April 15, 1993

18106,012.04

Blue Print Service Company
149 Second Street
San Francisco, California 94105

Attention: Mr. Jeff Christoff

Gentlemen:

Quarterly Report
December 30, 1992 through March 30, 1993
City Blue Groundwater Treatment System
1700 Jefferson Street
Oakland, California

This letter presents the current status and discusses the results of sampling and analysis from the groundwater treatment system at the City Blue Production facility at 1700 Jefferson Street in Oakland, California for the period of December 30, 1992 through March 30, 1993.

BACKGROUND

Three underground storage tanks were removed from the northwestern portion of the property in June 1987 (Plate 1). 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.

Petroleum hydrocarbons as gasoline were 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 offsite monitoring well (MW-5) was installed by HLA in August 1988.

HLA performed additional investigations in 1989 and performed an aquifer testing and groundwater treatment feasibility study in 1990. The groundwater treatment feasibility study identified biodegradation as the most appropriate treatment for the City Blue site.

This quarterly report is the fourth report issued since the system began operating in June 1992. Previous quarterly reports were issued on July 17, 1992, October 13, 1992, and January 20, 1993.

PROCESS DESCRIPTION

Groundwater containing elevated concentrations of petroleum hydrocarbons as gasoline and non-aqueous phase gasoline (floating product) is being collected from two onsite extraction wells, MW-1A and MW-4. Average system flow rates are 1 to 2 gallons per minute (gpm). Air pumps installed in the wells extract water and convey it

through aboveground and underground piping to the treatment system. The treatment system is comprised of the following three modules:

Pretreatment: The groundwater and floating product are pumped from the extraction wells to an aboveground oil/water separator. The gasoline is separated from the water and flows to a recovered product tank.

Treatment: The water separated from the gasoline is pumped to a 3,000-gallon biotreatment tank where the water is mixed with nutrient and oxygen to stimulate the growth of microorganisms that degrade the hydrocarbons.

Post-treatment: The contents of the biotreatment tank are pumped through sand filters to remove particulates and activated carbon drums to adsorb the remaining hydrocarbons. Effluent from the activated carbon drums is discharged to the sanitary sewer. Vapor from the bioreactor is passed through a vapor phase carbon adsorption unit before being released to the atmosphere.

Under normal operation, the treatment system processes approximately 1,000 gallons per day. A flow totalizer records the flow in gallons being discharged to the sanitary sewer. Flow totalizer readings are presented in Table 3. Treatment system maintenance must be performed three times a week to maintain continuous operation.

The treatment system has been permitted by the Bay Area Air Quality Management District (BAAQMD), the East Bay Municipal Utilities District (EBMUD), and the Oakland Fire Department.

TREATMENT SYSTEM STATUS

On October 24, 1992, a level control switch in the oil/water separator failed, resulting in overfilling of the recovered product tank with gasoline and water. The recovered product tank overflowed into the BPS parking lot and into the street. This incident was reported in the last quarterly report dated January 20, 1993. The level switches failed because they had been fouled by a film of microorganisms and emulsion. The coalescing unit in the separator had also become clogged and had expanded. The coalescing unit was replaced on January 8, 1993.

The treatment system has not been fully operational since October 24, 1993. In the meantime, HLA has performed an engineering evaluation of the treatment system and recommended modifications to improve the safety and maintenance features. The recommended modifications were submitted on April 13, 1993 to BPS and the contractor expected to perform the modifications.

TREATMENT SYSTEM SAMPLING

HLA has collected water and air samples from the treatment system. The samples were analyzed by EPA Test Method 8015 for total petroleum hydrocarbons as gasoline (TPH-G) and EPA Test Method 8020 for benzene, toluene, ethyl benzene, and xylenes (BTEX). Water samples were collected from the bioreactor effluent before the carbon beds, CB-1 and CB-2, and from the first carbon bed effluent, CB-1, to monitor for breakthrough of CB-1. In addition, samples of the bioreactor influent have been

analyzed to determine the degradation efficiency of the bioreactor. Subsequent water sampling will include the effluent from the second carbon bed, CB-2, before the treated water is discharged to the sanitary sewer.

Air samples were collected from the vapor phase carbon bed influent and effluent through the August 20, 1992 sampling. Subsequent air sampling will be from the effluent side only. The sampling locations are shown on Plate 2, Process Flow and Sampling Locations. Water samples were decanted from sampling ports into 40-milliliter volatile organic analysis (VOA) vials. Air samples were collected into 1-liter Tedlar bags with a vacuum box sampler. The air and water samples were stored in coolers on ice and submitted to Superior Analytical Laboratory in San Francisco under chain-of-custody protocols for analysis.

In addition to sampling air and groundwater, the system is maintained and inspected at least twice weekly during normal operation.

MONITORING WELL SAMPLING

In accordance with the sampling schedule submitted with the monitoring proposal and regulatory agency permit applications, HLA has sampled the offsite Monitoring Well MW-5 semiannually. The two extraction wells MW-1A and MW-4, and Monitoring Well MW-3 have floating product and have therefore not been sampled semiannually. The results of the MW-5 monitoring are presented in Table 1. The thickness of floating product in the onsite wells is presented in Table 2.

SAMPLING SCHEDULE

Air and water samples were collected one hour after the system started on June 16, 1992; every 24 hours for the first three days after the system started; weekly for the first three weeks of operation; and monthly thereafter. When the system is restarted, HLA will monitor the TPH-G and BTEX concentrations in the bioreactor before discharging to the carbon beds and sanitary sewer. The bioreactor influent and effluent and the discharge to the sanitary sewer will be sampled one hour and 24 hours after the system begins discharging to the sanitary sewer. The monthly sampling schedule will resume thereafter.

ANALYTICAL RESULTS

A summary of past results of chemical analyses are presented in Table 1. The results indicate that no detectable concentrations of TPH-G or BTEX are in the effluent water being discharged to the sanitary sewer. The bioreactor influent and effluent sample results indicate that the bioreactor treatment has been degrading over 90 percent of the TPH-G and BTEX concentrations before post-treatment polishing by the carbon beds.

The analytical results of the air samples (Table 1) indicate that no detectable concentrations of TPH-G or BTEX have been released from the vapor phase carbon adsorption unit into the atmosphere.

After the modifications to the treatment system are complete, HLA will train BPS personnel to operate and maintain the treatment system. The analytical results from startup activities and the resumed monthly sampling will be presented in the next quarterly report.

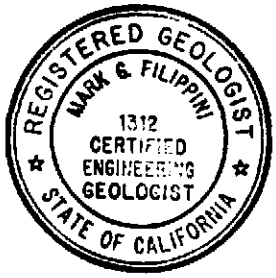
If you have any questions, please contact either of the undersigned.

Yours very truly,

HARDING LAWSON ASSOCIATES

David F. Scrivner
Project Engineer

Mark G. Filippini
Engineering Geologist



DFS/MGF/dm/b16954-ct110

Attachments: Laboratory Reports and Chain-of-Custody Records
Table 1 - Results of Chemical Analyses
Table 2 - Monitoring Well Product Thickness Measurements
Table 3 - Flow Totalizer Readings
Plate 1 - Site Plan
Plate 2 - Process Flow and Sampling Locations

cc: East Bay Municipal Utility District
P.O. Box 24055
Oakland, California 94623-1055
Attention: Ms. Molly Ong

Bay Area Air Quality Management District
939 Ellis Street
San Francisco, California 94109
Attention: Mr. Alexander V. Saschin
Ms. Loretta Robinson

Alameda County Health Care Services
Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, California 94621
Attention: Mr. Scott Seery

LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS

Superior Precision Analytical, Inc.
1555 Burke, Unit I • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

Harding Lawson Associates
Attn: Dave Scrivner

Project 11295-012
Reported 04/07/93

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
56238- 1	MW-5	03/30/93	04/06/93	Water

RESULTS OF ANALYSIS

Laboratory Number: 56238- 1

Gasoline:	74000
Benzene:	16000
Toluene:	5000
Ethyl Benzene:	1800
Xylenes:	2700
Concentration:	ug/L

Superior Precision Analytical, Inc.
1555 Burke, Unit I • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

C E R T I F I C A T E O F A N A L Y S I S

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 56238

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
ug/L = parts per billion (ppb)

OIL AND GREASE ANALYSIS By Standard Methods Method 5520F:
Minimum Detection Limit in Water: 5000ug/L

Modified EPA SW-846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Water: 50ug/L

EPA SW-846 Method 8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Water: 50ug/L

EPA SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Water: 0.3ug/L

ANALYTE	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Gasoline:	95/101	6%	76-111
Benzene:	100/101	1%	78-110
Toluene:	103/105	2%	78-111
Ethyl Benzene:	107/108	1%	78-118
Xylenes:	102/104	2%	73-113

Richard Srna, Ph.D.
Laboratory Director

Harding Lawson Associates
Marathon Plaza
303 Second Street, Suite 630 North
San Francisco, CA 94107
(415) 543-8422 • (415) 777-9706 Telecopy

CHAIN OF CUSTODY FORM 56238

Lab: Superior Analytical

Samplers: Ron Reidl

Job Number: 11295-03

Name/Location: City Blue

Project Manager: Dave Scrivner

Recorder: _____ (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCL	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH-Gas / BTEX
	X							X	M	W	5	9	3	0	3	3	0	1	7	3	0	3 VOAs							X

ANALYSIS REQUESTED

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

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature) Wk McCon Ac1069	DATE/TIME
RELINQUISHED BY: (Signature) Ac10 619	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 5/31/93 10:45
METHOD OF SHIPMENT		

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

6533

Table 1. Results of Air and Groundwater Chemical Analysis
Groundwater Treatment System
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)	MW-5
06/16/92						
TPH-G	NA	3300	ND<50	NA	ND<30000	NA
Benzene	NA	220	ND<0.3	NA	ND<85	NA
Toluene	NA	460	ND<0.3	NA	ND<250	NA
Ethylbenzene	NA	35	ND<0.3	NA	ND<65	NA
Xylene	NA	290	ND<0.3	NA	ND<250	NA
06/17/92						
TPH-G	NA	43000	ND<50	NA	ND<30000	NA
Benzene	NA	4900	ND<0.3	NA	ND<85	NA
Toluene	NA	7600	ND<0.3	NA	ND<250	NA
Ethylbenzene	NA	500	ND<0.3	NA	ND<65	NA
Xylene	NA	4100	ND<0.3	NA	ND<250	NA
06/18/92						
TPH-G	NA	4300	ND<50	NA	ND<30000	NA
Benzene	NA	20	ND<0.3	NA	160	NA
Toluene	NA	48	ND<0.3	NA	710	NA
Ethylbenzene	NA	3.6	ND<0.3	NA	89	NA
Xylene	NA	970	ND<0.3	NA	670	NA
06/19/92						
TPH-G	180000	1600	ND<50	NA	ND	NA
Benzene	18000	1.6	ND<0.3	NA	ND	NA
Toluene	31000	5.0	ND<0.3	NA	ND	NA
Ethylbenzene	2200	ND<0.3	ND<0.3	NA	ND	NA
Xylene	16000	150	ND<0.3	NA	ND	NA
06/24/92						
TPH-G	NA	980	ND<50	NA	ND<30000	NA
Benzene	NA	11	ND<0.3	NA	ND<85	NA
Toluene	NA	13	ND<0.3	NA	ND<250	NA
Ethylbenzene	NA	1.8	ND<0.3	NA	ND<65	NA
Xylene	NA	140	ND<0.3	NA	ND<250	NA

Table 1. Results of Air and Groundwater Chemical Analysis
Groundwater Treatment System
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)	MW-5
07/02/92						
TPH-G	160000	210	ND<50	NA	ND<30000	NA
Benzene	14000	1.4	ND<0.3	NA	ND<85	NA
Toluene	27000	ND<0.3	ND<0.3	NA	ND<250	NA
Ethylbenzene	1700	ND<0.3	ND<0.3	NA	ND<65	NA
Xylene	1300	1.0	ND<0.3	NA	ND<250	NA
07/10/92						
TPH-G	150000	2800	ND<50	NA	ND<30000	NA
Benzene	14000	41	ND<0.3	NA	ND<85	NA
Toluene	26000	36	ND<0.3	NA	ND<250	NA
Ethylbenzene	1700	2.2	ND<0.3	NA	ND<65	NA
Xylene	12000	360	ND<0.3	NA	ND<250	NA
07/17/92						
TPH-G	190000	400	NA	NA	NA	NA
Benzene	22000	21	NA	NA	NA	NA
Toluene	34000	25	NA	NA	NA	NA
Ethylbenzene	2100	0.8	NA	NA	NA	NA
Xylene	17000	27	NA	NA	NA	NA
07/24/92						
TPH-G	140000	1100	NA	NA	NA	NA
Benzene	13000	15	NA	NA	NA	NA
Toluene	23000	2.4	NA	NA	NA	NA
Ethylbenzene	1700	ND<0.3	NA	NA	NA	NA
Xylene	12000	200	NA	NA	NA	NA
08/20/92						
TPH-G	190000	6400	73	NA	ND<30000	NA
Benzene	14000	31	ND<0.3	NA	ND<85	NA
Toluene	24000	14	ND<0.3	NA	ND<250	NA
Ethylbenzene	2000	ND<6	ND<0.3	NA	ND<65	NA
Xylene	13000	150	ND<0.3	NA	ND<250	NA

Table 1. Results of Air and Groundwater Chemical Analysis
Groundwater Treatment System
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)	MW-5
09/15/92						
TPH-G	230000	23000	54	NA	ND<30000	NA
Benzene	17000	1100	0.4	NA	ND<85	NA
Toluene	29000	3600	0.8	NA	ND<250	NA
Ethylbenzene	2200	59	ND<0.3	NA	ND<65	NA
Xylene	15000	1100	0.6	NA	ND<250	NA
09/30/92						
TPH-G	NA	NA	NA	NA	NA	51000
Benzene	NA	NA	NA	NA	NA	13000
Toluene	NA	NA	NA	NA	NA	5900
Ethylbenzene	NA	NA	NA	NA	NA	1400
Xylene	NA	NA	NA	NA	NA	2600
03/30/93						
TPH-G	NA	NA	NA	NA	NA	74000
Benzene	NA	NA	NA	NA	NA	16000
Toluene	NA	NA	NA	NA	NA	5000
Ethylbenzene	NA	NA	NA	NA	NA	1800
Xylene	NA	NA	NA	NA	NA	2700

(1) = Sample Location Identification Number (see Plate 2).
All concentrations in parts per billion (ppb).
ND = Not detected above the reporting limit.
NA = Not analyzed.

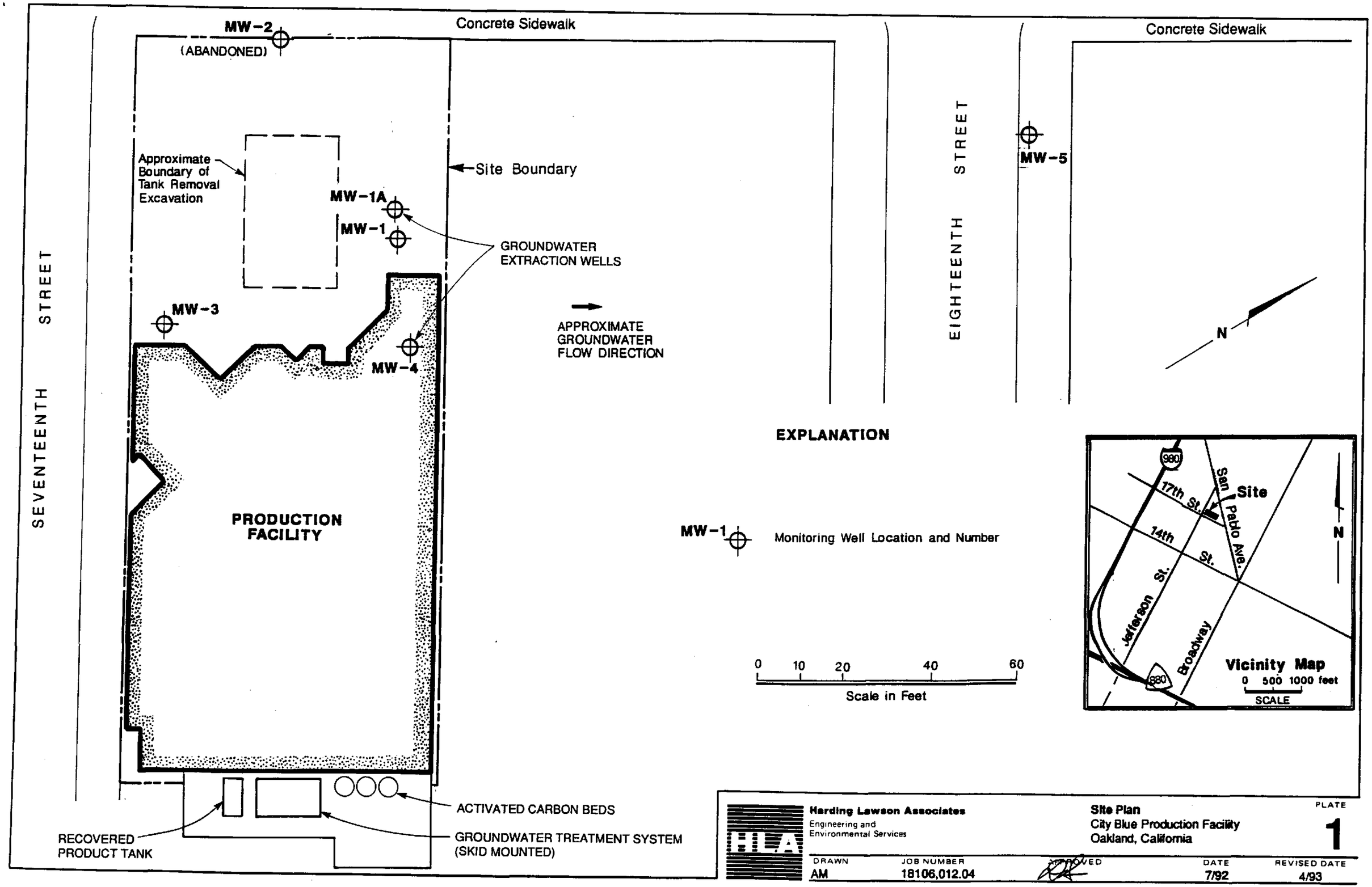
Table 2. Monitoring Well Product Thickness Measurements

Date	MW-1	MW-1A	MW-3	MW-4	MW-5
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

All measurements in inches.
NM = Not measured

Table 3. Flow Totalizer Readings
Discharge to Sanitary Sewer

Date	Flow Total to Sanitary Sewer (gallons)
06/16/92	1,000
06/17/92	2,957
06/18/92	4,011
06/19/92	5,650
06/24/92	6,830
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

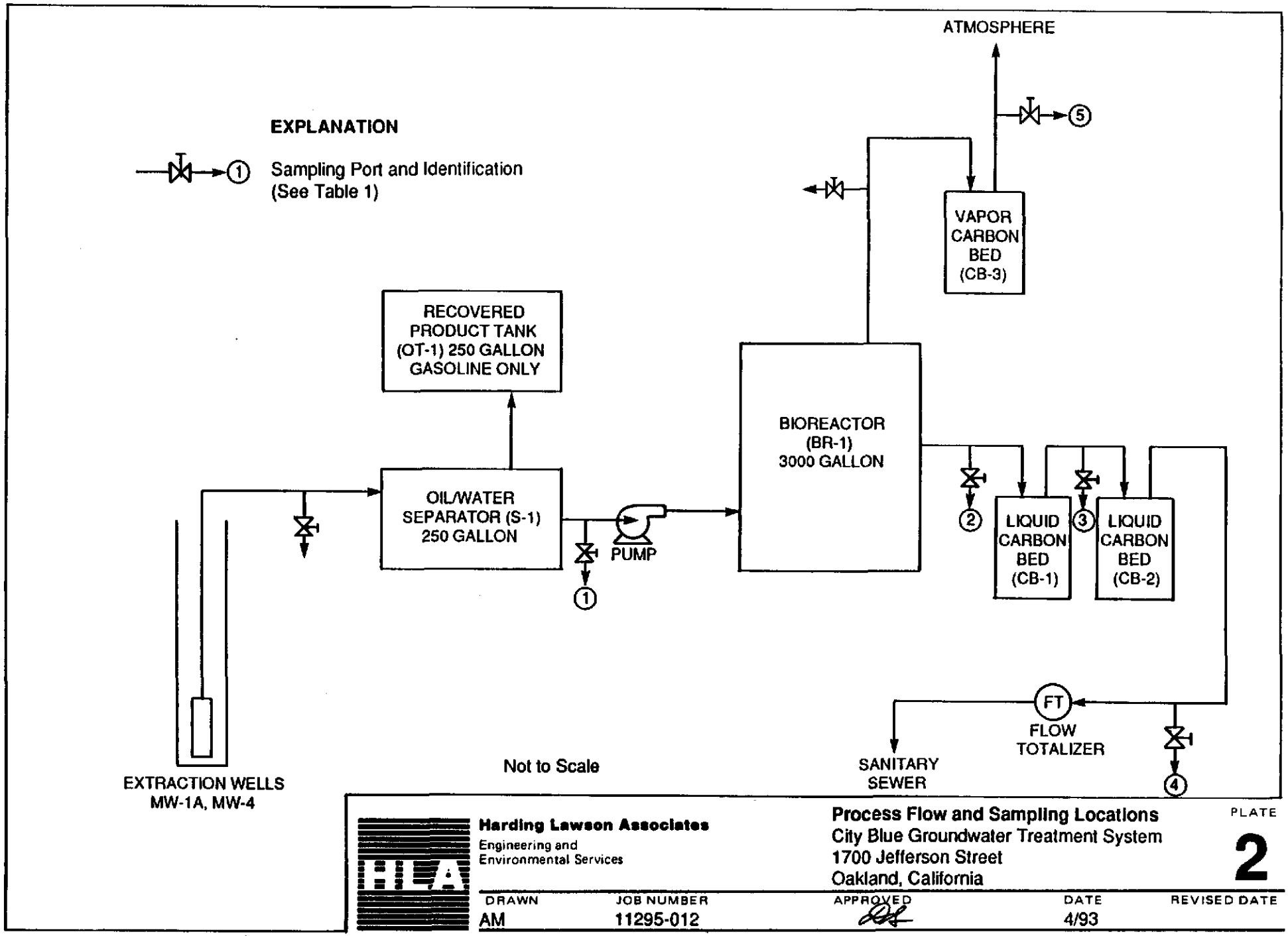


Harding Lawson Associates
Engineering and Environmental Services

Site Plan
City Blue Production Facility
Oakland, California

PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
AM	18106,012.04		7/92	4/93



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	JOB NUMBER	APPROVED	DATE	REVISED DATE
AM	11295-012		4/93	