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# PORT OF OAKLAND

September 5, 1996

Ms. Jennifer Eberle  
Hazardous Materials Specialist  
Alameda County Environmental Protection Division  
1131 Harbor Bay Parkway, Room 250  
Alameda, CA 94502-6577

**SUBJECT: SECOND QUARTER 1996  
GROUNDWATER MONITORING AND SAMPLING REPORT  
BUILDING C-401, 2277 7TH STREET, OAKLAND  
STID # 3899**

Dear Jennifer:

Please find enclosed a copy of the Groundwater Monitoring and Sampling Report, Second Quarter 1996, prepared on the behalf of the Port of Oakland by Alisto Engineering Group (Alisto). The report, dated May 31, 1996, addresses groundwater monitoring and sampling and product recovery activities that were performed by Alisto in April 1996 at Building C-401, 2277 7th Street, Oakland, California.

If you have any questions, please feel free to contact me at 272-1373.

Sincerely,

John Prall, R.G.

Associate Environmental Scientist

Enclosure

cc (w/enclosure): Don Ringsby, Dongary Investments  
Rich Hiett, RWQCB

cc (w/o enclosure): Neil Werner

PORT OF OAKLAND  
ENVIRONMENTAL DIVISION

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GROUNDWATER MONITORING AND SAMPLING REPORT  
SECOND QUARTER 1996

Port of Oakland  
Building C-401  
2277 Seventh Street  
Oakland, California

Project No. 10-270-04-001

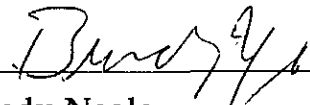
Prepared for:


Port of Oakland  
530 Water Street  
Oakland, California

Prepared by:

Alisto Engineering Group  
1575 Treat Boulevard, Suite 201  
Walnut Creek, California

May 31, 1996

  
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Brady Nagle  
Project Manager

  
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Al Sevilla, P.E.  
Principal



# GROUNDWATER MONITORING AND SAMPLING REPORT SECOND QUARTER 1996

Port of Oakland  
Building C-401  
2277 Seventh Street  
Oakland, California

Project No. 10-270-04-001

May 31, 1996

## INTRODUCTION

This report presents the results and findings of the groundwater monitoring and sampling conducted by Alisto Engineering Group at the Port of Oakland, Building C-401, 2277 Seventh Street, Oakland, California for the second quarter 1996. A site vicinity map is shown on Figure 1.

The monitoring and sampling was performed on April 4, 1996. Monitoring Wells MW-1, MW-3, and MW-8 were not sampled due to the presence of liquid-phase petroleum hydrocarbons.

## FIELD PROCEDURES

Field activities were performed in accordance with the procedures and guidelines of the Alameda County Health Care Services Agency and the California Regional Water Quality Control Board, San Francisco Bay Region.

Before purging and sampling, the groundwater level in each well was measured from a permanent mark on top of the casing to the nearest 0.01 foot using an electronic sounder. The depth to groundwater and top of casing elevation data were used to calculate the groundwater elevation in each well in reference to mean lower low water. The survey data and groundwater elevation measurements collected to date are presented in Table 1. The volume of liquid-phase hydrocarbons removed from Monitoring Wells MW-1, MW-3, and MW-8 is presented in Table 2.

Before sample collection, each well was purged of 3 casing volumes while recording field readings of pH, temperature, and electrical conductivity. Groundwater samples were collected for laboratory analysis by lowering a bottom-fill, disposable bailer to just below the water level in each well. The samples were transferred from the bailer into laboratory-supplied containers. The field procedures for groundwater monitoring well sampling and the water sampling field survey forms are presented in Appendix A.



## SAMPLING AND ANALYTICAL RESULTS

The groundwater samples were analyzed by Pace Analytical Services, Inc., a state-certified laboratory, for the following:

WELL ID	ANALYTE			
	TPH-G	BTEX	TPH-D	TPH-O
MW-1	---	---	---	---
MW-2	X	X	X	X
MW-3	---	---	---	---
MW-4	X	X	X	X
MW-5	X	X	X	X
MW-6	X	X	X	X
MW-7	X	X	X	X
MW-8	---	---	---	---

- TPH-G Total petroleum hydrocarbons as gasoline, generally C4 to C12, using EPA Method 8015
- BTEX Benzene, toluene, ethylbenzene, and total xylenes using EPA Method 8020
- TPH-D Total petroleum hydrocarbons as diesel, generally C10 to C20, using EPA Method 8015 (modified)
- TPH-O Total petroleum hydrocarbons as oil, generally C20 to C42, using EPA Method 8015 (modified)

The results of monitoring and laboratory analysis of the groundwater samples for this and previous events are summarized in Table 1. The potentiometric groundwater elevations as interpreted from the results of this monitoring event are shown on Figure 2. The results of groundwater analysis are shown on Figure 3. The field procedures for chain of custody documentation, laboratory report, and chain of custody record are presented in Appendix B.

## RESULTS AND FINDINGS

The findings of the second quarter 1996 groundwater monitoring and sampling event are summarized as follows:

- Liquid-phase hydrocarbons were observed at thicknesses ranging from 0.05 to 4.40 feet in Monitoring Wells MW-1, MW-3, and MW-8.



- Groundwater elevations indicated a gradient of 0.007 foot per foot in a northerly direction across the site.
- Analysis of samples collected from the monitoring wells detected the following:
  - TPH-G at concentrations of 1100 and 440 micrograms per liter (ug/l) in the samples collected from Monitoring MW-4 and MW-6. TPH-G was not detected in the samples collected from MW-2, MW-5, and MW-7.
  - TPH-D at concentrations of 160, 180, 180, 6100, and 530 ug/l in the samples collected from MW-2, MW-4, MW-5, MW-6, and MW-7.
  - TPH-O at concentrations of 320, 300, 520, 1200, and 340 ug/l in the samples collected from MW-2, MW-4, MW-5, MW-6, and MW-7.
  - Benzene, toluene, ethylbenzene, and total xylenes (BTEX) at concentrations of up to 320, 1.6, 3.9, and 3 ug/l in the samples collected from MW-4 and MW-6. BTEX was not detected in the samples collected from MW-2, MW-5, and MW-7.



TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING  
 PORT OF OAKLAND, BUILDING C-401  
 2277 SEVENTH STREET, OAKLAND, CALIFORNIA

ALJSTO PROJECT NO 10-270

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION) (a) (feet)	DEPTH TO WATER (feet)	PRODUCT THICKNESS (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ug/l)	TPH-D (ug/l)	TPH-O (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	LAB
MW-1	03/29/95	14.14	7.67	0.17	6.60	--	--	--	--	--	--	--	--
MW-1	09/06/95	14.14	9.45	0.77	5.27	--	--	--	--	--	--	--	--
MW-1	09/28/95	14.14	9.85	1.11	5.12	--	--	--	--	--	--	--	--
MW-1	12/27/95	14.14	9.04	0.53	5.50	--	--	--	--	--	--	--	--
MW-1	01/08/96	14.14	9.15	0.48	5.35	--	--	--	--	--	--	--	--
MW-1	04/04/96	14.14	8.50	0.25	5.83	--	--	--	--	--	--	--	--
MW-2	05/27/94	14.36	8.01	--	6.35	87	470	--	ND<0.50	ND<0.50	ND<0.50	ND<0.50	D&M
MW-2	03/29/95	14.36	7.47	--	6.89	ND<50	110	1400	ND<0.4	ND<0.3	ND<0.3	ND<0.4	CEC
QC-1 (c)	03/29/95	--	--	--	--	ND<50	--	--	ND<0.4	ND<0.3	ND<0.3	ND<0.4	CEC
MW-2	09/06/95	14.36	9.04	--	5.32	ND<50	--	--	ND<0.4	ND<0.3	ND<0.3	ND<0.4	CEC
QC-1 (c)	09/06/95	--	--	--	--	ND<50	ND<60	400	ND<0.4	ND<0.3	ND<0.3	ND<0.4	CEC
MW-2	09/28/95	14.36	7.47	--	6.89	--	--	--	--	--	--	--	--
MW-2	12/27/95	14.36	8.95	--	5.41	--	--	--	--	--	--	--	--
MW-2	01/08/96	14.36	8.95	--	5.41	ND<50	ND<50	1200	ND<0.4	ND<0.3	ND<0.3	ND<0.4	CEC
MW-2	04/04/96	14.36	8.46	--	5.90	ND<50	160	320	ND<0.5	ND<0.5	ND<0.5	ND<1	PACE
MW-3	03/29/95	14.22	9.59	2.93	6.83	--	--	--	--	--	--	--	--
MW-3	09/06/95	14.22	13.70	5.22	4.44	--	--	--	--	--	--	--	--
MW-3	09/28/95	14.22	13.60	5.80	4.97	--	--	--	--	--	--	--	--
MW-3	12/27/95	14.22	12.71	4.70	5.04	--	--	--	--	--	--	--	--
MW-3	01/08/96	14.22	13.10	4.94	4.83	--	--	--	--	--	--	--	--
MW-3	04/04/96	14.22	11.50	4.40	6.02	--	--	--	--	--	--	--	--
MW-4	03/29/95	13.15	9.59	--	3.56	--	--	--	--	--	--	--	--
MW-4	09/06/95	13.15	8.48	--	4.67	--	--	--	--	--	--	--	--
MW-4	09/11/95	13.15	9.59	--	3.56	150	ND<200	500	23	ND<0.3	ND<0.3	ND<0.4	CEC
MW-4	09/28/95	13.15	9.59	--	3.56	--	--	--	--	--	--	--	--
MW-4	12/27/96	13.15	8.39	--	4.76	--	--	--	--	--	--	--	--
MW-4	01/08/96	13.15	8.42	--	4.73	790	90	400	170	1.2	0.6	0.6	CEC
MW-4	04/04/96	13.15	8.19	--	4.96	1100	180	300	320	1.6	1.1	1.2	PACE
QC-1 (c)	04/04/96	--	--	--	--	1200	--	--	320	2.2	0.57	1.2	PACE
MW-5	09/06/95	13.49	6.90	--	6.59	--	--	--	--	--	--	--	--
MW-5	09/11/95	13.49	9.59	--	3.90	90	ND<300	2500	3.3	ND<0.3	ND<0.3	ND<0.4	CEC
MW-5	09/28/95	13.49	9.59	--	3.90	--	--	--	--	--	--	--	--
MW-5	12/27/96	13.49	7.17	--	6.32	--	--	--	--	--	--	--	--
MW-5 (d)	01/08/96	13.49	--	--	--	--	--	--	--	--	--	--	--
MW-5	04/04/96	13.49	6.44	--	7.05	ND<50	180	520	ND<0.5	ND<0.5	ND<0.5	ND<1	PACE

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING  
 PORT OF OAKLAND, BUILDING C-401  
 2277 SEVENTH STREET, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-270

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION) (a) (feet)	DEPTH TO WATER (feet)	PRODUCT THICKNESS (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ug/l)	TPH-D (ug/l)	TPH-O (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	LAB
MW-6	09/06/95	14.00	7.40	2.93	8.80	---	---	---	---	---	---	---	---
MW-6	09/28/95	14.00	9.59	2.93	6.61	---	---	---	---	---	---	---	---
MW-6	12/27/96	14.00	8.07	---	5.93	---	---	---	---	---	---	---	---
MW-6	01/08/96	14.00	7.70	---	6.30	480	11000	6100	15	1.9	9.7	5.2	CEC
QC-1 (c)	01/08/96	---	---	---	---	530	---	---	15	1.9	12	6.4	CEC
MW-6	04/04/96	14.00	7.70	---	6.30	440	6100	1200	16	0.97	3.9	3	PACE
MW-7	09/06/95	14.35	9.10	---	5.25	ND<50	ND<300	800	ND<0.4	ND<0.3	ND<0.3	ND<0.4	CEC
MW-7	09/28/95	14.35	9.74	---	4.61	---	---	---	---	---	---	---	---
MW-7	12/27/96	14.35	9.06	---	5.29	---	---	---	---	---	---	---	---
MW-7	01/08/96	14.35	9.06	---	5.29	ND<50	410	1100	ND<0.4	ND<0.3	ND<0.3	ND<0.4	CEC
MW-7	04/04/96	14.35	8.57	---	5.78	ND<50	530	340	ND<0.5	ND<0.5	ND<0.5	ND<1	PACE
MW-8	09/06/95	12.94	7.84	---	5.10	---	---	---	---	---	---	---	---
MW-8	09/28/95	12.94	8.91	0.12	4.12	---	---	---	---	---	---	---	---
MW-8	12/27/95	12.94	8.61	0.31	4.56	---	---	---	---	---	---	---	---
MW-8	01/08/96	12.94	8.80	0.45	4.48	---	---	---	---	---	---	---	---
MW-8	04/04/96	12.94	8.37	0.05	4.61	---	---	---	---	---	---	---	---
QC-2 (e)	03/29/95	---	---	---	---	ND<50	---	---	ND<0.4	ND<0.3	ND<0.3	ND<0.4	CEC
QC-2 (e)	09/06/95	---	---	---	---	ND<50	---	---	ND<0.4	ND<0.3	ND<0.3	ND<0.4	CEC
QC-2 (e)	09/28/95	---	---	---	---	ND<50	---	---	ND<0.4	ND<0.3	ND<0.3	ND<0.4	CEC
QC-2 (e)	01/08/96	---	---	---	---	ND<50	---	---	ND<0.4	ND<0.3	ND<0.3	ND<0.4	CEC
QC-2 (e)	04/04/96	---	---	---	---	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1	PACE

ABBREVIATIONS:

TPH-G Total petroleum hydrocarbons as gasoline  
 TPH-D Total petroleum hydrocarbons as diesel (C10 to C20)  
 TPH-O Total petroleum hydrocarbons as oil (C20 to C42)  
 B Benzene  
 T Toluene  
 E Ethylbenzene  
 X Total xylenes  
 ug/l Micrograms per liter  
 --- Not analyzed/applicable/measured  
 ND Not detected above reported detection limit  
 D&M D&M Laboratories  
 CEC Clayton Environmental Consultants, Inc.  
 PACE Pace Analytical Services, Inc.

NOTES:

- (a) Top of casing elevations surveyed to the nearest 0.01 foot relative to mean lower low water (3.2 feet below mean sea level, port of Oakland datum).
- (b) Groundwater elevations in feet above mean lower low water.
- (c) Blind duplicate.
- (d) Well inaccessible.
- (e) Travel blank.

TABLE 2 - LIQUID-PHASE HYDROCARBON REMOVAL STATUS  
 PORT OF OAKLAND, BUILDING C-401  
 2277 SEVENTH STREET, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-270

WELL ID	DATE	CASING ELEVATION (a) (feet)	DEPTH TO WATER (feet)	DEPTH TO PRODUCT	PRODUCT THICKNESS	GROUNDWATER ELEVATION (b) (Feet)	PRODUCT REMOVED (Gallons)	PRODUCT REMOVED CUMULATIVE (Gallons)	
MW-1	06/30/94	14.17	9.75	9.20	0.55	4.83	1.5	1.5	(c)
	07/08/94	14.17	9.88	9.12	0.76	4.86	1.5	3.0	(c)
	07/14/94	14.17	9.90	9.12	0.78	4.86	1.5	4.5	(c)
	7/21-22/94	14.17	9.78	9.16	0.62	4.86	1.5	6.0	(c)
	07/29/94	14.17	10.30	9.13	0.87	4.52	3.0	9.0	(c)
	08/03/94	14.17	10.00	9.19	1.11	5.00	3.0	12.0	(c)
	08/11/94	14.17	10.51	9.24	1.27	4.61	3.0	15.0	(c)
	08/18/94	14.17	10.38	9.25	1.13	4.64	3.0	18.0	(c)
	09/29/94	14.17	10.50	9.30	1.20	4.57	3.0	21.0	(c)
	10/04/94	14.17	9.75	9.30	0.45	4.76	1.5	22.5	(c)
	10/14/94	14.17	10.05	9.25	0.80	4.72	1.5	24.0	(c)
	10/21/94	14.17	10.84	9.49	1.35	4.34	---	24.0	(c)
	11/02/94	14.17	10.26	9.44	0.82	4.53	2.5	26.5	(c)
	11/10/94	14.17	9.80	8.45	1.35	5.38	3.0	29.5	(c)
	11/18/94	14.17	9.76	8.78	0.98	5.15	3.0	32.5	(c)
	12/08/94	14.17	9.46	8.69	0.77	5.29	3.0	35.5	(c)
	01/20/95	14.17	8.01	7.73	0.28	6.37	2.0	37.5	(c)
	01/27/95	14.17	7.54	7.52	0.02	6.65	2.0	39.5	(c)
	02/10/95	14.17	8.15	7.92	0.23	6.19	2.0	41.5	(c)
	02/16/95	14.17	8.40	8.18	0.23	5.94	1.0	42.5	(c)
	02/23/95	14.17	8.46	8.21	0.25	5.90	2.0	44.5	(c)
	03/03/95	14.17	8.25	8.15	0.10	6.00	2.0	46.5	(c)
	03/10/95	14.17	7.63	7.53	0.10	6.62	2.0	48.5	(c)
	03/17/95	14.17	8.00	7.80	0.20	6.32	2.0	50.5	(c)
	04/07/95	14.17	---	---	---	14.17	2.0	52.5	(c)
	04/14/95	14.17	---	---	---	14.17	3.0	55.5	(c)
	04/19/95	14.17	8.34	7.10	0.24	6.01	0.5	56.0	(c)
	04/26/95	14.17	8.26	7.98	0.28	6.12	1.0	57.0	(c)
	05/03/95	14.17	8.77	8.47	0.30	5.63	0.5	57.5	(c)
	05/12/95	14.17	8.33	7.87	0.46	6.19	2.0	59.5	(c)
	05/16/95	14.17	8.42	8.64	0.22	5.92	1.5	61.0	(c)
	05/23/95	14.17	8.68	8.51	0.17	5.62	1.5	62.5	(c)
	05/31/95	14.17	8.71	8.54	0.17	5.59	1.0	63.5	(c)
	06/07/95	14.17	8.77	8.61	0.16	5.52	2.5	66.0	(c)
	06/14/95	14.17	9.51	7.88	1.63	5.88	5.0	71.0	(c)
	06/23/95	14.17	9.60	8.20	1.40	5.62	4.0	75.0	(c)
	06/28/95	14.17	8.41	7.61	0.80	6.36	15.0	90.0	(c)
	07/07/95	14.17	8.70	8.09	0.61	5.93	8.0	98.0	(c)
	07/10/95	14.17	8.91	8.00	0.91	5.94	12.0	110.0	(c)
	07/19/95	14.17	8.87	8.49	0.38	5.59	10.0	120.0	(c)
	07/28/95	14.17	9.01	8.54	0.47	5.51	10.0	130.0	(c)
	08/04/95	14.17	9.20	8.76	0.44	5.30	8.0	138.0	(c)
	08/11/95	14.17	9.30	9.07	0.23	5.04	6.0	144.0	(c)
	08/14/95	14.17	9.06	8.52	0.54	5.52	4.0	148.0	(c)
	08/17/95	14.17	8.89	8.41	0.48	5.84	8.0	156.0	(c)
	08/23/95	14.17	9.55	8.95	0.60	5.07	5.0	161.0	(c)
	09/07/95	14.17	9.42	8.87	0.55	5.16	11.0	172.0	(c)
	09/15/95	14.17	9.21	8.98	0.23	5.13	12.0	184.0	(c)
	09/20/95	14.17	9.23	8.79	0.44	5.27	5.0	189.0	(c)
	10/06/95	14.17	9.45	9.14	0.31	4.95	8.0	197.0	(c)
	10/11/95	14.17	9.08	8.48	0.60	5.54	4.0	201.0	(c)
	10/18/95	14.17	9.20	8.72	0.48	5.33	8.0	209.0	(c)
	10/26/95	14.17	9.11	8.43	0.68	5.57	8.0	217.0	(c)
	11/01/95	14.17	8.98	8.52	0.46	5.54	8.0	225.0	(c)
	11/06/95	14.17	9.32	8.86	0.46	5.20	10.0	235.0	(c)
	11/21/95	14.17	9.44	8.78	0.66	5.23	6.0	241.0	(c)
	11/25/95	14.17	9.22	8.38	0.84	5.58	5.0	246.0	(c)
	12/15/95	14.17	9.36	8.65	0.71	5.34	3.0	249.0	(c)
	01/05/96	14.17	9.08	8.64	0.44	5.42	8.0	257.0	(c)
	01/13/96	14.17	9.33	8.79	0.54	5.25	4.0	261.0	(c)
	01/30/96	14.17	9.66	8.62	1.04	5.29	4.0	265.0	(c)
	02/09/96	14.17	9.44	8.91	0.53	5.13	4.0	269.0	(c)
	02/23/96	14.17	9.63	8.95	0.68	5.05	4.0	273.0	(c)
	03/08/96	14.17	9.58	9.09	0.49	4.96	4.0	277.0	(c)
	03/13/96	14.17	9.66	9.18	0.48	4.87	4.0	281.0	(c)
	04/05/96	14.17	8.70	8.45	0.25	0.00	8.0	289.0	(c)
	04/26/96	14.17	8.91	8.55	0.36	5.53	4.0	293.0	(c)
	05/17/96	14.17	8.87	8.44	0.43	5.62	5.0	298.0	(c)
	06/02/96	14.17	9.01	8.28	0.73	5.71	5.0	303.0	(c)
	06/07/96	14.17	9.20	8.56	0.64	5.45	10.0	313.0	(c)
	06/10/96	14.17	9.30	8.83	0.47	5.22	5.0	318.0	(c)
	06/17/96	14.17	9.06	8.33	0.73	5.66	8.0	326.0	(c)
	06/28/96	14.17	8.89	8.22	0.67	5.78	15.0	341.0	(c)
	07/10/96	14.17	9.55	8.73	0.82	5.24	10.0	351.0	(c)
	07/16/96	14.17	9.42	8.54	0.88	5.41	10.0	361.0	(c)
	07/24/96	14.17	9.21	8.42	0.79	5.55	5.0	366.0	(c)
	08/01/96	14.17	9.23	8.36	0.87	5.59	15.0	381.0	(c)



TABLE 2 - LIQUID-PHASE HYDROCARBON REMOVAL STATUS  
 PORT OF OAKLAND, BUILDING C-401  
 2277 SEVENTH STREET, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-270

WELL ID	DATE	CASING ELEVATION (a) (feet)	DEPTH TO WATER (feet)	DEPTH TO PRODUCT	PRODUCT THICKNESS	GROUNDWATER ELEVATION (b) (Feet)	PRODUCT REMOVED (Gallons)	PRODUCT REMOVED CUMULATIVE (Gallons)
MW-3	06/30/94	14.24	14.97	8.83	6.14	3.88	45.0	45.0
	07/08/94	14.24	14.85	8.34	6.51	4.27	45.0	90.0
	07/14/94	14.24	14.41	8.35	6.06	4.38	45.0	135.0
	7/21-22/94	14.24	14.32	8.45	5.87	4.32	45.0	180.0
	07/29/94	14.24	14.45	8.90	5.55	3.95	18.0	198.0
	08/03/94	14.24	14.45	8.45	6.00	4.29	30.0	228.0
	08/11/94	14.24	14.45	9.52	4.93	3.49	30.0	258.0
	08/18/94	14.24	14.38	9.48	4.90	3.54	45.0	303.0
	09/23/94	14.24	14.45	8.75	5.70	4.07	100.0	403.0
	09/29/94	14.24	14.45	8.85	5.60	3.99	165.0	568.0
	10/04/94	14.24	14.50	8.65	5.85	4.13	165.0	733.0
	10/14/94	14.24	14.50	9.60	4.90	3.42	165.0	898.0
	10/21/94	14.24	14.50	8.88	5.62	3.96	90.0	988.0
	11/02/94	14.24	14.50	8.79	5.71	4.02	50.0	1038.0
	11/10/94	14.24	13.12	8.07	5.05	4.91	---	1038.0
	11/18/94	14.24	13.10	7.91	5.19	5.03	90.0	1128.0
	12/08/94	14.24	13.58	7.95	5.63	4.88	50.0	1178.0
	01/20/95	14.24	10.11	7.09	3.02	6.40	40.0	1218.0
	01/27/95	14.24	11.09	7.15	3.94	6.11	20.0	1238.0
	02/10/95	14.24	11.05	7.05	4.00	6.19	0.0	1238.0
	02/16/95	14.24	12.10	7.20	4.90	5.82	140.0	1378.0
	02/23/95	14.24	12.00	7.33	4.67	5.74	100.0	1478.0
	03/03/95	14.24	12.25	7.40	4.85	5.63	150.0	1628.0
	03/10/95	14.24	10.40	7.10	3.30	6.32	150.0	1778.0
	03/17/95	14.24	9.80	6.90	2.90	6.62	165.0	1943.0
	03/31/95	14.24	---	6.60	---	---	100.0	2043.0
	04/07/95	14.24	---	6.80	---	---	160.0	2203.0
	04/14/95	14.24	---	6.90	---	---	160.0	2363.0
	04/19/95	14.24	11.30	4.26	7.04	8.22	110.0	2473.0
	04/26/95	14.24	11.11	4.83	6.28	7.84	125.0	2598.0
	05/03/95	14.24	10.84	4.89	5.95	7.86	130.0	2728.0
	05/12/95	14.24	11.08	4.86	6.22	7.83	140.0	2868.0
	05/18/95	14.24	11.11	4.72	6.39	7.92	150.0	3018.0
	05/23/95	14.24	11.09	4.63	6.46	8.00	100.0	3118.0
	05/31/95	14.24	10.84	5.20	5.64	7.63	100.0	3218.0
	06/07/95	14.24	12.26	7.33	4.93	5.68	150.0	3368.0
	06/14/95	14.24	12.01	6.21	5.80	6.58	90.0	3458.0
	06/23/95	14.24	12.21	6.12	6.09	6.60	100.0	3558.0
	06/28/95	14.24	11.04	5.76	5.28	7.16	125.0	3683.0
	07/07/95	14.24	10.82	4.61	6.21	8.08	70.0	3753.0
	07/10/95	14.24	10.96	5.25	5.71	7.56	40.0	3793.0
	07/19/95	14.24	10.80	4.80	6.00	7.94	100.0	3893.0
	07/28/95	14.24	10.78	5.68	5.10	7.29	180.0	4073.0
	08/04/95	14.24	12.76	7.88	4.88	5.14	60.0	4133.0
	08/11/95	14.24	12.75	7.52	5.23	5.41	40.0	4173.0
	08/14/95	14.24	13.01	7.99	5.02	5.00	55.0	4228.0
	08/17/95	14.24	14.01	8.02	5.99	4.72	60.0	4288.0
	08/23/95	14.24	13.27	8.42	4.85	4.61	75.0	4363.0
	09/07/95	14.24	12.99	8.33	4.66	4.75	30.0	4393.0
	09/15/95	14.24	10.55	5.66	4.89	7.36	55.0	4448.0
	09/20/95	14.24	12.67	7.45	5.22	5.49	70.0	4518.0
	10/06/95	14.24	13.65	7.77	5.88	5.00	55.0	4573.0
	10/11/95	14.24	11.58	6.73	4.85	6.30	55.0	4628.0
	10/18/95	14.24	11.28	5.29	5.99	7.45	60.0	4688.0
	10/26/95	14.24	10.22	5.26	4.96	7.74	45.0	4733.0
	11/01/95	14.24	9.88	4.92	4.96	8.08	40.0	4773.0
	11/06/95	14.24	10.22	4.84	5.38	8.06	70.0	4843.0
	11/21/95	14.24	10.30	5.59	4.71	7.47	60.0	4903.0
	11/25/95	14.24	12.11	6.80	5.31	6.11	30.0	4933.0
	12/15/95	14.24	11.88	6.11	5.77	6.69	40.0	4973.0
	01/05/96	14.24	10.34	5.46	4.88	7.56	55.0	5028.0
	01/13/96	14.24	9.65	4.63	5.02	8.36	55.0	5083.0
	01/30/96	14.24	11.62	5.94	5.68	6.88	55.0	5138.0
	02/09/96	14.24	12.33	7.37	4.96	5.63	55.0	5193.0
	02/23/96	14.24	11.21	5.90	5.31	7.01	55.0	5248.0
	03/08/96	14.24	11.56	5.67	5.89	7.10	55.0	5303.0
	03/13/96	14.24	12.32	6.24	6.08	6.48	55.0	5358.0
	04/05/96	14.24	10.80	6.40	4.40	6.74	50.0	5408.0
	04/26/96	14.24	10.78	6.02	4.76	7.03	50.0	5458.0
	05/17/96	14.24	12.76	8.04	4.72	5.02	100.0	5558.0
	06/02/96	14.24	12.75	8.37	4.38	4.78	60.0	5618.0
	06/07/96	14.24	13.01	8.05	4.96	4.95	60.0	5678.0
	06/10/96	14.24	14.01	9.05	4.96	3.95	35.0	5713.0
	06/17/96	14.24	12.76	7.55	5.21	5.39	50.0	5763.0
	06/28/96	14.24	12.75	7.71	5.04	5.27	40.0	5803.0
	07/10/96	14.24	13.01	7.67	5.34	5.24	50.0	5853.0
	07/16/96	14.24	14.01	8.78	5.23	4.15	55.0	5908.0
	07/24/96	14.24	13.27	8.29	4.98	4.71	20.0	5928.0
	08/01/96	14.24	12.32	7.12	5.20	5.82	60.0	5988.0

TABLE 2 - LIQUID-PHASE HYDROCARBON REMOVAL STATUS  
 PORT OF OAKLAND, BUILDING C-401  
 2277 SEVENTH STREET, OAKLAND, CALIFORNIA

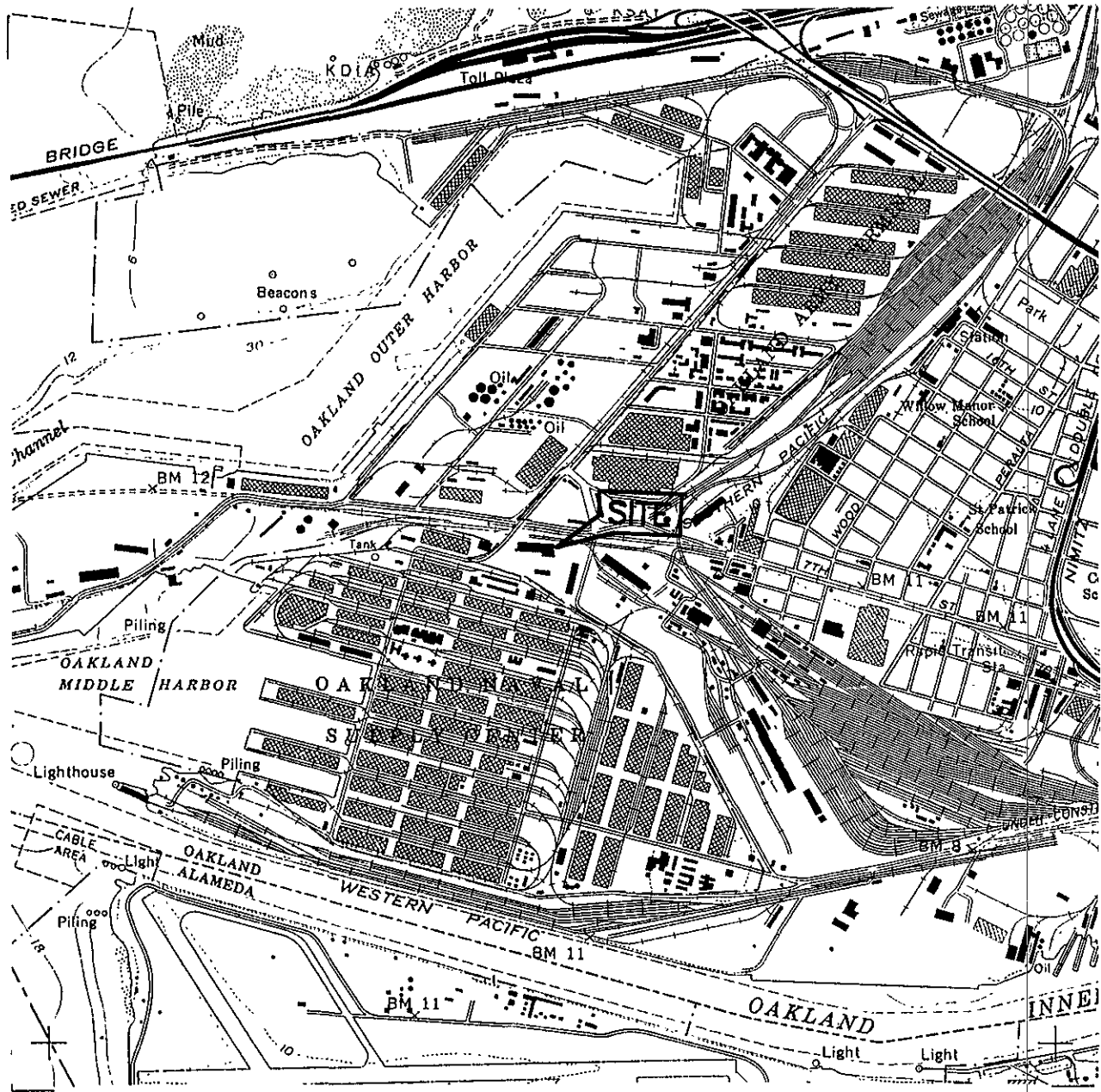
ALISTO PROJECT NO. 10-270

WELL ID	DATE	CASING ELEVATION (a) (feet)	DEPTH TO WATER (feet)	DEPTH TO PRODUCT	PRODUCT THICKNESS	GROUNDWATER ELEVATION (b) (Feet)	PRODUCT REMOVED (Gallons)	PRODUCT REMOVED CUMULATIVE (Gallons)
MW-8	12/15/95	12.94	8.87	8.77	0.10	4.15	0.1	0.1
	01/05/96	12.94	9.02	8.96	0.06	3.97	0.5	0.6
	01/13/96	12.94	8.99	8.95	0.04	3.98	0.5	1.1
	01/30/96	12.94	9.01	8.95	0.06	3.98	0.5	1.6
	02/09/96	12.94	9.05	8.94	0.11	3.97	0.5	2.1
	02/23/96	12.94	9.12	9.09	0.03	3.84	0.5	2.6
	03/08/96	12.94	9.03	8.83	0.20	4.06	0.5	3.1
	03/13/96	12.94	9.11	8.95	0.16	3.95	0.5	3.6
	04/05/96	12.94	8.72	8.67	0.05	4.26	0.8	4.4
	04/26/96	12.94	8.33	8.29	0.04	4.64	0.5	4.9
	05/17/96	12.94	8.66	8.62	0.04	4.31	0.5	5.4
	06/02/96	12.94	8.95	8.93	0.02	4.01	0.3	5.6
	06/07/96	12.94	8.12	8.10	0.02	4.84	0.5	6.1
	06/10/96	12.94	8.44	8.38	0.06	4.55	0.6	6.7
	06/17/96	12.94	7.92	7.88	0.04	5.05	0.5	7.2
	06/28/96	12.94	9.02	8.98	0.04	3.95	2.0	9.2
	07/10/96	12.94	9.11	9.08	0.03	3.85	0.5	9.7
	07/16/96	12.94	8.77	8.74	0.03	4.19	0.3	10.0
	07/24/96	12.94	9.01	8.83	0.18	4.07	0.3	10.2
	08/01/96	12.94	9.11	9.07	0.04	3.86	0.3	10.5

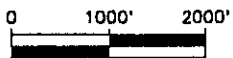
NOTES:

- (a) Casing elevations surveyed to the nearest 0.01 foot relative to mean lower low water (3.2 feet below mean sea level) Port of Oakland datum.
- (b) Groundwater elevations adjusted assuming a specific gravity of 0.75 for the liquid-phase hydrocarbons.
- (c) The estimated amount bailed is approximately 75% product and 25% water.

E:1010-270PRODUCT



SOURCE:  
USGS MAP, OAKLAND WEST QUADRANGLE,  
7.5 MINUTE SERIES, 1959.  
PHOTOREVISED 1980.



## FIGURE 1

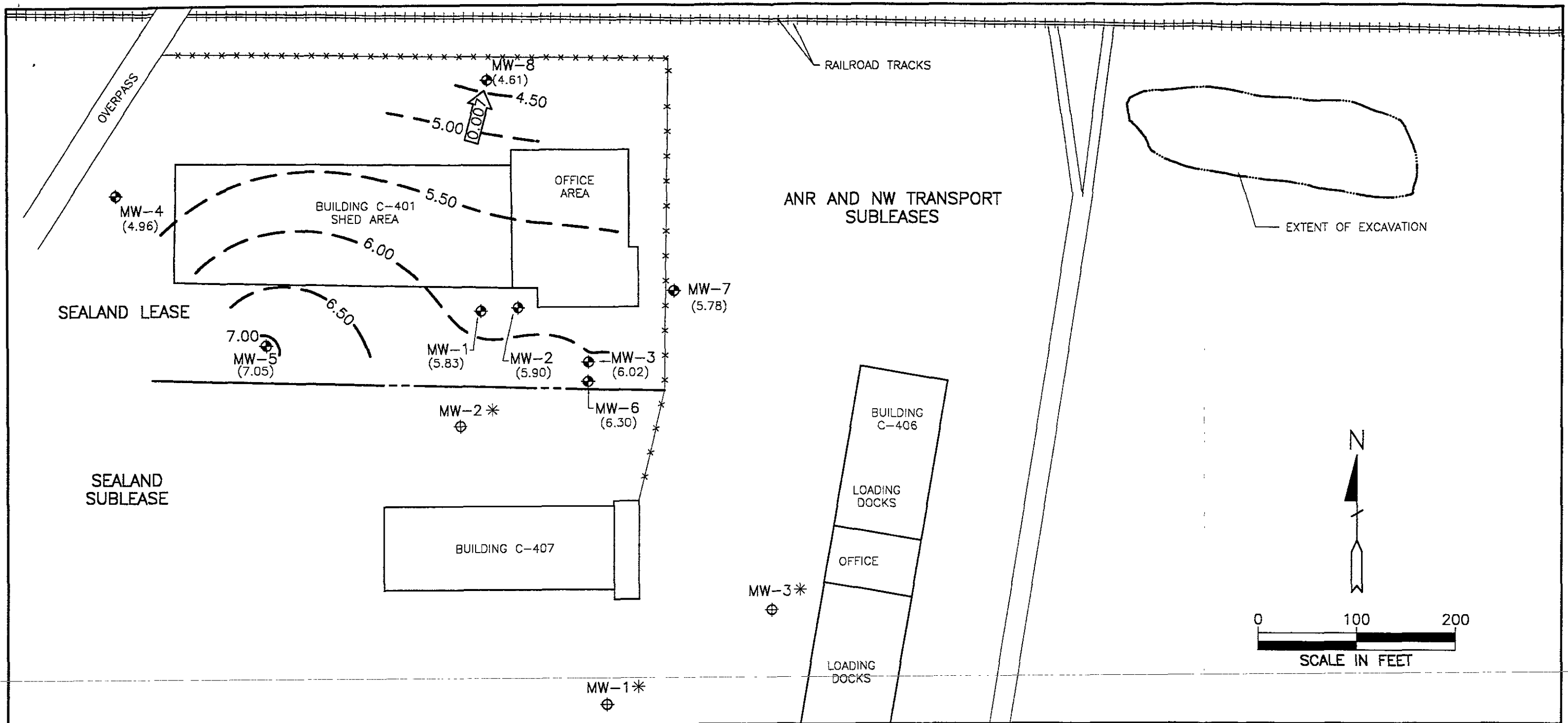
### SITE VICINITY MAP

PORT OF OAKLAND  
BUILDING C-401  
2277 SEVENTH STREET  
OAKLAND, CALIFORNIA

PROJECT NO. 10-270



**ALISTO ENGINEERING GROUP**  
WALNUT CREEK, CALIFORNIA



**LEGEND**

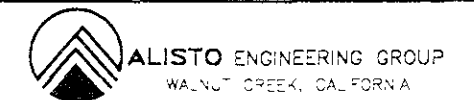
- ◆ EXISTING PORT OF OAKLAND GROUNDWATER MONITORING WELL
- ⊕ EXISTING DONGARY INVESTMENTS GROUNDWATER MONITORING WELL
- (6.30) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 6.50 - GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL=0.50 FOOT)
- ← 0.007 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT
- \* SITES NOT MONITORED

**FIGURE 2**  
**POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP**

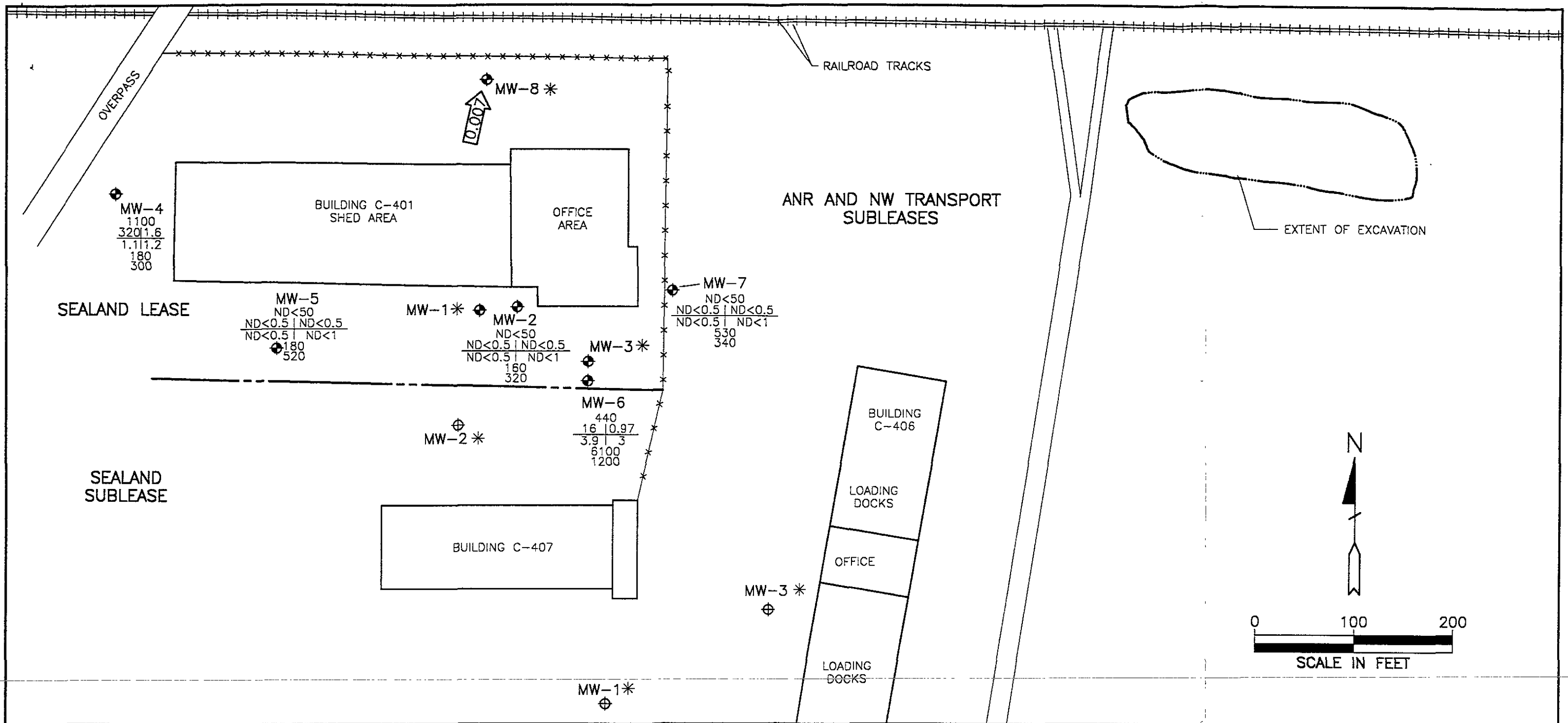
**APRIL 4, 1996**

PORT OF OAKLAND  
 BUILDING C-401  
 2277 SEVENTH STREET  
 OAKLAND, CALIFORNIA

PROJECT NO. 10-270



10/27/96 R/DWG 5 17 06 SAC 1-100



**LEGEND**

- ⊕ EXISTING PORT OF OAKLAND GROUNDWATER MONITORING WELL
  - ⊕ EXISTING DONGARY INVESTMENTS GROUNDWATER MONITORING WELL
  - TPH-O CONCENTRATION OF CONSTITUENTS IN MICROGRAMS PER LITER,
  - B X
  - T
  - E
  - X
  - ND
  - ←0.007
  - \* SITES NOT SAMPLED
- TPH-O TOTAL PETROLEUM HYDROCARBONS AS OIL
  - B BENZENE
  - T TOLUENE
  - E ETHYLBENZENE
  - X TOTAL XYLENES
  - ND NOT DETECTED ABOVE REPORTED DETECTION LIMIT
  - ←0.007 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT
  - \* SITES NOT SAMPLED

**FIGURE 3**

**CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER**

**APRIL 4, 1996**

PORT OF OAKLAND  
 BUILDING C-401  
 2277 SEVENTH STREET  
 OAKLAND, CALIFORNIA

PROJECT NO. 10-270



**APPENDIX A**

**FIELD PROCEDURES FOR  
GROUNDWATER MONITORING WELL SAMPLING  
AND WATER SAMPLING FIELD SURVEY FORMS**

**FIELD PROCEDURES  
FOR  
GROUNDWATER MONITORING WELL SAMPLING**

Groundwater Level Measurement

Before beginning groundwater sampling, the groundwater level in each well was measured from a marked survey reference point at the top of the well casing. Groundwater in each well was monitored for free-floating product or sheen. The depth to groundwater was measured to an accuracy of 0.01 foot from the top of the PVC well casing using an electronic sounder.

Groundwater Monitoring Well Sampling

To ensure that the groundwater samples were representative of the aquifer, the wells were purged of 3 well casing volumes before sample collection. This purging was accomplished using a clean bailer or pump.

The groundwater samples were collected using a disposable bailer, and then transferred into laboratory-supplied containers. Care was taken to avoid turbulence when transferring the water samples, and all volatile analysis vials were filled so that no air bubbles were trapped. The sampling technician wore nitrile gloves at all times during purging and well sampling. The samples were labeled with the well number, site identification, date and time of sample collection, and sampler's initials, and transported in an iced cooler maintained at 4 degrees Centigrade to Pace Analytical Services, a state-certified laboratory, following preservation and chain of custody protocol.

# ALISTO

## Field Report / Sampling Data Sheet

ENGINEERING

GROUP

1575 TREAT BOULEVARD, SUITE 201

Project No. 10-270-4-1

Date: 4/4/96

Address Part of Oakland

Day: MTWTF

Contract No. Biking 6401

City: Oakland CA

Station No.

Sampler: DL

WELL ID	SAMPLE ID	DEPTH TO WATER	TOTAL DEPTH	PRODUCT THICKNESS	TIME Monitors	COMMENTS:
mw-2	-	8.46'	15.00	φ	1247	
mw-7	-	8.57'	17.5	↓	1252	
mw-5	-	6.44'	15.00		1304	
mw-6	-	7.70	15.00		1310	
mw-4	-	8.19	18.00	↓	1313	
mw-8	-	8.37'	Nm	0.05'	1317	
mw-1	-	8.50	↓	0.25'	1321	
mw-3	-	11.50	↓	4.40'	1327	

### FIELD INSTRUMENT CALIBRATION DATA

Ph METER Aquachek 4.00  7.00  10.00

TEMPERATURE COMPENSATED  Y  N

TIME 1400

D.O. METER NA ZERO D.O. SOLUTION NA BAROMETRIC PRESSURE \_\_\_\_\_ TEMP 72°F

WEATHER Sunny

CONDUCTIVITY METER Aquachek 10,000 \_\_\_\_\_ TURBIDITY METER \_\_\_\_\_ 5.0 NTU \_\_\_\_\_

OTHER Factory Solrd

Well ID	Depth to Water	Diam	Cap/Lock	Product Dept	Irridescence	Gal.	Time	Temp *F	pH	E.C.	D.O.	
mw-2	8.46	2"	OK	φ	Y <input checked="" type="radio"/> N	1	1402	72.8	7.33	2.07ms		<input type="radio"/> EPA 601
Total Depth - Water Level =						2	1404	71.9	7.35	2.05		<input checked="" type="radio"/> TPH-G/BTEX <u>Her</u>
$15.00 - 8.46 = 6.54 \times .16 = 1.05 \times 3 = 3.14$						3.25	1406	71.6	7.37	2.05		<input checked="" type="radio"/> TPH Diesel <u>Her</u>
Purge Method: <input checked="" type="checkbox"/> Surface Pump <input type="checkbox"/> ODisp. Tube <input type="checkbox"/> OWinch <input type="checkbox"/> ODisp. Bailer(s) <input type="checkbox"/> OSys Port												<input type="radio"/> TOG 5520
Comments:												TIME/SAMPLE ID
												<u>1412</u>
mw-7	8.57	2"	OK	φ	Y <input checked="" type="radio"/> N	1.5	1420	70.9	7.01	2.11ms		<input type="radio"/> EPA 601
Total Depth - Water Level =						3	1426	70.9	7.01	2.08		<input checked="" type="radio"/> TPH-G/BTEX <u>Her</u>
$17.50 - 8.57 = 8.93 \times .16 = 1.42 \times 3 = 4.29$						4.5	1430	71.0	7.02	2.07		<input checked="" type="radio"/> TPH Diesel <u>Her</u>
Purge Method: <input checked="" type="checkbox"/> Surface Pump <input type="checkbox"/> ODisp. Tube <input type="checkbox"/> OWinch <input type="checkbox"/> ODisp. Bailer(s) <input type="checkbox"/> OSys Port												<input type="radio"/> TOG 5520
Comments:												TIME/SAMPLE ID
												<u>1440</u>



# ALISTO

## Field Report / Sampling Data Sheet

ENGINEERING  
GROUP

Groundwater Sampling

Date: 4/4/96 Project No. 10-270-4-1

Day: Thur Station No. C-401

1575 TREAT BOULEVARD, SUITE 201  
WALNUT CREEK CA 94596 (510) 295-1650 FAX 295-1823

Weather: Sunny Address Port of Oakland, Oakland CA  
SAMPLER: DC

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Thickness	Gal.	Time	Temp *F	pH	E.C.	D.O.	
mw-5	6.44	2"	OL	Φ	Φ	1.5	1450	69.8	6.84	2.49 mS		<input type="checkbox"/> EPA 601
Total Depth - Water Level=						3	1453	68.9	6.99	2.52		<input checked="" type="checkbox"/> TPH-G/BTEX <u>Am</u>
x Well Vol. Factor=						4.25	1456	68.6	7.02	2.54		<input checked="" type="checkbox"/> TPH Diesel <u>none</u>
x#vol. to Purge=												<input type="checkbox"/> TOG 5520
Purge Vol.=												Time Sampled
Purge Method: <input checked="" type="checkbox"/> Surface Pump <input type="checkbox"/> Disp. Tube <input type="checkbox"/> Winch <input type="checkbox"/> Disp. Bailer(s) <input type="checkbox"/> Sys Port												1502
Comments:												

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Thickness	Gal.	Time	Temp *F	pH	E.C.	D.O.	
mw-6	7.70	2"	OL	Φ	Φ	1	1518	70.9	7.87	3.89 mS		<input type="checkbox"/> EPA 601
Total Depth - Water Level=						2	1522	70.4	7.41	3.89 mS		<input checked="" type="checkbox"/> TPH-G/BTEX <u>Am</u>
x Well Vol. Factor=						3.5	1525	70.3	7.39	3.84 mS		<input checked="" type="checkbox"/> TPH Diesel <u>none</u>
x#vol. to Purge=												<input type="checkbox"/> TOG 5520
Purge Vol.=												Time Sampled
Purge Method: <input checked="" type="checkbox"/> Surface Pump <input type="checkbox"/> Disp. Tube <input type="checkbox"/> Winch <input type="checkbox"/> Disp. Bailer(s) <input type="checkbox"/> Sys Port												1530
Comments:												

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Thickness	Gal.	Time	Temp *F	pH	E.C.	D.O.	
mw-4	8.19	2"	OL	Φ	Φ	2	1539	69.1	7.88	1.39 mS		<input type="checkbox"/> EPA 601
Total Depth - Water Level=						4	1546	67.9	7.17	1.37		<input checked="" type="checkbox"/> TPH-G/BTEX <u>Am</u>
x Well Vol. Factor=						5	1550	67.4	7.13	1.37		<input checked="" type="checkbox"/> TPH Diesel <u>none</u>
x#vol. to Purge=												<input type="checkbox"/> TOG 5520
Purge Vol.=												Time Sampled
Purge Method: <input checked="" type="checkbox"/> Surface Pump <input type="checkbox"/> Disp. Tube <input type="checkbox"/> Winch <input type="checkbox"/> Disp. Bailer(s) <input type="checkbox"/> Sys Port												1600
Comments: <u>GL-1 from this well</u>												

**APPENDIX B**

**FIELD PROCEDURES FOR CHAIN OF CUSTODY DOCUMENTATION,  
LABORATORY REPORT, AND CHAIN OF CUSTODY RECORD**

**FIELD PROCEDURES  
FOR  
CHAIN OF CUSTODY DOCUMENTATION**

Samples were handled in accordance with the California Department of Health Services guidelines. The samples were labeled in the field and immediately stored in coolers and preserved with blue ice for transport to a state-certified laboratory for analysis.

A chain of custody record accompanied the samples, and included the site and sample identification, date and time of collection, analysis requested, and the name and signature of the sampling technician. When transferring possession of the samples, the transferee signed and dated the chain of custody record.

# Pace Analytical

Tel: 707-792-1865  
Fax: 707-792-0342

May 2, 1996 Reissued

Mr. Dale Swain  
Alisto Engineering  
1575 Treat Blvd.  
Suite 201  
Walnut Creek, CA 94598

RE: PACE Project Number: 705444  
Client Project ID: Port of Oakland

Dear Mr. Swain:

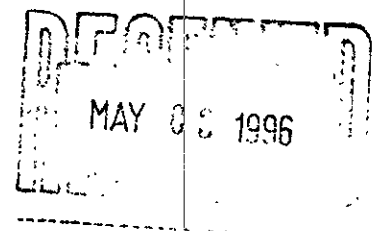
Enclosed are the results of analyses for sample(s) received on April 8, 1996. This report has been amended. The compound MTBE has been removed from the TPH purgeable (8015) list. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



David A. Pichette  
Project Manager

Enclosures



## REPORT OF LABORATORY ANALYSIS

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# Pace Analytical

Pace Analytical Services, Inc.  
 1455 McDowell Blvd. North, Suite D  
 Petaluma, CA 94954

Tel: 707-792-1865  
 Fax: 707-792-0342

DATE: 04/22/96  
 PAGE: 4

PACE Project Number: 705444  
 Client Project ID: Port of Oakland

PACE Sample No: 70569702  
 Client Sample ID: MW-6

Date Collected: 04/04/96  
 Date Received: 04/08/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	440	ug/L	50	04/10/96	CA LUFT	AMH		
Benzene	16	ug/L	0.5	04/10/96	CA LUFT	AMH	71-43-2	
Toluene	0.97	ug/L	0.5	04/10/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	3.9	ug/L	0.5	04/10/96	CA LUFT	AMH	100-41-4	
Xylene (Total)	3	ug/L	1	04/10/96	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	95	%		04/10/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	98	%		04/10/96	CA LUFT	AMH	460-00-4	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	6.1	mg/L	0.05	04/16/96	TPH by EPA 8015M	DLL		
Motor Oil	1.2	mg/L	0.25	04/16/96	TPH by EPA 8015M	DLL		
JP4	ND	mg/L	0.5	04/16/96	TPH by EPA 8015M	DLL	.....	
n-Pentacosane (S)	45	%		04/16/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				04/11/96				

## REPORT OF LABORATORY ANALYSIS

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DATE: 04/22/96

PAGE: 3

PACE Project Number: 705444

Client Project ID: Port of Oakland

PACE Sample No: 70569694  
 Client Sample ID: MW-5

Date Collected: 04/04/96  
 Date Received: 04/08/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	04/10/96	CA LUFT	AMH		
Benzene	ND	ug/L	0.5	04/10/96	CA LUFT	AMH	71-43-2	
Toluene	ND	ug/L	0.5	04/10/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	ND	ug/L	0.5	04/10/96	CA LUFT	AMH	100-41-4	
Xylene (Total)	ND	ug/L	1	04/10/96	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	94	%		04/10/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	96	%		04/10/96	CA LUFT	AMH	460-00-4	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	0.18	mg/L	0.05	04/16/96	TPH by EPA 8015M	DLL		1
Motor Oil	0.52	mg/L	0.25	04/16/96	TPH by EPA 8015M	DLL		
JP4	ND	mg/L	0.5	04/16/96	TPH by EPA 8015M	DLL	.....	
n-Pentacosane (S)	41	%		04/16/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				04/11/96				

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Tel: 707-792-1865  
 Fax: 707-792-0342

DATE: 04/22/96  
 PAGE: 2

PACE Project Number: 705444  
 Client Project ID: Port of Oakland

PACE Sample No: 70569686  
 Client Sample ID: MW-7

Date Collected: 04/04/96  
 Date Received: 04/08/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	04/11/96	CA LUFT	AMH		
Benzene	ND	ug/L	0.5	04/11/96	CA LUFT	AMH	71-43-2	
Toluene	ND	ug/L	0.5	04/11/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	ND	ug/L	0.5	04/11/96	CA LUFT	AMH	100-41-4	
Xylene (Total)	ND	ug/L	1	04/11/96	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	89	%		04/11/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	101	%		04/11/96	CA LUFT	AMH	460-00-4	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	0.53	mg/L	0.05	04/16/96	TPH by EPA 8015M	DLL		
Motor Oil	0.34	mg/L	0.25	04/16/96	TPH by EPA 8015M	DLL		
JP4	ND	mg/L	0.5	04/16/96	TPH by EPA 8015M	DLL	.....	
n-Pentacosane (S)	23	%		04/16/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				04/11/96				

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DATE: 04/22/96  
 PAGE: 1

Alisto Engineering  
 1575 Treat Blvd.  
 Suite 201  
 Walnut Creek, CA 94598

PACE Project Number: 705444  
 Client Project ID: Port of Oakland

Attn: Mr. Dale Swain  
 Phone: (510)295-1650

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
PACE Sample No: 70569678 Date Collected: 04/04/96 Client Sample ID: MW-2 Date Received: 04/08/96								
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	04/11/96	CA LUFT	AMH		
Benzene	ND	ug/L	0.5	04/11/96	CA LUFT	AMH	71-43-2	
Toluene	ND	ug/L	0.5	04/11/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	ND	ug/L	0.5	04/11/96	CA LUFT	AMH	100-41-4	
Xylene (Total)	ND	ug/L	1	04/11/96	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	89	%		04/11/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	100	%		04/11/96	CA LUFT	AMH	460-00-4	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	0.16	mg/L	0.05	04/16/96	TPH by EPA 8015M	DLL		1
Motor Oil	0.32	mg/L	0.25	04/16/96	TPH by EPA 8015M	DLL		
JP4	ND	mg/L	0.5	04/16/96	TPH by EPA 8015M	DLL	.....	
n-Pentacosane (S)	36	%		04/16/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				04/11/96				

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Petaluma, CA 94954

Tel: 707-792-1865  
Fax: 707-792-0342

DATE: 04/22/96  
PAGE: 6

PACE Project Number: 705444  
Client Project ID: Port of Oakland

PACE Sample No: 70569728  
Client Sample ID: QC-1

Date Collected: 04/04/96  
Date Received: 04/08/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	1200	ug/L	50	04/11/96	CA LUFT	AMH		
Benzene	320	ug/L	0.5	04/11/96	CA LUFT	AMH	71-43-2	
Toluene	2.2	ug/L	0.5	04/11/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	0.57	ug/L	0.5	04/11/96	CA LUFT	AMH	100-41-4	
Xylene (Total)	1.2	ug/L	1	04/11/96	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	114	%		04/11/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	99	%		04/11/96	CA LUFT	AMH	460-00-4	

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Tel: 707-792-1865

Fax: 707-792-0342

DATE: 04/22/96

PAGE: 5

PACE Project Number: 705444

Client Project ID: Port of Oakland

PACE Sample No: 70569710  
 Client Sample ID: MW-4

Date Collected: 04/04/96  
 Date Received: 04/08/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	1100	ug/L	50	04/10/96	CA LUFT	AMH		
Benzene	320	ug/L	0.5	04/10/96	CA LUFT	AMH	71-43-2	
Toluene	1.6	ug/L	0.5	04/10/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	1.1	ug/L	0.5	04/10/96	CA LUFT	AMH	100-41-4	
Xylene (Total)	1.2	ug/L	1	04/10/96	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	99	%		04/10/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	98	%		04/10/96	CA LUFT	AMH	460-00-4	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	0.18	mg/L	0.05	04/16/96	TPH by EPA 8015M	DLL		1
Motor Oil	0.3	mg/L	0.25	04/16/96	TPH by EPA 8015M	DLL		
JP4	ND	mg/L	0.5	04/16/96	TPH by EPA 8015M	DLL	.....	
n-Pentacosane (S)	39	%		04/16/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				04/11/96				

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Petaluma, CA 94954

Tel: 707-792-1865  
Fax: 707-792-0342

DATE: 04/22/96  
PAGE: 8

PACE Project Number: 705444  
Client Project ID: Port of Oakland

---

## PARAMETER FOOTNOTES

ND Not Detected  
NC Not Calculable  
PRL PACE Reporting Limit  
(S) Surrogate  
(1) Hydrocarbons present do not match profile of laboratory standard.

## REPORT OF LABORATORY ANALYSIS

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Petaluma, CA 94954

Tel: 707-792-1865

Fax: 707-792-0342

DATE: 04/22/96

PAGE: 7

PACE Project Number: 705444

Client Project ID: Port of Oakland

PACE Sample No: 70569736  
Client Sample ID: QC-2

Date Collected: 04/04/96  
Date Received: 04/08/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	04/11/96	CA LUFT	AMH		
Benzene	ND	ug/L	0.5	04/11/96	CA LUFT	AMH	71-43-2	
Toluene	ND	ug/L	0.5	04/11/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	ND	ug/L	0.5	04/11/96	CA LUFT	AMH	100-41-4	
Xylene (Total)	ND	ug/L	1	04/11/96	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	86	%		04/11/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	91	%		04/11/96	CA LUFT	AMH	460-00-4	

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QUALITY CONTROL DATA

DATE: 04/22/96  
 PAGE: 10

PACE Project Number: 705444  
 Client Project ID: Port of Oakland

METHOD BLANK: 70572771  
 Associated PACE Samples:

Parameter	Units	70569686	70569728 Method Blank Result	70569736 PRL	Footnotes
4-Bromofluorobenzene (S)	%		95		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70569926 70569934

Parameter	Units	70569678	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Benzene	ug/L	ND	100	98	98	100	100	2	
Toluene	ug/L	ND	100	94	94	95	95	1	
Ethylbenzene	ug/L	ND	100	94	94	95	95	1	
Xylene (Total)	ug/L	ND	300	290	95	290	96	1	
a,a,a-Trifluorotoluene (S)					87		85		
4-Bromofluorobenzene (S)					103		103		

LABORATORY CONTROL SAMPLE & LCSD: 70569942 70569959

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Benzene	ug/L	100	98	98	99	99	1	
Toluene	ug/L	100	94	94	95	95	1	
Ethylbenzene	ug/L	100	96	96	96	96	0	
Xylene (Total)	ug/L	300	290	96	290	97	1	
a,a,a-Trifluorotoluene (S)				90		87		
4-Bromofluorobenzene (S)				105		103		

## REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

DATE: 04/22/96  
 PAGE: 9

Alisto Engineering  
 1575 Treat Blvd.  
 Suite 201  
 Walnut Creek, CA 94598

PACE Project Number: 705444  
 Client Project ID: Port of Oakland

Attn: Mr. Dale Swain  
 Phone: (510)295-1650

QC Batch ID: 13794  
 Analysis Method: CA LUFT  
 Associated PACE Samples: 70569678 70569728 70569686 70569736 70569694 70569702 70569710

Date of Batch: 04/09/96

METHOD BLANK: 70569918  
 Associated PACE Samples:

Parameter	Units	70569678	70569694 Method Blank Result	70569702 PRL	70569710 Footnotes
Gasoline	ug/L		ND	50	
Benzene	ug/L		ND	0.5	
Toluene	ug/L		ND	0.5	
Ethylbenzene	ug/L		ND	0.5	
Xylene (Total)	ug/L		ND	1	
a,a,a-Trifluorotoluene (S)	%		90		
4-Bromofluorobenzene (S)	%		98		

METHOD BLANK: 70572771  
 Associated PACE Samples:

Parameter	Units	70569686	70569728 Method Blank Result	70569736 PRL	Footnotes
Gasoline	ug/L		ND	50	
Benzene	ug/L		ND	0.5	
Toluene	ug/L		ND	0.5	
Ethylbenzene	ug/L		ND	0.5	
Xylene (Total)	ug/L		ND	1	
a,a,a-Trifluorotoluene (S)	%		86		

## REPORT OF LABORATORY ANALYSIS

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DATE: 04/22/96  
PAGE: 12

PACE Project Number: 705444  
Client Project ID: Port of Oakland

## QUALITY CONTROL DATA PARAMETER FOOTNOTES

The Quality Control Sample Final Results listed above have been rounded to reflect an appropriate number of significant figures. Consistent with EPA guidelines unrounded concentrations have been used to calculate % Rec and RPD values.

ND	Not Detected
NC	Not Calculable
PRL	PACE Reporting Limit
RPD	Relative Percent Difference
(S)	Surrogate

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## QUALITY CONTROL DATA

DATE: 04/22/96

PAGE: 11

Alisto Engineering  
 1575 Treat Blvd.  
 Suite 201  
 Walnut Creek, CA 94598

PACE Project Number: 705444  
 Client Project ID: Port of Oakland

Attn: Mr. Dale Swain  
 Phone: (510)295-1650

QC Batch ID: 13858      QC Batch Method: EPA 3520      Date of Batch: 04/11/96  
 Analysis Method: TPH by EPA 8015M      Analysis Description: TPH in Water by 8015 Modified  
 Associated PACE Samples:      70569678      70569686      70569694      70569702      70569710

METHOD BLANK: 70573225  
 Associated PACE Samples:

	70569678	70569686	70569694	70569702	70569710
		Method Blank			
Parameter	Units	Result	PRL	Footnotes	
Diesel Fuel	mg/L	ND	0.05		
Motor Oil	mg/L	ND	0.25		
JP4	mg/L	ND	0.5		
n-Pentacosane (S)	%	78			

LABORATORY CONTROL SAMPLE & LCSD: 70573233

Parameter	Units	70573241		70573241		70573241		Footnotes
		Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	
Diesel Fuel	mg/L	1	0.85	85	0.87	87	2	
n-Pentacosane (S)				76		79		

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### Instructions for completing Chain of Custody (COC)

1. Complete all Client Information at top of sheet: name, address, phone, contact (person to whom report will be sent and contact can be made if questions arise), billing information if different from client, PO#, Project Name and/or Project Number as it will appear on the report.
2. Pace Client No., Project Manager and Project No. will be completed by Pace.
3. A separate COC must be filled out for each day of sample collection.
4. Sampler should print their name in the space provided and sign their name followed by the date of the sampling event.
5. Complete Sample Description as it will appear on the laboratory report: include time of sampling, sample matrix, no. of containers and container types.
6. Analysis Requested: Complete analysis on the lines provided and place a check in the column for the samples requiring the analysis. It may be necessary to use the space provided for additional comments or include attachments for extended lists of parameters.
7. Indicate method of shipment used for return of samples and date sent.
8. Submission of samples to laboratory: Indicate Item Number of those samples being transferred; sign relinquished by, and include your affiliation.

**\* IMPORTANT NOTE:**

Standard Turnaround Time is 3-4 weeks. If this does not satisfy your requirements, arrangements must be made prior to samples being submitted to the laboratory. Contact your project manager.

Special Project Requirements such as Low Level Detection Limits or level of QC reported must be indicated on the chain of custody. (Use Additional Comments Section.)

# Pace Analytical

(707) 792-7525

336575

## CHAIN-OF-CUSTODY RECORD Analytical Request

Client Port of Oakland 201867

Report To: Brady Nagle

Pace Client No. \_\_\_\_\_

Address 530 Water Street  
Oakland Ca

Bill To: Port of Oakland

Pace Project Manager DAP

Phone \_\_\_\_\_

P.O. # / Billing Reference 201867

Pace Project No. 705444

Sampled By (PRINT):

Project Name / No. 10-270-4-1

\*Requested Due Date: \_\_\_\_\_

Sampler Signature David Cusack

Date Sampled 4/14/96

Sampler Signature

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.
----------	--------------------	------	--------	----------

NO. OF CONTAINERS

PRESERVATIVES

ANALYSES REQUEST

UNPRESERVED

H<sub>2</sub>SO<sub>4</sub>

HNO<sub>3</sub>

VOA

TPH 0.5 (137X)  
TPH 1.0 (137X)  
TPH - 1.0 (137X)  
C.C. - 1.0 (137X)  
C.C. - 1.0 (137X)

REMARKS

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	VOA	ANALYSES REQUEST	REMARKS
1	mw-2	1412	H <sub>2</sub> O	5696786	5	X		X	X X X	liters have no preservative
2	mw-7	1440		686	5					
3	mw-5	1502		694	5					
4	mw-6	1530		702	5					
5	mw-4	1600		710	5					
6	QC-1	-		728	3					
7	QC-2	-		736	2					
8										

COOLER NOS.

BAILERS

SHIPMENT METHOD

OUT DATE

RETURNED DATE

ITEM NUMBER

RELINQUISHED BY / AFFILIATION

ACCEPTED BY / AFFILIATION

DATE

TIME

Additional Comments

mail analytical report  
to Brady Nagle - Project Manager  
at Alisto Engineering Group  
1575 Treat Blvd # 201  
Walnut Creek CA 94598

David Cusack add 2:35  
Paul Herrmann 4/8 2:35  
Paul Herrmann 4/8 4:10

ORIGINAL

SEE REVERSE SIDE FOR INSTRUCTIONS