

October 30, 1997

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

RE: *Semi-Annual Monitoring Report (April Through September 1997)*, Oakland Fueling Area
in the Oakland TOFC Railyard, Oakland, California

Dear Mr. Patterson:

Enclosed is the final copy of the *Semi-Annual Monitoring Report (April Through September 1997)*, dated October 30, 1997, for the Union Pacific Railroad Fueling Area at the trailer-on-flat-car (TOFC) loading facility at 1717 Middle Harbor Road in Oakland, California

Currently, the Alameda County Department of Environmental Health (ACDEH) and the East Bay Municipal Utility District (EBMUD) require the submittal of semi-annual reports. The ACDEH reports are submitted in April and October of each calendar year, while the EBMUD reports are submitted in July and January. The reporting arrangement necessitates the preparation of four reports per year, and the reporting periods overlap.

To allow the completion of only two reports per year and to encompass information required by both agencies, Consulting Services of Laidlaw Environmental Services, Inc. (Laidlaw) recommends changing the submittal dates of the ACDEH reports from April and October to July and January of each year. This would enable the ACDEH and EBMUD reports to be combined into one report and would streamline the reporting process to two reports per year. Groundwater sampling would continue during the first and third quarters of the year to account for seasonal fluctuations.

We hope to get a response from ACDEH regarding the revised reporting arrangement by the end of the year. If we do not receive a response, Laidlaw will contact ACDEH about the above reporting arrangement. If you have any questions, please call (303) 938-5500.

Sincerely,



Denton Mauldin
Project Manager, P.E.



Sam Marquis, R.G., P.G.
Project Hydrogeologist

cc: Jennifer Eberle, ACDEH
John Prall, Port of Oakland
Philip Herden, APL

**SEMI-ANNUAL MONITORING REPORT
(APRIL TO SEPTEMBER 1997)
OAKLAND FUELING AREA
UNION PACIFIC RAILROAD
1717 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA**

Laidlaw Project No. 792930

October 30, 1997

**Prepared For:
Union Pacific Railroad
Omaha, Nebraska**

**Prepared By:
Laidlaw
Consulting Services
5665 Flatiron Parkway
Boulder, Colorado 80301**

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1717 MIDDLE HARBOR ROAD
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Prepared for:

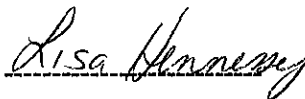
Union Pacific Railroad
Environmental Management - Room 930
1416 Dodge Street
Omaha, Nebraska 68179

For submittal to:

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October 30, 1997

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1. INTRODUCTION

This report was prepared by Consulting Services of Laidlaw Environmental Services, Inc. (Laidlaw) for Union Pacific Railroad (UPRR) in accordance with the Alameda County Department of Environmental Health (ACDEH) letter dated September 21, 1994. The purpose of this report is to provide groundwater monitoring information pertaining to the hydrocarbon recovery system located at the fueling area of the UPRR Oakland Trailer on Flat Car (TOFC) railyard at 1717 Middle Harbor Road in Oakland, California. The objective of the groundwater monitoring is to evaluate changes in the distribution of petroleum hydrocarbons in groundwater and to assess the effectiveness of the hydrocarbon recovery system.

This report presents the results of fluid-level measurements collected in July 1997 and August 1997, in addition to analytical results for groundwater samples obtained on August 28, 1997. In accordance with a letter from ACDEH dated March 21, 1997, groundwater sampling is performed semi-annually (during the first and third quarters of the year) to account for seasonal groundwater fluctuations. The semi-annual period covered by this report is from April through September 1997.

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 was installed to remove mobile diesel from near the fueling area. The results from prior investigations and environmental engineering activities conducted by Laidlaw have been documented in previous reports.

The results of the initial site investigation were presented in the *Hydrocarbon Investigation and Remediation Design* report dated June 10, 1991, which also presented a conceptual design of the system. The system design was outlined in the *Draft 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* of July 20, 1992. Process changes to the system were presented in the permit renewal application letter prepared by Laidlaw for UPRR, dated March 22, 1993.

An *Additional Remediation Workplan* was submitted by Laidlaw and approved by ACDEH on March 21, 1997. The workplan proposed the recovery of total fluids (water and diesel) from groundwater monitoring well OMW-9 and piezometer OP-4 and treatment at the existing system. The workplan was implemented on June 24 and 25, 1997, by Burns & McDonnell. New recovery pumps were installed in wells OMW-9 and OP-4, and became operational on June 26, 1997.

3. CURRENT ACTIVITIES

The current activities at the site consist of performing sampling and maintenance on the system and conducting a groundwater monitoring program.

3.1 System Activities

Water samples are collected from the water stream of the system periodically. Reporting of the system monitoring is conducted on a semi-annual frequency with the next report due January 1998. The samples are collected to assess the performance of the system and to compare the concentrations of the discharge with limits established by the East Bay Municipal Utility District.

Water samples are collected from sampling ports located before, between, and after the two granular activated carbon vessels at varying frequencies. On a quarterly basis, samples are collected from before and after 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 sample ports before and between the carbon vessels and analyzed for TPH-D. The water samples collected from between the two vessels are also analyzed for BTEX.

System maintenance consists of changing particulate filters, 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-level 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 in which diesel is found. The groundwater elevations in these wells are corrected to account for the diesel overlying the water column in the well. The

correction is 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.

During a sampling event, groundwater samples are collected from wells in which diesel is absent. For wells that indicate the presence of diesel, the diesel is recovered by hand using disposable bailers. The samples are submitted to a certified laboratory and analyzed for BTEX and TPH-D.

4. SYSTEM OPERATIONS

The five well recovery system operated throughout third quarter of 1997 with limited downtime required for periodic maintenance or a disruption in the operation of the UPRR air compressor, which supplies air for the recovery pumps. During the last week of September the air dryer for the air compressor became inoperative and is currently being repaired.

Recovery wells OMW-9 and OP-4 became operational on June 26, 1997. Well OMW-9 has been operational without incident. However, the pump in recovery well OP-4 has been operating sporadically throughout the months of July and August 1997, but there were no reported incidences during the month of September.

Detailed performance records and monitoring results for the recovery system are included in the semi-annual reports prepared following the second and fourth quarters of each year.

5. GROUNDWATER MONITORING

The following sections provide information about the recent groundwater monitoring.

5.1 Fluid Level Measurements

Third-quarter fluid-level measurements were obtained from groundwater monitoring wells and piezometers at the fueling area on July 15, August 28, and September 15, 1997. Measurements from wells OMW-9 and OP-4 could not be collected, due the presence of pumping components. However, field measurements were able to confirm that the fluid levels in OMW-9 and OP-4 were below the top of the pump housing. The measurement to the top of the pump housing was used as the minimum drawdown value for the two wells in completion of the potentiometric surface maps.

Overall, the monitoring wells and piezometers at the site indicated a decrease in water level elevations

from the previous quarter. The decrease of groundwater elevations during the third quarter is consistent with previous site data. Potentiometric surface maps created from fluid level measurements obtained July 1997 and August 1997 are presented in Figures 3 and 4 respectively. Historical fluid levels for each well are provided in Table 1.

The potentiometric surface results for July and August 1997 indicate that groundwater flow outside the influence of the recovery wells is to the south at a hydraulic gradient that ranges from 0.004 to 0.007 feet/foot (21 to 37 feet/mile). A groundwater depression created by the five recovery wells (ORW-1, ORW-2, ORW-3, OMW-9, and OP-4) is evident on the potentiometric surface maps (Figures 3 and 4). The figures indicate that the new recovery wells are increasing the area that the recovery system influences. There is evidence that a depression zone is forming around the new recovery well OP-4, and that the hydraulic capture zone originally attributed to ORW-3 has enlarged and currently shares a zone with the new recovery well OMW-9. The contour lines show an increased hydraulic gradient or convergent flow towards the entire well network in the portion of the site containing diesel. The hydraulic gradients in the immediate area of the recovery wells range from approximately 0.07 to 0.4 feet/foot (370 to 2,100 feet/mile), which is nearly two orders of magnitude greater than the natural gradient outside of the recovery well zone of influence.

During the July and August 1997 monitoring events, diesel was observed in two groundwater monitoring wells (OMW-4 and OMW-7) and three piezometers (OP-1, OP-2, and OP-3). There was a sheen noted in monitoring well OMW-10 in August but no noticeable product thickness was observed. Historically no product has been reported in this well so it was not included in the diesel plume delineation for August. Figures 5 and 6 illustrate the diesel thicknesses as measured in the monitoring wells and piezometers during the July and August 1997 monitoring events, respectively. As indicated by the differences between groundwater elevations wells outside of the diesel plume (OMW-2, OMW-5, and OMW-8) and the elevations of fluid levels in the recovery wells, the location of the diesel plume appears to be within the area having a hydraulic gradient towards the recovery wells.

5.2 Groundwater Sampling

The most recent semi-annual groundwater sampling event was conducted on August 28, 1997. Groundwater samples were obtained from monitoring wells OMW-1, OMW-2, OMW-3, OMW-5, OMW-6, and OMW-8. Monitoring well OMW-10 was not sampled due to the presence of diesel in the well.

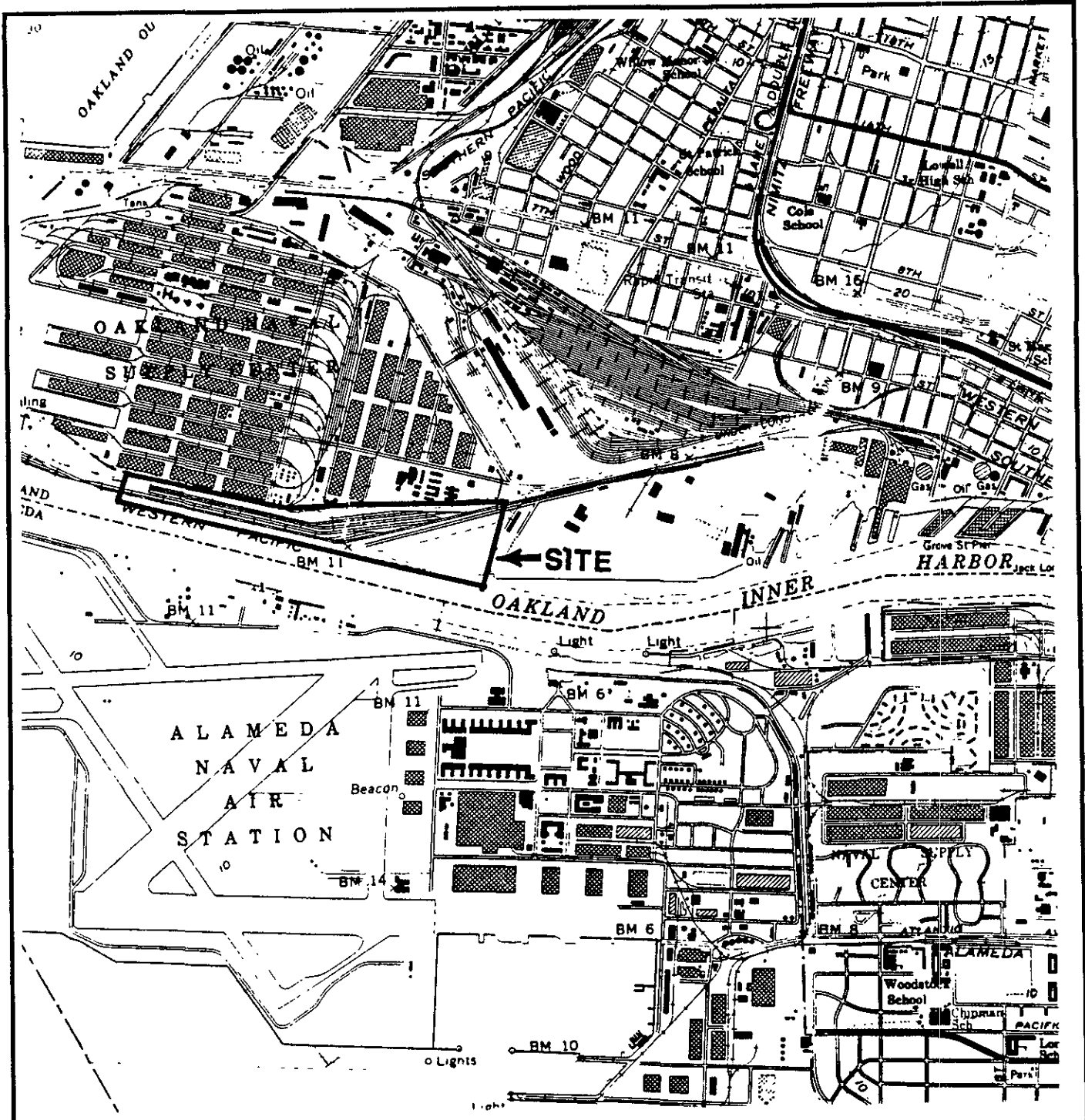
Analytical results indicate that BTEX concentrations in all monitoring wells sampled are below the MDL of 0.005 mg/l. These results are consistent with previous sampling data. TPH-D concentrations range from 0.13 mg/l in OMW-1 to 1.7 mg/l in OMW-5. The TPH-D concentrations show a decrease from the previous sampling event, but remain within historic ranges. Historical analytical results are presented in Table 2. Laboratory analytical reports for the August 1997 sampling event are included in Appendix A. Sampling and well stabilization forms are included as Appendix B. The next sampling event is scheduled for February 1997.

6. CONCLUSIONS

On the basis of the semi-annual monitoring event, the following conclusions have been made:

- A steep hydraulic gradient has been developed towards the recovery wells ORW-1, ORW-2, ORW-3, OMW-9, and OP-4 such that diesel is contained within and controlled by the hydraulic gradient created by the recovery wells.
- The new recovery wells OMW-9 and OP-4 are lowering water levels and enlarging the zone of influence of the recovery system.
- The groundwater gradient, fluid-level elevations, and field observations of diesel are consistent with previous monitoring events.
- BTEX concentrations were below MDL for all wells sampled.

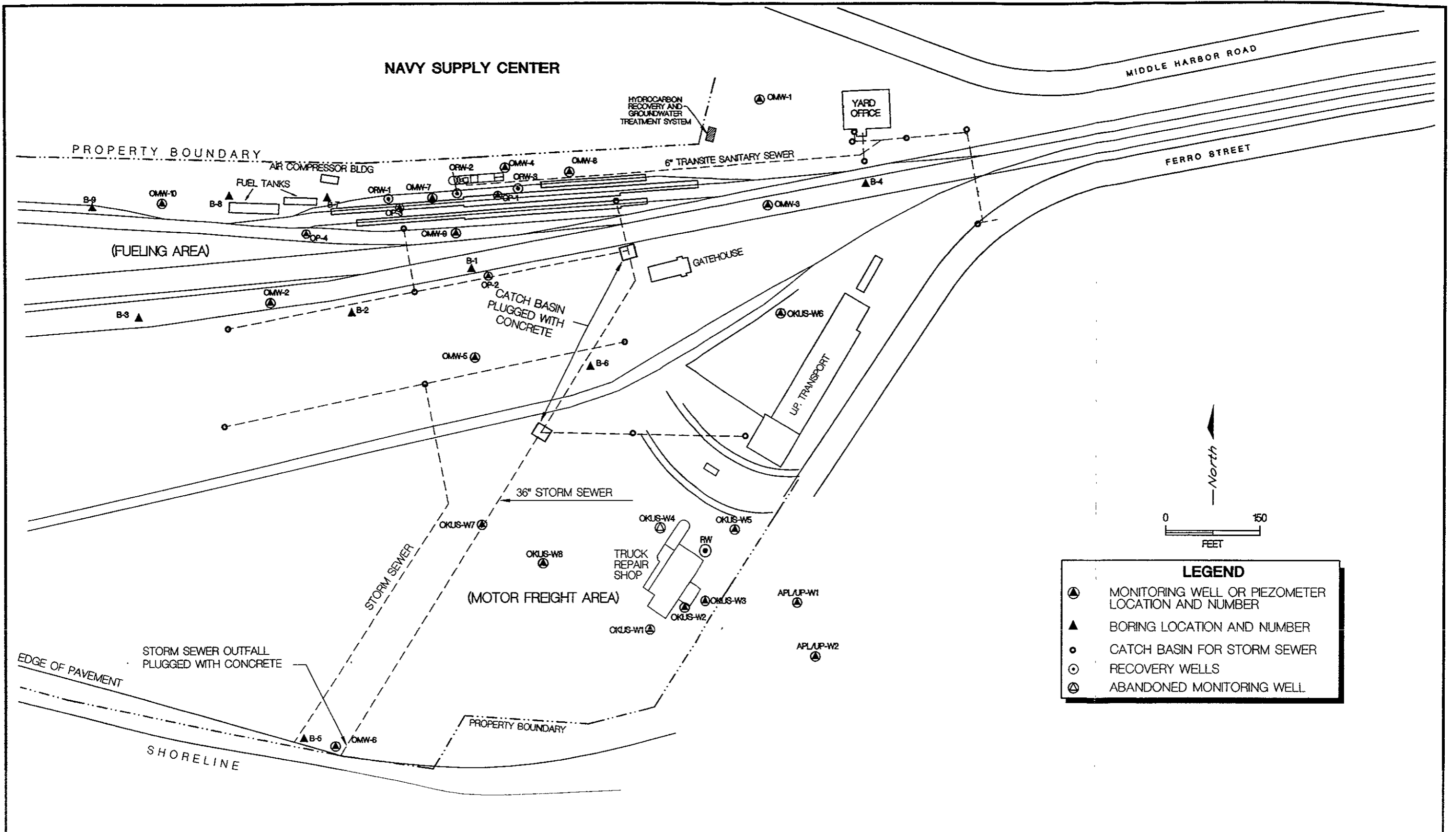
FIGURES



LOCMAP

North

<h1>USPCI</h1> <p>A LANDLAW COMPANY</p>	
<p>UPRR TOFC RAILYARD - OAKLAND, CALIFORNIA</p>	
<p>FIGURE 1 SITE LOCATION MAP</p>	
SCALE	DATE
1" = 2000'	10/29/96



LEGEND

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

OAKLAND ESTUARY

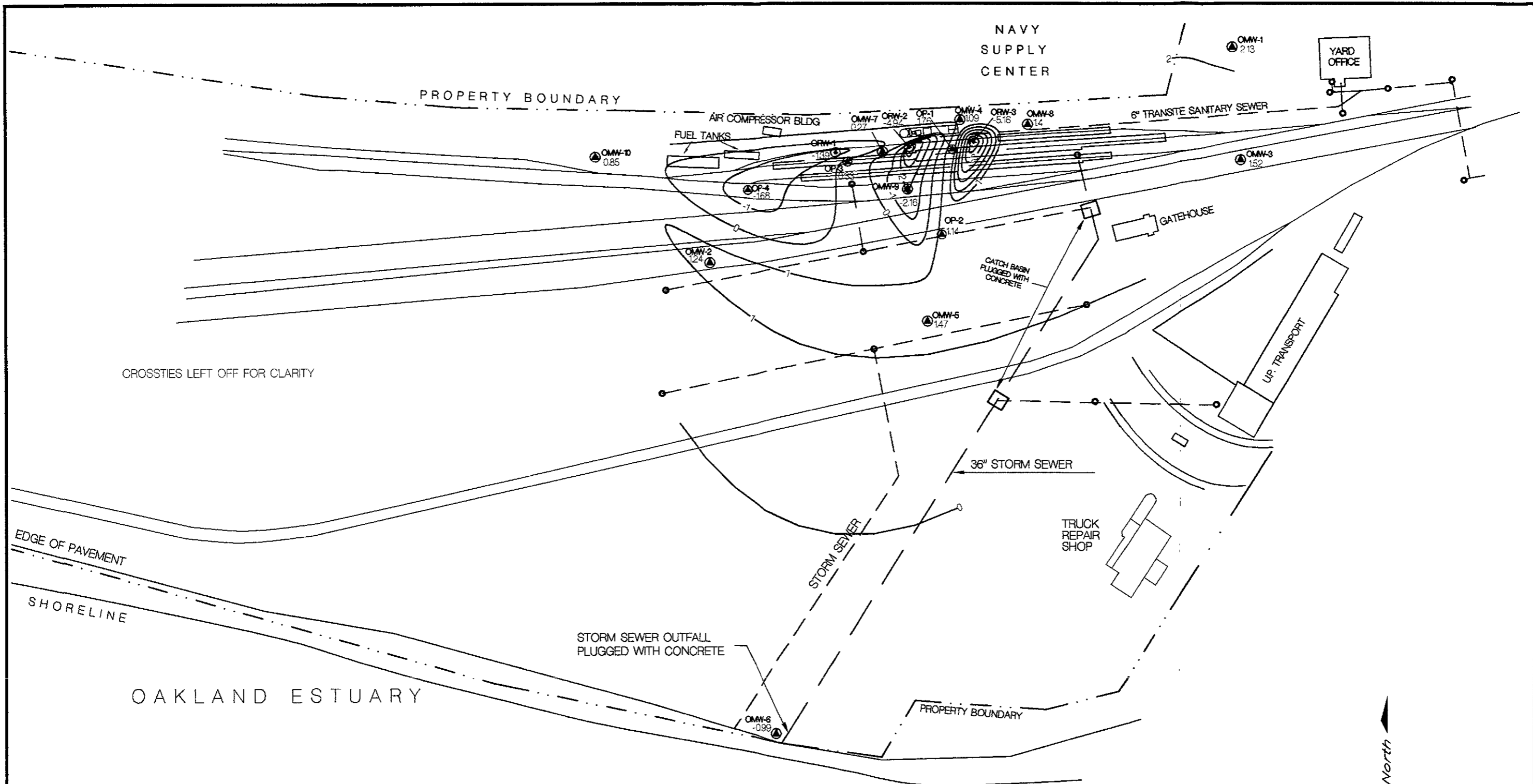
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APPROVED	

LAI DLAW
ENVIRONMENTAL SERVICES

UPRR TOFC RAILYARD
 UPMF REPAIR SHOP- OAKLAND, CALIFORNIA
FIGURE 2
SITE VICINITY MAP

SCALE 1" = 150'

DWG. NO. 96120-861

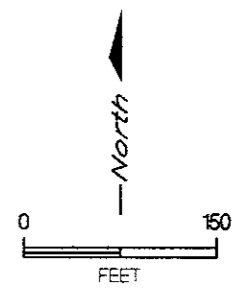


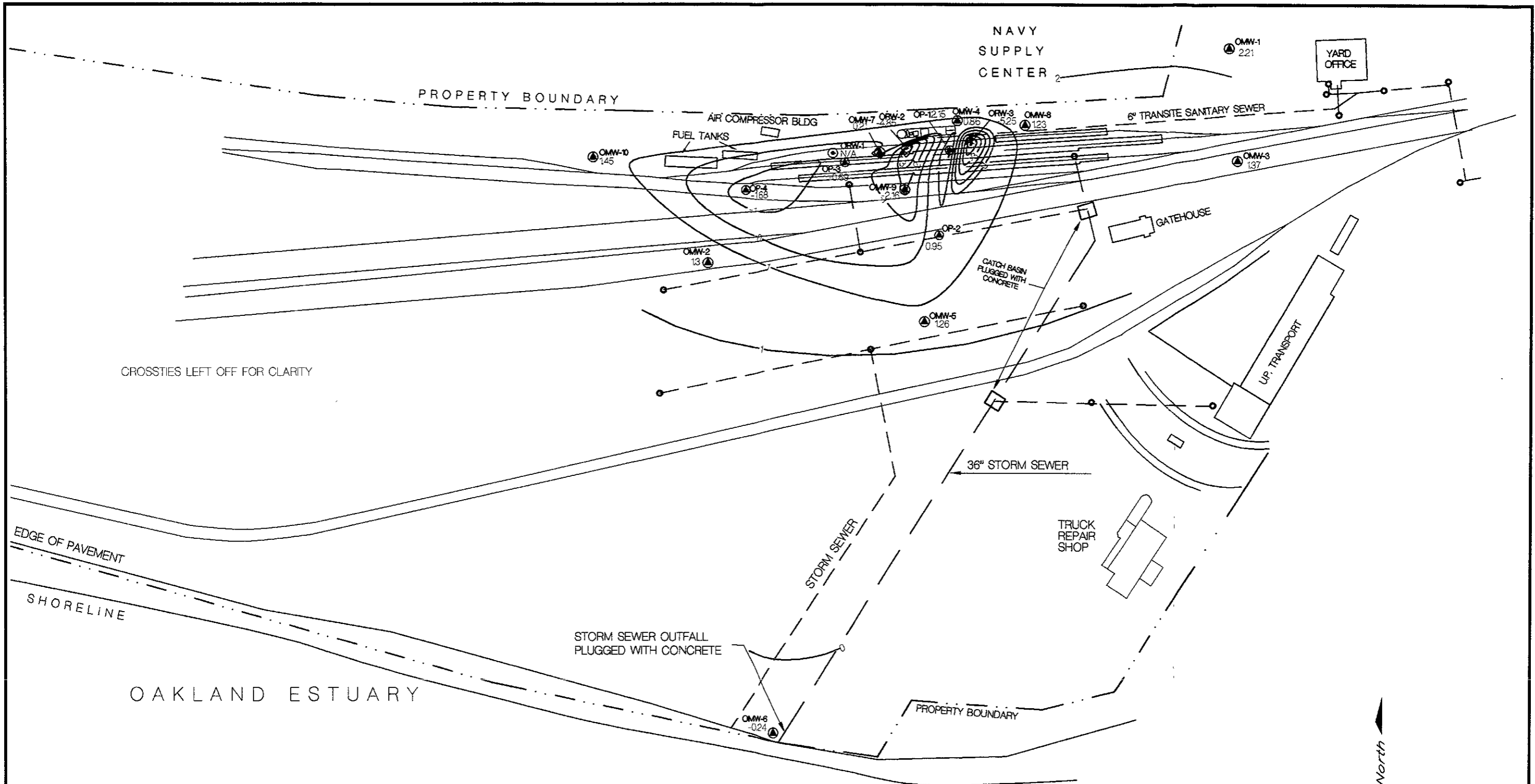
LEGEND	
	MONITORING WELL OR RECOVERY WELL LOCATION AND NUMBER
	CATCH BASIN FOR STORM SEWER
	RECOVERY WELLS
	GROUNDWATER ELEVATION IN FEET

BY	DA
WRB	10/30/97
CHECKED	
APPROVED	
APPROVED	
APPROVED	



UPRR TOFC RAILYARD - OAKLAND CALIFORNIA	
FIGURE 3 POTENTIOMETRIC SURFACE MAP JULY 1997	
SCALE	1" = 150'
DWG NO	96199-87





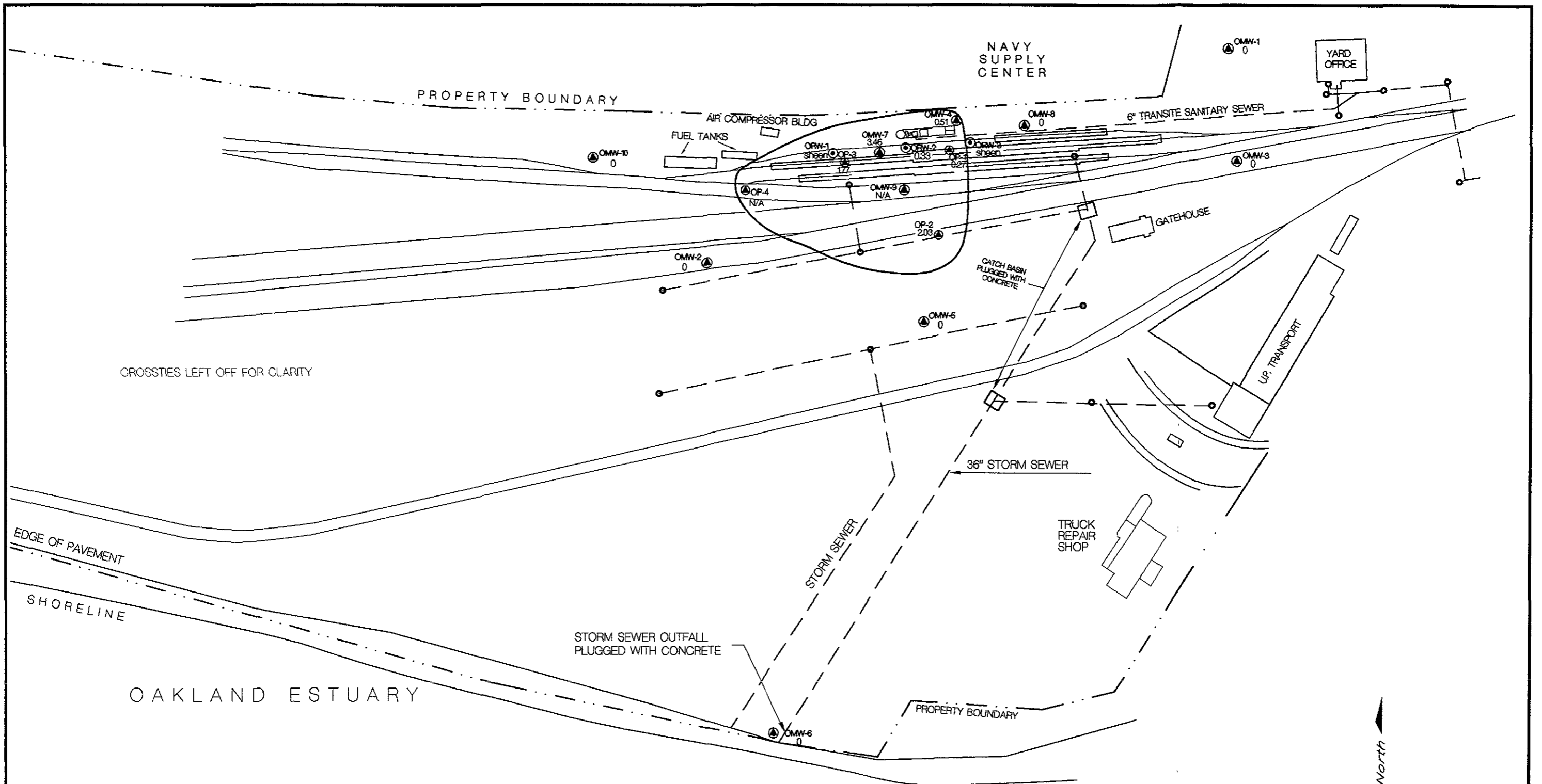
CROSSTIES LEFT OFF FOR CLARITY

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

BY	DATE
DRAWN WRB	10/30/97
CHECKED	
APPROVED	
APPROVED	
APPROVED	



UPRR TOFC RAILYARD - OAKLAND CALIFORNIA	
FIGURE 4 POTENTIOMETRIC SURFACE MAP AUGUST 1997	
SCALE	1" = 150'
DWG NO	96199-88



CROSSTIES LEFT OFF FOR CLARITY

OAKLAND ESTUARY

LEGEND

- ▲ MONITORING WELL OR PIEZOMETER LOCATION AND NUMBER
- CATCH BASIN FOR STORM SEWER
- RECOVERY WELLS
- PRODUCT THICKNESS (FT)
- APPROXIMATE LATERAL EXTENT OF DIESEL (NOT AVAILABLE)

BY	DATE
DRAWN WRB	10/30/97
CHECKED	
APPROVED	
APPROVED	
APPROVED	



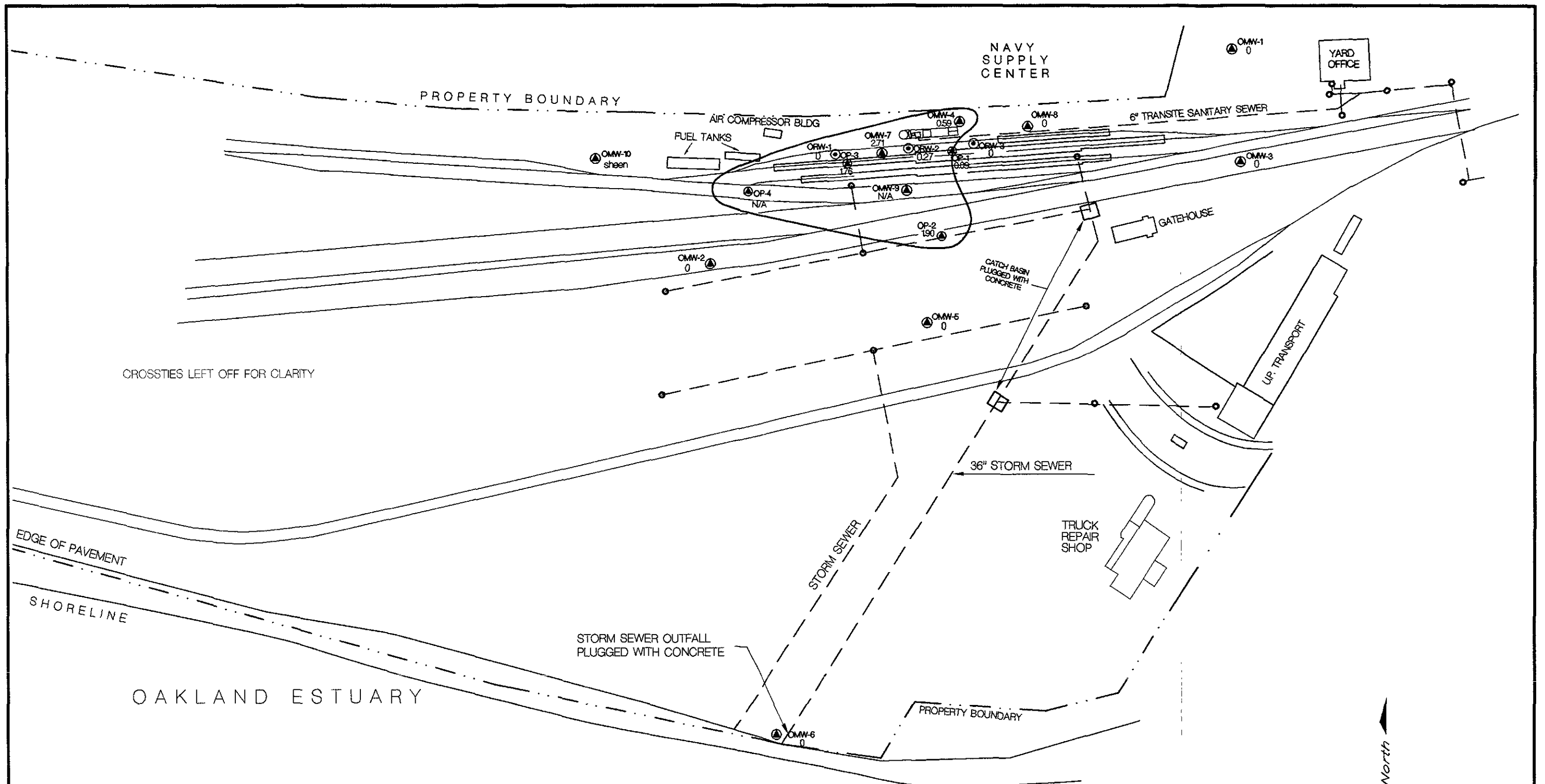
UPRR TOFC RAILYARD - OAKLAND CALIFORNIA

FIGURE 5
APPROXIMATE LATERAL EXTENT OF DIESEL
JULY 1997

SCALE 1" = 150'

DWG NO 96199-89





CROSSTIES LEFT OFF FOR CLARITY

EDGE OF PAVEMENT
SHORELINE

OAKLAND ESTUARY

LEGEND

- ▲ MONITORING WELL OR PIEZOMETER LOCATION AND NUMBER
- CATCH BASIN FOR STORM SEWER
- ⊙ RECOVERY WELLS
- PRODUCT THICKNESS (FT)
- APPROXIMATE LATERAL EXTENT OF DIESEL, NOT AVAILABLE

BY	DATE
DRAWN WRB	10/30/97
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APPROVED	
APPROVED	

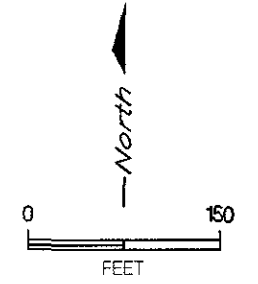


UPRR TOFC RAILYARD - OAKLAND CALIFORNIA

FIGURE 6
APPROXIMATE LATERAL EXTENT OF DIESEL
AUGUST 1997

SCALE 1" = 150'

DWG NO 96199-90



TABLES

TABLE 1
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		8.79						
	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
	07/25/96				6.29	2.50		2.50
	09/16/96				7.05	1.74		1.74
	11/12/96				7.51	1.28		1.28
	01/20/97				4.26	4.53		4.53
	03/06/97				4.65	4.14		4.14
	05/20/97				6.11	2.68		2.68
07/15/97			6.66	2.13		2.13		
08/28/97			6.58	2.21		2.21		
09/15/97			7.16	1.63		1.63		
OMW-2		5.88						
	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
	07/25/96				4.07	1.81		1.81
	09/16/96				4.60	1.28		1.28
	11/12/96				4.93	-0.95		0.95
	01/20/97				2.44	3.44		3.44
	03/06/97				4.26	1.62		1.62
	05/20/97				4.65	1.23		1.23
07/15/97			4.64	1.24		1.24		
08/28/97			4.58	1.30		1.30		
09/15/97			4.90	0.98		0.98		
OMW-3		7.16						
	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
	07/25/96				5.26	1.90		1.90
	09/16/96				5.90	1.26		1.26
	11/12/96				6.22	0.94		0.94
	01/20/97				3.79	3.37		3.37
	03/06/97				4.02	3.14		3.14
	05/20/97				5.34	1.82		1.82
07/15/97			5.64	1.52		1.52		
08/28/97			5.79	1.37		1.37		
09/15/97			5.95	1.21		1.21		

TABLE 1
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-4		7.41					
	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
	07/25/96		TRACE	5.82	1.59		1.59
	09/16/96		6.11	7.55	-0.14	1.44	1.07
	11/12/96		6.58	8.12	-0.71	1.54	0.58
	01/20/97		4.75	6.45	0.96	1.70	2.39
	03/06/97		5.25	6.24	1.17	0.99	2.00
	05/20/97		5.83	6.35	1.06	0.52	1.50
07/15/97	6.24	6.75	0.66	0.51	1.09		
08/28/97	6.46	7.05	0.36	0.59	0.86		
09/15/97	6.40	7.11	0.30	0.71	0.90		
OMW-5		7.62					
	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
	07/25/96			5.66	1.96		1.96
	09/16/96			6.17	1.45		1.45
	11/12/96		TRACE	6.59	1.03		1.03
	01/20/97			3.73	3.89		3.89
	03/06/97			5.34	2.28		2.28
	05/20/97			5.59	2.03		2.03
07/15/97		6.15	1.47		1.47		
08/28/97		6.36	1.26		1.26		
09/15/97		6.58	1.04		1.04		
OMW-6		5.78					
	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
	07/25/96			6.62	-0.84		-0.84
	09/16/96			6.44	-0.66		-0.66
	11/12/96			5.65	0.13		0.13
	01/20/97			5.52	0.26		0.26
	03/06/97			7.17	-1.39		-1.39
	05/20/97			6.39	-0.61		-0.61
07/15/97		6.77	-0.99		-0.99		
08/28/97		6.59	-0.81		-0.81		
09/15/97		6.02	-0.24		-0.24		

TABLE 1
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		7.03					
	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
	07/25/96		5.92	9.32	-2.29	3.40	0.57
	09/16/96		6.18	8.86	-1.83	2.68	0.42
	11/12/96		6.50	8.79	-1.76	2.29	0.16
	01/20/97		4.95	10.76	-3.73	5.81	1.15
	03/06/97		5.26	7.70	-0.67	2.44	1.38
	05/20/97		5.71	8.26	-1.23	2.55	0.91
	07/15/97		6.21	9.67	-2.64	3.46	0.27
08/28/97	6.39	9.10	-2.07	2.71	0.21		
09/15/97	6.51	8.03	-1.00	1.52	0.28		
OMW-8		7.52					
	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
	07/25/96			5.77	1.75		1.75
	09/16/96			6.21	1.31		1.31
	11/12/96			6.69	0.83		0.83
	01/20/97			4.84	2.68		2.68
	03/06/97			5.15	2.37		2.37
05/20/97		5.81	1.71		1.71		
07/15/97		6.12	1.40		1.40		
08/28/97		6.29	1.23		1.23		
09/15/97		6.40	1.12		1.12		
OMW-9		6.64					
	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
	07/25/96		5.16	8.41	-1.77	3.25	0.96
	09/16/96		5.75	6.19	0.45	0.44	0.82
	11/12/96		5.84	8.37	-1.73	2.53	0.40
	01/20/97		4.10	9.42	-2.78	5.32	1.69
	03/06/97		4.55	7.95	-1.31	3.40	1.55
	05/20/97		5.09	7.11	-0.47	2.02	1.23
	07/15/97			* 8.8	-2.16		-2.16
08/28/97		* 8.8	-2.16		-2.16		
09/15/97		7.80	-1.16		-1.16		

TABLE 1
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-10		7.56	NOT GAUGED - WELL COVERED						
	01/25/95		NOT GAUGED - WELL COVERED						
	05/09/95		TRACE				4.64	2.92	
	05/17/95		NOT GAUGED - WELL COVERED					2.92	
	07/31/95		NOT GAUGED - WELL COVERED						
	09/07/95		TRACE				6.02	1.54	
	11/30/95		TRACE				7.78	-0.22	
	01/10/96		TRACE				4.68	2.88	
	03/25/96						4.58	-4.58	
	05/17/96						4.75	2.81	
	07/25/96						5.79	1.77	
	09/16/96						6.33	1.23	
	11/12/96		TRACE				6.50	1.06	
	01/20/97						4.33	3.23	
	03/06/97						5.05	2.51	
	05/20/97						5.69	1.87	
	07/15/97						6.71	0.85	
08/28/97					6.11	1.45			
09/15/97					6.75	0.81			
						SHEEN			
						SHEEN			
ORW-1		6.59	NOT GAUGED						
	01/25/95		NOT GAUGED						
	05/09/95		8.77				9.76	-3.17	0.99
	05/18/95		8.35				10.55	-3.96	2.20
	07/31/95		8.55				11.03	-4.44	2.48
	09/07/95		5.92				5.98	0.61	0.06
	11/30/95		TRACE				11.20	-4.61	
	01/10/96						11.20	-4.61	
	03/25/96						11.40	-4.81	
	05/17/96		TRACE				10.90	-4.31	
	07/25/96						9.60	-3.01	
	09/16/96						9.60	-3.01	
	11/12/96								
	01/20/97		NOT GAUGED						
	03/06/97		9.55				9.75	-3.16	0.20
	05/20/97		9.75				9.86	-3.27	0.11
	07/15/97						7.98	-1.39	SHEEN
08/28/97	NOT GAUGED								
09/15/97	NOT GAUGED								
ORW-2		6.79	NOT GAUGED						
	01/25/95		NOT GAUGED						
	05/09/95		9.55				9.56	-2.77	0.01
	05/18/95		9.30				9.45	-2.66	0.15
	07/31/95		9.45				9.50	-2.71	0.05
	09/07/95		9.66				9.68	-2.89	0.02
	11/30/95		9.55				9.60	-2.81	0.05
	01/10/96		10.75				11.85	-5.06	1.10
	03/25/96		10.60				11.60	-4.81	1.00
	05/17/96		11.70				12.30	-5.51	0.60
	07/25/96		10.95				12.30	-5.51	1.35
	09/16/96		9.63				10.87	-4.08	1.24
	11/12/96		9.61				11.00	-4.21	1.39
	01/20/97		10.05				11.09	-4.30	1.04
	03/06/97		10.70				11.46	-4.67	0.76
	05/20/97		11.68				12.01	-5.22	0.33
	07/15/97		11.60				11.87	-5.08	0.27
08/28/97	11.90				12.08	-5.29	0.18		
09/15/97									

TABLE 1
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		6.30	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
	07/25/96			11.60	-5.30		-5.30
	09/16/96		11.40	11.90	-5.60	0.50	-5.18
	11/12/96		11.63	11.87	-5.57	0.24	-5.37
	01/20/97		NOT GAUGED		6.30	0.00	6.30
	03/06/97		11.20	11.50	-5.20	0.30	-4.95
	05/20/97		8.60	11.49	-5.19	2.89	-2.76
	07/15/97			11.46	-5.16	SHEEN	-5.16
08/28/97		11.55	-5.25		-5.25		
09/15/97	11.40	11.47	-5.17	0.07	-5.11		
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
	07/25/96			3.71	3.00		3.00
	09/16/96			3.15	3.56		3.56
	11/12/96		TRACE	2.90	3.81		3.81
	01/20/97		TRACE	3.90	2.81		2.81
	03/06/97		TRACE	4.19	2.52		2.52
	05/20/97		4.87	4.94	1.77	0.07	1.83
	07/15/97		4.91	5.18	1.53	0.27	1.76
	08/28/97		4.55	4.64	2.07	0.09	2.15
09/15/97	4.89	5.03	1.68	0.14	1.80		
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
	07/25/96		5.97	6.62	1.18	0.65	1.73
	09/16/96		6.25	8.15	-0.35	1.90	1.25
	11/12/96		6.66	8.79	-0.99	2.13	0.80
	01/20/97		4.74	6.35	1.45	1.61	2.80
	03/06/97		5.38	6.40	1.40	1.02	2.26
	05/20/97		5.92	7.26	0.54	1.34	1.67
	07/15/97		6.34	8.37	-0.57	2.03	1.14
	08/28/97		6.55	8.45	-0.65	1.90	0.95
09/15/97	6.62	8.59	-0.79	1.97	0.86		

TABLE 1
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)
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	0.61
	07/25/96		TRACE	5.61	0.87		0.87
	09/16/96		5.75	9.29	-2.81	3.54	0.16
	11/12/96		6.14	8.89	-2.41	2.75	-0.10
	01/20/97		4.96	8.20	-1.72	3.24	1.00
	03/06/97		4.75	8.42	-1.94	3.67	1.14
	05/20/97		6.38	6.95	-0.47	0.57	0.01
	07/15/97		5.87	7.64	-1.16	1.77	0.33
08/28/97	6.89	8.65	-2.17	1.76	-0.69		
09/15/97	6.03	8.03	-1.55	2.00	0.13		
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
	07/25/96		4.30	7.58	-1.26	3.28	1.50
	09/16/96		4.71	8.09	-1.77	3.38	1.07
	11/12/96		5.10	8.56	-2.24	3.46	0.67
	01/20/97		3.30	6.49	-0.17	3.19	2.51
	03/06/97		3.80	4.99	1.33	1.19	2.33
	05/20/97		4.59	5.28	1.04	0.69	1.62
	07/15/97				* 6.32	-1.68	
08/28/97			* 6.32	-1.68		-1.68	
09/15/97			9.90	-3.58		-3.58	

* Water and product levels below pump housing - reported value is depth to pump.
 Data collected prior to 1995 was submitted in previous reports.
 M.S.L. = Mean Sea Level

TABLE 2
Analytical Results
Groundwater Monitoring Wells
Union Pacific Railroad
Oakland Fueling Area

Well Number	Date Sampled	Total Petroleum Hydrocarbons-Diesel (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
	11/12/96	<0.050	<0.0005	<0.0005	<0.0005	<0.0005
08/28/97	0.13	<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
	11/12/96	3.4	<0.0005	<0.0005	<0.0005	<0.0005
08/28/97	0.72	<0.0005	<0.0005	<0.0005	<0.0005	
OMW-3	05/11/92	2.3	.0003 J	0.0013	.0003 J	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	1.8	<0.0003	0.0005	<0.0003	<0.0009
	05/02/94	1.8	<0.0005	0.0023	<0.0005	0.00089
	11/15/94	1.2	<0.0005	<0.0005	<0.0005	<0.0005
	05/17/95	0.46	<0.0005	0.0013	<0.0005	<0.0005
	11/30/95	2.4	<0.0005	<0.0005	<0.0005	<0.0005
	05/29/96	2.3	<0.0005	<0.0005	<0.0005	<0.0005
	11/12/96	3.1	<0.0005	<0.0005	<0.0005	<0.0005
08/28/97	1.4	<0.0005	<0.0005	<0.0005	<0.0005	
OMW-5	05/11/92	2.1	<0.0005	.0004 J	<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 2
Analytical Results
Groundwater Monitoring Wells
Union Pacific Railroad
Oakland Fueling Area

Well Number	Date Sampled	Total Petroleum Hydrocarbons-Diesel (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
OMW-5	11/12/96	***** NOT SAMPLED - Well Contained Product *****				
	08/28/97	1.7	<0.0005	<0.0005	<0.0005	<0.0005
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
	11/12/96	1.9	<0.0005	<0.0005	<0.0005	<0.0005
	08/28/97	0.99	<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
	11/12/96	1.3	<0.0005	<0.0005	<0.0005	<0.0005
	08/28/97	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 *****				
	11/12/96	***** NOT SAMPLED - Well Contained Product*****				
	08/28/97	***** NOT SAMPLED - Well Contained Product*****				

NOTES: J = Estimated value below reporting limit.
* 0.00062 mg/L was detected in the trip blank.

Due to the presence of product, recovery wells ORW-1, ORW-2, ORW-3, and monitoring wells OMW-4, OMW-7, and OMW-9 were not sampled.

APPENDICES

APPENDIX A

Analytical Results



Sequoia Analytical

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Sacramento, CA 95834

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(510) 988-9600
(916) 921-9600

FAX (415) 364-9233
FAX (510) 988-9673
FAX (916) 921-0100

Laidlaw Environmental Services
5665 Flatiron Parkway
Boulder, CO 80301
Attention: Denton Mauldin

Client Project ID: UP Fueling Area
Sample Matrix: Water
Analysis Method: EPA 5030/8015 Mod./8020
First Sample #: 708-1575

Sampled: Aug 28, 1997
Received: Aug 28, 1997
Reported: Sep 11, 1997

QC Batch Number: SP090497 SP090497 SP090497 SP090497 SP090497 SP090497
802004A 802004A 802004A 802004A 802004A 802004A

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 708-1575 OMW-1	Sample I.D. 708-1576 OMW-3	Sample I.D. 708-1577 OMW-8	Sample I.D. 708-1578 OMW-5	Sample I.D. 708-1579 OMW-6	Sample I.D. 708-1580 OMW-16
Purgeable Hydrocarbons	50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
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:		--	--	--	--	--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	9/4/97	9/4/97	9/4/97	9/4/97	9/4/97	9/4/97
Instrument Identification:	HP-4	HP-4	HP-4	HP-4	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	99	98	102	100	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

Melissa A. Brewer

Melissa A. Brewer
Client Services Representative

7081575.LLL <1>





Sequoia Analytical

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Laidlaw Environmental Services
5665 Flatiron Parkway
Boulder, CO 80301
Attention: Denton Mauldin

Client Project ID: UP Fueling Area
Sample Matrix: Water
Analysis Method: EPA 5030/8015 Mod./8020
First Sample #: 708-1581

Sampled: Aug 28, 1997
Received: Aug 28, 1997
Reported: Sep 11, 1997

QC Batch Number: GC090497 GC090497 GC090497
802004A 802004A 802004A

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 708-1581 OMW-2	Sample I.D. 708-1582 Trip Blank	Sample I.D. Method Blank
Purgeable Hydrocarbons	50	N.D.	N.D.	N.D.
Benzene	0.50	N.D.	N.D.	N.D.
Toluene	0.50	N.D.	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	N.D.
Total Xylenes	0.50	N.D.	N.D.	N.D.
Chromatogram Pattern:		--	--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0
Date Analyzed:	9/4/97	9/4/97	9/4/97
Instrument Identification:	HP-4	HP-4	HP-4
Surrogate Recovery, %: (QC Limits = 70-130%)	100	100	100

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

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Laidlaw Environmental Services
5665 Flatiron Parkway
Boulder, CO 80301
Attention: Denton Mauldin

Client Project ID: UP Fueling Area
Sample Matrix: Water
Analysis Method: EPA 3510/8015 Mod.
First Sample #: 708-1575

Sampled: Aug 28, 1997
Received: Aug 28, 1997
Reported: Sep 11, 1997

QC Batch Number:

SP082997	SP082997	SP082997	SP082997	SP082997	SP082997
8015EXA	8015EXA	8015EXA	8015EXA	8015EXA	8015EXA

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 708-1575 OMW-1	Sample I.D. 708-1576 OMW-3	Sample I.D. 708-1577 OMW-8	Sample I.D. 708-1578 OMW-5	Sample I.D. 708-1579 OMW-6	Sample I.D. 708-1580 OMW-16
Extractable Hydrocarbons	50	130	1,400	1,300	1,700	990	960
Chromatogram Pattern:		Unidentified Hydrocarbons > C20	Diesel	Diesel	Diesel & Unidentified Hydrocarbons > C20	Diesel	Diesel

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	10	1.0	1.0
Date Extracted:	8/29/97	8/29/97	8/29/97	8/29/97	8/29/97	8/29/97
Date Analyzed:	8/30/97	8/30/97	8/30/97	8/30/97	8/30/97	8/30/97
Instrument Identification:	HP-3A	HP-3A	HP-3A	HP-3A	HP-3B	HP-3B

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

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Laidlaw Environmental Services
5665 Flatiron Parkway
Boulder, CO 80301
Attention: Denton Mauldin

Client Project ID: UP Fueling Area
Sample Matrix: Water
Analysis Method: EPA 3510/8015 Mod.
First Sample #: 708-1581

Sampled: Aug 28, 1997
Received: Aug 28, 1997
Reported: Sep 11, 1997

QC Batch Number: SP082997 SP082997
8015EXA 8015EXA

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 708-1581 OMW-2	Sample I.D. Method Blank
---------	-------------------------	----------------------------------	--------------------------------

Extractable Hydrocarbons	50	720	N.D.
--------------------------	----	-----	------

Chromatogram Pattern: Diesel --

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Extracted:	8/29/97	8/29/97
Date Analyzed:	8/30/97	8/30/97
Instrument Identification:	HP-3B	HP-3B

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

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Laidlaw Environmental Services
 5665 Flatiron Parkway
 Boulder, CO 80301
 Attention: Denton Mauldin

Client Project ID: UP Fueling Area
 Matrix: Liquid

QC Sample Group: 7081575-582

Reported: Sep 11, 1997

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel
QC Batch#:	GC090497 802004A	GC090497 802004A	GC090497 802004A	GC090497 802004A	SP082997 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:	D.Newcomb	D.Newcomb	D.Newcomb	D.Newcomb	A. Kemp
MS/MSD #:	7081575	7081575	7081575	7081575	7081534
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	450 µg/L
Prepared Date:	9/4/97	9/4/97	9/4/97	9/4/97	8/29/97
Analyzed Date:	9/4/97	9/4/97	9/4/97	9/4/97	8/30/97
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	HP-3B
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	500 µg/L

Result:	19	19	18	56	660
MS % Recovery:	95	95	90	93	42

Dup. Result:	19	19	18	56	760
MSD % Recov.:	95	95	90	93	62

RPD:	0.0	0.0	0.0	0.0	14
RPD Limit:	0-20	0-20	0-20	0-20	0-50

LCS #:	4LCS090497	4LCS090497	4LCS090497	4LCS090497	LCS082997
Prepared Date:	9/4/97	9/4/97	9/4/97	9/4/97	8/29/97
Analyzed Date:	9/4/97	9/4/97	9/4/97	9/4/97	8/30/97
Instrument I.D.#:	HP-4	HP-4	HP-4	HP-4	HP-3B
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	500 µg/L

LCS Result:	18	18	17	54	310
LCS % Recov.:	90	90	85	90	62

MS/MSD LCS Control Limits	70-130	70-130	70-130	70-130	60-140
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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, #1271

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**Sequoia
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Laidlaw Environmental Services
5665 Flatiron Parkway
Boulder, CO 80301
Attention: Denton Mauldin

Client Project ID: UP Fueling Area

Lab Number: 7081575-582

Received: Aug 28, 1997

Reported: Sep 11, 1997

LABORATORY NARRATIVE

EPA 3510/8015 Mod.: Total Extractable Petroleum Hydrocarbons Quality Control

The recovery for the Matrix Spike was outside of the lower Control Limit. The batch was validated using the LCS.

All other quality control measures were within criteria.

SEQUOIA ANALYTICAL, #1271

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7081575.LLL <6>





SEQUOIA ANALYTICAL CHAIN OF CUSTODY

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- 404 N. Wiget Lane • Walnut Creek, CA 94598 • (510) 988-9600 FAX (510) 988-9673

Company Name:		Project Name: UP FUELING AREA	
Address: SAME AS P.1		Billing Address (if different):	
City:	State:	Zip Code:	
Telephone:		FAX #:	P.O. #: 96199-01
Report To:	Sampler:	QC Data: <input type="checkbox"/> Level D (Standard) <input checked="" type="checkbox"/> Level C <input type="checkbox"/> Level B <input type="checkbox"/> Level A	

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

Drinking Water
 Waste Water
 Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Sequoia's Sample #	Analyses Requested										Comments				
1. DMW-16	8/28/97 1010	AQU	3	VOA	7081580	X														
2. I	I	I	1	IL AMBER			X													
3. DMW-2	1040	I	3	VOA	7081581	X														
4. I	I	I	1	IL AMBER			X													
5. TRIP BLANK	-	I	1	VOA	7081582	X														
6.																				
7.																				
8.																				
9.																				
10.																				

Relinquished By: <i>[Signature]</i>	Date: 8/28/97	Time: 1340	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab: <i>[Signature]</i>	Date: 8/28/97	Time: 1340

Were Samples Received in Good Condition? Yes No

Samples on Ice? Yes No

Method of Shipment _____

Pink - Client

Yellow - Sequoia

White - Sequoia

APPENDIX B

Sampling and Well Stabilization Forms

LIDLAW SAMPLING AND WELL STABILIZATION FORM

Laidlaw Project Name: UP Fueling Area		Laidlaw Project Number: 96199-01	
Measuring Point (MP) Location: Top Of Casing (North Side)		Well No. OMW-1	
Well Depth: (Below MP): 12.02 Feet			
Casing Diameter: 2 Inches		Sampling Date: 8/28/97	
Depth to Ground Water (Below MP): 6.58 Feet		Sample ID No. OMW-1	
Method of Well Development:		Time: 0745	
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump		Riser Elevation (MP):	
<input checked="" type="checkbox"/> Bailer <input type="checkbox"/> Centrifugal Pump <input type="checkbox"/> Other		Top of Screen Elevation:	
Sampling Collection Method:		Sample Appearance: Highly Turbid - Orange	
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump Sample		Odor: None	
<input checked="" type="checkbox"/> Bailer Type <input type="checkbox"/> Teflon <input type="checkbox"/> Stainless Steel		Sampling Problems (if any): Well bailed dry	
<input type="checkbox"/> ABS Plastic <input type="checkbox"/> PVC <input checked="" type="checkbox"/> HDPE		after 2 volumes.	
Pump Intake Or Bailer Set At _____ Feet Below MP		Decontamination Performed: Probe	
Tubing Type (if used):			
Tubing Used For: <input type="checkbox"/> Sample Collection <input type="checkbox"/> Well Development/Field Tests		Samples Collected: BTEX, TPH-Diesel	

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)
7:19	Begin Well					
7:21	7.2	1,300	16.0		1.00	
7:23	7.1	1,200	16.0		1.75	
	Well bailed dry					
7:45	Sample Well					

At Least 2 Well Bore Volumes Were Evacuated Before Sampling

Comments:

[Comments may continue on back]

Form Completed By: **Mark McCormick**

Witnessed By:

LIDLAW SAMPLING AND WELL STABILIZATION FORM

Laidlaw Project Name: UP Fueling Area		Laidlaw Project Number: 96199-01	
Measuring Point (MP) Location: Top Of Casing (North Side)		Well No. OMW-2	
Well Depth: (Below MP): 9.76 Feet		Casing Diameter: 2 Inches	
Depth to Ground Water (Below MP): 4.58 Feet		Sampling Date: 8/28/97	
Method of Well Development:		Sample ID No. OMW-2	
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump		Time: 1040	
<input checked="" type="checkbox"/> Bailer <input type="checkbox"/> Centrifugal Pump <input type="checkbox"/> Other		Riser Elevation (MP):	
Sampling Collection Method:		Top of Screen Elevation:	
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump Sample		Sample Appearance: Clear/Sand Grains	
<input checked="" type="checkbox"/> Bailer Type <input type="radio"/> Teflon <input type="radio"/> Stainless Steel		Odor: None	
<input type="radio"/> ABS Plastic <input type="radio"/> PVC <input checked="" type="radio"/> HDPE		Sampling Problems (if any):	
Pump Intake Or Bailer Set At _____ Feet Below MP		Decontamination Performed: Probe	
Tubing Type (if used):			
Tubing Used For: <input type="checkbox"/> Sample Collection <input type="checkbox"/> Well Development/Field Tests		Samples Collected: BTEX, TPH-Diesel	

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)
10:17	Begin Well					
10:22	7.0	600	13.3		1.00	
10:25	7.0	600	13.0		1.75	
10:28	7.0	600	13.0		2.50	
Well bailed dry after 3 volumes.						
10:40	Sample Well					

At Least 3 Well Bore Volumes Were Evacuated Before Sampling

Comments:

[Comments may continue on back]

Form Completed By: **Mark McCormick**

Witnessed By:

LIDLAW SAMPLING AND WELL STABILIZATION FORM

Laidlaw Project Name: UP Fueling Area		Laidlaw Project Number: 96199-01	
Measuring Point (MP) Location: Top Of Casing (North Side)		Well No. OMW-3	
Well Depth: (Below MP): 12.26 Feet			
Casing Diameter: 2 Inches		Sampling Date: 8/28/97	
Depth to Ground Water (Below MP): 5.79 Feet		Sample ID No. OMW-3	
Method of Well Development:		Time: 0800	
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump		Riser Elevation (MP):	
<input checked="" type="checkbox"/> Bailer <input type="checkbox"/> Centrifugal Pump <input type="checkbox"/> Other		Top of Screen Elevation:	
Sampling Collection Method:		Sample Appearance: Lightly turbid - gray	
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump Sample		Odor: Light	
<input checked="" type="checkbox"/> Bailer Type <input type="checkbox"/> Teflon <input type="checkbox"/> Stainless Steel		Sampling Problems (if any):	
<input type="checkbox"/> ABS Plastic <input type="checkbox"/> PVC <input checked="" type="checkbox"/> HDPE			
Pump Intake Or Bailer Set At _____ Feet Below MP		Decontamination Performed: Probe	
Tubing Type (if used):			
Tubing Used For: <input type="checkbox"/> Sample Collection <input type="checkbox"/> Well Development/Field Tests		Samples Collected: BTEX, TPH-Diesel	

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)
7:33	Begin Well					
7:35	6.9	3,500	13.5		1.0	
7:40	6.9	3,400	14.0		1.5	
	Well bailed dry					
8:00	Sample Well					

At Least 1 Well Bore Volumes Were Evacuated Before Sampling

Comments:

[Comments may continue on back]

Form Completed By: **Mark McCormick**

Witnessed By:

LIDLAW SAMPLING AND WELL STABILIZATION FORM

Laidlaw Project Name: UP Fueling Area		Laidlaw Project Number: 96199-01	
Measuring Point (MP) Location: Top Of Casing (North Side)		Well No. OMW-6	
Well Depth: (Below MP): 11.81 Feet		Casing Diameter: 2 Inches	
Depth to Ground Water (Below MP): 6.59 Feet		Sampling Date: 8/28/97	
Method of Well Development:		Time: 1000	
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump		Riser Elevation (MP):	
<input checked="" type="checkbox"/> Bailer <input type="checkbox"/> Centrifugal Pump <input type="checkbox"/> Other		Top of Screen Elevation:	
Sampling Collection Method:		Sample Appearance: Lightly turbid, gray-black	
<input type="checkbox"/> Tap <input type="checkbox"/> Submersible Pump <input type="checkbox"/> Bladder Pump Sample		Odor: Light	
<input checked="" type="checkbox"/> Bailer Type <input type="checkbox"/> Teflon <input type="checkbox"/> Stainless Steel		Sampling Problems (if any):	
<input type="checkbox"/> ABS Plastic <input type="checkbox"/> PVC <input checked="" type="checkbox"/> HDPE			
Pump Intake Or Bailer Set At _____ Feet Below MP		Decontamination Performed: Probe	
Tubing Type (if used):			
Tubing Used For: <input type="checkbox"/> Sample Collection <input type="checkbox"/> Well Development/Field Tests		Samples Collected: BTEX, TPH-Diesel	

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)
9:42	Begin Well					
9:48	7.1	3,200	12.5		1.0	
9:52	7.1	3,300	12.2		2.0	
9:55	7.0	3,300	12.0		3.0	
10:00	Sample Well					

At Least 3 Well Bore Volumes Were Evacuated Before Sampling

Comments: **Duplicate Sample = OMW-16 at 1010**

[Comments may continue on back]

Form Completed By: **Mark McCormick**

Witnessed By:

