

10-30-95

**THIRD QUARTER 1995 MONITORING
REPORT
OAKLAND FUELING AREA
UNION PACIFIC RAILROAD
1717 MIDDLE HARBOR ROAD
OAKLAND, CALIFORNIA**

USPCI PROJECT No. 96199

OCTOBER 30, 1995

**Prepared for:
Union Pacific Railroad**

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



October 31, 1995

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

RE: "Third Quarter 1995 Monitoring Report", Oakland Fueling Area in the Oakland TOFC Railyard, Oakland, California, USPCI Project No. 96199

Dear Mr. Patterson:

Enclosed is the final copy of the "Third Quarter 1995 Monitoring Report", dated October 30, 1995, for the Union Pacific Railroad Fueling Area at the trailer-on-flat-car (TOFC) loading facility at 1717 Middle Harbor Road in Oakland, California.

If you have any questions, please call us at (303) 938-5500.

Sincerely,

Denton Mauldin
Engineer III

Sam Marquis
Project Hydrogeologist

cc: Charley Pinkerton, USPCI
Dale Klettke, ACDEH
John Amdur, Port of Oakland
Philip Herden, APL
Ken Fossey, USPCI (cover letter)

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CH2M HILL
PROJECT NO. 96199

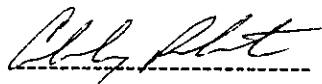
Enclosure
DM/tjh

**THIRD QUARTER 1995 MONITORING
REPORT
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OAKLAND, CALIFORNIA
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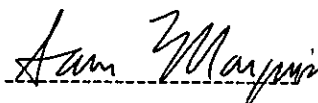
Prepared for:
Union Pacific Railroad
Environmental Management - Room 930
1416 Dodge Street
Omaha, Nebraska 68179

for submittal to:
Dale Klettke
Alameda County
Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502

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



Charley Pinkerton
Engineer



Sam Marquis
Project Hydrogeologist
R.G. No. 5110

October 31, 1995

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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 Alameda County Department of Environmental Health letter dated September 21, 1994. The purpose of this report is to provide quarterly 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 quarterly groundwater monitoring is to evaluate changes in the distribution of petroleum hydrocarbons in groundwater and to assess the effectiveness of the hydrocarbon recovery system.

The results from prior investigations and environmental engineering activities conducted by Laidlaw have been documented in previous reports and are, therefore, not included in detail in this report. The modeling efforts discussed in the September 24, 1994, letter were included in the "Third Quarter 1994 Monitoring Report," dated October 28, 1994. 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 hydrocarbon recovery and treatment 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 groundwater recovery and treatment system has been presented in the "Hydrocarbon Recovery System, As-Built Construction Report," dated July 20, 1992. Any process changes in the hydrocarbon recovery and treatment system were presented in the letter from UPRR dated March 22, 1993, which represented the permit renewal application.

2. GROUNDWATER MONITORING

Third quarter fluid level measurements were obtained from groundwater monitoring wells and piezometers at the fueling area on July 31 and September 7, 1995. A site map including all monitoring well and piezometer locations for the fueling area is presented in Figure 1. Historical fluid levels for each well are provided in Table 1.

Fluid levels in three of the ten groundwater monitoring wells (OMW-2, OMW-5, and OMW-10) and two of the piezometers (OP-2 and OP-4) at the site were not measured in July 1995 due to obstructions. These obstructions were removed, and fluid levels in all monitoring wells and piezometers were measured in September 1995.

All monitoring wells and piezometers with the exception of OMW-6, OMW-9, and OP-3, demonstrated decreasing water levels in the Third Quarter of 1995. Fluid levels in monitoring well OMW-6 increased approximately 1.3 feet during this period. Fluid levels in monitoring well OMW-9 and piezometer OP-3 decreased between May and July and increased between July and September of

this year. The average change in fluid levels between May and September 1995 was a decrease of approximately one foot in the groundwater wells and piezometers. Fluid levels measured in July and September 1995 were used to generate potentiometric surface maps presented in Figures 2 and 3. Fluid level measurements used in these maps included those wells in which light non-aqueous phase liquid (diesel) was present. The groundwater elevations in these wells were 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.

A groundwater depression created by the recovery wells is evident on the potentiometric surface maps. The contour lines show a groundwater gradient towards the recovery system in the portion of the site containing diesel. The three well recovery system operated properly throughout the Third Quarter of 1995 with only limited downtime required for periodic maintenance. Detailed performance records for the recovery system are included in the semi-annual reports prepared following the second and fourth quarters of each year. Groundwater flow downgradient of the recovery system is south towards the Oakland Estuary.

The presence of diesel was observed in monitoring wells OMW-4, OMW-7, and OMW-9 and piezometers OP-1, OP-2, OP-3, and OP-4 during the third quarter fluid level measuring events. This is consistent with previous fluid level measurements. Diesel thicknesses decreased in the three monitoring wells and four piezometers during the Third Quarter of 1995. The average decrease in diesel thickness was approximately 1.25 feet. Figures 4 and 5 illustrate the diesel thicknesses as measured in the monitoring wells and piezometers during the July and September monitoring events, respectively.

Groundwater sampling of the monitoring wells not exhibiting the presence of diesel will occur during the Fourth Quarter of 1995. The results of the sampling will appear in the semi-annual report. The results of previous sampling events are included in Table 2.

3. CONCLUSIONS

Fluid level measurement results from the Third Quarter event have demonstrated a groundwater gradient that is inclined towards the recovery system in the portion of the site containing diesel. A groundwater depression is evident in the area of the recovery wells. The site-wide groundwater gradient is to the south, which is consistent with previous monitoring events. Diesel thicknesses decreased in all monitoring wells and piezometers between the May and September monitoring events.

FIGURES

NAVY
SUPPLY
CENTER

PROPERTY BOUNDARY

YARD OFFICE

6" TRANSITE SANITARY SEWER

AIR COMPRESSOR BLDG

FUEL TANKS

GATEHOUSE

U.P. TRANSPORT

TRUCK REPAIR SHOP

PROPERTY BOUNDARY

OAKLAND ESTUARY

CROSSTIES LEFT OFF FOR CLARITY

EDGE OF PAVEMENT

SHORELINE

36" STORM SEWER

STORM SEWER OUTFALL
PLUGGED WITH CONCRETE

CATCH BASIN
PLUGGED WITH
CONCRETE

North

0 150
FEET

LEGEND

- ▲ MONITORING WELL OR BOREHOLE LOCATION AND NUMBER
- ▲ BORING LOCATION AND NUMBER
- CATCH BASIN FOR STORM WATER
- RECOVERY WELLS

DATE	10/09/95
BY	ARB
CHECKED	
APPROVED	
SCALE	

USPCI
A **LAIDLAW** COMPANY

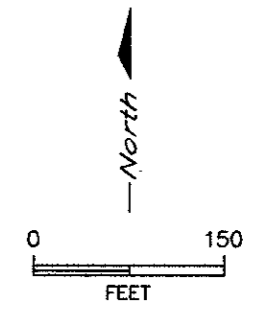
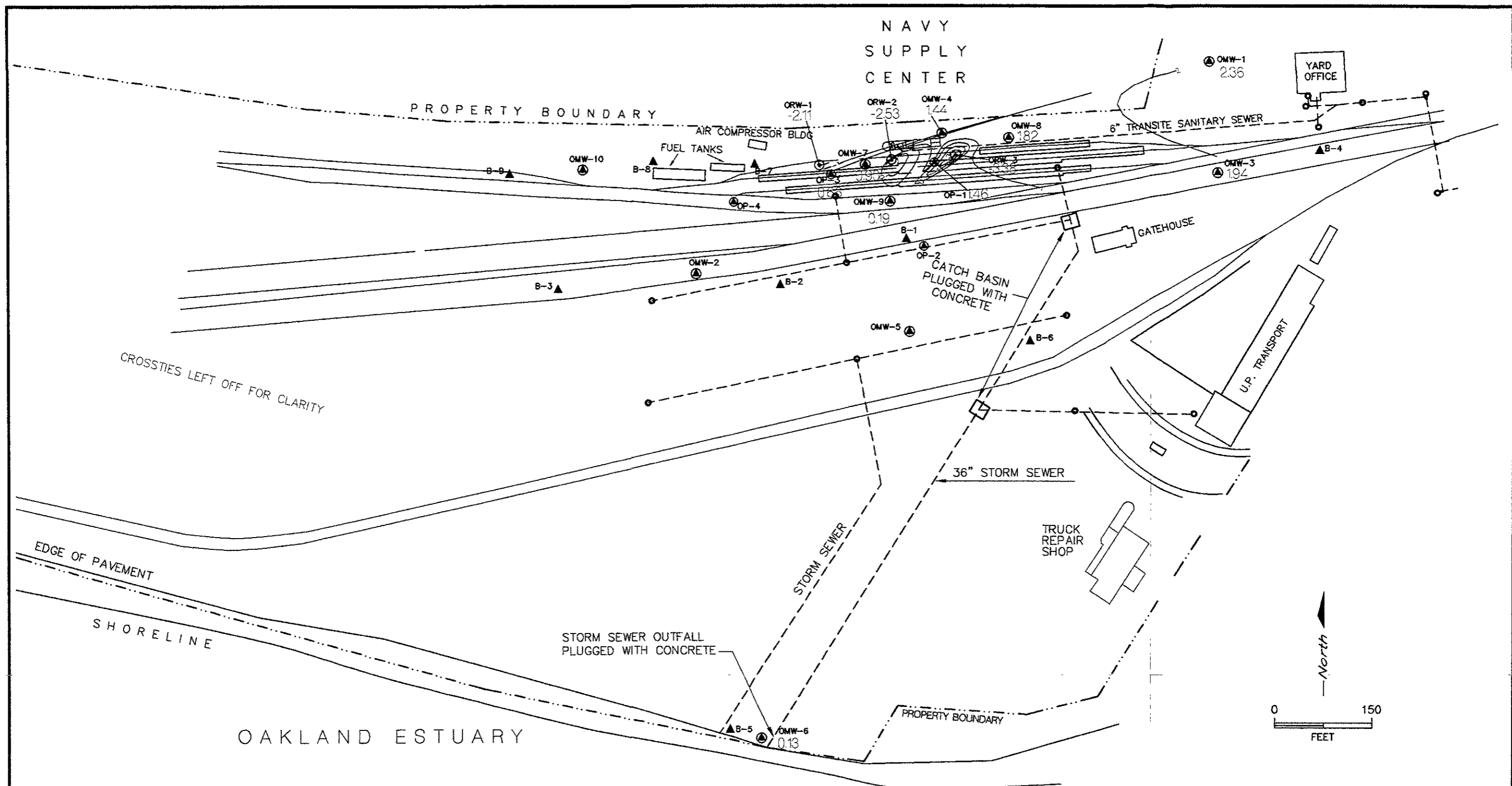
UPRR TOFC RAILYARD - OAKLAND CALIFORNIA

FIGURE 1
SITE MAP

SCALE 1" = 150'

DWG NO. 96199-55

NAVY
SUPPLY
CENTER



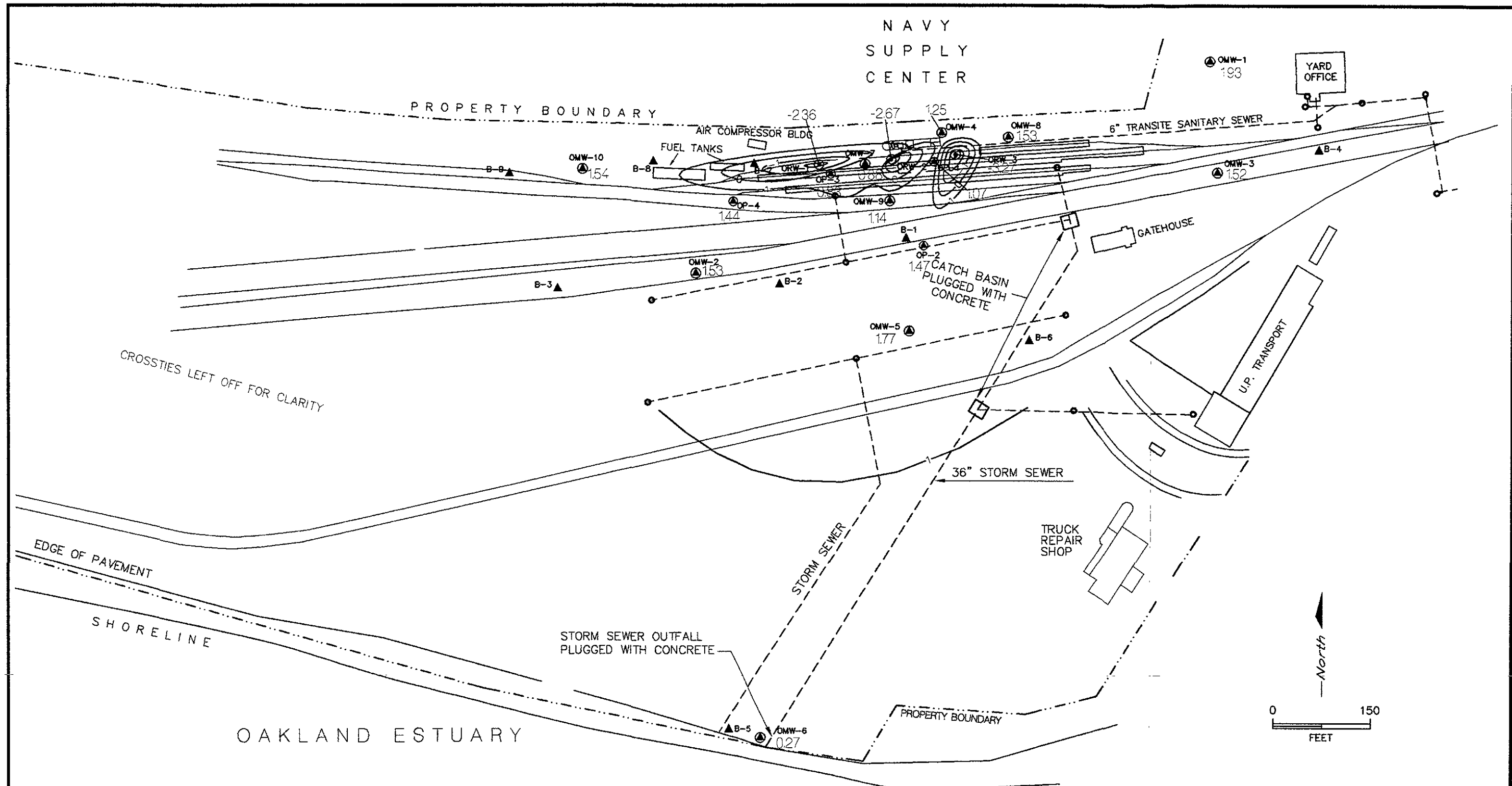
LEGEND	
	MONITORING WELL OR PIEZOMETER LOCATION AND NUMBER
	BORING LOCATION AND NUMBER
	CATCH BASIN FOR STORM SEWER
	RECOVERY WELLS
	GROUNDWATER ELEVATION IN FEET

BY	DATE
DRAWN WRB	10/10/95
CHECKED	
APPROVED	
APPROVED	
APPROVED	



UPRR TOFC RAILYARD - OAKLAND CALIFORNIA	
FIGURE 2 WATER LEVELS MEASURED IN MONITORING WELLS JULY 1995	
SCALE	1" = 150'
DWG. NO.	96199-59

NAVY
SUPPLY
CENTER

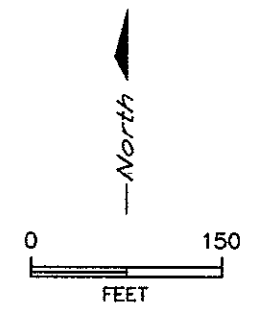


CROSSTIES LEFT OFF FOR CLARITY

EDGE OF PAVEMENT

SHORELINE

OAKLAND ESTUARY

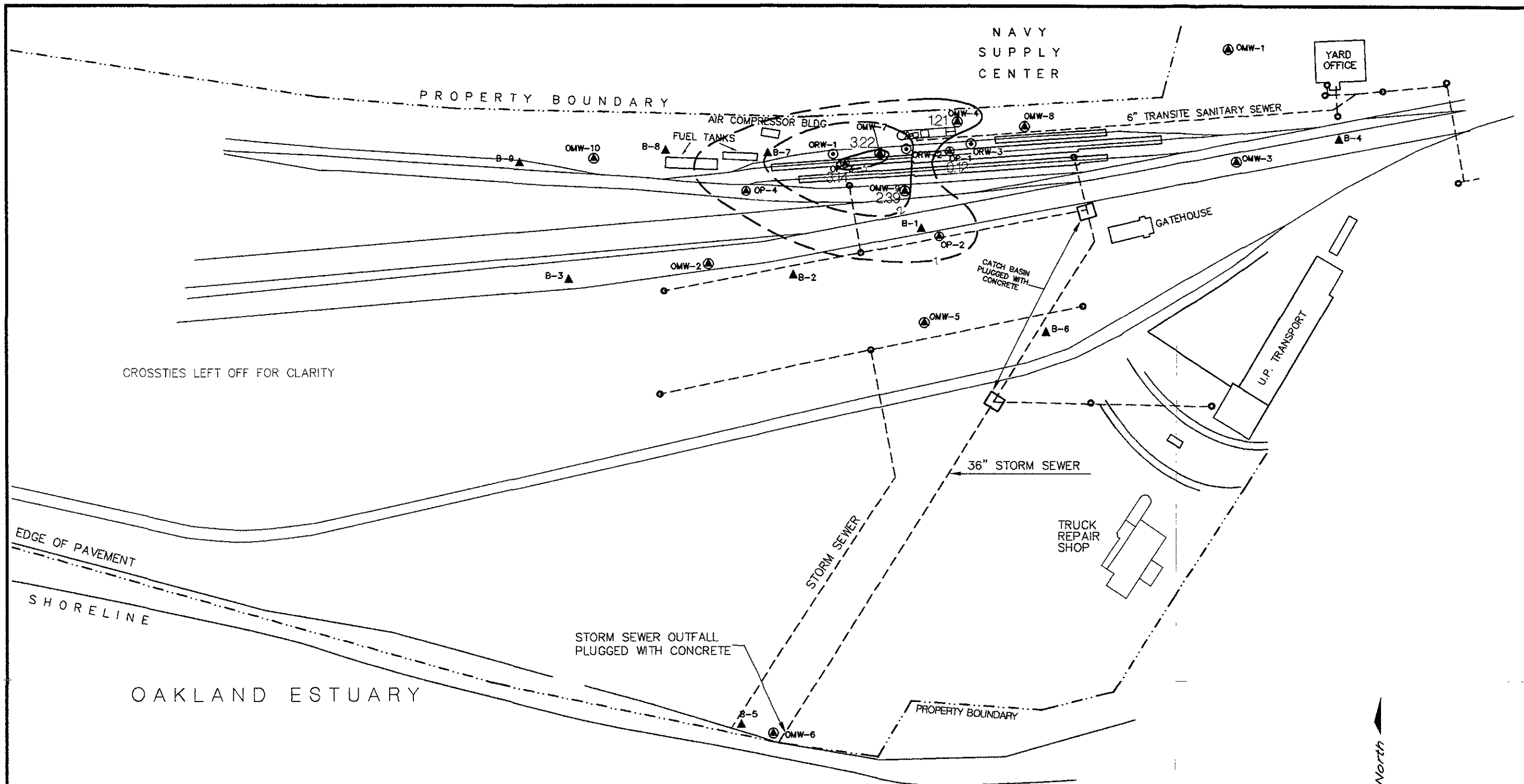


LEGEND	
⊕	MONITORING WELL OR PIEZOMETER LOCATION AND NUMBER
▲	BORING LOCATION AND NUMBER
○	CATCH BASIN FOR STORM SEWER
⊙	RECOVERY WELLS
	GROUNDWATER ELEVATION IN FEET

BY	DATE
DRAWN WFE	10/4/95
CHECKED	
APPROVED	
APPROVED	
APPROVED	



UPRR TOFC RAILYARD - OAKLAND CALIFORNIA	
FIGURE 3 WATER LEVELS MEASURED IN MONITORING WELLS SEPTEMBER 1995	
SCA:c	DWG NC
1" = 150'	96199-58

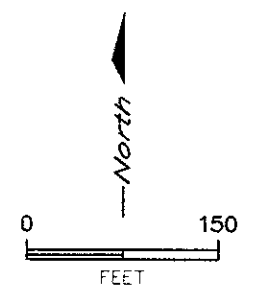


CROSSTIES LEFT OFF FOR CLARITY

LEGEND

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

PRODUCT THICKNESS IN FT. (EXCLUDING ORWs)



BY	DATE
WRB	10/10/95
CHECKED	
APPROVED	
APPROVED	
APPROVED	

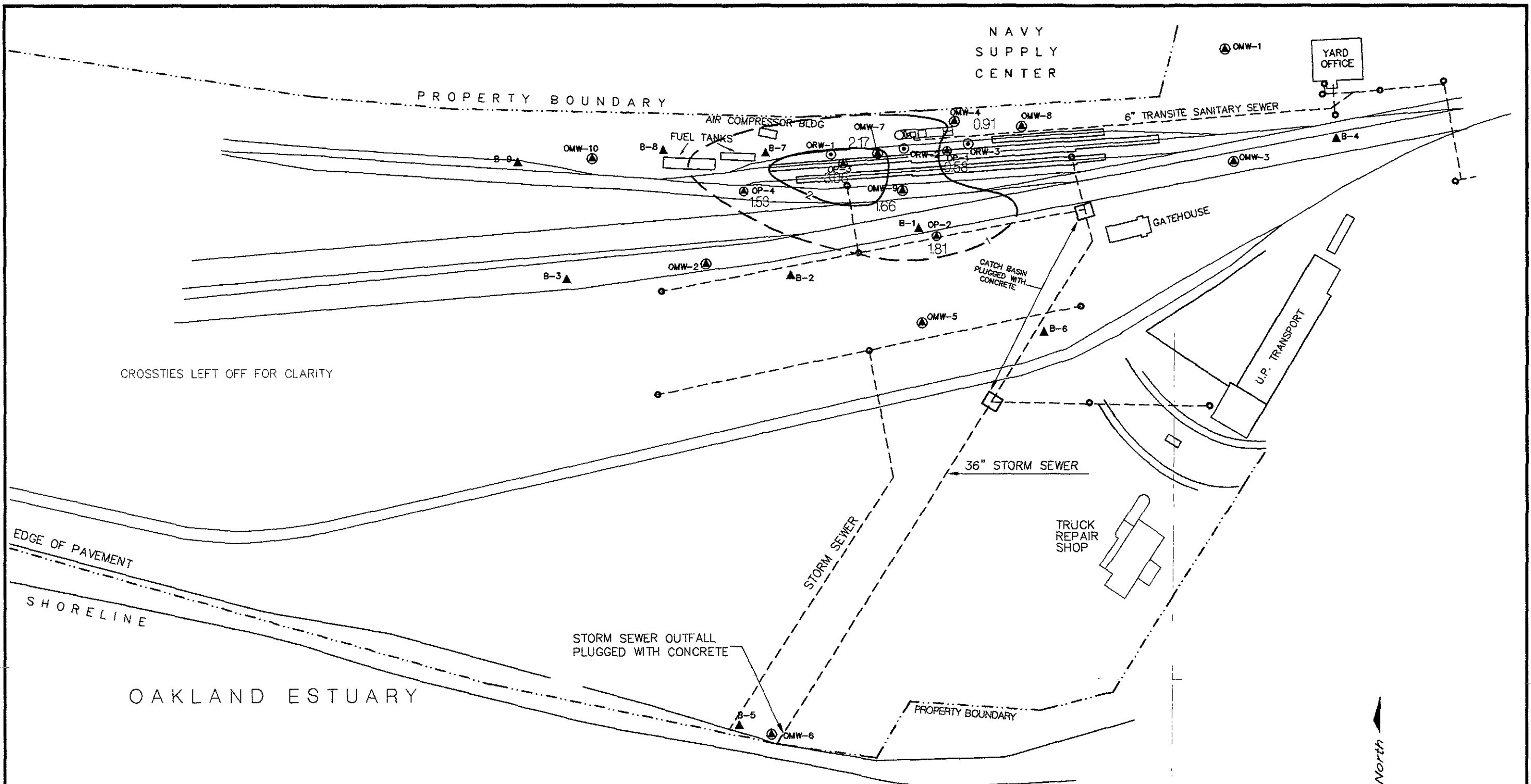


UPRR TOFC RAILYARD - OAKLAND CALIFORNIA

FIGURE 4
DIESEL THICKNESS MEASURED IN MONITORING WELLS
JULY 1995

SCALE 1" = 150'

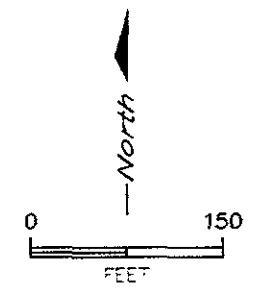
DWG NO 96199-56



LEGEND

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

PRODUCT THICKNESS IN FT. (EXCLUDING ORWs)



BY	DATE
WRB	10/10/95
CHECKED	
APPROVED	
APPROVED	



UPRR TOFC RAILYARD - OAKLAND CALIFORNIA	
FIGURE 5 DIESEL THICKNESS MEASURED IN MONITORING WELLS SEPTEMBER 1995	
SCALE	DWG NO
1" = 150'	96199-57

TABLES

TABLE 1
Water Level Data
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	
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

TABLE 1 (con't)
Water Level Data
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	
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		

TABLE 1 (con't)
Water Level Data
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
	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	

TABLE 1 (con't)
Water Level Data
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		
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	

TABLE 1 (con't)
Water Level Data
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	
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	

TABLE 1 (con't)
Water Level Data
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
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

TABLE 1 (con't)
Water Level Data
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	
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	
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	
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	
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	

* 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 2
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
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
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
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

TABLE 2 (con't)
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	
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	
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*****					

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.