PORT OF OAKLAND

December 9, 1993

Ms. Jennifer Eberle
Hazardous Materials Division
Department of Environmental Health
Alameda County Health Services Agency
80 Swan Way, Room 200
Oakland, CA 94621

SUBJECT: American President Lines (APL), Berth 60-63, Port of Oakland, Oakland, California

Dear Ms. Eberle:

Enclosed, you will find a copy of the letter report of the third quaterly groundwater sampling, American President Lines Terminal, 1395 Middle Harbor Road, Port of Oakland, Oakland, California. The third quaterly sampling took place on 19 August 1993. The report was completed by Geomatrix Consultants for the Port of Oakland.

Four Underground Storage Tanks (USTs), two diesel, one gasoline and one waste oil, were removed from this site between 6 January and 4 March 1992. The sampling and analysis for this report was conducted in accordance with the workplan prepared by Geomatrix dated October 1992.

Please call me at (510)-272-1184 if you have any comments or questions.

Sincerely,

Jon Amdur
Environmental Scientist

cc w/report: Mr. Rich Hiett, SFRWQCB, 2101 Webster Street, 5th Floor, Oakland, CA 94612

cc w/o report: Neil Werner (Environmental Department)

enclosure\

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

4721 Tidewater Avenue, Suite C
Oakland, CA 94614
(510) 535-2445 • FAX (510) 535-2408

GEOMATRIX

30 November 1993
Project No. 2026

Mr. Jon Amdur
Port of Oakland
530 Water Street
Oakland, California 94607

Subject: Groundwater Sampling
American President Lines Terminal
1395 Middle Harbor Road
Port of Oakland
Oakland, California

Dear Mr. Amdur:

This letter report presents the results of the third quarterly groundwater sampling event performed by Geomatrix Consultants, Inc. (Geomatrix) on 19 August 1993 at the American President Lines Terminal (APL), 1395 Middle Harbor Road, at the Port of Oakland (Port; Figure 1). The work was conducted in accordance with our October 1992 Work Plan and in response to the 13 November 1992 Alameda County Health Care Services Agency letter to the Port.

For the quarterly monitoring program, Geomatrix performed water-level measurements and groundwater sampling. These activities and the results are described below.

WATER-LEVEL MEASUREMENTS

Geomatrix measured water levels in the three shallow groundwater monitoring wells (Figure 2) on 19 August 1993 before groundwater was sampled. Water levels were measured to the nearest 0.01 foot using a steel tape. The measurements were used to calculate water-level elevations at each of the wells; the elevations are shown on Figure 2.

Water-level elevations on 19 August 1993 ranged from 6.27 to 6.34 feet Mean Lower Low Water (MLLW; Port datum). The water-level elevations are slightly lower than those measured during the previous quarter. The horizontal gradient, as in previous quarters, is very flat; horizontal flow direction during this sampling event would appear to be to the northwest, as opposed to southwest in previous quarters.

GROUNDWATER SAMPLING

Geomatrix collected groundwater samples from the three on-site monitoring wells on 19 August 1993 (Figure 2). All equipment used in the wells was washed with a laboratory-grade detergent (Alconox) and rinsed with deionized water. Prior to sampling, the wells were purged using a Teflon bailer. To obtain groundwater representative of the aquifer screened by the well, the wells were purged until the temperature, pH, and specific conductance of the purged groundwater stabilized and at least four casing volumes had been removed. Groundwater purged from the site was contained in a labeled 55-gallon drum which is being temporarily stored on site.

After the wells were purged, groundwater samples were collected from the approximate mid-point of the screened interval using a disposable bailer. The samples were decanted from the bailer directly into the appropriate containers. The samples were labeled and placed in an ice-cooled chest for delivery under Geomatrix chain-of-custody to Curtis and Tompkins, Ltd. (Curtis and Tompkins) of Berkeley, California, a state-certified analytical laboratory retained by the Port. A copy of the chain-of-custody record is included in Attachment A.

Groundwater samples were analyzed by Curtis and Tompkins for total petroleum hydrocarbons as gasoline (TPHg) by modified United States Environmental Protection Agency (EPA) Method 8015; total petroleum hydrocarbons as diesel (TPHd) by EPA Method 8015; total oil and grease (TOG) by Standard Method 5520C and F; halogenated volatile organic compounds (VOCs) by EPA Method 8010; benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8020; and total dissolved solids (TDS) by EPA Method 160.1. A copy of the analytical laboratory report is included in Attachment A.

ANALYTICAL RESULTS

The analytical results are summarized in Tables 1 and 2 (attached). TPHd was detected in the groundwater samples from monitoring wells MW-2 and MW-3 at concentrations of 620 and 840 micrograms per liter (μg/l), respectively; these wells have been downgradient of the tank excavation during previous sampling events. 1,2-dichlorobenzene (1,2-DCB) and 1,4-dichlorobenzene (1,4-DCB) were detected in the groundwater samples from MW-2 at concentrations of 1.0 and 3.0 μg/l, respectively. The groundwater sample from MW-3 contained 1,4-DCB at a concentration of 1.0 μg/l. The groundwater sample from MW-

1, upgradient of the former tank excavation during previous sampling events, contained TPHd and TPHg at concentrations of 2,300 and 60 µg/l, respectively. Benzene was detected in the groundwater sample from MW-1 at a concentration of 9.0 µg/l. 1,1-dichloroethane (1,1-DCA) and 1,1-dichloroethene (1,1-DCE) were detected in the groundwater sample from MW-1 at concentrations of 2.0 µg/l each. TDS were reported at concentrations of 2,600, 18,800, and 20,300 milligrams per liter (mg/l) in the groundwater samples from MW-1, MW-2, and MW-3, respectively.

The analytical results for the groundwater samples are generally consistent with the previous results.

The fourth quarterly sampling event was performed in November 1993. If you have any questions or require further information, please contact either of the undersigned.

Sincerely yours,

GEOMATRIX CONSULTANTS, INC.

Elizabeth K. Wells

Elizabeth K. Wells, P.E.
Project Engineer

Sally E. Goodin

Sally E. Goodin, R.G.
Senior Geologist

EKW/SEG/slr
2026\2026QTR3.LTR

Attachments: Tables (2)
Figures (2)
Attachment A - Chain-of-Custody Record and Analytical Laboratory Report

GEOMATRIX

TABLE 1

SUMMARY OF COMPOUNDS DETECTED IN GROUNDWATER SAMPLES

American President Lines Terminal
1395 Middle Harbor Road
Port of Oakland
Oakland, California

Concentrations in parts per billion (µg/l)

Well No.	Date	TPH as Gasoline	TPH as Diesel	Total Oil and Grease	Benzene	Toluene	Ethylbenzene	Total Xylenes	EPA Method 8010
MW-1	2/5/93	1,800	4,700	5,000	9.2	1.6	8.9	2.7	1,1-DCA 0.8
	5/11/93	260	4,800	7,000	3.2	2.3	0.7	0.5	1,1-DCA 0.6
	8/19/93	60	2,300	ND	9.0	ND	ND	ND	1,1-DCA 2.0 1,1-DCE 2.0
MW-2	2/5/93	ND	840	2,000	ND	ND	ND	ND	ND
	5/11/93	ND	3,700	ND	ND	ND	ND	ND	ND
	8/19/93	ND	620	ND	ND	ND	ND	ND	1,4-DCB 3.0 1,2-DCB 1.0
MW-3	2/5/93	ND	3,400	2,000	2.1	0.9	1.7	3.1	Cis-1,2-DCE 0.4
	5/11/93	ND	3,300	ND	ND	ND	ND	ND	ND
	8/19/93	ND	840	ND	ND	ND	ND	ND	1,4-DCB 1.0

Notes:

[1] Samples collected by Geomatrix Consultants, Inc. and analyzed by Curtis & Tomkins, Ltd., of Berkeley, California, for TPH as gasoline by modified EPA Method 8015; TPH as diesel by EPA Method 8015; total oil and grease by Standard Method 5520 C and F; benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8020; and halogenated volatile organic compounds by EPA Method 8010.

[2] TPH = total petroleum hydrocarbons
ND = not detected at or above detection limit
DCA = dichloroethane
DCE = dichloroethene
DCB = dichlorobenzene

GEOMATRIX

TABLE 2

TOTAL DISSOLVED SOLIDS IN GROUNDWATER SAMPLES

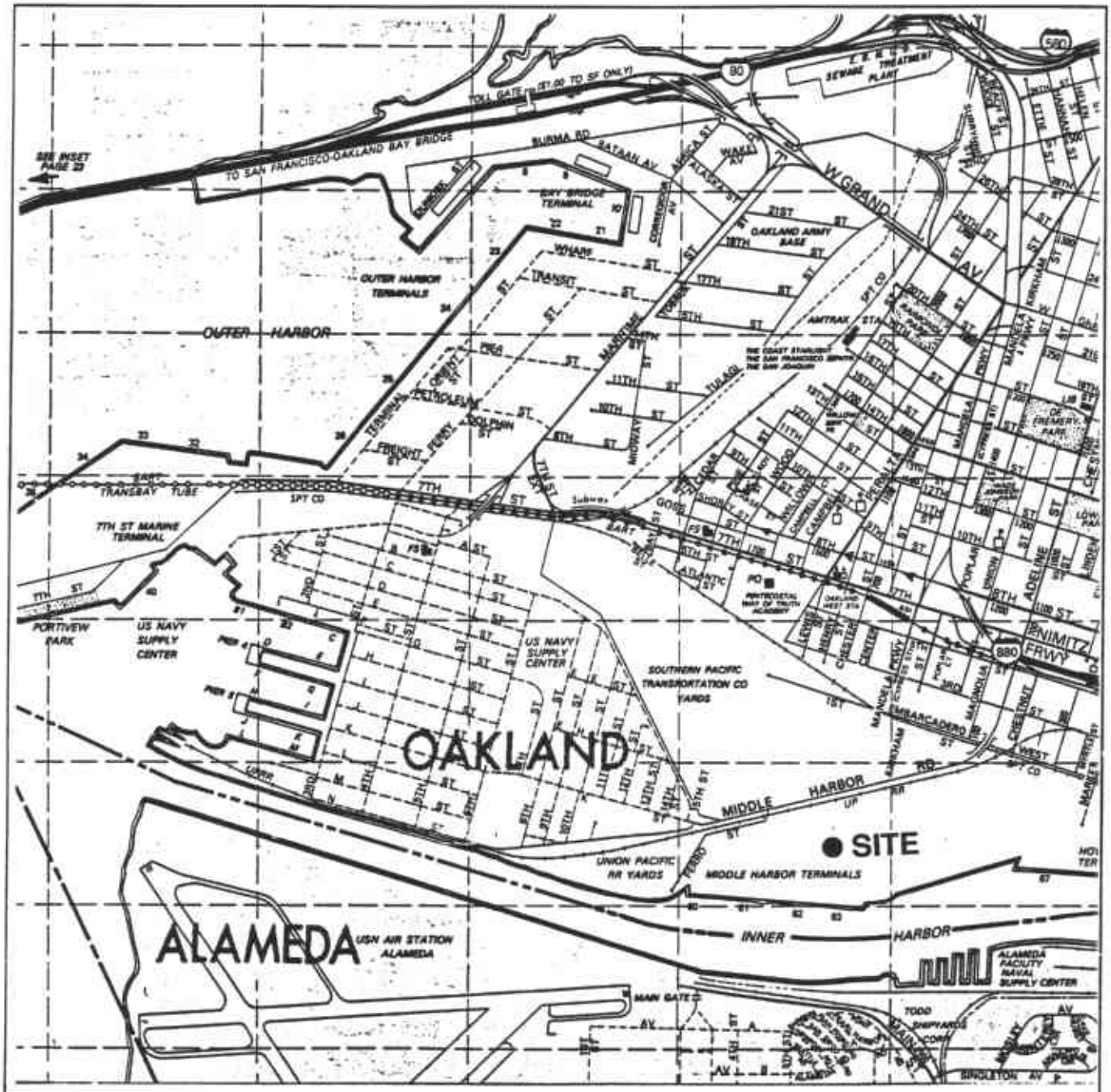
American President Lines Terminal
1395 Middle Harbor Road
Port of Oakland
Oakland, California

Concentrations in parts per million (mg/l)

Well No.	Date	Total Dissolved Solids
MW-1	2/5/93	3,000
	5/11/93	12,000
	8/19/93	2,680
MW-2	2/5/93	23,000
	5/11/93	12,000
	8/19/93	18,880
MW-3	2/5/93	1,600
	5/11/93	7,200
	8/19/93	20,300

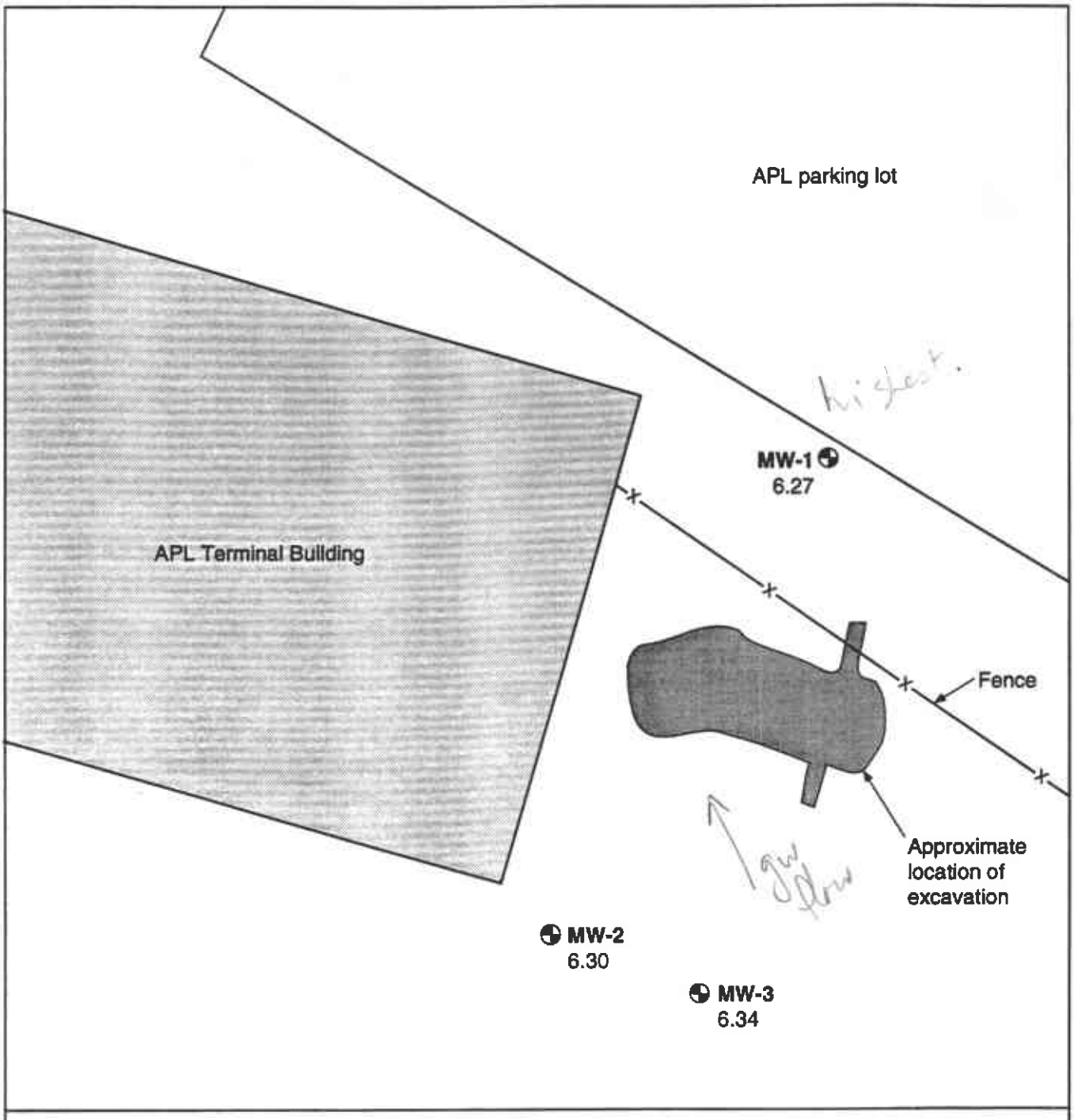
Note:

1. Samples collected by Geomatrix Consultants, Inc., and analyzed by Curtis & Tomkins, Ltd., for total dissolved solids (TDS) by EPA Method 160.1.



Reference: Thomas Brothers Maps
Alameda County
1990

GEOMATRIX	SITE LOCATION MAP American President Lines Terminal 1395 Middle Harbor Road Oakland, California	Figure 1 Project No. 2026



EXPLANATION

MW-2 Monitoring well

6.30 Water-level elevation, in feet

0 50 Feet

Based on figure provided by the Port of Oakland.

Elevations referenced to Mean Lower Low Water Port Datum.

GEOMATRIX

WATER-LEVEL ELEVATIONS – 19 AUGUST 1993
American President Lines Terminal
1395 Middle Harbor Road
Oakland, California

Figure 2

Project No. 2026

GEOMATRIX

ATTACHMENT A

Chain-of-Custody Record
and
Analytical Laboratory Report

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L R E P O R T

Prepared for:

Geomatrix Consultants
100 Pine Street
10th Floor
San Francisco, CA 94111

Date: 02-SEP-93
Lab Job Number: 111975
Project ID: 2026
Location: Port of Oakland

Reviewed by: _____

Reviewed by: _____

Curtis & Tompkins, Ltd.

Client: Geomatrix Consultants

Laboratory Login Number: 111975

Project Name: Port of Oakland
Project Number: 2026

Report Date: 02 September 93

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **METHOD: SMWW 17:5520BF**

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
111975-001	MW-1	Water	19-AUG-93	20-AUG-93	31-AUG-93	ND	mg/L	5	TR	10374
111975-002	MW-2	Water	19-AUG-93	20-AUG-93	31-AUG-93	ND	mg/L	5	TR	10374
111975-003	MW-3	Water	19-AUG-93	20-AUG-93	31-AUG-93	ND	mg/L	5	TR	10374

ND = Not Detected at or above Reporting Limit (RL).

Curtis & Tompkins, Ltd.

QC Batch Report

Client: PRC Environmental Management
Project Name: Mare Island
Project Number: 044-0144IRRII0

Laboratory Login Number: 111944
Report Date: 02 September 93

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **QC Batch Number: 10374**

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	5	mg/L	SMWW 17:5520BF	31-AUG-93

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	84%	SMWW 17:5520BF	31-AUG-93
BSD	82%	SMWW 17:5520BF	31-AUG-93

		Control Limits
Average Spike Recovery	83%	80% - 120%
Relative Percent Difference	3.2%	< 20%

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 111975
CLIENT: GEOMATRIX CONSULTANTS
PROJECT ID: 2026
LOCATION: PORT OF OAKLAND

DATE SAMPLED: 08/19/93
DATE RECEIVED: 08/20/93
DATE ANALYZED: 08/24/93
DATE REPORTED: 09/02/93

Total Volatile Hydrocarbons as Gasoline in Aqueous Solutions
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	TVH AS GASOLINE (ug/L)	REPORTING LIMIT (ug/L)
111975-1	MW-1	60	50
111975-2	MW-2	ND	50
111975-3	MW-3	ND	50

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	<1
RECOVERY, %	100

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 111975
CLIENT: GEOMATRIX CONSULTANTS
PROJECT ID: 2026
LOCATION: PORT OF OAKLAND

DATE SAMPLED: 08/19/93
DATE RECEIVED: 08/20/93
DATE ANALYZED: 08/25/93
DATE REPORTED: 09/02/93

ANALYSIS: TOTAL DISSOLVED SOLIDS
ANALYSIS METHOD: EPA 160.1

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
111975-1	MW-1	2680	mg/L	20
111975-2	MW-2	18,800	mg/L	100
111975-3	MW-3	20,300	mg/L	100

QA/QC SUMMARY:

RPD, %	<1

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 111975-1
CLIENT: GEOMATRIX CONSULTANTS
PROJECT ID: 2026
LOCATION: PORT OF OAKLAND
SAMPLE ID: MW-1

DATE SAMPLED: 08/19/93
DATE RECEIVED: 08/20/93
DATE ANALYZED: 08/25/93
DATE REPORTED: 09/02/93

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L		REPORTING LIMIT ug/L
Chloromethane	ND		2
Bromomethane	ND		2
Vinyl chloride	ND		2
Chloroethane	ND		2
Methylene chloride	ND		20
Trichlorofluoromethane	ND		1
1,1-Dichloroethene	ND		1
1,1-Dichloroethane		2	1
cis-1,2-Dichloroethene		2	1
trans-1,2-Dichloroethene	ND		1
Chloroform	ND		1
Freon 113	ND		1
1,2-Dichloroethane	ND		1
1,1,1-Trichloroethane	ND		1
Carbon tetrachloride	ND		1
Bromodichloromethane	ND		1
1,2-Dichloropropane	ND		1
cis-1,3-Dichloropropene	ND		1
Trichloroethene	ND		1
1,1,2-Trichloroethane	ND		1
trans-1,3-Dichloropropene	ND		1
Dibromochloromethane	ND		1
Bromoform	ND		2
Tetrachloroethene	ND		1
1,1,2,2-Tetrachloroethane	ND		1
Chlorobenzene	ND		1
1,3-Dichlorobenzene	ND		1
1,4-Dichlorobenzene	ND		1
1,2-Dichlorobenzene	ND		1

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

SURROGATE RECOVERY, %	102

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 111975-1
CLIENT: GEOMATRIX CONSULTANTS
PROJECT ID: 2026
LOCATION: PORT OF OAKLAND
SAMPLE ID: MW-1

DATE SAMPLED: 08/19/93
DATE RECEIVED: 08/20/93
DATE ANALYZED: 08/25/93
DATE REPORTED: 09/02/93

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	9	1
Toluene	ND	1
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

SURROGATE RECOVERY, %	102

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 111975-2
CLIENT: GEOMATRIX CONSULTANTS
PROJECT ID: 2026
LOCATION: PORT OF OAKLAND
SAMPLE ID: MW-2

DATE SAMPLED: 08/19/93
DATE RECEIVED: 08/20/93
DATE ANALYZED: 08/25/93
DATE REPORTED: 09/02/93

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
Chloromethane	ND	2
Bromomethane	ND	2
Vinyl chloride	ND	2
Chloroethane	ND	2
Methylene chloride	ND	20
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
cis-1,2-Dichloroethene	ND	1
trans-1,2-Dichloroethene	ND	1
Chloroform	ND	1
Freon 113	ND	1
1,2-Dichloroethane	ND	1
1,1,1-Trichloroethane	ND	1
Carbon tetrachloride	ND	1
Bromodichloromethane	ND	1
1,2-Dichloropropane	ND	1
cis-1,3-Dichloropropene	ND	1
Trichloroethene	ND	1
1,1,2-Trichloroethane	ND	1
trans-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Bromoform	ND	2
Tetrachloroethene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
Chlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	3	1
1,2-Dichlorobenzene	1	1

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

SURROGATE RECOVERY, %	100

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 111975-2
CLIENT: GEOMATRIX CONSULTANTS
PROJECT ID: 2026
LOCATION: PORT OF OAKLAND
SAMPLE ID: MW-2

DATE SAMPLED: 08/19/93
DATE RECEIVED: 08/20/93
DATE ANALYZED: 08/25/93
DATE REPORTED: 09/02/93

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1
Toluene	ND	1
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	3	1
1,2-Dichlorobenzene	1	1

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

SURROGATE RECOVERY, %	101

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 111975-3
CLIENT: GEOMATRIX CONSULTANTS
PROJECT ID: 2026
LOCATION: PORT OF OAKLAND
SAMPLE ID: MW-3

DATE SAMPLED: 08/19/93
DATE RECEIVED: 08/20/93
DATE ANALYZED: 08/26/93
DATE REPORTED: 09/02/93

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
Chloromethane	ND	2
Bromomethane	ND	2
Vinyl chloride	ND	2
Chloroethane	ND	2
Methylene chloride	ND	20
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
cis-1,2-Dichloroethene	ND	1
trans-1,2-Dichloroethene	ND	1
Chloroform	ND	1
Freon 113	ND	1
1,2-Dichloroethane	ND	1
1,1,1-Trichloroethane	ND	1
Carbon tetrachloride	ND	1
Bromodichloromethane	ND	1
1,2-Dichloropropane	ND	1
cis-1,3-Dichloropropene	ND	1
Trichloroethene	ND	1
1,1,2-Trichloroethane	ND	1
trans-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Bromoform	ND	2
Tetrachloroethene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
Chlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	1	1
1,2-Dichlorobenzene	ND	1

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

SURROGATE RECOVERY, %	101

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 111975-3
CLIENT: GEOMATRIX CONSULTANTS
PROJECT ID: 2026
LOCATION: PORT OF OAKLAND
SAMPLE ID: MW-3

DATE SAMPLED: 08/19/93
DATE RECEIVED: 08/20/93
DATE ANALYZED: 08/26/93
DATE REPORTED: 09/02/93

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1
Toluene	ND	1
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	1	1
1,2-Dichlorobenzene	ND	1

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

SURROGATE RECOVERY, %	101

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 111975-METHOD BLANK
CLIENT: GEOMATRIX CONSULTANTS
PROJECT ID: 2026
LOCATION: PORT OF OAKLAND

DATE ANALYZED: 08/25/93
DATE REPORTED: 09/02/93

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
Chloromethane	ND	2
Bromomethane	ND	2
Vinyl chloride	ND	2
Chloroethane	ND	2
Methylene chloride	ND	20
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
1,1-Dichloroethane	ND	1
cis-1,2-Dichloroethene	ND	1
trans-1,2-Dichloroethene	ND	1
Chloroform	ND	1
Freon 113	ND	1
1,2-Dichloroethane	ND	1
1,1,1-Trichloroethane	ND	1
Carbon tetrachloride	ND	1
Bromodichloromethane	ND	1
1,2-Dichloropropane	ND	1
cis-1,3-Dichloropropene	ND	1
Trichloroethene	ND	1
1,1,2-Trichloroethane	ND	1
trans-1,3-Dichloropropene	ND	1
Dibromochloromethane	ND	1
Bromoform	ND	2
Tetrachloroethene	ND	1
1,1,2,2-Tetrachloroethane	ND	1
Chlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

SURROGATE RECOVERY, %	100

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 111975-METHOD BLANK
CLIENT: GEOMATRIX CONSULTANTS
PROJECT ID: 2026
LOCATION: PORT OF OAKLAND

DATE ANALYZED: 08/25/93
DATE REPORTED: 09/02/93

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1
Toluene	ND	1
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

SURROGATE RECOVERY, %	100

Curtis & Tompkins, Ltd.

MS/MSD SUMMARY SHEET FOR EPA 8010/8020

Laboratory Number: 111975
Sample type: Water
Date Analyzed: 08/26/93
Spike file: 237E017
Spike dup file: 237E018

8010 MS/MSD DATA (spiked at 20 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
1,1-Dichloroethene	20.2	101 %	OK	61 - 145
Trichloroethene	19.4	97 %	OK	71 - 120
Chlorobenzene	20.8	104 %	OK	75 - 130
SPIKE DUP COMPOUNDS				
1,1-Dichloroethene	19.9	100 %	OK	61 - 145
Trichloroethene	19.3	97 %	OK	71 - 120
Chlorobenzene	21.3	107 %	OK	75 - 130
SURROGATES				
BROMOBENZENE (MS)	99.6	100 %	OK	75 - 125
BROMOBENZENE (MSD)	101.0	101 %	OK	75 - 125

8020 MS/MSD DATA (spiked at 20 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
Benzene	20.3	102 %	OK	76 - 127
Toluene	21.1	106 %	OK	76 - 125
Chlorobenzene	21.0	105 %	OK	75 - 130
SPIKE DUP COMPOUNDS				
Benzene	20.1	101 %	OK	76 - 127
Toluene	20.9	105 %	OK	76 - 125
Chlorobenzene	20.9	105 %	OK	75 - 130
SURROGATES				
BROMOBENZENE (MS)	100.0	100 %	OK	75 - 125
BROMOBENZENE (MSD)	99.7	100 %	OK	75 - 125

MATRIX RESULTS

1,1-Dichloroethene	0
Trichloroethene	0
Chlorobenzene	0
Benzene	0
Toluene	0
Chlorobenzene	0

RPD DATA

8010 COMPOUNDS	SPIKE	SPIKE DUP	RPD	STATUS	LIMITS
1,1-Dichloroethene	20.20	19.90	1 %	OK	<= 14
Trichloroethene	19.40	19.30	1 %	OK	<= 14
Chlorobenzene	20.80	21.30	2 %	OK	<= 13
8020 COMPOUNDS					
Benzene	20.30	20.10	1 %	OK	<= 11
Toluene	21.10	20.90	1 %	OK	<= 13
Chlorobenzene	21.00	20.90	0 %	OK	<= 13

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 111975
CLIENT: GEOMATRIX CONSULTANTS
PROJECT ID: 2026
LOCATION: PORT OF OAKLAND

DATE SAMPLED: 08/19/93
DATE RECEIVED: 08/20/93
DATE EXTRACTED: 08/25/93
DATE ANALYZED: 08/27/93
DATE REPORTED: 09/02/93

Extractable Petroleum Hydrocarbons in Aqueous Solutions
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
111975-1	MW-1	**	2,300	60
111975-2	MW-2	**	620	50
111975-3	MW-3	**	840	50

** Kerosene range not reported due to overlap of hydrocarbon ranges.

* Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	4
RECOVERY, %	91

111975

Chain-of-Custody Record

№ 4017

Date: 8/19/93

Page 1 of 1

Project No.: 2026

Samplers (Signatures): [signature]

Date	Time	Sample Number	EPA Method 8010	EPA Method 8020	EPA Method 8240	EPA Method 8270	TPH as gasoline	TPH as diesel	TPH as BTEX	TOG 5520 C/F	TDS 160.1	Cooled	Soil (S) or water (W)	Acidified	Number of containers
8/19	1015	MW-1	X	X			X	X		X	X	X	W	X	9
↓	1200	MW-2	X	X			X	X		X	X	X	W	X	9
↓	1315	MW-3	X	X			X	X		X	X	X	W	X	9

REMARKS

Additional comments

Copy of results to Dan Schwenholz at Port of Oakland

Port of Oakland work order #201476

Turnaround time: Normal

Results to: James Abitz

Total No. of containers: 27

Relinquished by:	Date:	Relinquished by:	Date:	Relinquished by:	Date:	Method of shipment:
Signature: [signature]	8/20/93	DON JOHNSTON Signature: [signature]	8/20/93	Signature:		Pick up.
Printed name: JAMES ABITZ		Printed name:		Printed name:		Laboratory comments and Log No.:
Company: GEOMATRIX		Company: EXPRESS-IT		Company:		
Received by:	Time:	Received by: Teresa Morrison	Time:	Received by:	Time:	
Signature: [signature]	1050	Signature: TERESA MORRISON	8/20 12:55	Signature:		
Printed name: John ADAMS		Printed name: Curtis Tompkins		Printed name:		
Company: Express-it		Company:		Company:		

Geomatrix Consultants
100 Pine St. 10th Floor
San Francisco, CA. 94111
(415) 434-9400