Harding Lawson Associates

October 13, 1992

18106,012.04

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

Attention: Mr. Jeff Christoff

Gentlemen:

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

This letter presents 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 June 30, 1992 through September 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.

PROCESS DESCRIPTION

Groundwater containing elevated concentrations of petroleum hydrocarbons and free-phase hydrocarbons (floating product) is being collected from two onsite extraction wells, MW-1A and MW-4. Maximum average system flow rates are 2 to 5 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 three modules: pretreatment (oil/water separation), treatment (biotreatment), and post-treatment (filtration and carbon bed polishing modules). The pretreatment module is a vapor-tight oil/water separator that separates the free-phase gasoline from the water. The gasoline flows to a recovered product tank and the water is pumped to the bioreactor for treatment. The bioreactor is a 3,000-gallon tank with associated nutrient, air, and caustic feed systems. The post-treatment module consists of a sand filter and two liquid phase carbon beds. Effluent from the second carbon bed is discharged to the sanitary sewer drain onsite. Vapor from the bioreactor is passed through a vapor phase carbon adsorption unit before being released to the atmosphere.

On average, the treatment system processes approximately 1,000 gallons per day. The system has experienced frequent automatic shutdowns due to microorganisms clogging the post-treatment module. Microorganisms must be backwashed from the sand filter and carbon beds at least twice weekly for the system to operate properly.

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 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 first carbon bed effluent before the second carbon bed and subsequent 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. The chain-of-custody records are included as an attachment.

In addition to sampling air and groundwater, the system is maintained and inspected at least twice weekly. Copies of the inspection logs are included as an attachment.

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. For this period, samples were collected on July 10, August 20, and September 15, 1992. In addition, samples of bioreactor influent and effluent were collected on July 17 and 24, 1992, and Monitoring Well MW-5 was sampled on September 30, 1992. MW-5 is the only well that does not contain floating product.

ANALYTICAL RESULTS

The results of chemical analyses are presented in Table 1. The laboratory reports are attached. 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.

Based on current loading data we had estimated that the primary carbon bed would not allow a breakthrough of detectable TPH-G or BTEX until May 1993. However, the relatively high concentrations of TPH-G and BTEX in the bioreactor influent on September 15, 1992, were not degraded sufficiently to be completely adsorbed by the first carbon bed. The treatment system experienced a prolonged shutdown between September 10 and 14, 1992. The microorganism population decreases during shutdown periods due to a shortage of hydrocarbons. The sample results from September 15, 1992, indicate that the microorganism population had not yet increased sufficiently to achieve maximum degradation of the hydrocarbons.

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.

On September 30, 1992, the floating product thickness was measured in Monitoring Wells MW-1 and MW-3. MW-1, which is located between the two extraction wells, contained 2.47 feet of floating product. MW-3 is located approximately 60 feet south of the extraction wells and contained 0.34 feet of floating product.

HLA is continuing to monitor and sample the groundwater treatment system at City Blue. The sampling is being performed monthly and the results will be presented in the next quarterly report in January 1993.

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/B14691-CT88

Attachments: Table 1 - Results of Chemical Analyses
Plate 1 - Site Plan
Laboratory Reports and Chain-of-Custody
Facility Inspection Logs

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.

Concrete Sidewalk

MW-2
(ABANDONED)

Approximate Boundary of Tank Removal Excavation

Site Boundary

MW-1A

MW-1

GROUNDWATER EXTRACTION WELLS

MW-3

MW-4

APPROXIMATE GROUNDWATER FLOW DIRECTION

SEVENTEENTH STREET

PRODUCTION FACILITY

ACTIVATED CARBON BEDS

GROUNDWATER TREATMENT SYSTEM (SKID MOUNTED)

RECOVERED PRODUCT TANK

Concrete Sidewalk

EIGHTEENTH STREET

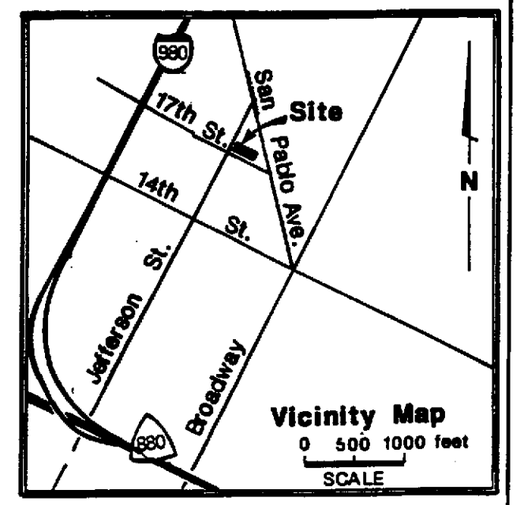
MW-5

N

EXPLANATION

MW-1 — Monitoring Well Location and Number

0 10 20 40 60
Scale in Feet



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	

LABORATORY REPORTS, CHAIN-OF-CUSTODY RECORDS, AND INSPECTION LOGS

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

LABORATORY NO.: 55195
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/02/92
DATE REPORTED: 07/10/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92070201	210
2	92070202	ND<50

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15
MS/MSD Recovery =104%: Duplicate RPD = 8%

Richard Srna, Ph.D.

Cecilia G. Jorgensen (for)
Laboratory Manager

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55195
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/02/92
DATE REPORTED: 07/10/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES
by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92070201	1.4	ND<0.3	ND<0.3	1.0
2	92070202	ND<0.3	ND<0.3	ND<0.3	ND<0.3

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15
MS/MSD Average Recovery = 96%: Duplicate RPD = 0.7%

Richard Srna, Ph.D.

Laboratory Manager

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55195
CLIENT: HARDING LAWSON ASSOCIATES
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/02/92
DATE REPORTED: 07/06/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ppm) Gasoline Range
3	92070203	43
4	92070204	ND<30

ppm - parts per million in air
Minimum Detection Limit for Gasoline in Air: 30 ppm
Concentration of gasoline in air is calculated based on 20 C and 1 ATM and an assumed molecular weight of hexane.
Reported as volume to volume.

QAQC Summary:
Daily Standard run at 2mg/L: %DIFF Gasoline = <15
MS/MSD Average Recovery = 91%: Duplicate RPD = 2%

Richard Srna, Ph.D.

Laboratory Director

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

LABORATORY NO.: 55195
CLIENT: HARDING LAWSON ASSOCIATES
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/02/92
DATE REPORTED: 07/06/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ppb) Benzene	Toluene	Ethyl Benzene	Xylenes
3	92070203	140	ND<250	79	360
4	92070204	ND<85	ND<250	ND<65	ND<250

ppb - parts per billion in air

Minimum Detection Limit for Benzene in air = 85 ppb
Minimum Detection Limit for Toluene and Xylenes in air = 250 ppb
Minimum Detection Limit for Ethyl Benzene in air = 65 ppb
Concentration of BTXE in air is calculated based on 20 C and 1 ATM.
Reported as volume to volume.

QAQC Summary:

Daily Standard run at 20ug/L: %DIFF 8020 = <15%
MS/MSD Average Recovery = 92% : Duplicate RPD = 4%

Richard Srna, Ph.D.

Laboratory Director

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

LABORATORY NO.: 55211
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/07/92
DATE REPORTED: 07/14/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92070205	160000

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15
MS/MSD Recovery = 89%: Duplicate RPD = 3

Richard Srna, Ph.D.
Laboratory Manager

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

LABORATORY NO.: 55211
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/07/92
DATE REPORTED: 07/14/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES
by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92070205	14000	27000	1700	13000

ug/L - parts per billion (ppb)
Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15%
MS/MSD Average Recovery =96%: Duplicate RPD = 3

Richard Syna, Ph.D.
Laboratory Manager

55195

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

Lab: Superior

Samplers: Dave Scrivner

Job Number: 11295-017

Name/Location: City Blue

Project Manager: Cheryl Nelson

Recorder: [signature] (Signature Required)

ANALYSIS REQUESTED: EPA 601/8010 | EPA 602/8020 | EPA 624/8240 | EPA 625/8270 | ICP METALS | EPA 8015M/TPH | TPH-GAS + BTEX

RUSH

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	AIR	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCl/Ice	Tedlar	SAMPLE NUMBER OR LAB NUMBER (Yr Wk Seq)	DATE (Yr Mo Dy Time)	STATION DESCRIPTION/NOTES	TPH-GAS + BTEX
	X								2		92070201	920702 1000		X
	X								2		92070202	920702 1000		X
					X					1	92070203	920702 1000		X
					X					1	92070204	920702 1000		X
	X								2		92070205	920702 1000	HOLD 92070205	

RUSH

LAB NUMBER (Yr Wk Seq)	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
				Please Initial:

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
[signature]	R. M. EXPRESS IT	7-2-92 1510
R. M. EXPRESS IT 1257	Peter B. Aaron	7-2-92 1536

DISPATCHED BY: (Signature)	DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME

METHOD OF SHIPMENT

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

6533

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

Lab: Superior

Samplers: Dave Scrivner

Job Number: 11295-017

Name/Location: City Blue

Project Manager: Cheryl Nelson

Recorder: [signature] (Signature Required)

RUSH

Source Code	Matrix: Water	Sediment	Soil	Oil	AIR	#Containers & Preserv.: Unpres.	H_2SO_4	HNO_3	HCl/Ice	Tedlar	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								Z		92	07	0201	92	07	02	1000								X
	X								Z		92	07	0202	92	07	02	1000								X
					X					1	92	07	0203	92	07	02	1000								X
					X					1	92	07	0204	92	07	02	1000								X
	X								Z		92	07	0205	92	07	02	1000	HOLD 92070205							

please analyze as per client 7/7/92

ADDITIONAL REQUEST

RUSH

Lab Number: Yr	Wk	Seq	Depth in Feet	Col Mtd Cd	QA Code	Miscellaneous
						Please initial:
						Samples stored in ice: Yes
						Appropriate containers: Yes
						Samples preserved: Yes
						VOA's without headspace: Yes
						Comments:

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Received by: (Signature)	Date/Time
[signature]	R. R. G Express IT	7-2-92 / 1510
R. M Express IT 1257	Peter B. Aaron	7-2-92 / 1536

Dispatched by: (Signature)	Date/Time	Received for Lab by: (Signature)	Date/Time

Method of Shipment

Laboratory Copy Project ...

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

LABORATORY NO.: 55213
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/10/92
DATE REPORTED: 07/13/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92071001	2800
2	92071002	ND<50

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15
MS/MSD Recovery = 99%: Duplicate RPD = 5%

Richard Srna, Ph.D.

(for)

Laboratory Manager

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55213
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 07/10/92
DATE REPORTED: 07/13/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES
by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92071001	41	36	2.2	360
2	92071002	ND<0.3	ND<0.3	ND<0.3	ND<0.3

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15%
MS/MSD Average Recovery =95%: Duplicate RPD = 2%

Richard Srna, Ph.D.

Laboratory Manager

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

LABORATORY NO.:55213 DATE RECEIVED: 07/10/92
CLIENT:Harding Lawson Associates DATE REPORTED: 07/13/92
CLIENT JOB NO.:11295-017

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ppm) Gasoline Range
3	92071003	660
4	92071004	ND<30

ppm - parts per million in air
Minimum Detection Limit for Gasoline in Air: 30 ppm
Concentration of gasoline in air is calculated based on 20 C and 1 ATM and an assumed molecular weight of hexane.
Reported as volume to volume.

QAQC Summary:
Daily Standard run at 2mg/L: %DIFF Gasoline = <15
MS/MSD Average Recovery =92%: Duplicate RPD = 2%

Richard Srna, Ph.D.
Laboratory Director

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

LABORATORY NO.:55213
CLIENT:Harding Lawson Associates
CLIENT JOB NO.:11295-017

DATE RECEIVED: 07/10/92
DATE REPORTED: 07/13/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ppb) Benzene	Toluene	Ethyl Benzene	Xylenes
3	92071003	15000	23000	1900	23000
4	92071004	ND<85	ND<250	ND<65	ND<250

ppb - parts per billion in air

Minimum Detection Limit for Benzene in air = 85 ppb
Minimum Detection Limit for Toluene and Xylenes in air = 250 ppb
Minimum Detection Limit for Ethyl Benzene in air = 65 ppb
Concentration of BTXE in air is calculated based on 20 C and 1 ATM.
Reported as volume to volume.

QAQC Summary:

Daily Standard run at 20ug/L: %DIFF 8020 = <15
MS/MSD Average Recovery =94 % : Duplicate RPD = 0.5%

Richard Srna, Ph.D.
(for)
Laboratory Director

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

LABORATORY NO.: 55223
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-016

DATE RECEIVED: 07/10/92
DATE REPORTED: 07/15/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92071005	150000

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15
MS/MSD Recovery = 110%: Duplicate RPD = 5.7

Richard Srna, Ph.D.
Laboratory Manager

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

LABORATORY NO.: 55223
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-016

DATE RECEIVED: 07/10/92
DATE REPORTED: 07/15/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92071005	14000	26000	1700	12000

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15%
MS/MSD Average Recovery =95%: Duplicate RPD = 3.4

Richard Srna, Ph.D.
Laboratory Manager

Harding Lawson Associates
666 Howard Street, Third Floor
San Francisco, California 94105
415/543-8422
Telecopy: 415/777-9706

CHAIN OF CUSTODY FORM 55213

Lab: Superior (clay)

Job Number: 11295-017
Name/Location: City Blue
Project Manager: Cheryl Nelson

Samplers: David Scrivner
Recorder: [signature] (Signature Required)

SOURCE CODE	Water	Sediment	Soil	Oil	AIR	Unpres.	H_2SO_4	HNO_3	VOA/HCL		Tedlar	Sample Yr	Sample Wk	Sample Seq	Date Yr	Date Mo	Date 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								2			92	07	1001	92	07	10	0900								X
	X								2			92	07	1002	92	07	10	0900								X
					X						1	92	07	1003	92	07	10	0900								X
					X						1	92	07	1004	92	07	10	0900								X
	X								2			92	07	1006	92	07	10	0915	2ND CB Effl, HOLD							

Plea...
Sam...
App...
Samp...
VOA without...
Comments: H2O / air
CHAIN OF CUSTODY RECORD

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

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
[signature]	Lester B. Aaron	7-10-92 1005
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

Laboratory Copy W | Project Office Copy Yell | Field or Office Copy Pink

6533

Harding Lawson Associates
666 Howard Street, Third Floor
San Francisco, California 94105
415/543-8422
Telecopy: 415/777-9706

CHAIN OF CUSTODY FORM

55223

Lab: Superior

Samplers: David Scrivner

Job Number: 11295-016

Name/Location: City Blue

Project Manager: Cheryl Nelson

Recorder: (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	VOA/HCl	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES
	X							2	9	2	07100	59	2	07	1009	

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH-Gas/BTEX

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

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature) Peter B. Mason	DATE/TIME 7-10-92 1005
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		

Laboratory Copy W[redacted] Project Office Copy Yell[redacted] Field or Office Copy Pin[redacted]

6533

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

LABORATORY NO.: 55262
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-016

DATE RECEIVED: 07/17/92
DATE REPORTED: 07/24/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92071701	400
2	92071705	190000

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15
MS/MSD Recovery = 99%: Duplicate RPD = 7%

Richard Srna, Ph.D.

Laboratory Manager

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

LABORATORY NO.: 55262
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-016

DATE RECEIVED: 07/17/92
DATE REPORTED: 07/24/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92071701	21	25	0.8	27
2	92071705	22000	34000	2100	17000

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15%
MS/MSD Average Recovery = 95%: Duplicate RPD = 3%

Richard Srna, Ph.D.

Laboratory Manager

5562

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

Lab: Superior

Samplers: Dave Scrivner

Job Number: 11295-016

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
	X							2	92	07	1701	92	07	17	0830	
	X							2	92	07	1705	92	07	17	0830	

ANALYSIS REQUESTED	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH-G/BTEX
							X
							X

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

Please initial:
Samples Stored on Ice.
Appropriate containers.
Samples preserved.
VOAs without headspace.
Correct pH.

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME 7-17-92 1510
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 7/17/92 1530
METHOD OF SHIPMENT		

Laboratory Copy Project Office Copy Field or Office Copy

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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

LABORATORY NO.: 55301
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-016

DATE RECEIVED: 07/24/92
DATE REPORTED: 07/29/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92072401	1100
2	92072405	140000

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15
MS/MSD Recovery = 95%: Duplicate RPD = 3.7%

Richard Srna, Ph.D.

Cecilia D. Joaquin (for)
Laboratory Manager

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55301
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-016

DATE RECEIVED: 07/24/92
DATE REPORTED: 07/29/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

		Concentration (ug/L)			
LAB #	Sample Identification	Benzene	Toluene	Ethyl Benzene	Xylenes
1	92072401	15	2.4	ND<0.3	200
2	92072405	13000	23000	1700	12000

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15
MS/MSD Average Recovery =93%: Duplicate RPD = 2.7%

Richard Srna, Ph.D.
Cecilia G Jaoquin (for)
Laboratory Manager

Harding Lawson Associates
666 Howard Street, Third Floor
San Francisco, California 94105
415/543-8422
Telecopy: 415/777-9706

CHAIN OF CUSTODY FORM 5530/

Lab: Superior

Samplers: Dave Scrivner

Job Number: 11295-016

Name/Location: City Blue

Project Manager: David Scrivner

Recorder: [signature] (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
	X							2	92	07	2401	92	07	24	0940
	X							2	92	07	2405	92	07	24	0945

STATION DESCRIPTION/ NOTES: Normal Turnaround Time

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH-Gas/BTEX
						X
						X

Please initial: [illegible]
Samples stored in ice. ✓
Appropriate containers. ✓
Sufficient sample volume. ✓
Volatile analyses headspace. ✓

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

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) [signature]	RECEIVED BY: (Signature) [signature]	DATE/TIME 7-24-92 11:15
RELINQUISHED BY: (Signature) [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) [signature] DATE/TIME 7/24/92 1115	
METHOD OF SHIPMENT: SUPERIOR		

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

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55419
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 08/20/92
DATE REPORTED: 08/27/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92082001	6400
2	92082002	73

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15
MS/MSD Recovery = 89%: Duplicate RPD = 1%

Richard Srna, Ph.D.
Laboratory Manager

8/27/92

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

LABORATORY NO.: 55419
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 08/20/92
DATE REPORTED: 08/27/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92082001	31	14	ND<6	150
2	92082002	ND<0.3	ND<0.3	ND<0.3	ND<0.3

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15%
MS/MSD Average Recovery = 97%: Duplicate RPD = 2%

Richard Srna, Ph.D.
Laboratory Manager

8/27/92

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 55419
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 08/20/92
DATE REPORTED: 08/24/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ppm) Gasoline Range
3	92082003	520
4	92082004	ND<30

ppm - parts per million in air
Minimum Detection Limit for Gasoline in Air: 30 ppm
Concentration of gasoline in air is calculated based on 20 C and 1 ATM and an assumed molecular weight of hexane.
Reported as volume to volume.

QAQC Summary:
Daily Standard run at 2mg/L: %DIFF Gasoline = <15
MS/MSD Average Recovery =93%: Duplicate RPD = 2%

Richard Srna, Ph.D.

Laboratory Director

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

LABORATORY NO.: 55419
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 08/20/92
DATE REPORTED: 08/24/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ppb) Benzene	Toluene	Ethyl Benzene	Xylenes
3	92082003	6800	9100	630	4600
4	92082004	ND<85	ND<250	ND<65	ND<250

ppb - parts per billion in air

Minimum Detection Limit for Benzene in air = 85 ppb
Minimum Detection Limit for Toluene and Xylenes in air = 250 ppb
Minimum Detection Limit for Ethyl Benzene in air = 65 ppb
Concentration of BTXE in air is calculated based on 20 C and 1 ATM.
Reported as volume to volume.

QAQC Summary:

Daily Standard run at 20ug/L: %DIFF 8020 = <15%
MS/MSD Average Recovery = 98 %: Duplicate RPD = 8%

Richard Srna, Ph.D.

Laboratory Director

Superior Precision Analytical, Inc.
1555 Burke, Unit . • 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

LABORATORY NO.: 55420
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-016

DATE RECEIVED: 08/20/92
DATE REPORTED: 08/27/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	92082005	190000

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15
MS/MSD Recovery = 91%: Duplicate RPD = 4%

Richard Srna, Ph.D.
Laboratory Manager

8/27/92

Superior Precision Analytical, Inc.
1555 Bu[illegible] Unit L • 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

LABORATORY NO.: 55420
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-016

DATE RECEIVED: 08/20/92
DATE REPORTED: 08/27/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration(ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	92082005	14000	24000	2000	13000

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15%
MS/MSD Average Recovery = 100%: Duplicate RPD = 4%

Richard Srna, Ph.D.
Laboratory Manager

8/27/92

Harding Lawson Associates
666 Howard Street, Third Floor
San Francisco, California 94105
415/543-8422
Telecopy: 415/777-9706

CHAIN OF CUSTODY FORM

~~13392~~ 55419

Lab: Superior

Samplers: David Scrivner

Job Number: 11295-017

Name/Location: City Blue

Project Manager: David Scrivner

Recorder: David Scrivner (Signature Required)

SOURCE CODE	MATRIX: Air	Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCL/MeOH	Tedlar	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							2		92	08	2001	92	08	20	0830								X
		X							2		92	08	2002	92	08	20	0830								X
	X									1	92	08	2003	92	08	20	0800								X
	X									1	92	08	2004	92	08	20	0800								X

ANALYSIS REQUESTED

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

MISCELLANEOUS

Please initial:
Samples Stored in ice.
Appropriate containers.
VOC samples preserved.
VOA's without headspace.
Comments.

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
David Scrivner	[signature]	8-20 1126
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
[signature]		
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 8/20 1126

METHOD OF SHIPMENT

Laboratory Copy W[illegible] Project Office Copy Yell[illegible] Field or Office Copy Pin[illegible]

6533

Harding Lawson Associates
666 Howard Street, Third Floor
San Francisco, California 94105
415/543-8422
Telecopy: 415/777-9706

SF # 53420

CHAIN OF CUSTODY FORM

Lab: Superior

Samplers: David Scrivner

Job Number: 11295-016

Name/Location: City Blue

Project Manager: David Scrivner

Recorder: (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCL/VOA	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH-Gas/BTEX
	X							2	9	20	8	9	20	8	0830	Note: Different job number than other samples from same job on same day. Separate Invoice							X

Please initial:
Samples Stored in ice.
Appropriate containers.
Samples preserved.
VOA's without headspace.
Comments:

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

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME: 8-20-92 1125
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: 12:40
METHOD OF SHIPMENT		

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

6533

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

LABORATORY NO.: 55608
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 09/30/92
DATE REPORTED: 10/05/92

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
by Modified EPA SW-846 Method 5030 and 8015

LAB #	Sample Identification	Concentration (ug/L) Gasoline Range
1	MW-5	51000

ug/L - parts per billion (ppb)

Method Detection Limit for Gasoline in Water: 50 ug/L

QAQC Summary:

Daily Standard run at 2mg/L: %Diff Gasoline = <15
MS/MSD Recovery = 83%: Duplicate RPD = 0%

Richard Srna, Ph.D.

Laboratory Manager

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

LABORATORY NO.: 55608
CLIENT: Harding Lawson Associates
CLIENT JOB NO.: 11295-017

DATE RECEIVED: 09/30/92
DATE REPORTED: 10/05/92

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES by EPA SW-846 Methods 5030 and 8020

LAB #	Sample Identification	Concentration (ug/L) Benzene	Toluene	Ethyl Benzene	Xylenes
1	MW-5	13000	5900	1400	2600

ug/L - parts per billion (ppb)

Method Detection Limit in Water: 0.3 ug/L

QAQC Summary:

Daily Standard run at 20ug/L: %Diff 8020 = <15%
MS/MSD Average Recovery =92%: Duplicate RPD = 4%

Richard Srna, Ph.D.

Laboratory Manager

53600

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

Lab: Superior Analytical

Samplers: Ron Reindl

Job Number: 11295-017

Name/Location: City Blue

Project Manager: Dave Scrivner

Recorder: [signature] (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	Dy	Time	STATION DESCRIPTION/ NOTES	EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH-G/BTEX
2	3	X								X		MW-5			92	09	30	0845	3 VOAS							X

Lease Initial: NV
Samples Stored in Ice. ✓
Appropriate containers. ✓
Samples preserved. ✓
VOA's without headspace. ✓
Comments:

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

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
[signature]		
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature) [signature]	DATE/TIME 9/30/92 12:10P
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
METHOD OF SHIPMENT		

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

6533

Harding Lawson Associates
Engineering
and
Environmental Services

SHEET 1 OF 1
JOB NO. 11295-012
DATE 6-18-92
COMPUTED BY DFS
CHECKED BY

PROJECT City Blue, 1700 Jefferson Street
SUBJECT General Inspection Log

General System Inspection Log To Be Completed By HLA Personnel visiting the site.

1 - Gasoline Product Inspection Log - Perform visual inspection as detailed on the log sheet and check that City Blue personnel are performing same check.

2 - Nutrient and Caustic Supply Tank Levels

3 - Sand Filters - Record pressure differential

4 - Control Panel - Are any indicator lights on, record if any.

5 - SCFM Gauge - Check that gauge reads 1.0 SCFM

6 - Pumps P-1, P-2, P-3, P-4 - Check that pumps are in the "ON" or "AUTO" position, are pumps running.

7 - Flow Totalizer - Record total Flow of effluent to sanitary sewer.

8 - Bio-Reactor Level - Visually check the water level.

Date	Initials	1	2	3	4	5	6	7	8	
7/23/92	DS	✓	N-130g C-15"	—	BR-1 High System Reset	✓ 1.5	✓	18120 gals.	Low	
7/24/92	DS	—	—	—	None ✓	1.5	✓	19450 gals	—	
7/27/92	DS	✓	N-100g C-15"	—	None ✓	1.5	✓	22530 gals	Low	
8/3/92	DS	✓	N-100g C-15"	—	None ✓	1.5	✓	27080 gals	—	
8/6/92	DS	✓	—	—	None ✓	1.5	✓	29770 gals	—	
8/10/92	DS	—	—	—	BR-1 High Reset	1.5	✓	32460	—	

Notes/Comments:

Harding Lawson Associates
Engineering
and
Environmental Services

SHEET 1 OF 1
JOB NO. 11295-012
DATE 6-18-92
COMPUTED BY DFS
CHECKED BY

PROJECT City Blue, 1700 Jefferson Street
SUBJECT General Inspection Log

General System Inspection Log To Be Completed By HLA Personnel visiting the site.

1 - Gasoline Product Inspection Log - Perform visual inspection as detailed on the log sheet and check that City Blue personnel are performing same check.

2 - Nutrient and Caustic Supply Tank Levels

3 - Sand Filters - Record pressure differential

4 - Control Panel - Are any indicator lights on, record if any.

5 - SCFM Gauge - Check that gauge reads 1.0 SCFM

6 - Pumps P-1, P-2, P-3, P-4 - Check that pumps are in the "ON" or "AUTO" position, are pumps running.

7 - Flow Totalizer - Record total flow of effluent to sanitary sewer.

8 - Bio-Reactor Level - Visually check the water level.

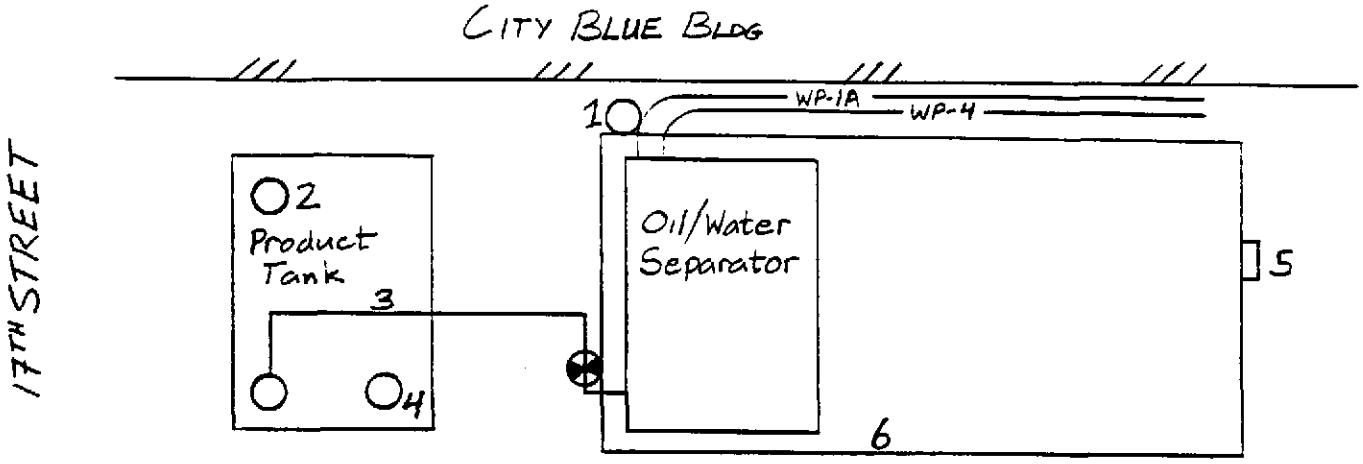
Date	Initials	1	2	3	4	5	6	7	8	
8/20/92	RS	—	—	6 psi Δp	✓ None	1.5	✓	34660 gals	High	System Sampled
8/24/92	RS	✓	OK	28 psi / 10 psi	✓ None	1.5	✓	39537 gals	Low	
9/1/92	RS	✓	N-200 g C-15°	28 psi / 10 psi	✓ None	1.5	✓	46220 gals	—	Nutrient Tank Filled
9/9/92	RS	✓	—	—	BR-1 High SF-1 High	1.5	✓	49020 gal	—	
9/15/92	RS	✓	OK	—	✓ None	1.5	✓	51190 gal	—	System Sampled
9/22/92	RS	✓	N-175 g C-15°	—	BR-1 High SF-1 High	1.5	✓	54340 gal		

Notes/Comments:

Harding Lawson Associates
Engineering
and
Environmental Services

SHEET _____ OF _____
JOB NO. _____
DATE _____
COMPUTED BY _____
CHECKED BY _____

PROJECT City Blue, 1700 Jefferson St.
SUBJECT Gasoline Product Inspection Log



1 - Influent from wells WP-1A and WP-4 to Oil/Water Separator

2 - Convault Product Tank Dispenser

3 - Recovered Product Line from Oil/Water Separator to Convault Product Tank

4 - Fuel Level Gauge

5 - Control Panel

6 - Secondary Containment

If Any Questions Contact:

Cheryl Nelson (415) 543-8422

OR David Scrivner (415) 543-842?

OR Dan Johnson (415) 892-082

CHECKPOINTS

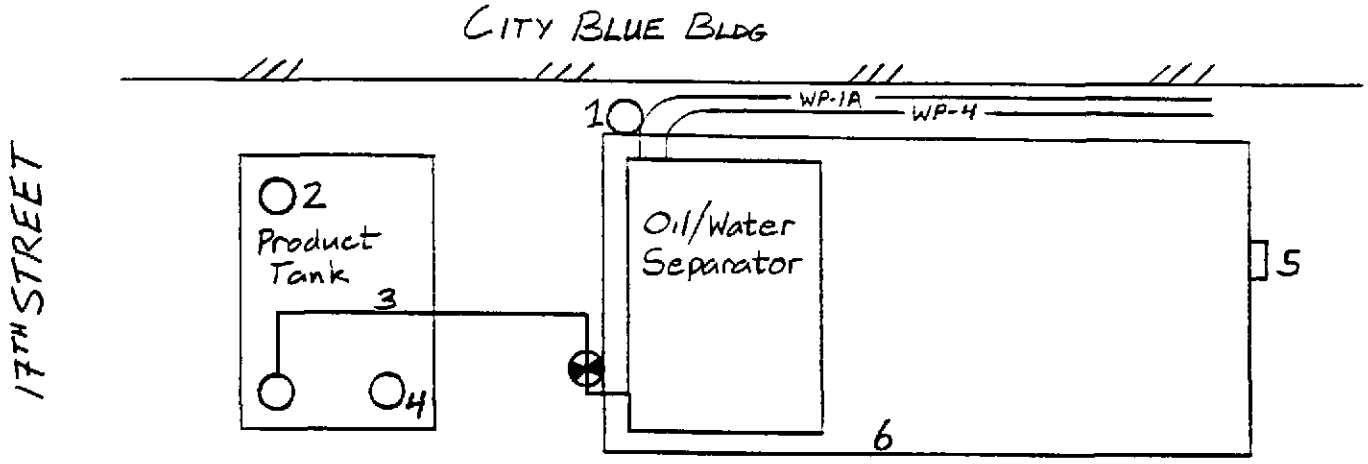
DATE	INITIALS	#1	#2	#3	#4	#5	#6
7/23/92	[signature]	✓	✓	✓	3/8	BR-1 High System Reset	Dry
7/27/92	[signature]	✓	✓	✓	1/2	—	—
8/3/92	[signature]	✓	✓	✓	5/8	—	—
8/6/92	[signature]	✓	✓	✓	5/8	—	—
8/17/92	[signature]	✓	✓	✓	1/2	—	—

Comments:
Sand filters changed to finer sand on 8/17/92 and 8/18/92

Harding Lawson Associates
Engineering
and
Environmental Services

SHEET _____ OF _____
JOB NO. _____
DATE _____
COMPUTED BY _____
CHECKED BY _____

PROJECT City Blue, 1700 Jefferson St.
SUBJECT Gasoline Product Inspection Log



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CHECKPOINTS

DATE	INITIALS	#1	#2	#3	#4	#5	#6
8/24/92	[illegible]	✓	✓	✓	3/8	✓	Dry
9/1/92	[illegible]	✓	✓	✓	—	✓	Dry
9/9/92	[illegible]	✓	✓	✓	—	BR-1 High SF-1 High Reset	Dry
9/15/92	[illegible]	✓	✓	✓	—	✓	Dry
9/22/92	[illegible]	✓	✓	✓	~1/8	BR-1 High SF-1 High Reset	Dry

Comments: