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January 20, 1993

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

Attention: Mr. Jeff Christoff

Gentlemen:

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

This letter presents the current status and 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 from September 30, 1992 through December 30, 1992.

**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 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 third report issued since the system began operating in June 1992. Previous quarterly reports were issued on July 17, 1992 and October 13, 1992.

**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 above-ground 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. 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. The Oakland Fire Department was notified by an anonymous caller, who in turn contacted the manager of the BPS facility. The facility manager shut off all power to the treatment system. HLA was notified of this incident on Monday, October 26, 1992 when an HLA technician visited the site to perform routine maintenance. The contractor who constructed the treatment system determined that the level switches had been fouled by a build-up of gasoline/water emulsion. The coalescing unit in the separator was also determined to have become clogged with emulsion and had expanded. This coalescing unit had expanded from prolonged contact with the gasoline. The manufacturer was notified immediately and a replacement coalescing unit designed for prolonged contact with gasoline was ordered. The replacement unit arrived on January 6, 1993 and was installed on January 8, 1993.

The shutdown of the system on October 24, 1992 took place before the system had been sampled for October. The treatment system has not been fully operational since the shutdown. In the meantime, BPS has authorized HLA to perform an engineering evaluation of the treatment system and recommend modifications to improve the performance. The engineering evaluation and recommendations should be completed

by the end of February, 1993. In the interim, the system will be restarted with the repaired oil/water separator to continue removing floating product.

#### **TREATMENT SYSTEM SAMPLING**

HLA has collected water and air samples from the treatment system and analyzed the samples by EPA Test Method 8015 for total petroleum hydrocarbons as gasoline (TPH-G) and by EPA Test Method 8020 for benzene, toluene, ethyl benzene, and xylenes (BTEX). Water samples are collected from the bioreactor effluent before the carbon beds and from the carbon bed effluent before discharge to the sanitary sewer. In addition, samples of the bioreactor influent and effluent have been analyzed to determine the degradation efficiency of the bioreactor. 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. 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.

#### **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.

#### **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 is 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.

HLA will continue to monitor and sample the groundwater treatment system at City Blue through completion of the anticipated modifications. After the modifications to the treatment system are complete, BPS may choose to operate and maintain the treatment system. The sampling schedule will resume after the system is restarted. When the system is restarted, the biotreatment tank will not be discharged until laboratory analyses indicate that an effective microorganism population has been established to degrade the hydrocarbons to an acceptable level for carbon adsorption. The analytical results from startup activities and the resumed monthly sampling schedule will be presented in the next quarterly report in April 1993.

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Mr. Jeff Christoff  
Blue Print Services Company  
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Harding Lawson Associates

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

Yours very truly,

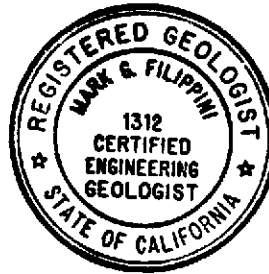
HARDING LAWSON ASSOCIATES



David F. Scrivner  
Project Engineer



Mark G. Filippini  
Engineering Geologist



DFS/MGF/dm/B16397-CT103

Attachments: Table 1 - Results of Chemical Analyses  
Plate 1 - Site Plan

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 Analyses  
Groundwater Treatment System  
City Blue Production Facility**

Sample Number	TPH-G	Benzene	Toluene	Ethyl-Benzene	Xylene
92061601	3300	220	460	35	290
92061602	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92061603	110000	5200	6900	360	2200
92061604	ND<30000	ND<85	ND<250	ND<65	ND<250
92061701	43000	4900	7600	500	4100
92061702	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92061703	1300000	120000	140000	7100	40000
92061704	ND<30000	ND<85	ND<250	ND<65	ND<250
92061801	4300	20	48	3.6	970
92061802	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92061803	210000	1100	2200	240	10000
92061804	ND<30000	160	710	89	670
92061901	1600	1.6	5.0	ND<0.3	150
92061902	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92061903	490000	4900	5700	550	7300
92061904	ND<30000	ND<85	ND<250	ND<65	ND<250
92061905	180000	18000	31000	2200	16000
92062401	980	11	13	1.8	140
92062402	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92062403	230000	3100	3600	380	6400
92062404	ND<30000	ND<85	ND<250	ND<65	ND<250
92070201	210	1.4	ND<0.3	ND<0.3	1.0
92070202	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92070203	43000	140	ND<250	79	360
92070204	ND<30000	ND<85	ND<250	ND<65	ND<250
92070205	160000	14000	27000	1700	1300
92071001	2800	41	36	2.2	360
92071002	ND<50	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92071003	660000	15000	23000	1900	23000
92071004	ND<30000	ND<85	ND<250	ND<65	ND<250
92071005	150000	14000	26000	1700	12000
92071701	400	21	25	0.8	27
92071705	190000	22000	34000	2100	17000
92072401	1100	15	2.4	ND<0.3	200
92072405	140000	13000	23000	1700	12000

**Table 1. Results of Air and Groundwater Chemical Analyses  
Groundwater Treatment System  
City Blue Production Facility**

Sample Number	TPH-G	Benzene	Toluene	Ethyl-Benzene	Xylene
92082001	6400	31	14	ND<6	150
92082002	73	ND<0.3	ND<0.3	ND<0.3	ND<0.3
92082003	520000	6800	9100	630	4600
92082004	ND<30	ND<85	ND<250	ND<65	ND<250
92082005	190000	14000	24000	2000	13000
92091501	23000	1100	3600	59	1100
92091502	54	0.4	0.8	ND<0.3	0.6
92091504	ND<30	ND<85	ND<250	ND<65	ND<250
92091505	230000	17000	29000	2200	15000
92091506*	52	ND<0.3	0.4	ND<0.3	ND<0.3
MW-5	51000	13000	5900	1400	2600

Sample number begins with year, month, and day of sampling

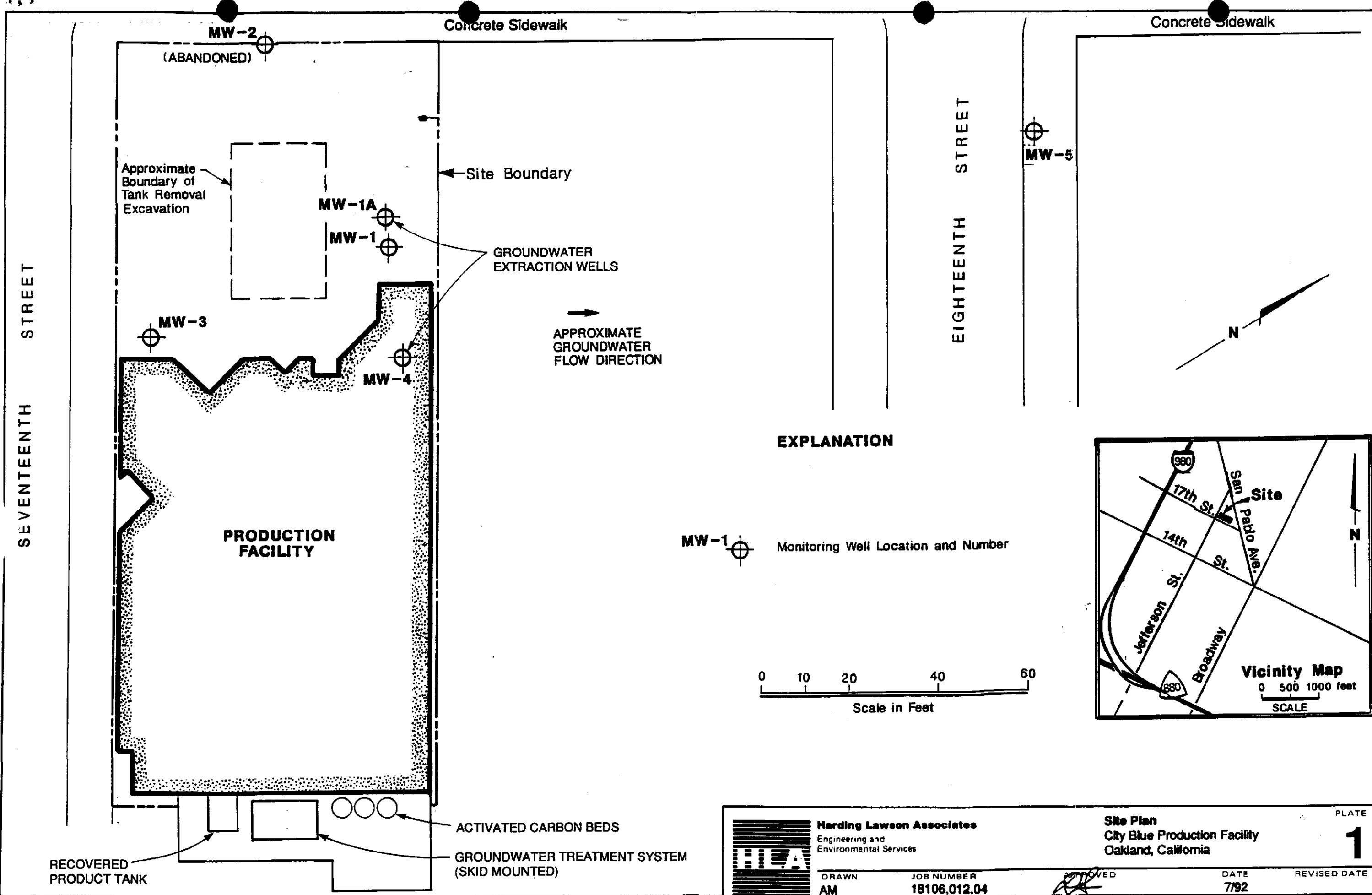
Sample Sequence:

- 01 - Bioreactor Effluent (water)
- 02 - First Carbon Bed Effluent (water)
- 03 - Vapor Phase Carbon Influent (Air)
- 04 - Vapor Phase Carbon Effluent (Air)
- 05 - Bioreactor Influent (water)

All concentrations in parts per billion (ppb).

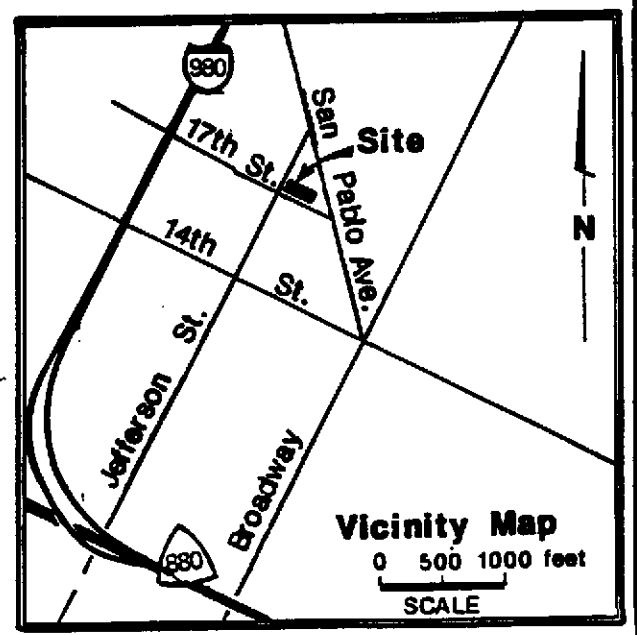
TPH-G in air has been converted to ppb from parts per million (ppm) reported by Superior Analytical.

\*Sample 92091506 was collected as a duplicate of 92091502.



**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
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RECOVERED  
PRODUCT TANK

ACTIVATED CARBON BEDS

GROUNDWATER TREATMENT SYSTEM  
(SKID MOUNTED)

**PRODUCTION  
FACILITY**

Concrete Sidewalk

Concrete Sidewalk

EIGHTEENTH STREET

SEVENTEENTH STREET

MW-2  
(ABANDONED)

MW-1A

MW-1

Approximate  
Boundary of  
Tank Removal  
Excavation

Site Boundary

GROUNDWATER  
EXTRACTION WELLS

APPROXIMATE  
GROUNDWATER  
FLOW DIRECTION

MW-3

MW-4

MW-5

N

**Vicinity Map**

0 500 1000 feet  
SCALE

N