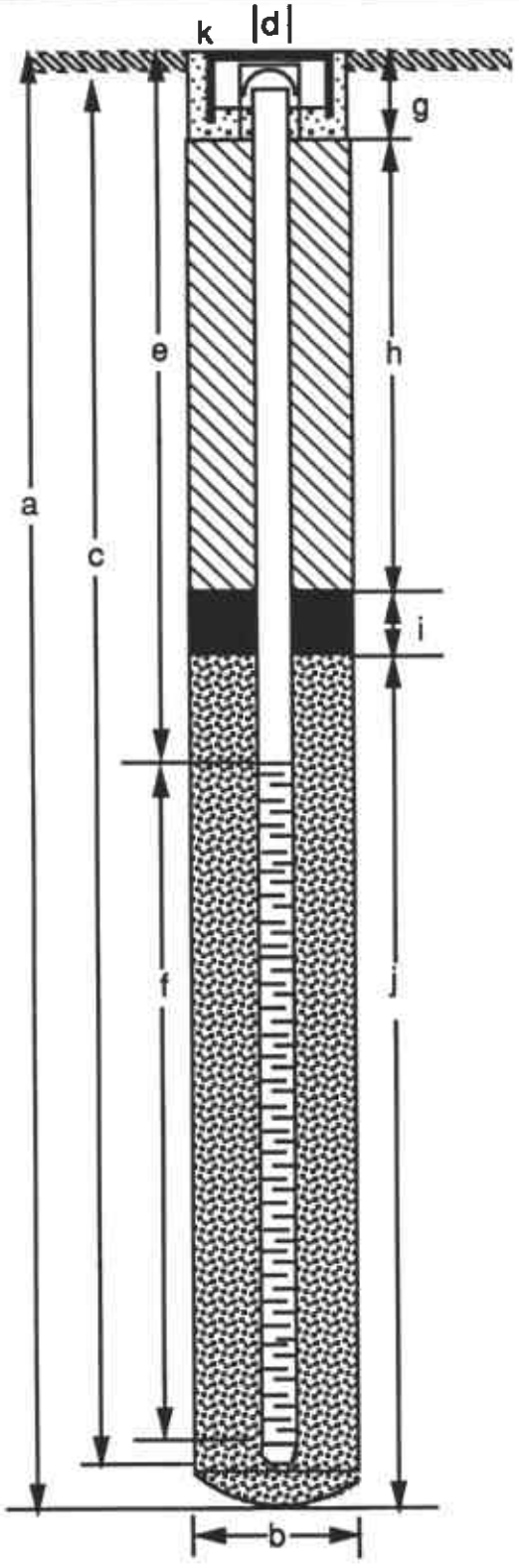
Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	OVM Reading (ppm)
22			GW	Sandy gravel, grey with green streaks, dense, wet (some clay)		
23						
24						
25			CL	SILTY CLAY, dark grey, medium plasticity, very stiff, very moist, (trace fine to medium sand)		
26	S-26-B10	23				0
27						
28						
29						
30	S-29.5-B10	17		green-brown mottling		0
				Bottom of boring at approximately 30 feet		
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						

REVIEWED BY R.G./C.E.G.

RESNA

MONITORING WELL DETAIL

Project Number	3-30092-32	**Boring/Well No.**	MW-10
Project Name	Ultramar/Beacon No. 721	**Top of Casing Elev.**	42.34
County	Alameda	**Ground Surface Elev.**	43.09
Well Permit No.	91606	**Datum**	Alameda County Datum



EXPLORATORY BORING

a. **Total depth** 30 ft.

b. **Diameter** 8 in.

Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. **Casing length** 30 ft.

Material PVC

d. **Diameter** 2 in.

e. **Depth to top perforations** 15 ft.

f. **Perforated length** 15 ft.

Perforated interval from 30 **to** 15 ft.

Perforation type Machine Slot

Perforation size 0.020 in.

g. **Surface seal** 1 ft.

Seal material Concrete

h. **Backfill** 11 ft.

Backfill material Neat Cement

i. **Seal** 1 ft.

Seal material Hydrated Bentonite Pellets

j. **Gravel pack** 17 ft.

Pack material 2/12 Sand

k. Expansion plug, lock, 12-inch water-tight vault box

o l w w

RESNA EXPLORATORY BORING LOG

Project Name: Ultramar/Beacon No. 721
44 Lewelling Boulevard
San Lorenzo, California

Project Number: 3-30092-32

Boring No. MW-11

Date Drilled: 10/17/91

Logged By: K. McVicker

Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	OVM Reading (ppm)
1			ML	SANDY SILT, dark reddish brown, low plasticity, stiff, damp (fine sand)		0
6	S-6-B11	10		(Some fine sand and clay)		0
11	S-11-B11	19		Very stiff		0
16	S-16-B11	16		CLAYEY SILT with some fine sand, moist		0
18					▽	
19				Encountered water at approximately 18 feet		
21	S-21B11	14	CL	SILTY CLAY, dark olive brown, stiff, wet, trace fine to medium sand		0

REVIEWED BY R.G./C.E.G.

ok W

RESNA EXPLORATORY BORING LOG

Project Name: Ultramar/Beacon No. 721
44 Lewelling Boulevard
San Lorenzo, California

Project Number: 3-30092-32

Boring No. MW-11

Date Drilled: 10/17/91

Logged By: K. McVicker

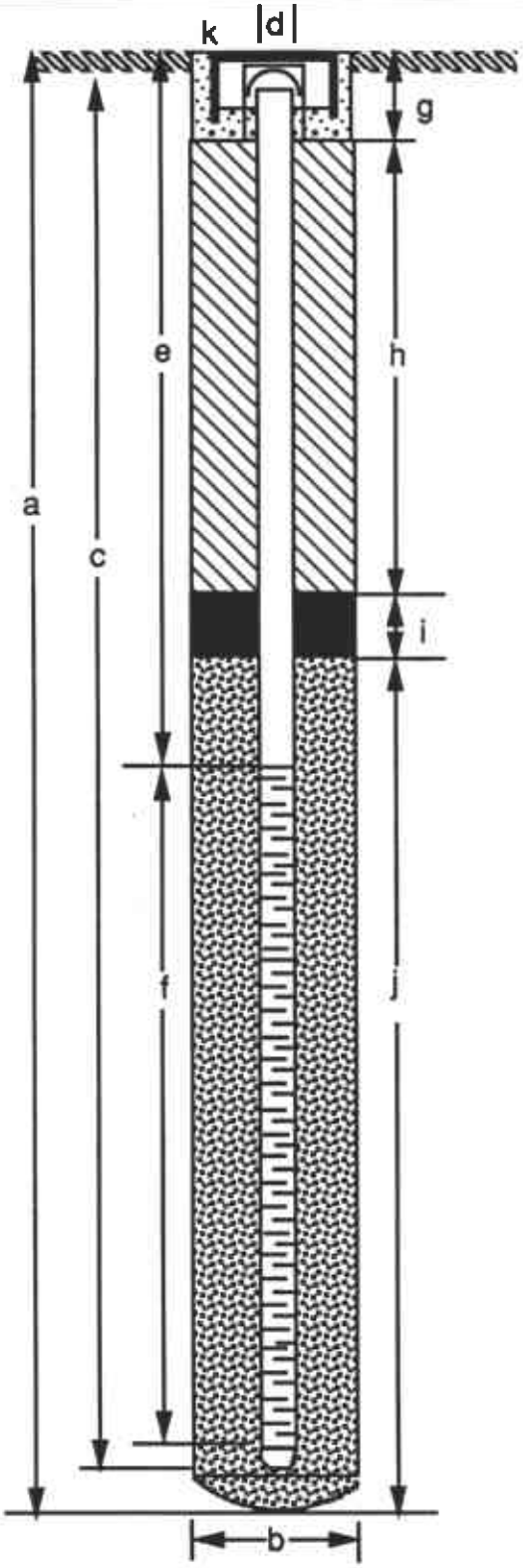
Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	OVM Reading (ppm)
22	S-21-B11	14	CL	Silty clay, dark olive brown, stiff, wet, trace fine to medium sand		0
26	S-26-B11	17		Color change to dark grey, very stiff		0
30	S-29.5-B11	28		Color change to light olive brown, trace gravel		
				Bottom of boring at approximately 30 feet		

REVIEWED BY R.G./C.E.G.

RESNA

MONITORING WELL DETAIL

Project Number	3-30092-32	**Boring/Well No.**	MW-11
Project Name	Ultramar/Beacon No. 721	**Top of Casing Elev.**	45.00
County	Alameda	**Ground Surface Elev.**	45.36
Well Permit No.	91606	**Datum**	Alameda County Datum



EXPLORATORY BORING

a. **Total depth** 30 ft.

b. **Diameter** 8 in.

Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. **Casing length** 30 ft.

Material PVC

d. **Diameter** 2 in.

e. **Depth to top perforations** 15 ft.

f. **Perforated length** 15 ft.

Perforated interval from 30 **to** 15 ft.

Perforation type Machine Slot

Perforation size 0.020 in.

g. **Surface seal** 1 ft.

Seal material Concrete

h. **Backfill** 11 ft.

Backfill material Neat Cement

i. **Seal** 1 ft.

Seal material Hydrated Bentonite Pellets

j. **Gravel pack** 17 ft.

Pack material 2/12 Sand

k. Expansion plug, lock, 12-inch water-tight vault box

ok. Wp

RESNA EXPLORATORY BORING LOG

Project Name: Ultramar/Beacon No. 721
44 Lewelling Boulevard
San Lorenzo, California

Project Number: 3-30092-32

Boring No. RW-1

Date Drilled: 10/17/91

Logged By: D. Wolfe

Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	OVM Reading (ppm)
				Asphalt over baserock		
1-5			CL	SILTY CLAY, very dark grayish brown (10YR 3/2), moist, (minor sand and gravel)		8
6	RW-5	11	SC	SILTY-CLAYEY SAND, dark brown (7.5YR 4/3), medium plasticity, medium dense, moist (minor gravel)		69
10	RW-10	9	CL	SANDY CLAY, dark grey (7.5YR N4), silt≈20%, sand ≈30% very plastic stiff, moist		51
15	RW-15	12	SC	CLAYEY SAND, dark grey (7.5YR N4), (fine to coarse with trace silt and gravel), slightly plastic, medium dense, moist-very moist, poorly sorted		702
20	RW-20	18	ML	SANDY SILT, dark grey (10YR N4), 40% fine to medium sand, ≈10% clay, ≈10% gravel, stiff, saturated (hydrocarbon product)	▽	3384

REVIEWED BY R.G./C.E.G.

RESNA EXPLORATORY BORING LOG

Project Name: Ultramar/Beacon No. 721
44 Lewelling Boulevard
San Lorenzo, California

Project Number: 3-30092-32

Boring No. RW-1

Date Drilled: 10/17/91

Logged By: D. Wolfe

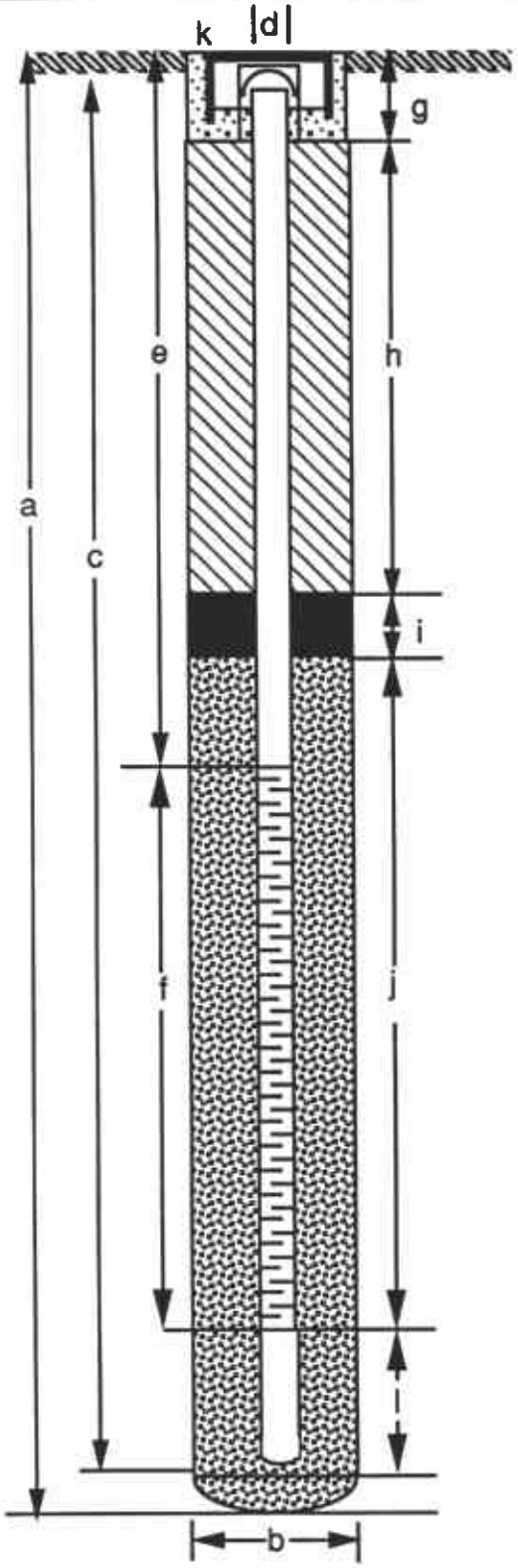
Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	OVM Reading (ppm)
22	RW-20	18	ML	(Same as above)		
23						
24						
25			CL	SILTY CLAY, grey (7.5YR N6), very plastic, very stiff, saturated (mottled with calcite and limonite streaks, trace gravel)		250
26	RW-25	30				
27						
28						
29						
30						
31	RW-30	29		SANDY CLAY, brown (7.5YR 5/3), ≈20% silt, carbonaceous and caliche streaks, very plastic, very stiff, saturated		
32						
33						
34						
35			SW	GRAVELLY SAND, (fine to medium sand, poorly sorted) loose (flowing), saturated		
36		14				
37			CL	SILTY CLAY, dark yellowish brown (10YR 4/4), trace gravel and sand, plastic, stiff, saturated		
38						
39				Bottom of boring at approximately 39 feet		
40						
41						
42						

REVIEWED BY R.G./C.E.G. s/c

RESNA

MONITORING WELL DETAIL

Project Number	3-30092-32	**Boring/Well No.**	RW-1
Project Name	Ultramar/Beacon No. 721	**Top of Casing Elev.**	43.17
County	Alameda	**Ground Surface Elev.**	43.71
Well Permit No.	91606	**Datum**	Alameda County Datum



EXPLORATORY BORING

a. **Total depth** 39 ft.

b. **Diameter** 15 in.

Drilling method Hollow Stem Auger

WELL CONSTRUCTION

c. **Casing length** 37 ft.

Material PVC

d. **Diameter** 6 in.

e. **Depth to top perforations** 15 ft.

f. **Perforated length** 20 ft.

Perforated interval from 35 **to** 15 ft.

Perforation type Wire wrap, PVC coated slots

Perforation size 0.020 in.

g. **Surface seal** 1 ft.

Seal material Concrete

h. **Backfill** 12 ft.

Backfill material Neat Cement

i. **Seal** 1 ft.

Seal material Hydrated Bentonite Pellets

j. **Gravel pack** 21 ft.

Pack material 2/12 Sand

k. Expansion plug, lock, 12-inch water-tight vault box. Bentonite pellets backfilled at the bottom of the well.

l. **Silt trap** 2 ft.

RON ARCHER
CIVIL ENGINEER, INC.
CONSULTING • PLANNING • DESIGN • SURVEYING

4133 Mohr Ave., Suite E • Pleasanton, CA 94566
(415) 462-9372

NOVEMBER 6, 1991 JOB NO. 1863

ELEVATIONS OF EXISTING MONITOR WELLS AT AND IN THE VICINITY OF THE BEACON ULTRA MART GAS STATION NO.721, LOCATED AT 44 LEWELLING BOULEVARD, SAN LORENZO, ALAMEDA COUNTY, CALIFORNIA

FOR: EXCELTECH/A RESNA COMPANY
PROJECT NO. 3-30092-33

BENCHMARK:
A FOUND CHISLED "T" 1' FROM WEST END OF A 6' CONCRETE SIDEWALK 1' FROM NORTH EDGE OF WALKWAY 46'+/- FROM THE CENTERLINE OF LEWELLING BOULEVARD AT WEST PROPERTY LINE OF SAN LORENZO HIGH SCHOOL. ELEVATION TAKEN AS 48.016 ALAMEDA COUNTY DATUM

MONITOR WELL DATA TABLE

WELL DESIGNATION	ELEVATION	DESCRIPTION
MW1	43.67	TOP OF PVC CASING
	43.95	TOP OF BOX
MW2	43.09	TOP OF PVC CASING
	43.38	TOP OF BOX
MW3	43.10	TOP OF PVC CASING
	43.39	TOP OF BOX
MW4	44.66	TOP OF PVC CASING
	44.98	TOP OF BOX
MW5	43.79	TOP OF PVC CASING
	44.07	TOP OF BOX
MW6	42.47	TOP OF PVC CASING
	42.64	TOP OF BOX
MW7	41.54	TOP OF PVC CASING
	42.16	TOP OF BOX
MW8	42.26	TOP OF PVC CASING
	42.56	TOP OF BOX
MW9	44.94	TOP OF PVC CASING
	45.29	TOP OF BOX
MW10	42.34	TOP OF PVC CASING
	43.09	TOP OF BOX
MW11	45.00	TOP OF PVC CASING
	45.36	TOP OF BOX
RW1	43.17	TOP OF PVC CASING
	43.71	TOP OF BOX

NORTH

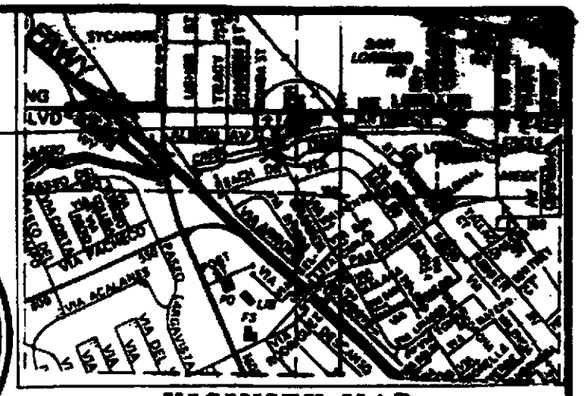
BENCHMARK:
A FOUND CHISLED "T" 1' FROM WEST END OF A 6' CONCRETE SIDEWALK 1' FROM NORTH EDGE OF WALKWAY 46'+/- FROM THE CENTERLINE OF LEWELLING BOULEVARD AT WEST PROPERTY LINE OF SAN LORENZO HIGH SCHOOL. ELEVATION TAKEN AS 48.816 ALAMEDA COUNTY DATUM

1" = 40'

0 20 40 80 120

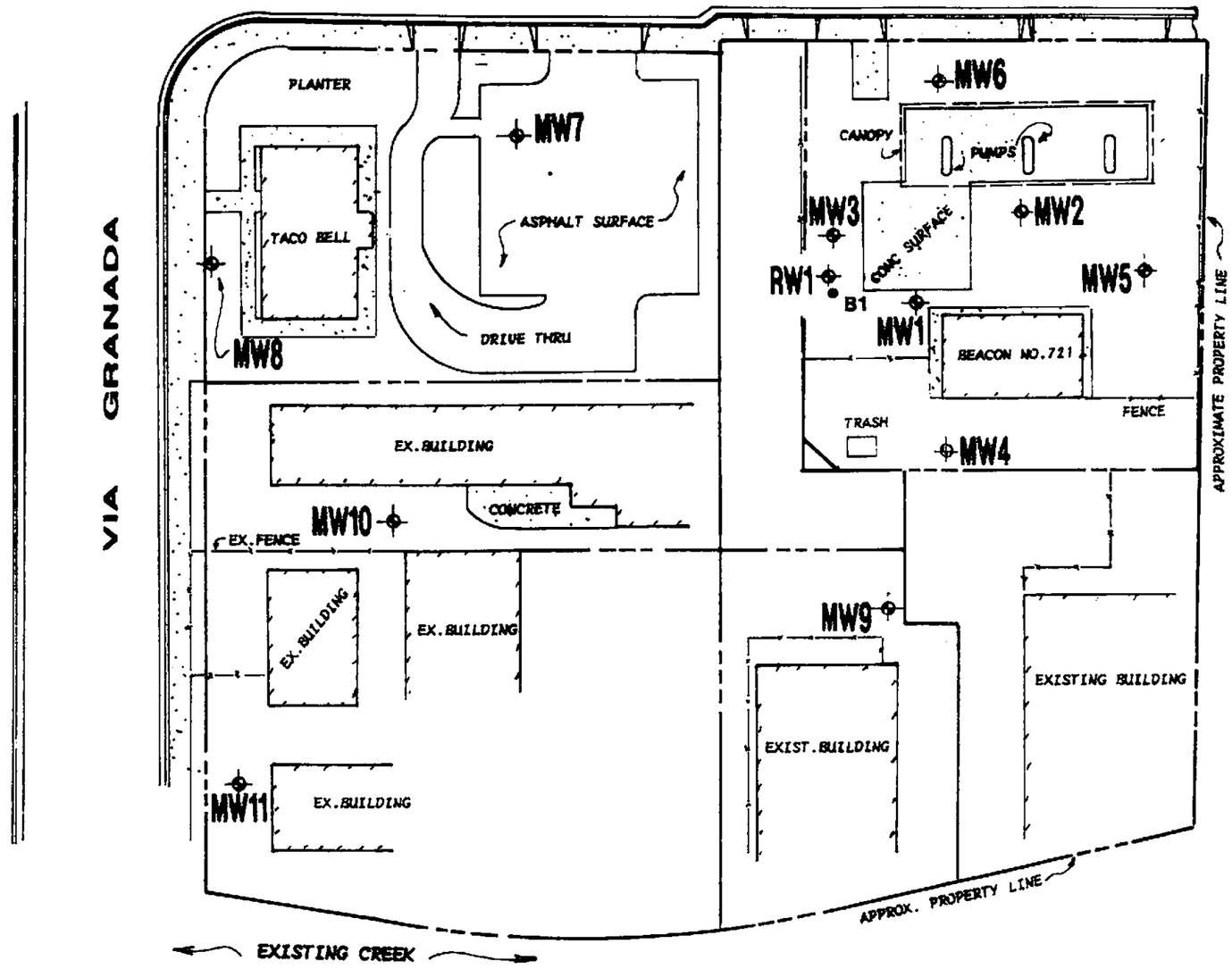
Graphic Scale in feet

SITE



VICINITY MAP
N.T.S.

REGISTERED PROFESSIONAL ENGINEER
RONALD R. ARCHER
No. 23721
EXP. 12/31/93
CIVIL
STATE OF CALIFORNIA



MONITOR WELL DATA TABLE

WELL DESIGNATION	ELEVATION	DESCRIPTION
MW1	43.67	TOP OF PVC CASING
	43.85	TOP OF BOX
MW2	43.89	TOP OF PVC CASING
	43.38	TOP OF BOX
MW3	43.18	TOP OF PVC CASING
	43.39	TOP OF BOX
MW4	44.66	TOP OF PVC CASING
	44.98	TOP OF BOX
MW5	43.79	TOP OF PVC CASING
	44.87	TOP OF BOX
MW6	42.47	TOP OF PVC CASING
	42.64	TOP OF BOX
MW7	41.54	TOP OF PVC CASING
	42.16	TOP OF BOX
MW8	42.26	TOP OF PVC CASING
	42.56	TOP OF BOX
MW9	44.94	TOP OF PVC CASING
	45.29	TOP OF BOX
MW10	42.34	TOP OF PVC CASING
	43.89	TOP OF BOX
MW11	45.89	TOP OF PVC CASING
	45.36	TOP OF BOX
RW1	43.17	TOP OF PVC CASING
	43.71	TOP OF BOX

NOVEMBER 6, 1991 JOB NO. 1863

PLAT SHOWING EXISTING MONITOR WELLS AT AND IN THE VICINITY OF THE BEACON ULTRA MART GAS STATION NO.721, LOCATED AT 44 LEWELLING BOULEVARD, SAN LORENZO, ALAMEDA COUNTY, CALIFORNIA

FOR: EXCELTECH/A RESNA COMPANY
PROJECT NO. 3-38892-33

RON ARCHER
CIVIL ENGINEER, INC.
CONSULTING • PLANNING • DESIGN • SURVEYING
4133 Mohr Ave., Suite E • Pleasanton CA 94566
(415) 462-8378

APPENDIX B

SOIL SAMPLING PROTOCOL

Soil Sampling Protocol

SOIL SAMPLING PROTOCOL

I. SOIL SAMPLING BY DRILLING RIG

1) Prior to initiating an exploratory boring, all equipment to be used during drilling and sampling operation is steam cleaned. Such equipment includes, but is not limited to, augers, bits, drilling rod, and soil samplers. Additionally, before each sampling event, the sampler and any sample liners are thoroughly cleaned with a dilute trisodium phosphate solution and rinsed with clean tap water or distilled water. Additional decontamination procedures are implemented as needed by specific projects.

2) Each exploratory boring is drilled with a truck-mounted drilling rig using either solid flight or hollow stem augers. The boring is advanced to the desired sampling depth and the sampler is lowered to the bottom of the hole. The sampler is driven a maximum of 18 inches into native material ahead of the auger by a 140-pound, rig-operated hammer falling 30 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the boring log. When necessary, the sampler may be pushed by the drill rig hydraulics. In such cases, the pressure exerted (in pounds per square inch) is recorded. After the sampler has penetrated the full depth, it is retrieved to the surface.

3) The samplers commonly used are either a California modified sampler (3 inch or 2.5 inch O.D.) or a standard penetrometer (2 inch O.D.). The standard penetrometer does not contain sample liners. If samples are collected for laboratory analysis a California modified sampler is used with brass liners. When analysis will be made for iron, copper or zinc the sample may be collected using plastic liners.

   Upon retrieval, the sampler is disassembled into its component parts. One or more of the liners (typically the liner closest to the drive shoe) is selected for chemical analysis. The ends of the selected liner(s) are sealed with aluminum foil or teflon tape, capped with plastic caps, labeled, logged on chain-of-custody forms and stored in a chilled ice chest for preservation in the field and during transport to the analytical laboratory. All labels are pre-written to the extent possible using indelible ink.

4) Samples not sealed for chemical analysis are checked for the presence of contamination in the field by the geologist. Any discoloration or odor is noted on the boring log. Each sample is classified in the field by a geologist using the Unified Soil Classification System and a Munsell soil color chart. In addition, samples may also be field-screened with a photoionization detector (calibrated daily) or threshold limit value sniffer. In either case, the instrument probe is held adjacent to freshly crumbled soil and the stabilized reading value is recorded on the log. Values of volatile vapors measured in the field are reconnaissance only and are not meant to supplant chemical analysis in a certified laboratory. Other visual screening techniques include examination of the sample under hand-lens magnification as-well-as floating sheen inspection resulting from immersion in water.

   Lithology logging will collect geologic data as required, using conventional geologic and hydrogeologic terminology. When rock is logged, a GSA Rock Color Chart and appropriate terminology will be employed to describe rock, fractures, bedding, etc. Soil or rock coring may be specified by the supervising geologist on a project-specific basis.

5) Samples are held in the possession of RESNA personnel until transferred to the analytical laboratory. Transfer to the laboratory is accomplished with either delivery by RESNA personnel, pick-up by laboratory personnel, or transfer by a personal delivery service. Each transfer of responsibility is recorded on a chain-of-custody record that accompanies the samples.

6) Conditions occasionally arise when other drilling equipment are used given site-specific formation conditions. Rotary drilling may be selected if coring or bearing conditions arise. Rotary or casing hammer may be used as deep drilling, flowing sands, or formation-specific conditions require.

7) When drilling though an aquifer known to be contaminated, a staged drilling approach will be used. This would involve using either a temporary or permanent conductor casing placed adjacent to the contaminated aquifer and pressed or advanced slightly into the underlying aquitard. The cased hole will be cleaned as necessary, following which, a smaller diameter drill bit/auger will be advanced to the next underlying water bearing stratum. An impermeable seal will be placed in the borehole or annular space as appropriate upon completion of exploratory boring/well construction.

II. SOIL SAMPLING BY HAND

1) Some situations require that samples be collected by hand without the assistance of a drill rig (e.g., soil stock piles, excavation sidewall sampling, etc.). When possible, soil samples will be collected using a steel core sampler equipped with clean brass liners which is advanced into the soil with a slide hammer. In other cases, the outer surface of the soil is removed and a brass liner is driven into the soil by hand or with a hammer. To avoid damaging the liner, a block of wood can be held next to the liner so that the hammer strikes the block rather than the liner. The liner is removed and handled as described above. In deep excavations where safety factors preclude the direct sampling of the bottom or side wall, soil is retrieved by a backhoe bucket and this soil is sampled.

APPENDIX C

CERTIFIED LABORATORY RESULTS AND CHAIN-OF-CUSTODY RECORD

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (510) 623-0775
Fax: (510) 651-2233

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Doug Wolfe	Date Sampled:	10-17-91
	Exceltech	Date Received:	10-17-91
	41674 Christy St.	BTEX Analyzed:	10-31-91
	Fremont, CA 94538	TPHg Analyzed:	10-31-91
Project:	19505-L, Station # 721	TPHd Analyzed:	NR
	Project #3-30092-31, San Lorenzo	Matrix:	Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.005	0.005	0.005	0.005	1.0	10
SAMPLE Laboratory Identification						
RW-5 S1110535	ND	ND	ND	ND	ND	NR
RW-10 S1110536	0.009	0.025	0.018	0.11	1.5	NR
RW-15 S1110537	7.9	29	28	160	1900	NR
S-6-B11 S1110538	ND	ND	ND	ND	ND	NR
S-11-B11 S1110539	ND	ND	ND	ND	ND	NR

ppm = parts per million = mg/kg = milligrams per kilogram.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

November 5, 1991
Date Reported

APPLIED ANALYTICAL LABORATORY IS CERTIFIED BY THE STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY (Certification No. E1211)

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (510) 623-0775
Fax: (510) 651-2233

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Doug Wolfe	Date Sampled:	10-17-91
	Exceltech	Date Received:	10-17-91
	41674 Christy St.	BTEX Analyzed:	10-31-91
	Fremont, CA 94538	TPHg Analyzed:	10-31-91
Project:	19505-L, Station # 721	TPHd Analyzed:	NR
	Project #3-30092-31, San Lorenzo	Matrix:	Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.005	0.005	0.005	0.005	1.0	10
SAMPLE Laboratory Identification						
S-16-B11 S1110540	ND	ND	ND	ND	ND	NR
S-6-B10 S1110541	ND	ND	ND	ND	ND	NR
S-11-B10 S1110542	ND	ND	ND	ND	ND	NR
S-16-B10 S1110543	ND	ND	ND	ND	ND	NR

ppm = parts per million = mg/kg = milligrams per kilogram.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

November 5, 1991
Date Reported

APPLIED ANALYTICAL LABORATORY IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. E1211)

Ultramar Inc.

CHAIN OF CUSTODY REPORT

BEACON

094177

Beacon Station No. 721	Sampler (Print Name) Douglas Wolfe	ANALYSES	Date 10/17/91	Form No. 1 of 2
Project No. 3-30092-31	Sampler (Signature)			
Project Location 44 Lewelling Blvd San Lorenzo CA	Affiliation RESNA/Excelfech			

Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)	No. of Containers	REMARKS
RW-5	10/17/91	AM		✓	✓		1	Std turn around
RW-10	10/17/91	AM		✓	✓		1	
RW-15	10/17/91	AM		✓	✓		1	
S-6-B11	10/17/91	PM		✓	✓		1	
S-11-B11	10/17/91	PM		✓	✓		1	
S-16-B11	10/17/91	PM		✓	✓		1	

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date 10/17	Time 1800	Received by: (Signature/Affiliation) M Petty	Date 10/17	Time 16:00

Report To: Douglas Wolfe
RESNA Christy Street

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Terry Fox

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32-8003 1/90

Ultramar Inc.

CHAIN OF CUSTODY REPORT

BEACON

Beacon Station No.	Sampler (Print Name)	ANALYSES									Date	Form No. 2 of 2
721	Douglas Wolfe										10/17/91	
Project No.	Sampler (Signature)										Std Turnaround	
3-30092-31												
Project Location 44 Lewelling Blvd San Lorenzo CA	Affiliation RESNA/Excelted											
Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)					No. of Containers	REMARKS
S-6-B10	10/17/91	AM		✓	✓						1	
S-11-B10	10/17/91	AM		✓	✓						1	
S-16-B10	10/17/91	AM		✓	✓						1	

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date 10/17	Time 16:00	Received by: (Signature/Affiliation)	Date 10/17	Time 1600

Report To: Douglas Wolfe
RESNA Christy Street

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Terry Fox

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32-8003 1/90

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (510) 623-0775
Fax: (510) 651-2233

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Doug Wolfe	Date Sampled:	11-05-91
	Exceltech/RESNA	Date Received:	11-06-91
	41674 Christy St.	BTEX Analyzed:	11-06-91
	Fremont, CA 94538	TPHg Analyzed:	11-06-91
Project:	19505-L, Station # 721	TPHd Analyzed:	NR
	Project #3-30092-33, San Lorenzo	Matrix:	Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.005	0.005	0.005	0.005	1.0	10
SAMPLE Laboratory Identification						
SP(1-4) S1111043	ND	0.012	0.011	0.067	2.8	NR
SP(5-8) S1111044	ND	ND	ND	ND	ND	NR

ppm = parts per million = mg/kg = milligrams per kilogram.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

November 11, 1991
Date Reported

APPLIED ANALYTICAL LABORATORY IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. E1211)

Ultramar Inc.

CHAIN OF CUSTODY REPORT

BEACON

194203

Beacon Station No. 721	Sampler (Print Name) Robin Sutherland			ANALYSES								Date 11-5-91	Form No. 1 of 1
Project No. 3-30092-33	Sampler (Signature) Robin Sutherland												
Project Location 44 Lewelling ave San Lorenzo, CA	Affiliation Resna			BTEX	TPH (gasoline)	TPH (diesel)					No. of Containers	REMARKS	
Sample No./Identification	Date	Time	Lab No.										
Composit sp-1, sp-2, sp-3, sp-4 into 1 sample	11-5-91	09:00		X	X						4	Soil	
Composit sp-5, sp-6, sp-7, sp-8 into 1 sample	↓	09:10		X	X						4	Soil	

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Robin Sutherland ET	11/6/91	08:50	Anthony Caens - Applied Analytical	11/6/91	8:50
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time

Report To: Doug Wolfe

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Glenn Dembroff

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32-8003 1/90

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

3-30092-31\011873

RESNA Laboratories, Inc.
42501 Albrae Street, Suite 100
Fremont, CA 94639
ATTN: Laura Kuck
Project Manager

Date Sampled: 11-14-91
Date Received: 11-19-91
Date Reported: 11-20-91

ORGANIC LEAD

Sample Number	Sample Description	Detection Limit ppm	SOIL RESULTS ppm
	Project No.: 3-30092-31 Beacon #721		
B111013	SPL-1,2,3,4	0.5	<0.5

Note: California LUFT 12/87
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

Ultramar Inc.

CHAIN OF CUSTODY REPORT

BEACON

194224

Beacon Station No.	Sampler (Print Name)	ANALYSES								Date	Form No.
721	Douglas Young									11/14/91	1 of 1
Project No.	Sampler (Signature)										
3-30092-31											
Project Location	Affiliation										
44 Lewelling Blvd San Lorenzo Calif	RESNA	BTEX	TPH (gasoline)	TPH (diesel)	Oil and Lead				No. of Containers		

Sample No./Identification	Date	Time	Lab No.	REMARKS
SPL-1	11/14/91	1230		Normal Turnaround
SPL-2		1232		
SPL-3		1235		
SPL-4		1240		

Composite

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
	11/14/91	1604		11-14-91	1609
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
	11-14-91	1615		11/14/91	4:10
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time

Report To:
Terry Fox (Ultramar)
Carolyn Nunz (Ultramar)
Dory Wilfe (RESNA)

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Terry Fox

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32-8003 1/90

RESNA

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.	PROJECT NAME/SITE
3-30092-31	Beacon # 721

SAMPLERS (SIGN) / (PRINT)

SAMPLE IDENTIFICATION	DATE	TIME	COMP	GRAB	PRES. USED	ICED	NO. CONTAINERS	SAMPLE TYPE	BTEX (602/8020)	TPHg (8015)	TPHd (8015)	TOG 418.1/5520	601/8010	624/8240	625/8270	Organic Pb					REMARKS
SPL-1,2,3,4 composite	4/4/91		X				4	S							X						

please send soil sleeves & coolers back to Applied Analytical.

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Anthony Guerra	4/8/91	15:28	M.S. Cons 8992
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY LABORATORY:

LABORATORY: Mobile Chem

REQUESTED TURNAROUND TIME: Normal / wk

RECEIPT CONDITION:

PLEASE SEND RESULTS TO:

APPLIED ANALYTICAL
42501 Albrae Street
Fremont, CA 94538

PROJECT MANAGER: L. Lucke / D. Young

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (510) 623-0775
Fax: (510) 651-2233

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Doug Wolfe	Date Sampled:	11-05-91
	Exceltech/RESNA	Date Received:	11-06-91
	41674 Christy St.	BTEX Analyzed:	11-06-91
	Fremont, CA 94538	TPHg Analyzed:	11-06-91
Project:	AGS 19505-L, Project #3-30092-33	TPHd Analyzed:	NR
	Station #721, San Lorenzo	Matrix:	Water

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppb	ppb	ppb	ppb	ppb	ppb
Detection Limit:	0.5	0.5	0.5	0.5	50	100
SAMPLE Laboratory Identification						
BB1 W1111045	ND	ND	ND	ND	ND	NR
MW-9 W1111046	ND	ND	ND	ND	ND	NR
MW-5 W1111047	ND	ND	ND	ND	ND	NR
MW-4 W1111048	ND	ND	3.2	1.1	3500	NR
MW-11 W1111049	ND	ND	ND	ND	890	NR

ppb = parts per billion = µg/L = micrograms per liter.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX-- Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg--Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd--Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

November 11, 1991
Date Reported

APPLIED ANALYTICAL LABORATORY IS CERTIFIED BY THE STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 1211)

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (510) 623-0775
Fax: (510) 651-2233

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Doug Wolfe	Date Sampled:	11-05-91
	Exceltech/RESNA	Date Received:	11-06-91
	41674 Christy St.	BTEX Analyzed:	11-06-91
	Fremont, CA 94538	TPHg Analyzed:	11-06-91
Project:	AGS 19505-L, Project #3-30092-33	TPHd Analyzed:	NR
	Station #721, San Lorenzo	Matrix:	Water

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppb	ppb	ppb	ppb	ppb	ppb
Detection Limit:	0.5	0.5	0.5	0.5	50	100
SAMPLE Laboratory Identification						
MW-10 W1111050	29	140	500	320	27000	NR
MW-8 W1111051	ND	ND	15	ND	1400	NR
MW-7 W1111052	52	ND	76	58	1100	NR
MW-6 W1111053	ND	ND	ND	ND	130	NR
MW-2 W1111054	ND	ND	1.1	ND	700	NR

ppb = parts per billion = µg/L = micrograms per liter.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

November 11, 1991
Date Reported

APPLIED ANALYTICAL LABORATORY IS CERTIFIED BY THE STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 1211)

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (510) 623-0775
Fax: (510) 651-2233

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Doug Wolfe	Date Sampled:	11-05-91
	Exceltech/RESNA	Date Received:	11-06-91
	41674 Christy St.	BTEX Analyzed:	11-06-91
	Fremont, CA 94538	TPHg Analyzed:	11-06-91
Project:	AGS 19505-L, Project #3-30092-33	TPHd Analyzed:	NR
	Station #721, San Lorenzo	Matrix:	Water

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppb	ppb	ppb	ppb	ppb	ppb
Detection Limit:	0.5	0.5	0.5	0.5	50	100
SAMPLE Laboratory Identification						
MW-1 W1111055	420	45	410	780	35000	NR

ppb = parts per billion = µg/L = micrograms per liter.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX-- Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg--Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd--Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

November 9, 1991
Date Reported

APPLIED ANALYTICAL LABORATORY IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 1211)

Ultramar Inc.

CHAIN OF CUSTODY REPORT

BEACON

094202

Beacon Station No.	Sampler (Print Name)	Date	Form No.
721	Robin Sutherland	11-5-91	1 of 2

Project No.: 3-30092-33

Sampler (Signature): [signature]

Project Location: 44 Leveling ave San Lorenzo, CA

Affiliation: Resna

Sample No./Identification		Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)						No. of Containers	REMARKS
BB-1	3 pres Voas	11-5-91	10:30		X	X							3	
MW-9	↓	↓	11:00		X	X							3	
MW-5			11:50		X	X							3	
MW-4			12:45		X	X							3	
MW-11			13:40		X	X							3	
MW-10			14:35		X	X							3	
MW-8			15:30		X	X							3	
MW-7			16:25		X	X							3	

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
[signature] ET	11-6-91	08:50	Anthony Enero - Applied Analytical	11/6/9	8:50

Report To: Doug Wolfe

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Glen Dembroff

32-8003 1/90

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

Ultramar Inc.
CHAIN OF CUSTODY REPORT

BEACON

Beacon Station No. 721	Sampler (Print Name) Robin Sutherland	Date 11-5-91	Form No. 2 of 2
Project No. 3-30092-33	Sampler (Signature) Robin Sutherland		
Project Location 44 Leweling ave San Lorenzo CA	Affiliation Resna		

Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)					No. of Containers	REMARKS
MW-6 3 pres Voas	11-5-91	17:15		X	X						3	
MW-2 ↓	↓	18:00		X	X						3	
MW-1 ↓	↓	18:45		X	X						3	

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Robin Sutherland	11-6-91	08:50	Anthony Guerra - Applied Analytical	11/6/91	8:50

Report To: Doug Wolfe

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Glen Pembroff

32-8003 1/90

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (510) 623-0775
Fax: (510) 651-2233

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Doug Wolfe	Date Sampled:	11-13-91
	Exceltech	Date Received:	11-14-91
	41674 Christy St.	Date Extracted:	11-20-91
	Fremont, CA 94538	Date Reported:	11-21-91
Project:	AGS 19505-L,Project 3-30092-31	Batch No.:	0002,0003,0022
	Station 721, San Lorenzo	Matrix:	Water
	Client Sample ID: RW-1	Lab ID #:	W1111442

Element	Results (mg/L)	Rpt. Limit (mg/L)	Method
Ag (Silver)	ND	0.05	6010
As (Arsenic)	ND	0.005	7060
Ba (Barium)	NR	0.05	6010
Be (Berylium)	ND	0.01	6010
Cd (Cadium)	ND	0.01	6010
Cr (Chromium - total)	ND	0.05	6010
Co (Cobalt)	NR	0.05	6010
Cu (Copper)	ND	0.05	6010
Hg (Mercury)	ND	0.0005	7470
Mo (Molybdenum)	NR	0.05	6010
Ni (Nickel)	ND	0.05	6010
Pb (Pb)	ND	0.05	6010
Sb (Antimony)	ND	0.10	6010
Se (Selenium)	ND	0.005	7740
Tl (Thallium)	ND	0.10	6010
V (Vanadium)	NR	0.05	6010
Zn (Zinc)	ND	0.05	6010

Analysis Report: Metals, TTLC, EPA Method 6010
Rpt. Limit - Reporting Limit
ND - Not Detected at or above indicated Reporting Limit.
NR - Not Requested.

Laboratory Representative

August 19, 1991
Date Reported

APPLIED ANALYTICAL LABORATORY IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 1211)

McINTOSH LABORATORIES

2292 TRADE ZONE BLVD. SAN JOSE, CALIFORNIA 95131 (408) 946-3935

: November 22, 1991

Chromalab, Inc.
2239 Omega Road, #1
San Ramon, California 94583
: Attn: D. Duong

Date Received: 11/15/91
Date Sampled : 11/15/91
By Whom : Client
Project No. : 119'145

Laboratory No: 55984 Sample ID: RW-1

Determination	EPA Method	Milligrams per liter Analytical Results
Alkalinity, Total	310.1	: 350
Alkalinity (HCO3)	310.1	:
Calcium (Ca)	215.1	:
Alkalinity (CO3)	310.1	: <1
Chloride (Cl)	325.3	:
Bio Oxygen Demand	405.1	:
Cyanide (CN)	335.2	:
Copper (Cu)	220.1	:
Fluoride (F)	340.2	:
Magnesium (Mg)	242.1	:
pH	150.1	:
Potassium (K)	258.1	:
Sodium (Na)	273.1	:
Solids (TDS)	160.1	:
Sulfate (SO4)	375.4	:
Settleable Solids	160.5	:
Surfactants (MBAS)	425.1	:
Turbicity (NTU)	180.1	:
Zinc (Zn)	289.1	:
Carbon, Ttl Organic	415.1	:
Chem. Oxygen Demand	410.1,2,3,4	: 8
Nitrogen, Ammonia	350.2	:
Nitrogen, Kjeldahl	351.3	:
Nitrogen, Nitrate	352.1	:
Nitrate (NO3)	352.1	:
Nitrite (N)	354.1	:
Chlorine, Residual	330.1	:
Solids, Suspended	160.2	: <1
Sulfide (S)	376.2	:
Formaldehyde (HCHO)		:

THESE ANALYSES ARE PERFORMED UNDER CALIFORNIA DEPARTMENT OF HEALTH SERVICES ENVIRONMENTAL LABORATORY ACCREDITATION/REGISTRATION

CERTIFICATE NUMBER 1570.

BY _____

Ultramar Inc.

CHAIN OF CUSTODY REPORT

BEACON

094303

Beacon Station No.	Sampler (Print Name)	ANALYSES									Date	Form No.
721	Douglas Young										11/13/91	1 of 1
Project No.	**Sampler (Signature)**											
330092-31												
Project Location	**Affiliation**											
44 Lewelling Blvd. San Lorenzo, Calif	RESNA										Normal Turnaround Time	
Sample No./Identification	**Date**	**Time**	**Lab No.**	BTEX	TPH (gasoline)	TPH (diesel)	Total Lead	Reactivity metals	601	Total Suspended Solids	Chem Ox distillation	No. of Containers	REMARKS
3 VOA preserved HCL RW-1	11/13/91	8:50		X	X							3	
2 Liter HNO_3 preserved RW-1	11/13/91						X	X				2	
3 VOA UN preserved RW-1	11/13/91	8:45							X			3	
1 plastic H_2SO_4 preserved RW1	11/13/91	8:40								X	X	1	
1 plastic No preserv RW-1	11/13/91	8:50										1	pH, Alkalinity, Carbonate

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
	11/14/91	10:15		11/14/91	10:15
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time

Report To:
Douglas Wolf (RESNA)
Terrance Fox (Ultramar)

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Terrance Fox

WHITE: Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32-8003 1/90

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

December 2, 1991 — ChromaLab File # 1191145

Client: Applied Analytical
Attn: Laura Kuck
Date Sampled: Nov. 13, 1991 — Date Submitted: Nov. 14, 1991
Date Analyzed: Nov. 27, 1991

Project Number: 3-30092-31 — Project Name: Beacon Station 721
Sample I.D.: RW-1
Method of Analysis: 601 — Detection Limit: 0.5 µg/l

COMPOUND NAME	µg/l	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	90.2% 88.7%
1,1-DICHLOROETHENE	N.D.	---
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	93.5% 91.6%
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
TRICHLOROETHENE	N.D.	---
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	94.2% 95.2%
TETRACHLOROETHENE	N.D.	---
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	---
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	91.5% 93.3%

*1,1,2-TRICHLORO-1,2,2-TRIFLUORO-ETHANE is found at 100 µg/l.

ChromaLab, Inc.

David Duong
Senior Chemist

Eric Tam
Lab Director

2239 Omega Road, #1 • San Ramon, California 94583
510/831-1788 • Facsimile 510/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

December 6, 1991 ChromaLab File No.: 1191145

APPLIED ANALYTICAL

Attn: Laura Kuck

RE: One water sample for pH analysis

Project Name: BEACON STATION #721
Project Number: 3-30092-31
Date Sampled: N/A Date Submitted: Nov. 14, 1991
Date Extracted: Nov. 16, 1991 Date Analyzed: Nov. 16, 1991

RESULTS:

Sample I.D.	pH
RW-1	8.2
BLANK	7.0

ChromaLab, Inc.

David Duong
Chief Chemist

Eric Tam (by DD)
Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
510/831-1788 • Facsimile 510/831-8798
Federal ID #68-0140157

RESNA

CHAIN OF CUSTODY

CHROMALAB FILE # 1191145

COC # 4184

JEST

PROJECT NO.	PROJECT NAME/SITE	P.O. #:
3-30092-31	Beacon Station # 721	

SAMPLERS (SIGN) / (PRINT)

SAMPLE IDENTIFICATION	DATE	TIME	COMP	GRAB	PRES. USED	ICED	NO. CONTAINERS	SAMPLE TYPE	BTEX (602/8020)	TPHg (8015)	TPHd (8015)	TOG 418.1/5520	601/8010	624/8240	625/8270	COD	TSS	pH, ALKALINITY, CARBONATE			REMARKS
KW-1													X			X	X				

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Anthony Ewens	11/14/91	3:15	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE 11/14	TIME 3:15	RECEIVED BY LABORATORY:

LABORATORY: Chromalab

REQUESTED TURNAROUND TIME: 2 wks

RECEIPT CONDITION:

PLEASE SEND RESULTS TO:

APPLIED ANALYTICAL
42501 Albrae Street
Fremont, CA 94538

PROJECT MANAGER: Laura Luck / D. Young

APPENDIX D

GROUNDWATER SAMPLING PROTOCOL AND LABORATORY PROCEDURES

Groundwater Sampling Protocol

GROUNDWATER SAMPLING PROTOCOL

Sampling of groundwater is performed by RESNA Industries Inc. sampling technicians. Summarized field sampling procedures are as follows:

1. Proceed to first well with clean and decontaminated equipment.

2. Measurements depth(s) of liquid surface(s) in the well, and total depth of well. Note presence of sediment.

3. Field check for presence of floating product; measure thickness.

4. Purge well prior to collecting samples; purge volume (casing volumes) calculated prior to removal.

5. Monitor groundwater for temperature, pH, and specific conductance during purging.

6. Allow well to recover.

7. Collect samples using Environmental Protection Agency (EPA) recommended sample collection devices, i.e., teflon or stainless steel bailers or pumps.

8. Transfer samples into laboratory-supplied containers containing any necessary chemical preservations.

9. Label samples and log onto chain-of-custody form.

10. Store samples in a chilled ice chest for shipment to a state-certified analytical laboratory.

11. Decontaminate equipment prior to sampling next well.

Equipment Cleaning and Decontamination

All water samples are placed in precleaned laboratory-supplied bottles. Sample bottles and caps remain sealed until actual usage at the site. All equipment which comes in contact with the well or groundwater is thoroughly cleaned with a trisodium phosphate (TSP) solution and rinsed with deionized or distilled water before use at the site. This cleaning procedure is performed after sampling each well. Wells are sampled in approximate order of increasing contamination. If a teflon cord is used, the cord is cleaned. If a nylon or cotton cord is used, a new cord is used to sample each well. All equipment blanks are collected prior to sampling. The blanks are analyzed periodically to ensure proper cleaning procedures are used.

Water Level Measurements

Depth to groundwater is measured in each well prior to purging or sampling using a sealed sampling tape or scaled electric sounder. If the well is known or suspected of containing free-phase petroleum hydrocarbons, an optical interface probe is used to measure the depth to the hydrocarbons, the hydrocarbon thickness and groundwater level. Measurements are recorded to the nearest 0.01 foot. Each monitoring well's total depth is also measured.

Bailer Sheen Check

If no measurable free-phase petroleum hydrocarbons are detected, a clear acrylic bailer is used to retrieve a water sample. The sample in the bailer is evaluated for the presence of a sheen. Any observed film as well as odor and color of the water is recorded.

Groundwater Sampling

Each well is purged of several volumes of groundwater prior to sampling. Either a bailer, hand pump, or submersible pump is used to purge the well. The amount of purging is dependent on the well yield. In a high yield formation, samples will be collected when normal field measurement, including temperature, pH, and specific conductance stabilize, provided a minimum of three well-casing volumes of water have been removed. Field measurements will be taken after purging each well volume. Physical parameter measurements (temperature, pH, and specific conductance) are closely monitored throughout the well purging process and are used as indicators to assess the adequacy of purging. The purging parameters are measured to observe stabilization to a range of values typical for that aquifer and well. Stable field

parameters are recognized as indicative of groundwater aquifer chemistry entering the well. Specific conductance (conductivity) meters are read to the nearest ±10 umhos/cm and are calibrated daily. pH meters are read to the nearest ±0.1 pH units and are calibrated daily. Temperature is read to the nearest 0.1 °F. Calibration of physical parameter meters will follow manufacturer's specifications. Collected field data during purging activities will be entered on the Well Sampling Field Data Sheet.

In low yield formations, one volume of water is removed and the well is allowed to recharge. (Normal field measurements will be periodically recorded during the purging process.) In situations where recovery to 80% of static water level does not occur within two hours, a sample will be collected when sufficient volume is available. In high-yield formations, the well is not pumped so quickly that water cascades into the well through the well screen.

In wells where free-phase hydrocarbons are detected, the free-phase portion will be bailed from the well and an estimate of the volume removed will be recorded. A groundwater sample will be collected if bailing reduces the amount of free-phase hydrocarbons to the point where a measurable thickness is no longer present in the well. If free-phase hydrocarbons persist throughout bailing, then a groundwater sample will not be collected.

Volatile organic groundwater samples are collected so that air passage through the sample is minimal (to prevent volatiles from being stripped from the water): To do this, sample bottles are filled by slowly running water down the side of the bottle until there is an upwardly convex meniscus over the mouth of the bottle. The teflon side of the septum (in cap) is then positioned against the meniscus, and the cap is screwed on tightly. The sample is then inverted and the bottle lightly tapped. If an air bubble is evident, the cap is removed, more sample is added, and the bottle is resealed.

Chain-of-Custody

Groundwater sample containers are labeled with a unique sample number, location, and date of collection. All samples are logged into a chain-of-custody form and placed in a chilled ice chest for shipment to a laboratory certified by the State of California Department of Health Services.

Sample Storage

Groundwater samples collected in the field are stored in an ice chest cooled to approximately 4 °C while in transit to the office or analytical laboratory. Samples are stored in a refrigerator prior to being taken to the designated analytical laboratory.

The refrigerator is set to 4 °C and access to it is controlled by a designated sample custodian.

Quality Assurance/Quality Control Objectives

The sampling and analysis procedures employed by RESNA for groundwater sampling and monitoring follow quality assurance/quality control (QA/QC) guidelines. Quality assurance objectives have been established to develop and implement procedures for obtaining and evaluating water quality and field data in an accurate, precise, and complete manner. In this way, sampling procedures and field measurements provide information that is comparable and representative of actual field conditions. Quality control (QC) is maintained by site-specific field protocols and requiring the analytical laboratory to perform internal and external QC checks. The goal is to provide data that are accurate, precise, complete, comparable, and representative. The definitions as developed by overseeing federal, state, and local agency guidance documents for accuracy, precision, completeness, comparability, and representativeness are:

- **Accuracy** — the degree of agreement of a measurement with an accepted reference or true value.

- **Precision** — a measure of agreement among repeated measurements of the same material under similar conditions.

Laboratory Procedures

LABORATORY PROCEDURES

Selection of the Laboratory

The laboratories which performed the analytical work reported here were certified by the California State Department of Health Services (DHS) as being qualified to perform the selected analyses.

Chain-of-Custody Control

The following procedures are used during sampling and analytical activities to provide chain-of-custody control during transfer of samples from collection through delivery to the laboratories. Record keeping activities used to achieve chain-of-custody control are:

- Contact made by sampling organization with facility supervisor and laboratory prior to sampling to alert them of dates of sampling and sample delivery.
- Labels for identifying individual samples.
- Chain-of-custody record for documenting transfer and possession of samples.

Sample Containers

Sample containers vary with each type of analytical parameter. Selected container types and materials are non-reactive with the sample and the particular analytical parameter being tested. Appropriate containers for volatile organics are glass bottles of at least 40 milliliters in size, fitted with teflon-faced silicon septa. Sample containers are properly cleaned and sterilized by the certified laboratory according to the Environmental Protection Agency (EPA) protocol for the individual analysis. RESNA uses laboratory-prepared sample containers for the sampling and analysis desired. Containers prepared by one laboratory are not sent to a different laboratory.

Sample Preservation and Shipment

Various preservatives are used by the certified laboratory to retard changes in samples. Sample shipment from RESNA to laboratories performing the selected analyses

routinely occurs within 24 hours of sample collection. If an overnight delivery service is required, samples are shipped at the end of each day.

Analytical Procedures

The analysis of groundwater samples is conducted in accordance with accepted quantitative analytical procedures. The following six publications are considered the primary references for groundwater sample analysis, and the contracts with the laboratories analyzing the samples stipulate that the methods set out in these publications be used. Please note that procedures used are periodically updated by federal and state agencies, and that the certified laboratories amend analysis as required by the update.

- Standard Methods for the Examination of Water and Wastewater, 16th Ed., American Public Health Association, et al., 1985, and later revisions.
- Methods for Chemical Analysis of Water and Wastes, U.S. EPA, 600/4-79-020, March 1979, and later revisions.
- Test Methods for Evaluation of Solid Waste: Physical/Chemical Methods, U.S. EPA SW-846, 1982, and later revisions.
- Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA, 600/4-82-057, 1982, and later revisions.
- Practical Guide for Groundwater Sampling, EPA, 600/2-85/104, September 1985.
- RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, EPA, September 1986.

Analytical Methods

The analytical methods used by the selected laboratories are those required by the type of analysis (fuels, metals, etc.). These methods are those currently approved by the State Regional Water Quality Control Board (RWQCB). Additional information regarding chemical analyses are contained in the RWQCB Leaking Underground Fuel Tank(LUFT) Manual; Tri-Regional Board guidance dated August 2, 1988; policy letters on guidance offered at irregular intervals; or analytical procedures selected for site-specific project needs.