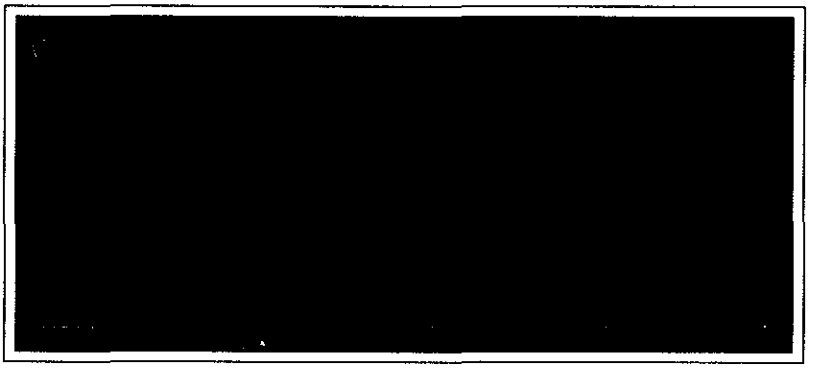

7-26-96

LAIDLAW ENVIRONMENTAL SERVICES

SEMI-ANNUAL MONITORING REPORT
HYDROCARBON RECOVERY SYSTEM
UNION PACIFIC RAILROAD YARD
OAKLAND, CALIFORNIA
DECEMBER 1995 AND JUNE 1996

Prepared for
Union Pacific Railroad
by

USPCI, a Laidlaw Company
Consulting Services
5665 Flatiron Parkway
Boulder, Colorado 80301
Project Number 96199
July 26, 1996

USPCI
A LAIDLAW COMPANY

Consulting Services

July 26, 1996

Mr. Harry Patterson
Union Pacific Railroad
1416 Dodge Street, Room 930
Omaha, NE 68179

RE: **"Semi-Annual Monitoring Report, December 1995 to June 1996"**, for the Fueling Area of the UPRR Oakland TOFC Railyard at 1717 Middle Harbor Road

Dear Mr. Patterson:

Enclosed are five copies of the **"Semi-Annual Monitoring Report, December 1995 to June 1996"** for the fueling area of the Union Pacific Railroad (UPRR) Oakland trailer-on-flat-car (TOFC) railyard. Please submit the reports to:

East Bay Municipal Utility District
Post Office Box 24055
Source Control Division, Mail Slot 702
Oakland, California 94623-1056
Attn: Safa Toma

Alameda County, Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502-6577
Attn: Ms. Jennifer Eberle

Port of Oakland
530 Water Street
Oakland, California 94607
Attn: Mr. John Amdur

American Presidents Line
1111 Broadway
Oakland, California 94607
Attn: Ms. Jami Matanky

5665 Flatiron Parkway Boulder, Colorado 80301-2800
Phone 303.938.5500 Fax 303.938.5520

K. R. (KEN) WELCH
Assistant Vice President
Environmental Management

Mailing Address.
Room 930
1416 Dodge Street
Omaha, Nebraska 68179
Fax No. (402) 271-4461

UNION PACIFIC RAILROAD COMPANY

G. (GLENN) THOMAS
Director-Environmental Operations-Central
S W. (STEVE) BERKI
Director-Environmental Operations-Western
L. A. (LANNY) SCHMID
Director-Environmental Operations-Southern
R. L. (RICK) EADES
Director-Environmental Site Remediation

File: Oakland, Ca.
Environmental

July 31, 1996

Mr. Safa Toma
East Bay Municipal Utility District
Source Control Division, Mail Slot 702
375 Eleventh Street
Post Office Box 24055
Oakland, Ca. 94623-1056

Dear Mr. Toma:

Semi-Annual Monitoring Report for Groundwater Discharge Permit account number 502-51231, for Union Pacific Railroad's Hydrocarbon Recovery System in Oakland, Ca.

Attached is the Semi-Annual (December 1995 to June 1996) Monitoring Report" for our Hydrocarbon Recovery System in Oakland.

If you have any questions on the report, please call me at (402) 271-4078.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true , accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Yours truly,

Harry P. Patterson

Harry P. Patterson, P.E.
Manager Environmental Site Remediation

SEMI-ANNUAL MONITORING REPORT
HYDROCARBON RECOVERY SYSTEM
UNION PACIFIC RAILROAD YARD
OAKLAND, CALIFORNIA
DECEMBER 1995 TO JUNE 1996

Prepared for:
Union Pacific Railroad
Environmental Management - Room 930
1416 Dodge Street
Omaha, Nebraska 68179

for submittal to:
Ms. Jennifer Eberle
Alameda County
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502-6577

Prepared by:
USPCI, a Laidlaw Company
Consulting Services
5665 Flatiron Parkway
Boulder, Colorado 80301

Charley Pinkerton
Project Engineer

Sam Marquis, R.G. 5110
Project Hydrogeologist

July 26, 1996

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1. INTRODUCTION

This report was prepared by USPCI, a Laidlaw company (Laidlaw) for Union Pacific Railroad (UPRR) in accordance with the East Bay Municipal Utility District (EBMUD) permit number 502-51231. The purpose of this report is to provide semi-annual monitoring information pertaining to the hydrocarbon recovery and groundwater treatment system and the groundwater monitoring wells located at the fueling area of the UPRR Oakland trailer-on-flat-car (TOFC) railyard at 1717 Middle Harbor Road in Oakland, California. This report also contains quarterly groundwater monitoring information requested in a letter from Alameda County Department of Environmental Health (ACDEH), dated September 21, 1994. The objective of the monitoring program is to evaluate the distribution and movement of petroleum hydrocarbons in groundwater and the effectiveness of the hydrocarbon recovery system.

2. BACKGROUND INFORMATION

The fueling area is located in the northern portion of the UPRR Oakland TOFC Yard, which is adjacent to the Oakland Inner Harbor or Oakland Estuary (Figure 1). The area surrounding the site is used for heavy to light commerce. Residential areas are located approximately one-half mile north of the site and across the Oakland Estuary one-half mile south of the site.

Previous investigations indicated the presence of light non-aqueous-phase liquid petroleum hydrocarbons (diesel) floating on the groundwater near the fueling area. A hydrocarbon recovery and groundwater treatment system (system) was installed to remove diesel from near the fueling area.

The results from prior investigations and environmental engineering activities conducted by Laidlaw have been documented in previous reports. Background information about the site was presented in the *Hydrocarbon Investigation and Remediation Design* report dated June 10, 1991. The results of the hydrocarbon investigation and a conceptual design of the system were also presented in the June 10, 1991, report. The system design was outlined in the *Preliminary Design Report*, dated September 5, 1991. As-built information for the system has been presented in the *Hydrocarbon Recovery System, As-Built Construction Report*, dated July 20, 1992. Process changes to the system were presented in a letter from UPRR dated March 22, 1993 to the EBMUD, which represented the permit renewal application.

3. CURRENT ACTIVITIES

The current activities at the site consist of sampling and maintenance of the system and conducting a groundwater monitoring program. Descriptions of these activities follows.

3.1 System Monitoring

Samples are collected from the water stream of the system to assess the performance of the system and to compare discharge concentrations with limits established by the EBMUD.

At varying frequencies, water samples are collected from sampling ports located before, between, and after the two granular activated carbon vessels. On a quarterly basis, samples are collected from the influent and effluent water stream through the carbon vessels. The samples are analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA method 8020 and total petroleum hydrocarbons as diesel (TPH-D) using EPA method 8015 modified. On a monthly basis, water samples are collected from the influent and midfluent of the water stream through the carbon vessels. The influent samples are analyzed for TPH-D and used for estimating the loading of contaminants on the first vessel. The water samples collected from between the two vessels are analyzed for BTEX and used to monitor for the breakthrough of organics from the first vessel.

System maintenance consists of changing particulate filters (typically weekly), backwashing the carbon, and checking the chlorine feed system. Operational readings (cumulative flow, hydrocarbon storage volume, and pressure drop across the particle filters) are collected during each site visit.

3.2 Groundwater Monitoring

Groundwater monitoring activities consist of collecting fluid level measurements in the groundwater monitoring wells on a bi-monthly basis and collecting groundwater samples on a semi-annual basis.

Fluid levels measurements are used to generate potentiometric surface maps. The potentiometric surface maps provide information about the groundwater gradient and the operation of the recovery wells. The data used in these maps include wells with diesel. The groundwater elevations in these wells are corrected to account for the diesel overlying the water column in the well. This correction was performed by multiplying the specific gravity of the diesel by the diesel thickness and adding this value to the water elevation measurement from the well.

Groundwater samples are collected from wells that do not exhibit the presence of diesel. The samples are submitted to a state-certified laboratory and analyzed for BTEX and TPH-D. Diesel is recovered by hand using disposable bailers from wells containing measurable amounts of diesel.

4. SYSTEM MONITORING

The recovery of diesel is accomplished by depressing the groundwater table with total-fluids pumps to recover diesel and water and creating a cone of depression surrounding the recovery wells. The recovery and treatment system consists of three recovery wells, a diesel/water separator, a recovered diesel storage tank, and an activated carbon treatment system. The recovered groundwater is treated and discharged to the EBMUD sanitary sewer. The locations of the three recovery wells and the water treatment facility are indicated on Figure 1.

4.1 System Operation

During the operating period of December 1, 1995 to June 28, 1996, the groundwater recovery and treatment system treated approximately 910,000 gallons of groundwater. Since start-up on May 12, 1992, until June 28, 1996, the system has recovered approximately 8,900 gallons of diesel. Recovery well operation was normal throughout this operational period with only minor down time for required periodic maintenance. Combined pumping rates for the three well recovery system averaged approximately three gallons per minute for the semi-annual period. Copies of the field logs for the hydrocarbon recovery system have been included as Appendix A.

4.2 Analytical Results

Analytical results of BTEX and TPH-D from the influent to the activated carbon system are presented in Table 1. The EBMUD discharge limits for BTEX, as well as the analytical results from the sampling of the effluent from the water treatment system, are listed in Table 2. A summary of results from the samples collected between carbon vessels are included as Table 3. Laboratory analytical reports from the system sampling are included in Appendix B.

4.2.1 Influent Water Stream To Carbon Units

Sample results from the influent water stream to the carbon units reported benzene concentrations that ranged from 0.0097 to 0.013 milligrams per liter (mg/l) for the two sampling events. Sample results for the influent water stream reported toluene concentrations below the method detection limit (MDL) of 0.0005 mg/l for both sampling events. Ethylbenzene and xylenes ranged from 0.0067 to 0.010 mg/l and 0.010 to 0.021 mg/l, respectively. Influent TPH-D concentrations ranged from below the MDL of 0.05 mg/l to 56 mg/l.

4.2.2 Effluent Water Stream From Carbon Units

Analytical results indicate that all BTEX concentrations in the effluent samples were below the MDLs of 0.0005 mg/L for benzene, toluene, and ethylbenzene and 0.002 mg/l for xylenes during the January 8 and April 10, 1996 sampling events. The effluent TPH-D concentrations were 36 mg/l for the January 1996 sampling event and 1.8 mg/L for the April 1996 sampling event. The detection of TPH-D in the discharge is most likely due to the routine backwashing procedures that were performed on the carbon canisters during the week that sampling was performed.

4.2.3 Water Stream Between Carbon Units

The benzene results from the midfluent samples ranged from below the MDL of 0.0005 mg/l to 0.0018 mg/l during the semi-annual period. Toluene and ethylbenzene concentrations for this period ranged from below the MDL of 0.0005 mg/L to 0.0005 mg/L for both parameters. Xylenes were reported below the MDL of 0.002 mg/l for all sampling events.

4.3 Granular Activated Carbon Usage

This section provides an estimate of carbon usage for the first or "lead" vessel. Two 2,000 pound granular activated carbon vessels are connected in series to remove organic compounds dissolved in the recovered groundwater. The second vessel prevents a release of water above the discharge limits once the first carbon vessel is loaded with organics or "breakthrough" occurs.

Table 4 presents the estimated amount of spent carbon (adsorption sites loaded with contaminants) and the expected life of the vessel. The "lead" carbon vessel was replaced with fresh activated carbon on May 6, 1996, as noted in the table. Estimates indicate that breakthrough should occur in the new vessel in October 1996. As discussed above, future sampling results will confirm the breakthrough of the lead vessel. The sample calculations that are presented in Table 4 were originally presented in the *Hydrocarbon Recovery System Quarterly Monitoring Report, Second Quarter, 1992.*

5. GROUNDWATER MONITORING

The following sections present information about the fluid levels and sampling results for the May 1996 sampling event. Monitoring information and an evaluation of changes in the potentiometric surfaces for the January and March 1996 monitoring events were included in the *First Quarter 1996 Monitoring Report,* and submitted to ACDEH on April 30, 1996. Historical fluid levels and groundwater sampling results are presented in Tables 5 and 6 respectively.

5.1 Fluid Level Measurements

Corrected groundwater elevations increased in seven of the fourteen monitoring wells and piezometers between March and May 1996. The average change in corrected groundwater elevations was an increase of approximately one third of a foot. The largest increase was two feet in monitoring well OMW-1. Monitoring well OMW-3 and piezometer OP-1 also exhibited groundwater elevation increases of over one foot. The largest decrease was observed in monitoring well OMW-9 (0.78 feet).

Fluid levels measured during the May 1996 sampling event were used to generate the potentiometric surface map presented in Figure 2. Groundwater depressions created by the recovery wells (ORW-1, ORW-2, and ORW-3) are evident on the potentiometric surface map. The contours lines show an increased hydraulic gradient or convergent flow towards each individual recovery well. The increased flow towards the recovery well network indicates that groundwater and diesel within the area of influence of the wells tend to be recovered from the portion of the site where diesel is present. Groundwater flow outside the influence of the recovery wells is to the south towards the Oakland Estuary.

The presence of diesel was observed in monitoring wells OMW-4, OMW-7, OMW-9, and OMW-10 and piezometers OP-2, OP-3, and OP-4 during the May 1996 sampling event. This is consistent with previous fluid level measurements. The largest change in measurable diesel thickness was a decrease of 2.78 feet in monitoring OMW-9. Piezometer OP-1 has not contained measurable amounts of diesel since the November 1995 sampling event. Figure 3 illustrates the diesel thickness across the site as measured in monitoring wells and piezometers during the May 1996 sampling event.

5.2 Groundwater Sampling

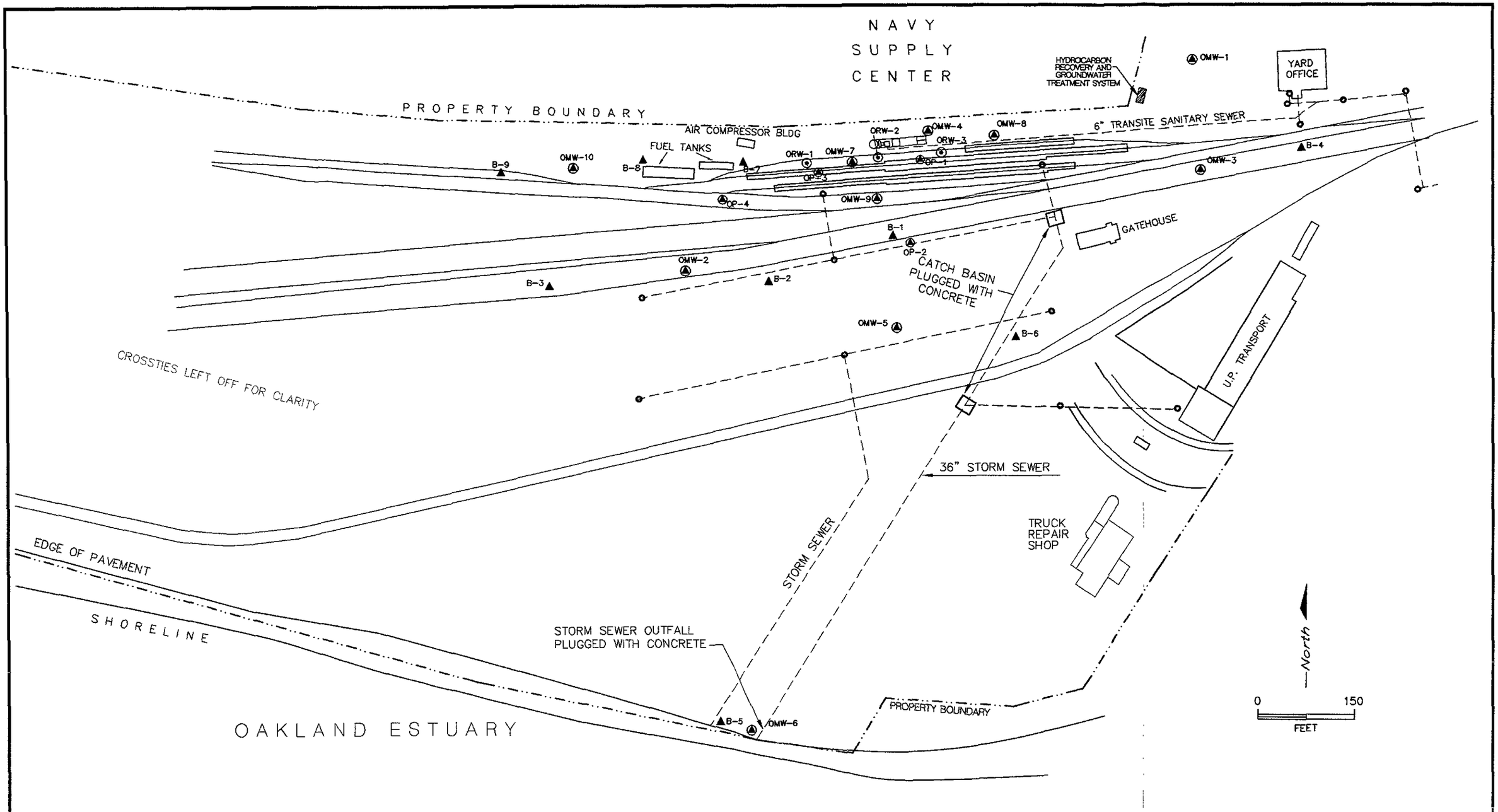
Groundwater samples were collected on May 17, 1996, from monitoring wells OMW-1, OMW-2, OMW-3, OMW-5, OMW-6, and OMW-8. Monitoring wells OMW-4, OMW-7, OMW-9, and OMW-10 were not sampled due to the presence of diesel in the wells.

The sampling results indicated that BTEX concentrations in all monitoring wells were below the MDL of 0.0005 mg/l for this semi-annual sampling event. These results were consistent with previous sampling data. TPH-D concentrations ranged from 0.056 mg/l in monitoring well OMW-1 to 5.8 mg/l in monitoring well OMW-5. TPH-D concentrations were consistent with the November 1995 sampling event but remain above values observed since 1992. Laboratory analytical reports from the May 1996 sampling events are included in Appendix B. Sampling and well stabilization forms are included as Appendix C.

6. CONCLUSIONS

The following conclusions are drawn from the system and groundwater monitoring data collected from December 1, 1995 to June 28, 1996:

- Water discharge from the system did not exceed the EBMUD discharge limits during the monitoring period
- The potentiometric surface indicates a site-wide groundwater gradient to the south, except where the recovery wells create a groundwater depression
- The potentiometric surface is consistent with previous monitoring events
- Fluid level measurements in the area of the recovery system indicate that drawdown is occurring in the vicinity of each operational recovery well and the diesel plume is being controlled by the system
- The system has removed 8,900 gallons of diesel since start-up in May 1992
- The system has removed diesel consistently and effectively over its operational life



LEGEND

- MONITORING WELL OR PIEZOMETER LOCATION AND NUMBER
- BORING LOCATION AND NUMBER
- CATCH BASIN FOR STORM SEWER
- RECOVERY WELLS

	BY	DATE
DRAWN	CJJ	11/28/95
CHECKED		
APPROVED		
APPROVED		
APPROVED		

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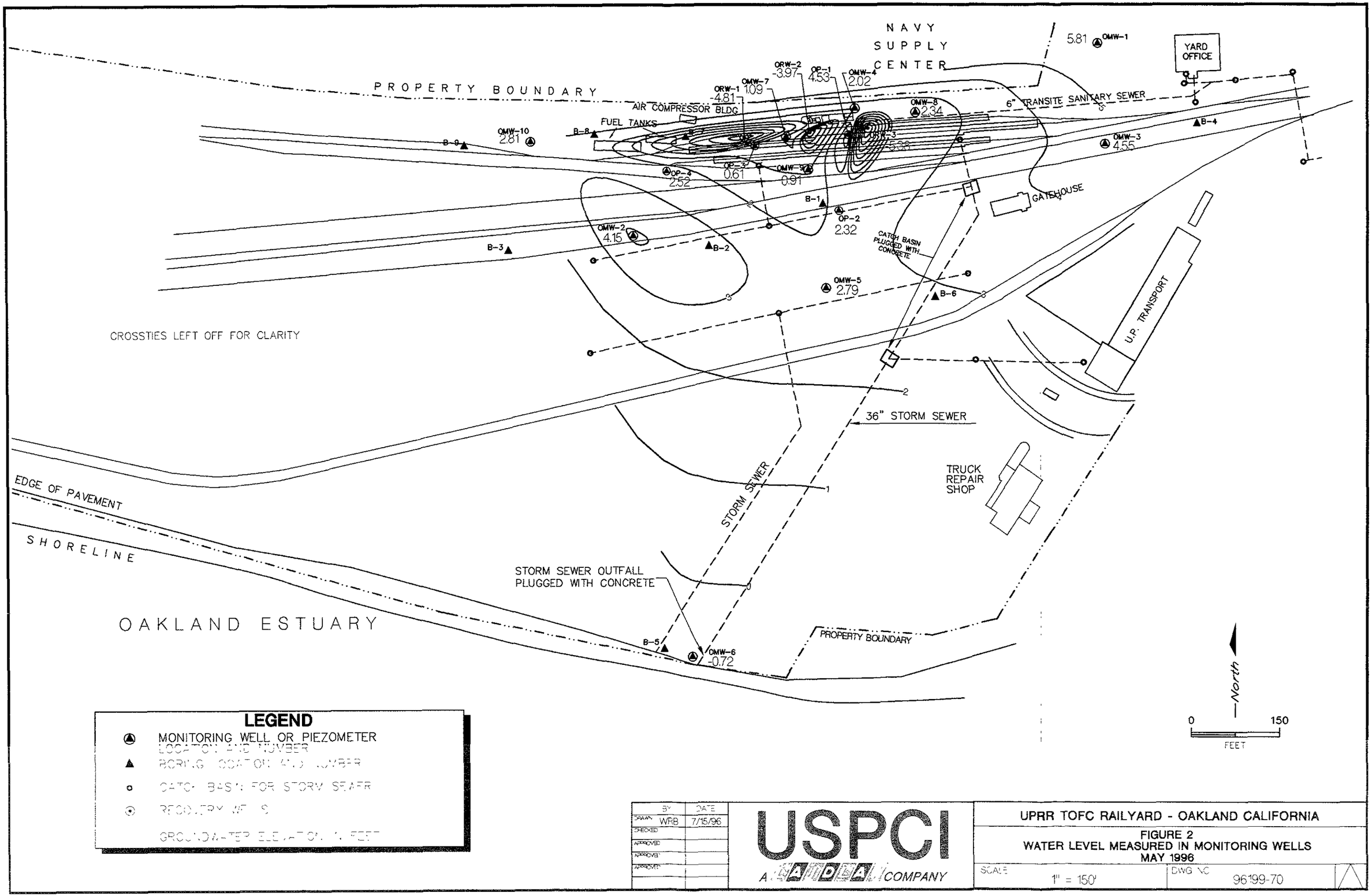
A MAXXAM COMPANY

UPRR TOFC RAILYARD - OAKLAND CALIFORNIA

FIGURE 1
SITE LOCATION MAP

SCALE 1" = 150'

DWG NO 96199-55



LEGEND

- MONITORING WELL OR PIEZOMETER LOCATION AND NUMBER
- BORING LOCATION AND NUMBER
- CATCH BASIN FOR STORM SEWER
- RECOVERY WELL
- GROUNDWATER ELEVATION IN FEET

BY	DATE
DRAWN WRB	7/15/96
CHECKED	
APPROVED	
APPROVED	
APPROVED	

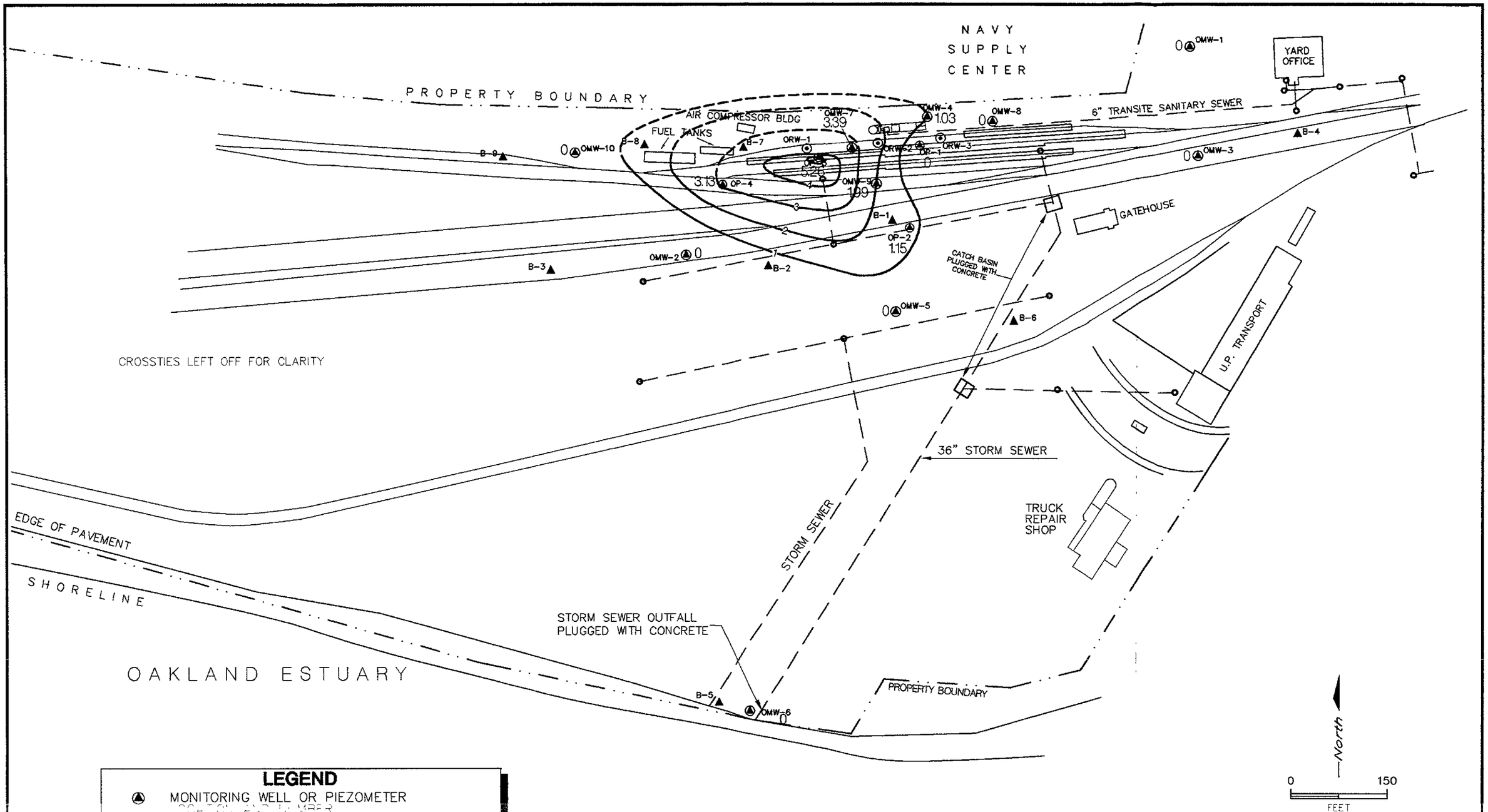
USPCI
A WASTE MANAGEMENT COMPANY

UPRR TOFC RAILYARD - OAKLAND CALIFORNIA

FIGURE 2
WATER LEVEL MEASURED IN MONITORING WELLS
MAY 1996

SCALE 1" = 150'

DWG NO 96199-70



LEGEND

- MONITORING WELL OR PIEZOMETER LOCATION AND NUMBER
- BORING LOCATION AND NUMBER
- CATCH BASIN FOR STORM SEWER
- RECOVERY WELL
- PRODUCT THICKNESS IN FT (EXCLUDING ORMs)

BY	DATE
DRAWN WRE	7/15/96
CHECKED	
APPROVED	
APPROVED	
APPROVED	

USPCI
A LANDAL COMPANY

UPRR TOFC RAILYARD - OAKLAND CALIFORNIA

FIGURE 3
DIESEL THICKNESS MEASURED IN MONITORING WELLS
MAY 1996

SCALE 1" = 150'

DWG NO 96199-69

TABLES

TABLE 1
Analytical Results
Influent Water Stream to Carbon Units
Hydrocarbon Treatment System
Oakland Fueling Area

Date Collected	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Total Petroleum Hydrocarbons as Diesel (mg/L)
05/12/92	0.023	0.022	0.029	0.200	7
05/19/92	<0.002	0.007	0.003	0.064	59
05/27/92	<0.005	<0.005	0.006	0.059	61
06/02/92	<0.005	<0.005	<0.005	0.025	100
07/07/92	<0.005	<0.005	0.005	0.026	200
08/11/92	0.0091	<0.003	0.013	0.051	6.1
09/25/92	0.0085	<0.003	0.0055	0.024	17
11/16/92	<0.050	<0.050	<0.050	<0.050	100
12/04/92	0.0042	<0.001	<0.001	0.009	8.7
02/02/93	0.0083	<0.001	<0.001	0.0012	6.9
03/30/93	0.0095	0.0015	0.0087	0.030	44
04/30/93	0.0007	0.0012	0.001	0.0069	14
05/27/93	0.0054	0.019	0.0092	0.040	120
06/30/93	<0.0003	<0.0003	<0.0003	<0.0009	1.2
07/28/93	0.014	0.0006	0.0054	0.025	2.2
08/31/93	0.012	0.0007	0.0041	0.023	3.2
09/30/93	0.011	0.0007	0.013	0.035	20
10/28/93	0.010	0.0006	0.0098	0.026	6.1
11/30/93	0.0092	<0.0005	0.0012	0.013	31
12/28/93	0.011	<0.0005	0.0041	0.016	10
01/31/94	<0.0005	<0.0005	<0.0005	<0.0005	3.3
02/25/94	0.013	0.0013	0.0077	0.021	9.3
03/30/94	0.012	<0.0005	0.0027	0.018	2.7
05/03/94	0.0044	0.0018	0.0097	0.028	67
06/01/94	0.0065	<0.0005	<0.0005	0.0094	3.5
07/29/94	0.0091	<0.0005	0.0043	0.017	1.4
08/31/94	NA	NA	NA	NA	2.1
09/27/94	NA	NA	NA	NA	5.9
10/27/94	0.011	0.0031	0.0095	0.018	5.5
11/16/94	NA	NA	NA	NA	39
01/05/95	NA	NA	NA	NA	140
01/25/95	<0.03	<0.03	<0.03	<0.03	550
04/12/95	0.0015	<0.0003	<0.0003	0.0023	3.7
05/29/95	NA	NA	NA	NA	<0.02*
06/30/95	NA	NA	NA	NA	25
07/19/95	0.011	0.0006	0.005	0.015	13
08/08/95	NA	NA	NA	NA	11
09/08/95	NA	NA	NA	NA	11
10/13/95	0.009	0.0006	0.010	0.020	66
11/22/95	NA	NA	NA	NA	38
12/15/95	NA	NA	NA	NA	19
01/08/96	0.013	<0.0005	0.010	0.021	<0.05
02/12/96	NA	NA	NA	NA	56
03/12/96	NA	NA	NA	NA	42
04/10/96	0.0097	<0.0005	0.0067	0.010	36
05/13/96	NA	NA	NA	NA	14
06/13/96	NA	NA	NA	NA	18

NA -- Not Analyzed
*Unknown hydrocarbon in the Diesel range reported concentration of 14 mg/L

TABLE 2
Analytical Results
Effluent Water Stream from Carbon Units
Hydrocarbon Treatment System
Oakland Fueling Area

Date Collected	Benzene *(mg/L)*	Toluene *(mg/L)*	Ethylbenzene *(mg/L)*	Xylenes *(mg/L)*	Total Petroleum Hydrocarbons as Diesel *(mg/L)*
EDMUD Discharge Limit*	0.005	0.005	0.005	0.005	N/A
05/12/92	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
05/19/92	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
05/27/92	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
06/02/92	<0.0005	<0.0005	<0.0005	<0.0005	0.12
07/07/92	<0.0005	<0.0005	<0.0005	0.0011	18
08/11/92	<0.0005	<0.0005	<0.0005	<0.0005	1.3
09/25/92	<0.001	<0.001	<0.001	0.0014	9.7
11/16/92	<0.0005	<0.0005	<0.0005	<0.0005	0.53
12/04/92	<0.0005	<0.0005	<0.0005	<0.0005	0.24
02/02/93	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
03/30/93	<0.0005	<0.0005	<0.0005	<0.0005	0.074
04/30/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.050
05/27/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.050
06/30/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.050
07/28/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.100
08/31/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.050
09/30/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.050
10/28/93	<0.0003	<0.0003	<0.0003	<0.0009	<0.050
11/30/93	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
12/28/93	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
01/31/94	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
02/25/94	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
03/30/94	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
05/03/94	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
06/01/94	<0.0005	<0.0005	<0.0005	<0.0005	<0.050
07/29/94	<0.0005	<0.0005	<0.0005	0.0007	<0.050
10/27/94	<0.0005	<0.0005	<0.0005	0.0006	<0.050
01/25/95	<0.03	<0.03	<0.03	<0.03	470
04/12/95	<0.0003	<0.0003	<0.0003	<0.0003	<0.050
07/19/95	<0.0005	<0.0005	<0.0005	<0.002	1.5
10/13/95	<0.0005	<0.0005	<0.0005	<0.002	<0.050
01/08/96	<0.0005	<0.0005	<0.0005	<0.002	36
04/10/96	<0.0005	<0.0005	<0.0005	<0.002	1.8

* – Discharge limits updated on May 4, 1994.
N/A – Not Applicable

TABLE 3
Analytical Results
Water Stream Between Carbon Units
Hydrocarbon Treatment System
Oakland Fueling Area

Date Collected	Benzene *(mg/L)*	Toluene *(mg/L)*	Ethylbenzene *(mg/L)*	Xylenes *(mg/L)*
08/11/92	<0.0005	<0.0005	<0.0005	<0.0005
09/14/92	<0.003	<0.003	<0.003	<0.003
11/06/92	<0.0005	<0.001	<0.0005	<0.0005
12/04/92	<0.003	<0.003	<0.003	<0.003
12/18/92	<0.005	<0.005	<0.005	<0.005
01/20/93	0.0012	0.0005	<0.0005	0.0015
02/02/93	0.00077	<0.0005	<0.0005	<0.0005
02/16/93	0.0043	<0.0005	0.0012	0.0038
03/30/93	<0.0005	<0.0005	<0.0005	<0.0005
04/22/93	<0.0005	<0.0005	<0.0005	<0.0005
04/30/93	<0.0003	<0.0003	<0.0003	<0.0009
05/27/93	<0.003	<0.003	<0.003	<0.009
06/14/93	0.0004	0.0004	0.0004	0.0023
06/30/93	<0.0003	<0.0003	<0.0003	<0.0009
07/13/93	0.0007	0.0004	<0.0003	<0.0009
07/28/93	<0.0003	<0.0003	<0.0003	<0.0009
08/31/93	<0.0003	<0.0003	<0.0003	<0.0009
09/30/93	<0.0003	<0.0003	<0.0003	<0.0009
10/28/93	<0.0003	<0.0003	<0.0003	<0.0009
11/30/93	0.0006	<0.0005	<0.0005	<0.0005
12/28/93	0.0017	<0.0005	<0.0005	0.0007
01/31/94	0.0001	<0.0005	<0.0005	0.0005
02/25/94	<0.0005	<0.0005	<0.0005	<0.0005
03/30/94	<0.0005	<0.0005	<0.0005	<0.0005
05/03/94	<0.0005	<0.0005	0.0013	0.0033
06/01/94	<0.0005	<0.0005	<0.0005	<0.0005
07/29/94	0.0008	<0.0005	<0.0005	0.0006
08/31/94	0.0017	<0.0005	<0.0005	<0.0005
09/27/94	0.0010	<0.0005	<0.0005	<0.0005
10/27/94	0.0012	0.00050	<0.0005	0.00090
11/16/94	<0.0005	<0.0005	<0.0005	<0.0005
01/05/95	0.0048	0.0035	<0.003	0.015
01/25/95	<0.03	<0.03	<0.03	<0.03
04/12/95	0.0013	<0.0003	<0.0003	<0.0003
05/29/95	0.0032	<0.0005	<0.0005	<0.0005
06/30/95	0.002	<0.0005	<0.0005	<0.002
07/19/95	0.002	<0.0005	<0.0005	<0.002
08/08/95	<0.0005	<0.0005	<0.0005	<0.002
09/08/95	<0.0005	0.0008	<0.0005	<0.002
11/22/95	<0.0005	<0.0005	<0.0005	<0.002
12/15/95	<0.0005	<0.0005	<0.0005	<0.002
01/08/96	0.0008	<0.0005	<0.0005	<0.002
02/12/96	0.0012	0.0005	<0.0005	<0.002
03/12/96	<0.0005	<0.0005	<0.0005	<0.002
04/10/96	0.0018	<0.0005	0.0005	<0.002
05/13/96	<0.0005	<0.0005	<0.0005	<0.002
06/13/96	<0.0005	<0.0005	<0.0005	<0.002

TABLE 4
Hydrocarbon Treatment System
Granular Activated Carbon Usage
Oakland Fueling Area

Date	Time	Volume (gallons)	Periodic Flowrate (gpm)	Average Flowrate (gpm)	Influent Conc TPHd (mg/l)	Carbon Used (pounds)	Spent Carbon Estimate (pounds)	Remaining Pumpable (gallons)	Remaining Pumpable (days)	Projected Breakthru Date
05/07/92	11:35 PM	2020	1.74	1.74	45 *	8	8	531663	213	Dec-92
05/12/92	08:30 AM	12980	1.74	1.74	45	41	49	520703	208	Dec-92
05/19/92	01:30 PM	24990	1.16	1.55	59	50	98	387036	174	Nov-92
05/27/92	10:50 AM	45350	1.79	1.61	61	89	187	356823	154	Oct-92
06/02/92	03:00 PM	73150	3.13	1.91	100	144	331	200426	73	Aug-92
07/07/92	05:35 PM	166500	1.85	1.90	200	661	992	60539	22	Jul-92
08/11/92	11:56 AM	232370	1.32	1.32	6.1	0 +	0	1771651	935	Mar-95
09/25/92	09:55 AM	388390	2.41	1.86	17	333	333	529708	197	Apr-93
11/16/92	09:55 AM	484380	1.28	1.67	100	729	1062	50663	21	Dec-92
12/04/92	09:55 AM	518160	1.30	1.58	8.7	206	1268	454391	200	Jun-93
02/02/93	02:30 PM	673180	1.79	1.62	6.9	796	2064	-50298	-22	Jan-93
03/10/93	03:00 PM	741070	1.31	1.31	30 *	0 +	0	400262	212	Oct-93
03/30/93	09:00 AM	743950	0.10	1.61	44	18	18	270484	117	Jul-93
04/30/93	04:00 PM	755900	0.27	1.51	14	58	76	825055	379	May-94
05/27/93	01:40 PM	854610	2.55	1.58	120	855	931	53482	23	Jun-93
06/30/93	07:30 AM	1007200	3.14	1.68	1.2	1063	1994	27899	12	Jul-93
07/21/93	07:30 AM	1094630	2.89	2.89	2.2 *	0 +	0	2183247	524	Dec-94
07/28/93	08:30 AM	1125630	3.06	2.97	2.2	28	28	2152247	503	Dec-94
08/31/93	01:55 PM	1256910	2.66	2.87	3.2	138	167	1375740	333	Jul-94
09/30/93	04:00 PM	1333050	1.76	2.59	20	219	386	193850	52	Nov-93
10/28/93	05:50 PM	1411050	1.93	2.46	6.1	219	605	549390	155	Apr-94
11/30/93	08:00 PM	1475300	1.35	2.27	31	288	893	85757	26	Dec-93
12/28/93	12:00 PM	1526880	1.29	2.13	10	229	1122	210802	69	Mar-94
01/31/94	03:00 PM	1584340	1.17	2.01	3.3	233	1356	469026	162	Jul-94
02/07/94	12:00 PM	1595300	1.11	1.11	8.0 *	0 +	0	1500982	942	Sep-96
02/25/94	04:00 PM	1658010	2.40	1.75	9.3	90	90	1232840	489	Jun-95
03/30/94	11:00 AM	1785000	2.69	2.06	2.7	141	231	3932895	1323	Nov-97
05/03/94	05:00 PM	1841190	1.14	1.83	67	204	435	140249	53	Jun-94
06/01/94	04:00 PM	1909040	1.63	1.79	3.5	205	639	2333885	904	Nov-96
07/29/94	07:30 PM	2029010	1.43	1.73	1.4	306	946	4522185	1813	Jul-99
08/31/94	07:00 PM	2113920	1.79	1.74	2.1	190	1135	2471828	986	May-97
09/27/94	11:00 AM	2175320	1.60	1.72	5.9	128	1263	749848	302	Jul-95
10/28/94	12:00 PM	2254600	1.77	1.73	5.5	155	1418	635573	255	Jul-95
11/16/94	03:30 PM	2269370	0.54	1.61	39	36	1453	84163	36	Dec-94
11/23/94	11:00 AM	2276880	0.77	0.77	16 *	0 +	0	750491	681	Oct-96
01/25/95	01:30 PM	2468180	2.11	1.44	35 *'	812	812	203706	99	May-95
04/12/95	10:50 AM	2549270	0.73	1.20	3.7	246	1059	1527342	883	Sep-97
05/29/95	03:30 PM	2732640	2.70	1.58	0	418	1476	1527342	673	Apr-97
06/30/95	02:00 PM	2830380	2.13	1.69	25	259	1736	63424	26	Jul-95
07/19/95	02:30 PM	2882550	1.90	1.72	13	134	1870	59968	24	Aug-95
07/21/95	11:00 AM	2890500	2.98	2.98	12 *	0 +	0	1000655	233	Mar-96
08/08/95	04:00 PM	2986700	3.67	3.32	11	184	184	991051	207	Mar-96
09/08/95	02:00 PM	3108110	2.73	3.12	11	229	413	865962	192	Mar-96
10/13/95	10:30 AM	3206500	1.96	2.83	66	410	823	107058	26	Nov-95
11/22/95	03:30 PM	3318600	1.94	2.65	38	515	1338	104523	27	Dec-95
12/15/95	08:00 AM	3369800	1.57	2.47	19	223	1562	138533	39	Jan-96
01/08/96	11:45 AM	3554790	5.32	2.88	0.05	691	2253	255074	62	Mar-96
02/12/96	08:00 AM	3714500	3.18	2.92	56	708	2961	4150	1	Feb-96
03/12/96	11:00 AM	3814170	2.38	2.86	42	470	3432	2610	1	Mar-96
04/10/96	08:00 AM	3927670	2.73	2.84	36	550	3982	3011	1	Apr-96
05/06/96	08:00 AM	4035290	2.87	2.87	25 *	0 +	0	480314	116	Aug-96
05/13/96	08:00 AM	4055530	2.69	2.78	14	66	66	829513	207	Dec-96
06/13/96	07:00 AM	4172140	2.62	2.73	18	369	435	522088	133	Oct-96

* – Concentration estimate

** – Concentration represents the average estimated value from January to the next sampling event.

\+ – Changed carbon vessel on this date.

TABLE 5
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
OMW-1	04/09/91	8.79		5.54	3.25		3.25
	06/19/91			6.89	1.90		1.90
	05/11/92			6.34	2.45		2.45
	06/09/92			6.91	1.88		1.88
	07/07/92			7.21	1.58		1.58
	08/11/92			7.55	1.24		1.24
	09/04/92			7.82	0.97		0.97
	10/13/92			7.96	0.83		0.83
	11/12/92			7.64	1.15		1.15
	12/17/92			6.64	2.15		2.15
	03/18/93			5.98	2.81		2.81
	05/14/93			6.39	2.40		2.40
	07/13/93			7.12	1.67		1.67
	09/30/93			7.84	0.95		0.95
	11/10/93			8.08	0.71		0.71
	01/24/94			7.54	1.25		1.25
	03/23/94			6.69	2.10		2.10
	05/02/94			6.61	2.18		2.18
	07/29/94			7.32	1.47		1.47
	09/26/94			7.67	1.12		1.12
	11/15/94			3.67	5.12		5.12
	01/25/95			2.52	6.27		6.27
	05/09/95			5.55	3.24		3.24
	05/17/95			4.43	4.36		4.36
	07/31/95			6.43	2.36		2.36
	09/07/95			6.86	1.93		1.93
	11/30/95			7.69	1.10		1.10
	01/10/96			6.48	2.31		2.31
	03/25/96			5.00	3.79		3.79
	05/17/96			2.98	5.81		5.81
OMW-2	04/09/91	5.88		2.10	3.78		3.78
	06/19/91			3.59	2.29		2.29
	05/11/92			3.22	2.66		2.66
	06/09/92			3.97	1.91		1.91
	07/07/92			4.21	1.67		1.67
	08/11/92			4.46	1.42		1.42
	09/04/92			4.77	1.11		1.11
	10/13/92			4.96	0.92		0.92
	11/12/92			4.08	1.80		1.80
	12/17/92			1.70	4.18		4.18
	03/18/93			1.94	3.94		3.94
	05/14/93			3.29	2.59		2.59
	07/13/93			4.28	1.60		1.60
	09/30/93			4.99	0.89		0.89
	11/10/93			5.23	0.65		0.65
	01/24/94			3.30	2.58		2.58
	03/23/94			3.55	2.33		2.33
	05/02/94			4.95	0.93		0.93
	07/29/94			4.49	1.39		1.39
	09/26/94			4.92	0.96		0.96
	11/16/94			1.03	4.85		4.85
	01/25/95			3.35	2.53		2.53
	05/09/95		NOT GAUGED				
	05/17/95			2.44	3.44		3.44
	07/31/95		NOT GAUGED				
	09/07/95			4.35	1.53		1.53
	11/30/95			5.12	0.76		0.76
	01/10/96			2.60	3.28		3.28
	03/25/96			2.35	3.53		3.53
	05/17/96			1.73	4.15		4.15

TABLE 5 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
OMW-3	04/09/91	7.16		3.93	3.23		3.23
	06/19/91			5.33	1.83		1.83
	05/11/92			5.92	1.24		1.24
	06/09/92			5.48	1.68		1.68
	07/07/92			5.78	1.38		1.38
	08/11/92			6.09	1.07		1.07
	09/04/92			6.33	0.83		0.83
	10/13/92			6.55	0.61		0.61
	11/12/92			6.16	1.00		1.00
	12/17/92			5.15	2.01		2.01
	03/18/93			2.58	4.58		4.58
	05/14/93			4.91	2.25		2.25
	07/13/93			5.70	1.46		1.46
	09/30/93			6.43	0.73		0.73
	11/10/93			6.92	0.24		0.24
	01/24/94			3.50	3.66		3.66
	03/23/94			5.90	1.26		1.26
	05/02/94			5.84	1.32		1.32
	07/29/94			5.98	1.18		1.18
	09/26/94			6.32	0.84		0.84
	11/15/94			2.36	4.80		4.80
	01/25/95		NOT GAUGED – WELL UNDER WATER				
	05/09/95			4.37	2.79		2.79
	05/17/95			4.46	2.70		2.70
	07/31/95			5.22	1.94		1.94
	09/07/95			5.64	1.52		1.52
	11/30/95			6.36	0.80		0.80
	01/10/96			5.13	2.03		2.03
	03/25/96			4.08	3.08		3.08
	05/17/96			2.61	4.55		4.55
OMW-4	04/09/91	7.41	3.79	6.23	1.18	2.44	3.23
	06/19/91		4.44	8.68	−1.27	4.24	2.29
	05/11/92		NOT GAUGED				
	06/09/92		5.88	9.81	−2.40	3.93	0.90
	07/07/92		6.00	9.88	−2.47	3.88	0.79
	08/11/92		6.13	8.23	−0.82	2.10	0.94
	09/04/92		6.78	8.37	−0.96	1.59	0.38
	10/13/92**			6.58	0.83		0.83
	11/12/92		5.74	7.33	0.08	1.59	1.42
	12/17/92		5.77	7.28	0.13	1.51	1.40
	03/18/93		3.82	5.73	1.68	1.91	3.28
	05/14/93		5.76	8.45	−1.04	2.69	1.22
	07/13/93		5.94	7.78	−0.37	1.84	1.18
	09/30/93		6.85	8.17	−0.76	1.32	0.35
	11/10/93		7.03	7.59	−0.18	0.56	0.29
	01/24/94		6.15	6.76	0.65	0.61	1.16
	03/23/94		6.09	6.80	0.61	0.71	1.21
	05/02/94		5.25	5.54	1.87	0.29	2.11
	07/29/94		6.40	7.15	0.26	0.75	0.89
	09/26/94		6.31	6.93	0.48	0.62	1.00
	11/16/94		4.30	5.05	2.36	0.75	2.99
	01/25/95		6.23	7.12	0.29	0.89	1.04
	05/09/95		4.99	6.38	1.03	1.39	2.20
	05/17/95		5.19	6.58	0.83	1.39	2.00
	07/31/95		5.78	6.99	0.42	1.21	1.44
	09/07/95		6.01	6.92	0.49	0.91	1.25
	11/30/95		6.60	7.06	0.35	0.46	0.74
	01/10/96		5.73	6.48	0.93	0.75	1.56
	03/25/96		5.22	6.19	1.22	0.97	2.03
	05/17/96		5.23	6.26	1.15	1.03	2.02

TABLE 5 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
OMW-5	04/09/91	7.62		4.64	2.98		2.98
	06/19/91			5.35	2.27		2.27
	05/11/92			5.18	2.44		2.44
	06/09/92			5.85	1.77		1.77
	07/07/92			6.02	1.60		1.60
	08/11/92			6.18	1.44		1.44
	09/04/92			6.59	1.03		1.03
	10/13/92			6.54	1.08		1.08
	11/12/92			6.23	1.39		1.39
	12/17/92			5.23	2.39		2.39
	03/18/93			3.33	4.29		4.29
	05/14/93			5.06	2.56		2.56
	07/13/93			5.96	1.66		1.66
	09/30/93			6.70	0.92		0.92
	11/10/93			5.92	1.70		1.70
	01/24/94		NOT GAUGED				
	03/23/94			5.74	1.88		1.88
	05/02/94			5.71	1.91		1.91
	07/29/94			6.27	1.35		1.35
	09/26/94			6.56	1.06		1.06
	11/16/94			5.31	2.31		2.31
	01/25/95		NOT GAUGED				
	05/09/95		NOT GAUGED				
	05/18/95			4.84	2.78		2.78
	07/31/95		NOT GAUGED				
	09/07/95			5.85	1.77		1.77
	11/30/95			6.55	1.07		1.07
	01/10/96			5.46	2.16		2.16
	03/25/96			4.63	2.99		2.99
	05/17/96			4.83	2.79		2.79
OMW-6	04/09/91	5.78		7.60	-1.82		-1.82
	06/19/91			6.98	-1.20		-1.20
	05/11/92			7.41	-1.63		-1.63
	06/09/92			7.18	-1.40		-1.40
	07/07/92			6.61	-0.83		-0.83
	08/11/92			7.14	-1.36		-1.36
	09/04/92			6.58	-0.80		-0.80
	10/13/92**			6.16	-0.38		-0.38
	11/12/92			6.91	-1.13		-1.13
	12/17/92			6.16	-0.38		-0.38
	03/18/93			7.31	-1.53		-1.53
	05/14/93			6.59	-0.81		-0.81
	07/13/93			6.58	-0.80		-0.80
	09/30/93			5.49	0.29		0.29
	11/10/93			5.08	0.70		0.70
	01/24/94			5.40	0.38		0.38
	03/23/94			6.90	-1.12		-1.12
	05/02/94			7.44	-1.66		-1.66
	07/29/94			5.65	0.13		0.13
	09/26/94			6.88	-1.10		-1.10
	11/16/94			5.35	0.43		0.43
	01/25/95			6.91	-1.13		-1.13
	05/09/95			7.19	-1.41		-1.41
	05/17/95			6.84	-1.06		-1.06
	07/31/95			5.65	0.13		0.13
	09/07/95			5.51	0.27		0.27
	11/30/95			6.71	-0.93		-0.93
	01/10/96			6.72	-0.94		-0.94
	03/25/96			6.73	-0.95		-0.95
	05/17/96			6.50	-0.72		-0.72

TABLE 5 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
OMW-7	04/09/91	7.03	3.26	7.48	-0.45	4.22	3.09
	06/19/91		4.13	7.66	-0.63	3.53	2.34
	05/11/92		3.70	7.32	-0.29	3.62	2.75
	06/09/92		5.79	7.78	-0.75	1.99	0.92
	07/07/92		5.98	7.88	-0.85	1.90	0.75
	08/11/92		6.01	9.22	-2.19	3.21	0.51
	09/04/92		6.53	8.92	-1.89	2.39	0.12
	10/13/92		5.97	8.00	-0.97	2.03	0.74
	11/12/92		5.29	8.69	-1.66	3.40	1.20
	12/17/92		5.60	8.66	-1.63	3.06	0.94
	03/18/93		3.93	7.97	-0.94	4.04	2.45
	05/14/93		5.34	8.21	-1.18	2.87	1.23
	07/13/93		5.95	7.49	-0.46	1.54	0.83
	09/30/93		6.65	9.75	-2.72	3.10	-0.12
	11/10/93		6.75	9.12	-2.09	2.37	-0.10
	01/24/94		6.00	7.87	-0.84	1.87	0.73
	03/23/94		5.79	8.56	-1.53	2.77	0.80
	05/02/94		4.79	6.64	0.39	1.85	1.94
	07/29/94		6.15	8.46	-1.43	2.31	0.51
	09/26/94		6.14	7.11	-0.08	0.97	0.73
	11/16/94		4.23	4.63	2.40	0.40	2.74
	01/25/95		3.31	9.53	-2.50	6.22	2.72
	05/09/95		5.22	9.25	-2.22	4.03	1.17
	05/17/95		5.41	8.38	-1.35	2.97	1.14
	07/31/95		5.61	8.83	-1.80	3.22	0.90
	09/07/95		5.80	7.97	-0.94	2.17	0.88
	11/30/95		6.49	7.54	-0.51	1.05	0.37
	01/10/96		5.40	8.33	-1.30	2.93	1.16
	03/25/96		5.46	9.60	-2.57	4.14	0.91
	05/17/96		5.40	8.79	-1.76	3.39	1.09
OMW-8	04/09/91	7.52		4.25	3.27		3.27
	06/19/91			5.27	2.25		2.25
	05/11/92			5.05	2.47		2.47
	06/09/92			6.25	1.27		1.27
	07/07/92			6.33	1.19		1.19
	08/11/92			6.48	1.04		1.04
	09/04/92			7.00	0.52		0.52
	10/13/92			6.23	1.29		1.29
	11/12/92			6.34	1.18		1.18
	12/17/92			6.10	1.42		1.42
	03/18/93			4.51	3.01		3.01
	05/14/93			5.78	1.74		1.74
	07/13/93			6.26	1.26		1.26
	09/30/93			7.06	0.46		0.46
	11/10/93			7.12	0.40		0.40
	01/24/94			6.58	0.94		0.94
	03/23/94			6.15	1.37		1.37
	05/02/94			6.06	1.46		1.46
	07/29/94			6.47	1.05		1.05
	09/26/94			6.50	1.02		1.02
	11/15/94			4.74	2.78		2.78
	01/25/95		TRACE	3.55	3.97		3.97
	05/09/95			5.00	2.52		2.52
	05/17/95			5.16	2.36		2.36
	07/31/95			5.70	1.82		1.82
	09/07/95			5.99	1.53		1.53
	11/30/95			6.53	0.99		0.99
	01/10/96			5.87	1.65		1.65
	03/25/96			5.01	2.51		2.51
	05/17/96			5.18	2.34		2.34

TABLE 5 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
OMW-9	05/11/92	6.64	3.41	7.65	-1.01	4.24	2.55
	06/09/92		5.09	8.17	-1.53	3.08	1.06
	07/07/92		5.28	8.42	-1.78	3.14	0.86
	08/11/92		5.29	9.45	-2.81	4.16	0.68
	09/04/92		5.70	9.56	-2.92	3.86	0.32
	10/13/92		5.70	6.88	-0.24	1.18	0.75
	11/12/92		5.23	6.44	0.20	1.21	1.22
	12/17/92		5.08	6.40	0.24	1.32	1.35
	03/18/93		3.01	6.69	-0.05	3.68	3.04
	05/14/93		4.38	10.37	-3.73	5.99	1.30
	07/13/93		5.57	6.79	-0.15	1.22	0.87
	09/30/93		5.86	9.81	-3.17	3.95	0.15
	11/10/93		6.06	9.61	-2.97	3.55	0.01
	01/24/94		5.41	7.71	-1.07	2.30	0.86
	03/23/94		4.91	9.10	-2.46	4.19	1.06
	05/02/94		4.52	4.54	2.10	0.02	2.12
	07/29/94		5.46	8.40	-1.76	2.94	0.71
	09/26/94		5.74	6.39	0.25	0.65	0.80
	11/16/94		4.91	4.95	1.69	0.04	1.72
	01/25/95		3.83	6.25	0.39	2.42	2.42
	05/09/95		4.94	9.02	-2.38	4.08	1.05
	05/17/95		4.18	8.95	-2.31	4.77	1.70
	07/31/95		6.07	8.46	-1.82	2.39	0.19
	09/07/95		5.23	6.89	-0.25	1.66	1.14
	11/30/95		5.76	7.25	-0.61	1.49	0.64
	01/10/96		4.45	9.00	-2.36	4.55	1.46
	03/25/96		4.19	8.96	-2.32	4.77	1.69
	05/17/96		5.41	7.40	-0.76	1.99	0.91
OMW-10	05/11/92	7.56		4.76	2.80		2.80
	06/09/92			5.42	2.14		2.14
	07/07/92			5.58	1.98		1.98
	08/11/92			5.83	1.73		1.73
	09/04/92			6.18	1.38		1.38
	10/13/92**			5.30	2.26		2.26
	11/12/92			5.41	2.15		2.15
	12/17/92			4.20	3.36		3.36
	03/18/93		3.93	4.00	3.56	0.07	3.62
	05/14/93		4.83	4.92	2.64	0.09	2.72
	07/13/93		5.64	5.67	1.89	0.03	1.92
	09/30/93		6.36	6.38	1.18	0.02	1.20
	11/10/93			6.55	1.01		1.01
	01/24/94			5.55	2.01		2.01
	03/23/94			4.81	2.75		2.75
	05/02/94			5.06	2.50		2.50
	07/29/94			6.94	0.62		0.62
	09/26/94			6.36	1.20		1.20
	11/15/94			4.01	3.55		3.55
	01/25/95		NOT GAUGED – WELL COVERED				
	05/09/95		NOT GAUGED – WELL COVERED				
	05/17/95		TRACE	4.64	2.92		2.92
	07/31/95		NOT GAUGED – WELL COVERED				
	09/07/95			6.02	1.54		1.54
	11/30/95		TRACE	7.78	-0.22		-0.22
	01/10/96		TRACE	4.68	2.88		2.88
	03/25/96			4.58	2.98		2.98
	05/17/96			4.75	2.81		2.81

TABLE 5 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
ORW-1	06/19/91	6.59	3.91	9.36	-2.77	5.45	1.81
	05/11/92		NOT GAUGED				
	06/09/92		NOT GAUGED				
	07/07/92		NOT GAUGED				
	08/11/92			8.39	-1.80		-1.80
	09/04/92			8.35	-1.76		-1.76
	10/13/92		6.95	8.15	-1.56	1.20	-0.55
	11/12/92		NOT GAUGED				
	12/17/92		8.30	8.35	-1.76	0.05	-1.72
	03/18/93		3.60	7.39	-0.80	3.79	2.38
	05/14/93			8.63	-2.04		-2.04
	07/13/93			8.60	-2.01		-2.01
	09/30/93		NOT GAUGED				
	11/10/93		NOT GAUGED				
	01/24/94		NOT GAUGED				
	03/23/94		NOT GAUGED				
	05/02/94		NOT GAUGED				
	07/29/94		NOT GAUGED				
	09/26/94		NOT GAUGED				
	11/15/94		NOT GAUGED				
	01/25/95		NOT GAUGED				
	05/09/95		NOT GAUGED				
	05/18/95		8.77	9.76	-3.17	0.99	-2.34
	07/31/95		8.35	10.55	-3.96	2.20	-2.11
	09/07/95		8.55	11.03	-4.44	2.48	-2.36
	11/30/95		5.92	5.98	0.61	0.06	0.66
	01/10/96		TRACE	11.20	-4.61		-4.61
	03/25/96			11.20	-4.61		-4.61
	05/17/96			11.40	-4.81		-4.81
ORW-2	06/19/91	6.79	4.36	4.38	2.41	0.02	2.43
	05/11/92		3.55	6.34	0.45	2.79	2.79
	06/09/92		NOT GAUGED				
	07/07/92		NOT GAUGED				
	08/11/92			9.30	-2.51		-2.51
	09/04/92			9.31	-2.52		-2.52
	10/13/92		8.20	9.20	-2.41	1.00	-1.57
	11/12/92		NOT GAUGED				
	12/17/92			9.45	-2.66		-2.66
	03/18/93		2.94	7.48	-0.69	4.54	3.12
	05/14/93			8.21	-1.42		-1.42
	07/13/93		9.30	9.41	-2.62	0.11	-2.53
	09/30/93		NOT GAUGED				
	11/10/93		NOT GAUGED				
	01/24/94		NOT GAUGED				
	03/23/94		NOT GAUGED				
	05/02/94		NOT GAUGED				
	07/29/94		NOT GAUGED				
	09/26/94		NOT GAUGED				
	11/15/94		NOT GAUGED				
	01/25/95		NOT GAUGED				
	05/09/95		NOT GAUGED				
	05/18/95		9.55	9.56	-2.77	0.01	-2.76
	07/31/95		9.30	9.45	-2.66	0.15	-2.53
	09/07/95		9.45	9.50	-2.71	0.05	-2.67
	11/30/95		9.66	9.68	-2.89	0.02	-2.87
	01/10/96		9.55	9.60	-2.81	0.05	-2.77
	03/25/96		10.75	11.85	-5.06	1.10	-4.14
	05/17/96		10.60	11.60	-4.81	1.00	-3.97

TABLE 5 (cont.)
Fluid Level Measurements
Union Pacific Railroad
Oakland Fueling Area

Well No.	Date	Well Elev. Above M.S.L. (FT)	Depth to Product (FT)	Depth to Water (FT)	Water Level Elevation (FT)	Product Thickness (FT)	Corr Water Level Elevation* (FT)
ORW-3	06/19/91	6.30	4.07	4.10	2.20	0.03	2.23
	05/11/92		3.24	5.31	0.99	2.07	2.73
	06/09/92		NOT GAUGED				
	07/07/92		NOT GAUGED				
	08/11/92			8.90	-2.60		-2.60
	09/04/92			8.75	-2.45		-2.45
	10/13/92			8.59	-2.29		-2.29
	11/12/92		NOT GAUGED				
	12/17/92			8.35	-2.05		-2.05
	03/18/93		2.90	5.71	0.59	2.81	2.95
	05/14/93			8.16	-1.86		-1.86
	07/13/93		9.08	9.46	-3.16	0.38	-2.84
	09/30/93		NOT GAUGED				
	11/10/93		NOT GAUGED				
	01/24/94		NOT GAUGED				
	03/23/94		NOT GAUGED				
	05/02/94		NOT GAUGED				
	07/29/94		NOT GAUGED				
	09/26/94		NOT GAUGED				
	11/15/94		NOT GAUGED				
	01/25/95		NOT GAUGED				
	05/09/95		NOT GAUGED				
	05/18/95		9.45	9.48	-3.18	0.03	-3.15
	07/31/95		TRACE	9.68	-3.38		-3.38
	09/07/95		9.57	9.60	-3.30	0.03	-3.27
	11/30/95		TRACE	9.67	-3.37		-3.37
	01/10/96		TRACE	9.55	-3.25		-3.25
	03/25/96		11.55	12.05	-5.75	0.50	-5.33
	05/17/96		11.60	12.10	-5.80	0.50	-5.38
OP-1	05/18/95	6.71	3.84	5.05	1.66	1.21	2.68
	07/31/95		5.23	5.35	1.36	0.12	1.46
	09/07/95		5.55	6.13	0.58	0.58	1.07
	11/30/95		5.81	9.36	-2.65	3.55	0.33
	01/10/96		TRACE	4.41	2.30		2.30
	03/25/96			3.78	2.93		2.93
	05/17/96			2.18	4.53		4.53
OP-2	05/18/95	7.80	5.15	6.97	0.83	1.82	2.36
	07/31/95		NOT GAUGED				
	09/07/95		6.04	7.85	-0.05	1.81	1.47
	11/30/95		6.85	7.26	0.54	0.41	0.88
	01/10/96		5.70	6.25	1.55	0.55	2.01
	03/25/96		5.00	6.67	1.13	1.67	2.53
	05/17/96		5.30	6.45	1.35	1.15	2.32
OP-3	05/18/95	6.48	4.88	9.86	-3.38	4.98	0.80
	07/31/95		5.32	8.46	-1.98	3.14	0.66
	09/07/95		5.16	8.22	-1.74	3.06	0.83
	11/30/95		5.75	6.52	-0.04	0.77	0.61
	01/10/96		4.84	10.20	-3.72	5.36	0.78
	03/25/96		5.12	9.84	-3.36	4.72	0.60
	05/17/96		5.03	10.29	-3.81	5.26	max 0.61
OP-4	05/18/95	6.32	3.28	7.15	-0.83	3.87	2.42
	07/31/95		NOT GAUGED				
	09/07/95		4.64	6.17	0.15	1.53	1.44
	11/30/95		5.56	5.75	0.57	0.19	0.73
	01/10/96		3.43	6.45	-0.13	3.02	2.41
	03/25/96		3.11	6.89	-0.57	3.78	2.61
	05/17/96		3.30	6.43	-0.11	3.13	2.52

* Corrected water level elevation assumes product density of 0.84 g/cm3

** Gauging data for these may have been switched.

M.S.L. = Mean Sea Level

TABLE 6
Analytical Results
Groundwater Monitoring Wells
Union Pacific Railroad
Oakland Fueling Area

Well Number	Date Sampled	Total Petroleum Hydrocarbons (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
OMW-1	05/11/92	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	08/11/92	0.060	<0.0005	<0.0005	<0.0005	<0.0005
	11/13/92	0.067	<0.0005	0.00061*	<0.0005	<0.0005
	05/14/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	11/10/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	05/02/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	11/15/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	05/17/95	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	11/30/95	0.240	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	0.056	<0.0005	<0.0005	<0.0005	<0.0005
OMW-2	05/11/92	4.5	<0.0005	<0.0005	<0.0005	<0.0005
	08/11/92	2.7	<0.0005	<0.0005	<0.0005	<0.0005
	11/13/92	3.4	<0.0005	0.00057*	0.0011	0.0033
	05/14/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	11/10/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	05/02/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	11/16/94	0.26	<0.0005	<0.0005	<0.0005	<0.0005
	05/17/95	0.082	<0.0005	<0.0005	<0.0005	<0.0005
	11/30/95	4.0	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	0.58	<0.0005	<0.0005	<0.0005	<0.0005
OMW-3	05/11/92	2.3	.0003J	0.0013	.0003J	0.0034
	08/11/92	5.8	<0.0005	0.00071	<0.0005	.0017
	11/13/92	110	<0.0005	0.00089*	0.0015	.0084
	05/14/93	0.180	<0.0003	0.036	<0.0003	.0027
	11/10/93	1.80	<0.0003	0.0005	<0.0003	<0.0009
	05/02/94	1.80	<0.0005	0.0023	<0.0005	0.00089
	11/15/94	1.20	<0.0005	<0.0005	<0.0005	<0.0005
	05/17/95	0.46	<0.0005	0.0013	<0.0005	<0.0005
	11/30/95	2.40	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	2.30	<0.0005	<0.0005	<0.0005	<0.0005
OMW-5	05/11/92	2.1	<0.0005	.0004J	<0.0005	0.0003
	08/11/92	2.1	<0.0005	<0.0005	<0.0005	<0.0005
	11/13/92	4.4	<0.0005	0.00078*	<0.0005	<0.0005
	05/14/93	11	<0.0003	0.0018	<0.0003	<0.0009
	11/10/93	<0.050	<0.0003	0.0006	<0.0003	<0.0009
	05/02/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	11/16/94	0.52	<0.0005	0.0012	0.0014	0.0077
	05/18/95	2.4	<0.0005	<0.0005	<0.0005	0.0017
	11/30/95	13	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	5.8	<0.0005	<0.0005	<0.0005	<0.0005

TABLE 6 (cont.)
Analytical Results
Groundwater Monitoring Wells
Union Pacific Railroad
Oakland Fueling Area

Well Number	Date Sampled	Total Petroleum Hydrocarbons (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
OMW-6	05/11/92	0.52	<0.0005	<0.0005	<0.0005	0.0016
	08/11/92	0.55	<0.0005	<0.0005	<0.0005	<0.0005
	11/13/92	6.0	<0.0005	0.00077*	<0.0005	<0.0005
	05/14/93	0.18	<0.0003	<0.0003	<0.0003	<0.0009
	11/10/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	05/02/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	11/16/94	0.46	<0.0005	<0.0005	<0.0005	<0.0005
	05/17/95	1.1	<0.0005	<0.0005	<0.0005	<0.0005
	11/30/95	2.5	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	2.3	<0.0005	<0.0005	<0.0005	<0.0005
OMW-8	05/11/92	0.24	<0.0005	<0.0005	<0.0005	<0.0005
	08/11/92	0.22	<0.0005	<0.0005	<0.0005	<0.0005
	11/13/92	0.26	<0.0005	0.00058*	<0.0005	<0.0005
	05/14/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	11/10/93	<0.050	<0.0003	<0.0003	<0.0003	<0.0009
	05/02/94	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
	11/15/94	0.26	<0.0005	<0.0005	<0.0005	<0.0005
	05/17/95	0.26	<0.0005	<0.0005	<0.0005	<0.0005
	11/30/95	1.7	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	1.3	<0.0005	<0.0005	<0.0005	<0.0005
OMW-10	05/11/92	2.1	0.033	<0.0005	<0.0005	0.0027
	08/11/92	1.3	0.0096	<0.0005	<0.0005	.00062
	11/13/92	2.8	0.0066	0.00084*	<0.0005	.00062
	05/14/93	****** NOT SAMPLED – Well Contained Product **********				
	11/10/93	2.6	0.0043	0.0011	<0.0003	.00012
	05/02/94	2.6	0.00052	<0.0005	<0.0005	<0.0005
	11/16/94	****** NOT SAMPLED – Well Contained Product **********				
	05/17/95	****** NOT SAMPLED – Well Contained Product **********				
	11/30/95	****** NOT SAMPLED – Well Contained Product **********				
	05/29/96	****** NOT SAMPLED – Well Contained Product **********				

NOTES J = Estimated value below reporting limit.
Due to the presence of product, recovery wells ORW-1, ORW-2, ORW-3, and monitoring wells OMW-4, OMW-7, and OMW-9, are not sampled.
* 0.00062 mg/L was detected in the Trip Blank.

TABLE 7
Diesel Recovery
Union Pacific Railroad
Oakland Fueling Area

DATE	TOTAL VOLUME RECOVERED (gallons)	RECOVERY RATE (gal/day)	NOTES
03/02/93	1500	--	VOLUME ESTIMATED FROM GAUGE
05/11/93	1700	2.9	TANK EMPTIED
06/10/93	1900	6.7	VOLUME ESTIMATED FROM GAUGE
09/03/93	2700	9.4	TANK EMPTIED
11/30/93	3400	8.0	VOLUME ESTIMATED FROM GAUGE
02/25/94	4200	9.2	VOLUME ESTIMATED FROM GAUGE
06/01/94	4800	6.3	VOLUME ESTIMATED FROM GAUGE
06/27/94	4900	3.8	TANK EMPTIED
09/23/94	5500	6.8	TANK EMPTIED
12/27/94	6000	5.3	TANK EMPTIED
03/17/95	6300	3.8	TANK EMPTIED
07/14/95	6900	5.0	TANK EMPTIED
10/18/95	7500	6.3	TANK EMPTIED
01/30/96	8200	6.7	TANK EMPTIED
06/28/96	8900	4.7	VOLUME ESTIMATED FROM GAUGE

APPENDIX A

FIELD LOGS
GROUNDWATER RECOVERY
AND TREATMENT SYSTEM

GROUNDWATER TREATMENT SYSTEM FIELD LOG
OAKLAND FUELING AREA
UNION PACIFIC RAILROAD

Date	Time	Volume		Flow Rate Thru Carbon (gal/min)	Filter Pressure		Oil Level In Tank (inches)	Comments (Maintenance, Adjustments, and Observations)
		Signet (gallons)	Neptune (gallons)		Inlet (psig)	Outlet (psig)		
6/3/96	0730	1064490	4185000	20.0	9.5	8.5	<35"	
6/6/96	0700	1069130	4201100	24.0	9.0	8.5	36"	
6/10/96	0700	1070340	4208300	25.0	9.0	9.0	37"	BAAQMD inspection of o/w sep.
6/13/96	0700	1082250	4220800	21.5	10.0	8.5	<38"	Gauge wells / Sample influent and midfluent
6/17/96	0730	1098720	4238300	21.1	10.0	8.5	38"	
6/20/96	1600	1115950	4256800	18.4	10.0	7.5	40"	
6/24/96	0800	1133850	4275900	15.8	10.5	8.5	41"	
6/26/96	0730	1143420	4286200	22.7	9.5	8.5	<42"	
6/28/96	0700	1149950	4292600	22.9	10	8.5	42"	

MAIL COPIES MONTHLY TO: USPCI/LAIDLAW, 5665 FLATIRON PARKWAY, BOULDER, COLORADO 80301, ATTENTION: DENTON MAULDIN

GROUNDWATER TREATMENT SYSTEM FIELD LOG
OAKLAND FUELING AREA
UNION PACIFIC RAILROAD

Date	Time	Volume		Flow Rate	Filter Pressure		Oil Level	Comments
		Signet (gallons)	Neptune (gallons)	Thru Carbon (gal/min)	Inlet (psig)	Outlet (psig)	In Tank (inches)	(Maintenance, Adjustments, and Observations)
5/3/96	0730	937820	4047500	14.6	10	8.5	27"	
5/6/96	0800	—	—	19.8	7.5	7.5	—	Carbon replacement (1 unit)
5/9/96	0900	945400	4055800	23.0	7.5	7.5	27"	
5/13/96	0800	965640	4077400	15.0	10	8.5	<28	Collected water samples
5/17/96	0830	985680	4098900	12.7	10	8.0	28"	Gauged wells
5/20/96	0730	1001920	4116400	14.4	10.5	7.5	<30"	
5/24/96	0730	1022260	4139600	7.9	11.0	7.5	31"	
5/28/96	1400	1033290	4151700	24.0	9.0	8.5	32"	USPCI on-site to gauge/sample wells
5/31/96	0730	1048590	4168200	13.7	10.0	7.5	34"	

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GROUNDWATER TREATMENT SYSTEM FIELD LOG
OAKLAND FUELING AREA
UNION PACIFIC RAILROAD

Date	Time	Volume		Flow Rate	Filter Pressure		Oil Level	Comments
		Signet (gallons)	Neptune (gallons)	Thru Carbon (gal/min)	Inlet (psig)	Outlet (psig)	In Tank (inches)	(Maintenance, Adjustments, and Observations)
4/4/96	08:00	809330	3907000	16.0	9.5	8.0	< 19"	
4/8/96	09:00	827580	3924800	20.5	8.5	8.5	21"	
4/10/96	08:00	837780	3936400	18.5	8.0	8.5	21"	Sampled inf., mid., eff.
4/13/96	12:00	852120	3953000	19.3	8.5	8.5	22"	
4/15/96	15:00	861550	3963300	15.3	8.5	8.5	< 23"	
4/18/96	07:30	873880	3976800	12.2	10.0	7.5	23"	gauge selected wells
4/23/96	13:30	897340	4003300	13.5	8.5	8.5	24"	
4/26/96	10:45	907240	4014100	15.9	8.5	8.5	25"	
4/29/96	08:00	916960	4024400	19.1	9.0	8.5	25"	

MAIL COPIES MONTHLY TO: USPCI/LAIDLAW, 5665 FLATIRON PARKWAY, BOULDER, COLORADO 80301, ATTENTION: DENTON MAULDIN

GROUNDWATER TREATMENT SYSTEM FIELD LOG
OAKLAND FUELING AREA
UNION PACIFIC RAILROAD

Date	Time	Volume		Flow Rate Thru Carbon (gal/min)	Filter Pressure		Oil Level In Tank (inches)	Comments (Maintenance, Adjustments, and Observations)
		Signet (gallons)	Neptune (gallons)		Inlet (psig)	Outlet (psig)		
3/4/96	07:30	705150	3770400	18.2	8.5	8.0	12"	
3/7/96	10:00	717420	3783300	20.8	7.0	7.0	12"	
3/12/96	11:00	724280	3790500	19.0	8.5	8.0	13"	Sample influent/midfluent
3/15/96	08:00	725360	3791600	20.0	8.5	8.0	13"	
3/17/96	15:00	731200	3803500	—	—	—	14'	Transfer pump inoperative
3/18/96	16:00	—	—	15.0	10.0	9.0	15'	
3/21/96	08:00	754310	3831000	10.5	10.0	8.5	15.75"	
3/23/96	16:00	761340	3838500	18.4	8.0	8.5	16"	
3/25/96	08:00	771650	3849800	21.0	8.0	8.0	16"	Gauge all wells
3/28/96	08:00	785470	3868000	16.0	10.0	10.0	17"	

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GROUNDWATER TREATMENT SYSTEM FIELD LOG
OAKLAND FUELING AREA
UNION PACIFIC RAILROAD

Date	Time	Volume		Flow Rate	Filter Pressure		Oil Level	Comments
		Signet (gallons)	Neptune (gallons)	Thru Carbon (gal/min)	Inlet (psig)	Outlet (psig)	In Tank (inches)	(Maintenance, Adjustments, and Observations)
2/2/96	8AM	592510	3635500	11.2/25.2	12/10	8/10	0.0	(#/# = FLOW OR PRESSURE BEFORE/AFTER →
2/5/96	10AM	—	—	—	—	—	—	SILT FILTER CHANGE AND BACKFLUSH
2/8/96	2PM	—	—	14.0	11.5	11.5	0.0.	Both 2/5, 2/8 visits were Alarm #3 responses.
2/12/96	8AM	624610	3679400	11.0	12	11	0.0	
2/16/96	9AM	651590	3711900	16.3	11	7	0.0	
2/20/96	8:30AM	676760	3740600	12.4/21	10/8	9/8	0.0	
2/23/96	2:00PM	689860	3754400	17.5/20.5	9/8	8.5/8	0.0	
2/26/96	1:00PM	694170	3758900	20.3	8	8	0.0	
2/29/96	8:00AM	698860	3763800	19.5	8	8	0.0	

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PROJECT # 96199

RES JOB # 4117

GROUNDWATER TREATMENT SYSTEM FIELD LOG

UNION PACIFIC RAILROAD - OAKLAND TOFC
1717 MIDDLE HARBOR ROAD

DATE [D-M-Y]	TIME [24:00]	FLOW RATE [GPM]	TOTALIZER SIGNET : NEPTUNE [GALLONS:GALLONS]	PRODUCT LEVEL [INCHES]	FILTER PRESS. INLET [PSIG]	FILTER PRESS. OUTLET [PSIG]	COMMENTS MAINTENANCE, ADJUSTMENTS NOTES, OBSERVATIONS	CHLORINE FREE:TOTAL [PPM]:[PPM]	pH [pH]	HARDNESS as $CaCO_3$ [PPM]
1/31/96	9:00AM	14.4	579900/3620900	0.0"	10+	9+	FLUSH, FILTERS, WELL BOX DRAINING.			
1/30/96	12:00	14.9	571810/3611600	38.5	10	8	FILTERS, UNCLOG CHK BALLS [illegible]			
1/27/96	10:00AM	22	553230/3590800	36.25	7	7	ALERT 1, CHECK SYS			

MAIL COPIES MONTHLY TO: USPCI: 5665 FLATIRON PARKWAY: BOULDER, COLORADO 80301: ATTENTION MR. DENTON MAULDIN

PROJECT # 96199

RES JOB # 4117

GROUNDWATER TREATMENT SYSTEM FIELD LOG

UNION PACIFIC RAILROAD - OAKLAND TOFC
1717 MIDDLE HARBOR ROAD

DATE	TIME	FLOW RATE	TOTALIZER SIGNET : NEPTUNE	PRODUCT LEVEL	FILTER PRESS. INLET	FILTER PRESS. OUTLET	COMMENTS MAINTENANCE, ADJUSTMENTS	CHLORINE FREE:TOTAL	pH	HARDNESS as $CaCO_3$
[D-M-Y]	[24:00]	[GPM]	[GALLONS:GALLONS]	[INCHES]	[PSIG]	[PSIG]	NOTES, OBSERVATIONS	[PPM]:[PPM]	[pH]	[PPM]
1/20/96	9:00 AM	14	544690/3586200	36	—	—	ORW-3 PUMP, SUMP PUMP WORK			
1/25/96	10:40 AM	—	541640/3573800	32.5	9	6	CHECK PUMPS, FLUSH, CHECK OIL PROD			
1/24/96	9:15 AM	19.3	536920/3573100	32.5	7	7.5	NEW PUMP INSTALLS			
1/22/96	11:30 AM	15.4	531600/3568100	32.5	9	9.3	FLUSH, CHANGE FILTERS			
1/19/96	11:45 AM	17	514336/3547800	32.5	9.0	7.5	ORW-4 LEVEL CHECK SYS			
1/17/96		14	504780/3537600	30.5	10	9	FILTERS, PRIMARY			
1/15/96	11:45	17.5	493310/3524200	~31	9	8	QUICK CHECK			
1/10/96	9:45 AM	19	475970/3504900	30	7	7	WELL LEVELS, FLUSH TO CHECK LOADING			
1/9/96	10:45 AM	19	470120/3498600	30	7.5	8	FLUSH, SURGE WELLS			
1/8/96	11:45 AM	15.7	464900/3492600	29.5	10	8	QUICK CHECK/SAMPLES FLUSH			
1/4/96	9:30 AM	19.2	449780/3471400	29	8	8	CHECK SYS PRIOR TO JOB WALK			
1/3/96	7:30	(AFTER OK) 19.2	446300/3471200	29	14/7	6/7	FLUSH (DID NOT GO TO 12) SURGE WELLS, FILTERS			
1/2/96	11:30 AM	17.6	442410/3465800	25.75/29	10	9	FLUSH, DRAIN OIL FROM OWS FIX SWITCH IN BATCH			
12/26/95	12:00 PM	13	345420/3445000	25.75	10	7	ALERT 4 ON HRS, BACKFLUSH WELL WORK			
12/15/95	8:00 AM	18.3	279910/3405900	25.75	8.5	6.5	SYS SAMPLES, FLUSH PRIMARY, DISPOSED OF FILTERS.			
12/14/95	7:30 AM	16.1	275890/3401100	25.5	8	7.5	QUICK CHECK			

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PROJECT # 96199

RES JOB # 4117

GROUNDWATER TREATMENT SYSTEM FIELD LOG

UNION PACIFIC RAILROAD - OAKLAND TOFC
1717 MIDDLE HARBOR ROAD

DATE	TIME	FLOW RATE	TOTALIZER SIGNET : NEPTUNE	PRODUCT LEVEL	FILTER INLET	PRESS. OUTLET	COMMENTS MAINTENANCE, ADJUSTMENTS	CHLORINE FREE:TOTAL	pH	HARDNESS as $CaCO_3$
[D-M-Y]	[24:00]	[GPM]	[GALLONS:GALLONS]	[INCHES]	[PSIG]	[PSIG]	NOTES, OBSERVATIONS	[PPM]:[PPM]	[pH]	[PPM]
12/12/95	7:50AM	15	286780/3390600	25.5	10+	7	CHANGE FILTERS, ADJUST WELLS			
12/11/95	5:20pm	16	263300/3386600	25.5	8	6.5	AM+PM STOPS DURING HEAVY RAIN.			
12/3/95	3:00pm	19	245180/3366400	25.5	9	7	FLUSH.			
11/30/95	1:30	9.7	237560/3357800	25.5"	10+	5.5	ORW-3, 2 BUBBLERS CLOGGED, CLEAN UP SYSTEM.			
11/22/95	3:30pm	17	225400/3342800	L12	9	7	NOV SAMPLING, BUBBLER (ORW-1) CLEAR, PHONE OUT!			
11/13/95	12:00pm	19.9	206930/3322100	L12	7.5	7.5	CL LINE SWITCH, FLUSH, ORW-1			
11/10/95	8:20 AM	17	198820/3312900	L12	9	9	WELL LEVELS, FILTERS RAIL.			
11/9/95	1:15pm	18	196420/3310100	L12	8	7.5	CL PUMP WORK, SYS CHECK			
11/8/95	1:00pm	17	192830/3059000	L12	8	7	MET HARRY PATTERSON, OILED ORW-1.			
11/3/95	2:15pm	19.7	180750/3292400	L12	7	7	WELL MEASURES, ORW-1			
11/2/95	1:45pm	205	177350/3288500	L12	7	7	PRIMARY, FILTERS.			
10/31/95	1:30pm	18.2	170050/3280300	L12"	7.5	7.0	CHECK SYS, CLEAR CL LINE CHECK & ADJUST ORW-1.			
10/24/95	1:20pm	17	152060/3260600	L12	8	10	FLUSH PRIMARY			
10/23/95	1:00pm	16	149770/3258000	L12	9	8	ORW-1, SPILLOVER WIER, CL LINE FILTERS - OIL OUT 18th.			
10/17/95	11:20 AM	15.2	130070/3234100	33	8	8.5	DROP OFF LOG, CHECK SYS			
10/16/95	10:20	18	127670/3232000	~~33~~ 33	~~7.5~~ 9	7.5	COPY LOGS, CHK ORW-1			

MAIL COPIES MONTHLY TO: USPCI: 5665 FLATIRON PARKWAY: BOULDER, COLORADO 80301: ATTENTION MR. DENTON MAULDIN

APPENDIX B

ANALYTICAL RESULTS

SMITH ENVIRONMENTAL
2900 MAIN STREET, BLDG. 140
ALAMEDA, CA 94501

ATTN: CHRIS MERRITT
CLIENT PROJ. ID: 4117
CLIENT PROJ. NAME: VPRR

REPORT DATE: 12/29/95

DATE(S) SAMPLED: 12/15/95

DATE RECEIVED: 12/15/95

AEN WORK ORDER: 9512204

PROJECT SUMMARY:

On December 15, 1995, this laboratory received 2 water sample(s).

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

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

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

Larry Klein
Laboratory Director

SMITH ENVIRONMENTAL

SAMPLE ID: INFLUENT
AEN LAB NO: 9512204-01
AEN WORK ORDER: 9512204
CLIENT PROJ. ID: 4117

DATE SAMPLED: 12/15/95
DATE RECEIVED: 12/15/95
REPORT DATE: 12/29/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
#Extraction for TPH	EPA 3510	-		Extrn Date	12/22/95
TPH as Diesel	GC-FID	19 *	0.05	mg/L	12/22/95

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

SMITH ENVIRONMENTAL

SAMPLE ID: MIDFLUENT
AEN LAB NO: 9512204-02
AEN WORK ORDER: 9512204
CLIENT PROJ. ID: 4117

DATE SAMPLED: 12/15/95
DATE RECEIVED: 12/15/95
REPORT DATE: 12/29/95

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	12/20/95
Toluene	108-88-3	ND	0.5	ug/L	12/20/95
Ethylbenzene	100-41-4	ND	0.5	ug/L	12/20/95
Xylenes, Total	1330-20-7	ND	2	ug/L	12/20/95

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

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9512204

CLIENT PROJECT ID: 4117

Quality Control and Project Summary

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

Definitions

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

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

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

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

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

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

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

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9512204
DATE EXTRACTED: 12/22/95
INSTRUMENT: A
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
12/22/95	INFLUENT	01	94
QC Limits:			59-118

DATE EXTRACTED: 12/17/95
DATE ANALYZED: 12/18/95
SAMPLE SPIKED: DI WATER
INSTRUMENT: C

Method Spike Recovery Summary

Analyte	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Diesel	2.06	80	2	58-107	15

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9512204
INSTRUMENT: F
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
12/20/95	MIDFLUENT	02	99
QC Limits:			70-130

DATE ANALYZED: 12/19/95
SAMPLE SPIKED: LCS
INSTRUMENT: F

Laboratory Control Sample Recovery

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	19.2	93	1	60-120	20
Toluene	56.5	95	5	60-120	20
Hydrocarbons as Gasoline	500	114	6	60-120	20

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

SMITH ENVIRONMENTAL
2900 MAIN STREET, BLDG. 140
ALAMEDA, CA 94501

ATTN: CHRIS MERRITT
CLIENT PROJ. ID: 4117
CLIENT PROJ. NAME: UPRR

REPORT DATE: 01/19/96

DATE(S) SAMPLED: 01/08/96

DATE RECEIVED: 01/09/96

AEN WORK ORDER: 9601073

PROJECT SUMMARY:

On January 9, 1996, this laboratory received 3 water sample(s).

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

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

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

Larry Klein
Laboratory Director

SMITH ENVIRONMENTAL

SAMPLE ID: INFLUENT
AEN LAB NO: 9601073-01
AEN WORK ORDER: 9601073
CLIENT PROJ. ID: 4117

DATE SAMPLED: 01/08/96
DATE RECEIVED: 01/09/96
REPORT DATE: 01/19/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	13 *	0.5	ug/L	01/11/96
Toluene	108-88-3	ND	0.5	ug/L	01/11/96
Ethylbenzene	100-41-4	10 *	0.5	ug/L	01/11/96
Xylenes, Total	1330-20-7	21 *	2	ug/L	01/11/96
#Extraction for TPH.	EPA 3510	-		Extrn Date	01/11/96
TPH as Diesel	GC-FID	ND	0.05	mg/L	01/12/96

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

SMITH ENVIRONMENTAL

SAMPLE ID: MIDFLUENT
AEN LAB NO: 9601073-02
AEN WORK ORDER: 9601073
CLIENT PROJ. ID: 4117

DATE SAMPLED: 01/08/96
DATE RECEIVED: 01/09/96
REPORT DATE: 01/19/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	0.8 *	0.5	ug/L	01/11/96
Toluene	108-88-3	ND	0.5	ug/L	01/11/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	01/11/96
Xylenes, Total	1330-20-7	ND	2	ug/L	01/11/96

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

SMITH ENVIRONMENTAL

SAMPLE ID: EFFLUENT
AEN LAB NO: 9601073-03
AEN WORK ORDER: 9601073
CLIENT PROJ. ID: 4117

DATE SAMPLED: 01/08/96
DATE RECEIVED: 01/09/96
REPORT DATE: 01/19/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	01/11/96
Toluene	108-88-3	ND	0.5	ug/L	01/11/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	01/11/96
Xylenes, Total	1330-20-7	ND	2	ug/L	01/11/96
#Extraction for TPH	EPA 3510	-		Extrn Date	01/11/96
TPH as Diesel	GC-FID	36 *	0.05	mg/L	01/15/96

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

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9601073

CLIENT PROJECT ID: 4117

Quality Control and Project Summary

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

Definitions

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

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

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

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

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

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

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

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9601073
DATE EXTRACTED: 01/11/96
INSTRUMENT: C
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
01/12/96	INFLUENT	01	98
01/15/96	EFFLUENT	03	106
QC Limits:			59-118

DATE EXTRACTED: 01/10/96
DATE ANALYZED: 01/10/96
SAMPLE SPIKED: DI WATER
INSTRUMENT: C

Method Spike Recovery Summary

Analyte	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Diesel	2.00	93	4	58-107	15

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9601073
INSTRUMENT: F
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
01/11/96	INFLUENT	01	89
01/11/96	MIDFLUENT	02	89
01/11/96	EFFLUENT	03	89
QC Limits:			70-130

DATE ANALYZED: 01/11/96
SAMPLE SPIKED: LCS
INSTRUMENT: F

Laboratory Control Sample Recovery

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	19.1	99	13	60-120	20
Toluene	63.4	97	13	60-120	20
Hydrocarbons as Gasoline	500	107	14	60-120	20

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

R-7,S-D R-3,S-) 96D1073

SMITH
ENVIRONMENTAL TECHNOLOGIES CORPORATION

2900 Main Street, Bldg. 140
Alameda, CA 94501
Phone: (510) 748-3800
Fax: (510) 748-3812

CHAIN OF CUSTODY REQUEST FOR ANALYSIS

Laboratory: AEN
Contact: ROBIN
Phone: ~~[illegible]~~ 9309090

Date: 1/8/95
Page: 1 of: 1

PROJECT INFORMATION

Project Manager: CHRIS MERRITT
Project Name: UPRR
Fax Results to: SAME
Samplers: CHRIS MERRITT
Project # 4117
P.O. # 35343

Turn Around Time: 10 Day (5 Day) 48 Hr. 24 Hr. Other:

Sample ID	Lab ID	Date	Time	Matrix	Preserv.	TPH Gasoline / BTEX (EPA 5030/8015/602/8020)	TPH Diesel (EPA 3510/3550/8015)	TEPH Kerosene/Diesel/Motor Oil (EPA 3510/3550/8015)	Purgeable Aromatics / BTEX (EPA 602/8020)	Purgeable Halocarbons (EPA 601/8010)	Volatile Organics (EPA 624/8240)	Semivolatile Organics (EPA 525/627/8270/525)	TOG (SM 5520) TRPH (EPA 418.1)			Title 22 Metals Total or Soluble	Soluble Extraction TCLP or STLC (WET)						Number of Containers
							D		RBC														
INFLUENT	01A-D	1/8/95		H_2O	HCL		X		X														4
MIDFLUENT	01A-C	↓		↓	↓				X														3
EFFLUENT	01A-D	↓		↓	↓		X		X														4

SPECIAL INSTRUCTIONS / COMMENTS

Relinquished by (Sampler)	Relinquished by	Relinquished by
CHRIS MERRITT 10:11 AM	[signature] 11:25	
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
CHRIS MERRITT 1/9/95	Michael McMillen 1-9-96	
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
SMITH	AEN	
(Company)	(Company)	(Company)
Received by:	**Received by:**	**Received by (Laboratory):**
[signature] 10:11		Gina M Bellucci
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
Michael McMillen 1/9/96		Gina M Bellucci 1125
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
AEN		AEN 1/9/96
(Company)	(Company)	(Company)

Total Number of Containers → 11

SAMPLE RECEIPT
Head Space? Y / N
Received in good Condition (Cold)? Y / N
Conforms to Record? Y / N

DOHS Certification: 1172
AIHA Accreditation: 11134

BURNS & MCDONNELL
500 YGNACIO VALLEY RD.
SUITE #250
WALNUT CREEK, CA 94596

ATTN: SCOTT KELLSTEDT
CLIENT PROJ. ID: UP/OAKLAND

REPORT DATE: 02/23/96

DATE(S) SAMPLED: 02/12/96

DATE RECEIVED: 02/12/96

AEN WORK ORDER: 9602175

PROJECT SUMMARY:

On February 12, 1996, this laboratory received 2 water sample(s).

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

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

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

Larry Klein
Laboratory Director

BURNS & MCDONNELL

SAMPLE ID: INFLUENT
AEN LAB NO: 9602175-01
AEN WORK ORDER: 9602175
CLIENT PROJ. ID: UP/OAKLAND

DATE SAMPLED: 02/12/96
DATE RECEIVED: 02/12/96
REPORT DATE: 02/23/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
#Extraction for TPH	EPA 3510	-		Extrn Date	02/14/96
TPH as Diesel	GC-FID	56 *	0.05	mg/L	02/15/96

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

BURNS & MCDONNELL

SAMPLE ID: MIDFLUENT
AEN LAB NO: 9602175-02
AEN WORK ORDER: 9602175
CLIENT PROJ. ID: UP/OAKLAND

DATE SAMPLED: 02/12/96
DATE RECEIVED: 02/12/96
REPORT DATE: 02/23/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	1.2 *	0.5	ug/L	02/16/96
Toluene	108-88-3	0.5 *	0.5	ug/L	02/16/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	02/16/96
Xylenes, Total	1330-20-7	ND	2	ug/L	02/16/96

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

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9602175

CLIENT PROJECT ID: UP/OAKLAND

Quality Control and Project Summary

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

Definitions

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

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

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

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

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

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

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

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9602175
DATE EXTRACTED: 02/14/96
INSTRUMENT: C
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
02/15/96	INFLUENT	01	102
QC Limits:			59-118

DATE EXTRACTED: 02/12/96
DATE ANALYZED: 02/12/96
SAMPLE SPIKED: 9601257-05
INSTRUMENT: C

Matrix Spike Recovery Summary

Analyte	Spike Added (mg/L)	Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Diesel	4.18	90	2	58-107	15

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9602175
INSTRUMENT: F
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
02/16/96	MIDFLUENT	02	99
QC Limits:			70-130

DATE ANALYZED: 02/15/96
SAMPLE SPIKED: LCS
INSTRUMENT: F

Laboratory Control Sample Recovery

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	19.1	97	4	60-120	20
Toluene	63.4	105	8	60-120	20
Hydrocarbons as Gasoline	500	110	1	60-120	20

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

Reporting Information:

1. Client: BURNS & McDONNELL
Address: 500 YGNACIO VALLEY RD. #250
WALNUT CREEK, CA 94596
Contact: SCOTT KELLSTEDT
Alt. Contact:

American Environmental Network
3440 Vincent Road, Pleasant Hill, CA 94523
Phone (510) 930-9090
FAX (510) 930-0256

AEN

R-3,5 3

Page 1 of 1

REQUEST FOR ANALYSIS / CHAIN OF CUSTODY

Lab Job Number: 9602175
Lab Destination:
Date Samples Shipped:
Lab Contact:
Date Results Required: Standard
Date Report Required: ASAP
Client Phone No.: (510) 926-6422
Client FAX No.: (510) 926-6494

Address Report To:
2. ABOVE

Send Invoice To:
3. ABOVE

Send Report To: 1 or 2 (Circle one)

Client P.O. No.: _____ Client Project I.D. No.: UP/OAKLAND

Sample Team Member (s) _____

Lab Number	Client Sample Identification	Air Volume	Date/ Time Collected	Sample Type*	Pres.	No. of Cont.	Type of Cont.	ANALYSIS: TPHd (8015M)	ANALYSIS: BTEX (8020)	Comments / Hazards
01A	INFLUENT		2/12 12:00		HCl	1	1L	✓	✓	
02AB	MIDFLUENT		2/12 12:05		HCl	2	40ml		✓	

Relinquished by: (Signature) X. [signature]	DATE 2/12/96	TIME 3:20	Received by: (Signature) Lisa L Pruitt
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)
Method of Shipment			Lab Comments

*Sample type (Specify): 1) 37mm 0.8 µm MCEF 2) 25mm 0.8 µm MCEF 3) 25mm 0.4 µm polycarb. filter
4) PVC filter, diam. _____ pore size _____ 5) Charcoal tube 6) Silica gel tube 7) Water 8) Soil 9) Bulk Sample
10) Other _____ 11) Other _____

COPIES: WHITE - JOB FILE YELLOW - PROJECT FILE PINK - CLIENT

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

BURNS & MCDONNELL
500 YGNACIO VALLEY RD.
SUITE #250
WALNUT CREEK, CA 94596

ATTN: SCOTT KELLSTEDT
CLIENT PROJ. ID: UP/OAKLAND

REPORT DATE: 03/20/96

DATE(S) SAMPLED: 03/12/96

DATE RECEIVED: 03/12/96

AEN WORK ORDER: 9603165

PROJECT SUMMARY:

On March 12, 1996, this laboratory received 2 water sample(s).

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

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

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

Larry Klein
Laboratory Director

BURNS & MCDONNELL

SAMPLE ID: INFLUENT
AEN LAB NO: 9603165-01
AEN WORK ORDER: 9603165
CLIENT PROJ. ID: UP/OAKLAND

DATE SAMPLED: 03/12/96
DATE RECEIVED: 03/12/96
REPORT DATE: 03/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
#Extraction for TPH	EPA 3510	-		Extrn Date	03/14/96
TPH as Diesel	GC-FID	42 *	0.05	mg/L	03/18/96

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

BURNS & MCDONNELL

SAMPLE ID: MIDFLUENT
AEN LAB NO: 9603165-02
AEN WORK ORDER: 9603165
CLIENT PROJ. ID: UP/OAKLAND

DATE SAMPLED: 03/12/96
DATE RECEIVED: 03/12/96
REPORT DATE: 03/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	03/18/96
Toluene	108-88-3	ND	0.5	ug/L	03/18/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	03/18/96
Xylenes, Total	1330-20-7	ND	2	ug/L	03/18/96

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

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9603165

CLIENT PROJECT ID: UP/OAKLAND

Quality Control and Project Summary

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

Definitions

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

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

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

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

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

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

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

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9603165
DATE EXTRACTED: 03/14/96
INSTRUMENT: C
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
03/18/96	INFLUENT	01	91
QC Limits:			59-118

DATE EXTRACTED: 03/14/96
DATE ANALYZED: 03/14/96
SAMPLE SPIKED: 9602283-01
INSTRUMENT: A

Matrix Spike Recovery Summary

Analyte	Spike Added (mg/L)	Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Diesel	4.18	83	1	58-107	15

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020

AEN JOB NO: 9603165
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
03/18/96	MIDFLUENT	02	102
QC Limits:			70-130

DATE ANALYZED: 03/17/96
SAMPLE SPIKED: 9603134-02
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	22.2	104	2	85-109	17
Toluene	73.9	93	1	87-111	16

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

R-3,S-2
R-1,S-A

9603165

Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell Waste Consultants, Inc.
~~10881 Lowell Avenue, Suite 200~~ 500 YGNACIO VALLEY RD,
~~Overland Park, Kansas 66210~~ SUITE 250
~~Tel: (816) 333-8787~~
~~Fax: (816) 822-3463~~ WALNUT CREEK, CA 94596

Attention: SCOTT KELLSTEDT

Laboratory: AEN
Address:
City/State/Zip: PLEASANT HILL, CA
Telephone:

Document Control No.:
Lab. Reference No. or Episode No.:

Project Number:
Project Name: UP/OAKLAND
Site, Group, or SWMU Name:

Sample Number		Sample Event		Sample Depth (in feet)		Samples Collected		Sample Type: Matrix					Number of Containers	Analysis: TPHdiesel - 8015M; BTEX - 8020							Remarks
Sample Point	Sample Designator	Round	Year	From	To	Date	Time	Liquid	Solid	Gas	Composite	Grab									
INFLUENT	01A					3/12	11:00	✓				✓	1	✓							
MIDFLUENT	02AB					"	"	✓				✓	2		✓						

Special Instructions: PHONE: (510) 926-6422
FAX: (510) 926-6494

Sampler (signature): X. Wellstedt

Sampler (signature):

Relinquished By:	Date/Time	Received By:	Date/Time
1. X. Wellstedt (signature)	3/12/96 2:00pm	Robin Bynes (signature)	3-12-96 14:00
Relinquished By:	Date/Time	Received By:	Date/Time
2. (signature)		(signature)	

Condition of Shipping Container: Good ☐ Fair ☐ Poor ☐
Ice Present in Container: Yes ☐ No ☐
Comments:

Burns & McDonnell Waste Consultants 022194 form WCI-OP1

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

BURNS & MCDONNELL
500 YGNACIO VALLEY RD.
SUITE #250
WALNUT CREEK, CA 94596

ATTN: SCOTT KELLSTEDT
CLIENT PROJ. ID: UP/OAKLAND

REPORT DATE: 04/24/96

DATE(S) SAMPLED: 04/10/96

DATE RECEIVED: 04/10/96

AEN WORK ORDER: 9604135

PROJECT SUMMARY:

On April 10, 1996, this laboratory received 3 water sample(s).

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

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

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

Larry Klein
Laboratory Director

BURNS & MCDONNELL

SAMPLE ID: INFLUENT
AEN LAB NO: 9604135-01
AEN WORK ORDER: 9604135
CLIENT PROJ. ID: UP/OAKLAND

DATE SAMPLED: 04/10/96
DATE RECEIVED: 04/10/96
REPORT DATE: 04/24/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	9.7 *	0.5	ug/L	04/16/96
Toluene	108-88-3	ND	0.5	ug/L	04/16/96
Ethylbenzene	100-41-4	6.7 *	0.5	ug/L	04/16/96
Xylenes, Total	1330-20-7	10 *	2	ug/L	04/16/96
#Extraction for TPH	EPA 3510	-		Extrn Date	04/16/96
TPH as Diesel	GC-FID	36 *	0.05	mg/L	04/18/96

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

BURNS & MCDONNELL

SAMPLE ID: MIDFLUENT
AEN LAB NO: 9604135-02
AEN WORK ORDER: 9604135
CLIENT PROJ. ID: UP/OAKLAND

DATE SAMPLED: 04/10/96
DATE RECEIVED: 04/10/96
REPORT DATE: 04/24/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	1.8 *	0.5	ug/L	04/15/96
Toluene	108-88-3	ND	0.5	ug/L	04/15/96
Ethylbenzene	100-41-4	0.5 *	0.5	ug/L	04/15/96
Xylenes, Total	1330-20-7	ND	2	ug/L	04/15/96

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

BURNS & MCDONNELL

SAMPLE ID: EFFLUENT
AEN LAB NO: 9604135-03
AEN WORK ORDER: 9604135
CLIENT PROJ. ID: UP/OAKLAND

DATE SAMPLED: 04/10/96
DATE RECEIVED: 04/10/96
REPORT DATE: 04/24/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	04/12/96
Toluene	108-88-3	ND	0.5	ug/L	04/12/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	04/12/96
Xylenes, Total	1330-20-7	ND	2	ug/L	04/12/96
#Extraction for TPH	EPA 3510	-		Extrn Date	04/16/96
TPH as Diesel	GC-FID	1.8 *	0.05	mg/L	04/18/96

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

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9604135

CLIENT PROJECT ID: UP/OAKLAND

Quality Control and Project Summary

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

Definitions

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

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

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

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

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

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

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

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9604135
DATE EXTRACTED: 04/16/96
INSTRUMENT: C
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
04/18/96	INFLUENT	01	114
04/18/96	EFFLUENT	03	97
QC Limits:			59-118

DATE EXTRACTED: 04/15/96
DATE ANALYZED: 04/15/96
SAMPLE SPIKED: 9603343-21
INSTRUMENT: A

Matrix Spike Recovery Summary

Analyte	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Diesel	4.00	93	2	58-107	15

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020 GCFID

AEN JOB NO: 9604135
INSTRUMENT: F, H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
04/16/96	INFLUENT	01	95
04/15/96	MIDFLUENT	02	102
04/12/96	EFFLUENT	03	102
QC Limits:			70-130

DATE ANALYZED: 04/09/96
SAMPLE SPIKED: 9603435-02
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	22.2	98	9	85-109	17
Toluene	73.9	89	8	87-111	16

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

Reporting Information: [redacted] Am[redacted]can[redacted]vi[redacted]en[redacted]Net[redacted]k [redacted] A[redacted] [redacted] Page [redacted] / [redacted] of [redacted]

3440 Vincent Road, Pleasant Hill, CA 94523
Phone (510) 930-9090
FAX (510) 930-0256

REQUEST FOR ANALYSIS / CHAIN OF CUSTODY

1. Client: BURNS & McDONNELL
Address: 500 YGNACIO VALLEY RD, #250
WALNUT CREEK, CA 94596
Contact: SCOTT KELLSTEDT
Alt. Contact:

Lab Job Number: 9604135
Lab Destination:
Date Samples Shipped: 4/10/96
Lab Contact:
Date Results Required: FIVE - TEN DAYS
Date Report Required: "
Client Phone No.: (510) 926-6422
Client FAX No.: (510) 926-6494

Address Report To:
2. ABOVE

Send Invoice To:
3. ABOVE.

Send Report To: 1 or 2 (Circle one)

Client P.O. No.:

Client Project I.D. No.: UP/OAKLAND

Sample Team Member (s) KELLSTEDT

Lab Number	Client Sample Identification	Air Volume	Date/ Time Collected	Sample Type*	Pres.	No. of Cont.	Type of Cont.	ANALYSIS: BTEX/8020	TPH/8015	Comments / Hazards
01A-C	INFLUENT		4/10/96 8:30		HCl	3		✓	✓	
02AB	MIDFLUENT		" 8:15		"	2		✓		
03A-C	EFFLUENT		" 8:00		"	3		✓	✓	

Relinquished by: (Signature) S. Kellstedt	DATE 4/10/96	TIME 12:16 pm	Received by: (Signature) Ronald C. Jensen	DATE 4/10/96	TIME 12:16
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)	DATE	TIME
Method of Shipment			Lab Comments		

*Sample type (Specify): 1) 37mm 0.8 μm MCEF 2) 25mm 0.8 μm MCEF 3) 25mm 0.4 μm polycarb. filter
4) PVC filter, diam. _____ pore size _____ 5) Charcoal tube 6) Silica gel tube 7) Water 8) Soil 9) Bulk Sample
10) Other _____ 11) Other _____

COPIES: WHITE - JOB FILE YELLOW - PROJECT FILE PINK - CLIENT

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

BURNS & MCDONNELL
500 YGNACIO VALLEY RD.
SUITE #250
WALNUT CREEK, CA 94596

ATTN: SCOTT KELLSTEDT
CLIENT PROJ. ID: M-96-071-1
CLIENT PROJ. NAME: UNPAC

REPORT DATE: 05/23/96

DATE(S) SAMPLED: 05/13/96

DATE RECEIVED: 05/13/96

AEN WORK ORDER: 9605167

PROJECT SUMMARY:

On May 13, 1996, this laboratory received 2 water sample(s).

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

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

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

Larry Klein
Laboratory Director

BURNS & MCDONNELL

SAMPLE ID: MID
AEN LAB NO: 9605167-01
AEN WORK ORDER: 9605167
CLIENT PROJ. ID: M-96-071-1

DATE SAMPLED: 05/13/96
DATE RECEIVED: 05/13/96
REPORT DATE: 05/23/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	05/17/96
Toluene	108-88-3	ND	0.5	ug/L	05/17/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	05/17/96
Xylenes, Total	1330-20-7	ND	2	ug/L	05/17/96

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

BURNS & MCDONNELL

SAMPLE ID: INF
AEN LAB NO: 9605167-02
AEN WORK ORDER: 9605167
CLIENT PROJ. ID: M-96-071-1

DATE SAMPLED: 05/13/96
DATE RECEIVED: 05/13/96
REPORT DATE: 05/23/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
#Extraction for TPH	EPA 3510	-		Extrn Date	05/16/96
TPH as Diesel	GC-FID	14 *	0.05	mg/L	05/17/96

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

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9605167

CLIENT PROJECT ID: M-96-071-1

Quality Control and Project Summary

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

Definitions

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

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

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

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

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

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

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

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9605167
DATE EXTRACTED: 05/16/96
INSTRUMENT: A
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
05/17/96	INF	02	92
QC Limits:			65-125

DATE EXTRACTED: 05/16/96
DATE ANALYZED: 05/16/96
SAMPLE SPIKED: 9604373-02
INSTRUMENT: C

Matrix Spike Recovery Summary

Analyte	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Diesel	4.00	78	<1	60-110	15

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020 GCFID

AEN JOB NO: 9605167
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
05/17/96	MID	01	100
QC Limits:			70-130

DATE ANALYZED: 05/17/96
SAMPLE SPIKED: 9605155-01
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	22.2	92	6	85-109	17
Toluene	73.9	87	6	87-111	16

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

R-1, S-A
R-3, S-1

Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell
Waste Consultants, Inc.
10881 Lowell Avenue, Suite 200
Overland Park, Kansas 66210
Tel: (816) 333-8787
Fax: (816) 822-3463

Laboratory: AEN
Address: 3440 VINCENT RD.
City/State/Zip: PLEASANT HILL, CA 94523
Telephone: (510) 930-9090

Document Control No.:
Lab. Reference No. or Episode No.: 9605167

Attention: SCOTT KELLSTEDT
Project Number: 4-96-071-1
Project Name: UNPAC
Site, Group, or SWMU Name:

Sample Number		Sample Event		Sample Depth (in feet)		Samples Collected		Sample Type: Matrix					Number of Containers	Analysis: BTEX (8020)	Analysis: TPH (diesel) (8015)	Remarks
Sample Point	Sample Designator	Round	Year	From	To	Date	Time	Liquid	Solid	Gas	Composite	Grab				
MID	01AB	MAY	'96			5/13/96	8:00	✓				✓	2	✓		
INF	02A	MAY	'96			5/13/96	8:05	✓				✓	1		✓	

Sampler (signature):
Sampler (signature):

Special Instructions:

Relinquished By:	Date/Time	Received By:	Date/Time
1. (signature)	5/13/96 1322	(signature)	5-13-96 1322
Relinquished By:	Date/Time	Received By:	Date/Time
2. (signature)		(signature)	

Condition of Shipping Container: Good ✓ Fair ☐ Poor ☐
Ice Present in Container: Yes ✓ No ☐
Comments:

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

U.S.P.C.I./Laidlaw
5665 Flatiron Pkwy
Boulder, CO 80301
Attention: Denton Maudlin

Client Project ID: UPRR Fueling Area-Oakland
Sample Matrix: Water
Analysis Method: EPA 5030/8015 Mod./8020
First Sample #: 606-0032

Sampled: May 29, 1996
Received: May 30, 1996
Reported: Jun 14, 1996

QC Batch Number: GC060796 802002A | GC061096 802002A | GC060796 802002A | GC060796 802002A | GC060796 802002A | GC060796 802002A

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 606-0032 OMW-1	Sample I.D. 606-0033 OMW-3	Sample I.D. 606-0034 OMW-8	Sample I.D. 606-0035 OMW-18	Sample I.D. 606-0036 OMW-5	Sample I.D. 606-0037 OMW-6
Purgeable Hydrocarbons	50	N.D.	N.D.	N.D.	N.D.	66	92
Benzene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Toluene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Total Xylenes	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Chromatogram Pattern:		--	--	--	--	Unidentified Hydrocarbons >C9	Discrete Peak & Unidentified Hydrocarbons >C9

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	6/7/96	6/10/96	6/7/96	6/7/96	6/7/96	6/7/96
Instrument Identification:	HP-2	HP-2	HP-2	HP-2	HP-2	HP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	102	89	102	101	100	101

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Kenneth L. Wimer
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
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U.S.P.C.I./Laidlaw
5665 Flatiron Pkwy
Boulder, CO 80301
Attention: Denton Maudlin

Client Project ID: UPRR Fueling Area-Oakland
Sample Matrix: Water
Analysis Method: EPA 5030/8015 Mod./8020
First Sample #: 606-0038

Sampled: May 29, 1996
Received: May 30, 1996
Reported: Jun 14, 1996

QC Batch Number: GC060796 GC061096

802002A 802002A

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 606-0038 OMW-2	Sample I.D. 606-0039 Trip Blank
Purgeable Hydrocarbons	50	N.D.	N.D.
Benzene	0.50	N.D.	N.D.
Toluene	0.50	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.
Total Xylenes	0.50	N.D.	N.D.
Chromatogram Pattern:		--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Analyzed:	6/7/96	6/7/96
Instrument Identification:	HP-2	HP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	101	99

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Kenneth L. Wimer
Project Manager

Sequoia Analytical

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U.S.P.C.I./Laidlaw
5665 Flatiron Pkwy
Boulder, CO 80301
Attention: Denton Maudlin

Client Project ID: UPRR Fueling Area-Oakland
Sample Matrix: Water
Analysis Method: EPA 3510/8015 Mod.
First Sample #: 606-0032

Sampled: May 29, 1996
Received: May 30, 1996
Reported: Jun 14, 1996

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 606-0032 OMW-1	Sample I.D. 606-0033 OMW-3	Sample I.D. 606-0034 OMW-8	Sample I.D. 606-0035 OMW-18	Sample I.D. 606-0036 OMW-5	Sample I.D. 606-0037 OMW-6
QC Batch Number:		SP053196 8015EXA	SP053196 8015EXA	SP053196 8015EXA	SP053196 8015EXA	SP053196 8015EXA	SP053196 8015EXA
Extractable Hydrocarbons	50	56	2,300	1,300	1,300	5,800	2,300
Chromatogram Pattern:		Unidentified Hydrocarbons >C20	Diesel & Unidentified Hydrocarbons >C25	Diesel & Unidentified Hydrocarbons >C25	Diesel & Unidentified Hydrocarbons >C25	Diesel & Unidentified Hydrocarbons >C25	Diesel & Unidentified Hydrocarbons >C25

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	20	1.0
Date Extracted:	5/31/96	5/31/96	5/31/96	5/31/96	5/31/96	5/31/96
Date Analyzed:	6/3/96	6/3/96	6/3/96	6/3/96	6/3/96	6/3/96
Instrument Identification:	HP-3A	HP-3A	HP-3A	HP-3A	HP-3A	HP-3A

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Kenneth L. Wimer
Project Manager

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U.S.P.C.I./Laidlaw
5665 Flatiron Pkwy
Boulder, CO 80301
Attention: Denton Maudlin

Client Project ID: UPRR Fueling Area-Oakland
Sample Matrix: Water
Analysis Method: EPA 3510/8015 Mod.
First Sample #: 606-0038

Sampled: May 29, 1996
Received: May 30, 1996
Reported: Jun 14, 1996

QC Batch Number: SP053196

8015EXA

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 606-0038 OMW-2
Extractable Hydrocarbons	50	580

Chromatogram Pattern: Unidentified Hydrocarbons >C18

Quality Control Data

Report Limit Multiplication Factor:	1.0
Date Extracted:	5/31/96
Date Analyzed:	6/3/96
Instrument Identification:	HP-3A

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Kenneth L. Wimer
Project Manager

Sequoia Analytical

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U.S.P.C.I./Laidlaw
5665 Flatiron Pkwy
Boulder, CO 80301
Attention: Denton Maudlin

Client Project ID: UPRR Fueling Area-Oakland
Matrix: Liquid

QC Sample Group: 6060032-039

Reported: Jun 14, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel
QC Batch#:	GC061096	GC061096	GC061096	GC061096	SP053196
	802002A	802002A	802002A	802002A	8015EXA
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 3510
Analyst:	S. Chullakorn	S. Chullakorn	S. Chullakorn	S. Chullakorn	J. Dinsay
MS/MSD #:	6060037	6060037	6060037	6060037	BLK053196
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	6/10/96	6/10/96	6/10/96	6/10/96	5/31/96
Analyzed Date:	6/10/96	6/10/96	6/10/96	6/10/96	6/3/96
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2	HP-3A
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	300 µg/L
Result:	22	22	23	70	290
MS % Recovery:	110	110	115	117	97
Dup. Result:	22	22	23	67	290
MSD % Recov.:	110	110	115	112	97
RPD:	0.0	0.0	0.0	4.4	0.0
RPD Limit:	0-25	0-25	0-25	0-25	0-50
LCS #:	2LCS061096	2LCS061096	2LCS061096	2LCS061096	LCS053196
Prepared Date:	6/10/96	6/10/96	6/10/96	6/10/96	5/31/96
Analyzed Date:	6/10/96	6/10/96	6/10/96	6/10/96	6/3/96
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2	HP-3A
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	300 µg/L
LCS Result:	20	21	22	64	290
LCS % Recov.:	100	105	110	107	97
MS/MSD LCS Control Limits	70-130	70-130	70-130	70-130	11-148

SEQUOIA ANALYTICAL, #1271

Kenneth L. Wimer
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

Sequoia Analytical

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U.S.P.C.I./Laidlaw
5665 Flatiron Pkwy
Boulder, CO 80301
Attention: Denton Maudlin

Client Project ID: UPRR Fueling Area-Oakland
Matrix: Liquid

QC Sample Group: 6060032-039

Reported: Jun 14, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC060796 802002A	GC060796 802002A	GC060796 802002A	GC060796 802002A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	M. Brewer	M. Brewer	M. Brewer	M. Brewer
MS/MSD #:	6060032	6060032	6060032	6060032
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	6/7/96	6/7/96	6/7/96	6/7/96
Analyzed Date:	6/7/96	6/7/96	6/7/96	6/7/96
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
Result:	21	21	23	66
MS % Recovery:	105	105	115	110
Dup. Result:	21	21	23	66
MSD % Recov.:	105	105	115	110
RPD:	0.0	0.0	0.0	0.0
RPD Limit:	0-25	0-25	0-25	0-25

LCS #:	2CLS060796	2CLS060796	2CLS060796	2CLS060796
Prepared Date:	6/7/96	6/7/96	6/7/96	6/7/96
Analyzed Date:	6/7/96	6/7/96	6/7/96	6/7/96
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L
LCS Result:	20	21	22	64
LCS % Recov.:	100	105	110	107

MS/MSD LCS Control Limits	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL, #1271

Kenneth L. Wimer
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

SEQUOIA ANALYTICAL
CHAIN OF CUSTODY

☐ 680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600 FAX (415) 364-9233
☐ 819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600 FAX (916) 921-0100
☒ 404 N. Wiget Lane • Walnut Creek, CA 94598 • (510) 988-9600 FAX (510) 988-9673

Company Name: USPCI / LAIDLAW	Project Name: UPRR FUELING AREA-OAKLAND
Address: 5665 FLATIRON PKWY	Billing Address (if different):
City: BOULDER State: CO Zip Code: 80301	96B5503
Telephone: 303-938-5500 FAX #: 303-938-5520	P.O. #: 794
Report To: DENTON MAULDIN Sampler: MARK MC CORMICK	QC Data: ☐ Level D (Standard) ☒ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Working Days ☐ 3 Working Days ☐ 2 - 8 Hours ☐ 7 Working Days ☐ 2 Working Days ☐ 5 Working Days ☐ 24 Hours

☐ Drinking Water ☐ Waste Water ☒ Other GW

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Sequoia's Sample #	MOD 8015 TPH-DIESEL	8020 BTEX						Comments
1. OMW-1	5/29/96 1111	GW	1	1L AMBER		X		6060032	A-D				
2.			3	VOA			X						
3. OMW-3	5/29/96 1150		1	1L AMBER		X		6060033					
4.			3	VOA			X						
5. OMW-8	5/29/96 1230		1	1L AMBER		X		6060034					
6.			3	VOA			X						
7. OMW-18	5/29/96 1245		1	1L AMBER		X		6060035					
8.			3	VOA			X						
9. OMW-5	5/29/96 1340		1	1L AMBER		X		6060036					
10.			3	VOA			X						

Relinquished By:	Date: 5/30/96	Time: 1450	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab:	Date: 5/30/96	Time: 1450

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment_____

Pink - Client
Yellow - Sequoia
White - Sequoia

SEQUOIA ANALYTICAL
CHAIN OF CUSTODY

☐ 680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600 FAX (415) 364-9233
☐ 819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600 FAX (916) 921-0100
☒ 404 N. Wiget Lane • Walnut Creek, CA 94598 • (510) 988-9600 FAX (510) 988-9673

Company Name: USPCI / LAIDLAW	Project Name: UPRR FUELING AREA-OAKLAND
Address: 5665 FLATIRON PKWY	Billing Address (if different):
City: BOULDER State: CO Zip Code: 80301	9606008
Telephone: 303-938-5500 FAX #: 303-938-5520	P.O. #: 794
Report To: DENTON MAULDIN Sampler: MARK M. MCCORMICK	QC Data: ☐ Level D (Standard) ☒ Level C ☐ Level B ☐ Level A

Turnaround Time: ~~☐ 10~~ Working Days ☐ 3 Working Days ☐ 2 - 8 Hours ☐ 7 Working Days ☐ 2 Working Days ☐ 5 Working Days ☐ 24 Hours

☐ Drinking Water ☐ Waste Water ☒ Other GW

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Sequoia's Sample #	MTBE 8015 TPH-Diesel	BTEX 8020							Comments
1. OMW-6	5/29/96 1430	GW	2	1L AMBER		X		6060037 A-E						USE FOR MS/MSD
2. "	"	"	3	VOA			X							
3. OMW-2	5/29/96 1520	"	1	1L AMBER		X		6060038 A-D						
4. "	"	"	3	VOA			X							
5. TRIP BLANK	—	—	2	VOA			X	6060039 A-B						
6.														
7.														
8.														
9.														
10.														

Relinquished By: [signature]	Date: 5/30/96	Time: 1450	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab: [signature]	Date: 5/30/96	Time: 1450

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment_____

Pink - Client
Yellow - Sequoia
White - Sequoia

BURNS & MCDONNELL
500 YGNACIO VALLEY RD.
SUITE #250
WALNUT CREEK, CA 94596

ATTN: SCOTT KELLSTEDT
CLIENT PROJ. ID: 96-071-1
CLIENT PROJ. NAME: UNPAC

REPORT DATE: 06/26/96

DATE(S) SAMPLED: 06/13/96

DATE RECEIVED: 06/13/96

AEN WORK ORDER: 9606170

PROJECT SUMMARY:

On June 13, 1996, this laboratory received 2 water sample(s).

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

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

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

Larry Klein
Laboratory Director

BURNS & MCDONNELL

SAMPLE ID: INF
AEN LAB NO: 9606170-01
AEN WORK ORDER: 9606170
CLIENT PROJ. ID: 96-071-1

DATE SAMPLED: 06/13/96
DATE RECEIVED: 06/13/96
REPORT DATE: 06/26/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
#Extraction for TPH	EPA 3510	-		Extrn Date	06/13/96
TPH as Diesel	GC-FID	18 *	0.05	mg/L	06/18/96

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

BURNS & MCDONNELL

SAMPLE ID: MID
AEN LAB NO: 9606170-02
AEN WORK ORDER: 9606170
CLIENT PROJ. ID: 96-071-1

DATE SAMPLED: 06/13/96
DATE RECEIVED: 06/13/96
REPORT DATE: 06/26/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	0.5	ug/L	06/18/96
Toluene	108-88-3	ND	0.5	ug/L	06/18/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	06/18/96
Xylenes, Total	1330-20-7	ND	2	ug/L	06/18/96

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

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9606170

CLIENT PROJECT ID: 96-071-1

Quality Control and Project Summary

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

Definitions

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

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

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

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

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

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

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

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9606170
DATE EXTRACTED: 06/13/96
INSTRUMENT: A
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
06/18/96	INF	01	91
QC Limits:			65-125

DATE EXTRACTED: 06/12/96
DATE ANALYZED: 06/19/96
SAMPLE SPIKED: 9605231-02
INSTRUMENT: A

Matrix Spike Recovery Summary

Analyte	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Diesel	4.00	88	5	60-110	15

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020 GCFID

AEN JOB NO: 9606170
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
06/18/96	MID	02	97
QC Limits:			70-130

DATE ANALYZED: 06/17/96
SAMPLE SPIKED: 9606170-02
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	22.2	92	11	85-109	17
Toluene	73.9	88	4	87-111	16

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

Request for Chemical Analysis and Chain of Custody Record

Burns & McDonnell
Waste Consultants, Inc.
10881 Lowell Avenue, Suite 200
Overland Park, Kansas 66210
Tel: (816) 333-8787
Fax: (816) 822-3463 WALNUT CREEK

Attention: SCOTT KELLSTEDT

Laboratory: AEN
Address:
City/State/Zip: PLEASANT HILL, CA
Telephone:

Document Control No.:
Lab. Reference No. or Episode No.: 9606170

Project Number: 96-071-1
Project Name: UNPAC
Site, Group, or SWMU Name:

Sample Number		Sample Event		Sample Depth (In feet)		Samples Collected		Sample Type: Matrix					Number of Containers	Analysis: TPH (diesel) EPA SW 8015	Analysis: BTEX - 8020	Remarks
Sample Point	Sample Designator	Round	Year	From	To	Date	Time	Liquid	Solid	Gas	Composite	Grab				
INF	01A	JUNE	96			6/13/96	0800	X				X	1	X		01A
MID	02AB	JUNE	96			"	"	X				X	2		X	02AB

Sampler (signature): X. [illegible]

Sampler (signature):

Special Instructions:

Relinquished By:	Date/Time	Received By:	Date/Time
1. X. [illegible] (signature)	6/13/96 10:15	[illegible] (signature)	6/13/96 1015
Relinquished By:	Date/Time	Received By:	Date/Time
2. (signature)		(signature)	

Condition of Shipping Container: Good ☐ Fair ☐ Poor ☐
Ice Present In Container: Yes ☐ No ☐

Comments: BURNS & McDONNELL (510) 926-6422

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: UPRR Fueling Area - Oakland USPCI Project Number: 96199

Measuring Point (MP) Location: TOC **Well No.** OMW-1

Well Depth: (Below MP): 12.02'

Casing diameter: Inches: 2" Sampling Date: 5-29-96

Depth To Ground Water (Below MP): Feet 5.28 / 5.42 Sample ID No. OMW-1

Method Of Well Development: Time: 1111 ☒AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other Top of Screen Elevation:

Sampling Collection Method: Sample Appearance: very turbid orange brown

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample Odor: None

☒ Bailer Type: ○ Teflon ○ Stainless Steel Sampling Problems (if any):

○ ABS Plastic ○ PVC ⊘ HDPE

Pump Intake Or Bailer Set At _____ Feet Below MP Decontamination Performed: Probe

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests Samples Collected: TPH-D, BTEX

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1042	Begin Well					
1053	7.1	700	20.7		1.25	
1057	7.1	700	20.6		2.25	
1101	7.	600	20.5		3.25	
1111	Sample	Well				

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: Witnessed By:

12.07
5.42
6.60 x 0.16 = 1.056 gal/ft x 3 = 3.168 gals = 3 vols

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: UPRR Fueling Area-Oakland | USPCI Project Number: 96199

Measuring Point (MP) Location: TOC | **Well No.** OMW-3

Well Depth: (Below MP): 12.26'

Casing diameter: Inches 2" | Sampling Date: 5-29-96

Depth To Ground Water (Below MP): Feet 4.41 / 4.44 | Sample ID No. OMW-3

Method Of Well Development: | Time: 1150 ☒AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump | Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other | Top of Screen Elevation:

Sampling Collection Method: | Sample Appearance: slightly turbid gray

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample | Odor: Light

☒ Bailer Type: ○ Teflon ○ Stainless Steel | Sampling Problems (if any):

○ ABS Plastic ○ PVC ☒ HDPE

Pump Intake Or Bailer Set At _____ Feet Below MP | Decontamination Performed: Probe

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests | Samples Collected: TPH-D, BTEX

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1028	Begin	Well				
1134	6.5	600	18.8		1.25	
1138	6.5	700	18.2		2.50	
1139	6.5	700	18.3		2.75	
1150	Sample	Well				

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: Well bailed dry after 2 vols

[Comments may continue on back]

Form Completed By: Witnessed By:

12.26
- 4.44
7.82 x 0.16 = 1.251 ≈ 1.25 gals/vol x 3 = 3.75 = 3 vols

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: UPRR Fueling Area - Oakland | USPCI Project Number: 96199

Measuring Point (MP) Location: TOC | **Well No.** OMW-8

Well Depth: (Below MP): 10.60'

Casing diameter: Inches 2" | Sampling Date: 5-29-96

Depth To Ground Water (Below MP): Feet 4.84' / 5.08 | Sample ID No. OMW-8

Method Of Well Development: | Time: 1230 ☐AM, ☒PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump | Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other | Top of Screen Elevation:

Sampling Collection Method: | Sample Appearance: Clear/sl. turbid

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample | Odor: Slight

☒ Bailer Type: ○ Teflon ○ Stainless Steel | Sampling Problems (if any):

○ ABS Plastic ○ PVC ☒ HDPE

Pump Intake Or Bailer Set At _____ Feet Below MP | Decontamination Performed: Probe

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests | Samples Collected: TPH-D, ~~BTEX~~

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1203	Begin	Well				
1208	6.7	2400	19.1		1.0	
1211	6.7	2700	18.4		2.0	
1214	6.7	3100	18.9		3.0	
1217	6.7	3200	18.9		4.0	
1230	Sample	Well				

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: · extra volume to stabilize readings

· Dupe = MW-18 at 1245

[Comments may continue on back]

Form Completed By: Witnessed By:

10.60
5.08
5.52 x 0.16 = 0.883 ~ 1 gal/vol

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: UPRR Fueling Area - Oakland | USPCI Project Number: 96199

Measuring Point (MP) Location: TOC | **Well No.** OMW-10

Well Depth: (Below MP): 12.85

Casing diameter: Inches 2"

Depth To Ground Water (Below MP): Feet 4.21' / 4.28

Sampling Date: 5/29/96

Sample ID No.

Time: ☐AM, ☐PM

Method Of Well Development:

☐ Tap ☐ Submersible Pump ☐ Bladder Pump

☒ Bailer ☐ Centrifugal Pump ☐ Other

Riser Elevation (MP):

Top of Screen Elevation:

Sampling Collection Method:

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample

☐ Bailer Type: ○ Teflon ○ Stainless Steel ○ ABS Plastic ○ PVC

Sample Appearance:

Odor: Strong

Sampling Problems (if any): Product in well water

Pump Intake Or Bailer Set At _____ Feet Below MP

Decontamination Performed: Probe

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests

Samples Collected: 1

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1250	Begin	Well				

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: Well not sampled because of free product in ground water the presence of

[Comments may continue on back]

Form Completed By:

Witnessed By:

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: UPRR Fueling Area - Oakland USPCI Project Number: 96199

Measuring Point (MP) Location: TOC **Well No. OMW-5**

Well Depth: (Below MP): 11.25'

Casing diameter: Inches 2" Sampling Date: 5/29/96

Depth To Ground Water (Below MP): Feet 4.56' / 4.63' Sample ID No. OMW-5

Method Of Well Development: Time: 1340 ☐AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other Top of Screen Elevation:

Sampling Collection Method: Sample Appearance: Very turbid dk gray/black

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample Odor: Light - Mod.

☒ Bailer Type: ○ Teflon ○ Stainless Steel Sampling Problems (if any): Bail at recharge rate

○ ABS Plastic ○ PVC ☒ HDPE

Pump Intake Or Bailer Set At _____ Feet Below MP Decontamination Performed: Probe

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests Samples Collected: TPH-D, BTEX

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1312	Begin	Well				
1317	6.7	1900	19.6		1.25 Well bailed dry	
1321	6.7	1800	19.5		2.25 Recharge OK	
1327	6.7	1900	19.2		3.25	
1340	Sample	Well				

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: Well dry (< ½ bailer) after 1st volume, recharge rate OK so continue purging

[Comments may continue on back]

Form Completed By: Witnessed By:

11.25
4.63
6.62 X 0.16 = 1.059 gals/vol x 3 = 3.177 ~ 3.25 gals = 3 vols

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: UPRR Fueling Area-Oakland | USPCI Project Number: 96199

Measuring Point (MP) Location: TOC | **Well No.** OMW-6

Well Depth: (Below MP): 11.83'

Casing diameter: Inches 2" | Sampling Date: 5-29-96

Depth To Ground Water (Below MP): Feet 6.91'/6.78 | Sample ID No. OMW-6

Method Of Well Development: | Time: 1430 ☐AM, ☐PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump | Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other | Top of Screen Elevation:

Sampling Collection Method: | Sample Appearance: lightly turbid black flecks

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample | Odor: Moderate

☒ Bailer Type: ○ Teflon ○ Stainless Steel | Sampling Problems (if any):

○ ABS Plastic ○ PVC ⊘ HDPE

Pump Intake Or Bailer Set At _____ Feet Below MP | Decontamination Performed: Probe

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests | Samples Collected: TPH-D, BTEX

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1410	Begin	Well				
1414	7.2	2500	17.0		0.75	
1418	7.2	2600	17.0		1.75	
1420	7.3	2400	17.1		2.50	
1430	Sample	Well				

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments: TPH-D x2 for MS/MSD

[Comments may continue on back]

Form Completed By: Witnessed By:

11.83
- 6.78
5.05 x 0.16 = 0.808 gals/vol x3 = 2.424 ~ 2.5 gals = 3 vols

USPCI SAMPLING AND WELL STABLIZATION FORM

USPCI Project Name: UPRR Fueling Area - Oakland | USPCI Project Number: 96199

Measuring Point (MP) Location: TOC | **Well No.** OMW-2

Well Depth: (Below MP): 9.59'

Casing diameter: Inches 2" | Sampling Date: 5-29-96

Depth To Ground Water (Below MP): Feet 1.94 / 1.99 | Sample ID No. OMW-2

Method Of Well Development: | Time: 1520 ☐AM, ☒PM

☐ Tap ☐ Submersible Pump ☐ Bladder Pump | Riser Elevation (MP):

☒ Bailer ☐ Centrifugal Pump ☐ Other | Top of Screen Elevation:

Sampling Collection Method: | Sample Appearance: Clear

☐ Tap ☐ Submersible Pump ☐ Bladder Pump Sample | Odor: None

☒ Bailer Type: ○ Teflon ○ Stainless Steel | Sampling Problems (if any):

○ ABS Plastic ○ PVC ☒ HDPE

Pump Intake Or Bailer Set At _____ Feet Below MP | Decontamination Performed: Probe

Tubing Type (if Used):

Tubing Used for: ☐ Sample Collection ☐ Well Development/Field Tests | Samples Collected: TPH-D, BTEX

Time	pH (Units)	Temperature Corrected Conductance (umho/cm)	Temperature (Centigrade)	Water Level (Nearest 0.01 Ft.)	Cumulative Volume of Water Removed From well (Gallons)	Pumping Rate in Gallons/Minute (GPM)
1454	Begin	Well				
1501	7.0	200	17.9		1.25	
1504	7.0	200	17.7		2.50	
1507	7.0	200	17.6		3.75	
1520	Sample	Well				

At Least Well Bore Volumes Were Evacuated Before Sampling Discharge Rate = GPM x 0.00223 = cfs

Comments:

[Comments may continue on back]

Form Completed By: Witnessed By:

9.59
- 1.99
7.60 x 0.16 = 1.216 ≈ 1.25 gals/vol