



STTD
1420

April 30, 1996

Mr. Stephen Wilson
Manager, Environmental Compliance
Crowley Marine Services, Inc.
2401 Fourth Avenue
P.O. Box 2287
Seattle, Washington 98111

Reference: Letter Report of Quarterly Groundwater Monitoring - March 5, 1996
Former Pacific Dry Dock and Repair Company Yard I,
1441 Embarcadero, Oakland, California;
Versar Project No. 2722-117

Dear Mr. Wilson:

Crowley Marine Services, Inc. (Crowley), has retained Versar, Inc. (Versar), to perform groundwater monitoring and sampling at the Former Pacific Dry Dock and Repair Company Yard I, located at 1441 Embarcadero, Oakland, California (Site). This letter presents the activities, results, and conclusions of the tenth round of groundwater monitoring and sampling at the Site.

1.0 Introduction

On March 5, 1996, Versar conducted the tenth round of groundwater monitoring and sampling at the Site. Figure 1 shows the Site location and Figure 2 shows the Site layout, which includes recently installed (February 1996) groundwater monitoring well MW6. Details of the drilling, soil sampling, construction, and developing of monitoring well MW6 will be included in an upcoming report.

The tenth round of groundwater monitoring and sampling activities included the following:

- Recording groundwater level measurements from the six wells at the Site
- Purging each monitoring well of three well volumes of water and collecting groundwater samples from each well

• SACRAMENTO OFFICE •



Letter to Mr. Stephen Wilson

April 30, 1996

Page 2

- Submitting the groundwater samples for laboratory analysis for total petroleum hydrocarbons as diesel (TPH-D); total petroleum hydrocarbons as gasoline (TPH-G); methyl *tert*-butyl ether (MTBE); benzene, toluene, ethylbenzene, and xylenes (BTEX); total dissolved solids (TDS); and dissolved lead
- Calculating the groundwater gradient
- Analyzing and summarizing the data, and generating this report

2.0 Monitoring and Sampling Activities

Prior to groundwater sampling, Versar measured the depth to groundwater below ground surface (bgs) in each monitoring well. Groundwater was present at depths of 3.95 feet bgs (MW1), 2.65 feet bgs (MW2), 8.10 feet bgs (MW3), 2.65 feet bgs (MW4), 5.70 feet bgs (MW5), and 3.48 feet bgs (MW6). Groundwater monitoring well MW6 was surveyed on March 7, 1996, relative to the other five monitoring wells. The groundwater gradient on March 5, 1996, was 0.017 to the southwest, as shown in Figure 3. Groundwater elevation data from MW4 was not included in the groundwater gradient calculation because it appeared to be anomalous. Water level data from this well has been anomalous in the past. The groundwater level data for previous sampling events are listed in Table 1.

After groundwater levels were measured, Versar purged the monitoring wells following Versar's standard procedures described in the June 13, 1991 workplan. Data collected during purging included (1) the initial depth to groundwater; (2) pH; (3) temperature; (4) conductivity; and (5) observations of sheen, odor, free product, and turbidity. Details of the purging were recorded and are included as Attachment I.

Versar collected groundwater samples from each monitoring well using a single-use bailer. The samples for TPH-G and BTEX were placed in pre-cleaned, 40-milliliter glass vials preserved with hydrochloric acid. Groundwater samples to be analyzed for TPH-D were placed in pre-cleaned, 1-liter amber glass containers. Samples collected for TDS were placed in pre-cleaned, 1-liter plastic containers. The samples collected for dissolved lead were placed in pre-cleaned, 1-liter amber glass containers, and filtered by the laboratory prior to analysis. Sampling containers were labeled with the date collected and a unique sample identification and stored on ice in an insulated cooler. All monitoring well groundwater samples were accompanied by Versar's chain-of-custody records and submitted for analysis to Trace Analysis Laboratory, Inc.,



Letter to Mr. Stephen Wilson
April 30, 1996
Page 3

(Trace) a California-certified laboratory (Certification No. 1199). Trace prepared the samples following U.S. Environmental Protection Agency (EPA) protocols.

3.0 Laboratory Analytical Results

Versar submitted six groundwater samples for laboratory analysis for TPH-D, TPH-G, BTEX, MTBE, TDS, and dissolved lead. A copy of the laboratory analytical report and chain-of-custody record from the sampling event is included as Attachment II.

The laboratory detected TPH-D in groundwater samples collected from monitoring wells MW1, MW2, MW5, and MW6. Toluene, ethylbenzene, and xylenes were not detected in the groundwater sample collected from MW1; however, benzene was detected at a concentration of 7.5 µg/L. BTEX was not detected in groundwater samples collected from monitoring wells MW2, MW3, MW4, MW5, and MW6. Concentrations of TPH-G, MTBE, and dissolved lead were not detected in any of the groundwater samples.

Laboratory analytical results for the groundwater samples are summarized in Table 2.

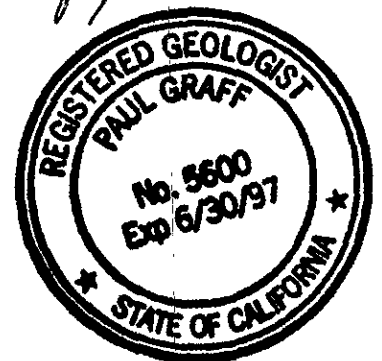
Prepared By:

Paul Graff
FOR Philip L. Hoffmeister
Staff Geologist

Approved for Release By:

Paul Graff
Paul Graff, R.G. 5600
Project Manager

cc: Ms. Beth Hamilton, Enea, Puinti & Hamilton





ATTACHMENTS

Statement of Limitations

Figures

- Figure 1 Site Location
- Figure 2 Site Layout With Groundwater Monitoring Well Locations
- Figure 3 Calculated Groundwater Gradient, March 5, 1996

Tables

- Table 1 Monitoring Well Groundwater Levels
- Table 2 Historical Chemical Data for Groundwater Monitoring Well Samples

Attachments

- Attachment I Monitoring Well Purge Table Sheets
- Attachment II Laboratory Analytical Reports and Chain-of-Custody Records for Groundwater Samples collected March 5, 1996, Tenth Groundwater Sampling Event



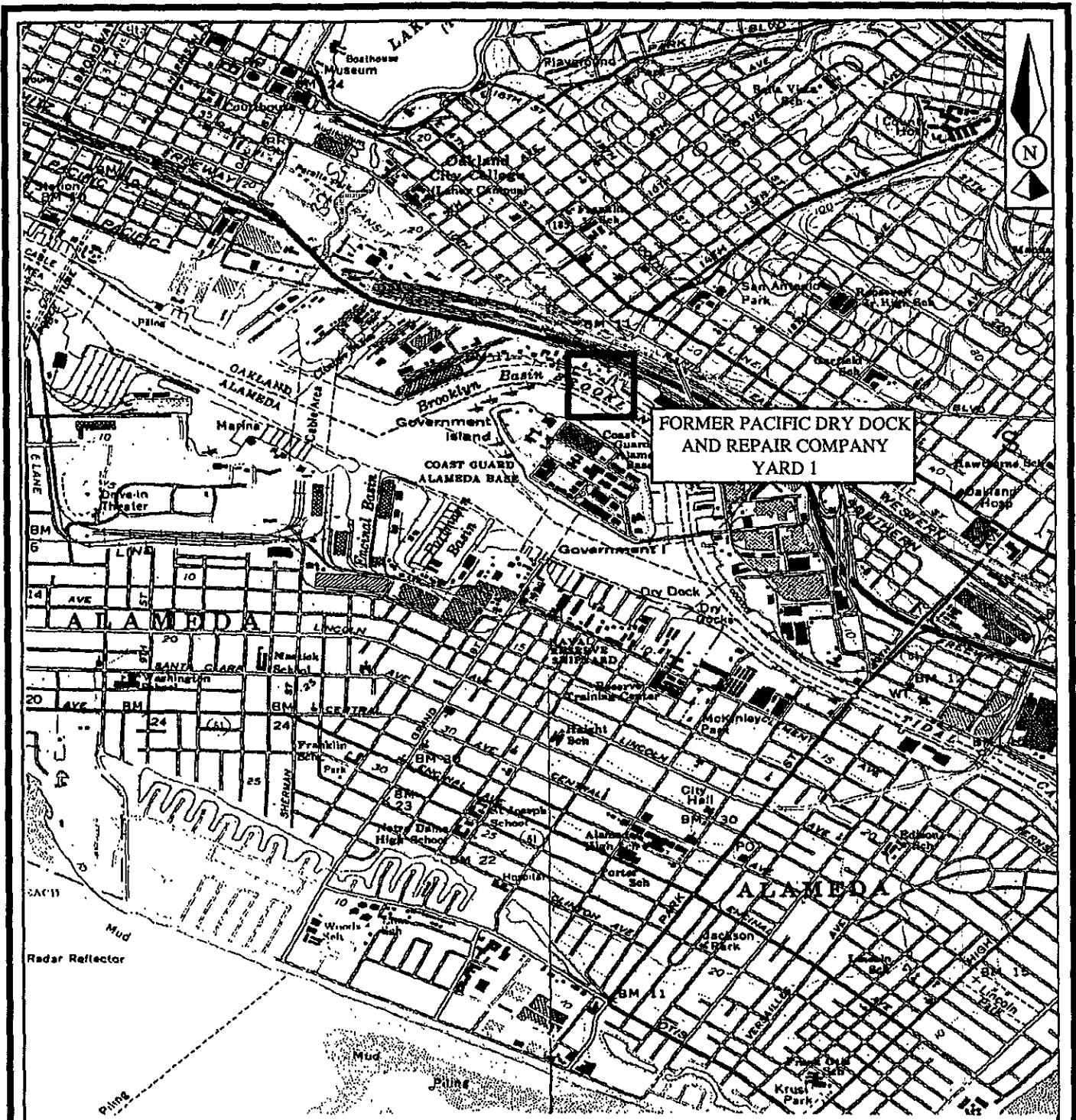
STATEMENT OF LIMITATIONS

The data presented and the opinions expressed in this report are qualified as follows:

- The sole purpose of the investigation and of this report is to assess the physical characteristics of the Site with respect to the presence or absence of oil or hazardous materials and substances in the environment as defined in the applicable state and federal environmental laws and regulations and to gather information regarding current and past environmental conditions at the Site.
- Versar derived the data in this report primarily from visual inspections, examination of records in the public domain, interviews with individuals with information about the Site, and a limited number of environmental samples. The passage of time, manifestation of latent conditions, or occurrence of future events may require further exploration at the Site, analysis of the data, and reevaluation of the findings, observations, conclusions, and recommendations expressed in the report.
- In preparing this report, Versar has relied upon and presumed accurate certain information (or the absence thereof) about the Site and adjacent properties provided by governmental officials and agencies, the Client, and others identified herein. Except as otherwise stated in the report, Versar has not attempted to verify the accuracy or completeness of such information.
- The data reported and the findings, observations, conclusions, and recommendations expressed in the report are limited by the Scope of Services, including the extent of environmental sampling and other tests. The Scope of Services was defined by the requests of the Client, the time and budgetary constraints imposed by the Client, and the availability of access to the Site.
- Because of the limitations stated above, the findings, observations, conclusions and recommendations expressed by Versar in this report are limited to the information obtained and the surface and subsurface investigation undertaken and should not be considered an opinion concerning the compliance of any past or current owner or operator of the Site with any federal, state, or local law or regulation. No warranty or guarantee, whether express or implied, is made with respect to the data reported or findings, observations, conclusions, and recommendations expressed in this report. Further, such data, findings, observations, conclusions, and recommendations are based solely upon Site conditions in existence at the time of investigation.
- This report has been prepared on behalf of and for the exclusive use of the Client, and is subject to and issued in connection with the Agreement and the provisions thereof.

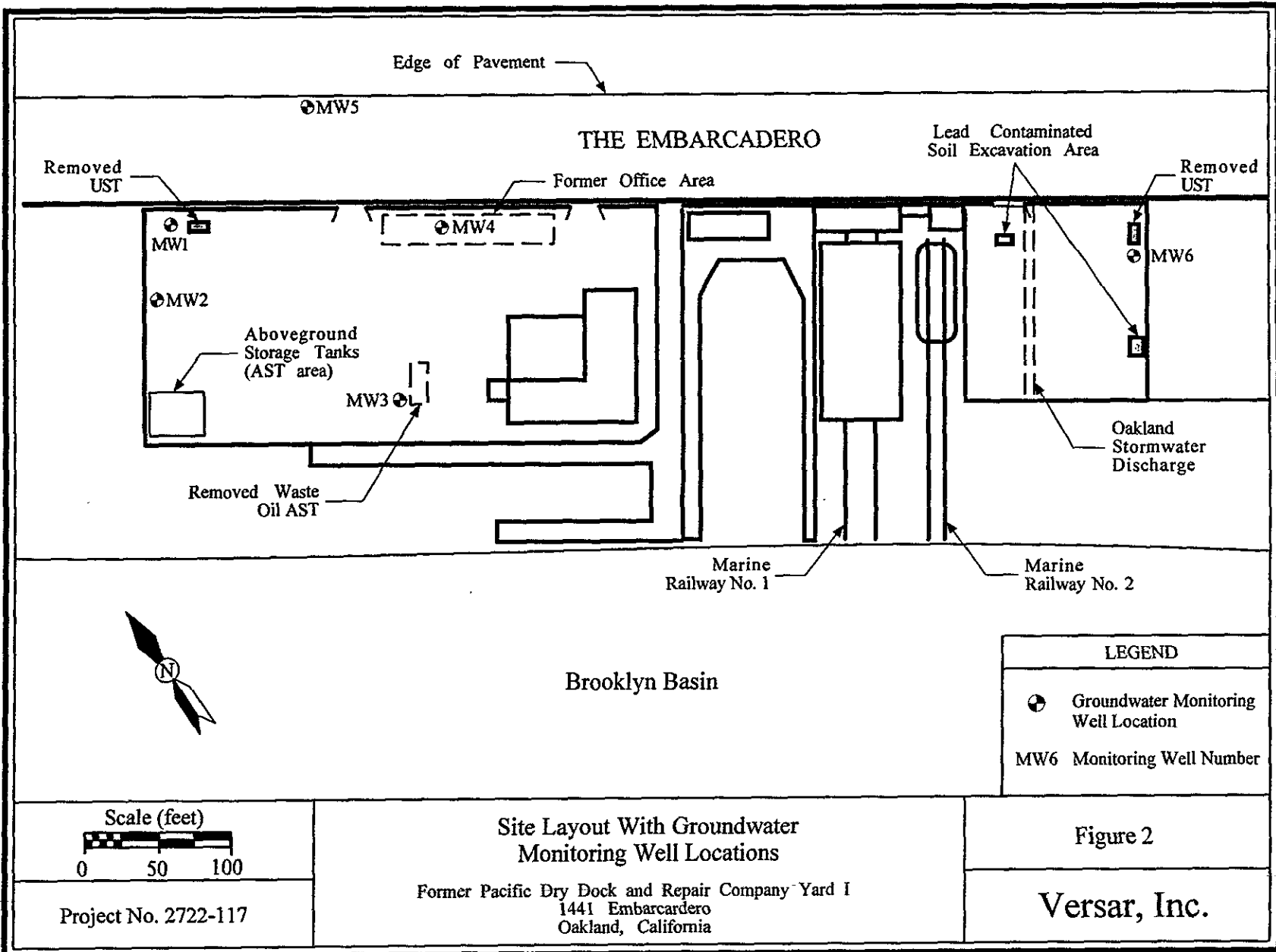


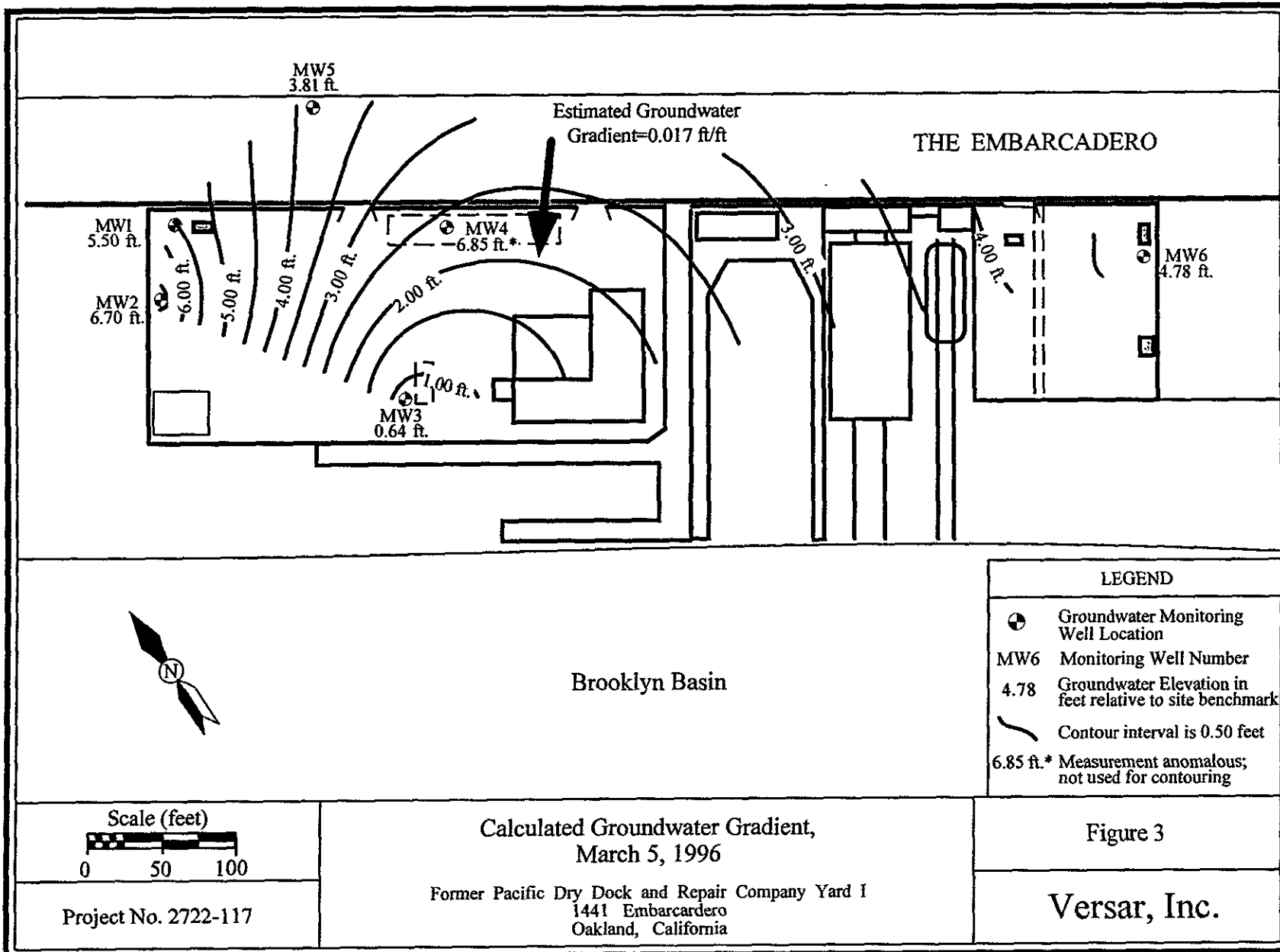
FIGURES



SOURCE: USGS Topographic Map, 1959

<p>Scale (miles)</p>  <p>0 0.25 0.50</p>	<p>Site Location</p>	<p>Figure 1</p>
<p>Project No. 2722-117</p>	<p>Former Pacific Dry Dock and Repair Company Yard I Oakland, California</p>	<p>Versar, Inc.</p>







TABLES

TABLE I

MONITORING WELL GROUNDWATER LEVELS

March 5, 1996

Former Pacific Dry Dock and Repair Company Yard I
Oakland, California

	MW1	MW2	MW3	MW4	MW5	Hydraulic Gradient (feet/foot)
Reference Casing Elevation (feet)	9.45	9.34	8.76	9.55	9.51	
<u>July 1, 1993</u>						
Depth to Groundwater (High Tide) ¹	5.01	4.94	5.54	9.33	6.56	
Groundwater Elevation	4.44	4.40	3.22	1.22	2.95	0.017 ft/ft to the east
<u>October 14, 1993</u>						
Depth to Groundwater (High Tide) ¹	6.54	5.74	3.98	6.45	6.92	
Groundwater Elevation	2.91	3.60	4.78	3.10	2.59	0.013 ft/ft to the north
<u>December 8, 1993</u>						
Depth to Groundwater (Low Tide) ²	6.28	4.55	6.50	6.02	6.71	
Groundwater Elevation	3.17	4.79	2.26	3.53	2.80	0.016 ft/ft to the east
<u>January 17, 1994</u>						
Depth to Groundwater (High Tide) ¹	4.93	4.90	6.60	6.05	6.60	
Groundwater Elevation	4.52	4.44	2.16	3.50	2.91	0.013 ft/ft to the southeast

¹ Depth-to-groundwater measurements were taken during high tide and are expressed in feet below top of casing.² Depth-to-groundwater measurements were taken during low tide and are expressed in feet below top of casing.

TABLE 1 (Continued)

MONITORING WELL GROUNDWATER LEVELS

March 5, 1996

Former Pacific Dry Dock and Repair Company Yard I
Oakland, California

	MW1	MW2	MW3	MW4	MW5	Hydraulic Gradient (feet/foot)
<u>March 30, 1994</u>						
Depth to Groundwater (Low Tide) ²	4.87	4.51	9.81	4.91	6.35	
Groundwater Elevation	4.58	4.83	-1.05	4.65	3.16	0.030 ft/ft to the southeast
<u>July 15, 1994</u>						
Depth to Groundwater (Outgoing Tide) ³	5.31	5.16	8.76	9.55	9.51	
Groundwater Elevation	4.14	4.18	1.81	3.49	2.95	0.013 ft/ft to the southeast
<u>October 19, 1994</u>						
Depth to Groundwater (Incoming Tide) ⁴	6.67	5.72	5.00	6.89	7.00	
Groundwater Elevation	2.78	3.62	3.76	2.66	2.51	0.007 ft/ft

¹ Depth-to-groundwater measurements were taken during high tide and are expressed in feet below top of casing.

² Depth-to-groundwater measurements were taken during low tide and are expressed in feet below top of casing.

³ Depth-to-groundwater measurements were taken on an outgoing tide and are expressed in feet below top of casing.

⁴ Depth-to-groundwater measurements were taken on an incoming tide and are expressed in feet below top of casing.

to the northeast

TABLE 1 (Continued)

MONITORING WELL GROUNDWATER LEVELS

March 5, 1996

Former Pacific Dry Dock and Repair Company Yard I
Oakland, California

	MW1	MW2	MW3	MW4	MW5	MW6	Hydraulic Gradient (feet/foot)
Reference Casing Elevation (feet) February 17, 1995	9.45	9.35	8.74	9.50	9.51		
<u>February 2, 1995</u>							
Depth to Groundwater (Incoming Tide) ⁴	4.24	3.43	6.06	2.92	5.15	0.017 ft/ft	
Groundwater Elevation	5.21	5.92	2.68	6.58	4.36	to the southeast	
<u>May 3, 1995</u>							
Depth to Groundwater (Outgoing Tide)	4.76	3.01	8.90	3.79	5.91	0.018 ft/ft	
Groundwater Elevation	4.69	6.34	-0.16	5.71	3.60	south of east	
<u>September 7, 1995</u>							
Depth to Groundwater (Outgoing Tide)	6.16	5.34	7.66	6.58	7.05	0.014 ft/ft	
Groundwater Elevation	3.29	4.01	1.08	2.92	2.46	south of east	

¹ Depth-to-groundwater measurements were taken during high tide and are expressed in feet below top of casing.
² Depth-to-groundwater measurements were taken during low tide and are expressed in feet below top of casing.
³ Depth-to-groundwater measurements were taken on an outgoing tide and are expressed in feet below top of casing.
⁴ Depth-to-groundwater measurements were taken on an incoming tide and are expressed in feet below top of casing.

TABLE 1 (Continued)

MONITORING WELL GROUNDWATER LEVELS

March 5, 1996

Former Pacific Dry Dock and Repair Company Yard I
Oakland, California

	MW1	MW2	MW3	MW4	MW5	MW6	Hydraulic Gradient (feet/foot)
Reference Casing Elevation (feet) March 7, 1996	9.45	9.35	8.74	9.50	9.51	8.26	
<u>March 5, 1996</u>							
Depth to Groundwater (Incoming Tide) ⁴	3.95	2.65	8.10	2.65	5.70	3.48	0.017 ft/ft
Groundwater Elevation	5.50	6.70	0.64	6.85	3.81	4.78	to the southwest

¹ Depth-to-groundwater measurements were taken during high tide and are expressed in feet below top of casing.

² Depth-to-groundwater measurements were taken during low tide and are expressed in feet below top of casing.

³ Depth-to-groundwater measurements were taken on an outgoing tide and are expressed in feet below top of casing.

⁴ Depth-to-groundwater measurements were taken on an incoming tide and are expressed in feet below top of casing.

TABLE 2

HISTORICAL CHEMICAL DATA FOR GROUNDWATER MONITORING WELL SAMPLES

March 5, 1996

Former Pacific Dry Dock and Repair Company Yard I
Oakland, California

Groundwater Monitoring Well	Sample Date	TPH-G (µg/L) ¹	TPH-D (µg/L)	Total Oil and Grease (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	TDS (µg/L)	Filtered Lead (µg/L)	Salinity
MW1	7/1/93	ND ²	ND	ND	ND	ND	ND	ND	NA ³	NA	NA
	10/14/93	ND	63	NA	ND	ND	ND	ND	8,800,000	NA	8.7
	1/18/94	ND	60	NA	NA	1.0	1.4	1.5	1,200,000	NA	1.0
	3/30/94	ND	110	NA	2.5	1.7	0.56	1.9	NA	NA	0.97
	7/15/94	ND	60	ND	ND	ND	ND	ND	NA	NA	NA
	10/19/94	ND	830	NA	ND	ND	ND	ND	NA	NA	NA
	2/2/95	ND	ND	NA	ND	ND	ND	ND	NA	NA	NA
	5/3/95	ND	78	NA	1.6	0.58	ND	ND	NA	NA	NA
	9/7/95	ND	ND	NA	ND	ND	ND	ND	NA	NA	NA
	3/5/96	ND	320	NA	7.5	ND	ND	ND	1,100,000	ND	NA
MW2	7/1/93	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA
	10/14/93	ND	ND	NA	ND	ND	ND	ND	12,000,000	NA	11
	1/18/94	ND	ND	NA	ND	ND	ND	ND	570,000	NA	0.46
	3/30/94	ND	ND	ND	ND	2.2	ND	ND	NA	NA	0.29
	7/15/94	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA
	3/5/96	ND	53	NA	ND	ND	ND	ND	300,000	ND	NA
MW3	7/1/93	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA
	10/14/93	ND	840	NA	ND	ND	ND	ND	31,000,000	NA	29
	1/18/94	ND	64	NA	ND	ND	ND	ND	28,000,000	NA	27
	3/30/94	ND	ND	NA	ND	0.90	ND	ND	NA	NA	21
	7/15/94	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA
	10/19/94	ND	ND	NA	ND	ND	ND	ND	NA	NA	NA
	2/2/95	100	ND	NA	38	0.55	ND	ND	NA	NA	NA
	5/3/95	ND	ND	NA	ND	ND	ND	ND	NA	NA	NA
	9/7/95	ND	ND	NA	ND	ND	ND	ND	NA	NA	NA
	3/5/96	ND	ND	NA	ND	ND	ND	ND	20,000,000	ND	NA

¹ µg/L = micrograms per liter² ND = Not Detected at or above method reporting limits.³ NA = Not Analyzed

Versar INC. SACRAMENTO

Versar INC.

ATTACHMENT I

MONITORING WELL PURGE TABLE

Project Number: 2722-117			Site Name: Former Pacific Dry Dock and Repair Company Yard I Facility		
Well Number: MW1			Date(s) Purged: 3/5/96		
OVA - Ambient: 0 ppm			Purge Method: Dedicated bailer		
OVA - Vault: 0 ppm			Purge Rate: 0.55 gallon/min		
OVA - Casing: 0 ppm			Date & Time Sampled: 3/5/96 (1000)		
Water Level - Initial: 3.95 feet			Purged & Sampled By: P. Hoffmeister		
Water Level - Final: 5.25 feet			Sampling Method: Dedicated bailer		
Well Depth: 14.30 feet			Free Product: No		
Well Diameter: 2 inches			Sheen: No		
Well Casing Volume: 1.69 gallons			Odor: Slight Hydrocarbons		
Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
0822	0.25	61.5	7.42	1,590	Clear
0823	1.00	62.5	7.02	1,130	Clear
0825	1.75	63.0	6.70	1,630	Clear
0826	2.50	64.4	5.70	7,440	Clear
0828	3.25	65.3	6.63	12,970	Clear
0829	4.00	64.9	6.12	5,990	Clear
0829	4.25	65.1	5.77	8,000	Clear
0830	4.50	65.1	5.82	6,360	Clear
0831	4.75	65.2	5.62	10,190	Clear
0831	5.00	65.3	5.54	12,820	Clear
1000	Sample	61.7	6.86	12,110	Clear
Field Notes:					

MONITORING WELL PURGE TABLE

Project Number: 2722-117			Site Name: Former Pacific Dry Dock and Repair Company Yard I Facility		
Well Number: MW2			Date(s) Purged: 3/5/96		
OVA - Ambient: 0 ppm			Purge Method: Dedicated bailer		
OVA - Vault: 0 ppm			Purge Rate: 0.58 gallon/min		
OVA - Casing: 0 ppm			Date & Time Sampled: 3/5/96 (1015)		
Water Level - Initial: 2.65 feet			Purged & Sampled By: P. Hoffmeister		
Water Level - Final: 2.85 feet			Sampling Method: Dedicated bailer		
Well Depth: 14.10 feet			Free Product: No		
Well Diameter: 2 inches			Sheen: No		
Well Casing Volume: 1.87 gallons			Odor: No		
Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
0838	0.25	61.3	7.24	940	Clear
0840	1.00	62.1	7.26	460	Clear
0841	1.75	62.1	7.07	440	Clear
0842	2.50	62.5	6.66	460	Clear
0844	3.25	62.6	6.45	460	Clear
0845	4.00	62.9	6.33	470	Clear
0846	4.75	63.1	6.26	470	Clear
0847	5.25	63.2	6.19	470	Clear
0847	5.50	63.3	6.11	480	Clear
0848	5.75	63.3	6.09	460	Clear
1015	Sample	60.6	7.04	395	Clear
Field Notes:					

MONITORING WELL PURGE TABLE

Project Number: 2722-117			Site Name: Former Pacific Dry Dock and Repair Company Yard I Facility		
Well Number: MW3			Date(s) Purged: 3/5/96		
OVA - Ambient: 0 ppm			Purge Method: Dedicated bailer		
OVA - Vault: 0 ppm			Purge Rate: 0.35 gallon/min		
OVA - Casing: 0 ppm			Date & Time Sampled: 3/5/96 (1030)		
Water Level - Initial: 8.10 feet			Purged & Sampled By: P. Hoffmeister		
Water Level - Final: 5.85 feet			Sampling Method: Dedicated bailer		
Well Depth: 14.95 feet			Free Product: No		
Well Diameter: 2 inches			Sheen: No		
Well Casing Volume: 1.12 gallons			Odor: Hydrogen Sulfide		
Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
0856	0.25	57.6	4.86	16,530	Clear
0858	0.75	58.7	4.28	Off Scale *	High
0859	1.25	58.7	4.82	18,880	High
0901	1.75	58.8	4.96	17,660	High
0902	2.25	58.9	5.16	17,920	High
0903	2.75	58.7	5.26	16,730	High
0904	3.00	58.9	5.39	17,020	High
0905	3.25	58.8	5.28	16,630	High
0906	3.50	58.8	5.71	15,900	High
1030	Sample	59.3	5.43	14,380	Clear
Field Notes: * Organic Debris					

MONITORING WELL PURGE TABLE

Project Number: 2722-117			Site Name: Former Pacific Dry Dock and Repair Company Yard I Facility		
Well Number: MW4			Date(s) Purged: 3/5/96		
OVA - Ambient: 0 ppm			Purge Method: Dedicated bailer		
OVA - Vault: 0 ppm			Purge Rate: 0.66 gallon/min		
OVA - Casing: 0 ppm			Date & Time Sampled: 3/5/96 (1045)		
Water Level - Initial: 2.65 feet			Purged & Sampled By: P. Hoffmeister		
Water Level - Final: 2.75 feet			Sampling Method: Dedicated bailer		
Well Depth: 13.15 feet			Free Product: No		
Well Diameter: 2 inches			Sheen: No		
Well Casing Volume: 1.71 gallons			Odor: No		
Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
0912	0.25	59.7	7.15	1,200	Clear
0913	1.00	60.1	7.10	676	Low
0914	1.75	59.9	7.12	527	Low
0915	2.50	59.5	7.01	476	Low
0917	3.25	59.2	6.80	451	Low
0918	4.00	59.0	6.77	385	Low
0919	4.25	59.8	6.54	495	Low
0919	4.50	59.6	6.55	438	Low
0920	5.00	59.5	6.53	442	Low
0920	5.25	59.2	6.59	441	Low
1045	Sample	57.1	7.17	717	Clear
Field Notes:					

MONITORING WELL PURGE TABLE

Project Number: 2722-117			Site Name: Former Pacific Dry Dock and Repair Company Yard I Facility		
Well Number: MW5			Date(s) Purged: 3/5/96		
OVA - Ambient: 0 ppm			Purge Method: Dedicated bailer		
OVA - Vault: 0 ppm			Purge Rate: 0.57 gallon/min		
OVA - Casing: 0 ppm			Date & Time Sampled: 3/5/96 (1100)		
Water Level - Initial: 5.70 feet			Purged & Sampled By: P. Hoffmeister		
Water Level - Final: 5.75 feet			Sampling Method: Dedicated bailer		
Well Depth: 13.60 feet			Free Product: No		
Well Diameter: 2 inches			Sheen: No		
Well Casing Volume: 1.29 gallons			Odor: No		
Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
0928	0.25	62.2	5.28	2,310	Clear
0929	1.00	63.6	4.90	2,420	Low
0930	1.50	64.4	4.91	2,660	Low
0931	2.00	64.6	4.90	2,710	Low
0932	2.50	64.9	4.88	2670	Low
0933	3.00	65.0	4.87	2,810	Low
0934	3.25	64.5	4.93	2,760	Low
0934	3.50	64.7	4.88	2,960	Low
0935	3.75	64.8	4.94	2,880	Low
0935	4.00	64.7	4.93	2,710	Low
1100	Sample	61.8	6.54	2,360	Clear
Field Notes:					

MONITORING WELL PURGE TABLE

Project Number: 2722-117			Site Name: Former Pacific Dry Dock and Repair Company Yard I Facility		
Well Number: MW6			Date(s) Purged: 3/5/96		
OVA - Ambient: 0 ppm			Purge Method: Dedicated bailer		
OVA - Vault: 0 ppm			Purge Rate: 0.59 gallon/min		
OVA - Casing: 0 ppm			Date & Time Sampled: 3/5/96 (1130)		
Water Level - Initial: 3.48 feet			Purged & Sampled By: P. Hoffmeister		
Water Level - Final: 3.45 feet			Sampling Method: Dedicated bailer		
Well Depth: 12.85 feet			Free Product: No		
Well Diameter: 2 inches			Sheen: No		
Well Casing Volume: 1.53 gallons			Odor: No		
Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
0942	0.25	59.5	5.70	872	Clear
0943	1.00	59.4	5.68	1,084	High
0945	1.75	59.3	5.75	1,137	High
0946	2.50	59.6	5.75	1,203	High
0947	3.25	59.7	5.82	1,249	High
0948	3.75	59.9	5.83	1,221	High
0949	4.25	60.2	5.84	1,205	High
0950	4.50	60.4	5.85	1,200	High
0950	4.75	60.2	5.88	1,238	High
1130	Sample	60.3	7.16	1,180	Clear
Field Notes:					

Versar INC.

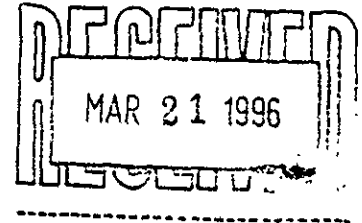
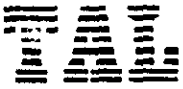
ATTACHMENT II

COPY

Trace Analysis Laboratory, Inc.

3423 Investment Boulevard, #8 • Hayward, California 94545

Telephone (510) 783-6960
Facsimile (510) 783-1512



March 18, 1996

Mr. Philip L. Hoffmeister
Versar, Inc.
7844 Madison Avenue, Suite 167
Fair Oaks, California 95628

Dear Mr. Hoffmeister:

Trace Analysis Laboratory received six water samples on March 5, 1996, for your Project No. 2722-117, Crowley Yard I (our custody log number 6230).

These samples were analyzed for Total Petroleum Hydrocarbons as Diesel, Gasoline, Methyl tert-butyl ether, Benzene, Toluene, Ethylbenzene, Xylenes, Dissolved Lead, and Total Dissolved Solids. Our analytical report and the completed chain of custody form are enclosed for your review.

Trace Analysis Laboratory is certified under the California Environmental Laboratory Accreditation Program. Our certification number is 1199.

If you should have any questions or require additional information, please call me.

Sincerely yours,

A handwritten signature in dark ink, appearing to read 'Louis W. DuPuis'. The signature is fluid and cursive.

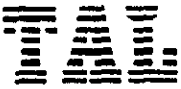
Louis W. DuPuis
Quality Assurance/Quality Control Manager

Enclosures

Trace Analysis Laboratory, Inc.

3423 Investment Boulevard, #8 • Hayward, California 94545

Telephone (510) 783-6960
Facsimile (510) 783-1512



LOG NUMBER: 6230
DATE SAMPLED: 03/05/96
DATE RECEIVED: 03/05/96
DATE EXTRACTED: 03/15/96
DATE ANALYZED: 03/16/96
DATE REPORTED: 03/18/96

CUSTOMER: Versar, Inc.
REQUESTER: Philip L. Hoffmeister
PROJECT: No. 2722-117, Crowley Yard I

Sample Type: Water

Method and Constituent:	Units	MW 1		MW 2		MW 3	
		Concentration	Reporting Limit	Concentration	Reporting Limit	Concentration	Reporting Limit

DHS Method:

Total Petroleum Hydrocarbons as Diesel	ug/l	320	50	53	50	ND	50
--	------	-----	----	----	----	----	----

Method and Constituent:	Units	MW 4		MW 5		MW 6	
		Concentration	Reporting Limit	Concentration	Reporting Limit	Concentration	Reporting Limit

DHS Method:

Total Petroleum Hydrocarbons as Diesel	ug/l	ND	50	98	50	77	50
--	------	----	----	----	----	----	----

Method and Constituent:	Units	Method Blank	
		Concentration	Reporting Limit

DHS Method:

Total Petroleum Hydrocarbons as Diesel	ug/l	ND	50
--	------	----	----

QC Summary:

% Recovery: 102
% RPD: 11

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 6230
 DATE SAMPLED: 03/05/96
 DATE RECEIVED: 03/05/96
 DATE ANALYZED: 03/13/96 and 03/15/96
 DATE REPORTED: 03/18/96
 PAGE: Two

Sample Type: Water

Method and Constituent:	Units	MW 1		MW 2		MW 3	
		Concentration	Reporting Limit	Concentration	Reporting Limit	Concentration	Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/l	ND	50	ND	50	ND	50
EPA Method 8020 for:							
Methyl t-Butyl Ether	ug/l	ND	5.0	ND	5.0	ND	5.0
Benzene	ug/l	7.5	0.50	ND	0.50	ND	0.50
Toluene	ug/l	ND	0.50	ND	0.50	ND	0.50
Ethylbenzene	ug/l	ND	0.50	ND	0.50	ND	0.50
Xylenes	ug/l	ND	1.5	ND	1.5	ND	1.5

Method and Constituent:	Units	MW 4		MW 5		MW 6	
		Concentration	Reporting Limit	Concentration	Reporting Limit	Concentration	Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/l	ND	50	ND	50	ND	50
EPA Method 8020 for:							
Methyl t-Butyl Ether	ug/l	ND	5.0	ND	5.0	ND	5.0
Benzene	ug/l	ND	0.50	ND	0.50	ND	0.50
Toluene	ug/l	ND	0.50	ND	0.50	ND	0.50
Ethylbenzene	ug/l	ND	0.50	ND	0.50	ND	0.50
Xylenes	ug/l	ND	1.5	ND	1.5	ND	1.5

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 6230
 DATE SAMPLED: 03/05/96
 DATE RECEIVED: 03/05/96
 DATE ANALYZED: 03/13/96 and 03/15/96
 DATE REPORTED: 03/18/96
 PAGE: Three

Sample Type: Water

<u>Method and Constituent:</u>	<u>Units</u>	<u>Method Blank</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>
DHS Method:			
Total Petroleum Hydro- carbons as Gasoline	ug/l	ND	50
EPA Method 8020 for:			
Methyl t-Butyl Ether	ug/l	ND	5.0
Benzene	ug/l	ND	0.50
Toluene	ug/l	ND	0.50
Ethylbenzene	ug/l	ND	0.50
Xylenes	ug/l	ND	1.5

QC Summary:

% Recovery: 84 99
 % RPD: 20 1.6

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 6230
 DATE SAMPLED: 03/05/96
 DATE RECEIVED: 03/05/96
 DATE EXTRACTED: 03/11/96
 DATE ANALYZED: 03/14/96
 DATE REPORTED: 03/18/96
 PAGE: Four

Sample Type: Water

Method and Constituent:	Units	MW 1		MW 2		MW 3	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 239.1: Dissolved Lead	ug/l	ND	100	ND	100	ND	100

Method and Constituent:	Units	MW 4		MW 5		MW 6	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 239.1: Dissolved Lead	ug/l	ND	100	ND	100	ND	100

Method and Constituent:	Units	Method Blank		QC Summary	
		Concen- tration	Reporting Limit	% Recovery	% RPD
EPA Method 239.1: Dissolved Lead	ug/l	ND	100	83	0.58

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 6230
 DATE SAMPLED: 03/05/96
 DATE RECEIVED: 03/05/96
 DATE ANALYZED: 03/15/96
 DATE REPORTED: 03/18/96
 PAGE: Five

Sample Type: Water

Method and Constituent:	Units	MW 1		MW 2		MW 3	
		Concentration	Reporting Limit	Concentration	Reporting Limit	Concentration	Reporting Limit
EPA Method 160.1:							
Total Dissolved Solids ug/l		1,100,000	25,000	300,000	25,000	20,000,000	25,000

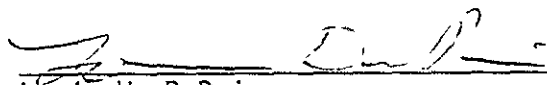
Method and Constituent:	Units	MW 4		MW 5		MW 6	
		Concentration	Reporting Limit	Concentration	Reporting Limit	Concentration	Reporting Limit
EPA Method 160.1:							
Total Dissolved Solids ug/l		300,000	25,000	1,800,000	25,000	1,100,000	25,000

Method and Constituent:	Units	Method Blank	
		Concentration	Reporting Limit
EPA Method 160.1:			
Total Dissolved Solids ug/l		ND	25,000

QC Summary:

% RPD: 0.0

Concentrations reported as ND were not detected at or above the reporting limit.


 Louis W. DuPuis
 Quality Assurance/Quality Control Manager

PROJECT NO.		PROJECT NAME					PARAMETERS								INDUSTRIAL HYGIENE SAMPLE	Y/N			
2722-117		CROWLEY YARD I					NO. OF CONTAINERS TPT - T TPT - G / B / R - M / B / E DISSOLVED LEAD - F / L / S TOTAL DISSOLVED SOLIDS									N			
SAMPLERS: (Signature)					(Printed)										REMARKS				
Philip A. Hoffmeister					Philip Hoffmeister														
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION														
MW1	3/5/96	1000		X			5	X	X	X	X							WATER	
MW2		1015						X	X	X	X								
MW3		1030						X	X	X	X								
MW4		1045						X	X	X	X								
MW5		1100						X	X	X	X								
MW6	∇	1130		∇			∇	X	X	X	X							∇	
Relinquished by: (Signature)			Date / Time		Received by: (Signature)			Relinquished by: (Signature)			Date / Time		Received by: (Signature)						
Philip A. Hoffmeister			3/5/96 1353																
(Printed)					(Printed)			(Printed)					(Printed)						
Relinquished by: (Signature)			Date / Time		Received for Laboratory by: (Signature)			Date / Time		Remarks									
					Flaw Riem			3/5/96 1:53		- FILTER DISSOLVED LEAD SAMPLES IN LAB - 14 DAY T.A.T. pH, water, TPAH = 1-1.2e, y/l 55 Pb = 1-1.2e, y/l 55 TDS = 1-1.2e plastic 2.12 - 2-4... H... 1.7 T-1 P.									
(Printed)					(Printed)														



CROWLEY MARINE SERVICES, INC.

ENVIRONMENTAL
PROTECTION
96 MAY -9 PM 12:27

May 7, 1996

Mr. Dale Klettke, CHMM
Hazardous Materials Specialist
Hazardous Materials Division
Department of Environmental Health
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, CA 94502

Reference: Groundwater Sampling Report for Pacific Dry Dock and Repair Company
Yard I

Dear Mr. Klettke:

Per your request please find enclosed the groundwater sampling report for the former Crowley Marine Services' facility referenced above, located at 1441 Embarcadero in Oakland. This report was prepared by Versar, Inc. for Crowley Marine Services.

If you have any questions or comments regarding this matter please contact me at (206) 443-8042.

Sincerely,

Stephen Wilson
Manager, Environmental Affairs

Enclosure

cc: PDD I Correspondence w/o enclosure
Beth Hamilton w/o enclosure
Dan Schoenholtz w/enclosure
Paul Graff w/o enclosure