PORT OF OAKLAND

August 12, 1996

Mr. Barney Chan
Alameda County Health Care Services Agency
Environmental Protection Division
1131 Harbor Bay Parkway, #250
Alameda, CA 94502-6577

SUBJECT: QUARTERLY GROUNDWATER MONITORING REPORT AND CLOSURE REQUEST - FORMER TANK NUMBERS MF-23 AND MF-24, METROPOLITAN OAKLAND INTERNATIONAL AIRPORT, UNITED AIRLINES HANGAR AREA -TAXIWAY SITE, 1100 AIRPORT DRIVE, OAKLAND, CALIFORNIA

Dear Mr. Chan:

Enclosed is a copy of the June 19, 1996 Groundwater Monitoring and Sampling Report - Tanks MF-23 and MF-24, United Airlines Hangar - Taxiway Site, Metropolitan Oakland International Airport, 1100 Airport Drive, Oakland, California. Monitoring activities were performed by Innovative Technical Solutions, Inc. (ITSI), one of the new "as needed" consultants retained by the Port of Oakland (Port).

The transition process from the Port's former consultant (Alisto Engineering Group) to ITSI caused a delay in collection of groundwater samples. As a result, this current submittal is the first round of monitoring in 1996. Quarterly monitoring is currently back on track.

Monitoring data for each of the three monitoring wells indicate that constituent concentrations have either generally stabilized or decreased over time (refer to Table 2). As a result, we are requesting that the County approve closure of this site and a letter of no further interest.

96 AUG 14 PM 2:57

Should you have any questions or need additional information,

ENVIRONMENTAL PROTECTION

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

please contact me at 272-1118. Thank you for your on-going assistance and support on this project.

Sincerely,

Jeffrey L. Rubin, REA, CPSS
Associate Environmental Scientist
Environmental Health & Safety Compliance

Enclosure

cc: Rich Hiett, Regional Water Quality Control Board, San Francisco Bay Region (w enc)
Neil Werner - EH & SC (w/o enc)
Mark O'Brien - EH & SC (w/o enc)
Jeff Hess - ITSI (w/o enc)

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PORT OF OAKLAND

August 12, 1996

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Alameda County Health Care Services Agency
Environmental Protection Division
1131 Harbor Bay Parkway, #250
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INNOVATIVE TECHNICAL SOLUTIONS, Inc.

ITSI

August 5, 1996

Project No. 95-113.02

Mr. Jeff Rubin
Port of Oakland
530 Water Street
Oakland, California 94604

Groundwater Monitoring and Sampling Report
Tanks MF23 and MF24, United Airlines Hangar-Taxiway Site
Metropolitan Oakland International Airport (MOIA)
1100 Airport Drive
Oakland, California
(Work Order No. 028692)

Dear Mr. Rubin:

This Groundwater Monitoring and Sampling Report (Report) has been prepared by Innovative Technical Solutions, Inc. (ITSI) on behalf of the Port of Oakland for groundwater monitoring and sampling performed on June 19, 1996 at the United Airlines Hangar-Taxiway Site, located at 1100 Airport Drive at the Metropolitan Oakland International Airport (MOIA) 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. The monitoring wells were installed in the vicinity of two former 10,000-gallon jet fuel underground storage tanks (MF-23 and MF-24), removed in June 1991.

SAMPLING OF MONITORING WELLS

The groundwater monitoring and sampling was performed on June 19, 1996. The monitoring wells were initially gauged for depth to water and checked for the presence of separate phase hydrocarbons. No separate 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 had 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, 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 groundwater flow direction is to the southeast, with a gradient of approximately 0.0001 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	Analyses					
ID	TPHg[1]	BTEX[2]	TPHj[3]	TPHd[4]	TPHmo[5]	TDS[6]
MW-1	x	x	x	x	x	x
MW-2	x	x	x	x	x	x
MW-3	x	x	x	x	x	x

[1]TPH as gasoline by California LUFT Method
[2]Benzene, toluene, ethylbenzene, and xylenes by California LUFT Method
[3]TPH as jet fuel by Modified EPA Method 8015
[4]TPH as diesel by Modified EPA Method 8015
[5]TPH as motor oil by Modified EPA Method 8015
[6]Total dissolved solids by EPA Method 160.1

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 19, 1996 groundwater monitoring and sampling are summarized below:

- TPHg, BTEX and TPHj were reportedly not detected in the three monitoring wells.
- TPHd was reported at a concentration of 1,500 µg/l in MW-1, and reportedly ranged from 140 to 230 µg/l in the other monitoring wells.
- TPHmo was reported at a concentration of 750 µg/l in MW-1, and reportedly ranged from <250 to 420 µg/l in the other monitoring wells.

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
TANKS MF23 AND MF24 (UNITED AIRLINES HANGAR-TAXIWAY SITE)
METROPOLITAN OAKLAND INTERNATIONAL AIRPORT
1100 AIRPORT DRIVE
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	7.43	5/15/92	3.16	4.27	1
		8/7/92	3.67	3.76	1
		11/24/92	4.55	2.88	1
		2/11/93	1.61	5.82	1
		5/17/93	3.55	3.88	1
		8/3/93	3.47	3.96	1
		11/19/93	3.91	3.52	1
		3/24/94	2.85	4.58	1
		6/1/94	3.02	4.41	1
		9/20/94	3.89	3.54	1
		4/25/95	2.30	5.05	1
		8/11/95	3.32	4.03	1
		11/3/95	3.98	3.37	1
		6/19/96	3.20	4.23	
MW-2	7.66	4/25/95	2.68	4.98	1
		8/11/95	3.62	4.04	1
		11/3/95	4.24	3.42	1
		6/19/96	3.41	4.25	
MW-3	8.12	4/25/95	3.08	5.04	1
		8/11/95	4.04	4.08	1
		11/3/95	4.75	3.37	1
		6/19/96	3.87	4.25	

1 Data from Table 1, Results of Groundwater Sampling, Port of Oakland, Oakland International Airport, United Airlines Hangar Area-Taxiway Site, dated February 21, 1996, by Alisto Engineering Group.

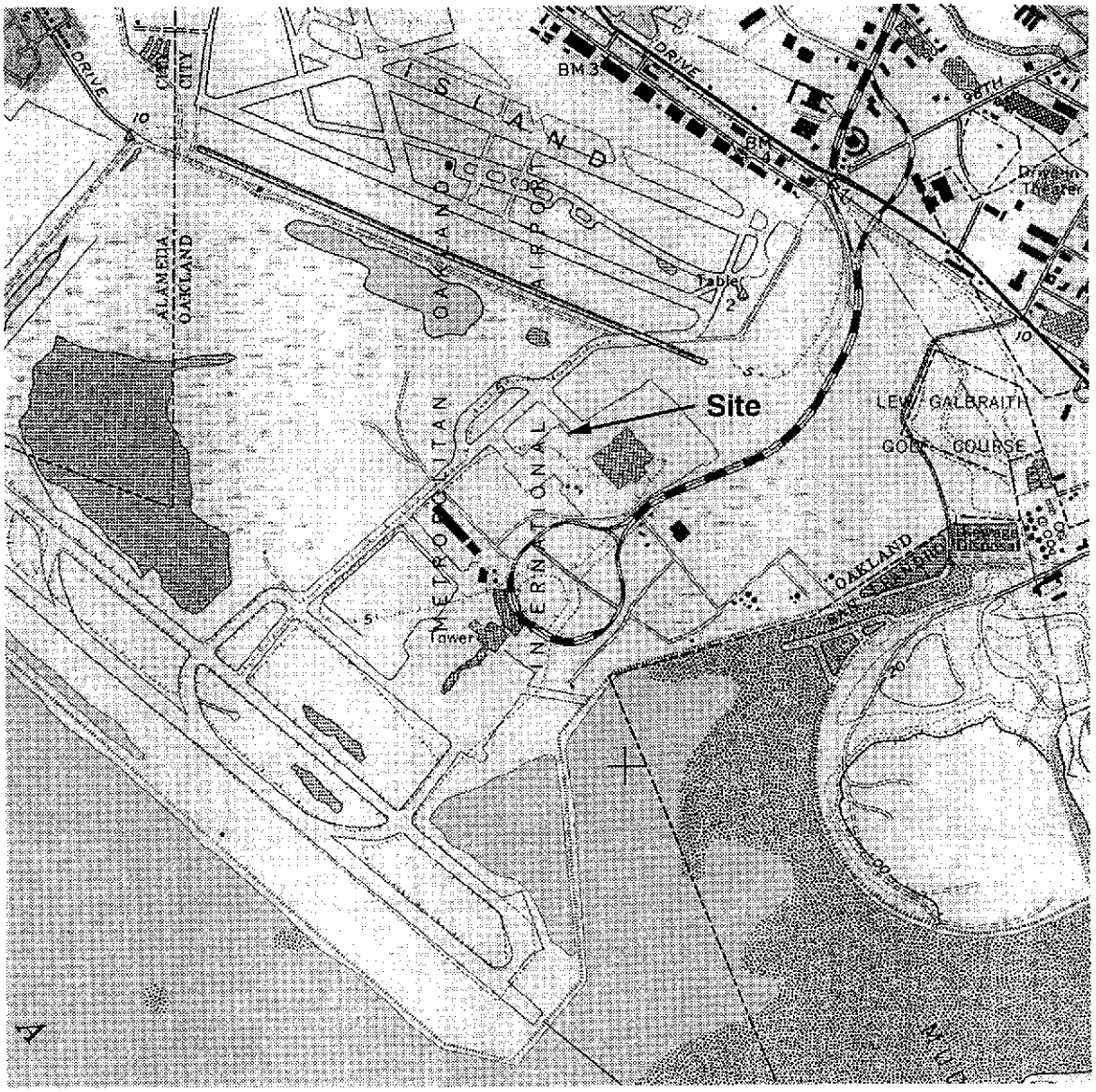
TABLE 2

SUMMARY OF LABORATORY RESULTS
TANKS MF23 AND MF24 (UNITED AIRLINES HANGAR AREA-TAXIWAY SITE)
METROPOLITAN OAKLAND INTERNATIONAL AIRPORT
1100 AIRPORT DRIVE
OAKLAND, CALIFORNIA

Monitoring Well ID	Date of Sampling	TPHg (µg/l)	B (µg/l)	T (µg/l)	E (µg/l)	X (µg/l)	TPHj (µg/l)	TPHd (µg/l)	TPHmo (µg/l)	TDS (mg/l)	Note
MW-1	5/15/92	-	1.0	1.0	2.0	8.0	4,900	-	-	2,200	1
	8/7/92	220	0.4	<0.3	1.4	3.7	6,400	-	-	-	1
	11/24/92	280	<0.4	0.5	1.4	2.9	<50	-	-	-	1
	2/11/93	<50	<0.4	<0.3	<0.3	0.4	4,100	-	-	-	1
	5/17/93	<300	<0.4	<0.3	1.0	2.4	5,500	-	-	1,100	1
	8/3/93	240	<0.5	<0.5	0.8	2.0	-	-	-	1,480	1
	11/19/93	160	<0.5	<0.5	<0.5	<0.5	<50	-	-	1,520	1
	3/24/94	<50	<0.5	<0.5	0.73	0.98	1,300	-	-	1,500	1
	6/1/94	<50	<0.5	<0.5	<0.5	<0.5	<50	-	-	1,200	1
	9/20/94	140	<0.5	<0.5	<0.5	<0.5	<500	-	-	1,600	1
	4/25/95	130	<0.4	<0.3	<0.3	<0.4	<50	6,000	2,900	760	1
	8/11/95	120	<0.4	<0.3	<0.3	<0.4	<50	2,100	1,700	1,100	1
	11/3/95	80	<0.4	0.8	<0.3	<0.4	<50	1,100	1,000	1,400	1
	6/19/96	<50	<0.5	<0.5	<0.5	<1.0	<500	1,500	750	835	
MW-2	4/25/95	<50	<0.4	<0.3	<0.3	<0.4	<50	570	3,000	340	1
	8/11/95	<50	<0.4	<0.3	<0.3	<0.4	<50	<50	430	430	1
	11/3/95	<50	<0.4	0.4	<0.3	<0.4	<50	420	1,200	590	1
	6/19/96	<50	<0.5	<0.5	<0.5	<1.0	<500	230	420	301	
MW-3	4/25/95	<50	<0.4	<0.3	<0.3	<0.4	<50	160	620	1,400	1
	8/11/95	<50	<0.4	<0.3	<0.3	<0.4	<50	120	<200	5,900	1
	11/3/95	<50	<0.4	0.4	<0.3	<0.4	<50	260	400	3,000	1
	6/19/96	<50	<0.5	<0.5	<0.5	<1.0	<500	140	<250	5,270	

1 Data from Table 1, Results of Groundwater Sampling, Port of Oakland, Oakland International Airport, United Airlines Hangar Area-Taxiway Site, dated February 21, 1996, by Alisto Engineering Group.

95-113.02/F.1-SiteLoc



0 1,000 Feet 2,000 Feet

Approximate Scale

FIGURE 1

SITE LOCATION

United Airlines Hangar-Taxiway Site
Oakland International Airport
1100 Airport Drive

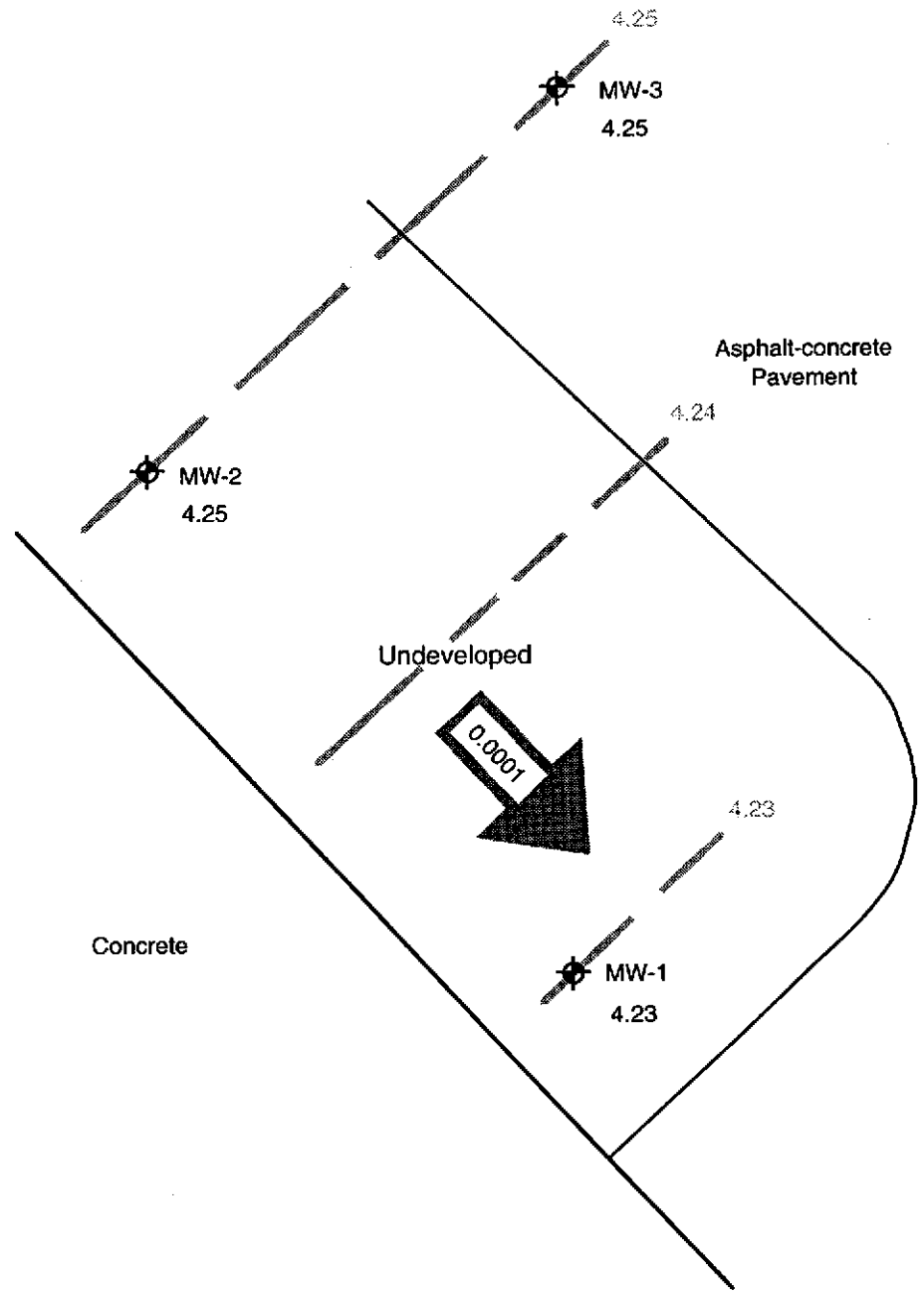
PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

Source: San Leandro, California 7.5-minute U.S.G.S. Quadrangle, dated 1959, and photorevised 1980.

95-113.02/F.2-GWElev



0 20 Feet 40 Feet

Approximate Scale

Legend

Monitoring Well

4.23 Groundwater Elevation on 6/19/96

Groundwater Elevation Contour Lines

Groundwater Flow Direction and Gradient

Source: Adapted from Figure 2, Potentiometric Groundwater Elevation Contour Map, November 3, 1995, Alisto Engineering Group.

FIGURE 2

GROUNDWATER ELEVATIONS AND FLOW DIRECTION FOR JUNE 19, 1996

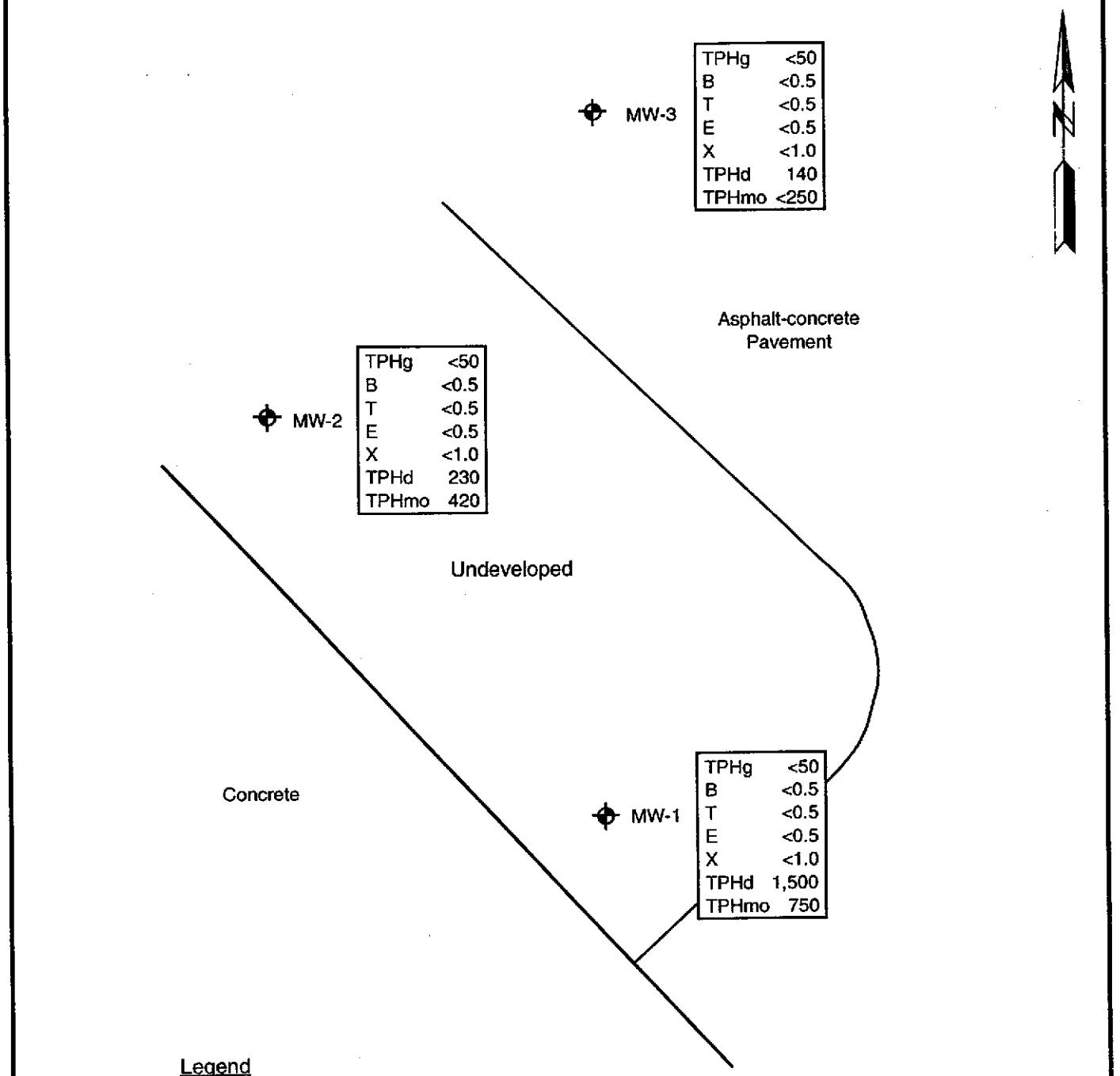
United Airlines Hangar-Taxiway Site
Oakland International Airport
1100 Airport Drive

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

95-113.02/F.3-Conc



Legend

Monitoring Well

TPHg	<50
B	<0.5
T	<0.5
E	<0.5
X	<1.0
TPHd	1,500
TPHmo	750

Groundwater Concentrations in µg/l on 6/19/96

TPHg - TPH as gasoline
B - Benzene
T - Toluene
E - Ethylbenzene
X - Total xylenes
TPHd - TPH as diesel
TPHmo - TPH as motor oil

0 20 Feet 40 Feet

Approximate Scale

Source: Adapted from Figure 2, Potentiometric Groundwater Elevation Contour Map, November 3, 1995, Alisto Engineering Group.

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER ON JUNE 19, 1996

United Airlines Hangar-Taxiway Site
Oakland International Airport
1100 Airport Drive

PORT OF OAKLAND

ITSI

INNOVATIVE TECHNICAL SOLUTIONS, INC.

MONITORING WELL
PURGE AND SAMPLE FORM

PROJECT NAME: Port of Oakland - Airport (MP 23+24) PROJECT NO.: 95-113.01

WELL NO.: MW1 TESTED BY: J. Scholland DATE: 6/19/96

Measuring Point Description: red notch, T.O.C. Static Water Level (ft.): 3.2' *

Total Well Depth (ft.): 8.34' Sample Method: 2" disposable teflon bailer

Water Level Measurement Method: Solinst DTW probe Time Sampled: 1515 (QC 1 @ 1520)

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

Time Start Purge: 1500 Field Filtering: N.A.

Time End Purge: 1508 Field Preservation: H_2O Ice

Comments: cut former lock + replaced with 0895 lock; well box filled with water → bailed off; significant pressure relief upon removal of well cap (under pressure) *

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)
	8.34	-	3.2'	=	5.14	x	0.16	0.64	1.44	=	0.82 (3 vols. = 2.47)

Time	1502	1505	1508				
Volume Purged (gals)	1.0	1.0	1.0				
Cumulative Volume Purged (gals)	1.0	2.0	3.0				
Cumulative Number of Casing Volumes	1.22	2.44	3.66				
Purge Rate (gpm)	0.5	0.33	0.33				
Temperature (F°) or (C°)	68.2	68.5	68.8 ~~68.8~~ *				
pH	7.35	7.46	7.52				
Specific Conductivity (µmhos/cm) x100	1154	11.63	11.60				
Dissolved Oxygen (mg/L)	NA →	→	→				
Turbidity/Color (NTU)	Very silty Grey →	→	→				
Odor	None →	→	→				
Dewatered?	No →	→	→				

J. Scholland ITSI

CHECKED BY: _____ DATE: _____

* water level rising upon removal of well cap; Thus water level measurement not static

QC-1 collected @ 1520

ITSI

MONITORING WELL
PURGE AND SAMPLE FORM

PROJECT NAME: Port of Oakland - Airport (#23024) PROJECT NO.: 95-113.01

WELL NO.: MW2 TESTED BY: J. Scholland DATE: 6/19/96

Measuring Point Description: red notch, mark T.O.C. Static Water Level (ft.): 3.41'

Total Well Depth (ft): 10.50' Sample Method: 2" disposable teflon bailer

Water Level Measurement Method: Solinist OTW probe Time Sampled: 1430

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

Time Start Purge: 1408 Field Filtering: N.A.

Time End Purge: 1418 Field Preservation: H_2O Ice

Comments: cut former lock → replaced with 0895 lock; bentonite clay hydrated + expanded filling entire well box → removed excess to top of casing to expose cap.

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)
	10.50'	-	3.41	=	7.09	x	0.16	0.64	1.44	=	1.13 (3 vols. = 3.40)

Time	1411	1415	1418				
Volume Purged (gals)	1.25	1.25	1.25				
Cumulative Volume Purged (gals)	1.25	2.50	3.75				
Cumulative Number of Casing Volumes	1.11	2.22	3.33				
Purge Rate (gpm)	0.42	0.31	0.42				
Temperature (F°) or (C°)	72.6	73.4	73.5				
pH	7.98	7.90	7.87				
Specific Conductivity (µmhos/cm) x100	7.36	4.37	4.27				
Dissolved Oxygen (mg/L)	NA	→	→				
Turbidity/Color (NTU)	Yellow	olive →	→				
Odor	None	→	→				
Dewatered?	No	→	→				

J. Scholland ITSI

CHECKED BY: _____ DATE: _____

ITSI

MONITORING WELL
PURGE AND SAMPLE FORM

PROJECT NAME: Port of Oakland - Airport (mf 23.24) PROJECT NO.: 95113.01

WELL NO.: MW3 TESTED BY: J. Schollard DATE: 6/19/96

Measuring Point Description: Red notch, top of casing Static Water Level (ft.): 3.87'

Total Well Depth (ft.): 14.0' Sample Method: 2" disposable teflon bailer

Water Level Measurement Method: Solinist OTW probe Time Sampled: 1330

Purge Method: 2" disposable teflon bailer Sample Depth (ft.): ~4.0'

Time Start Purge: 1316 Field Filtering: N.A.

Time End Purge: 1326 Field Preservation: H_2O Ice

Comments: cut former lock + replaced with 0895 lock

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		1.62
	14.0		3.87		10.13		0.16	0.64	1.44		(3 vols = 4.90)

Time	1319	1323	1326				
Volume Purged (gals)	1.75	1.75	1.75				
Cumulative Volume Purged (gals)	1.75	3.5	5.25				
Cumulative Number of Casing Volumes	1.08	2.16	3.24				
Purge Rate (gpm)	0.58	0.44	0.58				
Temperature (F°) or (C°)	81.4	80.7	80.9				
pH	7.15	7.30	7.32				
Specific Conductivity (µmhos/cm) X1000	3.65	3.83	4.20				
Dissolved Oxygen (mg/L)	NA	→	→				
Turbidity/Color (NTU)	olive	→	→				
Odor	None	→	→				
Dewatered?	No	→	→				

J. Schollard ITSI

CHECKED BY: _____ DATE: _____

ITSI

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: 705933
Client Project ID: Port of Oakland-(MF 23 & 24)

Dear Mr. Hess:

Enclosed are the results of analyses for sample(s) received on June 20, 1996. 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

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

Pace Analytical

DATE: 07/01/96
PAGE: 1

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

PACE Project Number: 705933
Client Project ID: Port of Oakland-(MF 23 & 24)

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

PACE Sample No: 70639000
Client Sample ID: MW3
Date Collected: 06/19/96
Date Received: 06/20/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Wet Chemistry								
Total Dissolved Solids								
Total Dissolved Solids	5270	mg/L	5	06/24/96	EPA 160.1	LMD		
GC -- Volatiles								
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	
a,a,a-Trifluorotoluene (S)	97	%		06/20/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	96	%		06/20/96	CA LUFT	AMH	460-00-4	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	0.14	mg/L	0.05	06/27/96	TPH by EPA 8015M	DLL		
Motor Oil	ND	mg/L	0.25	06/27/96	TPH by EPA 8015M	DLL		
JP4	ND	mg/L	0.5	06/27/96	TPH by EPA 8015M	DLL	.....	
n-Pentacosane (S)	82	%		06/27/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				06/21/96				

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: 705933
Client Project ID: Port of Oakland-(MF 23 & 24)

PACE Sample No: 70639018 Date Collected: 06/19/96
Client Sample ID: MW2 Date Received: 06/20/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Wet Chemistry								
Total Dissolved Solids								
Total Dissolved Solids	301	mg/L	5	06/24/96	EPA 160.1	LMD		
GC -- Volatiles								
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	
a,a,a-Trifluorotoluene (S)	100	%		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	0.23	mg/L	0.05	06/27/96	TPH by EPA 8015M	DLL		
Motor Oil	0.42	mg/L	0.25	06/27/96	TPH by EPA 8015M	DLL		
JP4	ND	mg/L	0.5	06/27/96	TPH by EPA 8015M	DLL	.....	
n-Pentacosane (S)	118	%		06/27/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				06/21/96				

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: 705933
Client Project ID: Port of Oakland-(MF 23 & 24)

PACE Sample No: 70639026 Date Collected: 06/19/96
Client Sample ID: MW1 Date Received: 06/20/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Wet Chemistry								
Total Dissolved Solids								
Total Dissolved Solids	835	mg/L	5	06/24/96	EPA 160.1	LMD		
GC -- Volatiles								
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	
a,a,a-Trifluorotoluene (S)	92	%		06/20/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	96	%		06/20/96	CA LUFT	AMH	460-00-4	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	1.5	mg/L	0.05	06/28/96	TPH by EPA 8015M	DLL		
Motor Oil	0.75	mg/L	0.25	06/28/96	TPH by EPA 8015M	DLL		
JP4	ND	mg/L	0.5	06/28/96	TPH by EPA 8015M	DLL	.....	
n-Pentacosane (S)	109	%		06/28/96	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: 705933
Client Project ID: Port of Oakland-(MF 23 & 24)

PACE Sample No: 70639034 Date Collected: 06/18/96
Client Sample ID: QC-1 Date Received: 06/20/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
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	
a,a,a-Trifluorotoluene (S)	96	%		06/20/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	101	%		06/20/96	CA LUFT	AMH	460-00-4	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

PACE Project Number: 705933
Client Project ID: Port of Oakland-(MF 23 & 24)

PACE Sample No: 70639091 Date Collected: 06/19/96
Client Sample ID: TRIP BLANKS Date Received: 06/20/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
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	
a,a,a-Trifluorotoluene (S)	100	%		06/20/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	99	%		06/20/96	CA LUFT	AMH	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Fax: 707-792-0342

Pace Analytical

PACE Project Number: 705933
Client Project ID: Port of Oakland-(MF 23 & 24)

PARAMETER FOOTNOTES

ND	Not Detected
NC	Not Calculable
PRL	PACE Reporting Limit
(S)	Surrogate

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Pace Analytical

QUALITY CONTROL DATA

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

PACE Project Number: 705933
Client Project ID: Port of Oakland-(MF 23 & 24)

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: 70639000 70639018 70639026 70639034 70639091

METHOD BLANK: 70638903
Associated PACE Samples: 70639000 70639018 70639026 70639034 70639091

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	
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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Pace Analytical

QUALITY CONTROL DATA

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

PACE Project Number: 705933
Client Project ID: Port of Oakland-(MF 23 & 24)

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: 70639000 70639018 70639026

METHOD BLANK: 70640099
Associated PACE Samples: 70639000 70639018 70639026

Parameter	Units	Method Blank 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)	%	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

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

Pace Analytical

QUALITY CONTROL DATA

DATE: 07/01/96

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

PACE Project Number: 705933
Client Project ID: Port of Oakland-(MF 23 & 24)

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

QC Batch ID: 15411
Analysis Method: EPA 160.1
Associated PACE Samples: 70639000 70639018 70639026

QC Batch Method: EPA 160.1
Analysis Description: Total Dissolved Solids

Date of Batch: 06/25/96

METHOD BLANK: 70641998
Associated PACE Samples: 70639000 70639018 70639026

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

Pace Analytical Services, Inc.
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Pace Analytical

PACE Project Number: 705933
Client Project ID: Port of Oakland-(MF 23 & 24)

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

INNOVATIVE TECHNICAL SOLUTIONS, Inc.

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

705933

PROJECT NAME: Port of Oakland - Airport (MF23-24)
PROJECT NUMBER: 95-113.01
SITE LOCATION: 1100 Airport Dr., Oakland CA

CHAIN OF CUSTODY

DATE: 6/19/96
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 Set fuels 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	Total Dissolved Solids (160.1)	SPECIAL INSTRUCTIONS/ NOTES/COMMENTS	TOTAL NUMBER OF ANALYSES
MW Trip Blanks		6/19/96	lab provided	2	VOA	W	X										639091	2
MW3			1330	3	VOA	W	X										639000	2
↓				1	1LA	W		X										1
↓			↓	1	1 250ml (P)	W										X		1
MW2			1430	3	VOA	W	X										639018	2
↓				1	1LA	W		X										1
↓			↓	1	1 250ml (P)	W										X		1
MW1			1515	3	VOA	W	X										639026	2
↓				1	1LA	W		X										1
↓			↓	1	1 250ml (P)	W										X		1
QC-1		↓	—	3	VOA	W	X				Not used		(5X)				639034	2
TOTAL NUMBER OF CONTAINERS					TOTAL TESTS		10	3								3		16

PACE Analytical
Petaluma, CA

SAMPLED BY: Jim Schollard
SIGNATURE: Jim Schollard / ITSI

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

RELINQUISHED BY: Jim Schollard / Jim Schollard
Printed Name / Signature
ITSI / 6/20/96 0847
Company / Date and Time

RECEIVED BY: Edgar / [signature]
Printed Name / Signature
PASI / 6/20/96 0827
Company / Date and Time

RELINQUISHED BY: _____
Printed Name / Signature
Company / Date and Time

RECEIVED BY: _____
Printed Name / Signature
Company / 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 Crk. CA 94598 510/256-8898