PORT OF OAKLAND

July 31, 1996

Mr. Dale Klettke
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, CA 94502

SUBJECT: STID ~~#3777~~ 2485 - GROUNDWATER SAMPLING REPORT, AMERICAN PRESIDENT LINES TERMINAL, 1395 MIDDLE HARBOR ROAD, OAKLAND, CALIFORNIA 1579

Dear Mr. Klettke:

Enclosed please find the report titled, Groundwater Monitoring And Sampling Report, American President Lines (APL) Terminal, Berths 60-63, Port of Oakland, 1395 Middle Harbor Road, Oakland, California, dated July 24, 1996. This report addresses the second quarter 1996 monitoring and sampling of three monitoring wells. These wells were constructed in the vicinity of four former underground storage tanks designated by the Port as EF-06, EF-07, EF-08, and EF-09.

If you have any questions regarding the report or need additional information, please contact the undersigned at 272-1373.

Sincerely,

John Prall, R.G.
Associate Environmental Scientist

Enclosure

cc: Neil Werner

ENVIRONMENTAL PROTECTION
96 AUG -2 PM 2:34

530 Water Street ■ Jack London's Waterfront ■ P.O. Box 2064 ■ Oakland, California 94604-2064
Telephone (510) 272-1100 ■ Fax (510) 272-1172 ■ TDD (510) 763-5703 ■ Cable address, PORTOFOAK, Oakland

INNOVATIVE TECHNICAL SOLUTIONS, Inc.

ITSI

July 24, 1996

Project No.: 95-113.07

Mr. John Prall, R.G.
Associate Environmental Scientist
Port of Oakland
530 Water Street
Oakland, California 94607

Groundwater Monitoring and Sampling Report
American President Lines (APL) Terminal, Berths 60-63, Port of Oakland
1395 Middle Harbor Road
Oakland, California
(Work Order No. 201476)

Dear Mr. Prall:

This Groundwater Monitoring and Sampling Report (Report) has been prepared by Innovative Technical Solutions, Inc. (ITSI), on behalf of the Port of Oakland, for the second quarter 1996 groundwater monitoring and sampling performed on June 18, 1996, at the American President Lines (APL) Terminal, Berths 60-63, located at 1395 Middle Harbor Road in Oakland, California. A site location map is shown on Figure 1.

The scope of work included monitoring and sampling of three groundwater monitoring wells, MW-1, MW-2 and MW-3, installed in January 1993. The wells were installed in the vicinity of four former underground storage tanks: a 10,000-gallon diesel tank (EF-06), a 5,000-gallon diesel tank (EF-07), a 1,000-gallon gasoline tank (EF-08), and a 550-gallon waste oil tank (EF-09).

SAMPLING OF MONITORING WELLS

The groundwater monitoring and sampling was performed on June 18, 1996. The monitoring wells were initially gauged for depth to water and checked for the presence of separate phase hydrocarbons. No sparate phase hydrocarbons were observed in the monitoring wells. Depth to water measurements were recorded on Monitoring Well Purge and Sample Forms. Copies of the Monitoring Well Purge and Sample Forms are provided in Attachment A.

1330 Broadway, Suite 1625, Oakland, CA 94612 (510) 286-8888 (510) 286-8889 Fax

After depth to water measurements were recorded, the monitoring wells were purged using clean disposable bailers. Approximately three casing volumes of water were removed, or until pH, conductivity, and temperature readings stabilized indicating formation water has entered the monitoring well. Field parameters were recorded on the Monitoring Well Purge and Sample Forms.

Groundwater samples from each monitoring well were collected using the disposable bailer and transferred into laboratory provided containers. Samples were properly labeled with the sample number, date and time of collection, and samplers initials, and were placed on ice in an insulated cooler. Purge water was stored in properly labeled drums onsite.

GROUNDWATER LEVELS IN MONITORING WELLS

Depth to water results are summarized in Table 1. Groundwater elevations were calculated using the measured depth to water and survey elevations of top of casing[1], and are provided in Table 1. This survey used the Port of Oakland datum, which is 3.2 feet below mean sea level.

Figure 2 shows the elevation contours and groundwater flow direction for the site. The calculated groundwater flow direction is generally to the southeast at a groundwater gradient of approximately 0.003 ft/ft.

LABORATORY ANALYSIS OF GROUNDWATER SAMPLES

The samples were then sent under chain-of-custody procedures to Pace Analytical in Petaluma, California, the current Port of Oakland contract laboratory. The samples were analyzed according to the following schedule:

Monitoring Well ID	Analyses					
	TPHg[(1)]	BTEX[(2)]	TPHd[(3)]	TPHmo[(4)]	HVOCs[(5)]	TDS[(6)]
MW-1	x	x	x	x	x	x
MW-2			x	x	x	x
MW-3			x	x	x	x

[(1)]TPH as gasoline by Modified EPA Method 8015
[(2)]Benzene, toluene, ethylbenzene, and xylenes by EPA Method 602
[(3)]TPH as diesel by Modified EPA Method 8015
[(4)]TPH as motor oil by Modified EPA Method 8015
[(5)]Halogenated volatile organic compounds by EPA Method 8010
[(6)]Total dissolved solids by EPA Method 160.1

[1] Top of Casing elevations obtained from Table 1, Summary of Groundwater Monitoring and Petroleum Hydrocarbons in Groundwater, Port of Oakland, American President Lines Terminal, dated November 3, 1995, by Alisto Engineering Group.

The laboratory results for the groundwater samples are summarized in Table 2, and shown in Figure 3. Copies of the laboratory results and chain-of-custodies are provided in Attachment B.

FINDINGS

Results of the June 18, 1996 groundwater monitoring and sampling are summarized below:

- TPHg was reported at a concentration of 68 µg/l in MW-1.
- Benzene was reported at a concentration of 5.8 µg/l in MW-1.
- TPHd was reported at a concentration of 350 µg/l in MW-1, and reportedly ranged from 110 to 340 µg/l in the other two monitoring wells.
- TPHmo was reported at a concentration of 750 µg/l in MW-1, and reportedly ranged from 330 to 560 µg/l in the other two monitoring wells.
- Low levels of HVOCs were reported in MW-1. No HVOCs were reported in MW-2 and MW-3.

Please give us a call if you have any questions or comments.

Sincerely,

Jeffrey D. Hess, R.G.
Project Director

Attachments

REGISTERED GEOLOGIST
JEFFREY D. HESS
No. 4776
Exp. 4/97
STATE OF CALIFORNIA

TABLE 1

GROUNDWATER ELEVATIONS
AMERICAN PRESIDENT LINES (APL) TERMINAL, BERTHS 60-63, PORT OF OAKLAND
1395 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA

Monitoring Well ID	Elevation of Top of Casing (feet)	Date of Monitoring	Measured Depth to Water (feet)	Groundwater Elevation (feet)	Note
MW-1	10.37	3/8/93	3.30	7.07	1
		5/11/93	3.29	7.06	1
		8/19/93	4.10	6.27	1
		11/24/93	4.48	5.89	1
		2/24/94	3.51	6.86	1
		6/14/94	3.54	6.83	1
		8/23/94	3.32	7.05	1
		11/4/94	3.52	6.85	1
		3/7/95	3.04	7.33	1
		9/25/95	3.87	6.50	1
		3/28/96	2.35	8.02	
		6/18/96	3.47	6.90	
MW-2	10.03	3/8/93	3.45	6.58	1
		5/11/93	3.24	6.79	1
		8/19/93	3.73	6.30	1
		11/24/93	4.01	6.02	1
		2/24/94	3.49	6.54	1
		6/14/94	3.69	6.34	1
		8/23/94	3.51	6.52	1
		11/4/94	3.65	6.38	1
		3/7/95	3.01	7.02	1
		9/25/95	3.48	6.55	1
		3/28/96	2.35	7.68	
		6/18/96	3.28	6.75	
MW-3	9.84	3/8/93	3.08	6.76	1
		5/11/93	2.89	6.95	1
		8/19/93	3.50	6.34	1
		11/24/93	3.79	6.05	1
		2/24/94	3.08	6.76	1
		6/14/94	3.41	6.43	1
		8/23/94	3.22	6.62	1
		11/4/94	3.51	6.33	1
		3/7/95	2.69	7.15	1
		9/25/95	3.19	6.65	1
		3/28/96	3.17	6.67	
		6/18/96	3.22	6.62	

1 Data from Table 1, Summary of Groundwater Monitoring and Petroleum Hydrocarbons in Groundwater, Port of Oakland, American President Lines Terminal, dated November 3, 1995, by Alisto Engineering Group.

TABLE 2

SUMMARY OF LABORATORY RESULTS FOR PETROLEUM HYDROCARBONS
AMERICAN PRESIDENT LINES (APL) TERMINAL, BERTHS 60-63, PORT OF OAKLAND
1395 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	TPHg (µg/l)	B (µg/l)	T (µg/l)	E (µg/l)	X (µg/l)	TPHd (µg/l)	TPHmo (µg/l)	TOG (µg/l)	TDS (mg/l)	Note
MW-1	2/5/93	1,800	9.2	1.6	8.9	2.7	4,700	-	5,000	3,000	1
	5/11/93	260	3.2	2.3	0.7	0.5	4,800	-	7,000	-	1
	8/19/93	60	9.0	ND	ND	ND	2,300	-	ND	-	1
	11/24/93	50	8.8	1.5	ND	3.0	280	-	ND	-	1
	2/24/94	360	12	ND	2	ND	2,000	-	-	-	1
	6/14/94	ND	9.4	ND	ND	0.7	ND	-	ND	-	1
	8/23/94	80	13	2.4	ND	9.0	3,000	-	ND	-	1
	11/4/94	ND	15	2.4	ND	11.2	1,600	-	ND	-	1
	3/7/95	<50	1.3	0.4	<0.3	<0.4	420	7,200	<5,000	9,000	1
	3/7/95	<50	0.9	0.3	<0.3	<0.4	-	-	-	-	1
	9/25/95	310	12	8.0	<0.3	22.5	<500	1,300	-	2,200	1
	3/28/96	430	6.6	2.4	12	8.5	710	820	-	453	
	6/18/96	68	5.8	1.3	<0.5	<1	350	750	-	953	
QC-1	6/18/96	<50	4.3	0.53	<0.5	<1	-	-	-	-	
MW-2	2/5/93	ND	ND	ND	ND	ND	840	-	2,000	23,000	1
	5/11/93	ND	ND	ND	ND	ND	3,700	-	ND	-	1
	8/19/93	ND	ND	ND	ND	ND	620	-	ND	-	1
	11/24/93	ND	ND	ND	ND	ND	80	-	ND	-	1
	2/24/94	ND	ND	ND	ND	ND	ND	-	-	-	1
	6/14/94	-	-	-	-	-	ND	-	ND	-	1
	8/23/94	-	-	-	-	-	620	-	ND	-	1
	11/4/94	-	-	-	-	-	1,400	-	ND	-	1
	3/7/95	<50	<0.4	<0.3	<0.3	<0.4	310	7,100	<5,000	20,000	1
	9/25/95	-	-	-	-	-	<300	880	-	11,000	1
	3/28/96	-	-	-	-	-	280	380	-	1,190	
	6/18/96	-	-	-	-	-	110	330	-	18,800	

1 Data from Table 1, Summary of Groundwater Monitoring and Petroleum Hydrocarbons in Groundwater, Port of Oakland, American President Lines Terminal, dated November 3, 1995, by Alisto Engineering Group.

TABLE 2 (continued)

SUMMARY OF LABORATORY RESULTS FOR PETROLEUM HYDROCARBONS
AMERICAN PRESIDENT LINES (APL) TERMINAL, BERTHS 60-63, PORT OF OAKLAND
1395 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	TPHg (µg/l)	B (µg/l)	T (µg/l)	E (µg/l)	X (µg/l)	TPHd (µg/l)	TPHmo (µg/l)	TOG (µg/l)	TDS (mg/l)	Note
MW-3	2/5/93	ND	2.1	0.9	1.7	3.1	3,400	-	2,000	1,600	1
	3/8/93	-	-	-	-	-	-	-	-	-	1
	5/11/93	ND	ND	ND	ND	ND	3,300	-	ND	-	1
	8/19/93	ND	ND	ND	ND	ND	840	-	ND	-	1
	11/24/93	ND	ND	ND	ND	ND	100	-	ND	-	1
	2/24/94	ND	ND	ND	ND	ND	890	-	-	-	1
	6/14/94	-	ND	ND	ND	ND	440	-	ND	-	1
	8/23/94	-	ND	ND	ND	ND	ND	-	ND	-	1
	11/4/94	-	ND	ND	ND	ND	630	-	ND	-	1
	3/7/95	<50	1.4	<0.3	<0.3	<0.4	330	3,200	<5,000	12,000	1
	9/25/95	-	-	-	-	-	200	1,300	-	19,000	1
	3/28/96	-	-	-	-	-	200	300	-	7,600	
	6/18/96	-	-	-	-	-	340	560	-	20,600	

1 Data from Table 1, Summary of Groundwater Monitoring and Petroleum Hydrocarbons in Groundwater, Port of Oakland, American President Lines Terminal, dated November 3, 1995, by Alisto Engineering Group.

TABLE 3

SUMMARY OF LABORATORY RESULTS FOR HALOGENATED VOLATILE ORGANIC COMPOUNDS
AMERICAN PRESIDENT LINES (APL) TERMINAL, BERTHS 60-63, PORT OF OAKLAND
1395 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	BDM (µg/l)	Chloroform (µg/l)	1,1-DCA (µg/l)	1,2-DCA (µg/l)	1,1-DCE (µg/l)	1,2-DCE (µg/l)	cis 1,2-DCE (µg/l)	1,2-DCB (µg/l)	1,4-DCB (µg/l)	VC (µg/l)	Note
MW-1	2/5/93	ND	ND	0.8	ND	ND	ND	ND	ND	ND	ND	1
	5/11/93	ND	ND	0.6	ND	ND	ND	ND	ND	ND	ND	1
	8/19/93	ND	ND	2.0	ND	2.0	ND	ND	ND	ND	ND	1
	11/24/93	ND	ND	0.7	ND	ND	ND	ND	ND	ND	ND	1
	2/24/94	ND	ND	2.0	ND	ND	ND	ND	ND	ND	ND	1
	6/14/94	ND	ND	1.0	ND	ND	ND	ND	ND	ND	ND	1
	8/23/94	ND	ND	2.3	0.3	ND	0.4	ND	ND	ND	1.1	1
	11/4/94	ND	ND	2.2	0.8	ND	ND	ND	ND	ND	0.7	1
	3/7/95	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	1
	9/25/95	ND	ND	1.7	ND	ND	ND	0.6	ND	ND	1.8	1
	3/28/96	ND	ND	1.2	ND	ND	ND	ND	ND	ND	4	
	6/18/96	ND	ND	1.2	ND	ND	ND	ND	ND	ND	2.6	
QC-1	6/18/96	ND	ND	1.2	ND	ND	ND	ND	ND	ND	2.6	
MW-2	2/5/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	5/11/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	8/19/93	ND	ND	ND	ND	ND	ND	ND	1.0	3.0	ND	1
	11/24/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	2/24/94	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ND	1
	6/14/94	ND	ND	ND	ND	ND	ND	ND	ND	0.8	ND	1
	8/23/94	ND	ND	ND	ND	ND	0.4	ND	ND	1.3	ND	1
	11/4/94	ND	ND	ND	ND	ND	2.2	ND	ND	0.9	ND	1
	3/7/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	9/25/95	ND	ND	ND	ND	ND	ND	0.4	ND	ND	ND	1
	3/28/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	6/18/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

1 Data from Table 2, Summary of Halogenated Volatile Organic Compounds in Groundwater, Port of Oakland, American President Lines Terminal, dated November 3, 1995, by Alisto Engineering Group.

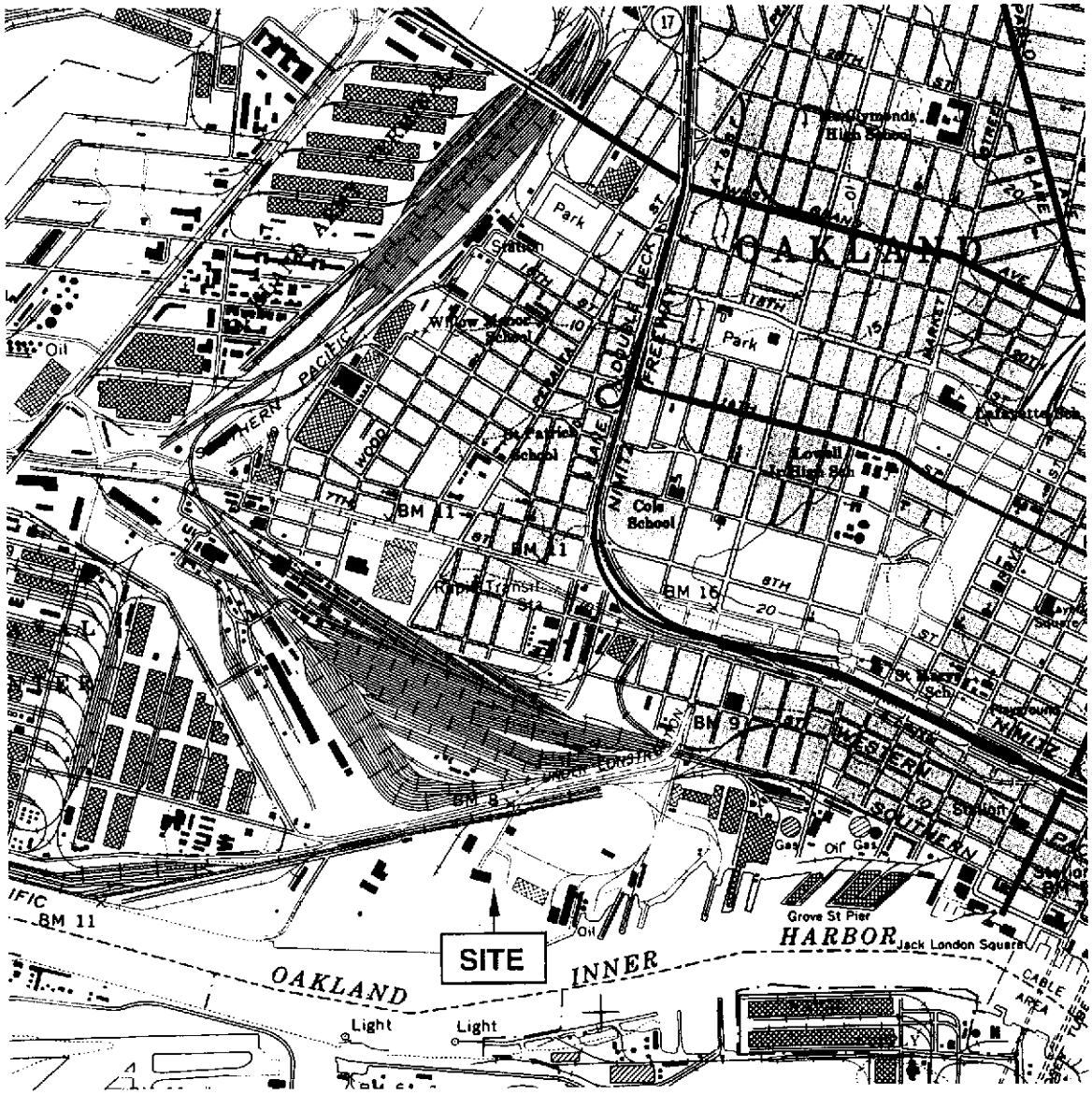
TABLE 3 (continued)

SUMMARY OF LABORATORY RESULTS FOR HALOGENATED VOLATILE ORGANIC COMPOUNDS
AMERICAN PRESIDENT LINES (APL) TERMINAL, BERTHS 60-63, PORT OF OAKLAND
1395 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	BDM (µg/l)	Chloroform (µg/l)	1,1-DCA (µg/l)	1,2-DCA (µg/l)	1,1-DCE (µg/l)	1,2-DCE (µg/l)	cis 1,2-DCE (µg/l)	1,2-DCB (µg/l)	1,4-DCB (µg/l)	VC (µg/l)	Note
MW-3	2/5/93	ND	ND	ND	ND	ND	ND	0.4	ND	ND	ND	1
	5/11/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	8/19/93	ND	ND	ND	ND	ND	ND	ND	ND	1.0	ND	1
	11/24/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	2/24/94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	6/14/94	ND	ND	ND	ND	ND	ND	ND	ND	0.6	ND	1
	8/23/94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	11/4/94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	3/7/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	9/25/95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1
	3/28/96	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	
	6/18/96	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

1 Data from Table 2, Summary of Halogenated Volatile Organic Compounds in Groundwater, Port of Oakland, American President Lines Terminal, dated November 3, 1995, by Alisto Engineering Group.

95-113.07/F.1-SitLoc



0 1,000 Feet 2,000 Feet

Approximate Scale

Source: Oakland West 7.5-minute U.S.G.S. Quadrangle, dated 1959, and photorevised in 1980.

FIGURE 1

SITE LOCATION

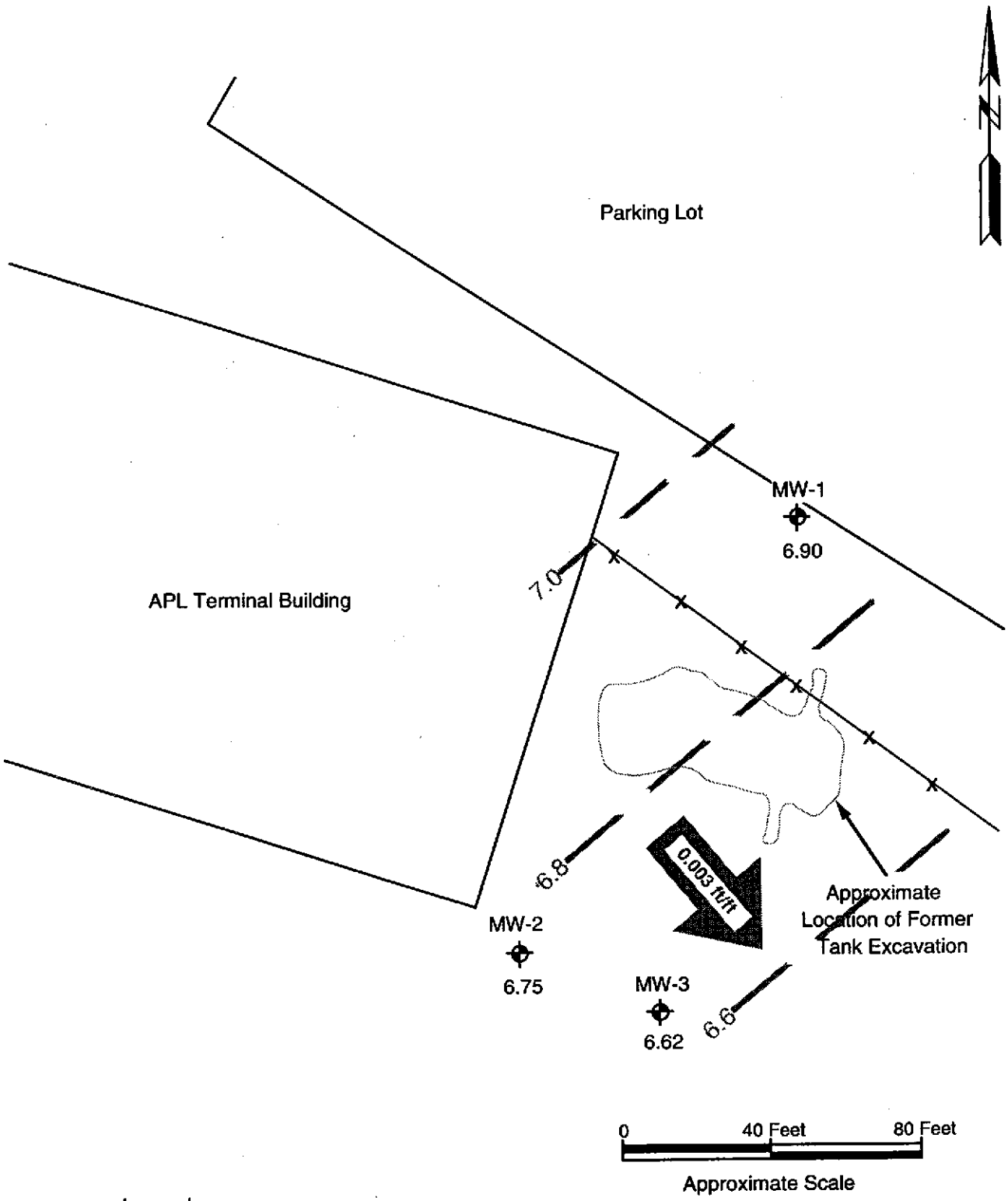
American Presidents Line Terminal, Berths 60-63
1395 Middle Harbor Road

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

95-113.07/F.2-GWElev



Legend

- Monitoring Well
- 6.75 Groundwater Elevation on 6/18/96
- Groundwater Elevation Contour Lines
- Groundwater Flow Direction and Gradient

Source: Adapted from Figure 3, Concentrations of Petroleum Hydrocarbons in Groundwater, September 25, 1995, Alisto Engineering Group.

FIGURE 2

GROUNDWATER ELEVATIONS AND FLOW DIRECTION FOR JUNE 18, 1996

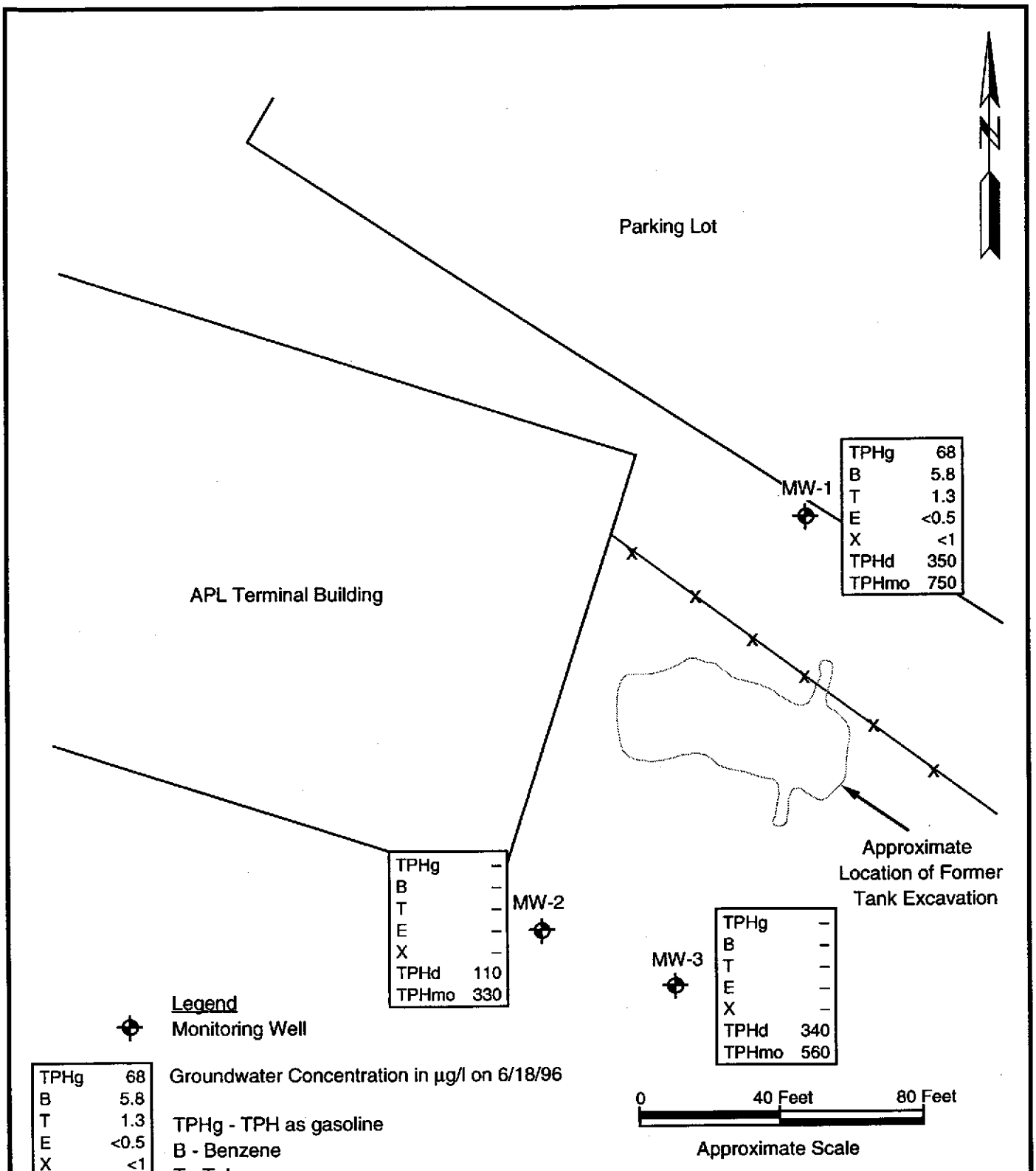
American President Lines Terminal, Berths 60-63
1395 Middle Harbor Road

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

95-113.07/F.3-Conc



Source: Adapted from Figure 3, Concentrations of Petroleum Hydrocarbons in Groundwater, September 25, 1995, Alisto Engineering Group.

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER ON JUNE 18, 1996

American President Lines Terminal, Berths 60-63
1395 Middle Harbor Road

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

ATTACHMENT A

COPY OF MONITORING WELL PURGE AND SAMPLE FORMS

MONITORING WELL
PURGE AND SAMPLE FORM

PROJECT NAME: Port of Oakland - A.P.L. PROJECT NO.: 75-113.07

WELL NO.: MW2 TESTED BY: J. Schollard DATE: 6/18/96

Measuring Point Description: N. side, Top of Casing Static Water Level (ft.): 3.28'

Total Well Depth (ft.): 9.46' Sample Method: 2" disposable teflon bailer

Water Level Measurement Method: Solinst DTW Probe Time Sampled: 1730

Purge Method: 2" disposable teflon bailer Sample Depth (ft.): ~3.5'

Time Start Purge: 1712 Field Filtering: N.A.

Time End Purge: 1724 Field Preservation: H_2O ice

Comments: well box lid shattered → not usable

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in) 2	4	6	=	Casing Volume (gal)
	9.46	-	3.28	=	6.18	x	0.16	0.64	1.44	3 vols	0.98 = 2.97

Time	1715	1720	1724				
Volume Purged (gals)	1.0	1.0	1.0				
Cumulative Volume Purged (gals)	1.0	2.0	3.0				
Cumulative Number of Casing Volumes	1.02	2.04	3.06				
Purge Rate (gpm)	0.33	0.20	0.25				
Temperature (F°) or (C°)	77.3	78.0	77.5				
pH	6.58	6.95	6.83				
Specific Conductivity (µmhos/cm) x1000	12.69	out of scale →					
Dissolved Oxygen (mg/L)	→	NA	→				
Turbidity/Color (NTU)	yellow	→	olive				
Odor	None	→	→				
Dewatered?	No	→	→				

J. Schollard 1/23/96

CHECKED BY: _____ DATE: _____

ITSI

MONITORING WELL
PURGE AND SAMPLE FORM

PROJECT NAME: Port of Oakland - A.P.L. PROJECT NO.: 95-113.07

WELL NO.: MW3 TESTED BY: S. Schollard DATE: 6/18/96

Measuring Point Description: N. Side, top of casing Static Water Level (ft.): 3.22'

Total Well Depth (ft.): 9.39' Sample Method: 2" disposable bailer

Water Level Measurement Method: Solinst OTW Probe Time Sampled: 1815

Purge Method: 2" disposable bailer Sample Depth (ft.): ~3.5'

Time Start Purge: 1802 Field Filtering: N.A.

Time End Purge: 1811 Field Preservation: H_2O Ice

Comments: Well box lid shattered → not usable

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in)			=	Casing Volume (gal)
							2	4	6		
	9.39		3.22		6.17		0.16	0.64	1.44		0.99 3 vols. = 2.97

Time	1804	1807	1811				
Volume Purged (gals)	1.0	1.0	1.0				
Cumulative Volume Purged (gals)	1.0	2.0	3.0				
Cumulative Number of Casing Volumes	1.01	2.02	3.03				
Purge Rate (gpm)	0.5	0.33	0.25				
Temperature (F°) or (C°)	71.8	72.1	71.4				
pH	7.16	~~6.55~~ 7.17	7.14				
Specific Conductivity (µmhos/cm)	Out of Scale →						
Dissolved Oxygen (mg/L)	NA →						
Turbidity/Color (NTU)	Silty + olive →		Dark olive/silty				
Odor	None →						
Dewatered?	No →						

Jon Schollard ITSI

CHECKED BY: _____ DATE: _____

ITSI

MONITORING WELL
PURGE AND SAMPLE FORM

PROJECT NAME: Port of Oakland - A.P.L PROJECT NO.: 95-113.07

WELL NO.: MW-1 TESTED BY: J. Schollard DATE: 6/18/96

Measuring Point Description: N. side, top of casing Static Water Level (ft.): 3.47'

Total Well Depth (ft.): 9.47' Sample Method: 2" disposable teflon bailer

Water Level Measurement Method: Solinst DTW probe Time Sampled: 1935 (QC-1 1940)

Purge Method: 2" disposable teflon bailer Sample Depth (ft.): ~3.5'

Time Start Purge: 1919 Field Filtering: N.A.

Time End Purge: 1929 Field Preservation: H_2O Ice

Comments: Well box lid cracked, ~1/3 of lid is missing. Produced 4 well volumes because conductivity readings exceeded 10% stabilization criteria.

Well Volume Calculation (fill in before purging)	Total Depth (ft)	-	Depth to Water (ft)	=	Water Column (ft)	x	Multiplier for Casing Diameter (in) 2	4	6	=	Casing Volume (gal)
	9.47	-	3.47	=	6.0	x	0.16	0.64	1.44	=	0.96 3 vols. = 2.88

Time	1922	1924	1927	1929			
Volume Purged (gals)	1.0	1.0	1.0	1.0			
Cumulative Volume Purged (gals)	1.0	2.0	3.0	4.0*			
Cumulative Number of Casing Volumes	1.04	2.08	3.12	4.16			
Purge Rate (gpm)	0.33	0.50	0.33	0.50			
Temperature (F°) or (C°)	71.9	71.8	71.2	71.2			
pH	6.76	6.75	6.70	6.68			
Specific Conductivity (µmhos/cm) x1000	6.39	4.37	8.50	4.18			
Dissolved Oxygen (mg/L)	NA	→	→	→			
Turbidity/Color (NTU)	Yellow	Yellow	→	→			
Odor	None	Slight petrol. odor	→	→			
Dewatered?	No	No	→	→			

J. Schollard ITSI

CHECKED BY: _____ DATE: _____

ITSI

ATTACHMENT B

COPY OF LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORM FOR GROUNDWATER SAMPLES

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

July 02, 1996

Mr. Jeff Hess
Innovative Technical Solutions
2855 Mitchell Drive, Suite 118
Walnut Creek, CA 94598

RE: PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

Dear Mr. Hess:

Enclosed are the results of analyses for sample(s) received on June 19, 1996.

Analysis of water samples for purgeable halogenated volatile organic compounds was performed according to USEPA Method 8010A (Test Methods for Evaluating Solid Waste--SW846, 3rd Ed., Revision 1, 1992).
QC batches 15252:
There were no recoveries of 2-chlorethyl vinyl ether in the MS/MSD analyses. This compound readily breaks down in the presence of HCl. The sample voas are preserved in HCl. The recoveries for 2-chlorethyl vinyl ether in the associated LCS/LCSD analyses were inside QC limits.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

David A. Pichette
Project Manager

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Pace Analytical

DATE: 07/01/96
PAGE: 1

Innovative Technical Solutions
2855 Mitchell Drive, Suite 118
Walnut Creek, CA 94598

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

Attn: Mr. Jeff Hess
Phone: 714-955-1390

PACE Sample No: 70638432
Client Sample ID: TRIP BLANK

Date Collected: 06/18/96
Date Received: 06/19/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
Volatile Halogenated Organics								
Chloromethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	74-87-3	
Bromomethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	74-83-9	
Vinyl Chloride	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-01-4	
Chloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-00-3	
Methylene Chloride	3	ug/L	0.5	06/24/96	EPA 8010	ads	75-09-2	
Trichlorofluoromethane	2.6	ug/L	0.5	06/24/96	EPA 8010	ads	75-69-4	
1,1-Dichloroethene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-35-4	
1,1-Dichloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-34-3	
trans-1,2-Dichloroethene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	156-60-5	
Chloroform	ND	ug/L	0.5	06/24/96	EPA 8010	ads	67-66-3	
1,2-Dichloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	107-06-2	
1,1,1-Trichloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	71-55-6	
Carbon Tetrachloride	ND	ug/L	0.5	06/24/96	EPA 8010	ads	56-23-5	
Bromodichloromethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-27-4	
1,2-Dichloropropane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	10061-01-5	
Trichloroethene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	79-01-6	
Dibromochloromethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	124-48-1	
1,1,2-Trichloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	79-00-5	
trans-1,3-Dichloropropene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	10061-02-6	
Bromoform	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-25-2	
Tetrachloroethene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	127-18-4	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	79-34-5	
Chlorobenzene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	108-90-7	
2-Chloroethyl Vinyl Ether	ND	ug/L	0.5	06/24/96	EPA 8010	ads	110-75-8	
1,2-Dichlorobenzene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	106-46-7	
Bromochloromethane (S)	119	%		06/24/96	EPA 8010	ads	74-97-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Pace Analytical

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

PACE Sample No: 70638432 Date Collected: 06/18/96
Client Sample ID: TRIP BLANK Date Received: 06/19/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
1,4-Dichlorobutane (S)	114	%		06/24/96	EPA 8010	ads	110-56-5	
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	06/20/96	CA LUFT	AMH		
Benzene	ND	ug/L	0.5	06/20/96	CA LUFT	AMH	71-43-2	
Toluene	ND	ug/L	0.5	06/20/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	ND	ug/L	0.5	06/20/96	CA LUFT	AMH	100-41-4	
Xylene (Total)	ND	ug/L	1	06/20/96	CA LUFT	AMH	1330-20-7	
Methyl-tert-butyl Ether	ND	ug/L	5	06/20/96	CA LUFT	AMH	1634-04-4	
a,a,a-Trifluorotoluene (S)	95	%		06/20/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	95	%		06/20/96	CA LUFT	AMH	460-00-4	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

PACE Sample No: 70638440 Date Collected: 06/18/96
Client Sample ID: MW2 Date Received: 06/19/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Wet Chemistry								
Total Dissolved Solids								
Total Dissolved Solids	18800	mg/L	5	06/24/96	EPA 160.1	LMD		
GC -- Volatiles								
Volatile Halogenated Organics								
Chloromethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	74-87-3	
Bromomethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	74-83-9	
Vinyl Chloride	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-01-4	
Chloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-00-3	
Methylene Chloride	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-09-2	
Trichlorofluoromethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-69-4	
1,1-Dichloroethene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-35-4	
1,1-Dichloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-34-3	
trans-1,2-Dichloroethene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	156-60-5	
Chloroform	ND	ug/L	0.5	06/24/96	EPA 8010	ads	67-66-3	
1,2-Dichloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	107-06-2	
1,1,1-Trichloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	71-55-6	
Carbon Tetrachloride	ND	ug/L	0.5	06/24/96	EPA 8010	ads	56-23-5	
Bromodichloromethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-27-4	
1,2-Dichloropropane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	10061-01-5	
Trichloroethene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	79-01-6	
Dibromochloromethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	124-48-1	
1,1,2-Trichloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	79-00-5	
trans-1,3-Dichloropropene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	10061-02-6	
Bromoform	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-25-2	
Tetrachloroethene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	127-18-4	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	79-34-5	
Chlorobenzene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	108-90-7	
2-Chloroethyl Vinyl Ether	ND	ug/L	0.5	06/24/96	EPA 8010	ads	110-75-8	
1,2-Dichlorobenzene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	106-46-7	
Bromochloromethane (S)	116	%		06/24/96	EPA 8010	ads	74-97-5	
1,4-Dichlorobutane (S)	116	%		06/24/96	EPA 8010	ads	110-56-5	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	0.11	mg/L	0.05	06/27/96	TPH by EPA 8015M	DLL		1
Motor Oil	0.33	mg/L	0.25	06/27/96	TPH by EPA 8015M	DLL		
n-Pentacosane (S)	43	%		06/27/96	TPH by EPA 8015M	DLL	629-99-2	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

PACE Sample No: 70638440 Date Collected: 06/18/96
Client Sample ID: MW2 Date Received: 06/19/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Date Extracted				06/21/96				

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Pace Analytical

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

PACE Sample No: 70638457 Date Collected: 06/18/96
Client Sample ID: MW3 Date Received: 06/19/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Wet Chemistry								
Total Dissolved Solids								
Total Dissolved Solids	20600	mg/L	5	06/24/96	EPA 160.1	LMD		
GC -- Volatiles								
Volatile Halogenated Organics								
Chloromethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	74-87-3	
Bromomethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	74-83-9	
Vinyl Chloride	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-01-4	
Chloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-00-3	
Methylene Chloride	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-09-2	
Trichlorofluoromethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-69-4	
1,1-Dichloroethene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-35-4	
1,1-Dichloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-34-3	
trans-1,2-Dichloroethene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	156-60-5	
Chloroform	ND	ug/L	0.5	06/24/96	EPA 8010	ads	67-66-3	
1,2-Dichloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	107-06-2	
1,1,1-Trichloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	71-55-6	
Carbon Tetrachloride	ND	ug/L	0.5	06/24/96	EPA 8010	ads	56-23-5	
Bromodichloromethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-27-4	
1,2-Dichloropropane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	10061-01-5	
Trichloroethene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	79-01-6	
Dibromochloromethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	124-48-1	
1,1,2-Trichloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	79-00-5	
trans-1,3-Dichloropropene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	10061-02-6	
Bromoform	ND	ug/L	0.5	06/24/96	EPA 8010	ads	75-25-2	
Tetrachloroethene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	127-18-4	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.5	06/24/96	EPA 8010	ads	79-34-5	
Chlorobenzene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	108-90-7	
2-Chloroethyl Vinyl Ether	ND	ug/L	0.5	06/24/96	EPA 8010	ads	110-75-8	
1,2-Dichlorobenzene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.5	06/24/96	EPA 8010	ads	106-46-7	
Bromochloromethane (S)	115	%		06/24/96	EPA 8010	ads	74-97-5	
1,4-Dichlorobutane (S)	114	%		06/24/96	EPA 8010	ads	110-56-5	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	0.34	mg/L	0.05	06/28/96	TPH by EPA 8015M	DLL		2
Motor Oil	0.56	mg/L	0.25	06/28/96	TPH by EPA 8015M	DLL		
n-Pentacosane (S)	97	%		06/28/96	TPH by EPA 8015M	DLL	629-99-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Pace Analytical

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

PACE Sample No: 70638457 Date Collected: 06/18/96
Client Sample ID: MW3 Date Received: 06/19/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Date Extracted				06/21/96				

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

PACE Sample No: 70638465 Date Collected: 06/18/96
Client Sample ID: MW1 Date Received: 06/19/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Wet Chemistry								
Total Dissolved Solids								
Total Dissolved Solids	953	mg/L	5	06/24/96	EPA 160.1	LMD		
GC -- Volatiles								
Volatile Halogenated Organics								
Chloromethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	74-87-3	
Bromomethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	74-83-9	
Vinyl Chloride	2.6	ug/L	0.5	06/25/96	EPA 8010	ads	75-01-4	
Chloroethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	75-00-3	
Methylene Chloride	ND	ug/L	0.5	06/25/96	EPA 8010	ads	75-09-2	
Trichlorofluoromethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	75-69-4	
1,1-Dichloroethene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	75-35-4	
1,1-Dichloroethane	1.2	ug/L	0.5	06/25/96	EPA 8010	ads	75-34-3	
trans-1,2-Dichloroethene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	156-60-5	
Chloroform	ND	ug/L	0.5	06/25/96	EPA 8010	ads	67-66-3	
1,2-Dichloroethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	107-06-2	
1,1,1-Trichloroethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	71-55-6	
Carbon Tetrachloride	ND	ug/L	0.5	06/25/96	EPA 8010	ads	56-23-5	
Bromodichloromethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	75-27-4	
1,2-Dichloropropane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	10061-01-5	
Trichloroethene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	79-01-6	
Dibromochloromethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	124-48-1	
1,1,2-Trichloroethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	79-00-5	
trans-1,3-Dichloropropene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	10061-02-6	
Bromoform	ND	ug/L	0.5	06/25/96	EPA 8010	ads	75-25-2	
Tetrachloroethene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	127-18-4	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	79-34-5	
Chlorobenzene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	108-90-7	
2-Chloroethyl Vinyl Ether	ND	ug/L	0.5	06/25/96	EPA 8010	ads	110-75-8	
1,2-Dichlorobenzene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	106-46-7	
Bromochloromethane (S)	112	%		06/25/96	EPA 8010	ads	74-97-5	
1,4-Dichlorobutane (S)	104	%		06/25/96	EPA 8010	ads	110-56-5	
GAS/BTEX by CA LUFT, Water								
Gasoline	68	ug/L	50	06/20/96	CA LUFT	AMH		
Benzene	5.8	ug/L	0.5	06/20/96	CA LUFT	AMH	71-43-2	
Toluene	1.3	ug/L	0.5	06/20/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	ND	ug/L	0.5	06/20/96	CA LUFT	AMH	100-41-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Pace Analytical

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

PACE Sample No: 70638465 Date Collected: 06/18/96
Client Sample ID: MW1 Date Received: 06/19/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Xylene (Total)	ND	ug/L	1	06/20/96	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	101	%		06/20/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	98	%		06/20/96	CA LUFT	AMH	460-00-4	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	0.35	mg/L	0.05	06/27/96	TPH by EPA 8015M	DLL		
Motor Oil	0.75	mg/L	0.25	06/27/96	TPH by EPA 8015M	DLL		1
n-Pentacosane (S)	66	%		06/27/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				06/21/96				

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

PACE Sample No: 70638473 Date Collected: 06/18/96
Client Sample ID: QC-1 Date Received: 06/19/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
Volatile Halogenated Organics								
Chloromethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	74-87-3	
Bromomethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	74-83-9	
Vinyl Chloride	2.6	ug/L	0.5	06/25/96	EPA 8010	ads	75-01-4	
Chloroethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	75-00-3	
Methylene Chloride	ND	ug/L	0.5	06/25/96	EPA 8010	ads	75-09-2	
Trichlorofluoromethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	75-69-4	
1,1-Dichloroethene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	75-35-4	
1,1-Dichloroethane	1.2	ug/L	0.5	06/25/96	EPA 8010	ads	75-34-3	
trans-1,2-Dichloroethene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	156-60-5	
Chloroform	ND	ug/L	0.5	06/25/96	EPA 8010	ads	67-66-3	
1,2-Dichloroethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	107-06-2	
1,1,1-Trichloroethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	71-55-6	
Carbon Tetrachloride	ND	ug/L	0.5	06/25/96	EPA 8010	ads	56-23-5	
Bromodichloromethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	75-27-4	
1,2-Dichloropropane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	78-87-5	
cis-1,3-Dichloropropene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	10061-01-5	
Trichloroethene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	79-01-6	
Dibromochloromethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	124-48-1	
1,1,2-Trichloroethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	79-00-5	
trans-1,3-Dichloropropene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	10061-02-6	
Bromoform	ND	ug/L	0.5	06/25/96	EPA 8010	ads	75-25-2	
Tetrachloroethene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	127-18-4	
1,1,2,2-Tetrachloroethane	ND	ug/L	0.5	06/25/96	EPA 8010	ads	79-34-5	
Chlorobenzene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	108-90-7	
2-Chloroethyl Vinyl Ether	ND	ug/L	0.5	06/25/96	EPA 8010	ads	110-75-8	
1,2-Dichlorobenzene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	0.5	06/25/96	EPA 8010	ads	106-46-7	
Bromochloromethane (S)	114	%		06/25/96	EPA 8010	ads	74-97-5	
1,4-Dichlorobutane (S)	109	%		06/25/96	EPA 8010	ads	110-56-5	
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	06/20/96	CA LUFT	AMH		
Benzene	4.3	ug/L	0.5	06/20/96	CA LUFT	AMH	71-43-2	
Toluene	0.53	ug/L	0.5	06/20/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	ND	ug/L	0.5	06/20/96	CA LUFT	AMH	100-41-4	
Xylene (Total)	ND	ug/L	1	06/20/96	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	98	%		06/20/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	97	%		06/20/96	CA LUFT	AMH	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

PARAMETER FOOTNOTES

ND	Not Detected
NC	Not Calculable
PRL	PACE Reporting Limit
(S)	Surrogate
[1]	Hydrocarbons present do not match profile of laboratory standard.
[2]	Diesel results are elevated due to a large misc peak in the diesel range.

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QUALITY CONTROL DATA

Innovative Technical Solutions
2855 Mitchell Drive, Suite 118
Walnut Creek, CA 94598

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

Attn: Mr. Jeff Hess
Phone: 714-955-1390

QC Batch ID: 15252
QC Batch Method: EPA 8010
Date of Batch: 06/18/96
Analysis Method: EPA 8010
Analysis Description: Volatile Halogenated Organics
Associated PACE Samples: 70638432 70638440 70638457 70638465 70638473

METHOD BLANK: 70641394
Associated PACE Samples: 70638432 70638440 70638457 70638465 70638473

Parameter	Units	Method Blank Result	PRL	Footnotes
Chloromethane	ug/L	ND	0.5	
Bromomethane	ug/L	ND	0.5	
Vinyl Chloride	ug/L	ND	0.5	
Chloroethane	ug/L	ND	0.5	
Methylene Chloride	ug/L	ND	0.5	
Trichlorofluoromethane	ug/L	ND	0.5	
1,1-Dichloroethene	ug/L	ND	0.5	
1,1-Dichloroethane	ug/L	ND	0.5	
trans-1,2-Dichloroethene	ug/L	ND	0.5	
Chloroform	ug/L	ND	0.5	
1,2-Dichloroethane	ug/L	ND	0.5	
1,1,1-Trichloroethane	ug/L	ND	0.5	
Carbon Tetrachloride	ug/L	ND	0.5	
Bromodichloromethane	ug/L	ND	0.5	
1,2-Dichloropropane	ug/L	ND	0.5	
cis-1,3-Dichloropropene	ug/L	ND	0.5	
Trichloroethene	ug/L	ND	0.5	
Dibromochloromethane	ug/L	ND	0.5	
1,1,2-Trichloroethane	ug/L	ND	0.5	
trans-1,3-Dichloropropene	ug/L	ND	0.5	
Bromoform	ug/L	ND	0.5	
Tetrachloroethene	ug/L	ND	0.5	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.5	
Chlorobenzene	ug/L	ND	0.5	
2-Chloroethyl Vinyl Ether	ug/L	ND	0.5	

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QUALITY CONTROL DATA

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

METHOD BLANK: 70641394
Associated PACE Samples: 70638432 70638440 70638457 70638465 70638473

Parameter	Units	Method Blank Result	PRL	Footnotes
1,2-Dichlorobenzene	ug/L	ND	0.5	
1,3-Dichlorobenzene	ug/L	ND	0.5	
1,4-Dichlorobenzene	ug/L	ND	0.5	
Bromochloromethane (S)	%	120		
1,4-Dichlorobutane (S)	%	114		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70635693 70635701

Parameter	Units	70632153	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Chloromethane	ug/L	ND	200	174	87	178	89	2	
Bromomethane	ug/L	ND	200	128	64	125	63	2	
Vinyl Chloride	ug/L	ND	200	173	87	176	88	1	
Chloroethane	ug/L	ND	200	135	68	132	66	3	
Methylene Chloride	ug/L	ND	200	200	98	202	99	1	
Trichlorofluoromethane	ug/L	ND	200	173	87	172	86	1	
1,1-Dichloroethene	ug/L	25	200	227	101	223	99	2	
1,1-Dichloroethane	ug/L	ND	200	209	103	209	103	0	
trans-1,2-Dichloroethene	ug/L	ND	200	211	106	208	104	2	
Chloroform	ug/L	8	200	208	100	210	101	1	
1,2-Dichloroethane	ug/L	ND	200	207	104	207	104	0	
1,1,1-Trichloroethane	ug/L	32	200	229	98	228	98	0	
Carbon Tetrachloride	ug/L	ND	200	210	104	206	102	2	
Bromodichloromethane	ug/L	ND	200	207	103	210	104	1	
1,2-Dichloropropane	ug/L	ND	200	206	103	209	105	2	
cis-1,3-Dichloropropene	ug/L	ND	200	196	98	196	98	0	
Trichloroethene	ug/L	200	200	361	79	358	78	1	
Dibromochloromethane	ug/L	ND	200	208	104	209	105	1	
1,1,2-Trichloroethane	ug/L	ND	200	203	102	205	103	1	
trans-1,3-Dichloropropene	ug/L	ND	200	196	98	197	99	1	
Bromoform	ug/L	ND	200	205	103	209	105	2	
Tetrachloroethene	ug/L	ND	200	205	103	204	102	1	
1,1,2,2-Tetrachloroethane	ug/L	ND	200	203	102	206	103	1	
Chlorobenzene	ug/L	ND	200	206	103	201	101	2	
2-Chloroethyl Vinyl Ether	ug/L	ND	200	ND	0	ND	0	0	
1,2-Dichlorobenzene	ug/L	ND	200	198	99	201	101	2	
1,3-Dichlorobenzene	ug/L	ND	200	204	102	204	102	0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Pace Analytical

QUALITY CONTROL DATA

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70635693 70635701

Parameter	Units	70632153	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
1,4-Dichlorobenzene	ug/L	ND	200	202	101	200	100	1	
Bromochloromethane (S)					107		106		
1,4-Dichlorobutane (S)					95		93		

LABORATORY CONTROL SAMPLE & LCSD: 70635677 70635685

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Chloromethane	ug/L	20	19	95	19.6	98	3	
Bromomethane	ug/L	20	15.1	76	15.8	79	4	
Vinyl Chloride	ug/L	20	18.8	94	19.4	97	3	
Chloroethane	ug/L	20	15.6	78	15.8	79	1	
Methylene Chloride	ug/L	20	20.4	102	21	105	3	
Trichlorofluoromethane	ug/L	20	18.3	92	18.9	95	3	
1,1-Dichloroethene	ug/L	20	21.4	107	21.9	110	3	
1,1-Dichloroethane	ug/L	20	21.1	106	21.8	109	3	
trans-1,2-Dichloroethene	ug/L	20	21.7	109	22.3	112	3	
Chloroform	ug/L	20	21.1	106	21.6	108	2	
1,2-Dichloroethane	ug/L	20	20.9	105	21.3	107	2	
1,1,1-Trichloroethane	ug/L	20	21.1	106	21.8	109	3	
Carbon Tetrachloride	ug/L	20	21.2	106	22.1	111	5	
Bromodichloromethane	ug/L	20	21	105	21.4	107	2	
1,2-Dichloropropane	ug/L	20	20.6	103	21	105	2	
cis-1,3-Dichloropropene	ug/L	20	20.5	103	21	105	2	
Trichloroethene	ug/L	20	20.6	103	21.2	106	3	
Dibromochloromethane	ug/L	20	21.1	106	21.6	108	2	
1,1,2-Trichloroethane	ug/L	20	20.6	103	21.1	106	3	
trans-1,3-Dichloropropene	ug/L	20	20.9	105	21.2	106	1	
Bromoform	ug/L	20	21.6	108	21.3	107	1	
Tetrachloroethene	ug/L	20	21.2	106	22.1	111	5	
1,1,2,2-Tetrachloroethane	ug/L	20	20.6	103	20.6	103	0	
Chlorobenzene	ug/L	20	20.6	103	22.4	112	8	
2-Chloroethyl Vinyl Ether	ug/L	20	25	125	23.8	119	5	
1,2-Dichlorobenzene	ug/L	20	20.7	104	21.1	106	2	
1,3-Dichlorobenzene	ug/L	20	19.1	96	21.2	106	10	
1,4-Dichlorobenzene	ug/L	20	20.7	104	21.1	106	2	
Bromochloromethane (S)				111		111		
1,4-Dichlorobutane (S)				98		96		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Innovative Technical Solutions
2855 Mitchell Drive, Suite 118
Walnut Creek, CA 94598

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

Attn: Mr. Jeff Hess
Phone: 714-955-1390

QC Batch ID: 15270
QC Batch Method: CA LUFT
Date of Batch: 06/18/96
Analysis Method: CA LUFT
Analysis Description: GAS/BTEX by CA LUFT, Water
Associated PACE Samples: 70638432 70638465 70638473

METHOD BLANK: 70638903
Associated PACE Samples: 70638432 70638465 70638473

Parameter	Units	Method Blank Result	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	
Methyl-tert-butyl Ether	ug/L	ND	5	
a,a,a-Trifluorotoluene (S)	%	99		
4-Bromofluorobenzene (S)	%	99		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70636345 70636352

Parameter	Units	70626122	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Gasoline	ug/L	ND	1000	874	87	881	88	1	

LABORATORY CONTROL SAMPLE & LCSD: 70636360 70636378

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Gasoline	ug/L	1000	859	86	847	85	1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Innovative Technical Solutions
2855 Mitchell Drive, Suite 118
Walnut Creek, CA 94598

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

Attn: Mr. Jeff Hess
Phone: 714-955-1390

QC Batch ID: 15320
QC Batch Method: EPA 3520
Date of Batch: 06/20/96
Analysis Method: TPH by EPA 8015M
Analysis Description: TPH in Water by 8015 Modified
Associated PACE Samples: 70638440 70638457 70638465

METHOD BLANK: 70640099
Associated PACE Samples: 70638440 70638457 70638465

Parameter	Units	Method Blank Result	PRL	Footnotes
Diesel Fuel	mg/L	ND	0.05	
Motor Oil	mg/L	ND	0.25	
n-Pentacosane (S)	%	84		

LABORATORY CONTROL SAMPLE & LCSD: 70638978 70638986

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Diesel Fuel	mg/L	1	0.755	76	0.87	87	13	
n-Pentacosane (S)				99		117		

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

QUALITY CONTROL DATA

Innovative Technical Solutions
2855 Mitchell Drive, Suite 118
Walnut Creek, CA 94598

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

Attn: Mr. Jeff Hess
Phone: 714-955-1390

QC Batch ID: 15411
QC Batch Method: EPA 160.1
Date of Batch: 06/25/96
Analysis Method: EPA 160.1
Analysis Description: Total Dissolved Solids
Associated PACE Samples: 70638440 70638457 70638465

METHOD BLANK: 70641998
Associated PACE Samples: 70638440 70638457 70638465

Parameter	Units	Method Blank Result	PRL	Footnotes
Total Dissolved Solids	mg/L	ND	5	

SAMPLE DUPLICATE: 70642004

Parameter	Units	70638440	Dup. Result	RPD	Footnotes
Total Dissolved Solids	mg/L	18800	19000	1	

SAMPLE DUPLICATE: 70642012

Parameter	Units	70639752	Dup. Result	RPD	Footnotes
Total Dissolved Solids	mg/L	849	843	1	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

PACE Project Number: 705929
Client Project ID: Port of Oakland/A.P.L. Term.

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

REPORT OF LABORATORY ANALYSIS

705929

INNOVATIVE TECHNICAL SOLUTIONS, Inc.

ITSI
2855 Mitchell Drive, Suite 118
Walnut Creek, California 94598
(510) 256-8898 (Tel), (510) 256-8998 (Fax)

PROJECT NAME: Port of Oakland - A.P.L. Terminal
PROJECT NUMBER: 95-117.07
SITE LOCATION: 1395 Middle Harbor Rd., Oakland

CHAIN OF CUSTODY

DATE: 6/18/96
PAGE: 1 of 1

SAMPLE I.D.	SAMPLE DEPTH	DATE	TIME	NUMBER OF CONTAINERS	TYPE OF CONTAINERS	SAMPLE MATRIX	ANALYSIS: TPH as Gas/BTEX - 8015/8020	TPH as Diesel - 8015 + Motor oil	TEPH - 8015	TRPH - 418.1	Oil and Grease - 5520 D&F	LUFT Metals (Cd, Cr, Ni, Pb, Zn)	CAM 17 Metals	VOCs - 8240	SVOCs - 8270	HVOCs - 8010	Total Dissolved Solids - 160.1	SPECIAL INSTRUCTIONS/ NOTES/COMMENTS	TOTAL NUMBER OF ANALYSES
																		PACE Analytical Petaluma, CA	
Trip Blank	NA	6/18/96	Lab provided	2	Voa	W	X									X		638432	2
MW2			1730	3	Voa	W										X		638440	1
				1	1lt a	W		X											2
				1	250 ml (p)	W											X		1
MW3			1915	3	Voa	W										X		638457	1
				1	1lt A	W		X											2
				1	250 ml (p)	W											X		1
MW1			1935	6	Voa	W	X									X		638465	3
				1	1lt A	W		X											2
				1	250 ml (p)	W											X		1
QC-1				6	Voa	W	X									X		638473	3
							Not Used (55)												
TOTAL NUMBER OF CONTAINERS				26	TOTAL TESTS		6	6								5	3		20

SAMPLED BY: Jim Schollard
SIGNATURE: Jim Schollard/ITSI

SPECIAL INSTRUCTIONS/COMMENTS: Standard T.A.T.

RELINQUISHED BY: Jim Schollard (Printed Name) Jim Schollard (Signature)
ITSI (Company) 6/18/96 (10:00pm) (Date and Time)

RECEIVED BY: Chuck Clyde (Printed Name) (Signature)
ITSI (Company) (Date and Time)

RELINQUISHED BY: (Printed Name) (Signature)
ITSI (Company) 6/19/96 5:40pm (Date and Time)

RECEIVED BY: GAIL HERRMANN (Printed Name) Gail Herrmann (Signature)
PASI (Company) 6/19 5:40 PM (Date and Time)

RELINQUISHED BY: (Printed Name) (Signature)
(Company) (Date and Time)

RECEIVED BY: (Printed Name) (Signature)
(Company) (Date and Time)

SEND RESULTS TO: Jeff Hess, ITSI, 2855 Mitchell Dr., Ste. 118, Walnut Creek, CA 94598 510/256-8898