PORT OF OAKLAND

#1049

February 26, 1996

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

SUBJECT: SUBSURFACE INVESTIGATION REPORT FOR THE FORMER UNDERGROUND TANKS MF 25 AND MF 26, UNITED AIRLINES HANGER AREA - ECONOMY PARKING LOT SITE, 1100 AIRPORT DRIVE, OAKLAND, CALIFORNIA

Dear Mr. Chan:

Enclosed please find the Groundwater Sampling Report for the United Airlines Hanger Area, Economy Parking Lot Site (Former underground tanks MF 25 and MF 26) at Metropolitan Oakland International Airport, Oakland, California.

If you have any questions or need additional information, please call me at (510) 272-1118.

Sincerely,

Susa Gates

Susa Gates

cc: Neil Werner

Enclosure

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

1049

PORT OF OAKLAND

February 26, 1996

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

SUBJECT: SUBSURFACE INVESTIGATION REPORT FOR THE FORMER UNDERGROUND TANKS MF 23 AND MF 24, UNITED AIRLINES HANGER AREA- TAXIWAY SITE, 1100 AIRPORT DRIVE, OAKLAND, CALIFORNIA

Dear Mr. Chan:

Enclosed please find the Groundwater Sampling Report for the United Airlines Hanger Area, Taxiway Site (Former underground tanks MF 23 and MF 24) at Metropolitan Oakland International Airport, Oakland, California. The Port is requesting reductions in the sampling analyses performed on samples at several monitoring wells based on atleast three quarters of non detect or nearly non detect sampling results. The reductions are requested for BETX at MW-1: TPH-G, TPH-JF, and BETX at MW-2: and TPH-G, TPH-JF, and BETX at MW-3.

If you have any questions or need additional information, please call me at (510) 272-1118.

Sincerely,

Susa Gates

cc: Neil Werner

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530 Water Street ■ Jack London's Waterfront ■ P.O. Box 2064 ■ Oakland, California 94604-2064
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GROUNDWATER MONITORING AND SAMPLING REPORT

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

Project No. 10-251-01-002

Prepared for:

Port of Oakland
530 Water Street
Oakland, California

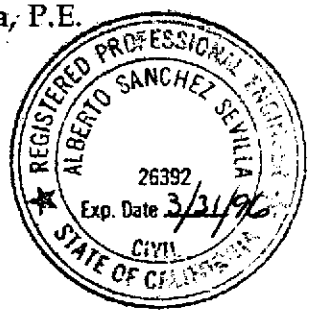
Prepared by:

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

February 21, 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

Project No. 10-251-01-002

February 21, 1996

INTRODUCTION

This report presents the results and findings of the November 3, 1995 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 in Figure 1.

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 Clayton Environmental Consultants, 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 2. The results of groundwater analysis are shown on Figure 3. 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 November 3, 1995 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 0.001 foot per foot in an easterly direction across the site.
- TPH-G was detected at a concentration of 80 micrograms per liter (ug/l) in the sample collected from Monitoring Well MW-1. Benzene, ethylbenzene, and total xylenes were not detected above the reported ~~de~~ limit in any of the wells. Toluene was detected in samples collected from MW-1 and MW-2 at concentrations of 0.8 and 0.4 ug/l.
- TPH-JF was not detected above the reported detection limit in samples collected from MW-1, MW-2, and MW-3.
- TPH-D was detected at concentrations of 1100 ug/l in the sample collected from MW-1, 420 ug/l from MW-2, and 260 ug/l from MW-3.
- TPH-MO was detected at concentrations of 1000 ug/l in the sample collected from MW-1, 1200 ug/l from MW-2, and 400 ug/l from MW-3.
- Total dissolved solids was detected at concentrations ranging from 590 to 3000 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	8.0	2200	---
MW-1	08/07/92	7.43	3.67	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	1600	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-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<0.4	0.4	ND<0.3	ND<0.4	590	CEC
MW-3	04/25/95	8.12	3.08	5.04	ND<50	ND<50	160	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
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

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:

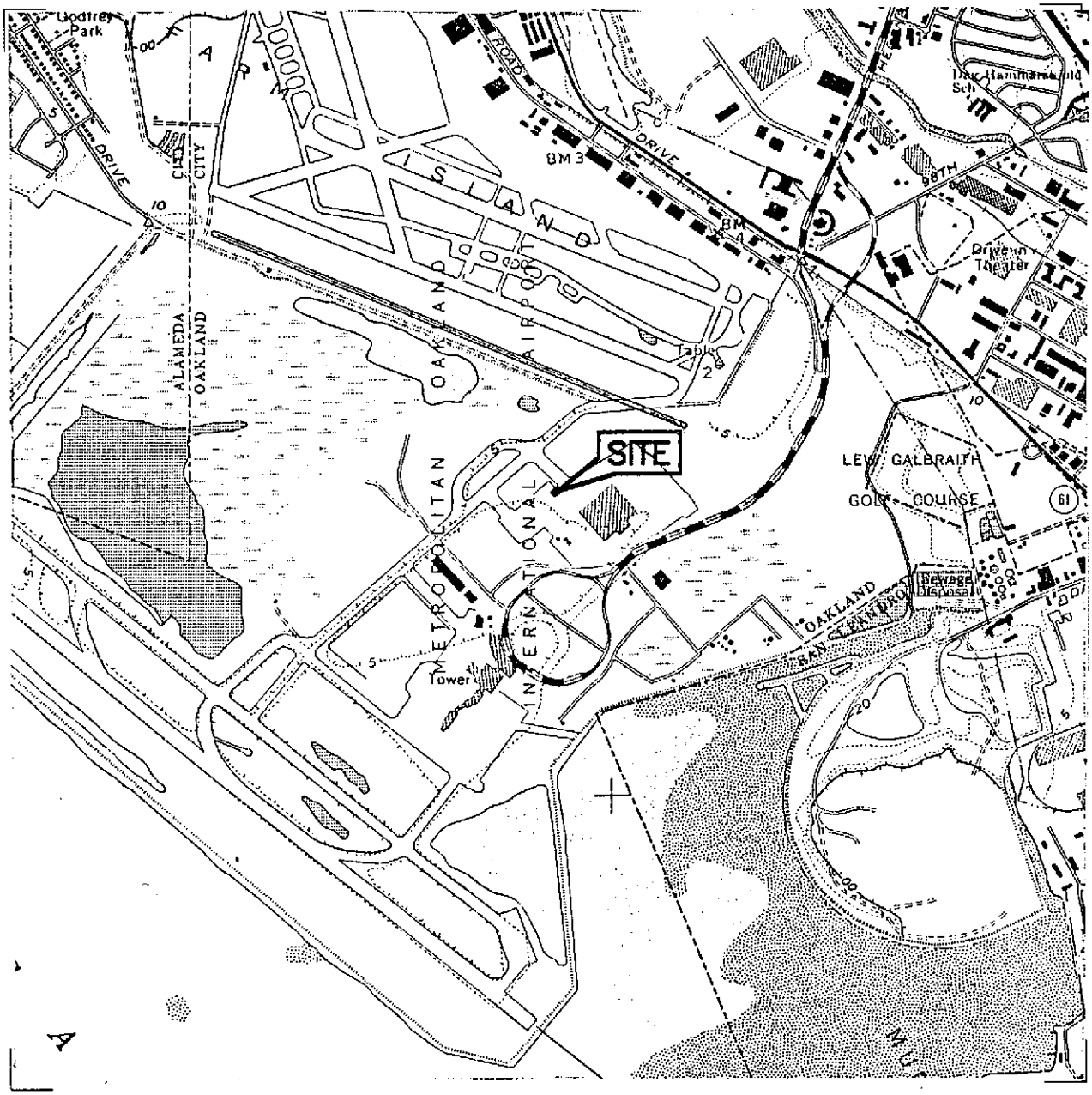
(a) Top of casing elevations surveyed to the nearest 0.01 foot relative to mean lower low water (3.2 feet below mean sea level, Port of Oakland Datum).

(b) Groundwater elevations expressed in feet above mean lower low water.

(c) Blind duplicate.

(d) Travel blank.

F:\0\10-251\251-1-2.WQ2



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

N

0 1000' 2000'

FIGURE 1

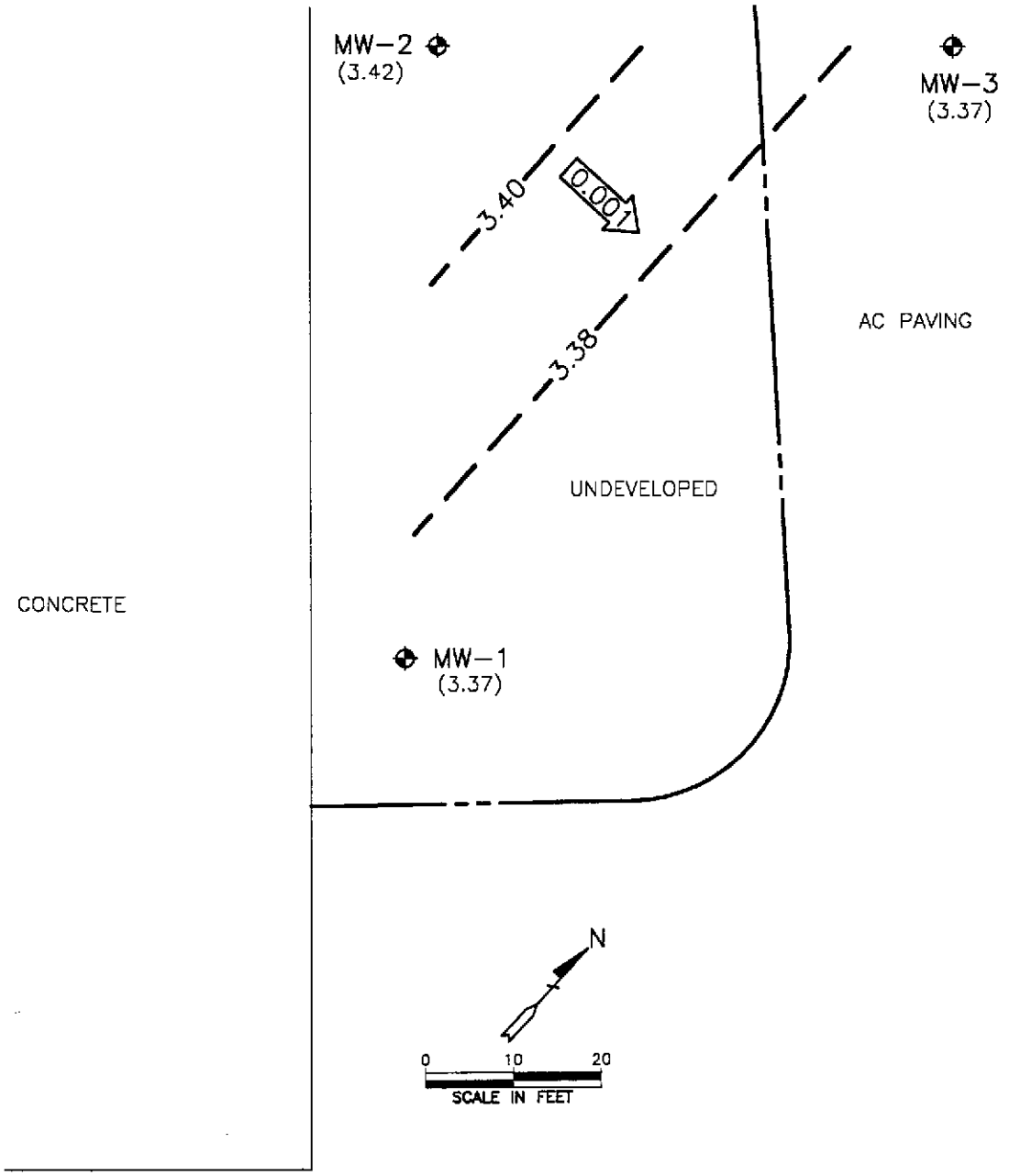
SITE VICINITY MAP

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

10251B---DWG 3-8-93 RKW 1=1



LEGEND

⊕	GROUNDWATER MONITORING WELL
(3.37)	GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
3.38	GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL–0.02 FOOT)
0.001	CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 2

POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP

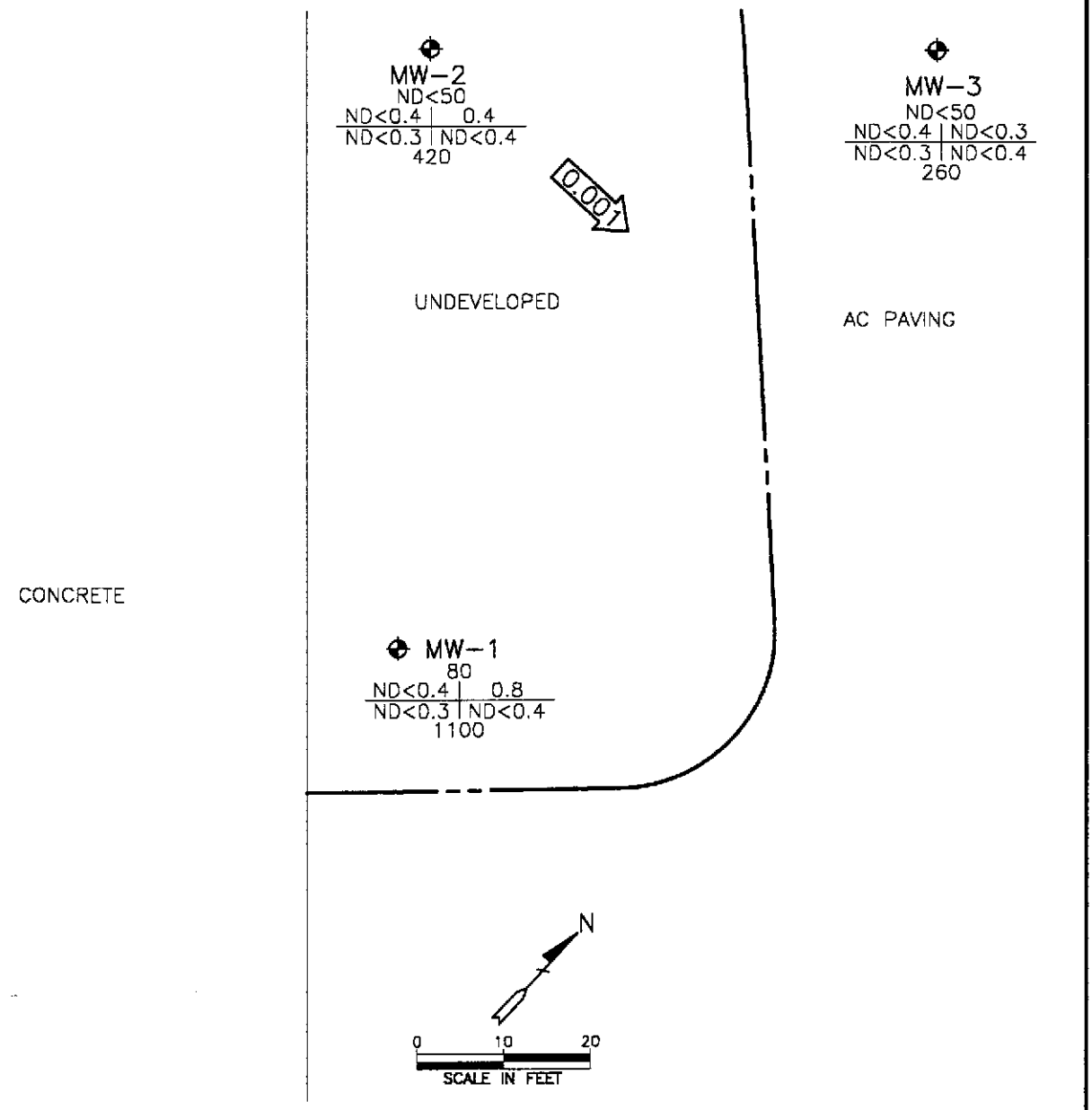
NOVEMBER 3, 1995

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

102510-P.DWG 1-17-98 RKW 1=20



LEGEND

⊕	GROUNDWATER MONITORING WELL
TPH-G / B | T / E | X / TPH-D	CONCENTRATION OF CONSTITUENTS IN MICROGRAMS PER LITER
TPH-G	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES
TPH-D	TOTAL PETROLEUM HYDROCARBONS AS DIESEL
ND	NOT DETECTED ABOVE REPORTED DETECTION LIMIT
0.001	CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER

NOVEMBER 3, 1995

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

10251F-P.DWG 1-17-96 RKW 1=20

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

ENGINEERING GROUP

1575 TREAT BOULEVARD, SUITE 201

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

Field Report / Sampling Data Sheet

☒ Groundwater Sampling

Date: 11/3/95 Project No. 10-251-R2-007

Day: Fri Station No. Taxiway Side

Weather: Sunny Address 1160 Airport Dr, Oakland CA

SAMPLER: DC

Well ID	SAMPLE#	WATER DEPTH	Well ID	SAMPLE #	WATER DEPTH	Well ID	SAMPLE	WATER DEPTH
mw-3	—	4.75'						
mw-2	—	4.24'						
mw-1	—	3.98'						

Well ID: mw-3 — Depth to Water: 4.75 | Diam: 2" | Cap/Lock: OK | Product Depth: Ø | Thickness: Ø

Total Depth - Water Level= 14.59 − 4.75 = 9.84 | x Well Vol. Factor= x16 | = 1.57 | x#vol. to Purge= x3 | = 4.72 | PurgeVol.

Purge Method: OSurface Pump ODisp.Tube OWinch ~~ODisp. Baller(s)~~ 1 OSys Port

Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.
1.5	1208	73.9	7.35	0.85	
3	1210	73.8	7.33	0.97	
4.75	1214	73.5	7.30	0.98	

O EPA 601 ____ *Various see COC
O TPH-G/BTEX ____
O TPH Diesel ____
O TOG 5520 ____

Time Sampled: 1224

Well ID: mw-2 — Depth to Water: 4.24 | Diam: 2" | Cap/Lock: OK | Product Depth: Ø | Thickness: Ø

Total Depth - Water Level= 10.38 − 4.24 = 6.14 | x Well Vol. Factor= x.16 | = 0.98 | x#vol. to Purge= x3 | = 2.95 | PurgeVol.

Purge Method: OSurface Pump ODisp.Tube OWinch ~~ODisp. Baller(s)~~ 1 OSys Port

Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.
1	1232	70.9	7.52	0.99	
2	1235	71.4	7.47	0.98	
3	1238	71.6	7.42	0.98	

O EPA 601 ____
O TPH-G/BTEX ____
O TPH Diesel ____
O TOG 5520 ____

Time Sampled: 1244

Well ID: mw-1 — Depth to Water: 3.98' | Diam: 2" | Cap/Lock: OK | Product Depth: Ø | Thickness: Ø

Total Depth - Water Level= 8.62 − 3.98 = 4.64 | x Well Vol. Factor= x.16 | = 0.74 | x#vol. to Purge= x3 | = 2.23 | PurgeVol.

Purge Method: OSurface Pump ODisp.Tube OWinch ~~ODisp. Baller(s)~~ 1 OSys Port

Comments: QC-1 from this well

Gal.	Time	Temp °F	pH	E.C.	D.O.
1	1259	72.3	7.25	2.11	
2	1304	71.9	7.39	2.07	
2.25	1305	71.9	7.38	2.07	

O EPA 601 ____
O TPH-G/BTEX ____
O TPH Diesel ____
O TOG 5520 ____

Time Sampled: 1315

Well ID: ____ — Depth to Water: ____ | Diam: ____ | Cap/Lock: ____ | Product Depth: ____ | Thickness: ____

Total Depth - Water Level= | x Well Vol. Factor= | x#vol. to Purge= | PurgeVol.

Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Baller(s)___ OSys Port

Comments:

Gal.	Time	Temp °F	pH	E.C.	D.O.

O EPA 601 ____
O TPH-G/BTEX ____
O TPH Diesel ____
O TOG 5520 ____

Time Sampled:

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.

Western Operations

1252 Quarry Lane
P.O. Box 9019
Pleasanton, CA 94566
(510) 426-2600
Fax (510) 426-0106

Clayton
ENVIRONMENTAL
CONSULTANTS

November 22, 1995

Mr. Brady Nagle
ALISTO ENGINEERING GROUP
1575 Treat Blvd., Suite 201
Walnut Creek, CA 94598

Client Ref.: 10-251-02-002
Clayton Project No.: 95111.14

Dear Mr. Nagle:

Attached is our analytical laboratory report for the samples received on November 8, 1995. Following the cover letter is the Quality Control Narrative detailing sample information/problems and a summary of the quality control issues. Also enclosed is a copy of the Chain-of-Custody record acknowledging receipt of these samples.

Please note that any unused portion of the samples will be discarded after December 22, 1995, unless you have requested otherwise.

We appreciate the opportunity to assist you. If you have any questions concerning this report, please contact Suzanne Haus, Client Services Supervisor, at (510) 426-2657.

Sincerely,

Harriotte A. Hurley, CIH
Director, Laboratory Services
San Francisco Regional Office

HAH/tjb

Attachments

QUALITY CONTROL NARRATIVE
for
Alisto Engineering Group
Client Reference: 10-251-02-002
Clayton Project No. 95111.14

Sample Information/Problems:

There were no problems with sample receipt.

Analytical Problems:

No problems were encountered with the sample analyses.

Quality Control:

The quality control data is summarized in the Quality Assurance Data Package, which follows the analytical report.

- MS/MSD: A matrix spike and matrix spike duplicate were analyzed where applicable, and all results were acceptable.
- LCS/LCSD: A laboratory control spike and duplicate were analyzed where applicable, and all results were acceptable.
- ICV/CCV: Response for all analytes met Clayton acceptance criteria.
- Surrogate Recovery: All surrogate recoveries were acceptable. The surrogate recoveries, where applicable are listed on the sample result pages.

Analytical Results
for
Alisto Engineering Group
Client Reference: 10-251-02-002
Clayton Project No. 95111.14

Sample Identification:	MW-3 1224	Date Sampled:	11/03/95
Lab Number:	9511114-01A	Date Received:	11/08/95
Sample Matrix/Media:	WATER	Date Prepared:	11/15/95
Preparation Method:	EPA 5030	Date Analyzed:	11/15/95
Method Reference:	EPA 8015/8020	Analyst:	FAK

Analyte	CAS #	Concentration (ug/L)	Method Detection Limit (ug/L)
BTEX/Gasoline			
Benzene	71-43-2	ND	0.4
Ethylbenzene	100-41-4	ND	0.3
Toluene	108-88-3	ND	0.3
o-Xylene	95-47-6	ND	0.4
p,m-Xylenes	--	ND	0.4
Gasoline	--	ND	50
Surrogates		Recovery (%)	QC Limits (%)
a,a,a-Trifluorotoluene	98-08-8	103	50 - 150

ND: Not detected at or above limit of detection
--: Information not available or not applicable

Analytical Results
for
Alisto Engineering Group
Client Reference: 10-251-02-002
Clayton Project No. 95111.14

Sample Identification:	MW-2 1244	Date Sampled:	11/03/95
Lab Number:	9511114-02A	Date Received:	11/08/95
Sample Matrix/Media:	WATER	Date Prepared:	11/14/95
Preparation Method:	EPA 5030	Date Analyzed:	11/15/95
Method Reference:	EPA 8015/8020	Analyst:	FAK

Analyte	CAS #	Concentration (ug/L)	Method Detection Limit (ug/L)
BTEX/Gasoline			
Benzene	71-43-2	ND	0.4
Ethylbenzene	100-41-4	ND	0.3
Toluene	108-88-3	0.4	0.3
o-Xylene	95-47-6	ND	0.4
p,m-Xylenes	--	ND	0.4
Gasoline	--	ND	50
Surrogates		Recovery (%)	QC Limits (%)
a,a,a-Trifluorotoluene	98-08-8	98	50 - 150

ND: Not detected at or above limit of detection
--: Information not available or not applicable

Analytical Results
for
Alisto Engineering Group
Client Reference: 10-251-02-002
Clayton Project No. 95111.14

Sample Identification:	MW-1 1315	Date Sampled:	11/03/95
Lab Number:	9511114-03A	Date Received:	11/08/95
Sample Matrix/Media:	WATER	Date Prepared:	11/14/95
Preparation Method:	EPA 5030	Date Analyzed:	11/15/95
Method Reference:	EPA 8015/8020	Analyst:	FAK

Analyte	CAS #	Concentration (ug/L)	Method Detection Limit (ug/L)
BTEX/Gasoline			
Benzene	71-43-2	ND	0.4
Ethylbenzene	100-41-4	ND	0.3
Toluene	108-88-3	0.8	0.3
o-Xylene	95-47-6	ND	0.4
p,m-Xylenes	--	ND	0.4
Gasoline	--	80	50
Surrogates		Recovery (%)	QC Limits (%)
a,a,a-Trifluorotoluene	98-08-8	92	50 - 150

ND: Not detected at or above limit of detection
--: Information not available or not applicable

Analytical Results
for
Alisto Engineering Group
Client Reference: 10-251-02-002
Clayton Project No. 95111.14

Sample Identification:	QC-1	Date Sampled:	11/03/95
Lab Number:	9511114-04A	Date Received:	11/08/95
Sample Matrix/Media:	WATER	Date Prepared:	11/15/95
Preparation Method:	EPA 5030	Date Analyzed:	11/15/95
Method Reference:	EPA 8015/8020	Analyst:	FAK

Analyte	CAS #	Concentration (ug/L)	Method Detection Limit (ug/L)
BTEX/Gasoline			
Benzene	71-43-2	ND	0.4
Ethylbenzene	100-41-4	ND	0.3
Toluene	108-88-3	ND	0.3
o-Xylene	95-47-6	ND	0.4
p,m-Xylenes	--	ND	0.4
Gasoline	--	ND	50
Surrogates		Recovery (%)	QC Limits (%)
a,a,a-Trifluorotoluene	98-08-8	106	50 - 150

ND: Not detected at or above limit of detection
--: Information not available or not applicable

Analytical Results
for
Alisto Engineering Group
Client Reference: 10-251-02-002
Clayton Project No. 95111.14

Sample Identification:	QC-2	Date Sampled:	11/03/95
Lab Number:	9511114-05A	Date Received:	11/08/95
Sample Matrix/Media:	WATER	Date Prepared:	11/15/95
Preparation Method:	EPA 5030	Date Analyzed:	11/15/95
Method Reference:	EPA 8015/8020	Analyst:	FAK

Analyte	CAS #	Concentration (ug/L)	Method Detection Limit (ug/L)
BTEX/Gasoline			
Benzene	71-43-2	ND	0.4
Ethylbenzene	100-41-4	ND	0.3
Toluene	108-88-3	ND	0.3
o-Xylene	95-47-6	ND	0.4
p,m-Xylenes	--	ND	0.4
Gasoline	--	ND	50
Surrogates		Recovery (%)	QC Limits (%)
a,a,a-Trifluorotoluene	98-08-8	97	50 - 150

ND: Not detected at or above limit of detection
--: Information not available or not applicable

Analytical Results
for
Alisto Engineering Group
Client Reference: 10-251-02-002
Clayton Project No. 95111.14

Sample Identification:	METHOD BLANK	Date Sampled:	--
Lab Number:	9511114-06A	Date Received:	--
Sample Matrix/Media:	WATER	Date Prepared:	11/15/95
Preparation Method:	EPA 5030	Date Analyzed:	11/15/95
Method Reference:	EPA 8015/8020	Analyst:	FAK

Analyte	CAS #	Concentration (ug/L)	Method Detection Limit (ug/L)
BTEX/Gasoline			
Benzene	71-43-2	ND	0.4
Ethylbenzene	100-41-4	ND	0.3
Toluene	108-88-3	ND	0.3
o-Xylene	95-47-6	ND	0.4
p,m-Xylenes	--	ND	0.4
Gasoline	--	ND	50
Surrogates		Recovery (%)	QC Limits (%)
a,a,a-Trifluorotoluene	98-08-8	103	50 - 150

ND: Not detected at or above limit of detection
--: Information not available or not applicable

Analytical Results
for
Alisto Engineering Group
Client Reference: 10-251-02-002
Clayton Project No. 95111.14

Sample Identification: See Below
Lab Number: 9511114
Sample Matrix/Media: WATER
Extraction Method: EPA 3510
Method Reference: EPA 8015 (Modified)

Date Received: 11/08/95
Date Extracted: 11/09/95
Date Analyzed: 11/14/95

Lab Number	Sample Identification	Date Sampled	Jet Fuel (ug/L)	Method Detection Limit (ug/L)
-01	MW-3 1224	11/03/95	ND	50
-02	MW-2 1244	11/03/95	ND	50
-03	MW-1 1315	11/03/95	ND	50
-06	METHOD BLANK	--	ND	50

ND: Not detected at or above limit of detection
--: Information not available or not applicable

Jet Fuel = Extractable petroleum hydrocarbons in the range of C8 to C16 matching the typical Jet Fuel pattern.

Analytical Results
for
Alisto Engineering Group
Client Reference: 10-251-02-002
Clayton Project No. 95111.14

Sample Identification: See Below
Lab Number: 9511114
Sample Matrix/Media: WATER
Extraction Method: EPA 3510
Method Reference: EPA 8015 (Modified)

Date Received: 11/08/95
Date Extracted: 11/09/95
Date Analyzed: 11/14/95

Lab Number	Sample Identification	Date Sampled	TPH-D (ug/L)		Method Detection Limit (ug/L)
-01	MW-3 1224	11/03/95	260	a	50
-02	MW-2 1244	11/03/95	420	a	50
-03	MW-1 1315	11/03/95	1100	a	50
-06	METHOD BLANK	--	ND		50

ND: Not detected at or above limit of detection
--: Information not available or not applicable

TPH-D = Extractable petroleum hydrocarbons from C10 to C20 quantitated as diesel.
a Unidentified hydrocarbons present in diesel range; quantitation based on diesel.

Analytical Results
for
Alisto Engineering Group
Client Reference: 10-251-02-002
Clayton Project No. 95111.14

Sample Identification: See Below
Lab Number: 9511114
Sample Matrix/Media: WATER
Preparation Method: EPA 3510
Method Reference: EPA 8015 (Modified)

Date Received: 11/08/95
Date Extracted: 11/09/95
Date Analyzed: 11/14/95

Lab Number	Sample Identification	Date Sampled	TPH-O (ug/L)		Method Detection Limit (ug/L)
-01	MW-3 1224	11/03/95	400	a	200
-02	MW-2 1244	11/03/95	1200	a	200
-03	MW-1 1315	11/03/95	1000	a	200
-06	METHOD BLANK	--	ND		200

ND: Not detected at or above limit of detection
--: Information not available or not applicable

TPH-O = Extractable petroleum hydrocarbons from C20 to C42 quantitated as motor oil.
a Unidentified hydrocarbons present in oil range; quantitation based on oil.

Analytical Results
for
Alisto Engineering Group
Client Reference: 10-251-02-002
Clayton Project No. 95111.14

Sample Identification: See Below
Lab Number: 9511114
Sample Matrix/Media: WATER
Method Reference: EPA 160.1

Date Received: 11/08/95
Date Analyzed: 11/10/95

Lab Number	Sample Identification	Date Sampled	Total Dissolved Solids (mg/L)	Method Detection Limit (mg/L)
-01	MW-3 1224	11/03/95	3000	10
-02	MW-2 1244	11/03/95	590	10
-03	MW-1 1315	11/03/95	1400	10
-06	METHOD BLANK	--	<10	10

ND: Not detected at or above limit of detection
--: Information not available or not applicable

Clayton
ENVIRONMENTAL
CONSULTANTS

Quality Assurance Results Summary

Matrix Spike/Matrix Spike Duplicate Results

for

Clayton Project No. 95111.14

Quality Assurance Results Summary - Matrix Spike/Matrix Spike Duplicate
for
Clayton Project No. 95111.14

Clayton Lab Number:	9511059-LCS	Analytical Method:	EPA 8015
Ext./Prep. Method:	EPA 3510	Instrument ID:	02893
Date:	11/09/95	Date:	11/13/95
Analyst:	MBN	Time:	21:01
Std. Source:	E951025-01W	Analyst:	GUD
Sample Matrix/Media:	WATER	Units:	UG/L
		QC Batch No:	95110965

Analyte	Sample Result	Spike Level	Matrix Spike Result	MS Recovery (%)	Matrix Spike Duplicate Result	MSD Recovery (%)	Average Recovery (% R)	LCL (% R)	UCL (% R)	RPD (%)	UCL (%RPD)
DIESEL	ND	1,000	1,010	101	1,040	104	103	65	128	3.0	25

ND = Not detected at or above limit of detection
SOR = Spike out of range due to high sample concentration.

LCL = Lower Control Limit

UCL = Upper Control Limit

Quality Assurance Results Summary - Matrix Spike/Matrix Spike Duplicate
for
Clayton Project No. 95111.14

Clayton Lab Number:	9511098-LCS	Analytical Method:	EPA 8015
Ext./Prep. Method:	EPA 3510	Instrument ID:	02893
Date:	11/10/95	Date:	11/14/95
Analyst:	MBN	Time:	15:41
Std. Source:	E951025-01W	Analyst:	GUD
Sample Matrix/Media:	WATER	Units:	UG/L
		QC Batch No:	95111068

Analyte	Sample Result	Spike Level	Matrix Spike Result	MS Recovery (%)	Matrix Spike Duplicate Result	MSD Recovery (%)	Average Recovery (% R)	LCL (% R)	UCL (% R)	RPD (%)	UCL (%RPD)
DIESEL	ND	1,000	1,030	103	931	93	98	65	128	10	25

ND = Not detected at or above limit of detection
SOR = Spike out of range due to high sample concentration.

LCL = Lower Control Limit

UCL = Upper Control Limit

Quality Assurance Results Summary - Matrix Spike/Matrix Spike Duplicate
for
Clayton Project No. 95111.14

Clayton Lab Number:	9511113-01A	Analytical Method:	EPA 8015/8020
Ext./Prep. Method:	EPA 5030	Instrument ID:	05587
Date:	11/14/95	Date:	11/14/95
Analyst:	FAK	Time:	16:09
Std. Source:	V951109-02W	Analyst:	DTL
Sample Matrix/Media:	WATER	Units:	ug/L
		QC Batch No:	95111421

Analyte		Sample Result	Spike Level	Matrix Spike Result	MS Recovery (%)	Matrix Spike Duplicate Result	MSD Recovery (%)	Average Recovery (% R)	LCL (% R)	UCL (% R)	RPD (%)	UCL (%RPD)
BENZENE	(PID)	0.401	4.20	4.43	96	4.48	97	96	79	125	1.1	20
ETHYLBENZENE	(PID)	ND	5.74	5.69	99	5.78	101	100	91	123	1.6	20
GASOLINE	(FID)	ND	500	550	110	566	113	112	80	120	2.9	25
TOLUENE	(PID)	0.405	25.8	25.5	98	26.1	100	99	84	118	2.1	20
TOTAL XYLENE	(PID)	ND	37.7	36.8	98	37.4	99	98	85	115	1.6	20

ND = Not detected at or above limit of detection
SOR = Spike out of range due to high sample concentration.

LCL = Lower Control Limit

UCL = Upper Control Limit

Clayton ENVIRONMENTAL CONSULTANTS

REQUEST FOR LABORATORY ANALYTICAL SERVICES

For Clayton Use Only	Page 1 of 1
Project No.	10-251-02-002
Batch No.	9511114
Ind. Code	W.P.
Date Logged In	By

REPORT RESULTS TO

Name: Brady Nagle | Title: Project manager
Company: AMSTO Engineers | Dept.:
Mailing Address: 1575 Treat Blvd
City, State, Zip: Walnut Creek CA 94598
Telephone No.: (510) 255 1650 | Telefax No.: (510) 255 1820

Purchase Order No.: | Client Job No.: 10-251-02-002

SEND INVOICE TO

Name:
Company: Port of Oakland | Dept.:
Address: 530 Water St
City, State, Zip: Oakland CA 94607

Date Results Req.: | Rush Charges Authorized? ☐ Yes ☒ No | Phone / Fax Results ☐ ☒

Special Instructions: (method, limit of detection, etc.)

* Explanation of Preservative: *P" = HCl

Samples are: (check if applicable)
☐ Drinking Water
☐ Collected in the State of New York

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request; Enter a 'P' if Preservative added. *)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MATRIX/ MEDIA	AIR VOLUME (specify units)	Number of Containers	TPH 6015 Bext	TPH Quantified as Diesel and Motor Oil	TDS	FOR LAB USE ONLY
MW-3 1224	11/3/95	H2O	2 gl 40ml vocs 2 gl 1 pl 125ml	5	X *P"	X *P"	X	-01 A-E
MW-2 1244	↓	↓	↓	5	↓	X	X	-02 ↓
MW-1 1315	↓	↓	4 gl 40ml vocs 1 pl 125ml	5	↓	X	X	-03 A-G
QC-1 -	↓	↓	1 gl 40ml 1 gl 1L	2	↓	↓	↓	-04 A BK
QC-2 -	↓	↓	2 gl 40ml vocs	2	↓	↓	↓	-05 ↓

CHAIN OF CUSTODY

Collected by: Dave Lisak (print) | Collector's Signature:
Relinquished by: | Date/Time 11/8 1000 | Received by: Bob Black | Date/Time 11-8-95 10:00
Relinquished by: Bob Black | Date/Time 11-8-95 3:00pm | Received at Lab by: Tonya Black | Date/Time 11/8/95 3:00pm
Method of Shipment:
Sample Condition Upon Receipt: ☐ Acceptable ☐ Other (explain)

Authorized by: _____ Date _____
(Client Signature Must Accompany Request)

Please return completed form and samples to one of the Clayton Environmental Consultants, Inc. labs listed below:

22345 Roethel Drive Novi, MI 48375 (810) 344-1770	Raritan Center 160 Fieldcrest Ave. Edison, NJ 08837 (908) 225-6040	400 Chastain Center Blvd., N.W. Suite 490 Kennesaw, GA 30144 (404) 499-7500	1252 Quarry Lane Pleasanton, CA 94566 (510) 426-2657

2/92

DISTRIBUTION:
WHITE - Clayton Laboratory
YELLOW - Clayton Accounting
PINK - Client Retains