PORT OF OAKLAND

July 15, 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 second quaterly groundwater sampling, American President Lines Terminal, 1395 Middle Harbor Road, Port of Oakland, Oakland, California. The second quaterly sampling took place on 11 May 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\

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

GEOMATRIX

9 July 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 second quarterly groundwater sampling event performed by Geomatrix Consultants, Inc. (Geomatrix) on 11 May 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 11 May 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 11 May 1993 ranged from 6.79 to 7.08 feet Mean Lower Low Water (MLLW; Port datum). The water-level elevations are similar to those measured during the previous quarter. The direction of the horizontal gradient was southwesterly, toward the Oakland Inner Harbor; this gradient is consistent with that of the previous quarter.

GROUNDWATER SAMPLING

Geomatrix collected groundwater samples from the three on-site monitoring wells on 11 May 1993 (Figure 2). All equipment used in the wells was washed with a laboratory-grade

detergent (Alconox) and rinsed with deionized water. Before being sampled, 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 were 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 Clayton Environmental Consultants (Clayton), of Pleasanton, 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 Clayton 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). The only compounds detected in the groundwater samples from monitoring wells MW-2 and MW-3, downgradient of the tank excavation, was TPHd at concentrations of 3,700 and 3,300 micrograms per liter (μg/l), respectively. The groundwater sample from MW-1 contained TPHd, TPHg, and TOG at concentrations of 4,800, 260, and 7,000 μg/l, respectively. BTEX were detected in the groundwater sample from MW-1 at concentrations of 3.2, 2.3, 0.7, and 0.5 μg/l, respectively. The only VOC detected in the sample from MW-1 was 1,1-dichloroethane (1,1-DCA) at a concentration of 0.8 μg/l. TDS were reported at concentrations of 12,000, 12,000, and 7,200 milligrams per liter (mg/l) in the groundwater samples from MW-1, MW-2, and MW-3, respectively.

The analytical data of the groundwater samples are consistent with the previous results which indicated generally higher concentrations in the upgradient well.

why?

The next quarterly sampling event will be performed in August 1993. If you have any questions of require further information, please contact either of the undersigned.

Sincerely yours,

GEOMATRIX CONSULTANTS, INC.

Elizabeth K. Wells, P.E.
Project Engineer

Sally E. Goodin, R.G.
Senior Geologist

EKW/SEG/lam
2026\2026GS.LTR

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

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	[redacted]	2.3	0.7	0.5	1,1-DCA 0.6
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
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

Notes:

1. Samples collected by Geomatrix Consultants, Inc. and analyzed by Clayton Environmental Consultants of Pleasanton, 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

* weathered gasoline
+ heavier HCs

GEOMATRIX

TABLE 2

TOTAL DISSOLVED SOLIDS IN GROUNDWATER SAMPLES

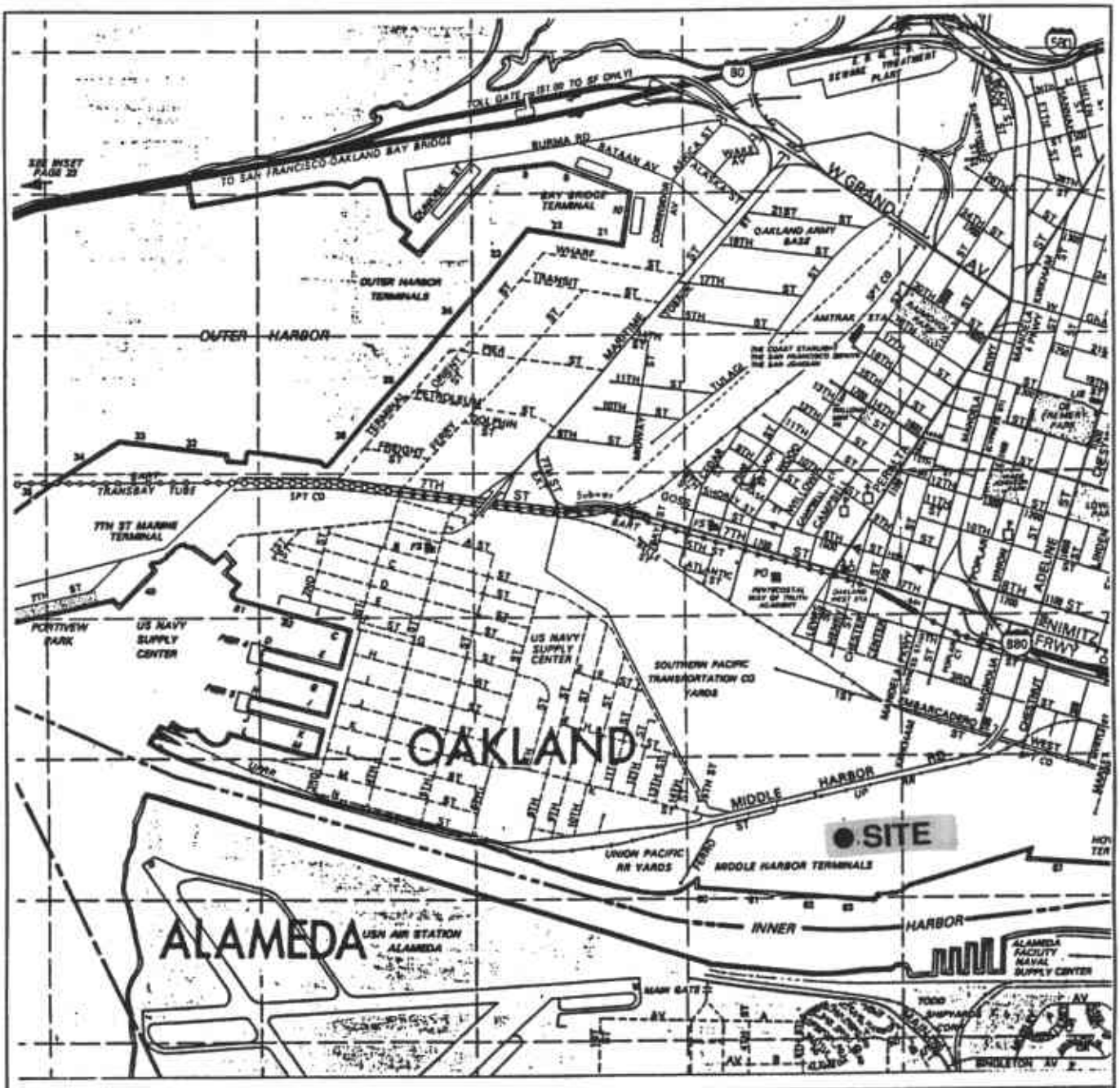
American President Lines Terminal
1395 Middle Harbor Road
Port of Oakland
Oakland, California

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
MW-2	2/5/93	23,000
	5/11/93	12,000
MW-3	2/5/93	1,600
	5/11/93	7,200

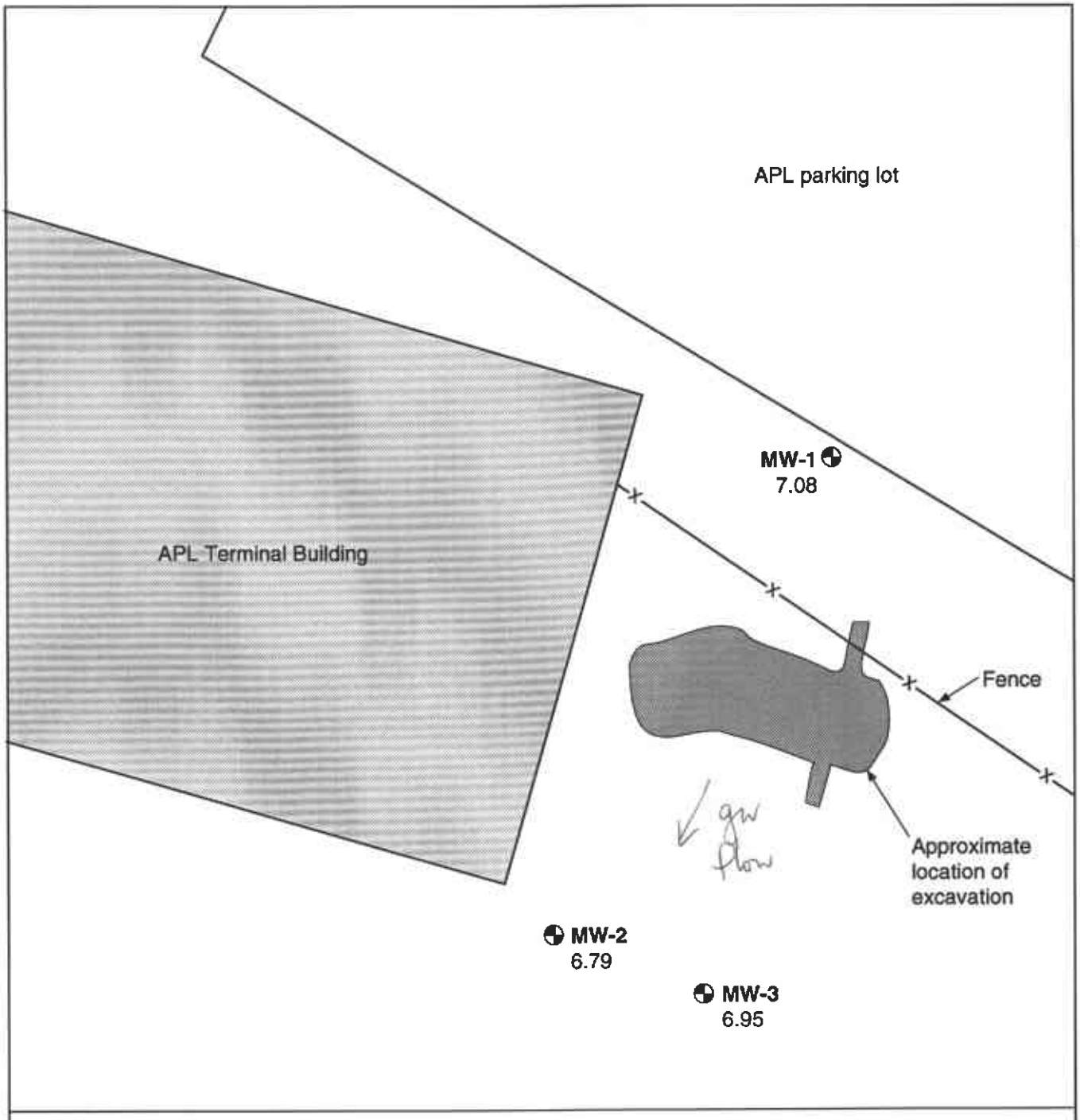
Note:

1. Samples collected by Geomatrix Consultants, Inc., and analyzed by Clayton Environmental Consultants 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

6.79 Water-level elevation, in feet

0 50 Feet

Based on figure provided by the Port of Oakland.

Elevations referenced to Mean Low Low Water Port Datum.

GEOMATRIX

WATER-LEVEL ELEVATIONS – 11 MAY 1993
American President Lines Terminal
1395 Middle Harbor Road
Oakland, California

Figure 2

Project No. 2026

GEOMATRIX

ATTACHMENT A

CHAIN-OF-CUSTODY RECORDS AND ANALYTICAL LABORATORY REPORTS

Western Operations

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

Clayton
ENVIRONMENTAL
CONSULTANTS

May 27, 1993

Ms. Elizabeth Wells
GEOMATRIX CONSULTANTS
100 Pine Street, 10th Floor
San Francisco, CA 94111

Client Ref. 2026I
Clayton Project No. 93051.22

Dear Ms. Wells:

Attached is our analytical laboratory report for the samples received on May 12, 1993. A copy of the Chain-of-Custody form acknowledging receipt of these samples is attached.

Please note that any unused portion of the samples will be disposed of 30 days after the date of this report, unless you have requested otherwise.

We appreciate the opportunity to be of assistance to you. If you have any questions, please contact Suzanne Silvera, Client Services Supervisor, at (510) 426-2657.

Sincerely,

Ronald H. Peters, CIH
Director, Laboratory Services
Western Operations

RHP/tb
Attachments

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification:	MW-2	Date Sampled:	05/11/93
Lab Number:	9305122-01A	Date Received:	05/12/93
Sample Matrix/Media:	WATER	Date Prepared:	05/25/93
Preparation Method:	EPA 5030	Date Analyzed:	05/25/93
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
Purgeable Halocarbons			
Bromodichloromethane	75-27-4	ND	0.7
Bromoform	75-25-2	ND	0.7
Bromomethane	74-83-9	ND	0.7
Carbon tetrachloride	56-23-5	ND	0.6
Chlorobenzene	108-90-7	ND	0.7
Chloroethane	75-00-3	ND	0.5
2-Chloroethylvinyl ether	110-75-8	ND	1
Chloroform	67-66-3	ND	0.5
Chloromethane	74-87-3	ND	0.6
Dibromochloromethane	124-48-1	ND	0.6
1,2-Dichlorobenzene	95-50-1	ND	4
1,3-Dichlorobenzene	541-73-1	ND	2
1,4-Dichlorobenzene	106-46-7	ND	4
Dichlorodifluoromethane	75-71-8	ND	1
1,1-Dichloroethane	75-34-3	ND	0.4
1,2-Dichloroethane	107-06-2	ND	0.3
1,1-Dichloroethene	75-35-4	ND	0.2
cis-1,2-Dichloroethene	156-59-2	ND	0.4
trans-1,2-Dichloroethene	156-60-5	ND	0.4
1,2-Dichloropropane	78-87-5	ND	0.5
cis-1,3-Dichloropropene	10061-01-5	ND	0.5
trans-1,3-dichloropropene	10061-02-6	ND	0.6
Freon 113	76-13-1	ND	0.6
Methylene chloride	75-09-2	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Tetrachloroethene	127-18-4	ND	0.5
1,1,1-Trichloroethane	71-55-6	ND	0.5
1,1,2-Trichloroethane	79-00-5	ND	0.6
Trichloroethene	79-01-6	ND	0.3
Trichlorofluoromethane	75-69-4	ND	0.4
Vinyl chloride	75-01-4	ND	0.5

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification:	MW-2	Date Sampled:	05/11/93
Lab Number:	9305122-01A	Date Received:	05/12/93
Sample Matrix/Media:	WATER	Date Prepared:	05/25/93
Preparation Method:	EPA 5030	Date Analyzed:	05/25/93
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
Surrogates		Recovery (%)	QC Limits (%)
Bromochloromethane	74-97-5	91	50 - 150

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

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification:	MW-3	Date Sampled:	05/11/93
Lab Number:	9305122-02A	Date Received:	05/12/93
Sample Matrix/Media:	WATER	Date Prepared:	05/25/93
Preparation Method:	EPA 5030	Date Analyzed:	05/25/93
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
Purgeable Halocarbons			
Bromodichloromethane	75-27-4	ND	0.7
Bromoform	75-25-2	ND	0.7
Bromomethane	74-83-9	ND	0.7
Carbon tetrachloride	56-23-5	ND	0.6
Chlorobenzene	108-90-7	ND	0.7
Chloroethane	75-00-3	ND	0.5
2-Chloroethylvinyl ether	110-75-8	ND	1
Chloroform	67-66-3	ND	0.5
Chloromethane	74-87-3	ND	0.6
Dibromochloromethane	124-48-1	ND	0.6
1,2-Dichlorobenzene	95-50-1	ND	4
1,3-Dichlorobenzene	541-73-1	ND	2
1,4-Dichlorobenzene	106-46-7	ND	4
Dichlorodifluoromethane	75-71-8	ND	1
1,1-Dichloroethane	75-34-3	ND	0.4
1,2-Dichloroethane	107-06-2	ND	0.3
1,1-Dichloroethene	75-35-4	ND	0.2
cis-1,2-Dichloroethene	156-59-2	ND	0.4
trans-1,2-Dichloroethene	156-60-5	ND	0.4
1,2-Dichloropropane	78-87-5	ND	0.5
cis-1,3-Dichloropropene	10061-01-5	ND	0.5
trans-1,3-dichloropropene	10061-02-6	ND	0.6
Freon 113	76-13-1	ND	0.6
Methylene chloride	75-09-2	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Tetrachloroethene	127-18-4	ND	0.5
1,1,1-Trichloroethane	71-55-6	ND	0.5
1,1,2-Trichloroethane	79-00-5	ND	0.6
Trichloroethene	79-01-6	ND	0.3
Trichlorofluoromethane	75-69-4	ND	0.4
Vinyl chloride	75-01-4	ND	0.5

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification:	MW-3	Date Sampled:	05/11/93
Lab Number:	9305122-02A	Date Received:	05/12/93
Sample Matrix/Media:	WATER	Date Prepared:	05/25/93
Preparation Method:	EPA 5030	Date Analyzed:	05/25/93
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
Surrogates		**Recovery (%)**	**QC Limits (%)**
Bromochloromethane	74-97-5	86	50 - 150

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

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification:	MW-1	Date Sampled:	05/11/93
Lab Number:	9305122-03A	Date Received:	05/12/93
Sample Matrix/Media:	WATER	Date Prepared:	05/25/93
Preparation Method:	EPA 5030	Date Analyzed:	05/25/93
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
Purgeable Halocarbons			
Bromodichloromethane	75-27-4	ND	0.7
Bromoform	75-25-2	ND	0.7
Bromomethane	74-83-9	ND	0.7
Carbon tetrachloride	56-23-5	ND	0.6
Chlorobenzene	108-90-7	ND	0.7
Chloroethane	75-00-3	ND	0.5
2-Chloroethylvinyl ether	110-75-8	ND	1
Chloroform	67-66-3	ND	0.5
Chloromethane	74-87-3	ND	0.6
Dibromochloromethane	124-48-1	ND	0.6
1,2-Dichlorobenzene	95-50-1	ND	4
1,3-Dichlorobenzene	541-73-1	ND	2
1,4-Dichlorobenzene	106-46-7	ND	4
Dichlorodifluoromethane	75-71-8	ND	2
1,1-Dichloroethane	75-34-3	0.6	0.4
1,2-Dichloroethane	107-06-2	ND	0.3
1,1-Dichloroethene	75-35-4	ND	0.2
cis-1,2-Dichloroethene	156-59-2	ND	0.4
trans-1,2-Dichloroethene	156-60-5	ND	0.4
1,2-Dichloropropane	78-87-5	ND	0.5
cis-1,3-Dichloropropene	10061-01-5	ND	0.5
trans-1,3-dichloropropene	10061-02-6	ND	0.6
Freon 113	76-13-1	ND	0.6
Methylene chloride	75-09-2	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Tetrachloroethene	127-18-4	ND	0.5
1,1,1-Trichloroethane	71-55-6	ND	0.5
1,1,2-Trichloroethane	79-00-5	ND	0.6
Trichloroethene	79-01-6	ND	0.3
Trichlorofluoromethane	75-69-4	ND	0.4
Vinyl chloride	75-01-4	ND	0.5

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification:	MW-1	Date Sampled:	05/11/93
Lab Number:	9305122-03A	Date Received:	05/12/93
Sample Matrix/Media:	WATER	Date Prepared:	05/25/93
Preparation Method:	EPA 5030	Date Analyzed:	05/25/93
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
Surrogates		Recovery (%)	QC Limits (%)
Bromochloromethane	74-97-5	85	50 - 150

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

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification:	METHOD BLANK	Date Sampled:	--
Lab Number:	9305122-06A	Date Received:	--
Sample Matrix/Media:	WATER	Date Prepared:	05/25/93
Preparation Method:	EPA 5030	Date Analyzed:	05/25/93
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
Purgeable Halocarbons			
Bromodichloromethane	75-27-4	ND	0.7
Bromoform	75-25-2	ND	0.7
Bromomethane	74-83-9	ND	0.7
Carbon tetrachloride	56-23-5	ND	0.6
Chlorobenzene	108-90-7	ND	0.7
Chloroethane	75-00-3	ND	0.5
2-Chloroethylvinyl ether	110-75-8	ND	1
Chloroform	67-66-3	ND	0.5
Chloromethane	74-87-3	ND	0.6
Dibromochloromethane	124-48-1	ND	0.6
1,2-Dichlorobenzene	95-50-1	ND	4
1,3-Dichlorobenzene	541-73-1	ND	2
1,4-Dichlorobenzene	106-46-7	ND	4
Dichlorodifluoromethane	75-71-8	ND	1
1,1-Dichloroethane	75-34-3	ND	0.4
1,2-Dichloroethane	107-06-2	ND	0.3
1,1-Dichloroethene	75-35-4	ND	0.2
cis-1,2-Dichloroethene	156-59-2	ND	0.4
trans-1,2-Dichloroethene	156-60-5	ND	0.4
1,2-Dichloropropane	78-87-5	ND	0.5
cis-1,3-Dichloropropene	10061-01-5	ND	0.5
trans-1,3-dichloropropene	10061-02-6	ND	0.6
Freon 113	76-13-1	ND	0.6
Methylene chloride	75-09-2	ND	5
1,1,2,2-Tetrachloroethane	79-34-5	ND	0.5
Tetrachloroethene	127-18-4	ND	0.5
1,1,1-Trichloroethane	71-55-6	ND	0.5
1,1,2-Trichloroethane	79-00-5	ND	0.6
Trichloroethene	79-01-6	ND	0.3
Trichlorofluoromethane	75-69-4	ND	0.4
Vinyl chloride	75-01-4	ND	0.5

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification:	METHOD BLANK	Date Sampled:	--
Lab Number:	9305122-06A	Date Received:	--
Sample Matrix/Media:	WATER	Date Prepared:	05/25/93
Preparation Method:	EPA 5030	Date Analyzed:	05/25/93
Analytical Method:	EPA 8010		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
Surrogates		Recovery (%)	QC Limits (%)
Bromochloromethane	74-97-5	90	50 - 150

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

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification:	MW-2	Date Sampled:	05/11/93
Lab Number:	9305122-01C	Date Received:	05/12/93
Sample Matrix/Media:	WATER	Date Prepared:	05/14/93
Preparation Method:	EPA 5030	Date Analyzed:	05/14/93
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (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 (%)**
1,4-Difluorobenzene	540-36-3	101	50 - 150

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

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification:	MW-3	Date Sampled:	05/11/93
Lab Number:	9305122-02C	Date Received:	05/12/93
Sample Matrix/Media:	WATER	Date Prepared:	05/14/93
Preparation Method:	EPA 5030	Date Analyzed:	05/14/93
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (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 (%)
1,4-Difluorobenzene	540-36-3	97	50 - 150

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

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification:	MW-1	Date Sampled:	05/11/93
Lab Number:	9305122-03C	Date Received:	05/12/93
Sample Matrix/Media:	WATER	Date Prepared:	05/14/93
Preparation Method:	EPA 5030	Date Analyzed:	05/14/93
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (ug/L)
BTEX/Gasoline			
Benzene	71-43-2	3.2	0.4
Ethylbenzene	100-41-4	0.7	0.3
Toluene	108-88-3	2.3	0.3
o-Xylene	95-47-6	ND	0.4
p,m-Xylenes	--	0.5	0.4
Gasoline	--	260 a	50
Surrogates		**Recovery (%)**	**QC Limits (%)**
1,4-Difluorobenzene	540-36-3	104	50 - 150

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

a Sample appears to be weathered gasoline.

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification:	METHOD BLANK	Date Sampled:	--
Lab Number:	9305122-06A	Date Received:	--
Sample Matrix/Media:	WATER	Date Prepared:	05/14/93
Preparation Method:	EPA 5030	Date Analyzed:	05/14/93
Analytical Method:	EPA 8015/8020		

Analyte	CAS #	Concentration (ug/L)	Limit of Detection (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 (%)
1,4-Difluorobenzene	540-36-3	101	50 - 150

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

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification: MW-2
Lab Number: 9305122-01
Sample Matrix/Media: WATER

Date Sampled: 05/11/93
Date Received: 05/12/93

Analyte	Concentration	Detection Limit	Units	Date Prepared	Date Analyzed	Prep Method	Analysis Method
Hydrocarbons	ND	1	mg/L	05/17/93	05/18/93	SM 5520C	SM 5520F
Total Dissolved Solids	12,000	10	mg/L	—	05/19/93	—	EPA 160.1
TPH-D	3,700 *	50	ug/L	05/14/93	05/15/93	EPA 3510	EPA 8015 (Mod.

ND Not detected at or above limit of detection
< Not detected at or above limit of detection
— Information not available or not applicable

TPH-D = Extractable petroleum hydrocarbons from C10 to C42 quantitated as diesel.
* Heavier hydrocarbons present in the range of C16 to C42.

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification: MW-3
Lab Number: 9305122-02
Sample Matrix/Media: WATER

Date Sampled: 05/11/93
Date Received: 05/12/93

Analyte	Concentration	Detection Limit	Units	Date Prepared	Date Analyzed	Prep Method	Analysis Method
Hydrocarbons	ND	1	mg/L	05/17/93	05/18/93	SM 5520C	SM 5520F
Total Dissolved Solids	7,200	10	mg/L	--	05/19/93	--	EPA 160.1
TPH-D	3,300 *	50	ug/L	05/14/93	05/15/93	EPA 3510	EPA 8015 (Mod.

ND Not detected at or above limit of detection
< Not detected at or above limit of detection
— Information not available or not applicable

TPH-D = Extractable petroleum hydrocarbons from C10 to C42 quantitated as diesel.
* Heavier hydrocarbons present in the range of C16 to C42.

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification: MW-1
Lab Number: 9305122-03
Sample Matrix/Media: WATER

Date Sampled: 05/11/93
Date Received: 05/12/93

Analyte	Concentration	Detection Limit	Units	Date Prepared	Date Analyzed	Prep Method	Analysis Method
Hydrocarbons	7	1	mg/L	05/17/93	05/18/93	SM 5520C	SM 5520F
Total Dissolved Solids	12,000	10	mg/L	—	05/19/93	—	EPA 160.1
TPH-D	4,800	50	ug/L	05/14/93	05/15/93	EPA 3510	EPA 8015 (Mod.

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

TPH-D = Extractable petroleum hydrocarbons from C10 to C42 quantitated as diesel.

Results of Analysis
for
Geomatrix Consultants/ Port of Oakland

Client Reference: 2026I
Clayton Project No. 93051.22

Sample Identification: METHOD BLANK
Lab Number: 9305122-06
Sample Matrix/Media: WATER

Date Sampled: --
Date Received: --

Analyte	Concentration	Detection Limit	Units	Date Prepared	Date Analyzed	Prep Method	Analysis Method
Hydrocarbons	ND	1	mg/L	05/17/93	05/18/93	SM 5520C	SM 5520F
Total Dissolved Solids	<10	10	mg/L	--	05/19/93	--	EPA 160.1
TPH-D	ND	50	ug/L	05/14/93	05/15/93	EPA 3510	EPA 8015 (Mod.

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

Quality Assurance Results Summary
for
Clayton Project No. 93051.22

Clayton Lab Number: 9305177-08b
Ext./Prep. Method:
Date: / /
Analyst:
Std. Source: v930521-01w
Sample Matrix/Media: WATER

Analytical Method: EPA601_2/801020
Instrument ID: 02911
Date: 05/25/93
Time: 02:46
Analyst: SCB
Units: UG/L

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)
1,1-DICHLOROETHENE	(HALL)	9.30	20.0	30.0	104	33.0	119	111	65	131	9.5	20
BENZENE	(PID)	ND	20.0	22.0	110	22.0	110	110	76	134	0.0	20
CHLOROBENZENE	(HALL)	ND	20.0	22.0	110	22.0	110	110	79	132	0.0	20
TOLUENE	(PID)	ND	20.0	23.0	115	23.0	115	115	71	125	0.0	20
TRICHLOROETHENE	(HALL)	212	20.0	230	SOR	220	SOR	SOR	69	133	4.4	20

LCS = Laboratory Control Sample
ND = Not detected at or above limit of detection
LCL = Lower Control Limit
UCL = Upper Control Limit
SOR = Spike out of range due to high sample concentration.

Quality Assurance Results Summary
for
Clayton Project No. 93051.22

Clayton Lab Number: 9305122-MB
Ext./Prep. Method:
Date: / /
Analyst:
Std. Source: V930521-01W
Sample Matrix/Media: WATER

Analytical Method: EPA8010_8020
Instrument ID: 02911
Date: 05/25/93
Time: 21:29
Analyst: NAN
Units: ug/L

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)
1,1-DICHLOROETHENE	(HALL)	ND	20.0	19.1	96	21.1	106	101	65	131	10.0	20
BENZENE	(PID)	ND	20.0	21.2	106	21.6	108	107	76	134	1.9	20
CHLOROBENZENE	(PID)	ND	20.0	15.3	77	15.5	78	77	77	127	1.3	20
CHLOROBENZENE	(HALL)	ND	20.0	21.3	107	22.2	111	109	79	132	4.1	20
TOLUENE	(PID)	ND	20.0	22.6	113	22.6	113	113	71	125	0.0	20
TRICHLOROETHENE	(HALL)	ND	20.0	18.6	93	20.7	104	98	69	133	11	20

LCS = Laboratory Control Sample
ND = Not detected at or above limit of detection
LCL = Lower Control Limit
UCL = Upper Control Limit
SOR = Spike out of range due to high sample concentration.

Quality Assurance Results Summary
for
Clayton Project No. 93051.22

Clayton Lab Number: 9305123-01H
Ext./Prep. Method:
Date: / /
Analyst:
Std. Source: V930330-01W
Sample Matrix/Media: WATER

Analytical Method: EPA8015 8020
Instrument ID: 05587
Date: 05/14/93
Time: 17:34
Analyst: NAN
Units: ug/L

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)	ND	3.85	3.62	94	3.64	95	94	81	118	0.6	20
GASOLINE	(FID)	ND	200	190	95	191	96	95	80	150	0.5	25
TOLUENE	(PID)	ND	11.5	11.1	97	11.7	102	99	84	118	5.3	20

LCS = Laboratory Control Sample
ND = Not detected at or above limit of detection
LCL = Lower Control Limit
UCL = Upper Control Limit
SOR = Spike out of range due to high sample concentration.

Quality Assurance Results Summary
for
Clayton Project No. 93051.22

Clayton Lab Number: 9305122-MB
Ext./Prep. Method: EPA3510
Date: 05/14/93
Analyst: C/N
Std. Source: G930423-02W
Sample Matrix/Media: WATER

Analytical Method: EPA8015
Instrument ID: 02883
Date: 05/14/93
Time: 22:25
Analyst: AM
Units: UG/L

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	1,200	120	1,100	110	115	40	140	8.7	40

LCS = Laboratory Control Sample
ND = Not detected at or above limit of detection

LCL = Lower Control Limit

UCL = Upper Control Limit
SOR = Spike out of range due to high sample concentration.

Quality Assurance Results Summary
for
Clayton Project No. 93051.22

Clayton Lab Number:	9305122-MB	Analytical Method:	SM5520CF
Ext./Prep. Method:	SM5520CF	Instrument ID:	07434
Date:	05/17/93	Date:	05/18/93
Analyst:	CS	Time:	11:00
Std. Source:	E930209-01W	Analyst:	SCB
Sample Matrix/Media:	WATER	Units:	MG/L

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)
TOTAL PETROLEUM HYDROCARBONS	ND	7.54	7.20	95	7.88	105	100	75	125	9.0	25

LCS = Laboratory Control Sample
ND = Not detected at or above limit of detection

LCL = Lower Control Limit

UCL = Upper Control Limit
SOR = Spike out of range due to high sample concentration.

Quality Assurance Results Summary
for
Port of Oakland/Uribe & Association

Client Reference No. 2026I
Clayton Project No. 93051.22

Lab Number:	9305143-06A	Date Analyzed:	05/19/93
Analytical Method:	EPA 160.1	Sample Matrix/Media:	Water
		Units:	mg/L

Analyte	Sample Result	Duplicate Sample	RPD (%)
Total Dissolved Solids	151	149	1.3

Chain-of-Custody Record

№ 2935

Date: 5/11/93

Page 1 of 1

Project No.: 2026 I

Samplers (Signatures): Elizabeth Wells

	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	TDS - 5520 C+F	TDS*	HOLD	Cooled	Soil (S) or water (W)	Acidified	Number of containers
1A-I	5/11	10:50	MW - 2	X				X	X	X	X	X		X	W	X	9
2	5/11	11:25	MW - 3	X				X	X	X	X	X		X	W	X	9
3	5/11	12:05	MW - 1	X				X	X	X	X	X		X	W	X	9
4A,B			0041593 HCl TRIP BLANK										X				2
5A,B			0030493 TRIP BLANK										X				2

REMARKS — Additional comments:

TDS - total dissolved solids

Bill Port of Oakland directly

No bubbles in VOA's at time of sampling

Bubble noted in trip blanks

COND OK on all

Turnaround time: Standard two week

Results to: Elizabeth Wells

Total No. of containers: 27

Relinquished by:	Date:	Relinquished by:	Date:	Relinquished by:	Date:
Signature: [signature]	5/12/93	Signature: Jim Mitchell	5/12/93	Signature:	
Printed name: James Abitz		Printed name: JIM MITCHELL		Printed name:	
Company: GEOMATRIX		Company: CLAYTON ENV.		Company:	
Received by:	**Time:**	**Received by:**	**Time:**	**Received by:**	**Time:**
Signature: Jim Mitchell	10:35 AM	Signature: Tammi R. Alton	11:40 AM	Signature:	
Printed name: JIM MITCHELL		Printed name: TAMMI R. ALTON		Printed name:	
Company: CLAYTON ENV		Company: CLAYTON ENV.		Company:	

Method of shipment: Lab pickup

Laboratory comments and Log No.:
FOR EACH SAMPLE REC'D 01-03 - A,B - 2x gl 40ml
C,D - 2x gl 40ml
E,F - 2x gl 1L
G,H - 2x gl 1L
I 1x pl 236
04-05 2x gl 40ml

9305122

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