

GROUNDWATER MONITORING AND SAMPLING REPORT

Port of Oakland, Oakland International Airport
United Airlines Hangar Area - Taxiway Site
1100 Airport Drive
Oakland, California

Project No. 10-251-01-003

Prepared for:

Port of Oakland
530 Water Street
Oakland, California

*Probably Should continue
monitor*

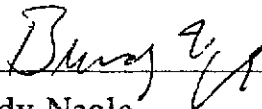
MF 23 + 24

Prepared by:


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

ENVIRONMENTAL
PROTECTION
96 APR 26 AM 10:58

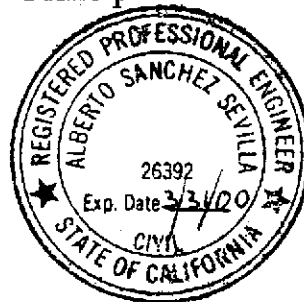
April 15, 1996



Brady Nagle
Project Manager



Al Sevilla, P.E.
Principal



GROUNDWATER MONITORING AND SAMPLING REPORT

Port of Oakland, Oakland International Airport
United Airlines Hangar Area - Taxiway Site
1100 Airport Drive
Oakland, California

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INTRODUCTION

This report presents the results and findings of the January 19, 1996 groundwater monitoring and sampling conducted by Alisto Engineering Group at the Port of Oakland, Oakland International Airport, United Airlines Hangar Area - Taxiway Site, 1100 Airport Drive, Oakland, California. A site vicinity map is shown on Figure 1, and a site plan is shown on Figure 2.

The scope of work includes monitoring and sampling of three groundwater monitoring wells, MW-1, MW-2, and MW-3, which have been installed in the vicinity of two former 10000-gallon underground jet fuel tanks, MF-23 and MF-24.

FIELD PROCEDURES

Field activities were performed in accordance with the procedures and guidelines of 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.

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.



ANALYTICAL RESULTS

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

- Total petroleum hydrocarbons as gasoline (TPH-G) using EPA Method 8015
- Benzene, toluene, ethylbenzene, and total xylenes using EPA Method 8020
- Total extractable petroleum hydrocarbons as jet fuel (TPH-JF), diesel (TPH-D), and motor oil (TPH-MO) using EPA Method 8015 (modified)
- Total dissolved solids using EPA Method 160.1

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 3. The results of groundwater analysis are shown on Figure 4. The field procedures for chain of custody documentation and the laboratory report and chain of custody record are presented in Appendix B.

FINDINGS

The findings of the January 19, 1996 groundwater monitoring and sampling event are summarized as follows:

- Liquid-phase hydrocarbons or sheen was not observed in any of the groundwater monitoring wells.
- Groundwater elevation data indicate a gradient of approximately 0.006 foot per foot in a northeasterly direction across the site.
- TPH-G and benzene, toluene, ethylbenzene, and total xylenes were not detected above the reported detection limits in any of the samples.
- TPH-JF was not detected above the reported detection limit in any of the samples.
- TPH-D was detected at concentrations of 2600, 1300, and 3100 micrograms per liter (ug/l) in the samples collected from MW-1, MW-2, and MW-3, respectively.
- TPH-MO was detected at concentrations of 1600, 1400, and 920 ug/l in the samples collected from MW-1, MW-2, MW-3, respectively.
- Total dissolved solids was detected at concentrations ranging from 478 to 7340 milligrams per liter in all the samples.



TABLE 1 - RESULTS OF GROUNDWATER SAMPLING
 PORT OF OAKLAND, OAKLAND INTERNATIONAL AIRPORT
 UNITED AIRLINES HANGAR AREA - TAXIWAY SITE
 1100 AIRPORT DRIVE, OAKLAND, CALIFORNIA

ALISTO PROJECT NUMBER 10-251

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ug/l)	TPH-JF (ug/l)	TPH-D (ug/l)	TPH-MO (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	TDS (mg/l)	LAB
MW-1	05/15/92	7.43	3.16	4.27	---	4900	---	---	1.0	1.0	2.0	6.0	2200	---
MW-1	08/07/92	7.43	3.87	3.76	220	6400	---	---	0.4	ND<0.3	1.4	3.7	---	---
MW-1	11/24/92	7.43	4.55	2.88	280	ND<50	---	---	ND<0.4	0.5	1.4	2.9	---	---
MW-1	02/11/93	7.43	1.61	5.82	ND<50	4100	---	---	ND<0.4	ND<0.3	ND<0.3	0.4	---	---
MW-1	05/17/93	7.43	3.55	3.88	ND<300	5500	---	---	ND<0.4	ND<0.3	1.0	2.4	1100	---
MW-1	08/03/93	7.43	3.47	3.96	240	---	---	---	ND<0.5	ND<0.5	0.8	2.0	1480	---
MW-1	11/19/93	7.43	3.91	3.52	160	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1520	---
MW-1	03/24/94	7.43	2.85	4.58	ND<50	1300	---	---	ND<0.5	ND<0.5	0.73	0.98	1500	---
MW-1	06/01/94	7.43	3.02	4.41	ND<50	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1200	D&M
MW-1	09/20/94	7.43	3.89	3.54	140	ND<500	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1800	D&M
MW-1	04/25/95	7.35	2.30	5.05	130	ND<50	6000	2900	ND<0.4	ND<0.3	ND<0.3	ND<0.4	760	CEC
MW-1	08/11/95	7.35	3.32	4.03	120	ND<50	2100	1700	ND<0.4	ND<0.3	ND<0.3	ND<0.4	1100	CEC
QC-1 (c)	08/11/95	---	---	---	110	---	---	---	ND<0.4	ND<0.3	ND<0.3	ND<0.4	---	CEC
MW-1	11/03/95	7.35	3.98	3.37	80	ND<50	1100	1000	ND<0.4	0.8	ND<0.3	ND<0.4	1400	CEC
QC-1 (c)	11/03/95	---	---	---	ND<50	---	---	---	ND<0.4	ND<0.3	ND<0.3	ND<0.4	---	CEC
MW-1	01/19/96	7.35	1.80	5.55	ND<50	ND<500	2600	1600	ND<0.5	ND<0.5	ND<0.5	ND<1	947	PACE
QC-1 (c)	01/19/96	---	---	---	ND<50	---	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1	---	PACE
MW-2	04/25/95	7.66	2.68	4.98	ND<50	ND<50	570	3000	ND<0.4	ND<0.3	ND<0.3	ND<0.4	340	CEC
MW-2	08/11/95	7.66	3.62	4.04	ND<50	ND<50	ND<50	430	ND<0.4	ND<0.3	ND<0.3	ND<0.4	430	CEC
MW-2	11/03/95	7.66	4.24	3.42	ND<50	ND<50	420	1200	ND<0.5	0.4	ND<0.3	ND<0.4	590	CEC
MW-2	01/19/96	7.66	1.99	5.67	ND<50	ND<500	1300	1400	ND<0.5	ND<0.5	ND<0.5	ND<1	478	PACE
MW-3	04/25/95	8.12	3.08	5.04	ND<50	ND<50	180	620	ND<0.4	ND<0.3	ND<0.3	ND<0.4	1400	CEC
QC-1 (c)	04/25/95	8.12	---	---	ND<50	---	---	---	ND<0.4	ND<0.3	ND<0.3	ND<0.4	---	CEC
MW-3	08/11/95	8.12	4.04	4.08	ND<50	ND<50	120	ND<200	ND<0.4	ND<0.3	ND<0.3	ND<0.4	5900	CEC
MW-3	11/03/95	8.12	4.75	3.37	ND<50	ND<50	260	400	ND<0.4	ND<0.3	ND<0.3	ND<0.4	3000	CEC
MW-3	01/19/96	8.12	2.78	5.34	ND<50	ND<500	3100	920	ND<0.5	ND<0.5	ND<0.5	ND<1	7340	PACE
QC-2 (d)	04/25/95	---	---	---	ND<50	---	---	---	ND<0.4	ND<0.3	ND<0.3	ND<0.4	---	CEC
QC-2 (d)	08/11/95	---	---	---	ND<50	---	---	---	ND<0.4	ND<0.3	ND<0.3	ND<0.4	---	CEC
QC-2 (d)	11/03/95	---	---	---	ND<50	---	---	---	ND<0.4	ND<0.3	ND<0.3	ND<0.4	---	CEC
QC-2 (d)	01/19/96	---	---	---	ND<50	---	---	---	ND<0.5	ND<0.5	ND<0.5	ND<1	---	PACE

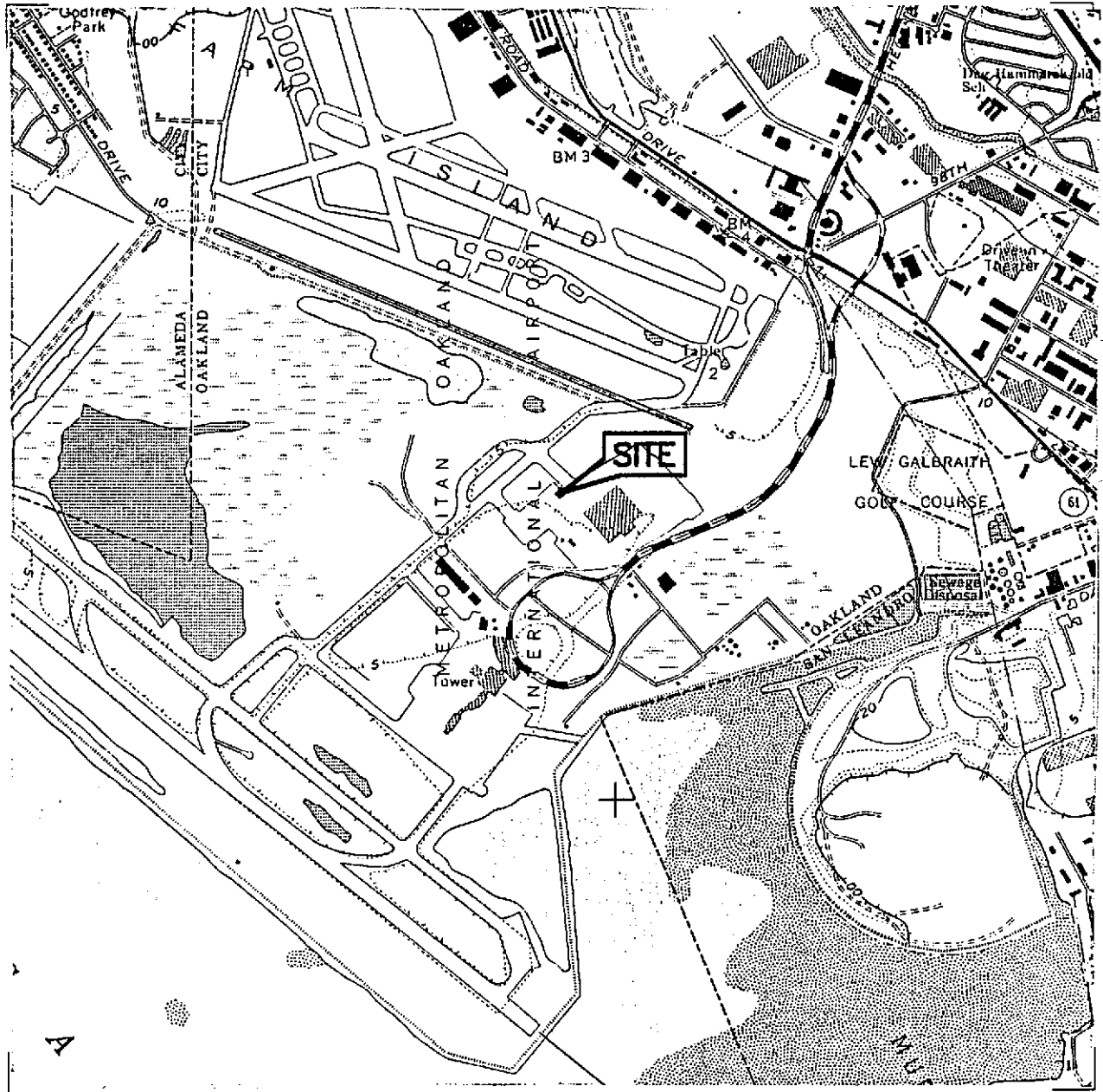
ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline using EPA Method 8015
TPH-JF	Total petroleum hydrocarbons as jet fuel using EPA Method 8015 (modified)
TPH-D	Total petroleum hydrocarbons as diesel using EPA Method 8015 (modified)
TPH-MO	Total petroleum hydrocarbons as motor oil using EPA Method 8015 (modified)
B	Benzene using EPA Method 8020
T	Toluene using EPA Method 8020
E	Ethylbenzene using EPA Method 8020
X	Total xylenes using EPA Method 8020
TDS	Total dissolved solids using EPA Method 160.1
ug/l	Micrograms per liter
mg/l	Milligrams per liter
---	Not analyzed/applicable
ND	Not detected above reported detection limit
D&M	D&M Laboratories
CEC	Clayton Environmental Consultants

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 expressed in feet above mean lower low water.
- (c) Blind duplicate.
- (d) Travel blank.

F3010-251/251-1-3.WQ2



SOURCE:
 USGS MAP, SAN LEANDRO QUADRANGLE,
 7.5 MINUTE SERIES, 1959.
 PHOTOREVISED 1980.

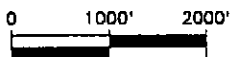


FIGURE 1

SITE VICINITY MAP

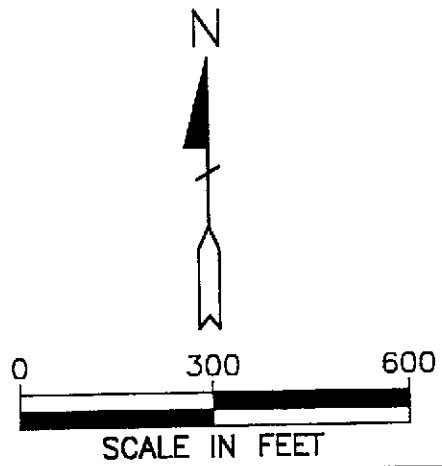
PORT OF OAKLAND,
 OAKLAND INTERNATIONAL AIRPORT
 UNITED AIRLINES HANGAR AREA—
 TAXIWAY SITE

1100 AIRPORT DRIVE
 OAKLAND, CALIFORNIA

PROJECT NO. 10-251



ALISTO ENGINEERING GROUP
 WALNUT CREEK, CALIFORNIA



LEGEND

◆ GROUNDWATER MONITORING WELL

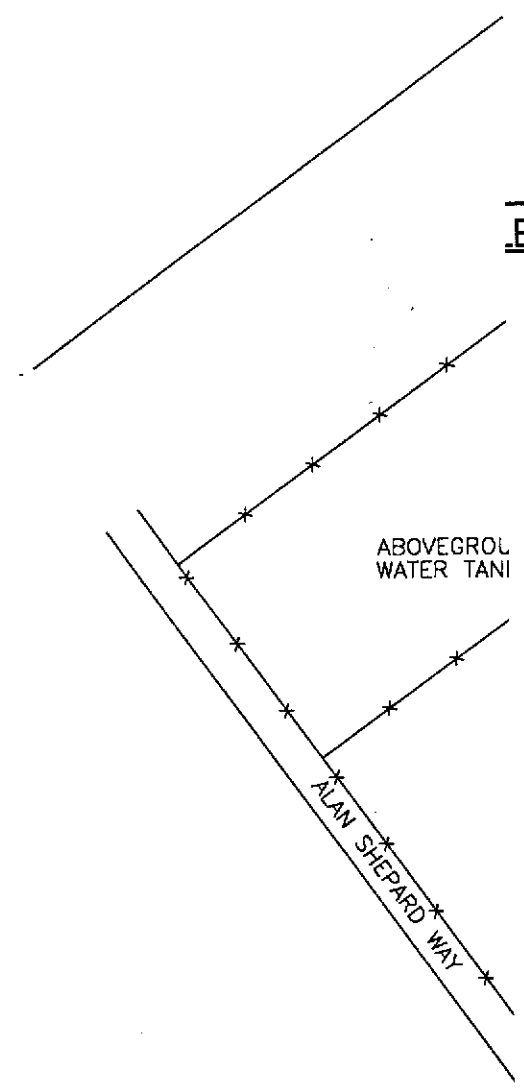


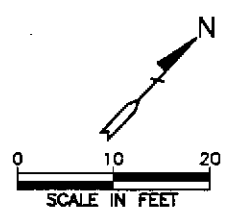
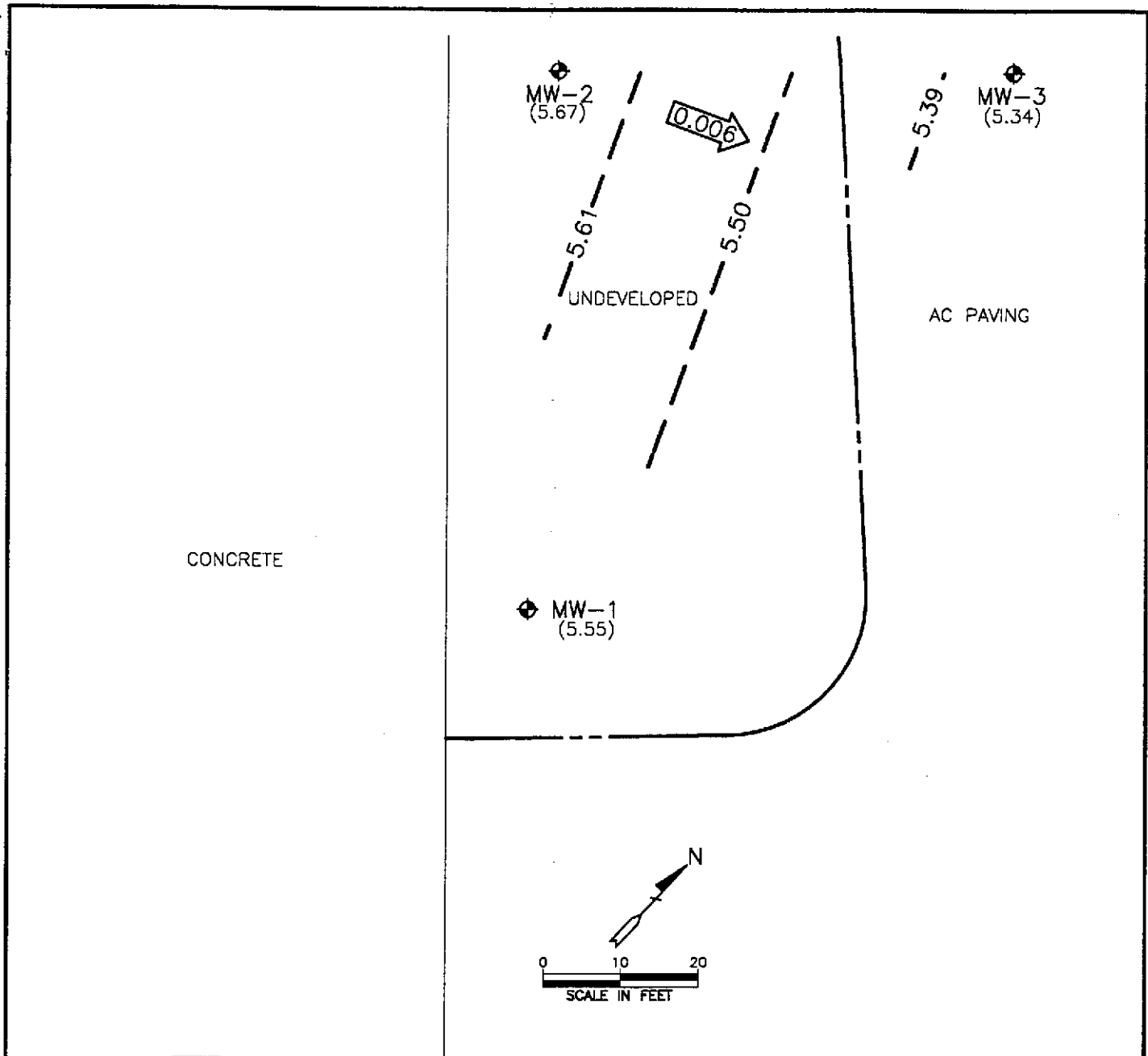
FIGURE 2

SITE PLAN

PORT OF OAKLAND,
 OAKLAND INTERNATIONAL AIRPORT
 UNITED AIRLINES HANGAR AREA—
 TAXIWAY SITE
 1100 AIRPORT DRIVE
 OAKLAND, CALIFORNIA

PROJECT NO. 10-251





LEGEND

- ◆ GROUNDWATER MONITORING WELL
- (5.34) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 5.39 - GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL-0.11 FOOT)
- ←.006→ CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 3

POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP

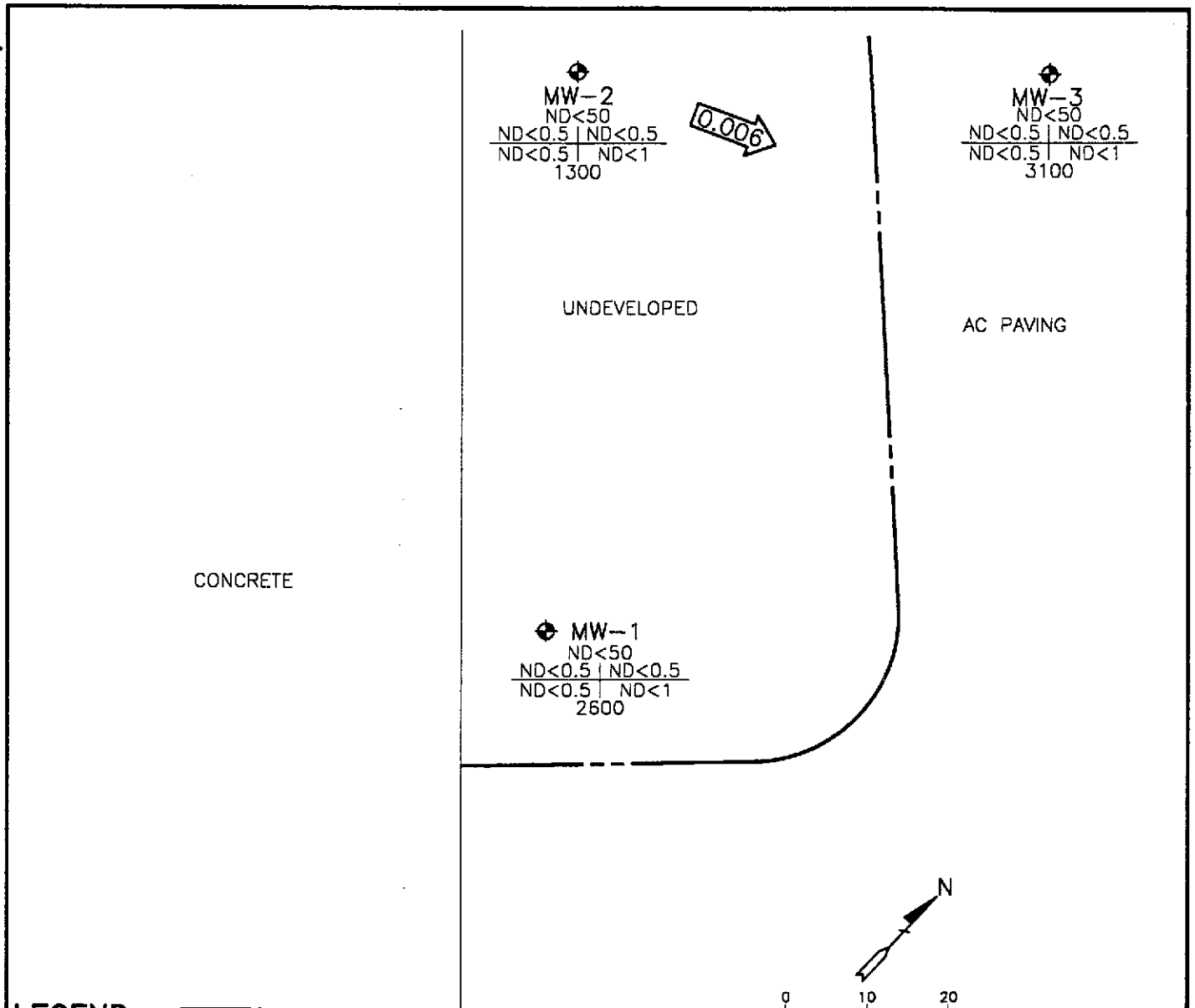
JANUARY 19, 1996

PORT OF OAKLAND,
 OAKLAND INTERNATIONAL AIRPORT
 UNITED AIRLINES HANGAR AREA-
 TAXIWAY SITE
 1100 AIRPORT DRIVE
 OAKLAND, CALIFORNIA


PROJECT NO. 10-251



ALISTO ENGINEERING GROUP
 WALNUT CREEK, CALIFORNIA



LEGEND

-  GROUNDWATER MONITORING WELL
- | | | |
|-------|---|---|
| TPH-G | B | T |
| E | X | |
| TPH-D | | |

 CONCENTRATION OF CONSTITUENTS
IN MICROGRAMS PER LITER
- | | |
|-------|--|
| TPH-G | |
| B | |
| T | |
| E | |
| X | |
| TPH-D | |
| ND | |

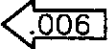
 TOTAL PETROLEUM
HYDROCARBONS AS GASOLINE
BENZENE
TOLUENE
ETHYLBENZENE
TOTAL XYLENES
TOTAL PETROLEUM
HYDROCARBONS AS DIESEL
NOT DETECTED ABOVE REPORTED
DETECTION LIMIT
-  .006
CALCULATED GROUNDWATER
GRADIENT DIRECTION AND
MAGNITUDE IN FOOT PER FOOT

FIGURE 4

**CONCENTRATIONS OF PETROLEUM
HYDROCARBONS IN GROUNDWATER**

JANUARY 19, 1996

PORT OF OAKLAND,
OAKLAND INTERNATIONAL AIRPORT
UNITED AIRLINES HANGAR AREA—
TAXIWAY SITE
1100 AIRPORT DRIVE
OAKLAND, CALIFORNIA

PROJECT NO. 10-251



ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

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 commencing 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 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 Clayton Environmental Consultants, a state-certified laboratory, following preservation and chain of custody protocol.

ALISTO

Field Report / Sampling Data Sheet

ENGINEERING
GROUP

Groundwater Sampling

Date: 11/9/96 Project No. 10-251-01-003

Day: Fri Station No. Taxiway Site

1575 TREAT BOULEVARD, SUITE 201

Weather: Overcast Address 1100 Airport Dr, Oakland CA

WALNUT CREEK CA 94596 (510) 295-1650 FAX 295-1823

SAMPLER: _____

Well ID	SAMPLE#	WATER	DEPTH	Well ID	SAMPLE #	WATER	DEPTH	Well ID	SAMPLE	WATER DEPTH
MW-3	-	2.78	1010							
MW-2	-	1.99	1016							
MW-1	-	1.80	1020							

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Thickness	Gal.	Time	Temp *F	pH	E.C.	D.O.	<input type="checkbox"/> EPA 601 _____ <input type="checkbox"/> TPH-G/BTEX _____ * Various See Col <input type="checkbox"/> TPH Diesel _____ <input type="checkbox"/> TOG 5520 _____ Time Sampled <u>1055</u>
MW-3	2.78	2"	OK	Φ	Φ	2	1037	67.0	7.31	11.47		
Total Depth - Water Level=						4	1042	66.1	7.29	9.13		
$14.58 - 2.78 = 11.80 \times 1.6 = 1.89 \times 3 = 5.66$						5.75	1047	66.1	7.27	8.34		
Purge Method: <input type="checkbox"/> Surface Pump <input type="checkbox"/> Disp. Tube <input type="checkbox"/> Winch <input checked="" type="checkbox"/> Disp. Baller(s) <input type="checkbox"/> OSys Port												
Comments: _____												

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Thickness	Gal.	Time	Temp *F	pH	E.C.	D.O.	<input type="checkbox"/> EPA 601 _____ <input type="checkbox"/> TPH-G/BTEX _____ <input type="checkbox"/> TPH Diesel _____ <input type="checkbox"/> TOG 5520 _____ Time Sampled <u>1130</u>
MW-2	1.99	2"	OK	Φ	Φ	1.5	1110	60.0	7.84	0.97		
Total Depth - Water Level=						3	1116	59.5	7.78	0.64		
$10.38 - 1.99 = 8.39 \times 1.6 = 1.34 \times 3 = 4.03$						4	1121	59.4	7.80	0.57		
Purge Method: <input type="checkbox"/> Surface Pump <input type="checkbox"/> Disp. Tube <input type="checkbox"/> Winch <input checked="" type="checkbox"/> Disp. Baller(s) <input type="checkbox"/> OSys Port												
Comments: _____												

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Thickness	Gal.	Time	Temp *F	pH	E.C.	D.O.	<input type="checkbox"/> EPA 601 _____ <input type="checkbox"/> TPH-G/BTEX _____ <input type="checkbox"/> TPH Diesel _____ <input type="checkbox"/> TOG 5520 _____ Time Sampled <u>1150</u>
MW-1	1.80	2"	OK	Φ	Φ	1	1134	61.5	7.65	1.21		
Total Depth - Water Level=						2	1138	63.3	7.60	1.32		
$8.62 - 1.80 = 6.82 \times 1.6 = 1.09 \times 3 = 3.27$						3.25	1141	63.7	7.58	1.42		
Purge Method: <input type="checkbox"/> Surface Pump <input type="checkbox"/> Disp. Tube <input type="checkbox"/> Winch <input checked="" type="checkbox"/> Disp. Baller(s) <input type="checkbox"/> OSys Port												
Comments: <u>QC-1 from this well</u>												

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Thickness	Gal.	Time	Temp *F	pH	E.C.	D.O.	<input type="checkbox"/> EPA 601 _____ <input type="checkbox"/> TPH-G/BTEX _____ <input type="checkbox"/> TPH Diesel _____ <input type="checkbox"/> TOG 5520 _____ Time Sampled
Total Depth - Water Level=												
Purge Method: <input type="checkbox"/> Surface Pump <input type="checkbox"/> Disp. Tube <input type="checkbox"/> Winch <input type="checkbox"/> Disp. Baller(s) <input type="checkbox"/> OSys Port												
Comments: _____												

calibration Hydric pit $\frac{24}{17}$ @ 1030

APPENDIX B

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

**FIELD PROCEDURES
FOR
CHAIN OF CUSTODY DOCUMENTATION**

All samples were handled in accordance with the California Department of Health Services guidelines. 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.



REPORT OF LABORATORY ANALYSIS

January 30, 1996

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

RE: PACE Project Number: 704849
Client Project ID: Port of Oakland-TAXIWAY SITE

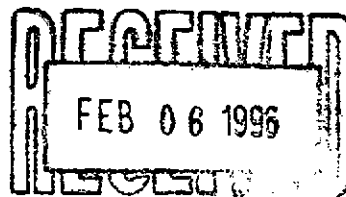
Dear Mr. Swain:

Enclosed are the results of analyses for sample(s) received on January 22, 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

DATE: 01/30/96
PAGE: 1

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

PACE Project Number: 704849
Client Project ID: Port of Oakland-TAXIWAY SITE

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

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
PACE Sample No: 70488325		Date Collected: 01/19/96						
Client Sample ID: MW-3		Date Received: 01/22/96						
Wet Chemistry								
Total Dissolved Solids								
Total Dissolved Solids	7340	mg/L	5	01/25/96	EPA 160.1	LDA		
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	01/24/96	CA LUFT	WAS		
Benzene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	71-43-2	
Toluene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	108-88-3	
Ethylbenzene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	100-41-4	
Xylene (Total)	ND	ug/L	1	01/24/96	CA LUFT	WAS	1330-20-7	
a,a,a-Trifluorotoluene (S)	94	%		01/24/96	CA LUFT	WAS	2164-17-2	
4-Bromofluorobenzene (S)	106	%		01/24/96	CA LUFT	WAS	460-00-4	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	3.1	mg/L	0.05	01/27/96	TPH by EPA 8015M	DLL		
Motor Oil	0.92	mg/L	0.25	01/27/96	TPH by EPA 8015M	DLL		
JP4	ND	mg/L	0.5	01/27/96	TPH by EPA 8015M	DLL		
n-Pentacosane (S)	112	%		01/27/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				01/24/96				



REPORT OF LABORATORY ANALYSIS

DATE: 01/30/96
PAGE: 2

PACE Project Number: 704849
Client Project ID: Port of Oakland-TAXIWAY SITE

PACE Sample No: 70488333
Client Sample ID: MW-2

Date Collected: 01/19/96
Date Received: 01/22/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Wet Chemistry								
Total Dissolved Solids								
Total Dissolved Solids	478	mg/L	5	01/25/96	EPA 160.1	LDA		
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	01/24/96	CA LUFT	WAS		
Benzene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	71-43-2	
Toluene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	108-88-3	
Ethylbenzene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	100-41-4	
Xylene (Total)	ND	ug/L	1	01/24/96	CA LUFT	WAS	1330-20-7	
a,a,a-Trifluorotoluene (S)	93	%		01/24/96	CA LUFT	WAS	2164-17-2	
4-Bromofluorobenzene (S)	103	%		01/24/96	CA LUFT	WAS	460-00-4	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	1.3	mg/L	0.05	01/27/96	TPH by EPA 8015M	DLL		1
Motor Oil	1.4	mg/L	0.25	01/27/96	TPH by EPA 8015M	DLL		
JP4	ND	mg/L	0.5	01/27/96	TPH by EPA 8015M	DLL	
n-Pentacosane (S)	122	%		01/27/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				01/24/96				



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PACE Project Number: 704849
Client Project ID: Port of Oakland-TAXIWAY SITE

PACE Sample No: 70488341
Client Sample ID: MW-1

Date Collected: 01/19/96
Date Received: 01/22/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
Wet Chemistry								
Total Dissolved Solids								
Total Dissolved Solids	947	mg/L	5	01/25/96	EPA 160.1	LDA		
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	01/24/96	CA LUFT	WAS		
Benzene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	71-43-2	
Toluene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	108-88-3	
Ethylbenzene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	100-41-4	
Xylene (Total)	ND	ug/L	1	01/24/96	CA LUFT	WAS	1330-20-7	
a,a,a-Trifluorotoluene (S)	92	%		01/24/96	CA LUFT	WAS	2164-17-2	
4-Bromofluorobenzene (S)	106	%		01/24/96	CA LUFT	WAS	460-00-4	
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	2.6	mg/L	0.05	01/27/96	TPH by EPA 8015M	DLL		
Motor Oil	1.6	mg/L	0.25	01/27/96	TPH by EPA 8015M	DLL		
JP4	ND	mg/L	0.5	01/27/96	TPH by EPA 8015M	DLL		
n-Pentacosane (S)	122	%		01/27/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				01/24/96				



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PACE Project Number: 704849
Client Project ID: Port of Oakland-TAXIWAY SITE

PACE Sample No: 70488358
Client Sample ID: QC-1

Date Collected: 01/19/96
Date Received: 01/22/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	01/24/96	CA LUFT	WAS		
Benzene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	71-43-2	
Toluene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	108-88-3	
Ethylbenzene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	100-41-4	
Xylene (Total)	ND	ug/L	1	01/24/96	CA LUFT	WAS	1330-20-7	
a,a,a-Trifluorotoluene (S)	91	%		01/24/96	CA LUFT	WAS	2164-17-2	
4-Bromofluorobenzene (S)	106	%		01/24/96	CA LUFT	WAS	460-00-4	



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PACE Project Number: 704849
Client Project ID: Port of Oakland-TAXIWAY SITE

PACE Sample No: 70488366
Client Sample ID: QC-2

Date Collected: 01/19/96
Date Received: 01/22/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	01/24/96	CA LUFT	WAS		
Benzene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	71-43-2	
Toluene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	108-88-3	
Ethylbenzene	ND	ug/L	0.5	01/24/96	CA LUFT	WAS	100-41-4	
Xylene (Total)	ND	ug/L	1	01/24/96	CA LUFT	WAS	1330-20-7	
a,a,a-Trifluorotoluene (S)	102	%		01/24/96	CA LUFT	WAS	2164-17-2	
4-Bromofluorobenzene (S)	101	%		01/24/96	CA LUFT	WAS	460-00-4	



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PACE Project Number: 704849
Client Project ID: Port of Oakland-TAXIWAY SITE

PARAMETER FOOTNOTES

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



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QUALITY CONTROL DATA

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

PACE Project Number: 704849
Client Project ID: Port of Oakland-TAXIWAY SITE

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

QC Batch ID: 11689 QC Batch Method: CA LUFT Date of Batch: 01/23/96
Associated PACE Samples: 70488325 70488333 70488341 70488358 70488366

METHOD BLANK: 70489349
Associated PACE Samples:

Parameter	Units	70488325	70488333	70488341	70488358	70488366
		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)	%	102				
4-Bromofluorobenzene (S)	%	99				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70489372 70489380

Parameter	Units	70488101	Spike	Matrix	Matrix	Spike	RPD	Footnotes
		70488101	Conc.	Spike	Sp. Dup.	Dup		
				Result	% Rec	Result	% Rec	
Benzene	ug/L	ND	100	100	105	110	108	3
Toluene	ug/L	ND	100	110	108	110	112	4
Ethylbenzene	ug/L	0.59	100	100	103	110	107	4
Xylene (Total)	ug/L	1.5	300	310	102	320	105	3
a,a,a-Trifluorotoluene (S)					108		103	
4-Bromofluorobenzene (S)					107		107	



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QUALITY CONTROL DATA

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PACE Project Number: 704849
Client Project ID: Port of Oakland-TAXIWAY SITE

LABORATORY CONTROL SAMPLE & LCSD: 70489356		70489364				Spike		
Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Benzene	ug/L	100	99	99	100	102	3	
Toluene	ug/L	100	100	103	110	106	3	
Ethylbenzene	ug/L	100	99	99	100	102	3	
Xylene (Total)	ug/L	300	290	97	300	100	3	
a,a,a-Trifluorotoluene (S)				104		105		
4-Bromofluorobenzene (S)				108		107		



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

PACE Project Number: 704849
Client Project ID: Port of Oakland-TAXIWAY SITE

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

QC Batch ID: 11720 QC Batch Method: EPA 3520
Associated PACE Samples: 70488325 70488333 70488341

Date of Batch: 01/24/96

METHOD BLANK: 70491279
Associated PACE Samples:

Parameter	Units	70488325	70488333	70488341	Footnotes
			Method Blank Result	PRL	
Diesel Fuel	mg/L		0.095	0.05	1,2
Motor Oil	mg/L		ND	0.25	
JP4	mg/L		ND	0.5	
n-Pentacosane (S)	%		94		

LABORATORY CONTROL SAMPLE & LCSD: 70491287

Parameter	Units	70491295		Spike % Rec	LCSD Result	Spike Dup		Footnotes
		Spike Conc.	LCS Result			% Rec	RPD	
Diesel Fuel	mg/L	1	0.95	95	1	100	5	
n-Pentacosane (S)				96		100		



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

PACE Project Number: 704849
Client Project ID: Port of Oakland-TAXIWAY SITE

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

QC Batch ID: 11776 QC Batch Method: EPA 160.1
Associated PACE Samples: 70488325 70488333 70488341

Date of Batch: 01/25/96

METHOD BLANK: 70493622
Associated PACE Samples:

Parameter	Units	70488325	70488333 Method Blank Result	70488341	PRL	Footnotes
Total Dissolved Solids	mg/L		ND		5	

SAMPLE DUPLICATE: 70493630

Parameter	Units	70491717	Dup. Result	RPD	Footnotes
Total Dissolved Solids	mg/L	258	257	0	



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PACE Project Number: 704849
Client Project ID: Port of Oakland-TAXIWAY SITE

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
[1] Possible laboratory contaminant.
[2] Hydrocarbons present do not match profile of laboratory standard.

