Harding Lawson Associates

STID 4148

July 25, 1995

31531 1

Mr. Jeff Christoff
Blue Print Service Company
1057 Shary Circle
Concord, California 94518

Quarterly Report
April 4, 1995 through July 3, 1995
City Blue Groundwater Monitoring
1700 Jefferson Street
Oakland, California

Dear Mr. Christoff:

This letter presents quarterly sampling results from the groundwater monitoring and extraction wells at the City Blue Production facility, 1700 Jefferson Street, Oakland, California. This report is for the period of April 4, 1995 through July 3, 1995. Quarterly groundwater monitoring and reporting is required by the Alameda County Health Care Services Agency.

BACKGROUND

Three underground gasoline storage tanks (USTs) were removed from the property in 1987 (Plate 1). Three groundwater monitoring wells were installed on the property to evaluate the distribution of petroleum hydrocarbons in the soil and groundwater and determine the direction of groundwater flow.

Gasoline was found floating on the surface of the groundwater in Monitoring Well MW-1. In January 1988, two additional monitoring wells (MW-1A and MW-4) were installed by HLA at the facility (Plate 1). One downgradient offsite monitoring well (MW-5) was installed by HLA in August 1988. Monitoring well MW-2 was destroyed during construction of the present facility.

The existing biodegradation groundwater treatment system began operation in June 1992. Groundwater is extracted from MW-1A and MW-4 for treatment in a 3,000-gallon bioreactor tank. The treated water from the bioreactor passes through two carbon adsorption vessels before being discharged to the sanitary sewer.

TREATMENT SYSTEM STATUS

During this reporting period the groundwater treatment system has treated and discharged approximately 110,000 gallons of water to the sanitary sewer. Over this period the average daily discharge flow rates have ranged from 559 gallons per day (gpd) to 2,024 gpd, for an average of

approximately 1,300 gpd. Separate-phase gasoline is no longer being detected or recovered from the extraction wells.

A Blue Print Service Company technician performs routine maintenance twice a week and an HLA engineer visits the site on a weekly basis to monitor the system performance, collect samples if necessary, and perform other maintenance functions as needed. HLA replaced one of the carbon vessels on May 2, 1995 and the other vessel on June 27, 1995.

TREATMENT SYSTEM SAMPLING AND ANALYSIS

In accordance with the East Bay Municipal Utilities District (EBMUD) Wastewater Discharge Permit (Account No. 500-68191), HLA has sampled the treatment system effluent on a quarterly basis. The treatment system water samples were collected on May 18, 1995 from the bioreactor effluent before carbon adsorption, the effluent side of the first carbon vessel (CB-1), and the effluent side of the second carbon vessel (CB-2), before discharge to the sanitary sewer. The sampling locations are shown on Plate 2, Process Flow and Sampling Locations, and the analytical results are summarized in Table 1. The laboratory reports are presented in Appendix A.

HLA collects water samples from brass sampling ports into 40-milliliter volatile organic analysis (VOA) vials. The water samples are placed in ice-chilled coolers and submitted to American Environmental Network Laboratory in Pleasant Hill, California under chain-of-custody protocol for analysis. The samples are analyzed by EPA Test Method 8015 for TPHg and EPA Test Method 8020 for BTEX.

The treatment system effluent was sampled by an EBMUD representative on April 5, 1995 and on June 21, 1995.

GROUNDWATER SAMPLING AND ANALYSIS

HLA sampled Wells MW-1A, MW-3, MW-4, and MW-5 on June 27, 1995. During construction of the present BPS facility, well MW-2 was damaged and abandoned.

Monitoring wells MW-3 and MW-5 were sampled after checking for separate-phase gasoline, measuring the water levels, purging at least three well volumes from each, and measuring the pH, conductivity, and temperature of the purge water. Three 40-milliliter VOA vials of water were collected from each well with a Teflon bailer. MW-3 contained a visible hydrocarbon sheen.

The two extraction wells, MW-1A and MW-4, were sampled from brass sampling ports in the flow line from the wells to the treatment system prior to the oil/water separator (Plate 2). Three 40-milliliter VOA vials were collected from each port.

All of the water samples were placed in ice-chilled coolers and submitted to American Environmental Network Laboratory in Pleasant Hill, California under chain-of-custody protocol for analysis. The samples were analyzed by EPA Test Method 8015 for TPHg and EPA Test Method 8020 for BTEX. The

analytical results are summarized in Table 2 along with past results. The laboratory report for the June 27, 1995 samples is presented in Appendix B.

DISCUSSION

Based on the flow total of approximately 400,000 gallons to the sewer and average dissolved TPHg and benzene concentrations in wells MW-1A and MW-4 since 1991, HLA has calculated the cumulative mass removal of dissolved TPHg and benzene. With an average concentration of 100 mg/l, approximately 330 pounds (approximately 50 gallons) of dissolved phase TPHg has been removed. With an average concentration of 8 mg/l, approximately 26 pounds (approximately 3.5 gallons) of dissolved phase benzene has been removed.

During this reporting period with average dissolved concentrations of 42 mg/l TPHg and 6.1 mg/l benzene and a flow total of 110,000 gallons, approximately 38 pounds of TPHg and 5.6 pounds of benzene have been removed from the dissolved phase.

With the exception of February and March 1995 when the groundwater treatment system was shut down to remove sludge from the bioreactor, the treatment system has been operating nearly continuously since May 1994.

Separate-phase gasoline has not been detected in any of the onsite wells or recovered by the oil/water separator since December 1994.

The water levels in MW-3 and MW-5 (measured on June 27, 1995) have risen 1.4 feet and 1.1 feet, respectively compared to this time last year (June 29, 1994). The elevated water level has resulted in a higher pumping rate from the extraction wells during this quarter.

If you have any questions, please contact David Scrivner at (510) 687-9660.

Yours very truly,

HARDING LAWSON ASSOCIATES

David F. Scrivner, P.E.
Civil Engineer

David R. Kleesattel, R.G.
Associate Geologist

DFS/DRK/mlw L/034802M

Attachments: Table 1 - Groundwater Treatment System Analytical Results
Table 2 - Groundwater Analytical Results
Table 3 - Flow Totalizer Readings
Table 4 - Monitoring Well Product Thickness Measurements
Plate 1 - Site Plan
Plate 2 - Process Flow and Sampling Locations
Appendix A - Treatment System Sample Laboratory Reports
Appendix B - Groundwater Sample Laboratory Reports

cc: Mr. Thomas F. Peacock
Alameda County Health Care Services Agency
Division of Hazardous Materials
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502-6577

Table 1. Groundwater Treatment System Analytical Results
1700 Jefferson Street
Oakland, California

Date/ Analytes	Bioreactor Influent (1)	Bioreactor Effluent (2)	First Carbon Bed Effluent (3)	Sanitary Sewer Influent (4)	Vapor Phase Carbon Effluent (Air) (5)
June 16, 1992					
TPHg	NA	3.3	ND <.05	NA	ND <30
Benzene	NA	220	ND <0.3	NA	ND <85
Toluene	NA	460	ND <0.3	NA	ND <250
Ethylbenzene	NA	35	ND <0.3	NA	ND <65
Xylene	NA	290	ND <0.3	NA	ND <250
June 19, 1992					
TPHg	180	1.6	ND <.05	NA	ND
Benzene	18,000	1.6	ND <0.3	NA	ND
Toluene	31,000	5.0	ND <0.3	NA	ND
Ethylbenzene	2,200	ND <0.3	ND <0.3	NA	ND
Xylene	16,000	150	ND <0.3	NA	ND
July 2, 1992					
TPHg	160	0.210	ND <.05	NA	ND <30
Benzene	14,000	1.4	ND <0.3	NA	ND <85
Toluene	27,000	ND <0.3	ND <0.3	NA	ND <250
Ethylbenzene	1,700	ND <0.3	ND <0.3	NA	ND <65
Xylene	1,300	1.0	ND <0.3	NA	ND <250
August 20, 1992					
TPHg	190	6.4	0.073	NA	ND <30
Benzene	14,000	31	ND <0.3	NA	ND <85
Toluene	24,000	14	ND <0.3	NA	ND <250
Ethylbenzene	2,000	ND <6	ND <0.3	NA	ND <65
Xylene	13,000	150	ND <0.3	NA	ND <250
September 15, 1992					
TPHg	230	23	0.054	NA	ND <30
Benzene	17,000	1,100	0.4	NA	ND <85
Toluene	29,000	3;600	0.8	NA	ND <250
Ethylbenzene	2,200	59	ND <0.3	NA	ND <65
Xylene	15,000	1,100	0.6	NA	ND <250

Table 1. (Continued)

Date/ Analytes	Bioreactor Influent (1)	Bioreactor Effluent (2)	First Carbon Bed Effluent (3)	Sanitary Sewer Influent (4)	Vapor Phase Carbon Effluent (Air) (5)
March 3, 1994					
TPHg	80	3.9	NA	ND <.05	NA
Benzene	1,500	270	NA	ND <0.5	NA
Toluene	9,200	370	NA	ND <0.5	NA
Ethylbenzene	1,000	32	NA	ND <0.5	NA
Xylene	14,000	840	NA	ND <0.5	NA
April 7, 1994					
TPHg	79	0.28	ND <.05	NA	NA
Benzene	8,300	16	3.7	NA	NA
Toluene	19,000	4.2	ND <0.5	NA	NA
Ethylbenzene	990	ND <0.5	ND <0.5	NA	NA
Xylene	9,300	1.9	ND <0.5	NA	NA
May 13, 1994					
TPHg	220	0.61	ND <.05	NA	NA
Benzene	12,000	45	ND <0.5	NA	NA
Toluene	23,000	7.1	ND <0.5	NA	NA
Ethylbenzene	1,700	0.8	ND <0.5	NA	NA
Xylene	17,000	11	ND <0.5	NA	NA
September 29, 1994					
TPHg	96	0.76	NA	ND <.05	NA
Benzene	8,000	4.9	NA	ND <0.5	NA
Toluene	16,000	7.8	NA	ND <0.5	NA
Ethylbenzene	ND <250	ND <2.5	NA	ND <0.5	NA
Xylene	9,000	8.7	NA	ND <0.5	NA
December 19, 1994					
TPHg	NA	5.5	0.59	ND <.05	NA
Benzene	NA	140	60	1.0	NA
Toluene	NA	100	14	0.5	NA
Ethylbenzene	NA	ND<5	ND<0.5	ND <0.5	NA
Xylene	NA	1,600	100	ND <0.5	NA
January 5, 1995					
TPHg	NA	NA	0.20	ND <.05	NA
Benzene	NA	NA	17	0.7	NA
Toluene	NA	NA	3	ND<0.5	NA
Ethylbenzene	NA	NA	ND<0.5	ND<0.5	NA
Xylene	NA	NA	3	ND<0.5	NA

Table 1. (Continued)

Date/ Analytes	Bioreactor Influent (1)	Bioreactor Effluent (2)	First Carbon Bed Effluent (3)	Sanitary Sewer Influent (4)	Vapor Phase Carbon Effluent (Air) (5)
April 14, 1995					
TPHg	NA	2.3	0.90	NA	NA
Benzene	NA	36	22	NA	NA
Toluene	NA	6	3	NA	NA
Ethylbenzene	NA	3	0.6	NA	NA
Xylene	NA	58	13	NA	NA
May 18, 1995					
TPHg	41	0.740	0.100	ND <.05	NA
Benzene	4,400	22	2	ND<0.5	NA
Toluene	5,700	9.4	ND<0.5	ND<0.5	NA
Ethylbenzene	430	ND<0.5	ND<0.5	ND<0.5	NA
Xylene	8,200	16	ND<0.5	ND<2	NA

(1) = Sample Location Identification Number (see Plate 2)
TPHg = total petroleum hydrocarbons as gasoline
TPHg concentrations presented in milligrams per liter (mg/l)
Benzene, Toluene, Ethylbenzene, and Xylenes concentrations presented in micrograms per liter (μg/l)
ND = Not detected above the reporting limit
NA = Not analyzed

Table 2. Groundwater Analytical Results
Groundwater Monitoring Wells
1700 Jefferson Street
Oakland, California

Date/ Analytes	MW-1A	MW-3	MW-4	MW-5
August 1, 1991				
TPHg	350	74	86	120
Benzene	17,000	1,600	1,500	20,000
Toluene	31,000	4,600	6,200	14,000
Ethylbenzene	3,000	670	1,000	1,900
Xylenes	22,000	4,300	7,300	4,900
September 30, 1992				
TPHg	NA	NA	NA	51
Benzene	NA	NA	NA	13,000
Toluene	NA	NA	NA	5,900
Ethylbenzene	NA	NA	NA	1,400
Xylene	NA	NA	NA	2,600
March 30, 1993				
TPHg	NA	NA	NA	74
Benzene	NA	NA	NA	16,000
Toluene	NA	NA	NA	5,000
Ethylbenzene	NA	NA	NA	1,800
Xylene	NA	NA	NA	2,700
January 13, 1994				
TPHg	NA	NA	NA	80
Benzene	NA	NA	NA	19,000
Toluene	NA	NA	NA	8,200
Ethylbenzene	NA	NA	NA	1,400
Xylene	NA	NA	NA	2,700
April 13, 1994				
TPHg	170	NA	58	63
Benzene	17,000	NA	1,500	14,000
Toluene	31,000	NA	2,500	3,500
Ethylbenzene	2,100	NA	520	1,500
Xylene	14,000	NA	3,200	2,100

Table 2. (Continued)

Date/ Analytes	MW-1A	MW-3	MW-4	MW-5
June 29, 1994				
TPHg	95	39	16	64
Benzene	16,000	3,200	1,300	29,000
Toluene	21,000	2,900	790	5,400
Ethylbenzene	1,500	580	51	2,800
Xylenes	12,000	4,300	3,400	4,500
December 8, 1994				
TPHg	190	4,600 *	92	59
Benzene	13,000	1,500	1,700	13,000
Toluene	21,000	4,200	4,100	3,800
Ethylbenzene	1,400	6,000	310	1,800
Xylenes	11,000	95,000	5,400	2,900
April 3, 1995				
TPHg	67	51	35	51
Benzene	11,000	1,100	1,200	15,000
Toluene	13,000	2,300	3,400	2,200
Ethylbenzene	910	580	280	2,800
Xylenes	9,800	4,800	5,800	4,500
June 27, 1995				
TPHg	53	20	13	41
Benzene	11,000	270	1,300	12,000
Toluene	9,900	550	1,600	2,100
Ethylbenzene	500	190	77	1,400
Xylenes	6,300	1,700	1,800	1,600

TPHg concentrations presented in milligrams per liter (mg/l)
Benzene, Toluene, Ethylbenzene, and Xylenes concentrations presented in micrograms per liter (μg/l)
* = This sample contained a visible amount of separate-phase gasoline.
TPHg = Total petroleum hydrocarbons as gasoline
NA = Not analyzed

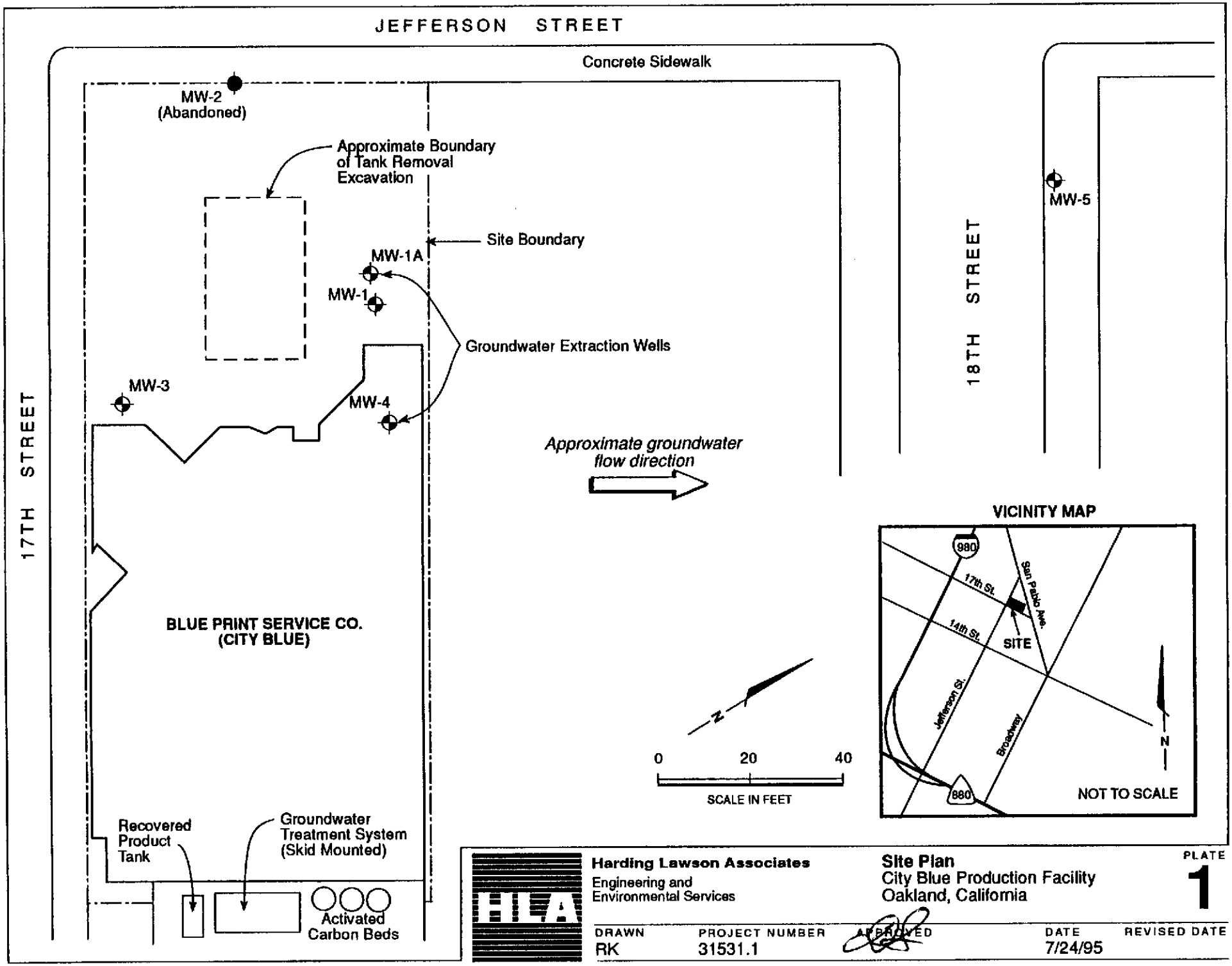
Table 3. Flow Totalizer Readings
Discharge to Sanitary Sewer
1700 Jefferson Street
Oakland, California

Date	Flow Total to Sanitary Sewer (gallons)
06/16/92	1,000
06/17/92	2,957
07/02/92	13,040
07/10/92	14,470
07/24/92	19,450
09/15/92	51,190
10/15/92	70,370
10/23/92	75,470
03/04/94	77,866
03/15/94	89,800
03/30/94	104,690
04/13/94	118,760
05/11/94	123,180
05/23/94	133,280
06/07/94	149,640
06/29/94	166,670
07/11/94	178,500
07/27/94	187,940
08/24/94	196,180
09/23/94	196,698
10/13/94	217,782
10/30/94	227,996
11/15/94	236,789
12/08/94	260,048
12/27/94	267,350
01/03/95	274,770
01/16/95	277,003
02/11/95	291,743
04/05/95	295,710
04/28/95	327,941
05/08/95	341,575
05/25/95	363,638
06/21/95	386,700
07/02/95	401,378

Table 4. Monitoring Well Product Thickness Measurements

Date	MW-1	MW-1A	MW-3	MW-4	MW-5
07/08/87	30	NA	0	NA	NA
07/12/89	21.6	18.6	0	25.2	0.4
06/18/92	34	NM	NM	NM	NM
07/02/92	18	NM	NM	NM	NM
07/23/92	10	NM	NM	NM	NM
08/18/92	10	NM	NM	NM	NM
09/30/92	NM	NM	4.1	NM	0
11/11/92	13	NM	2	NM	NM
01/29/93	25.2	NM	1.7	NM	NM
02/12/93	10.2	13	1.3	8.8	0
03/30/93	NM	NM	NM	NM	0.06
01/06/94	14.8	16.2	2.2	6.2	0
03/17/94	23.4	NM	2.4	NM	NM
04/07/94	14.2	NM	1.8	NM	0
04/13/94	12	NM	1.0	NM	0
05/13/94	1.7	NM	1.2	NM	0
06/17/94	0	NM	0	NM	0
06/29/94	NM	NM	0.25	NM	0
07/11/94	4.5	NM	1.0	NM	NM
12/08/94	NM	NM	0.25	NM	0
04/03/95	0	NM	Sheen	NM	0
06/27/95	Sheen	NM	Sheen	NM	0

All measurements in inches
NA = Not applicable, these wells not yet installed
NM = Not measured

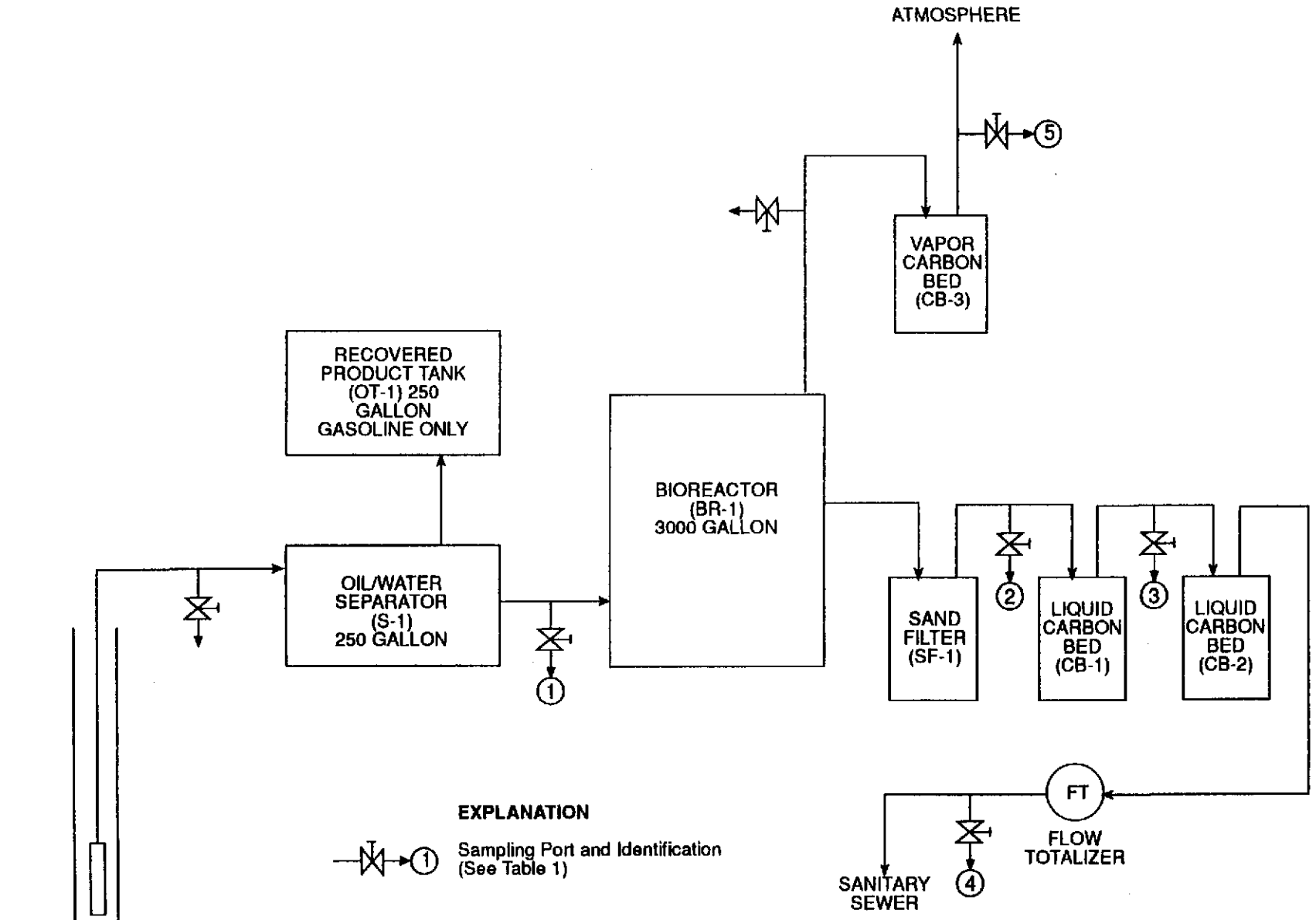


Harding Lawson Associates
Engineering and
Environmental Services

Site Plan
City Blue Production Facility
Oakland, California

PLATE
1

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
RK	31531.1		7/24/95	



Harding Lawson Associates
Engineering and Environmental Services

Process Flow and Sampling Locations
City Blue Groundwater Treatment System
1700 Jefferson Street
Oakland, California

PLATE **2**

DRAWN	PROJECT NUMBER	APPROVED	DATE	REVISED DATE
RK	31531.1		7/10/95	

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

HARDING LAWSON ASSOCIATES
1855 GATEWAY BLVD., STE. 500
CONCORD, CA 94520

ATTN: DAVE SCRIVNER
CLIENT PROJ. ID: 11295
CLIENT PROJ. NAME: CITY BLUE,OAK.
C.O.C. NUMBER: 413

REPORT DATE: 06/04/95

DATE(S) SAMPLED: 05/18/95

DATE RECEIVED: 05/18/95

AEN WORK ORDER: 9505252

PROJECT SUMMARY:

On May 18, 1995, this laboratory received 4 water sample(s).

Client requested sample(s) be analyzed for organic parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

HARDING LAWSON ASSOCIATES

SAMPLE ID: 95051801
AEN LAB NO: 9505252-01
AEN WORK ORDER: 9505252
CLIENT PROJ. ID: 11295

DATE SAMPLED: 05/18/95
DATE RECEIVED: 05/18/95
REPORT DATE: 06/04/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	22 *	0.5	ug/L	05/27/95
Toluene	108-88-3	9.4 *	0.5	ug/L	05/27/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	05/27/95
Xylenes, Total	1330-20-7	16 *	2	ug/L	05/27/95
Purgeable HCs as Gasoline	5030/GCFID	0.74 *	0.05	mg/L	05/27/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

HARDING LAWSON ASSOCIATES

SAMPLE ID: 95051802
AEN LAB NO: 9505252-02
AEN WORK ORDER: 9505252
CLIENT PROJ. ID: 11295

DATE SAMPLED: 05/18/95
DATE RECEIVED: 05/18/95
REPORT DATE: 06/04/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	2 *	0.5	ug/L	05/27/95
Toluene	108-88-3	ND	0.5	ug/L	05/27/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	05/27/95
Xylenes, Total	1330-20-7	ND	2	ug/L	05/27/95
Purgeable HCs as Gasoline	5030/GCFID	0.1 *	0.05	mg/L	05/27/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

HARDING LAWSON ASSOCIATES

SAMPLE ID: 95051805
AEN LAB NO: 9505252-03
AEN WORK ORDER: 9505252
CLIENT PROJ. ID: 11295

DATE SAMPLED: 05/18/95
DATE RECEIVED: 05/18/95
REPORT DATE: 06/04/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	4,400 *	50	ug/L	05/30/95
Toluene	108-88-3	5,700 *	50	ug/L	05/30/95
Ethylbenzene	100-41-4	430 *	50	ug/L	05/30/95
Xylenes, Total	1330-20-7	8,200 *	200	ug/L	05/30/95
Purgeable HCs as Gasoline	5030/GCFID	41 *	5	mg/L	05/30/95

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

HARDING LAWSON ASSOCIATES

SAMPLE ID: 95051806
AEN LAB NO: 9505252-04
AEN WORK ORDER: 9505252
CLIENT PROJ. ID: 11295

DATE SAMPLED: 05/18/95
DATE RECEIVED: 05/18/95
REPORT DATE: 06/04/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	ND	0.5	ug/L	05/30/95
Toluene	108-88-3	ND	0.5	ug/L	05/30/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	05/30/95
Xylenes, Total	1330-20-7	ND	2	ug/L	05/30/95
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	05/30/95

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9505252

CLIENT PROJECT ID: 11295

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9505252
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
05/27/95	95051801	01	101
05/27/95	95051802	02	100
05/30/95	95051805	03	102
05/30/95	95051806	04	99
QC Limits:			92-109

DATE ANALYZED: 05/27/95
SAMPLE SPIKED: 9505243-03
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	36.3	102	2	85-109	17
Toluene	103.0	104	5	87-111	16
HCs as Gasoline	1000	92	1	66-117	19

Daily method blanks for all associated analytical runs showed no contamination over the reporting limit.

*** END OF REPORT ***

[redacted] Laboratory Association
1855 Gateway Boulevard, Suite 500
Concord, California 94520
(510) 687-9660 • FAX (510) 687-9673

[redacted] CHAIN OF CUSTODY FORM [redacted]

No 413

Lab: AEN 9505252

Samplers: James McCarty

Job Number: 11295

Name/Location: City Blue, Oakland

Project Manager: Dave Scrivner

Recorder: James McCarty (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	# CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCL	Ice	SAMPLE NUMBER OR LAB NUMBER: Yr Wk Seq	DATE: Yr Mo Day Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	METALS	EPA 8015M/TPHg	EPA 8020/BTEX	EPA 8015M/TPHd,o
	X							3		95051801	95051818	D1A-C						X	X	
	X							3		95051802		D2A-C						X	X	
	X							3		95051805		D3A-C						X	X	
	X							3		95051806		D4A-C						X	X	

LAB NUMBER: Yr Wk Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
				Std TAT

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) James McCarty	RECEIVED BY: (Signature) [illegible]	DATE/TIME 1/12/95 0920
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME

METHOD OF SHIPMENT: cooler with ice

SAMPLE CONDITION WHEN RECEIVED BY THE LABORATORY:

Laboratory Copy White — Project Office Copy Yellow — Field or Office Copy Pink

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

HARDING LAWSON ASSOCIATES
1855 GATEWAY BLVD., STE. 500
CONCORD, CA 94520

ATTN: DAVE SCRIVNER
CLIENT PROJ. ID: 31531.1
CLIENT PROJ. NAME: CITY BLUE/OAK.
C.O.C. NUMBER: 504

REPORT DATE: 07/12/95

DATE(S) SAMPLED: 06/27/95

DATE RECEIVED: 06/27/95

AEN WORK ORDER: 9506363

PROJECT SUMMARY:

On June 27, 1995, this laboratory received 4 water sample(s).

Client requested sample(s) be analyzed for organic parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

HARDING LAWSON ASSOCIATES

SAMPLE ID: MW-1
AEN LAB NO: 9506363-01
AEN WORK ORDER: 9506363
CLIENT PROJ. ID: 31531.1

DATE SAMPLED: 06/27/95
DATE RECEIVED: 06/27/95
REPORT DATE: 07/12/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	11,000 *	10	ug/L	07/06/95
Toluene	108-88-3	9,900 *	10	ug/L	07/06/95
Ethylbenzene	100-41-4	500 *	10	ug/L	07/05/95
Xylenes, Total	1330-20-7	6,300 *	40	ug/L	07/05/95
Purgeable HCs as Gasoline	5030/GCFID	53 *	1	mg/L	07/06/95

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

HARDING LAWSON ASSOCIATES

SAMPLE ID: MW-3
AEN LAB NO: 9506363-02
AEN WORK ORDER: 9506363
CLIENT PROJ. ID: 31531.1

DATE SAMPLED: 06/27/95
DATE RECEIVED: 06/27/95
REPORT DATE: 07/12/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	270 *	10	ug/L	07/06/95
Toluene	108-88-3	550 *	10	ug/L	07/06/95
Ethylbenzene	100-41-4	190 *	10	ug/L	07/06/95
Xylenes, Total	1330-20-7	1,700 *	40	ug/L	07/06/95
Purgeable HCs as Gasoline	5030/GCFID	20 *	1	mg/L	07/06/95

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

HARDING LAWSON ASSOCIATES

SAMPLE ID: MW-4
AEN LAB NO: 9506363-03
AEN WORK ORDER: 9506363
CLIENT PROJ. ID: 31531.1

DATE SAMPLED: 06/27/95
DATE RECEIVED: 06/27/95
REPORT DATE: 07/12/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	1,300 *	10	ug/L	07/06/95
Toluene	108-88-3	1,600 *	10	ug/L	07/06/95
Ethylbenzene	100-41-4	77 *	10	ug/L	07/06/95
Xylenes, Total	1330-20-7	1,800 *	40	ug/L	07/06/95
Purgeable HCs as Gasoline	5030/GCFID	13 *	1	mg/L	07/06/95

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

HARDING LAWSON ASSOCIATES

SAMPLE ID: MW-5
AEN LAB NO: 9506363-04
AEN WORK ORDER: 9506363
CLIENT PROJ. ID: 31531.1

DATE SAMPLED: 06/27/95
DATE RECEIVED: 06/27/95
REPORT DATE: 07/12/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	12,000 *	20	ug/L	07/05/95
Toluene	108-88-3	2,100 *	20	ug/L	07/05/95
Ethylbenzene	100-41-4	1,400 *	20	ug/L	07/05/95
Xylenes, Total	1330-20-7	1,600 *	80	ug/L	07/05/95
Purgeable HCs as Gasoline	5030/GCFID	41 *	2	mg/L	07/05/95

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9506363

CLIENT PROJECT ID: 31531.1

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: *EPA 8020, 5030 GCFID*

AEN JOB NO: 9506363
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
07/06/95	MW-1	01	104
07/06/95	MW-3	02	99
07/06/95	MW-4	03	100
07/05/95	MW-5	04	101
QC Limits:			92-109

DATE ANALYZED: 07/03/95
SAMPLE SPIKED: 9506328-06
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	36.1	103	5	85-109	17
Toluene	99.3	111	6	87-111	16
Hydrocarbons as Gasoline	1000	112	<1	66-117	19

Daily method blanks for all associated analytical runs showed no contamination over the reporting limit.

*** END OF REPORT ***

[redacted] Laboratory Associates
1655 Gateway Boulevard, Suite 500
Concord, California 94520
(510) 687-9660 • FAX (510) 687-9673

[redacted] CHAIN OF CUSTODY FORM [redacted]

Lab: AEN 9506363

Samplers: James McCarty

Job Number: 31531.1

Name/Location: City Blue, Oakland

Project Manager: Dave Scrivner

Recorder: James McCarty (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	# CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCL	Ice	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Day	Time	STATION DESCRIPTION/ NOTES
	X							3				MW-1A	94	06	27		01A-C
	X							3				MW-3			↓		02A-C
	X							3				MW-4					03A-C
	X							3				MW-5					04A-C

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	METALS	EPA 8015M/TPHg	EPA 8020/BTEX	EPA 8015M/TPHd,o
					X	X	
					X	X	
					X	X	
					X	X	

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
						Std TAT

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) James McCarty	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature) Ai L. Pruitt	DATE/TIME 6/27/95 1546

METHOD OF SHIPMENT: cooler with ice

SAMPLE CONDITION WHEN RECEIVED BY THE LABORATORY

Laboratory Copy White | Project Office Copy Yellow | Field or Office Copy Pink