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September 9, 1993

18106,012.04

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

Attention: Mr. Jeff Christoff

Gentlemen:

Quarterly Report
April 1, 1993 through June 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 **April 1, 1993 through June 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.

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 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, 1992. 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. The contractor is presently performing the recommended modifications to the treatment system and should be finished on or around September 10, 1993. HLA will notify EBMUD, BAAQMD, and Alameda County before resuming operation of the treatment system.

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.

September 9, 1993
18106,012.04
Mr. Jeff Christoff
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Page 4

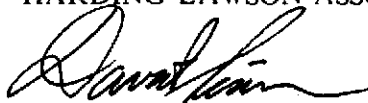
Harding Lawson Associates

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,

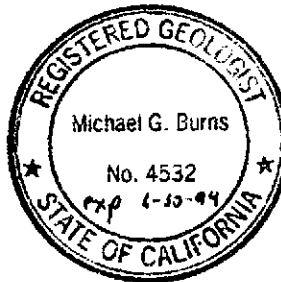
HARDING LAWSON ASSOCIATES



David F. Scrivner
Project Engineer



Michael G. Burns, R.G.
Associate Geologist



DFS/MGB/dm/A17095-CT68

Attachments: 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

Table 1. Results of Air and Groundwater Chemical Analysis Harding Lawson Associates
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
<u>06/16/92</u>						
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
<u>06/17/92</u>						
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
<u>06/18/92</u>						
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
<u>06/19/92</u>						
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
<u>06/24/92</u>						
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 Harding Lawson Associates
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
<u>07/02/92</u>						
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
<u>07/10/92</u>						
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
<u>07/17/92</u>						
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
<u>07/24/92</u>						
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
<u>08/20/92</u>						
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 **Harding Lawson Associates**
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
<u>09/15/92</u>						
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
<u>09/30/92</u>						
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
<u>03/30/93</u>						
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

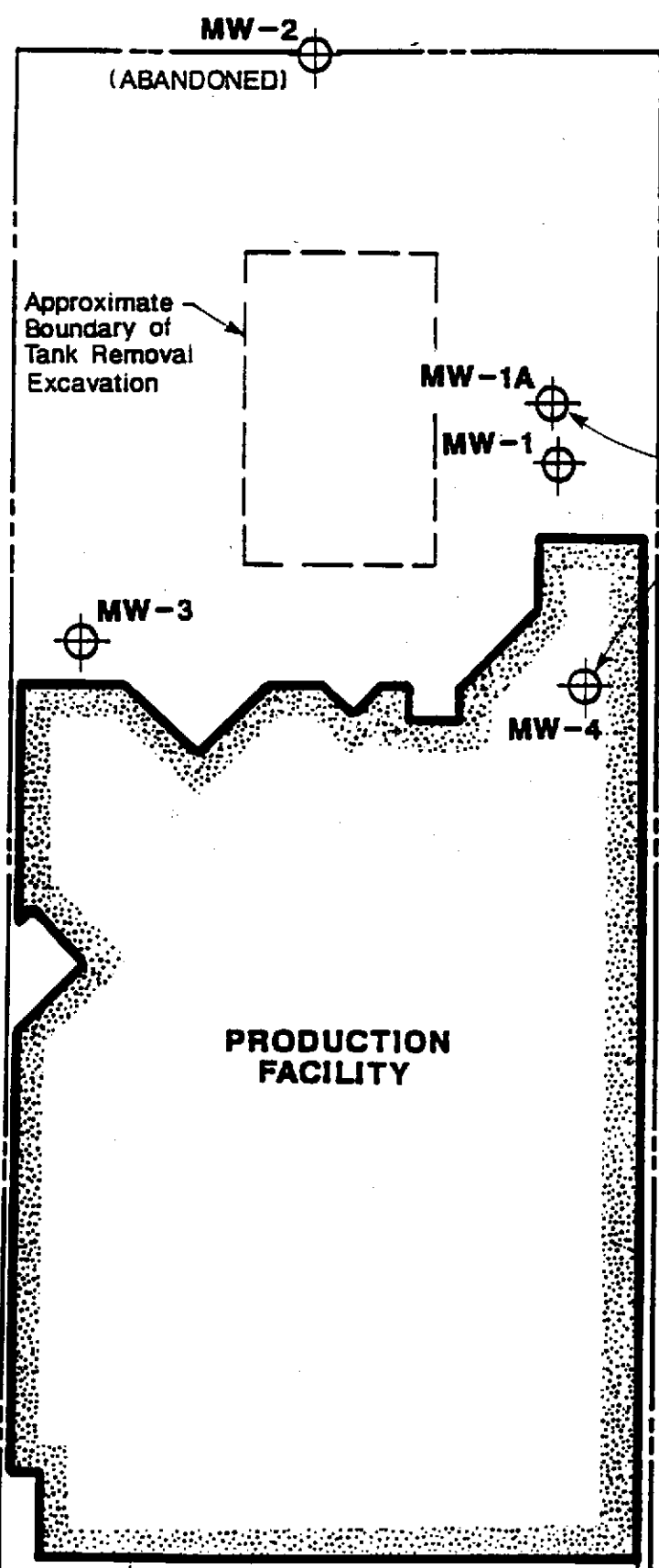
All measurements in inches.

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

SEVENTEENTH STREET



Concrete Sidewalk

EIGHTEENTH STREET

Concrete Sidewalk

Approximate Boundary of Tank Removal Excavation

Site Boundary

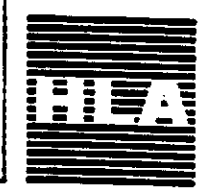
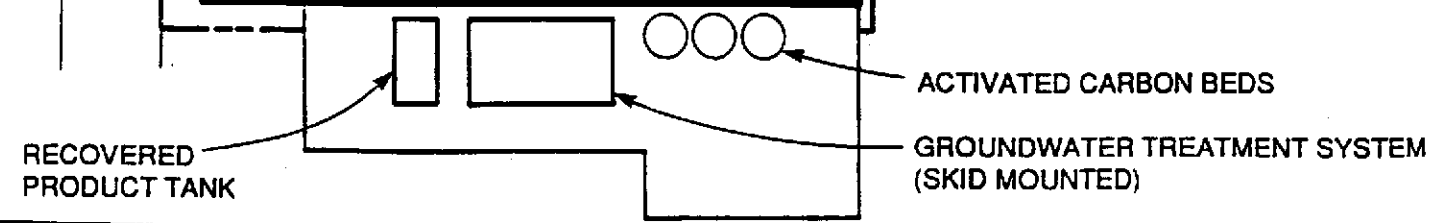
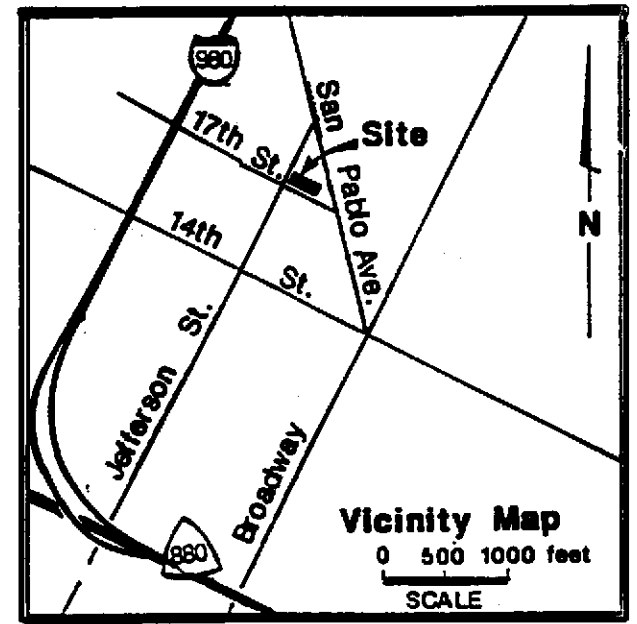
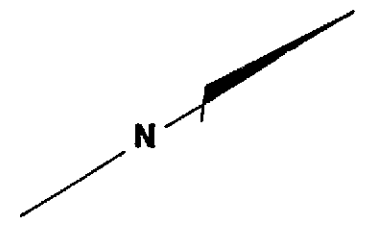
GROUNDWATER EXTRACTION WELLS

APPROXIMATE GROUNDWATER FLOW DIRECTION

PRODUCTION FACILITY

EXPLANATION

MW-1 Monitoring Well Location and Number



Harding Lawson Associates
Engineering and Environmental Services

Site Plan
City Blue Production Facility
Oakland, California

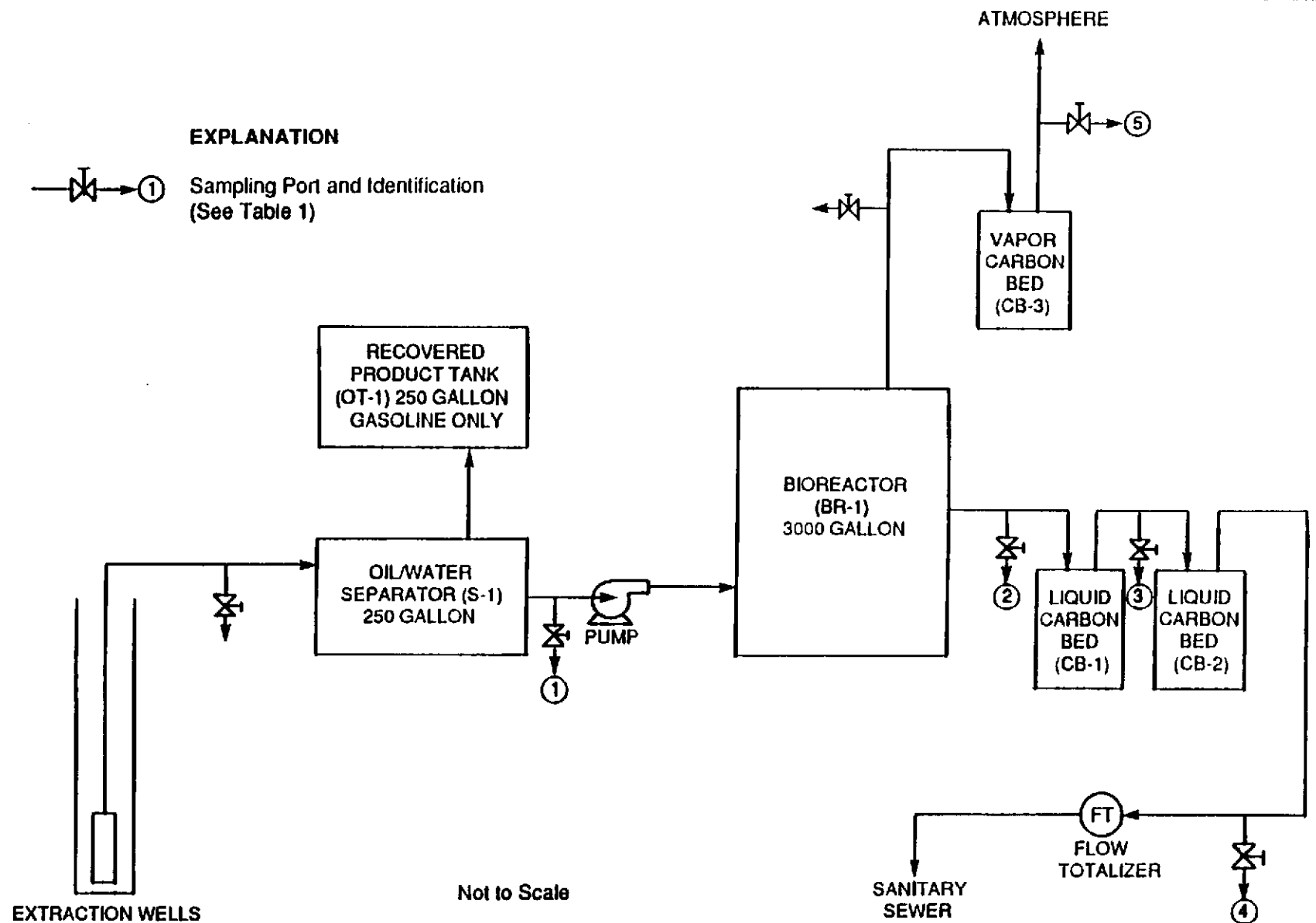
PLATE

1

DRAWN AM	JOB NUMBER 18106.012.04	APPROVED 	DATE 7/92	REVISED DATE 4/93
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EXPLANATION


 Sampling Port and Identification
 (See Table 1)



Not to Scale

EXTRACTION WELLS
MW-1A, MW-4

ATMOSPHERE

VAPOR CARBON BED (CB-3)

LIQUID CARBON BED (CB-1)

LIQUID CARBON BED (CB-2)

FLOW TOTALIZER (FT)

SANITARY SEWER



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