LM

Ultramar

Ultramar Inc.
[redacted]

Telecopy 209-584-6[illegible]3 Credit & Wholesale
209 583 3339 Administrative
209-583-3302 Information Services
209-583-3358 Accounting

December 13, 1991

Mr. Donald D. Dalke
San Francisco Bay Region
Regional Water Quality Control Board
2101 Webster Street, Suite 500
Oakland, CA 94612

[redacted]

SUBJECT: BEACON STATION NO. 720, 1088 MARINA BLVD., [redacted] CALIFORNIA

Dear Mr. Dalke:

Enclosed is a copy of the Quarterly Ground-Water Sampling Report, Third Quarter 1991 for the above-referenced Ultramar facility prepared by Environmental Geotechnical Consultants, Inc. Also included is a copy of the Quarterly Status Report which describes the work completed in this quarter and the anticipated to be completed in the next quarter.

Please call if you have any questions regarding this project.

Sincerely,

ULTRAMAR INC.

Terrence A. Fox
Senior Project Manager
Marketing Environmental Department

Enclosure: Ground-Water Sampling Report, Second Quarter 1991
Quarterly Status Report

cc w/encl: Mr. Rafat Shahid
Division of Hazardous Materials
Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, CA 94621

Ultramar

Ultramar Inc.
P.O. Box 4671
525 W. Main Street
Hanford, CA 93232-0466
(209) 582-7241

Telecopy: 209-584-6113 Credit & Wholesale
209-583-3330 Administrative
209-583-3362 Information Services
209-583-3358 Accounting

ENVIRONMENTAL PROJECT
QUARTERLY STATUS REPORT

DATE REPORT SUBMITTED: December 16, 1991
QUARTER ENDING: September 30, 1991

SERVICE STATION NO.: 720
ADDRESS: 1088 Marina Blvd., San Leandro, CA
COUNTY: Alameda

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

BACKGROUND:

In January 1987, three underground gasoline storage tanks and one waste oil tank were excavated and removed from two tank cavities. Samples collected from beneath the former tanks indicated that hydrocarbons were present in the soil. In March 1987, five monitoring wells (MW-1 through MW-5) were installed by Conoco. Hydrocarbons were detected in soil and ground-water samples collected from the wells with the highest concentrations being detected in the area of MW-4. In July 1987, four soil were drilled in the vicinity of MW-4 to further characterize the soil contamination in that area. TPH concentrations above 100 ppm were detected in each boring. The site has been on a monitoring program since June 1987.

In July 1990, the site was purchased by Ultramar Inc. from Conoco. The monitoring program has continued.

SUMMARY OF THIS QUARTER'S ACTIVITIES:

Performed third quarter monitoring on August 16, 1991. Conducted the initial shallow ground-water survey in September.

RESULT OF QUARTERLY MONITORING:

Monitoring data indicates that the benzene concentration decreased in MW-1 from 1,000 ppb to 310 ppb and in MW-2 from 2,200 ppb to 1,800 ppb. Benzene concentrations increased in MW-3 from 370 ppb to 480 ppb, in MW-4 from 7,300 ppb to 8,000 ppb, and in MW-5 from 3,800 ppb to 4,200 ppb.

PROPOSED ACTIVITY OR WORK FOR NEXT QUARTER:

ACTIVITY	ESTIMATED COMPLETION DATE
Drill additional wells installation	October 30, 1991
Perform pump test	October 30, 1991

QUARTERLY GROUNDWATER MONITORING
THIRD QUARTER 1991
BEACON STATION NO. 720
1088 MARINA BOULEVARD
SAN LEANDRO, CALIFORNIA
FOR
ULTRAMAR, INC.

NO. EU-501/E189-01
NOVEMBER 14, 1991

ENVIRONMENTAL GEOTECHNICAL CONSULTANTS, INC.
CONSULTANTS IN APPLIED EARTH SCIENCE

EGC

ENVIRONMENTAL GEOTECHNICAL CONSULTANTS, INC.

4229 NORTHGATE BOULEVARD, SUITE #3, SACRAMENTO, CALIFORNIA 95834
TELEPHONE (916) 925-4789 · FAX (916) 925-5973

No. EU-501/E189-01
November 14, 1991

Ultramar, Inc.
525 W. Third Street
Hanford, California 93232-0466

Attention: Mr. Terrence A. Fox

SUBJECT: Quarterly Groundwater Monitoring, Third Quarter 1991, Beacon Station No. 720, 1088 Marina Boulevard, San Leandro, California

Dear Mr. Fox:

Environmental Geotechnical Consultants, Inc., (EGC) is pleased to present the results of quarterly groundwater monitoring at the above-referenced site. This work was authorized by Ultramar, Inc., (Ultramar) as your Task Order Number 720-11-0000-C. Sampling and analysis were conducted in accordance with EGC's "Groundwater Sampling and Analysis" Protocols, included as Appendix A.

The location of the subject site is shown in Figure 1. On August 16, 1991, water levels were measured and samples were obtained from each of the five groundwater monitoring wells at the site. The locations of the wells and other site features are shown on Figure 2. Water purged from the wells before sampling was placed in one labelled 55-gallon drum which is being stored at the site. The samples were transported under chain-of-custody protocol for laboratory analysis. Samples were analyzed for Total Petroleum Hydrocarbons as Gasoline (TPHg) by standard method GC FID/5030 and Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX) by Environmental Protection Agency (EPA) method 602. Laboratory analyses were conducted by Applied Analytical Environmental Laboratories of Fremont, California, a laboratory certified by the State of California to conduct the analyses.

Discussion

Groundwater elevations were measured prior to purging the monitoring wells and sampling groundwater. The groundwater levels appear to have decreased approximately 1.5 feet since second quarter monitoring. The groundwater gradient on August 16, 1991, was directed towards the west-northwest at a magnitude of approximately 0.002-foot per foot (see Figure 2). Groundwater elevation data are summarized in Table 1.

Figure 3 represents an interpretive isopleth map of benzene concentrations in groundwater beneath the subject site. Laboratory analytical results indicate that the maximum concentration of benzene is highest in monitoring well MW-4.

The analytical results for TPHg and BTEX are summarized in Table 2. Laboratory analytical reports are included as Appendix B.

The next quarterly sampling for the site is scheduled for December 1991.

Reporting Responsibility

Responsibility for the reporting of these results to the regulatory agencies guiding this project lies with Ultramar. EGC therefore recommends that Ultramar provide this report to the following agencies:

Guidance Agencies

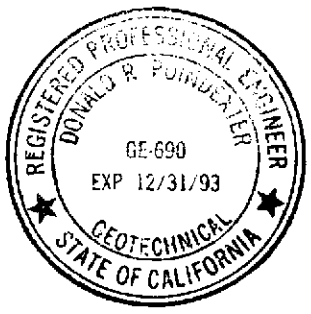
Regional Water Quality Control Board
San Francisco Bay Region
Toxics Cleanup Division
2101 Webster Street, Suite 500
Oakland, CA 94612
Attention: Mr. Donald D. Dalke, Chief

Alameda County Department of Environmental Health
Division of Hazards Materials
80 Swan Way, Room 200
Oakland, California 94621
Attention: Mr. Lowell Miller

LIMITATIONS

The scope of work for this project was strictly limited to the sampling and analysis of groundwater and the preparation of this report. Our services have been performed in accordance with generally accepted geoenvironmental consulting practice. No other representation, express or implied, and no warranty or guarantee is included or intended as to professional opinions, the recommendations or the laboratory analytical results provided.

EGC appreciates the opportunity to work with you. Please call us if you have any questions.



Very truly yours,

ENVIRONMENTAL GEOTECHNICAL CONSULTANTS, INC.

Don R. Poindexter
Senior Principal
C-24420, Exp. 12/31/93

vvk
E18901-3.GMW

Attachments: Figure 1--Project Site Location Map
Figure 2--Groundwater Gradient Map
Figure 3--Benzene Isopleth Map

Table 1--Summary of Groundwater Analytical Results
Table 2--Groundwater Elevations

Appendix A--Groundwater Sampling and Analysis Protocols
Appendix B--Chain of Custody Record and Laboratory Analytical Results

TABLE 1

GROUNDWATER ELEVATIONS
Beacon Station 720
1088 Marina Boulevard
San Leandro, California
Page 1 of 5

Date Sampled	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)
Groundwater Monitoring Well MW-1:		**Elevation of Top of Casing = 29.89 feet**
June 23, 1987	14.79	15.10
July 06, 1987	14.93	14.96
August 06, 1987	14.22	15.67
November 04, 1987	15.74	14.15
February 02, 1988	13.99	15.90
May 02, 1988	14.99	14.90
November 21, 1988	13.03	16.86
February 14, 1989	15.86	14.03
May 02, 1989	14.77	15.12
August 10, 1989	16.35	13.54
November 08, 1989	16.46	13.43
February 20, 1990	15.58	14.31
May 18, 1990	16.40	13.49
September 15, 1990	16.83	13.06
November 26, 1990	17.16	12.73
February 07, 1991	16.43	13.46
May 14, 1991	14.93	14.96
August 16, 1991	16.35	13.54
Groundwater Monitoring Well MW-2:		**Elevation of Top of Casing = 29.57 feet**
June 23, 1987	14.51	15.06

TABLE 1

GROUNDWATER ELEVATIONS
Page 2 of 5

Date Sampled	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)
July 06, 1987	14.63	14.94
August 06, 1987	14.95	14.62
November 04, 1987	15.45	14.12
February 02, 1988	13.74	15.83
May 02, 1988	14.63	14.94
November 21, 1988	12.99	16.58
February 14, 1989	15.66	13.91
May 02, 1989	14.56	15.01
August 10, 1989	16.22	13.35
November 08, 1989	16.19	13.38
February 20, 1990	15.34	14.23
May 18, 1990	16.20	13.37
September 15, 1990	16.42	13.05
November 26, 1990	16.83	12.74
February 07, 1991	16.13	13.44
May 14, 1991	14.62	14.95
August 16, 1991	16.00	13.57
Groundwater Monitoring Well MW-3:		**Elevation of Top of Casing = 29.13 feet**
June 23, 1987	14.13	15.00
July 06, 1987	14.24	14.89
August 06, 1987	14.52	14.61
November 04, 19887	15.09	14.04
February 02, 1988	13.37	15.76

TABLE 1

GROUNDWATER ELEVATIONS
Page 3 of 5

Date Sampled	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)
May 02, 1988	14.22	14.91
November 21, 1988	13.01	16.12
February 14, 1989	15.22	13.91
May 02, 1989	14.16	14.97
August 10, 1989	15.61	13.52
November 08, 1989	15.75	13.38
February 20, 1990	14.95	14.18
May 18, 1990	15.79	13.34
Sepember 15, 1990	16.07	13.06
November 26, 1990	16.36	12.77
February 07, 1991	15.74	13.39
May 14, 1991	14.19	14.94
August 16, 1991	15.55	13.58
Groundwater Monitoring Well MW-4:		**Elevation of Top of Casing = 29.72 feet**
June 23, 1987	14.77	14.95
July 06, 1987	14.91	14.81
August 06, 1987	15.19	14.53
November 04, 1987	15.72	14.00
February 02, 1088	14.03	15.69
May 02, 1988	14.89	14.83
November 21, 1988	12.88	16.84
February 14, 1989	15.83	13.89
May 02, 1989	14.75	14.97

TABLE 1

GROUNDWATER ELEVATIONS
Page 4 of 5

Date Sampled	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)
August 10, 1989	16.30	13.42
November 08, 1989	16.29	13.43
February 20, 1990	15.62	14.10
May 18, 1990	16.34	13.38
September 15, 1990	16.79	12.93
November 26, 1990	17.08	12.64
February 07, 1991	16.37	13.35
May 14, 1991	14.87	14.85
August 16, 1991	16.25	13.47
Groundwater Monitoring Well MW-5:		**Elevation of Top of Casing = 29.55 feet**
June 23, 1987	14.63	14.92
July 06, 1987	14.79	14.76
August 06, 1987	15.07	14.48
November 04, 1987	15.61	13.94
February 02, 1988	13.84	15.71
May 02, 1988	14.77	14.78
November 21, 1988	12.84	16.71
February 14, 1989	15.72	13.83
May 02, 1989	14.68	14.87
August 10, 1989	16.03	13.52
November 08, 1989	16.33	13.22
February 20, 1990	15.44	14.11

TABLE 1

GROUNDWATER ELEVATIONS
Page 5 of 5

Date Sampled	Depth to Groundwater (Feet)	Groundwater Elevation (Feet)
May 18, 1990	16.22	13.33
September 15, 1990	16.65	12.90
November 26, 1990	16.95	12.60
February 07, 1991	16.20	13.35
May 14, 1991	14.72	14.38
August 16, 1991	16.10	13.45

Notes:
1) All elevations surveyed to an arbitrary datum
2) Elevations and depths are given in feet
3) Groundwater Technology, Inc., made measurements until February 1989
4) Du Pont Environmental Services collected samples from February 1989 through February 1991
5) Environmental Geotechnical Consultants, Inc., made measurements beginning in May 1991

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
Beacon Station 720
1088 Marina Boulevard
San Leandro, California
Page 1 of 5

Well No.	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	TPH-G (µg/L)	Comments
MW-1	Apr. 16, 1987	2,313	3,770	664.1	3,331	17,276	
	June 23, 1987	1,887	2,141	466.7	1,652	26,027	
	July 06, 1987	778.2	943.7	133.2	422.1	3,938	
	Aug. 06, 1987	1,270	1,576	288.7	873.7	6,079	
	Nov. 04, 1987	1,700	4,000	720	2,200	15,000	
	Feb. 02, 1988	1,500	1,700	230	740	14,000	
	May 02, 1988	3,500	700	4,900	2,700	33,000	
	Nov. 21, 1988	2,200	560	2,800	2,200	15,000	
	Feb. 14, 1989	1,700	1,700	340	1,500	12,000	Odor
	May 02, 1989	1,500	2,400	510	2,400	18,000	Odor, Slight Sheen
	Aug. 10, 1989	1,400	1,500	360	1,600	10,000	Odor
	Nov. 08, 1989	920	470	190	360	7,200	Odor
	Feb. 20, 1990	810	540	270	800	3,300	
	May 18, 1990	1,900	500	560	1,600	5,600	
	Sep. 15, 1990	320	110	150	520	5,200	Odor
	Nov. 26, 1990	370	59	150	370	3,000	Odor
	Feb. 07, 1991	750	570	480	1,800	14,000	
	May 14, 1991	1,000	1,400	600	2,500	41,000	
	Aug. 16, 1991	310	210	150	480	4,000	Odor
MW-2	Apr. 16, 1987	3,131	4,239	1,067	4,608	17,920	
	June 23, 1987	2,188	2,622	1,047	4,699	49,354	
	July 06, 1987	1,575	1,729	457	1,702	8,676	
	Aug. 06, 1987	2,623	3,722	702	2,882	14,376	
	Nov. 04, 1987	2,200	4,100	900	3,500	19,000	

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
Page 2 of 5

Well No.	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	TPH-G (µg/L)	Comments
MW-2	Feb. 02, 1988	6,200	6,500	1,000	4,000	54,000	
	May 02, 1988	6,800	1,300	7,100	5,400	53,000	
	Nov. 21, 1988	--	--	--	--	--	Free product
	Feb. 14, 1989	6,900	4,300	1,100	5,200	48,000	Film of free product
	May 02, 1989	6,100	8,800	2,100	16,000	111,000	Odor, sheen
	Aug. 10, 1989	4,200	2,900	1,000	5,800	39,000	Odor, sheen
	Nov. 08, 1989	3,700	1,500	740	2,200	45,000	Odor, heavy sheen
	Feb. 20, 1990	5,000	8,200	1,600	11,000	60,000	
	May 18, 1990	6,200	1,900	1,300	610	19,000	
	Sep. 15, 1990	1,400	820	660	3,000	27,000	Odor, sheen
	Nov. 26, 1990	1,100	880	700	3,800	28,000	Odor, sheen
	Feb. 07, 1991	2,100	1,900	1,300	6,200	63,000	Odor, sheen
	May 14, 1991	2,200	2,700	1,100	5,900	100,000	Moderate odor Slight sheen
	[illegible]	1800	950	990	3900	32000	[illegible]
MW-3	Apr. 16, 1987	1,371	2,438	472.3	2,617	9,967	
	June 23, 1987	646.2	822.9	320.9	1,280	16,824	
	July 06, 1987	340.3	384.2	116.5	420.2	3,395	
	Aug. 06, 1987	441.9	436.3	118.2	417.3	3,107	
	Nov. 04, 1987	320	280	74	250	2,600	
	Feb. 02, 1988	2,200	2,300	500	2,300	44,000	
	May 02, 1988	1,600	450	840	1,700	14,000	
	Nov. 21, 1988	1,200	220	560	810	8,100	
	Feb. 14, 1989	1,500	220	220	500	5,500	Odor

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
Page 3 of 5

Well No.	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	TPH-G (µg/L)	Comments
	Aug. 10, 1989	750	10	190	210	2,700	Odor
	Nov. 08, 1989	370	90	ND	58	2,400	Odor
	Feb. 20, 1990	1,200	810	77	460	3,700	
	May 18, 1990	980	ND	330	250	2,300	
	Sep. 15, 1990	240	36	150	230	4,700	Odor
	Nov. 26, 1990	170	8.4	86	120	1,400	Odor
	Feb. 07, 1991	220	20	120	230	2,900	
	May 14, 1991	370	39	220	820	15,000	
	Aug. 16, 1991	480	50	360	680	7,200	Slight odor
MW-4:	Apr. 16, 1987	5,896	3,797	893.9	4,106	19,309	
	June 23, 1987	4,030	1,842	850.0	3,254	31,429	
	July 06, 1987	2,710	1,247	308.2	1,312	8,117	
	Aug. 06, 1987	3,992	1,589	447.9	1,611	10,464	
	Nov. 04, 1987	9,500	17,000	2,800	11,000	55,000	
	Feb. 02, 1988	11,000	7,400	1,400	6,200	47,000	
	May 02, 1988	9,200	1,300	6,100	6,400	58,000	
	Nov. 21, 1988	5,700	1,600	3,100	7,600	48,000	
	Feb. 14, 1989	8,700	2,500	900	3,800	29,000	Odor & sheen
	May 02, 1989	4,800	5,600	1,800	8,800	69,000	Odor, slight sheen
	Aug. 10, 1989	15,000	6,600	1,800	12,000	67,000	Odor, slight sheen
	Nov. 08, 1989	11,000	3,200	1,100	4,400	71,000	Odor, slight sheen
	Feb. 20, 1990	8,100	4,500	930	3,500	19,000	
	May 18, 1990	45,000	12,000	5,000	27,000	100,000	
	Sep. 15, 1990	4,200	1,200	740	3,000	38,000	

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
Page 4 of 5

Well No.	Date Sampled	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	TPH-G (µg/L)	Comments
[illegible]	Nov. 26, 1990	2,800	650	810	2,600	19,000	Odor
	Feb. 07, 1991	4,600	1,100	1,600	4,600	41,000	Odor, sheen
	May 14, 1991	7,300	830	3,900	3,600	100,000	Slight odor, sheen
	Aug. 16, 1991	8,000	2,500	1,100	4,000	45,000	[illegible]
MW-5	Apr. 16 1987	2,267	921.2	3,277	4,536	17,733	
	June 23, 1987	2,239	516.8	953.9	1,587	19,555	
	July 06, 1987	1,335	313.7	799.2	923.9	5,631	
	Aug. 06, 1987	1,890	881.2	576.8	93.4	6,450	
	Nov. 04, 1987	1,300	500	270	640	4,600	
	Feb. 02, 1988	3,100	1,500	550	1,400	24,000	
	May 02, 1988	4,400	490	1,200	1,500	17,000	
	Nov. 21, 1988	5,600	590	870	2,200	19,000	
	Feb. 14, 1989	4,300	810	410	1,300	13,000	Odor
	May 02, 1989	2,900	1,500	690	3,200	24,000	Odor, slight sheen
	Aug. 10, 1989	6,700	2,300	860	4,700	36,000	Odor, slight sheen
	Nov. 08, 1989	5,300	860	460	600	30,000	Odor
	Feb. 20, 1990	1,700	220	120	370	3,400	
	May 18, 1990	18,000	2,000	1,500	5,600	24,000	
	Sep. 15, 1990	2,600	2,200	1,000	4,900	42,000	Odor, sheen
	Nov. 26, 1990	1,900	280	260	800	8,500	Odor, sheen

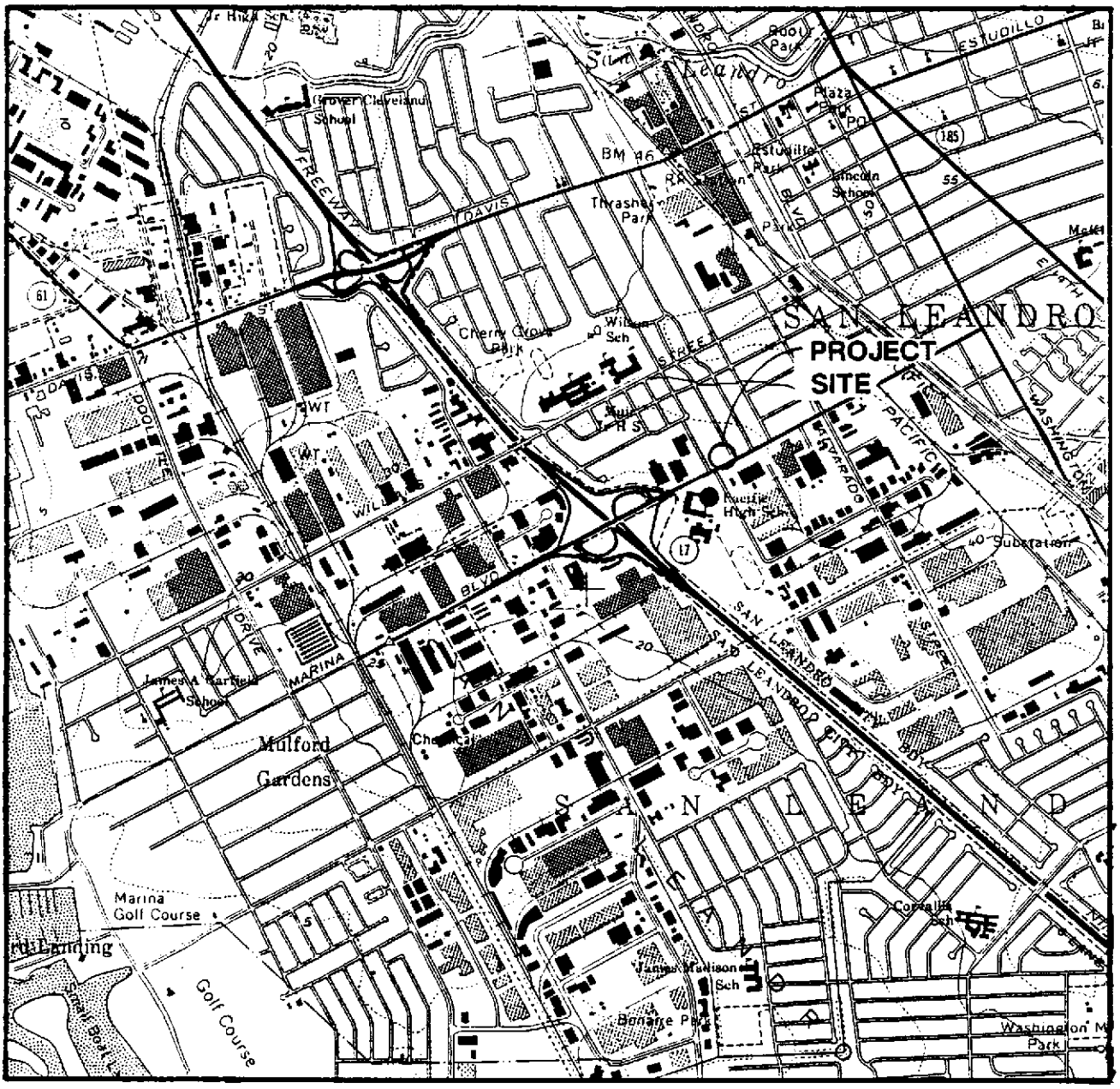
TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
Page 5 of 5

	Feb. 07, 1991	1,500	1,200	610	2,700	24,000	Odor
	May 14, 1991	3,800	4,400	1,400	6,400	120,000	Odor, sheen
	Aug. 16, 1991	4,200	1,900	760	2,900	29,000	Moderate odor, sheen

Notes:
1) TPH-G = Total Petroleum Hydrocarbons as gasoline
2) Odor refers to petroleum hydrocarbon odor
3) All results are presented in parts per billion
4) Groundwater Technology, Inc., collected samples prior to February 1989
5) Du Pont Environmental Services collected samples from February 1989 through February 1991
6) Environmental Geotechnical Consultants, Inc. collected samples beginning in May 1991

125311



NOTES

1. BASE MAP TAKEN FROM USGS SAN LEANDRO, CALIFORNIA 7.5 MINUTE TOPOGRAPHIC QUADRANGLE. (1980)

DATE	10/04/91
JOB NO.	E189-01
DWG NO.	E189-01/1
DRAWN	G BENAVIDES
CHK'D	J PHILLIPS
APP'D	J HICKS

EGC ENVIRONMENTAL GEOTECHNICAL CONSULTANTS, INC.
CONSULTANTS IN APPLIED EARTH SCIENCE

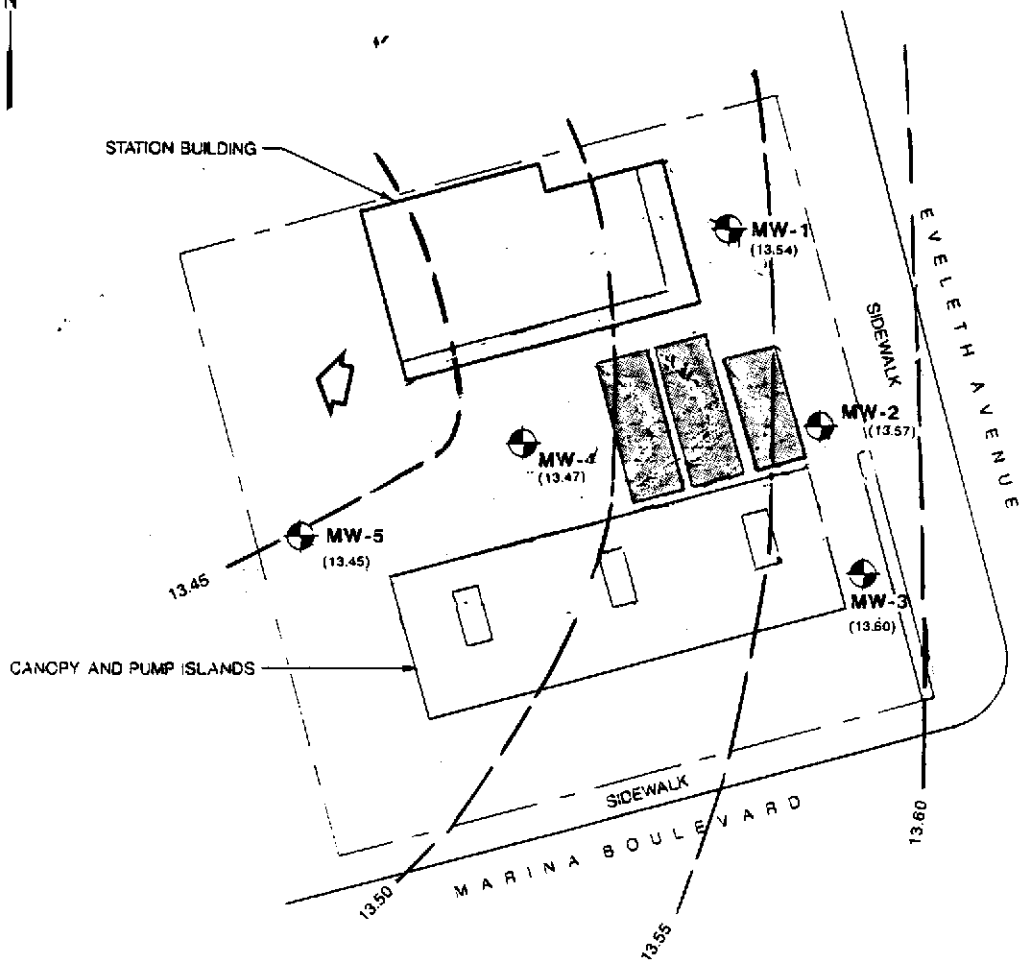
PROJECT SITE LOCATION MAP

1088 MARINA BLVD., SAN LEANDRO, CALIFORNIA

ULTRAMAR, INC.

FIGURE NO. 1

REV NO.



EXPLANATION

PROPERTY LIMITS

MW-5 (13.45) MONITORING WELL WITH GROUNDWATER SLEVATIONS IN FEET

UNDERGROUND FUEL STORAGE TANKS

APPROXIMATE DIRECTION OF GROUNDWATER FLOW FROM WATER LEVEL MEASUREMENTS TAKEN AUGUST, 16, 1991

13.60 APPROXIMATE GROUNDWATER CONTOUT WITH ELEVATION IN FEET

0 25 50 FT

APPROXIMATE SCALE

NOTES

1 BASE MAP TAKEN FROM PLAN BY DUPONT ENVIRONMENTAL REMEDIATION SERVICES, MARCH 14, 1991.

DATE 10/04/91
JOB NO. E189-01
DWG NO. E189-01/2
DRAWN D GALLANT
CHKD J PHILLIPS
APPD J HICKS

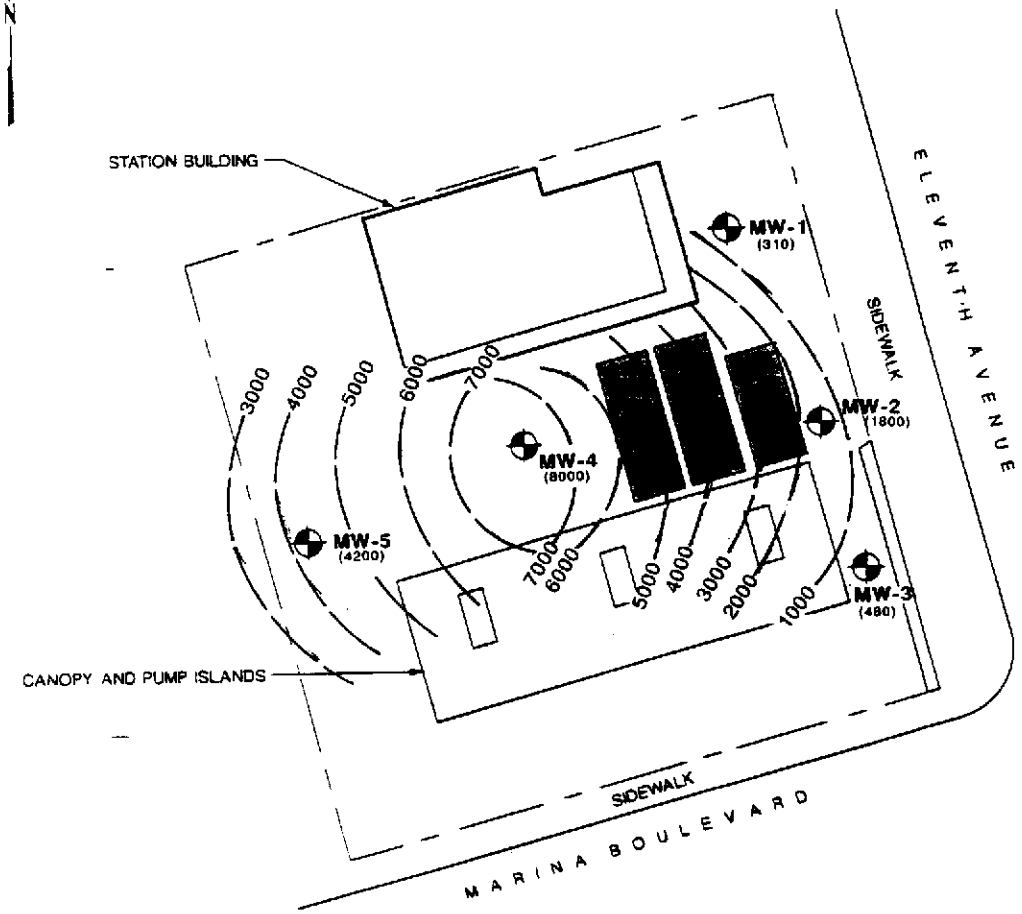
EGC ENVIRONMENTAL GEOTECHNICAL CONSULTANTS, INC.
CONSULTANTS IN APPLIED EARTH SCIENCE

GROUNDWATER GRADIENT MAP

1088 MARINA BLVD, SAN LEANDRO, CALIFORNIA

ULTRAMAR, INC

FIGURE NO. 2



EXPLANATION

PROPERTY LIMITS

MW-4 (8000) MONITORING WELL WITH BENZENE CONCENTRATION IN PARTS PER BILLION

UNDERGROUND FUEL STORAGE TANKS

1000 ISOPLETH OF BENZENE CONCENTRATION IN PARTS PER BILLION

0 40 80FT

APPROXIMATE SCALE

NOTES

1. BASE MAP TAKEN FROM PLAN BY DUPONT ENVIRONMENTAL REMEDIATION SERVICES, MARCH 14,1991.

REVISIONS			
NO.	DATE	DESCRIPTION	DRAWN / APPROVED

DATE	11/91
JOB NO.	E189-01
DWG. NO.	E189-01/3
DRAWN	D SUTU
CHKD	J PHILLIPS
APPD	J HICKS

EGC ENVIRONMENTAL GEOTECHNICAL CONSULTANTS, INC.
CONSULTANTS IN APPLIED EARTH SCIENCE

ISOPLETH MAP OF BENZENE CONCENTRATIONS IN GROUNDWATER

BEACON STATION NO.720
1088 MARINA BLVD, SAN LEANDRO, CALIFORNIA

ULTRAMAR, INC.

FIGURE NO. 3

APPENDIX A

GROUNDWATER SAMPLING AND ANALYSIS PROTOCOLS

GROUNDWATER SAMPLING AND ANALYSIS

Quality Assurance/Quality Control Objectives

The sampling and analysis procedures employed by EGC for groundwater sampling and monitoring follow specific Quality Assurance/Quality Control (QA/QC) guidelines. Quality Assurance objectives have been established by EGC to develop and implement procedures for obtaining and evaluating water quality and field data in an accurate, precise and complete manner so that sampling procedures and field measurements provide information that is comparable and representative of actual field conditions. Quality Control (QC) is maintained by EGC by using specific field protocols and requiring the analytical laboratory to perform internal and external QC checks. It is the goal of EGC to provide data that are accurate, precise, complete, comparable, and representative. The definitions for accuracy, precision, completeness, comparability, and representativeness are as follows:

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

2. Precision - a measure of agreement among individual measurements under similar conditions. Usually expressed in terms of the standard deviation.

3. Completeness - the amount of valid data obtained from a measurement system compared to the amount that was expected to meet the project data goals.

4. Comparability - expresses the confidence with which one data set can be compared to another.

5. Representativeness - a sample or group of samples that reflects the characteristics of the media at the sampling point. It also includes how well the sampling point represents the actual parameter variations which are under study.

As part of the EGC QA/QC program, applicable federal, state and local reference guidance documents are to be followed. The procedures outlined in these regulations, manuals, handbooks, guidance documents and journals are incorporated into the EGC sampling procedures to assure that: (1) groundwater samples are properly collected, (2) groundwater samples are identified, preserved, and transported in a manner such that they are representative of field conditions, and (3) chemical analyses of samples are accurate and reproducible.

GUIDANCE AND REFERENCE DOCUMENTS USED TO COLLECT GROUNDWATER SAMPLES

U.S.E.P.A. - 339/9-51-002	NEIC Manual for Groundwater/ Subsurface Investigation at Hazardous Waste Sites
U.S.E.P.A. - 503/SW611	Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities (August, 1977)
U.S.E.P.A. - 600/4-79-020	Methods for Chemical Analysis of Water and Wastes (1983)
U.S.E.P.A. - 600/4-82-029	Handbook for Sampling and Sample Preservation of Water and Wastewater (1982)
U.S.E.P.A. - SW-846#, 3rd Edition	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (November, 1986)
40 CFR 136.3e. Table II (Code of Federal Regulations)	Required Containers, Preservation Techniques, and Holding Times
Resources Conservation and Recovery Act (OSWER 9950.1)	Groundwater Monitoring Technical Enforcement Guidance Document (September, 1986)
California Regional Water Quality Control Board (Central Valley Region)	A Compilation of Water Quality Goals (September, 1988); Updates (October, 1988)
California Regional Water Quality Control Board (North Coast, San Francisco Bay, and Central Valley)	Regional Board Staff Recommendations for Initial Evaluations and Investigation of Underground Tanks: Tri-Regional Recommendations (June, 1988)
Regional Water Quality Control Board (Central Valley Region)	Memorandum: Disposal, Treatment, and Refuse of Soils Contaminated with Petroleum Fractions (August, 1986)
State of California Department of Health Services	Hazardous Waste Testing Laboratory Certification List (March, 1987)
State of California Water Resources Control Board	Leaking Underground Fuel Tank (LUFT) Field Manual (May, 1988), and LUFT Field Manual Revision (April, 1989)

State of California Water Resources Control Board	Title 23, (Register #85.#33-8-17-85), Subchapter 16: Underground Tank Regulations; Article 3, Sections 2632 and 2634; Article 4, Section 2647 (October, 1986)
Alameda County Water District	Groundwater Protection Program: Guidelines for Groundwater and Soil Investigations at Leaking Underground Fuel Tank Sites (November, 1988)
American Public Health Association	Standard Methods for the Examination of Water and Wastewaters, 16th Edition
Analytical Chemistry (journal)	Principles of Environmental Analysis. Volume 55, Pages 2212-2218 (December, 1983)
Santa Clara Valley Water District	Guidelines for Preparing or Reviewing Sampling Plans for Soil and Groundwater Investigation of Fuel Contamination Sites (January, 1989)
American Petroleum Institute	Groundwater Monitoring & Sample Bias; API Publication 4367, Environmental Affairs Department, June 1983

Because groundwater samples collected by EGC are analyzed in the parts per billion (ppb) range for many compounds, care is exercised to prevent contamination of samples. When volatile or semi-volatile organic compounds are included for analysis, EGC sampling crew members will adhere to the following precautions in the field:

1. A clean pair of new, disposable gloves are worn for each well being sampled.

2. When possible, samples are collected from known or suspected wells that are least contaminated (i.e., background) followed by wells in increasing order of contamination.

3. All sample bottles and equipment are kept away from fuels and solvents. When possible, gasoline (used in generators) is stored away from bailers, sample bottles, purging pumps, etc.

4. Bailers are made of Teflon or Stainless Steel. Other materials such as plastic may contaminate samples with phthalate esters which interfere with many Gas Chromatography (GC) analyses.

5. Volatile organic groundwater samples are collected so that air passage through the sample does not occur or is minimal (to prevent volatiles from being stripped from the samples); sample bottles are filled by slowly running the sample down the side

of the bottle until there is a positive convex meniscus over the neck of the bottle; the Teflon side of the septum (in cap) is positioned against the meniscus, and the cap screwed on tightly; the sample is inverted and the bottle lightly tapped. The absence of an air bubble indicates a successful seal; if a bubble is evident, the cap is removed, more sample is added, and the bottle is resealed.

6. Extra Teflon seals are brought into the field in case seals are difficult to handle and/or are dropped. Dropped seals are considered contaminated and are not used. When replacing seals or if seals become flipped, care is taken to assure that the Teflon seal faces down.

Laboratory and field handling procedures of samples are monitored by including QC samples for analysis with every submitted sample lot from a project site. QC samples may include any combination of the following:

1. Trip Blank. Used for purgeable organic compounds only; QC samples are collected in 40 milliliter (ml) sample vials filled in the analytical laboratory with organic-free water. Trip blanks are sent to the project site, and travel with project site samples. Trip blanks are not opened, and are returned from a project site with the project site samples for analysis.

2. Field Blank. Prepared in the field using organic-free water. These QC samples accompany project site samples to the laboratory and are analyzed for specific chemical parameters unique to the project site where they were prepared.

3. Duplicates. Duplicate samples are collected "second samples" from a selected well and project site. They are collected as either split samples or second-run samples collected from the same well.

4. Equipment Blank. Period QC sample collected from field equipment rinsate to verify decontamination procedures.

The number and types of QC samples are determined on a site-specific basis.

SAMPLE COLLECTION

This section describes the routine procedures followed by EGC while collecting groundwater samples for chemical analysis. These procedures include decontamination, water-level measurements, well purging, physical parameter measurements, sample collection, sample preservation, sample handling, and sample documentation. Critical sampling objectives for EGC are to:

1. Collect groundwater samples that are representative of the sampled matrix.

2. Maintain sample integrity from the time of sample collection to receipt by the analytical laboratory.

Decontamination Procedures

All physical parameter measuring and sampling equipment are decontaminated prior to sample collection using Alconox or equivalent detergent followed by steam cleaning with deionized water. Any sampling equipment surfaces or parts that might absorb specific contaminants, such as plastic pump valves, impellers, etc., are cleaned in the same manner.

Sample bottles, bottle caps and septa used for sampling volatile organics are thoroughly cleaned and prepared in the laboratory. Sample bottles, bottle caps and septa are protected from all potential chemical contact before actual usage at a sample location.

During field sampling, equipment which has been placed in a well shall be decontaminated by cleaning with Alconox or equivalent detergent followed by steam cleaning with deionized water before purging or sampling the next well.

Water-Level Measurements

Prior to purging and sampling a well, the static-water levels are measured in all wells at a project site using an electric sounder and/or calibrated portable oil-water interface probe. Both static water-level and separate-phase product thickness are measured to the nearest $\pm$0.01 foot. The presence of separate-phase product is confirmed using a clean, acrylic or polyvinylchloride (PVC) bailer, measured to the nearest $\pm$0.01 foot with an engineer's scale tape.

The monofilament line used to lower the bailer is replaced between wells with new line to preclude the possibility of cross-contamination. Field observations (e.g., well integrity, product color, turbidity, water color, odors, etc) are noted on the EGC Well Sampling Field Data Sheet. Before and after each use, the electric sounder, interface probe and bailer are decontaminated by washing with Alconox or equivalent detergent followed by rinsing with deionized water to prevent cross-contamination.

Well Purging

Before sampling occurs, well casing storage water and interstitial water in the artificial sand pack will be purged using: (1) a positive displacement bladder pump constructed of inert, non-wetting, Teflon and stainless steel; (2) a pneumatic-airlift pumping system; (3) a centrifugal pumping system; or (4) a Teflon or Stainless Steel bailer. Methods of purging will be assessed based on well size, location, accessibility, and known chemical conditions. Individual well purge volumes are calculated from casing volumes. As a general rule, a minimum of 3 to 5 casing volumes will be purged. Wells which dewater or demonstrate slow recharge periods (i.e., low-yield wells) during purging activities may be sampled after fewer purging cycles. If a low-yield (low recovery) well is to be sampled, sampling will not take place until at least 70 percent of the previously measured water column has been replaced by recharge. Removal of stagnant water will either be disposed of or stored in 55-gallon drums for future disposal as outlined for contaminated soil cuttings in the section on soil sampling protocol. Physical parameter measurements (temperature, pH, and specific conductance) are closely monitored throughout the well purging process and are used by the EGC sampling crew as indicators for assessing

sufficient purging. Purging is continued until all three physical parameters have stabilized. 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 degree F. Calibration of physical parameter meters will follow manufacturers specifications. Collected field data during purging activities will be entered on the EGC Well Sampling Field Data Sheet. Copies of the EGC Field Data Sheets will be reviewed by the EGC Sampling Manager for accuracy and completeness.

DOCUMENTATION

Sample Container Labels

Each sample container will be labeled immediately after the sample is collected. Label information will include:

Sample point designation (i.e., well number or code)
Sampler's identification
Project number
Date and time of collection
Type of preservation used

Well Sampling Data Forms

In the field, the EGC sampling crew will record the following information on the Well Sampling Data Sheet for each sample collected:

Project number
Client
Location
Source (i.e., well number)
Time and date
Well accessibility and integrity
Pertinent well data (e.g., depth, product thickness, static water-level, pH, specific conductance, temperature)
Calculated and actual purge volumes

Chain-of-Custody

A Chain-of-Custody record shall be completed and accompany every shipment of samples to the analytical laboratory in order to establish the documentation necessary to trace sample possession from time of collection. The record will contain the following information:

Sample or station number or sample identification (ID)
Signature of collector, sampler, or recorder
Date and time of collection
Place of collection

Sample type
Signatures of persons involved in chain of possession
Inclusive dates of possession

Samples shall always be accompanied by a Chain-of-Custody record. When transferring the samples, the individual relinquishing and receiving the samples will sign, date, and note the time on the Chain-of-Custody record. EGC will be responsible for notifying the laboratory coordinator when and how many samples will be sent to the laboratory for analysis, and what types of analyses shall be performed.

Sample Handling Storage and Transport

All chemical sampling, handling and storage will be conducted under the direction of our consulting Analytical Chemist. All laboratory chemical testing will be accomplished by a State approved laboratory.

All equipment that contacts samples will be thoroughly cleaned prior to arrival to a site and between samplings. New or used samplers will be steam-cleaned or washed with an anionic detergent solution (i.e., Liquinox or Alconox), rinsed well with tap water, rinsed with distilled water, drained of excess water and air-dried or wiped dry with a clean towel.

Equipment blanks will be taken during the final stage of decontamination at the rate of no more than one per groundwater monitoring well. Selected method blanks will be subjected to chemical analysis for quality control.

All samples will be collected in an order such that those parameters most sensitive to volatilization will be sampled first. A general order of collection for some common groundwater parameters follows:

- Volatile Organic Compounds (VOC's)
- Total Organic Halogens (TOX)
- Total Organic Carbon (TOC)
- Extractable Organics
- Total Metals
- Dissolved Metals
- Phenols
- Sulfate and Chloride
- Turbidity
- Nitrate and Ammonia

All samples will be held at 4°C by packing in ice in a covered ice chest specifically designated for that purpose. At no time will the elapsed time between sample collection and delivery at the outside laboratory be greater than 72 hours. Preservatives will not be added to any sample unless instructed, and preservatives will be supplied and requested by the outside laboratory. Under no circumstances will sample containers be opened by anyone other than laboratory personnel who will perform the specified chemical analysis.

If it is necessary for samples or sample chests to leave the immediate control of the sampler prior to delivery to the laboratory, such as shipment by a common carrier (e.g., Federal Express), a custody seal will be placed on each sample container and/or sample chest to ensure that the samples have not been tampered with during transportation. The custody seal will contain the sampler's signature, the date and time the seal was emplaced.

magnitude of approximately 0.006-foot per foot (see Figure 2). Groundwater elevation data are summarized in Table 1.

Figure 3 represents an interpretive isopleth map of benzene concentrations in groundwater beneath the site. Laboratory analytical results indicate that the maximum concentration of benzene is highest in monitoring well MW-1, compared to MW-3, in the second quarter of 1991.

The analytical results for TPHg and BTEX are summarized in Table 2. Laboratory analytical reports are included as Appendix B.

The next quarterly sampling for the site is scheduled for December 1991.

Reporting Responsibility

Responsibility for the reporting of these results to the regulatory agencies guiding this project lies with Ultramar. EGC therefore recommends that Ultramar provide this report to the following agencies:

Guidance Agencies

Regional Water Quality Control Board
San Francisco Bay Region
Toxics Cleanup Division
2101 Webster Street, Suite 500
Oakland, CA 94612
Attention: Mr. Eddy So

City of Hayward Fire Department
25151 Clawiter Road
Hayward, California 94545-2731
Attn: Hugh Murphy

Alameda County Department of Environmental Health
Division of Hazards Material
80 Swan Way, Room 200
Oakland, California 94621
Attention: Mr. Lowell Miller

LIMITATIONS

The scope of work for this project was strictly limited to the sampling and analysis of groundwater and the preparation of this report. Our services have been performed in accordance with generally accepted geoenvironmental consulting practice. No other representation, express or implied, and no warranty or guarantee is included or intended

APPENDIX B

ANALYTICAL RESULTS

APPLIED ANALYTICAL

Environmental Laboratories

42501 Albrae St., Suite 100
Fremont, CA 94538
Bus: (415) 623-0775
Fax: (415) 651-8647

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. Bart Britton	Date Sampled:	08-16/19-91
	EGC	Date Received:	08-20-91
	2495 Industrial Pkwy West	BTEX Analyzed:	08-22-91
	Hayward, CA 94545	TPHg Analyzed:	08-22-91
Project:	AGS 19505-L, Project #E189-01	TPHd Analyzed:	NR
	Station # , San Leandro	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 W1108351	310	210	150	480	4000	NR
MW-2 W1108352	1800	950	990	3900	32000	NR
MW-3 W1108353	480	50	360	680	7200	NR
MW-4 W1108354	8000	2500	1100	4000	45000	NR
MW-5 W1108355	4200	1900	760	2900	29000	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

August 23, 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

CHAIN OF CUSTODY REPORT

091872

BEACON

Beacon Station No.	Sampler (Print Name)			ANALYSES									Date	Form No.
	Bart Britton												8-19-91	1 of 1
Project No.	Sampler (Signature)													
E# 189-01														
Project Location	Affiliation													
San Leandro	EGC													
Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)						No. of Containers	REMARKS	
MW-1	8-16-91			X	X							3		
MW-2	8-19-91			X	X							3		
MW-3	8-16-91			X	X							3		
MW-4	8-16-91			X	X							3		
MW-5	8-16-91			X	X							3		

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
	8/19	1609		8/19	4:09
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
	8/19	1625	Espinosa		
Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
	8-20	905	Anthony Enero - AAA	8/20/91	905

Report To:

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

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

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