CROWLEY MARINE SERVICES, INC.

December 4, 1995

Mr. Barney Chan
Alameda County Health Care Service Agency
Department of Environmental Health
1131 Harbor Bay Parkway, #260
Alameda, California 94502-6577

Reference: **Groundwater Monitoring Report for the former Pacific Dry Dock and Repair Company Yard II Facility, Oakland, California**

Dear Mr. Chan:

Enclosed for your review is the groundwater monitoring report for the above referenced property at 321 Embarcadero, in Oakland.

Please contact me at (206) 443-8042 with any questions or comments that you may have regarding this matter.

Sincerely,

Stephen Wilson
Director, Environmental Affairs

Enclosure

cc: PDDII Correspondence w/o enclosure
PDDII Reports w/enclosure
Dan Schoenholtz w/enclosure
Beth Hamilton w/o enclosure
Paul Graff w/o enclosure

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Versar INC.

MONITORING WELL INSTALLATION AND THIRD ROUND GROUNDWATER MONITORING REPORT- OCTOBER 2, 1995

PACIFIC DRY DOCK AND REPAIR COMPANY
YARD II FACILITY
OAKLAND, CALIFORNIA

Prepared for:

CROWLEY MARINE SERVICES, INC.
2401 Fourth Avenue
P.O. Box 2287
Seattle, Washington 98111

Prepared by:

VERSAR, INC.
7844 Madison Avenue, Suite 167
Fair Oaks, California 95628

Versar Project No. 2463-103

December 1, 1995

SUMMARY

On October 2, 1995, Versar, Inc. (Versar) completed the third scheduled round of groundwater monitoring and sampling at the former Pacific Dry Dock and Repair Company Yard II facility located at 321 Embarcadero in Oakland, California (Site). This report documents these results and also the installation of four additional groundwater monitoring wells at the Site. The third round included sampling of all groundwater monitoring wells at the Site.

The purpose of the groundwater monitoring program is to conduct regularly scheduled sampling events at the Site. Each sampling event includes: (1) measurement of groundwater levels from all monitoring wells; (2) collection and laboratory analysis of groundwater samples from all monitoring wells; (3) calculation of the hydraulic gradient; and (4) production of a report summarizing the results of the sampling event.

Mr. Philip Cox, Geologist, prepared this report under the guidance of Mr. Michael D. Holley, Professional Civil Engineer, and Mr. Paul Graff, Registered Geologist.

A summary of the conclusions of the current investigation is as follows:

- On September 29, 1995, the calculated groundwater gradient was 0.008 in a northerly direction. The data used to calculate this gradient were collected at approximately 9:00 am, during an outgoing tide. The nearest high and low tides were approximately 4:41 am and 9:34 am, respectively. The high tide was approximately 5.3 feet, the low tide 2.6 feet.

- Total petroleum hydrocarbons as diesel were detected in groundwater samples collected from monitoring wells MW2, MW4, MW5, and MW7.

- Total petroleum hydrocarbons as gasoline were detected in groundwater samples collected from monitoring wells MW2, MW4, and MW5.

- Total petroleum hydrocarbons as motor oil were detected in the groundwater sample collected from monitoring well MW4.

Benzene was detected in groundwater samples collected from monitoring wells MW2, MW4, and MW5. Ethylbenzene was detected in a groundwater sample collected from monitoring well MW4.

- Chlorobenzene was detected in groundwater samples collected from monitoring wells MW2, MW4, and MW5.

- Copper and Lead were detected in groundwater samples collected from monitoring wells MW4 and MW7. Mercury was detected in groundwater samples from MW1 and MW4 through MW7. Zinc was detected in all seven monitoring well groundwater samples.

- Total petroleum hydrocarbons as gasoline and diesel were detected in soil samples collected from monitoring well boreholes MW4, MW6, and MW7. Total petroleum hydrocarbons as motor oil were detected in soil samples collected from borehole MW6. Chlorobenzene and 1,4-dichlorobenzene were detected in a soil sample from borehole MW4.

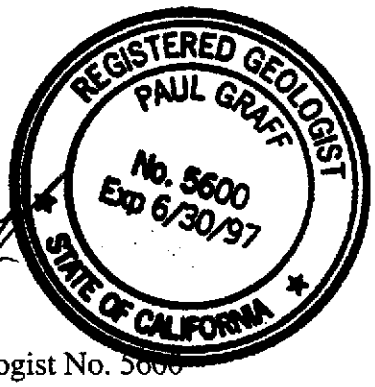
- Copper, zinc, and lead were detected in soil samples from boreholes MW4, MW6, and MW7. Mercury was detected in a soil sample from borehole MW6.

Prepared by:

FOR Philip Cox
Staff Geologist

Approved for Release:

Paul Graff
Senior Geologist
California Registered Geologist No. 5600



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1.0 INTRODUCTION

Crowley Marine Services, Inc. (Crowley) retained Versar, Inc. (Versar) to assist conducting an environmental investigation, including a program of groundwater monitoring, at the former Pacific Dry Dock and Repair Company Yard II Facility (the Site), located at 321 Embarcadero in Oakland, California (Figure 1). The investigation is being conducted in accordance with the policies of the San Francisco Bay Regional Water Quality Control Board and the Alameda County Health Care Services Agency (ACHCSA). This report describes the procedures used to install four new groundwater monitoring wells and the findings from the third round of monitoring and groundwater sampling.

1.1 Site History

The Site occupies approximately 1.5 acres of shoreline property between the Embarcadero and Oakland Inner Harbor. The property is bounded by Oakland Inner Harbor on the south, the Merritt Channel on the west, the Embarcadero on the north, and industrial property on the east (Figure 2).

The first recorded owner of the Site property was James T. Stratton, who secured a patent to the Tidelands of Brooklyn Basin in October 1889. In May 1911, the City of Oakland voided Mr. Stratton's property rights, and assumed ownership of the property. Approximately one year later in June 1911, General Engineering and Dry Dock, Co. (GEDD) obtained a lease and sublet the Site to Hanlon Dry Dock and Shipbuilding Company (Hanlon). This lease continued until December 1939. From approximately 1942, following the termination of the lease agreement with GEDD, until approximately 1962, the United States of America leased the property.

Crowley and its predecessors in interest have been at the Site since approximately 1951, first as a sub-lessee from the U.S. Navy, then as a direct lessee. In the past, while repairing and refurbishing seagoing vessels, Crowley used products containing regulated materials and generated various regulated and unregulated wastes.

Crowley's site assessment and investigation activities are documented in a letter to Mr. Barney Chan of the ACHCSA, dated July 31, 1995. Versar also performed a groundwater sampling event at the Site during June, 1995. The results of this sampling event were presented to Mr. Barney Chan of the ACHCSA in October 1995.

1.2 Groundwater Monitoring Well Installation

On September 25 and 26, 1995, Versar supervised the drilling of four boreholes and installation of an additional four, four-inch diameter groundwater monitoring wells (MW4, MW5, MW6, and MW7). The monitoring wells were installed according to the "Addendum to Work Plan for Site Investigation," dated September 14, 1995, that was submitted to and approved by the ACHCSA. The monitoring well locations are shown on Figure 2. Monitoring wells MW4, MW5, and MW6 were evenly spaced along the northern edge of the property to assess whether the previously encountered impacted groundwater extended to the property boundary. Monitoring well MW7 was located near the southern property boundary to assess the condition of groundwater migrating onto the Site. Prior to drilling and installing the monitoring wells, Versar submitted a Zone 7 Water Agency (Zone 7) well permit application on behalf of Crowley. The application was accepted and a permit issued by Mr. Wyman Hong of Zone 7. A copy of the Zone 7 permit is included as Appendix A.

The monitoring well boreholes were drilled with a truck-mounted drill rig using ten-inch outside diameter hollow stem augers (HSA). Five soil samples were collected using a California modified split-spoon sampler lined with pre-cleaned brass liners, and submitted for laboratory analysis. Due to poor recovery in borehole MW5, soil samples for laboratory analysis were not collected. Headspace analyses were performed on field samples. The headspace results are shown on Versar's borehole logs included as Appendix B.

The boreholes were extended to the top of the bay muds, between 15 and 16 feet below ground surface (bgs). Groundwater was encountered during drilling at between four and seven feet bgs. Versar did not encounter visible contamination while drilling boreholes MW5, MW6, or MW7. In borehole MW4, an oily substance was observed at and below the first groundwater

encountered. Versar supervised the construction of groundwater monitoring wells following the drilling of each borehole as outlined in the approved work plan addendum. In fulfilling permit requirements, Versar submitted well completion reports, borehole logs, and the drillers reports to Zone 7.

On September 29, 1995, Mr. Thomas Sekel, a Professional Land Surveyor, surveyed the four new and three existing monitoring wells to a Port of Oakland benchmark. Also on September 29, Versar representative Mr. Philip Hoffmeister developed the four new monitoring wells. Prior to development, the depth to groundwater was measured in all wells onsite at approximately 9:00 am (Table 3). The water levels were measured during an outgoing tide; the nearest high and low tides were approximately 4:41 am and 9:34 am, respectively. The high tide was approximately 5.3 feet, the low tide 2.6 feet.

The monitoring wells were developed by alternating groundwater bailing and well surging. Development was halted when 10 well volumes of groundwater had been removed. At this point, the turbidity of the groundwater in each well had begun to decrease but was still moderate to heavy. Data collected during development included: (1) the initial and final depth to groundwater; (2) pH; (3) temperature; (4) conductivity; and (5) observations of sheen, odor, free product, and turbidity. Details of the development were recorded and are included as Appendix C.

1.2.1 Soil Analytical Results

A total of five soil samples were collected and submitted to Trace Analysis Laboratories, Inc. (Trace), California Certification No. 1199. The samples were analyzed for total petroleum hydrocarbons as gasoline (TPH-G); TPH as diesel (TPH-D); TPH as motor oil (TPH-MO); volatile organic compounds (VOCs); copper; lead; mercury; and zinc. Originally, Versar had proposed to analyze the samples for TPH-G, TPH-D, and BTEX. At the request of the ACHCSA, TPH-MO, VOCs (using EPA Method 8240) copper, lead, mercury, and zinc were also included in the suite of analyses. All laboratory analyses were performed by the appropriate

Environmental Protection Agency (EPA) or California Department of Health Services (DHS) Methods. Analytical results of the soil samples are summarized in Tables 1 and 2, and shown in Figure 3. A copy of the laboratory analytical report and chain-of-custody record for the soil samples is included as Appendix D.

2.0 GROUNDWATER SAMPLING ACTIVITIES

The general objectives of the third round of groundwater monitoring and sampling were as follows:

- To measure groundwater levels in all monitoring wells, including the three original wells (MW1, MW2, and MW3) and the four additional monitoring wells (MW4, MW5, MW6, and MW7).
- To purge and collect groundwater samples from all monitoring wells.
- To submit the groundwater samples to a certified laboratory for analysis for TPH-G, BTEX, TPH-D, TPH-MO, halogenated VOCs (HVOCs), copper, lead, mercury, and zinc.
- To prepare this groundwater monitoring and monitoring well installation report.

The third round of monitoring and sampling at the Site was conducted between September 29 and October 2, 1995. The investigation included measurement of the groundwater levels and the collection of groundwater samples from the three original wells and four newly installed wells (a total of seven wells).

Prior to conducting any groundwater sampling, the depth to groundwater was measured in each monitoring well. These depths were converted to elevations and used to calculate the hydraulic gradient. The gradient on September 29, 1995 was 0.008 in a northerly direction, as shown in Figure 4. Groundwater level data for the third round are listed in Table 3. Previous groundwater elevation measurements are included in Figure 5.

Prior to collecting samples, all monitoring wells were purged following Versar's standard procedures, presented in Appendix E of Versar's "Groundwater Monitoring Well Installation and Monitoring Report-March 13, 1995." Monitoring well purging data are included in Appendix E.

Following purging, groundwater samples were collected from each monitoring well using a bailer. Sampling containers were labeled with the date collected and a unique sample identification and stored at approximately 4° C in an insulated cooler. All groundwater samples were picked up by a representative from Trace on September 29 and October 2, 1995. Groundwater samples were submitted for the following analyses: TPH-G, TPH-D, TPH-MO, HVOCs, BTEX, and total lead, mercury, copper, and zinc. The analyte methyl t-butyl ether was also reported with BTEX, as required by the San Francisco Regional Water Quality Control Board. The samples were prepared following EPA or DHS Methods and were accompanied by Versar's chain-of-custody record.

3.0 GROUNDWATER SAMPLE RESULTS

During the sampling event, seven groundwater samples (one from each monitoring well) were collected and submitted for laboratory analysis. Analytical results of groundwater samples are summarized in Tables 4, 5, and 6 and shown in Figure 6. A copy of the laboratory analytical report and chain-of-custody record from the sampling event is included as Appendix F. Historical groundwater analytical results are summarized in Table 7.

4.0 FUTURE ACTIVITIES

The next sampling event is scheduled for December 1995.

5.0 REFERENCES

Keiley, Enea, Piunti, & Hamilton. San Jose, California, July 31, 1995. *Status of Subsurface Investigation at Pacific Dry Dock Yard II, 321 Embarcadero, Oakland, California 94606.*

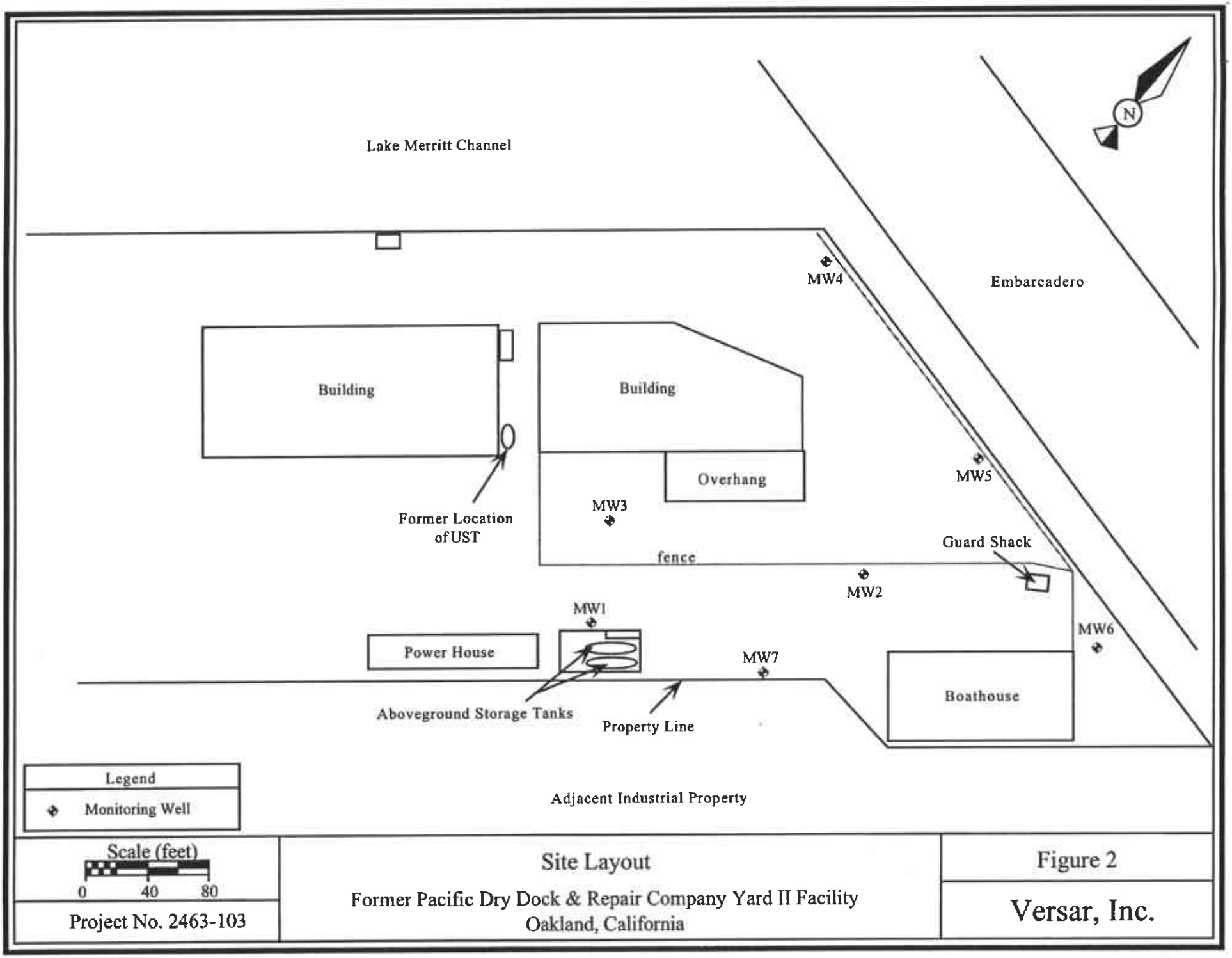
Versar, Inc. Fair Oaks, California. 1990, *Site Assessment Report for the Pacific Dry Dock and Repair Yards I and II, Oakland, California.*

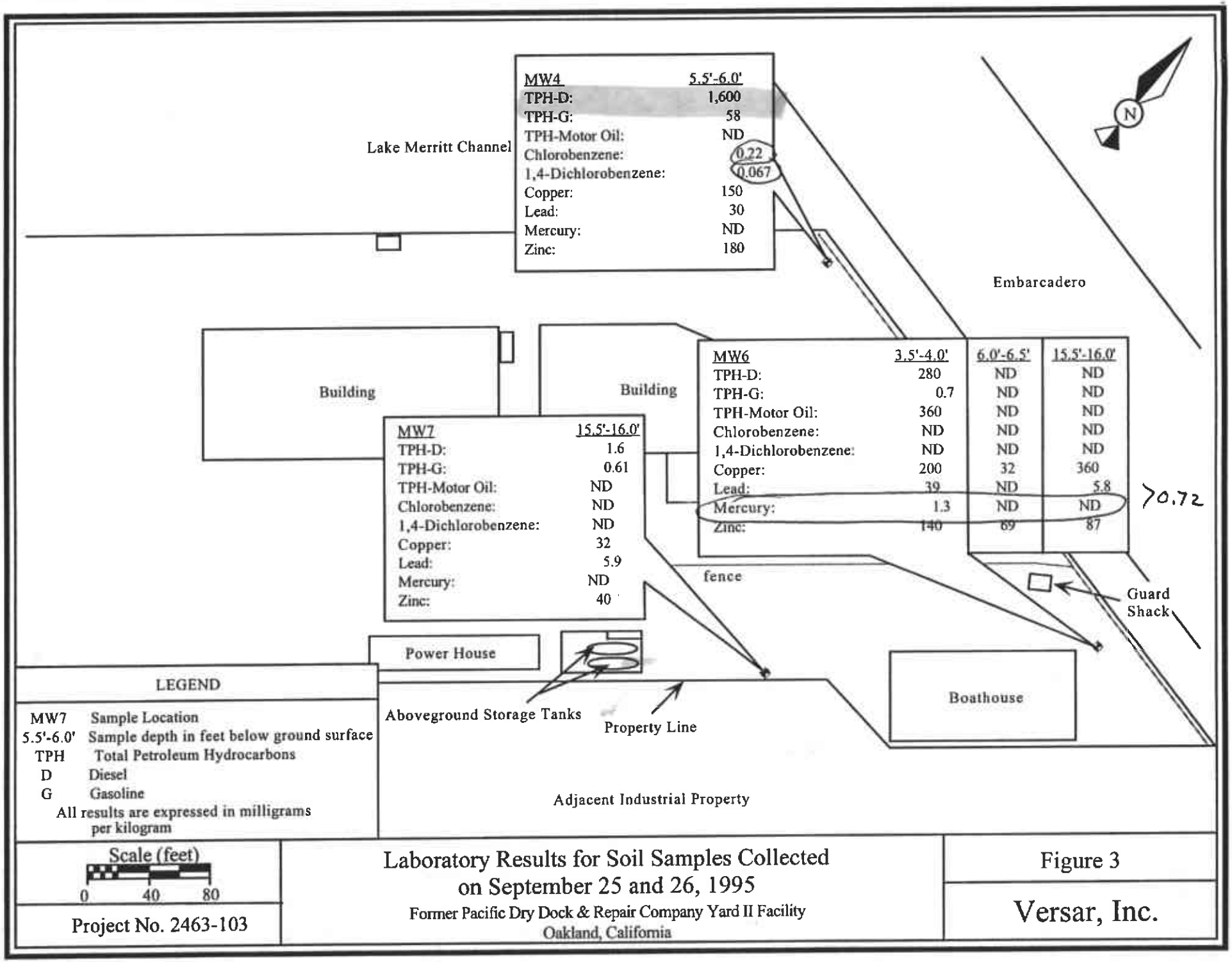
Versar, Inc. Fair Oaks, California. May 10, 1995. *Groundwater Monitoring Well Installation and Monitoring Report-March 13, 1995, Former Pacific Dry Dock and Repair Company Yard II Facility, Oakland, California.*

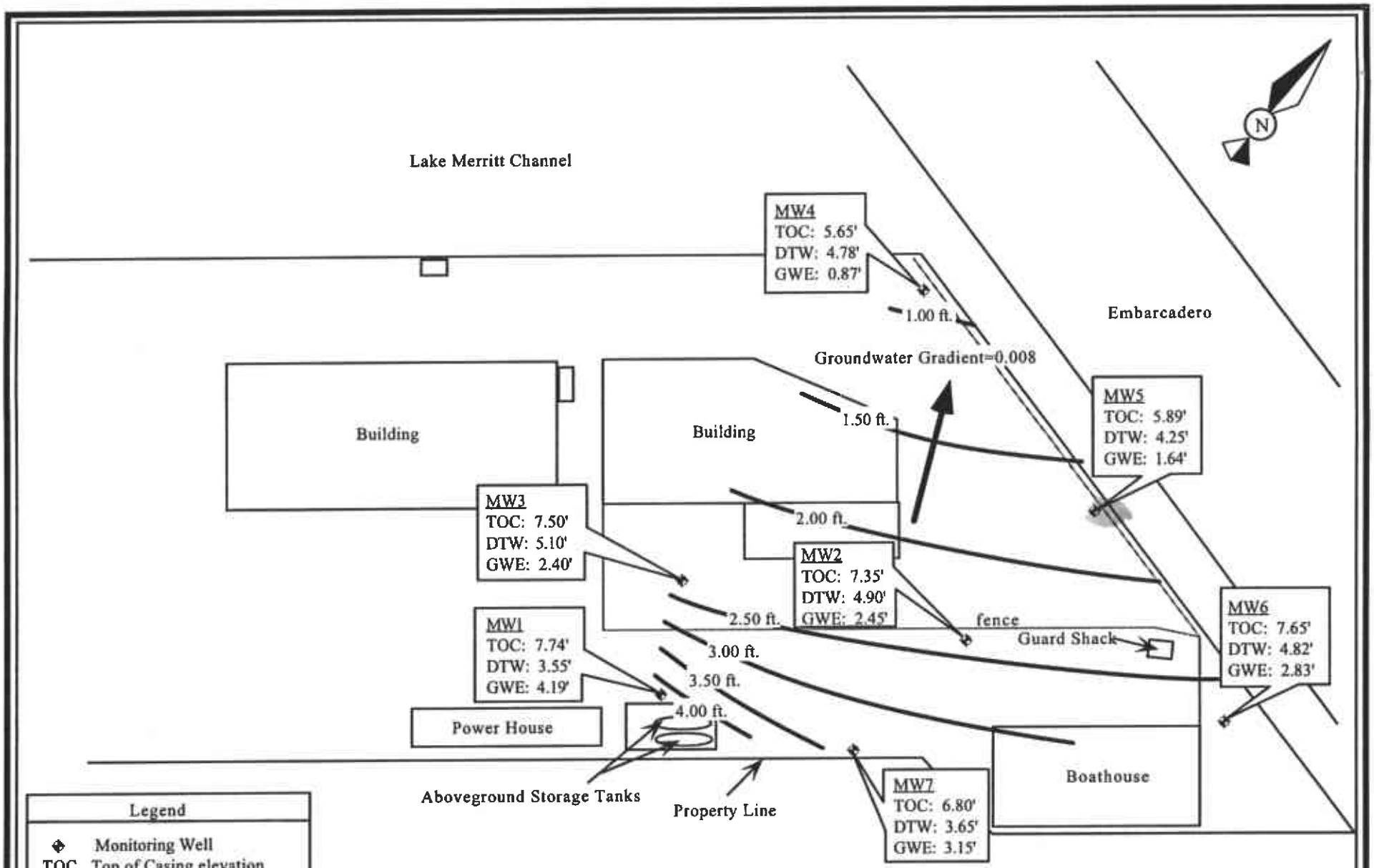
Versar, Inc. Fair Oaks, California. September 1995. *Addendum to Work Plan for Site Investigation, 321 Embarcadero, Oakland, California.*

Versar, Inc. Fair Oaks, California, October 2, 1995. *Groundwater Sampling Report-June 21, 1995, Former Pacific Dry Dock and Repair Company Yard II Facility, Oakland, California*

Scale (miles) 0 0.25 0.50	Site Location	Figure 1
Project No. 2463-103	Former Pacific Dry Dock & Repair Company Yard II Facility Oakland, California	Versar, Inc.


Lake Merritt Channel
N
MW4
Embarcadero
Building
Building
Overhang
MW5
MW3
Former Location
of UST
fence
Guard Shack
MW2
MW1
MW6
Power House
MW7
Boathouse
Aboveground Storage Tanks
Property Line
Legend
Monitoring Well
Adjacent Industrial Property
Scale (feet)
0
40
80
Project No. 2463-103
Site Layout
Former Pacific Dry Dock & Repair Company Yard II Facility
Oakland, California
Figure 2
Versar, Inc.


MW4 5.5'-6.0'
TPH-D: 1,600
TPH-G: 58
TPH-Motor Oil: ND
Chlorobenzene: 0.22
1,4-Dichlorobenzene: 0.067
Copper: 150
Lead: 30
Mercury: ND
Zinc: 180
Lake Merritt Channel
Embarcadero
N
Building
Building
MW6 3.5'-4.0' 6.0'-6.5' 15.5'-16.0'
TPH-D: 280 ND ND
TPH-G: 0.7 ND ND
TPH-Motor Oil: 360 ND ND
Chlorobenzene: ND ND ND
1,4-Dichlorobenzene: ND ND ND
Copper: 200 32 360
Lead: 39 ND 5.8
Mercury: 1.3 ND ND
Zinc: 140 69 87
>0.72
MW7 15.5'-16.0'
TPH-D: 1.6
TPH-G: 0.61
TPH-Motor Oil: ND
Chlorobenzene: ND
1,4-Dichlorobenzene: ND
Copper: 32
Lead: 5.9
Mercury: ND
Zinc: 40
fence
Guard Shack
Power House
Boathouse
Aboveground Storage Tanks
Property Line
Adjacent Industrial Property
LEGEND
MW7 Sample Location
5.5'-6.0' Sample depth in feet below ground surface
TPH Total Petroleum Hydrocarbons
D Diesel
G Gasoline
All results are expressed in milligrams per kilogram
Scale (feet)
0 40 80
Project No. 2463-103
Laboratory Results for Soil Samples Collected on September 25 and 26, 1995
Former Pacific Dry Dock & Repair Company Yard II Facility
Oakland, California
Figure 3
Versar, Inc.



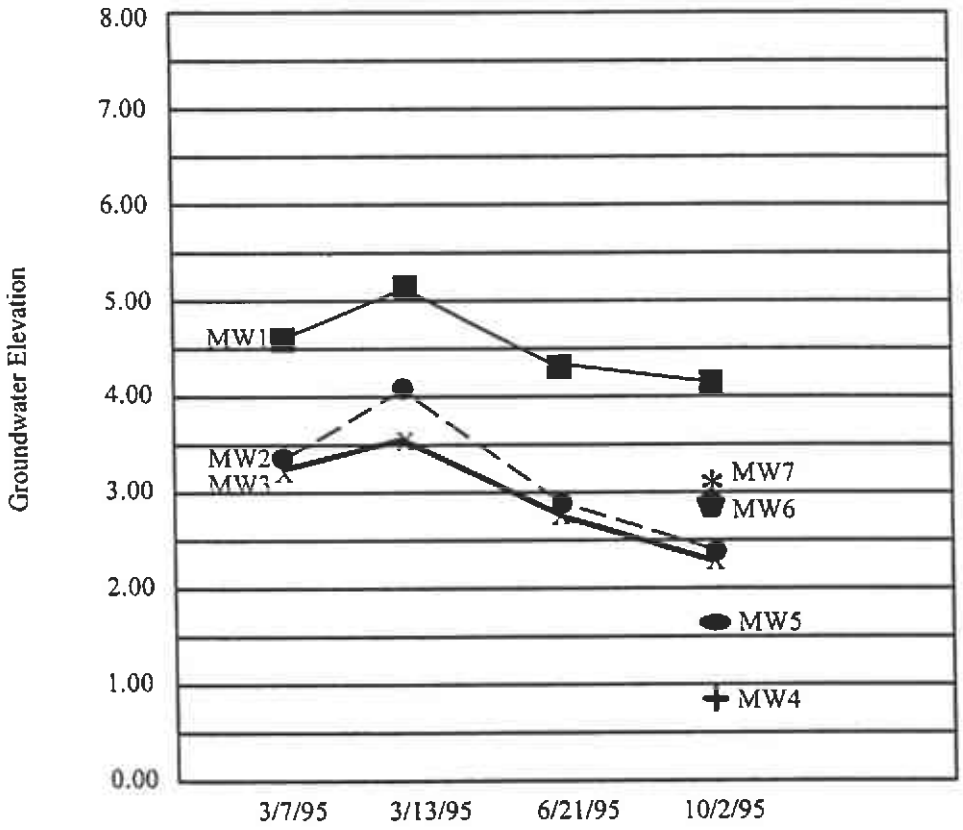
Project No. 2463-103

Calculated Groundwater Gradient, September 29, 1995

Former Pacific Dry Dock & Repair Company Yard II Facility
Oakland, California

Figure 4

Versar, Inc.



Key	
MW1 ■	MW4 +
MW2 ●	MW5 ⬬
MW3 X	MW6 ⬟
MW7 *	

Vertical Scale (feet)

0 0.50 1.00

Project No. 2463-103

Groundwater Measurements
March 7, 1995, through
September 29, 1995
Former Pacific Dry Dock & Repair
Company Yard II Facility
Oakland, California

Figure 5

Versar, Inc.

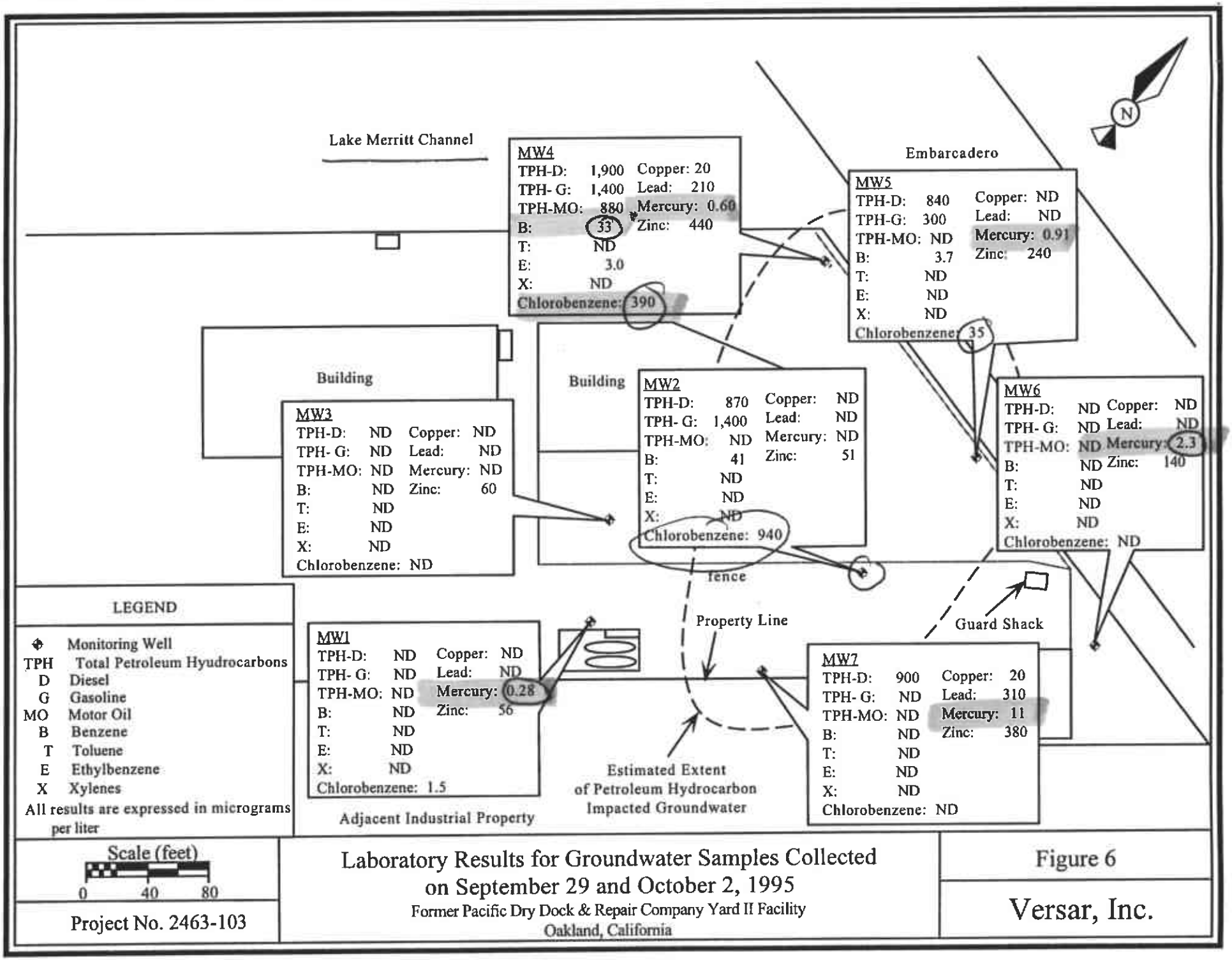

Lake Merritt Channel
Embarcadero
N
MW4
TPH-D: 1,900 Copper: 20
TPH- G: 1,400 Lead: 210
TPH-MO: 880 Mercury: 0.60
B: 33 Zinc: 440
T: ND
E: 3.0
X: ND
Chlorobenzene: 390
MW5
TPH-D: 840 Copper: ND
TPH-G: 300 Lead: ND
TPH-MO: ND Mercury: 0.91
B: 3.7 Zinc: 240
T: ND
E: ND
X: ND
Chlorobenzene: 35
Building
Building
MW3
TPH-D: ND Copper: ND
TPH- G: ND Lead: ND
TPH-MO: ND Mercury: ND
B: ND Zinc: 60
T: ND
E: ND
X: ND
Chlorobenzene: ND
MW2
TPH-D: 870 Copper: ND
TPH- G: 1,400 Lead: ND
TPH-MO: ND Mercury: ND
B: 41 Zinc: 51
T: ND
E: ND
X: ND
Chlorobenzene: 940
MW6
TPH-D: ND Copper: ND
TPH- G: ND Lead: ND
TPH-MO: ND Mercury: 2.3
B: ND Zinc: 140
T: ND
E: ND
X: ND
Chlorobenzene: ND
fence
Property Line
Guard Shack
LEGEND
Monitoring Well
TPH Total Petroleum Hyudrocarbons
D Diesel
G Gasoline
MO Motor Oil
B Benzene
T Toluene
E Ethylbenzene
X Xylenes
All results are expressed in micrograms per liter
MW1
TPH-D: ND Copper: ND
TPH- G: ND Lead: ND
TPH-MO: ND Mercury: 0.28
B: ND Zinc: 56
T: ND
E: ND
X: ND
Chlorobenzene: 1.5
MW7
TPH-D: 900 Copper: 20
TPH- G: ND Lead: 310
TPH-MO: ND Mercury: 11
B: ND Zinc: 380
T: ND
E: ND
X: ND
Chlorobenzene: ND
Adjacent Industrial Property
Estimated Extent of Petroleum Hydrocarbon Impacted Groundwater
Scale (feet)
0 40 80
Project No. 2463-103
Laboratory Results for Groundwater Samples Collected on September 29 and October 2, 1995
Former Pacific Dry Dock & Repair Company Yard II Facility
Oakland, California
Figure 6
Versar, Inc.

TABLE 1

GROUNDWATER MONITORING REPORT
LABORATORY ANALYTICAL RESULTS FOR SELECTED ORGANIC COMPOUNDS
IN SOIL SAMPLES

Third Round

Former Pacific Dry Dock and Repair Company Yard II Facility
Oakland, California

Sample Identification[1]	TPH-D (mg/kg)[2]	TPH-G (mg/kg)	TPH-MO (mg/kg)	Chlorobenzene (mg/kg)	1,4-Dichlorobenzene (mg/kg)
MW4-5.5-6.0	1,600	58	ND[3]	0.22	0.067
MW6-3.5-4.0	280	0.7	360	ND	ND
MW6-6.0-6.5	ND	ND	ND	ND	ND
MW6-15.5-16.0	ND	ND	ND	ND	ND
MW7-15.5-16.0	1.6	0.61	ND	ND	ND

[1] Sample identification includes borehole number and feet below ground surface sample was collected.
[2] mg/kg = milligrams per kilogram
[3] ND = not detected

Complete analytical results are included in Appendix D.

TABLE 2

GROUNDWATER MONITORING REPORT
LABORATORY ANALYTICAL RESULTS FOR METALS IN SOIL SAMPLES

Third Round

Former Pacific Dry Dock and Repair Company Yard II Facility
Oakland, California

Sample Identification[1]	Copper (mg/kg)[2]	Lead (mg/kg)	Mercury (mg/kg)	Zinc (mg/kg)
MW4-5.5-6.0	150	30	ND[3]	180
MW6-3.5-4.0	200	39	1.3	140
MW6-6.0-6.5	32	ND	ND	69
MW6-15.5-16.0	360	5.8	ND	87
MW7-15.5-16.0	32	5.9	ND	40

[1] Sample identification includes borehole number and feet below ground surface sample was collected.
[2] mg/kg = milligrams per kilogram
[3] ND = not detected

TABLE 3

GROUNDWATER MONITORING REPORT
MONITORING WELL GROUNDWATER LEVELS

Third Round

Former Pacific Dry Dock and Repair Company Yard II Facility
Oakland, California

Groundwater Monitoring Well	MW1	MW2	MW3	MW4[5]	MW5[5]	MW6[5]	MW7[5]	Hydraulic Gradient
Reference Casing Elevation (feet)	98.60	98.20	98.36					
March 7, 1995								
Depth to Groundwater[1]	3.15	3.93	4.12	---	---	---		0.015 to the
Groundwater Elevation[2]	95.45	94.27	94.24	---	---	---		northwest
March 13, 1995								
Depth to Groundwater[1]	2.62	3.23	3.96	---	---	---		0.019 to the
Groundwater Elevation[2]	95.98	94.97	94.40	---	---	---		northwest
June 21, 1995								
Depth to Groundwater[1]	3.44	4.44	4.63	---	---	---		0.022 to the
Groundwater Elevation[2]	95.16	93.76	93.73	---	---	---		north-northwest
Reference Casing Elevation Resurveyed on September 29, 1995[3]	7.74	7.35	7.50	5.65	5.89	7.65	6.80	
September 29, 1995								
Depth to Groundwater[1]	3.55	4.90	5.10	4.78	4.25	4.82	3.65	0.008 to the
Groundwater Elevation[4]	4.19	2.45	2.40	0.87	1.64	2.83	3.15	north-northwest

[1] Depth-to-groundwater measurements are expressed in feet below top of casing.
[2] Groundwater elevations are in feet relative to a temporary benchmark elevation of 100.00 feet.
[3] Top of casings resurveyed to feet above mean sea level datum, 1929.
[4] Feet above mean sea level, 1929.
[5] Wells MW4, MW5, MW6, and MW7 were installed in September 1995.

TABLE 4

GROUNDWATER MONITORING REPORT
LABORATORY ANALYTICAL RESULTS FOR PETROLEUM HYDROCARBONS
IN GROUNDWATER SAMPLES

Third Round

Former Pacific Dry Dock and Repair Company Yard II Facility
Oakland, California

Groundwater Monitoring Well	TPH-D (µg/L)[1]	TPH-G (µg/L)	TPH-MO (µg/L)	MTBE (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)
MW1	ND[2]	ND	ND	ND	ND	ND	ND	ND
MW2	870	1,400	ND	ND	41	ND	ND	ND
MW3	ND	ND	ND	ND	ND	ND	ND	ND
MW4	1,900	1,400	880	ND	33	ND	3.0	ND
MW5	840	300	ND	ND	3.7	ND	ND	ND
MW6	ND	ND	ND	ND	ND	ND	ND	ND
MW7	900	ND	ND	ND	ND	ND	ND	ND

[1] µg/L = micrograms per liter
[2] ND = not detected

GROUNDWATER MONITORING REPORT
LABORATORY ANALYTICAL RESULTS FOR HVOC'S
IN GROUNDWATER SAMPLES

Third Round

Former Pacific Dry Dock and Repair Company Yard II Facility
Oakland, California

Groundwater Monitoring Well	Chlorobenzene (µg/L)[1]	Chloroform (µg/L)	1,2-Dichloroethene (µg/L)	1,3-Dichlorobenzene (µg/L)	1,4-Dichlorobenzene (µg/L)
MW1	1.5	ND[2]	ND	ND	ND
MW2	940	ND	ND	ND	ND
MW3	ND	ND	ND	ND	ND
MW4	390	ND	ND	ND	ND
MW5	35	ND	ND	ND	ND
MW6	ND	ND	ND	ND	ND
MW7	ND	ND	ND	ND	ND

[1] µg/L = micrograms per liter
[2] ND = not detected

TABLE 6

GROUNDWATER MONITORING REPORT
LABORATORY ANALYTICAL RESULTS FOR METALS
IN GROUNDWATER SAMPLES

Third Round

Former Pacific Dry Dock and Repair Company Yard II Facility
Oakland, California

Groundwater Monitoring Well	Copper (µg/L)[1]	Lead (µg/L)	Mercury (µg/L)	Zinc (µg/L)
MW1	ND[2]	ND	0.28	56
MW2	ND	ND	ND	51
MW3	ND	ND	ND	60
MW4	20	210	0.60	440
MW5	ND	ND	0.91	240
MW6	ND	ND	2.3	140
MW7	20	310	11	380

[1] µg/L = micrograms per liter
[2] ND = not detected

TABLE 7

GROUNDWATER MONITORING REPORT
HISTORICAL GROUNDWATER ANALYTICAL RESULTS -
SELECTED ORGANIC COMPOUNDS

Third Round

Former Pacific Dry Dock and Repair Company Yard II Facility
Oakland, California

Groundwater Monitoring Well Date	TPH-D (µg/L)[1]	TPH-G (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Chlorobenzene (µg/L)
MW1							
3/13/95	220	ND[2]	ND	ND	ND	ND	4.6
6/21/95	160	ND	ND	ND	1.0	5.3	ND
MW2							
3/13/95	2,500	1,600	77	ND	ND	850	790
6/21/95	3,300	2,300	65	0.74	1.3	810	290
MW3							
3/13/95	ND	ND	ND	ND	ND	ND	0.51
6/21/95	140	ND	ND	ND	ND	ND	ND

[1] µg/L = micrograms per liter
[2] ND = not detected

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588 VOICE (510) 484-2600
FAX (510) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT FORMER PACIFIC DRY DOCK FACILITY
321 EMBARCADERO
OAKLAND, CA

PERMIT NUMBER
LOCATION NUMBER

CLIENT
Name CROWLEY MARINE SERVICES
Address 2401 FOURTH AVE. Voice (206) 443-8042
City P.O. BOX 2287 SEATTLE, WA Zip 98111

APPLICANT
Name VERSAR, INC ON BEHALF OF CROWLEY
Fax (916) 962-2678
Address 7844 MADISON AVE. #16 Voice (916) 962-1612
City FAIR OAKS, CA Zip 95628

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection		General	
Water Supply		Contamination	
Monitoring	X	Well Destruction	

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

DRILLER'S LICENSE NO. C57 602720

WELL PROJECTS
Drill Hole Diameter 10 in. Maximum
Casing Diameter 4 in. Depth 20 ft.
Surface Seal Depth 3 ft. Number 4

GEOTECHNICAL PROJECTS
Number of Borings ___ Maximum
Hole Diameter ___ Depth ___ ft.

ESTIMATED STARTING DATE 09/~~18~~25/95
ESTIMATED COMPLETION DATE 09/~~19~~26/95

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANTS SIGNATURE Philip M Cox Date 9/11/95

PERMIT CONDITIONS

Circled Permit Requirements Apply

A. GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

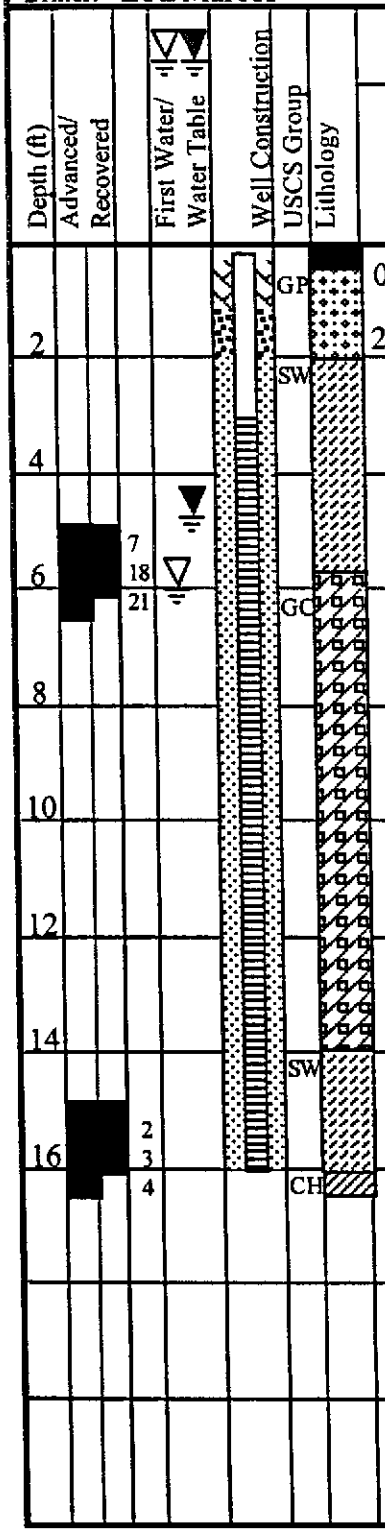
D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved ___ Date ___

91992

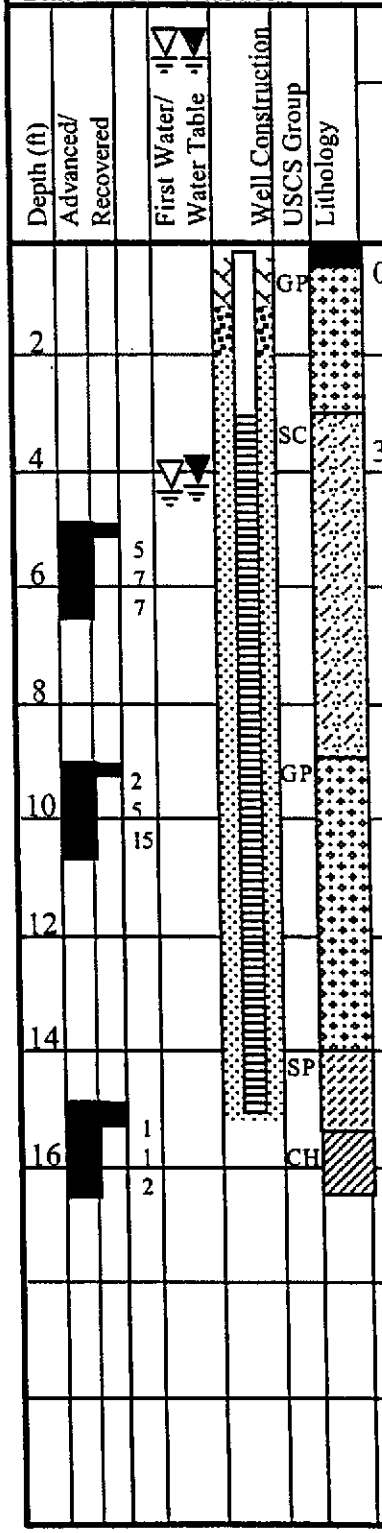
Versar Inc.	**DRILLING LOG**	PROJECT NO. 2463
Supervising Geologist: Michael Sellens	Site Name: Former Pacific Dry Dock & Repair Yard II	
Log By: Philip Cox	Boring No: MW4	
Date: 9/25/95	Boring Diameter: 10 inches	
Drilling Contractor: Turner Explorations, Inc.	Boring Depth: 16 feet	
Contractor Lic. No. C57-602720	Boring Location: Northeast Corner of Site	
Rig Type: B53		
Driller: Lou/Marcos		



USCS SOIL DESCRIPTION SOIL CONDITION AND GEOLOGIC INTERPRETATION SOIL TYPE, ROUNDING, SORTING, PERCENT: GRAVEL, SANDS, FINES COLOR, MOISTURE, DENSITY, SECONDARY POROSITY, ODORS, STAINING GEOLOGY: FILL, ALLUVIUM, BEDROCK	Headspace (ppm)
0.0'-2.0' Asphalt with sandy gravel base.	
2.0'-5.5' Sand: medium grain, strong hydrocarbon odor, green to blue color staining.	
	5.0' - >9,999
	6.0' - >9,999
5.5'-14.0' Gravely clay: gravel up to 1/2 inch, strong odor, oily product present, brown to green color. Saturated with water and product at approximately 6 feet.	
	8.0' - >9,999
14.0'-16.0' Sand: gray, medium grained, shells at approximately 14.5 feet.	
	16.0' - 85
16.0'-16.5' Bay muds in approximately 3 inches of sampler, gray.	
Well construction: 13' of 4 inch 0.020 inch slotted screen, 2.5' blank, 14' sand, 1 foot bentonite chips, and cement grout to approximately 6" bgs.	

Versar Inc.	**DRILLING LOG**	PROJECT NO. 2463

Supervising Geologist: Michael Sellens	Site Name: Former Pacific Dry Dock & Repair Yard II
Log By: Philip Cox	Boring No: MW5
Date: 9/25/95	Boring Diameter: 10 inches
Drilling Contractor: Turner Explorations, Inc.	Boring Depth: 15 feet
Contractor Lic. No. C57-602720	Boring Location: Eastern Property Boundary,
Rig Type: B53	midway along fence line
Driller: Lou/Marcos	



USCS SOIL DESCRIPTION
SOIL CONDITION AND GEOLOGIC INTERPRETATION

SOIL TYPE, ROUNDING, SORTING, PERCENT: GRAVEL, SANDS, FINES
COLOR, MOISTURE, DENSITY, SECONDARY POROSITY, ODORS, STAINING
GEOLOGY: FILL, ALLUVIUM, BEDROCK

Headspace (ppm)

0.0'-3.0' Asphalt with sandy gravel base.

4.0' - >9,999

3.0'-9.0' Clayey sand: sand fine to medium grained, moderate hydrocarbon odor, clay approximately 35%, saturated at 4.5 feet.

7.0' - >9,999

9.0'-14.0' Sandy gravel: sand approximately 30%, gravel up to 1inch, subangular, decreasing in depth, hydrocarbon odor.

11.0' - >9,999

14.0'-15.5' Sand: gray, medium to coarse grained.

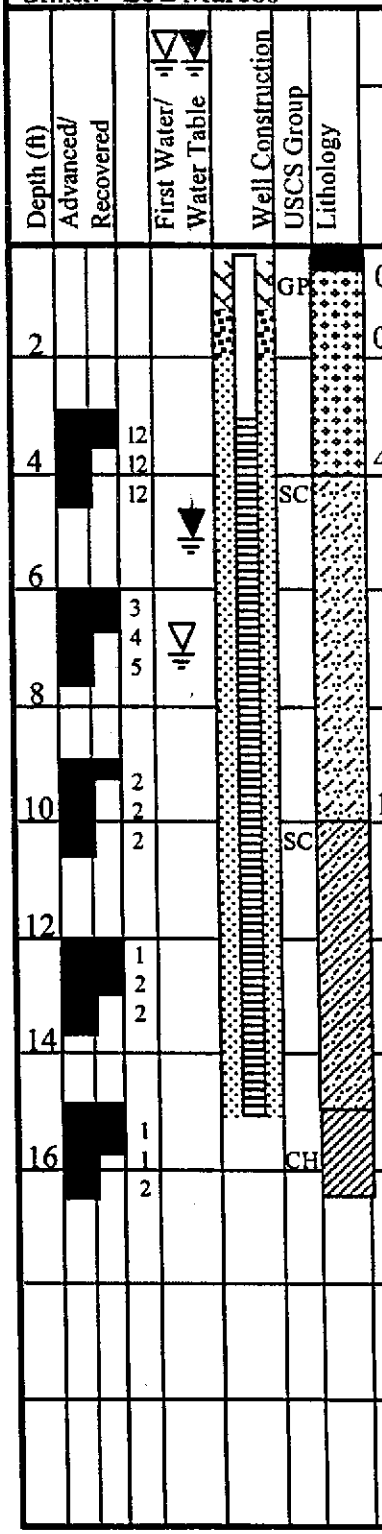
16.0' - 1,451

15.5'-16.5' Bay muds in approximately 12 inches of sampler, gray, shells.

Well construction: 12' of 4 inch 0.020 inch slotted screen, 2.5' blank, 13.0' sand 1 foot bentonite chips, and cement grout to approximately 6" bgs.

Versar Inc.	**DRILLING LOG**	PROJECT NO. 2463

Supervising Geologist: Michael Sellens	Site Name: Former Pacific Dry Dock & Repair Yard II
Log By: Philip Cox	Boring No: MW6
Date: 9/26/95	Boring Diameter: 10 inches
Drilling Contractor: Turner Explorations, Inc.	Boring Depth: 15 feet
Contractor Lic. No. C57-602720	Boring Location: Southeast corner of property
Rig Type: B53	approximately 15' east of entrance.
Driller: Lou/Marcos	



USCS SOIL DESCRIPTION
SOIL CONDITION AND GEOLOGIC INTERPRETATION

SOIL TYPE, ROUNDING, SORTING, PERCENT: GRAVEL, SANDS, FINES
COLOR, MOISTURE, DENSITY, SECONDARY POROSITY, ODORS, STAINING
GEOLOGY: FILL, ALLUVIUM, BEDROCK

Headspace (ppm)

0.0'-0.5' Asphalt.

0.5'-4.0' Sandy gravel: brown, gravel up to 2 inches, subangular, no hydrocarbon odor or staining, traces of clay.

4.0' - 0

4.0'-10.0' Clayey sand: clay approximately 40%, traces of gravel, sand fine to medium grained.

6.5' - 0

10.0'-15.0' Sandy clay: Traces of gravel, 3 inch section of peat at 13 feet, sand approximately 30%, fine to medium; clay moderate to high plasticity.

10' - 0

12 - 0

15' - 0

15.0'-16.5' Bay muds, gray.

Well construction: 12' of 4 inch 0.020 inch slotted screen, 2.5' blank, 13.0' sand, 1 foot bentonite chips, and cement grout to approximately 6" bgs.

Versar Inc.	**DRILLING LOG**	PROJECT NO. 2463
Supervising Geologist: Michael Sellens		Site Name: Former Pacific Dry Dock & Repair Yard II
Log By: Philip Cox		Boring No: MW7
Date: 9/26/95		Boring Diameter: 10 inches
Drilling Contractor: Turner Explorations, Inc.		Boring Depth: 15 feet
Contractor Lic. No. C57-602720		Boring Location: Southern property boundary, approximately 40' west of boathouse.
Rig Type: B53		
Driller: Lou/Marcos		

Depth (ft)	Advanced/ Recovered	First Water/ Water Table	Well Construction	USCS Group	Lithology	USCS SOIL DESCRIPTION SOIL CONDITION AND GEOLOGIC INTERPRETATION SOIL TYPE, ROUNDING, SORTING, PERCENT: GRAVEL, SANDS, FINES COLOR, MOISTURE, DENSITY, SECONDARY POROSITY, ODORS, STAINING GEOLOGY: FILL, ALLUVIUM, BEDROCK	Headspace (ppm)
2				GP		0.0'-0.5' Asphalt. 0.5'-4.0' Gravely sand: brown, gravel approximately 30% up to 3/4 inch, no hydrocarbon odor or staining, gravel decreasing with depth; sand fine grained.	
4	15 8	▽					3' - 5
6	7	▽		GC		4.0'-7.0' Gravely clay: gravel subangular up to 1/4", no odor, saturated at approximately 4.0'; clay moderate plasticity.	
8				SP			7' - 0
10						7.0'-15.0' Gravely sand: dark gray, sand fine to medium grained; gravel approximately 25%, slight hydrocarbon odor, subangular; traces of clay.	
12							
14							
16	2 2 2			CH		15.0'-16.5' Bay muds, gray.	15.5' - 0
						Well construction: 12' of 4 inch 0.020 inch slotted screen, 2.5' blank, 13.0' sand, 1 foot bentonite chips, and cement grout to approximately 6" bgs.	

MONITORING WELL DEVELOPMENT TABLE

Project Number: 2463-103	**Site Name:** Former Pacific Dry Dock and Repair Company Yard II Facility
Well Number: MW4	**Date(s) Developed:** 9/29/95
OVA - Ambient: 0 ppm	**Development Method:** Precleaned Bailer
OVA - Vault: 0 ppm	**Development Rate:** 1.9 gallons/min
OVA - Casing: 902 ppm	**Developed By:** P. Hoffmeister
Water Level - Initial: 4.78 feet	**Free Product:** No
Water Level - Final: 5.25 feet	**Sheen:** Yes
Well Depth: 15.75 feet	**Odor:** Strong Hydrocarbon
Well Diameter: 4 inches	
Well Casing Volume: 6.58 gallons	

Time	Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
0800	1.0	65.2	7.26	2,990	High
0803	7.0	70.1	7.48	2,880	High
0805	14	70.4	7.55	2,740	High
0808	21	70.9	7.63	2,660	High
0811	28	71.0	7.29	2,690	High
0814	35	71.8	7.15	2,740	High
0817	42	71.0	6.98	2,660	High
0821	49	71.1	6.90	2,570	High
0825	56	71.3	6.98	2,630	High
0830	63	70.3	6.93	2,470	High
0835	66	70.1	7.06	2,450	High

Field Notes:

MONITORING WELL DEVELOPMENT TABLE

Project Number: 2463-103	**Site Name:** Former Pacific Dry Dock and Repair Company Yard II Facility
Well Number: MW5	**Date(s) Developed:** 0/29/95
OVA - Ambient: 0 ppm	**Development Method:** Precleaned Bailer
OVA - Vault: 0 ppm	**Development Rate:** 1.4 gallons/min
OVA - Casing: 10,000 ppm	**Developed By:** P. Hoffmeister
Water Level - Initial: 4.25 feet	**Free Product:** No
Water Level - Final: feet	**Sheen:** Yes
Well Depth: 14.75 feet	**Odor:** Strong Hydrocarbon
Well Diameter: 4 inches	
Well Casing Volume: 6.3 gallons	

Time	Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
0900	1.0	66.0	8.14	5,600	Medium
0905	7.0	69.0	7.58	3,050	High
0910	14	69.4	7.26	2,960	High
0915	21	68.0	7.35	2,850	High
0920	28	69.0	7.18	2,790	High
0925	35	68.7	7.21	2,780	High
0930	42	70.0	7.24	2,850	High
0935	49	69.8	7.26	2,680	High
0940	56	70.4	7.21	2,790	High
0945	63	69.2	7.25	2,690	High

Field Notes:

MONITORING WELL DEVELOPMENT TABLE

Project Number: 2463-103	**Site Name:** Former Pacific Dry Dock and Repair Company Yard II Facility
Well Number: MW6	**Date(s) Developed:** 9/29/95
OVA - Ambient: 0 ppm	**Development Method:** Precleaned Bailer
OVA - Vault: 0 ppm	**Development Rate:** 1.1 gallons/min
OVA - Casing: 17 ppm	**Developed By:** P. Hoffmeister
Water Level - Initial: 4.82 feet	**Free Product:** No
Water Level - Final: 4.87 feet	**Sheen:** No
Well Depth: 14.28 feet	**Odor:** No
Well Diameter: 4 inches	
Well Casing Volume: 5.68 gallons	

Time	Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
1000	1.0	69.1	6.98	7,140	Low
1005	6.0	69.3	6.88	4,910	High
1010	12.0	70.2	7.29	3,560	High
1015	18.0	69.4	6.85	2,770	High
1020	24.0	69.6	6.84	2,440	High
1025	30.0	70.0	6.79	2,510	High
1030	36.0	70.1	6.78	2,420	High
1035	42.00	70.2	6.70	2,430	High
1040	48.0	70.0	6.82	2,340	High
1048	54.0	70.0	6.91	2,420	High
1050	57.0	70.5	6.61	2,300	High

Field Notes:

MONITORING WELL DEVELOPMENT TABLE

Project Number: 2463-103	**Site Name:** Former Pacific Dry Dock and Repair Company Yard II Facility
Well Number: MW7	**Date(s) Developed:** 9/29/95
OVA - Ambient: 0 ppm	**Development Method:** Precleaned Bailer
OVA - Vault: 0 ppm	**Development Rate:** 1.7 gallons/min
OVA - Casing: 120 ppm	**Developed By:** P. Hoffmeister
Water Level - Initial: 3.65 feet	**Free Product:** No
Water Level - Final: 4.05 feet	**Sheen:** Yes
Well Depth: 13.60 feet	**Odor:** Strong Hydrocarbon
Well Diameter: 4 inches	
Well Casing Volume: 5.97 gallons	

Time	Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
0700	1.0	66.1	5.69	5,680	High
0708	6.0	67.9	6.52	3,990	High
0711	12.0	67.5	6.49	3,950	High
0714	18.0	68.4	6.50	3,680	High
0718	24.0	68.7	6.53	3,510	High
0721	30.0	69.3	6.56	3,540	High
0724	36.0	69.2	6.29	3,690	High
0727	42.0	69.9	6.58	3,460	High
0729	48.0	70.6	6.51	3,590	High
0732	54.0	70.8	6.59	3,640	High
0735	60.0	70.7	6.48	3,250	High

Field Notes:

APPENDIX D

Laboratory Analytical Reports
and Chain-of-Custody Record for Soil Samples

COPY

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

October 24, 1995

Mr. Philip M. Cox
Versar, Inc.
7844 Madison Avenue, Suite 167
Fair Oaks, California 95628

Dear Mr. Cox:

Trace Analysis Laboratory received five soil samples on September 26, 1995 for your Project No. 2463-102, Crowley Yard 2 (our custody log number 5868).

These samples were analyzed for Total Petroleum Hydrocarbons as Diesel, Motor Oil, Gasoline, and by EPA 8240. 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,

Scott T. Ferriman
Project Specialist

Enclosures

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

LOG NUMBER: 5868
DATE SAMPLED: 09/25/95 and 09/26/95
DATE RECEIVED: 09/26/95
DATE EXTRACTED: 10/06/95
DATE ANALYZED: 10/22/95 and 10/23/95
DATE REPORTED: 10/24/95

CUSTOMER: Versar, Inc.

REQUESTER: Philip M. Cox

PROJECT: No. 2463-102, Crowley Yard 2

Sample Type: Soil

Method and Constituent:	Units	MW4-5.5-6.0 Concentration	MW4-5.5-6.0 Reporting Limit	MW6-3.5-4.0 Concentration	MW6-3.5-4.0 Reporting Limit	MW6-6.0-6.5 Concentration	MW6-6.0-6.5 Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Diesel	ug/kg	1,600,000	16,000	280,000	16,000	ND	1,000
Total Petroleum Hydrocarbons as Motor Oil	ug/kg	ND	80,000	360,000	80,000	ND	5,000

Method and Constituent:	Units	MW6-15.5-16.0 Concentration	MW6-15.5-16.0 Reporting Limit	MW7-15.5-16.0 Concentration	MW7-15.5-16.0 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Diesel	ug/kg	ND	1,000	1,600	1,000	ND	1,000
Total Petroleum Hydrocarbons as Motor Oil	ug/kg	ND	5,000	ND	5,000	ND	5,000

QC Summary:

% Recovery: 100, 97
% RPD: 8.4, 3.7

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

TAL Trace Analysis Laboratory, Inc.

LOG NUMBER: 5868
DATE SAMPLED: 09/25/95 and 09/26/95
DATE RECEIVED: 09/26/95
DATE EXTRACTED: 09/27/95
DATE ANALYZED: 09/28/95 and 09/29/95
DATE REPORTED: 10/24/95
PAGE: Two

Sample Type: Soil

Method and Constituent:	Units	MW4-5.5-6.0 Concentration	MW4-5.5-6.0 Reporting Limit	MW6-3.5-4.0 Concentration	MW6-3.5-4.0 Reporting Limit	MW6-6.0-6.5 Concentration	MW6-6.0-6.5 Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/kg	58,000	680	700	500	ND	500

Method and Constituent:	Units	MW6-15.5-16.0 Concentration	MW6-15.5-16.0 Reporting Limit	MW7-15.5-16.0 Concentration	MW7-15.5-16.0 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/kg	ND	500	610	500	ND	500

QC Summary:

% Recovery: 96
% RPD: 4.8

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

LOG NUMBER: 5854
DATE SAMPLED: 09/25/95 and 09/26/95
DATE RECEIVED: 09/26/95
DATE EXTRACTED: 10/04/95
DATE ANALYZED: 10/05/95
DATE REPORTED: 10/24/95
PAGE: Three

Sample Type: Soil

Method and Constituent:	Units	MW4-5.5-6.0 Concentration	MW4-5.5-6.0 Reporting Limit	MW6-3.5-4.0 Concentration	MW6-3.5-4.0 Reporting Limit	MW6-6.0-6.5 Concentration	MW6-6.0-6.5 Reporting Limit
EPA Method 8240:							
Chloromethane	ug/kg	ND	60	ND	60	ND	60
Bromomethane	ug/kg	ND	60	ND	60	ND	60
Dichlorodifluoromethane	ug/kg	ND	60	ND	60	ND	60
Vinyl Chloride	ug/kg	ND	120	ND	120	ND	120
Chloroethane	ug/kg	ND	120	ND	120	ND	120
Iodomethane	ug/kg	ND	1,200	ND	1,200	ND	1,200
Methylene Chloride	ug/kg	ND	1,200	ND	1,200	ND	1,200
Acetone	ug/kg	ND	1,200	ND	1,200	ND	1,200
Carbon Disulfide	ug/kg	ND	1,200	ND	1,200	ND	1,200
Trichlorofluoromethane	ug/kg	ND	120	ND	120	ND	120
1,1-Dichloroethene	ug/kg	ND	60	ND	60	ND	60
Allyl Chloride	ug/kg	ND	60	ND	60	ND	60
1,1-Dichloroethane	ug/kg	ND	60	ND	60	ND	60
Trans-1,2-Dichloroethene	ug/kg	ND	60	ND	60	ND	60
Chloroform	ug/kg	ND	60	ND	60	ND	60
2-Butanone (MEK)	ug/kg	ND	1,200	ND	1,200	ND	1,200
1,2-Dichloroethane	ug/kg	ND	60	ND	60	ND	60
Dibromomethane	ug/kg	ND	60	ND	60	ND	60
1,1,1-Trichloroethane	ug/kg	ND	60	ND	60	ND	60
Carbon Tetrachloride	ug/kg	ND	60	ND	60	ND	60

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

LOG NUMBER: 5854
DATE SAMPLED: 09/25/95 and 09/26/95
DATE RECEIVED: 09/26/95
DATE EXTRACTED: 10/04/95
DATE ANALYZED: 10/05/95
DATE REPORTED: 10/24/95
PAGE: Four

Sample Type: Soil

Method and Constituent	Units	MW4-5.5-6.0 Concentration	MW4-5.5-6.0 Reporting Limit	MW6-3.5-4.0 Concentration	MW6-3.5-4.0 Reporting Limit	MW6-6.0-6.5 Concentration	MW6-6.0-6.5 Reporting Limit
EPA Method 8240 (Continued):							
Vinyl Acetate	ug/kg	ND	600	ND	600	ND	600
Bromodichloromethane	ug/kg	ND	60	ND	60	ND	60
1,2-Dichloropropane	ug/kg	ND	60	ND	60	ND	60
Cis-1 3-Dichloropropene	ug/kg	ND	60	ND	60	ND	60
Bromoacetone	ug/kg	ND	1,200	ND	1,200	ND	1,200
Trichloroethene	ug/kg	ND	60	ND	60	ND	60
Benzene	ug/kg	ND	60	ND	60	ND	60
Chlorodibromomethane	ug/kg	ND	60	ND	60	ND	60
1,1,2-Trichloroethane	ug/kg	ND	60	ND	60	ND	60
Trans-1 3-Dichloropropane	ug/kg	ND	60	ND	60	ND	60
1 2-Dibromoethane (EDB)	ug/kg	ND	60	ND	60	ND	60
2-Chloroethylvinyl Ether	ug/kg	ND	120	ND	120	ND	120
Acrolein	ug/kg	ND	1,200	ND	1,200	ND	1,200
Bromoform	ug/kg	ND	60	ND	60	ND	60
1,1,1,2-Tetrachloroethane	ug/kg	ND	60	ND	60	ND	60
4-Methyl-2-Pentanone (MIBK)	ug/kg	ND	600	ND	600	ND	600
2-Hexanone	ug/kg	ND	600	ND	600	ND	600
1,2,3-Trichloropropane	ug/kg	ND	60	ND	60	ND	60
1,1,2,2-Tetracholorethane	ug/kg	ND	60	ND	60	ND	60
Tetrachloroethene	ug/kg	ND	60	ND	60	ND	60
Toluene	ug/kg	ND	60	ND	60	ND	60
Chlorobenzene	ug/kg	220	60	ND	60	ND	60
Ethylbenzene	ug/kg	ND	60	ND	60	ND	60

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

LOG NUMBER: 5854
DATE SAMPLED: 09/25/95 and 09/26/95
DATE RECEIVED: 09/26/95
DATE EXTRACTED: 10/04/95
DATE ANALYZED: 10/05/95
DATE REPORTED: 10/24/95
PAGE: Five

Sample Type: Soil

Method and Constituent	Units	MW4-5.5-6.0 Concentration	MW4-5.5-6.0 Reporting Limit	MW6-3.5-4.0 Concentration	MW6-3.5-4.0 Reporting Limit	MW6-6.0-6.5 Concentration	MW6-6.0-6.5 Reporting Limit
EPA Method 8240 (Continued):							
1,2-Dibromo 3-Chloropropane	ug/kg	ND	1,200	ND	1,200	ND	1,200
Benzyl Chloride	ug/kg	ND	1,200	ND	1,200	ND	1,200
Styrene	ug/kg	ND	60	ND	60	ND	60
Xylenes	ug/kg	ND	180	ND	180	ND	180
1,3-Dichlorobenzene	ug/kg	ND	60	ND	60	ND	60
1,2-Dichlorobenzene	ug/kg	ND	60	ND	60	ND	60
1,4-Dichlorobenzene	ug/kg	67	60	ND	60	ND	60
Surrogate % Recovery							
1,2-Dichloroethane-d4		98		60		97	
Toluene-d8		95		92		96	
4-Bromofluorobenzne		95		100		101	

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

LOG NUMBER: 5854
DATE SAMPLED: 09/26/95
DATE RECEIVED: 09/26/95
DATE EXTRACTED: 10/04/95
DATE ANALYZED: 10/05/95
DATE REPORTED: 10/24/95
PAGE: Six

Sample Type: Soil

Method and Constituent:	Units	MW6-15.5-16.0 Concentration	MW6-15.5-16.0 Reporting Limit	MW7-15.5-16.0 Concentration	MW7-15.5-16.0 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 8240:							
Chloromethane	ug/kg	ND	60	ND	60	ND	60
Bromomethane	ug/kg	ND	60	ND	60	ND	60
Dichlorodifluoromethane	ug/kg	ND	60	ND	60	ND	60
Vinyl Chloride	ug/kg	ND	120	ND	120	ND	120
Chloroethane	ug/kg	ND	120	ND	120	ND	120
Iodomethane	ug/kg	ND	1,200	ND	1,200	ND	1,200
Methylene Chloride	ug/kg	ND	1,200	ND	1,200	ND	1,200
Acetone	ug/kg	ND	1,200	ND	1,200	ND	1,200
Carbon Disulfide	ug/kg	ND	1,200	ND	1,200	ND	1,200
Trichlorofluoromethane	ug/kg	ND	120	ND	120	ND	120
1,1-Dichloroethene	ug/kg	ND	60	ND	60	ND	60
Allyl Chloride	ug/kg	ND	60	ND	60	ND	60
1,1-Dichloroethane	ug/kg	ND	60	ND	60	ND	60
Trans-1,2-Dichloroethene	ug/kg	ND	60	ND	60	ND	60
Chloroform	ug/kg	ND	60	ND	60	ND	60
2-Butanone (MEK)	ug/kg	ND	1,200	ND	1,200	ND	1,200
1,2-Dichloroethane	ug/kg	ND	60	ND	60	ND	60
Dibromomethane	ug/kg	ND	60	ND	60	ND	60
1,1,1-Trichloroethane	ug/kg	ND	60	ND	60	ND	60
Carbon Tetrachloride	ug/kg	ND	60	ND	60	ND	60

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

LOG NUMBER: 5854
DATE SAMPLED: 09/26/95
DATE RECEIVED: 09/26/95
DATE EXTRACTED: 10/04/95
DATE ANALYZED: 10/05/95
DATE REPORTED: 10/24/95
PAGE: Seven

Sample Type: Soil

Method and Constituent	Units	MW6-15.5-16.0 Concentration	MW6-15.5-16.0 Reporting Limit	MW7-15.5-16.0 Concentration	MW7-15.5-16.0 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 8240 (Continued):							
Vinyl Acetate	ug/kg	ND	600	ND	600	ND	600
Bromodichloromethane	ug/kg	ND	60	ND	60	ND	60
1,2-Dichloropropane	ug/kg	ND	60	ND	60	ND	60
Cis-1 3-Dichloropropene	ug/kg	ND	60	ND	60	ND	60
Bromoacetone	ug/kg	ND	1,200	ND	1,200	ND	1,200
Trichloroethene	ug/kg	ND	60	ND	60	ND	60
Benzene	ug/kg	ND	60	ND	60	ND	60
Chlorodibromomethane	ug/kg	ND	60	ND	60	ND	60
1,1,2-Trichloroethane	ug/kg	ND	60	ND	60	ND	60
Trans-1 3-Dichloropropane	ug/kg	ND	60	ND	60	ND	60
1 2-Dibromoethane (EDB)	ug/kg	ND	60	ND	60	ND	60
2-Chloroethylvinyl Ether	ug/kg	ND	120	ND	120	ND	120
Acrolein	ug/kg	ND	1,200	ND	1,200	ND	1,200
Bromoform	ug/kg	ND	60	ND	60	ND	60
1,1,1,2-Tetrachloroethane	ug/kg	ND	60	ND	60	ND	60
4-Methyl-2-Pentanone (MIBK)	ug/kg	ND	600	ND	600	ND	600
2-Hexanone	ug/kg	ND	600	ND	600	ND	600
1,2,3-Trichloropropane	ug/kg	ND	60	ND	60	ND	60
1,1,2,2-Tetracholorethane	ug/kg	ND	60	ND	60	ND	60
Tetrachloroethene	ug/kg	ND	60	ND	60	ND	60
Toluene	ug/kg	ND	60	ND	60	ND	60
Chlorobenzene	ug/kg	ND	60	ND	60	ND	60
Ethylbenzene	ug/kg	ND	60	ND	60	ND	60

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

LOG NUMBER: 5854
DATE SAMPLED: 09/26/95
DATE RECEIVED: 09/26/95
DATE EXTRACTED: 10/04/95
DATE ANALYZED: 10/05/95
DATE REPORTED: 10/24/95
PAGE: Eight

Sample Type: Soil

Method and Constituent	Units	MW6-15.5-16.0 Concentration	MW6-15.5-16.0 Reporting Limit	MW7-15.5-16.0 Concentration	MW7-15.5-16.0 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 8240 (Continued):							
1,2-Dibromo 3-Chloropropane	ug/kg	ND	1,200	ND	1,200	ND	1,200
Benzyl Chloride	ug/kg	ND	1,200	ND	1,200	ND	1,200
Styrene	ug/kg	ND	60	ND	60	ND	60
Xylenes	ug/kg	ND	180	ND	180	ND	180
1,3-Dichlorobenzene	ug/kg	ND	60	ND	60	ND	60
1,2-Dichlorobenzene	ug/kg	ND	60	ND	60	ND	60
1,4-Dichlorobenzene	ug/kg	ND	60	ND	60	ND	60
Surrogate % Recovery							
1,2-Dichloroethane-d4		99		80		97	
Toluene-d8		97		95		97	
4-Bromofluorobenzne		102		101		99	

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

Louis W. DuPuis
Quality Assurance/Quality Control Manager

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

LOG NUMBER: 5854A
DATE SAMPLED: 09/25/95 and 09/26/95
DATE RECEIVED: 09/26/95
DATE INITIATED: 10/09/95
DATE EXTRACTED: 10/26/95 and 11/07/95
DATE ANALYZED: 10/31/95, 11/01/95, and 11/08/95
DATE REPORTED: 11/08/95

CUSTOMER: Versar, Inc.

REQUESTER: Philip M. Cox

PROJECT: No. 2463-102, Crowley Yard 2

Sample Type: Soil

Method and Constituent:	Units	MW4-5.5-6.0 Concentration	MW4-5.5-6.0 Reporting Limit	MW6-3.5-4.0 Concentration	MW6-3.5-4.0 Reporting Limit	MW6-6.0-6.5 Concentration	MW6-6.0-6.5 Reporting Limit
EPA Method 7210:							
Copper	ug/kg	150,000	500	200,000	500	32,000	500
EPA Method 7420:							
Lead	ug/kg	30,000	3,600	39,000	3,600	ND	3,600
EPA Method 7471:							
Mercury	ug/kg	ND	120	1,300	120	ND	120
EPA Method 7950:							
Zinc	ug/kg	180,000	1,200	140,000	1,200	69,000	1,200

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

Trace Analysis Laboratory, Inc.

LOG NUMBER: 5854A
DATE SAMPLED: 09/26/95
DATE RECEIVED: 09/26/95
DATE INITIATED: 10/09/95
DATE EXTRACTED: 10/26/95 and 11/07/95
DATE ANALYZED: 10/31/95, 11/01/95, and 11/08/95
DATE REPORTED: 11/08/95
PAGE: Two

Sample Type: Soil

Method and Constituent:	Units	MW6-15.5-16.0 Concentration	MW6-15.5-16.0 Reporting Limit	MW7-15.5-16.0 Concentration	MW7-15.5-16.0 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 7210:							
Copper	ug/kg	360,000	500	32,000	500	ND	500
EPA Method 7420:							
Lead	ug/kg	5,800	3,600	5,900	3,600	ND	3,600
EPA Method 7471:							
Mercury	ug/kg	ND	120	ND	120	ND	120
EPA Method 7950:							
Zinc	ug/kg	87,000	1,200	40,000	1,200	ND	1,200

Trace Analysis Laboratory, Inc.

LOG NUMBER: 5854A
DATE SAMPLED: 09/26/95
DATE RECEIVED: 09/26/95
DATE INITIATED: 10/09/95
DATE EXTRACTED: 10/26/95 and 11/07/95
DATE ANALYZED: 10/31/95, 11/01/95, and 11/08/95
DATE REPORTED: 11/08/95
PAGE: Three

Sample Type: Soil

Method and Constituent:	Units	QC Summary % Recovery	QC Summary % RPD
EPA Method 7210:			
Copper	ug/kg	70	3.5
EPA Method 7420:			
Lead	ug/kg	93*	*
EPA Method 7471:			
Mercury	ug/kg	95	7.6
EPA Method 7950:			
Zinc	ug/kg	86	0.8

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

*The Recovery is for the laboratory Control Sample and the RPD is not reportable due to interference in the sample spiked.

Louis W. DuPuis
Quality Assurance/Quality Control Manager

Versar

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE	Y / N
2463-102	Crowley Yd II		N

SAMPLERS: *(Signature)* Philip M. Cox — (Printed) Philip M. Cox

	FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	TPH/D/MO ~~hold for PC 10/2/95~~	TPH/G	EPA 8240	~~TOG 5520 EF~~ Cancel per PC 10/2/95		Cu, Pb, Hg, Zn Initiated 10/9/95 by PC RSI TAT			REMARKS
H	MW4 5.5-6.0	9/25/95	930		X	Monitoring Well MW4	1	X	X	X	X		X			
N	MW6-3.5-4.0	9/26/95	1100		X	Monitoring Well MW6	1	X	X	X	X		X			
N	MW6-6.0-6.5	↓	1120		X	↓	1	X	X	X	X		X			
N	MW6-15.5-16.0	↓	1234		X	↓	1	X	X	X	X		X			
N	MW7-15.5-16.0	↓	825		X	Monitoring Well MW7	1	X	X	X	X		X			

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Philip M. Cox	9/26/95 1314				
(Printed) Philip M. Cox	Versar	(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
		Scott T. [illegible]	9/26/95 1314	Normal 15-20 day TAT
(Printed)		(Printed) Scott T. Ferriman		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink). P/4, Soil, 1-BT each, on ice, Y-8, Reg

MONITORING WELL PURGE TABLE

Project Number: 2463-103	**Site Name:** Former Pacific Dry Dock and Repair Company Yard II Facility
Well Number: MW1	**Date(s) Purged:** 9/29/95
OVA - Ambient: 0 ppm	**Purge Method:** Dedicated bailer
OVA - Vault: 0 ppm	**Purge Rate:** 1.4 gallon/min
OVA - Casing: 0 ppm	**Date & Time Sampled:** 9/29/95 (1155)
Water Level - Initial: 3.55 feet	**Purged & Sampled By:** P. Hoffmeister and Patrick Soluri
Water Level - Final: 3.72 feet	**Sampling Method:** Dedicated bailer
Well Depth: 14.75 feet	**Free Product:** No
Well Diameter: 4 inches	**Sheen:** No
Well Casing Volume: 6.72 gallons	**Odor:** No

Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
1135	1.0	72.3	8.45	2,900	Clear
1137	3.0	72.6	8.16	2,250	Low
1139	6.0	71.7	7.88	1,560	Low
1141	9.0	72.1	7.83	1,790	Low
1143	12.0	71.5	7.95	1,440	Low
1145	15.0	71.5	7.95	1,250	Low
1147	18.0	71.5	7.85	1,290	Low
1148	19.0	71.5	7.84	1,210	Low
1149	20.0	71.7	7.82	1,250	Low
1155	Sample	69.4	8.14	1,150	Low

MONITORING WELL PURGE TABLE

Project Number: 2463-103	**Site Name:** Former Pacific Dry Dock and Repair Company Yard II Facility
Well Number: MW2	**Date(s) Purged:** 9/29/95
OVA - Ambient: 0 ppm	**Purge Method:** Dedicated bailer
OVA - Vault: 0 ppm	**Purge Rate:** 1.3 gallon/min
OVA - Casing: 29 ppm	**Date & Time Sampled:** 9/29/95 (1235)
Water Level - Initial: 4.90 feet	**Purged & Sampled By:** P. Hoffmeister and Patrick Soluri
Water Level - Final: 5.00 feet	**Sampling Method:** Dedicated bailer
Well Depth: 16.60 feet	**Free Product:** No
Well Diameter: 4 inches	**Sheen:** Yes
Well Casing Volume: 7.02 gallons	**Odor:** Strong hydrocarbon

Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
1215	1.0	70.5	6.5	7,320	Clear
1217	3.0	72.9	6.35	1,800	Low
1219	6.0	72.9	6.11	1,960	Low
1221	9.0	72.2	6.16	1,950	Low
1223	12.0	71.9	6.10	1,860	Low
1225	15	72.0	6.18	1,830	Low
1227	18	72.0	6.17	1,770	Low
1229	19	71.8	6.16	1,830	Low
1230	20	71.6	6.18	1,850	Low
1231	21	71.7	6.09	1,860	Low
1235	Sample	70.5	6.63	1,800	Low

MONITORING WELL PURGE TABLE

Project Number: 2463-103	**Site Name:** Former Pacific Dry Dock and Repair Company Yard II Facility
Well Number: MW3	**Date(s) Purged:** 9/29/95
OVA - Ambient: 0 ppm	**Purge Method:** Dedicated bailer
OVA - Vault: 0 ppm	**Purge Rate:** 1.2 gallon/min
OVA - Casing: 0 ppm	**Date & Time Sampled:** 9/29/95 (1250)
Water Level - Initial: 5.10 feet	**Purged & Sampled By:** P. Hoffmeister and Patrick Soluri
Water Level - Final: 5.10 feet @ 12:50	**Sampling Method:** Dedicated bailer
Well Depth: 14.35 feet	**Free Product:** No
Well Diameter: 4 inches	**Sheen:** No
Well Casing Volume: 5.55 gallons	**Odor:** Slight hydrocarbon

Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
1115	1.0	69.3	5.74	16,430	High
1117	3.0	73.0	6.16	8,250	High
1119	6.0	73.1	5.94	8,610	High
1122	9.0	73.1	6.03	9,520	High
1124	12.0	72.6	6.09	9,950	High
1125	13.0	72.4	6.16	9,860	High
1126	14.0	72.0	6.22	8,680	High
1127	15.0	72.2	6.23	9,570	High
1128	16.0	72.1	6.21	11,050	High
1250	Sample	74.8	6.60	3,630	Clear

MONITORING WELL PURGE TABLE

Project Number: 2463-103	**Site Name:** Former Pacific Dry Dock and Repair Company Yard II Facility
Well Number: MW4	**Date(s) Purged:** 10/2/95
OVA - Ambient: 0 ppm	**Purge Method:** Dedicated bailer
OVA - Vault: 0 ppm	**Purge Rate:** 1.3 gallon/min
OVA - Casing: 0 ppm	**Date & Time Sampled:** 10/2/95 (1110)
Water Level - Initial: 4.10 feet	**Purged & Sampled By:** P. Hoffmeister and Patrick Soluri
Water Level - Final: 4.35 feet	**Sampling Method:** Dedicated bailer
Well Depth: 15.65 feet	**Free Product:** No
Well Diameter: 4 inches	**Sheen:** Yes
Well Casing Volume: 6.93 gallons	**Odor:** Strong hydrocarbon

Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
1045	1.0	71.2	5.98	1,700	Clear
1048	3.0	73.4	5.48	1,720	High
1051	6.0	72.8	5.47	1,590	High
1053	9.0	73.2	5.18	1,500	High
1054	12.0	73.1	5.14	1,400	High
1056	15.0	72.2	5.10	1,190	High
1058	18.0	72.1	5.08	1,270	High
1059	19.0	72.5	5.01	1,270	High
1100	20.0	72.5	4.98	1,220	High
1101	21.0	72.3	4.97	1,250	High
1110	Sample	71.3	5.6	1,140	High

MONITORING WELL PURGE TABLE

Project Number: 2463-103	**Site Name:** Former Pacific Dry Dock and Repair Company Yard II Facility
Well Number: MW5	**Date(s) Purged:** 10/2/95
OVA - Ambient: 0 ppm	**Purge Method:** Dedicated bailer
OVA - Vault: 0 ppm	**Purge Rate:** 1.5 gallon/min
OVA - Casing: 0 ppm	**Date & Time Sampled:** 10/2/95 (1150)
Water Level - Initial: 4.00 feet	**Purged & Sampled By:** P. Hoffmeister and Patrick Soluri
Water Level - Final: 4.35 feet	**Sampling Method:** Dedicated bailer
Well Depth: 14.75 feet	**Free Product:** No
Well Diameter: 4 inches	**Sheen:** Yes
Well Casing Volume: 6.45 gallons	**Odor:** Moderate hydrocarbon

Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
1132	1.0	72.7	5.64	1,240	Low
1134	3.0	73.2	5.79	1,390	High
1136	6.0	72.2	5.67	1,210	High
1138	9.0	71.6	5.69	1,170	High
1140	12.0	71.8	5.62	1,140	High
1142	15.0	71.1	5.67	1,180	High
1143	17.0	70.8	5.67	1,160	High
1144	18.0	70.9	5.62	1,120	High
1145	19.0	71.0	5.65	1,160	High
1150	Sample	71.2	5.61	1,230	High

MONITORING WELL PURGE TABLE

Project Number: 2463-103	**Site Name:** Former Pacific Dry Dock and Repair Company Yard II Facility
Well Number: MW6	**Date(s) Purged:** 10/2/95
OVA - Ambient: 0 ppm	**Purge Method:** Dedicated bailer
OVA - Vault: 0 ppm	**Purge Rate:** 1.0 gallon/min
OVA - Casing: 0 ppm	**Date & Time Sampled:** 10/2/95 (0940)
Water Level - Initial: 4.87 feet	**Purged & Sampled By:** P. Hoffmeister and Patrick Soluri
Water Level - Final: 4.95 feet	**Sampling Method:** Dedicated bailer
Well Depth: 14.24 feet	**Free Product:** No
Well Diameter: 4 inches	**Sheen:** No
Well Casing Volume: 5.63 gallons	**Odor:** Slight hydrocarbon

Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
0915	1.0	69.1	6.85	2,470	High
0917	3.0	71.1	7.07	1,180	High
0920	6.0	72.4	7.03	950	High
0923	9.0	72.2	6.95	960	High
0925	12.0	72.4	6.90	890	High
0928	13.0	72.3	6.79	890	High
0929	14.0	72.5	6.71	890	High
0930	15.0	72.0	6.56	1,140	High
0931	16.0	72.2	6.62	960	High
0932	17.0	72.1	6.69	940	High
0940	Sample	70.8	6.08	840	High

MONITORING WELL PURGE TABLE

Project Number: 2463-103	**Site Name:** Former Pacific Dry Dock and Repair Company Yard II Facility
Well Number: MW7	**Date(s) Purged:** 10/2/95
OVA - Ambient: 0 ppm	**Purge Method:** Dedicated bailer
OVA - Vault: 0 ppm	**Purge Rate:** 1.1 gallon/min
OVA - Casing: 0 ppm	**Date & Time Sampled:** 10/2/95 (1020)
Water Level - Initial: 3.65 feet	**Purged & Sampled By:** P. Hoffmeister and Patrick Soluri
Water Level - Final: 3.84 feet	**Sampling Method:** Dedicated bailer
Well Depth: 13.45 feet	**Free Product:** No
Well Diameter: 4 inches	**Sheen:** No
Well Casing Volume: 5.88 gallons	**Odor:** Moderate hydrocarbon

Time	Purge Water Removed (gallons)	Temperature (degrees Fahrenheit)	pH	Electrical Conductivity (umhos/cm)	Turbidity
1000	1.0	72.1	6.01	2,030	Clear
1009	3.0	72.5	5.83	1,310	High
1006	6.0	72.7	5.75	1,240	High
1008	9.0	72.6	5.77	1,310	High
1010	12.0	72.6	5.72	1,300	High
1011	13.0	72.5	5.79	1,250	High
1012	14.0	72.5	5.72	1,250	High
1013	15.0	72.5	5.77	1,240	High
1014	16.0	72.5	5.74	1,250	High
1015	17.0	72.6	5.73	1,240	High
1020	Sample	72.0	5.46	1,260	High

APPENDIX F

Laboratory Analytical Results
and Chain-of-Custody Records for Groundwater Samples

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

October 30, 1995

Mr. Philip M. Cox
Versar, Inc.
7844 Madison Avenue, Suite 167
Fair Oaks, California 95628

Dear Mr. Cox:

Trace Analysis Laboratory received four water samples on October 2, 1995 for your Project No. 2463-103, Crowley Yard 2 (our custody log number 5873 and 5873A).

These samples were analyzed for Total Petroleum Hydrocarbons as Diesel, Motor Oil, Gasoline, Benzene, Toluene, Ethylbenzene, Xylenes, by EPA 8010, Copper, Lead, Mercury, and Zinc. 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,

Scott T. Ferriman
Project Specialist

Enclosures

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

LOG NUMBER: 5873
DATE SAMPLED: 10/02/95
DATE RECEIVED: 10/02/95
DATE EXTRACTED: 10/16/95
DATE ANALYZED: 10/27/95
DATE REPORTED: 10/30/95

CUSTOMER: Versar, Inc.

REQUESTER: Philip M. Cox

PROJECT: No. 2463-103, Crowley Yard 2

Sample Type: Water

Method and Constituent:	Units	MW-4 Concentration	MW-4 Reporting Limit	MW-5 Concentration	MW-5 Reporting Limit	MW-6 Concentration	MW-6 Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Diesel	ug/l	1,900	50	840	50	ND	50
Total Petroleum Hydrocarbons as Motor Oil	ug/l	880	500	ND	500	ND	500

Method and Constituent:	Units	MW-7 Concentration	MW-7 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
DHS Method:					
Total Petroleum Hydrocarbons as Diesel	ug/l	900	50	ND	50
Total Petroleum Hydrocarbons as Motor Oil	ug/l	ND	500	ND	500

QC Summary:

% Recovery: 89
% RPD: 22

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

Sample MW-4 contains compounds eluting earlier than the diesel standard.

Trace Analysis Laboratory, Inc.

LOG NUMBER: 5873
DATE SAMPLED: 10/02/95
DATE RECEIVED: 10/02/95
DATE ANALYZED: 10/06/95 and 10/16/95
DATE REPORTED: 10/30/95
PAGE: Two

Sample Type: Water

Method and Constituent:	Units	MW-4 Concentration	MW-4 Reporting Limit	MW-5 Concentration	MW-5 Reporting Limit	MW-6 Concentration	MW-6 Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/l	1,400	120	300	50	ND	50
EPA Method 8020 for:							
Methyl t-Butyl Ether	ug/l	ND	25	ND	5.0	ND	5.0
Benzene	ug/l	33	2.5	3.7	0.50	ND	0.50
Toluene	ug/l	ND	2.5	ND	0.50	ND	0.50
Ethylbenzene	ug/l	3.0	2.5	ND	0.50	ND	0.50
Xylenes	ug/l	ND	7.5	ND	1.5	ND	1.5

Method and Constituent:	Units	MW-7 Concentration	MW-7 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
DHS Method:					
Total Petroleum Hydrocarbons as Gasoline	ug/l	ND	50	ND	50
EPA Method 8020 for:					
Methyl t-Butyl Ether	ug/l	ND	5.0	ND	5.0
Benzene	ug/l	ND	0.50	ND	0.50
Toluene	ug/l	ND	0.50	ND	0.50
Ethylbenzene	ug/l	ND	0.50	ND	0.50
Xylenes	ug/l	ND	1.5	ND	1.5

QC Summary:

% Recovery: 105, 107
% RPD: 6.9, 1.6

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

LOG NUMBER: 5873
DATE SAMPLED: 10/02/95
DATE RECEIVED: 10/02/95
DATE ANALYZED: 10/04/95 and 10/08/95
DATE REPORTED: 10/30/95
PAGE: Three

Sample Type: Water

Method and Constituent	Units	MW-4 Concentration	MW-4 Reporting Limit	MW-5 Concentration	MW-5 Reporting Limit	MW-6 Concentration	MW-6 Reporting Limit
EPA Method 601:							
Benzyl Chloride	ug/l	ND	6,000	ND	600	ND	120
Bromobenzene	ug/l	ND	6,000	ND	600	ND	120
Bromodichloromethane	ug/l	ND	25	ND	2.5	ND	0.50
Bromoform	ug/l	ND	25	ND	2.5	ND	0.50
Bromomethane	ug/l	ND	300	ND	30	ND	6.0
Carbon Tetrachloride	ug/l	ND	300	ND	30	ND	6.0
Chlorobenzene	ug/l	390	25	35	2.5	ND	0.50
Chloroethane	ug/l	ND	300	ND	30	ND	6.0
2-Chloroethyl Vinyl Ether	ug/l	ND	300	ND	30	ND	6.0
Chloroform	ug/l	ND	25	ND	2.5	ND	0.50
Chloromethane	ug/l	ND	300	ND	30	ND	6.0
Dibromochloromethane	ug/l	ND	25	ND	2.5	ND	0.50
Dibromomethane	ug/l	ND	6,000	ND	600	ND	120
1,2-Dichlorobenzene	ug/l	ND	300	ND	30	ND	6.0
1,3-Dichlorobenzene	ug/l	ND	300	ND	30	ND	6.0
1,4-Dichlorobenzene	ug/l	ND	300	ND	30	ND	6.0
Dichlorodifluoromethane	ug/l	ND	300	ND	30	ND	6.0
1,1-Dichloroethane	ug/l	ND	25	ND	2.5	ND	0.50
1,2-Dichloroethane	ug/l	ND	25	ND	2.5	ND	0.50
1,1-Dichloroethene	ug/l	ND	25	ND	2.5	ND	0.50

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

LOG NUMBER: 5873
DATE SAMPLED: 10/02/95
DATE RECEIVED: 10/02/95
DATE ANALYZED: 10/04/95 and 10/08/95
DATE REPORTED: 10/30/95
PAGE: Four

Sample Type: Water

Method and Constituent	Units	MW-4 Concentration	MW-4 Reporting Limit	MW-5 Concentration	MW-5 Reporting Limit	MW-6 Concentration	MW-6 Reporting Limit
EPA Method 601 (Continued):							
cis and trans-1,2-Dichloroethene	ug/l	ND	25	ND	2.5	ND	0.50
Dichloromethane	ug/l	ND	6,000	ND	600	ND	120
1,2-Dichloropropane	ug/l	ND	25	ND	2.5	ND	0.50
cis-1,3-Dichloropropene	ug/l	ND	25	ND	2.5	ND	0.50
trans-1,3-Dichloropropene	ug/l	ND	25	ND	2.5	ND	0.50
1,1,2,2-Tetrachloroethane	ug/l	ND	25	ND	2.5	ND	0.50
1,1,1,2-Tetrachloroethane	ug/l	ND	6,000	ND	600	ND	120
Tetrachloroethene	ug/l	ND	25	ND	2.5	ND	0.50
1,1,1-Trichloroethane	ug/l	ND	25	ND	2.5	ND	0.50
1,1,2-Trichloroethane	ug/l	ND	25	ND	2.5	ND	0.50
Trichloroethene	ug/l	ND	25	ND	2.5	ND	0.50
Trichlorofluoromethane	ug/l	ND	300	ND	30	ND	6.0
1,2,3-Trichloropropane	ug/l	ND	6,000	ND	600	ND	120
Vinyl Chloride	ug/l	ND	300	ND	30	ND	6.0

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

TAL Trace Analysis Laboratory, Inc.

LOG NUMBER: 5873
DATE SAMPLED: 10/02/95
DATE RECEIVED: 10/02/95
DATE ANALYZED: 10/04/95 and 10/08/95
DATE REPORTED: 10/30/95
PAGE: Five

Sample Type: Water

Method and Constituent	Units	MW-7 Concentration	MW-7 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 601:					
Benzyl Chloride	ug/l	ND	120	ND	120
Bromobenzene	ug/l	ND	120	ND	120
Bromodichloromethane	ug/l	ND	0.50	ND	0.50
Bromoform	ug/l	ND	0.50	ND	0.50
Bromomethane	ug/l	ND	6.0	ND	6.0
Carbon Tetrachloride	ug/l	ND	6.0	ND	6.0
Chlorobenzene	ug/l	ND	0.50	ND	0.50
Chloroethane	ug/l	ND	6.0	ND	6.0
2-Chloroethyl Vinyl Ether	ug/l	ND	6.0	ND	6.0
Chloroform	ug/l	ND	0.50	ND	0.50
Chloromethane	ug/l	ND	6.0	ND	6.0
Dibromochloromethane	ug/l	ND	0.50	ND	0.50
Dibromomethane	ug/l	ND	120	ND	120
1,2-Dichlorobenzene	ug/l	ND	6.0	ND	6.0
1,3-Dichlorobenzene	ug/l	ND	6.0	ND	6.0
1,4-Dichlorobenzene	ug/l	ND	6.0	ND	6.0
Dichlorodifluoromethane	ug/l	ND	6.0	ND	6.0
1,1-Dichloroethane	ug/l	ND	0.50	ND	0.50
1,2-Dichloroethane	ug/l	ND	0.50	ND	0.50
1,1-Dichloroethene	ug/l	ND	0.50	ND	0.50

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

LOG NUMBER: 5873
DATE SAMPLED: 10/02/95
DATE RECEIVED: 10/02/95
DATE ANALYZED: 10/04/95 and 10/08/95
DATE REPORTED: 10/30/95
PAGE: Six

Sample Type: Water

Method and Constituent	Units	MW-7 Concentration	MW-7 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 601 (Continued):					
cis and trans-1,2-Dichloroethene	ug/l	ND	0.50	ND	0.50
Dichloromethane	ug/l	ND	120	ND	120
1,2-Dichloropropane	ug/l	ND	0.50	ND	0.50
cis-1,3-Dichloropropene	ug/l	ND	0.50	ND	0.50
trans-1,3-Dichloropropene	ug/l	ND	0.50	ND	0.50
1,1,2,2-Tetrachloroethane	ug/l	ND	0.50	ND	0.50
1,1,1,2-Tetrachloroethane	ug/l	ND	120	ND	120
Tetrachloroethene	ug/l	ND	0.50	ND	0.50
1,1,1-Trichloroethane	ug/l	ND	0.50	ND	0.50
1,1,2-Trichloroethane	ug/l	ND	0.50	ND	0.50
Trichloroethene	ug/l	ND	0.50	ND	0.50
Trichlorofluoromethane	ug/l	ND	6.0	ND	6.0
1,2,3-Trichloropropane	ug/l	ND	120	ND	120
Vinyl Chloride	ug/l	ND	6.0	ND	6.0

QC Summary:

% Recovery: 107, 109
% RPD: 2.5, 0.5

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

LOG NUMBER: 5873A
DATE SAMPLED: 10/02/95
DATE RECEIVED: 10/02/95
DATE INITIATED: 10/09/95
DATE EXTRACTED: 10/10/95 and 10/12/95
DATE ANALYZED: 10/11/95, 10/12/95, and 10/20/95
DATE REPORTED: 10/30/95
PAGE: Seven

Sample Type: Water

Method and Constituent:	Units	MW-4 Concentration	MW-4 Reporting Limit	MW-5 Concentration	MW-5 Reporting Limit	MW-6 Concentration	MW-6 Reporting Limit
EPA Method 220.1:							
Copper	ug/l	20	20	ND	20	ND	20
EPA Method 239.1:							
Lead	ug/l	210	100	ND	100	ND	100
EPA Method 245.1:							
Mercury	ug/l	0.60	0.20	0.91	0.20	2.3	0.20
EPA Method 289.1:							
Zinc	ug/l	440	5.0	240	5.0	140	5.0

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

LOG NUMBER: 5873A
DATE SAMPLED: 10/02/95
DATE RECEIVED: 10/02/95
DATE INITIATED: 10/09/95
DATE EXTRACTED: 10/10/95 and 10/12/95
DATE ANALYZED: 10/11/95, 10/12/95, and 10/20/95
DATE REPORTED: 10/30/95
PAGE: Eight

Sample Type: Water

Method and Constituent:	Units	MW-7 Concentration	MW-7 Reporting Limit	Method Blank Concentration	Method Blank Reporting Limit	QC Summary % Recovery	QC Summary % RPD
EPA Method 220.1:							
Copper	ug/l	20	20	ND	20	100	0.8
EPA Method 239.1:							
Lead	ug/l	310	100	ND	100	89	3.6
EPA Method 245.1:							
Mercury	ug/l	11	0.20	ND	0.20	99	4.7
EPA Method 289.1:							
Zinc	ug/l	380	5.0	ND	5.0	100	0.7

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

Louis W. DuPuis
Quality Assurance/Quality Control Manager

5875

Versar

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE Y / (N)
2463-103	CROWLEY YD II	N

SAMPLERS: *(Signature)* Philip L. Hoffmeister (Printed) PHILIP HOFFMEISTER

PARAMETERS

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	HVOC's 8010	TPH-G/BTEX	TPH-D/MO	~~TOC~~	METALS Cu, Pb, Zn, Hg ...			REMARKS
MW4	10/2/95	11:10		X		7	X	X	X	~~4~~	X			WATER
MW5	↓	11:50		X		7	X	X	X	~~4~~	X			↓
MW6	↓	9:40		X		7	X	X	X	~~4~~	X			↓
MW7	↓	10:20		X		7	X	X	X	~~4~~	X			↓

(Metals annotation: Initiated 10/9/95 by PC Reg TAT)

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Philip L. Hoffmeister	10/2/95 1300				
(Printed) PHILIP HOFFMEISTER		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
		Scott T. Ferriman	10/2/95 1300	Res
(Printed)		(Printed) Scott T. Ferriman		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink). P/4, water, 2 R + 1-500 ml, + 4 vials, ~~on ice~~, on ice, Green, Tray 6, Res SF

Versar

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE Y / N
2463-103	CROWLEY YD II	

SAMPLERS: (Signature) Philip L. Hoffmeister (Printed) PHILIP HOFFMEISTER

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	HVOCs 8010	TPH-G/BTEX	TPH-D/MO	TOC	METALS Cu, Pb, Ni, Zn by FLAA 10/19/95 TAT	REMARKS
MW4	10/2/95	11:10		X		7	X	X	X	H	X	WATER
MW5		11:50		X		7	X	X	X	H	X	
MW6		9:40		X		7	X	X	X	H	X	
MW7		10:20		X		7	X	X	X	H	X	

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Philip L. Hoffmeister	10/2/95 1300				
(Printed) PHILIP HOFFMEISTER		(Printed)	(Printed)		(Printed)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) Scott T. Ferriman	Date / Time 10/2/95 1300	Remarks Res	
(Printed)		(Printed) Scott T. Ferriman			

White and yellow: Copy to Coordinator Field Files (pink) [illegible] Green Tray 6. Res

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

October 30, 1995

Mr. Philip M. Cox
Versar, Inc.
7844 Madison Avenue, Suite 167
Fair Oaks, California 95628

Dear Mr. Cox:

Trace Analysis Laboratory received three water samples on September 29, 1995 for your Project No. 2463-102, Crowley Yard 2 (our custody log number 5869).

These samples were analyzed for Total Petroleum Hydrocarbons as Diesel, Motor Oil, Gasoline, Benzene, Toluene, Ethylbenzene, Xylenes, and by EPA 8010. 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,

Scott T. Ferriman
Project Specialist

Enclosures

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

LOG NUMBER: 5869
DATE SAMPLED: 09/29/95
DATE RECEIVED: 09/29/95
DATE EXTRACTED: 10/13/95
DATE ANALYZED: 10/26/95
DATE REPORTED: 10/30/95

CUSTOMER: Versar, Inc.

REQUESTER: Philip M. Cox

PROJECT: No. 2463-102, Crowley Yard 2

Sample Type: Water

Method and Constituent:	Units	MW-1 Concentration	MW-1 Reporting Limit	MW-2 Concentration	MW-2 Reporting Limit	MW-3 Concentration	MW-3 Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Diesel	ug/l	ND	50	870	50	ND	50
Total Petroleum Hydrocarbons as Motor Oil	ug/l	ND	500	ND	500	ND	500

Method and Constituent:	Units	Method Blank Concentration	Method Blank Reporting Limit
DHS Method:			
Total Petroleum Hydrocarbons as Diesel	ug/l	ND	50
Total Petroleum Hydrocarbons as Motor Oil	ug/l	ND	500

QC Summary:

% Recovery: 102
% RPD: 36

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

LOG NUMBER: 5869
DATE SAMPLED: 09/29/95
DATE RECEIVED: 09/29/95
DATE ANALYZED: 10/11/95
DATE REPORTED: 10/30/95
PAGE: Two

Sample Type: Water

Method and Constituent:	Units	MW-1 Concentration	MW-1 Reporting Limit	MW-2 Concentration	MW-2 Reporting Limit	MW-3 Concentration	MW-3 Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/l	ND	50	1,400	620	ND	50
EPA Method 8020 for:							
Methyl t-Butyl Ether	ug/l	ND	5.0	ND	120	ND	5.0
Benzene	ug/l	ND	0.50	41	12	ND	0.50
Toluene	ug/l	ND	0.50	ND	12	ND	0.50
Ethylbenzene	ug/l	ND	0.50	ND	12	ND	0.50
Xylenes	ug/l	ND	1.5	ND	38	ND	1.5

Method and Constituent:	Units	Method Blank Concentration	Method Blank Reporting Limit
DHS Method:			
Total Petroleum Hydrocarbons 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: 86
% RPD: 12

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

LOG NUMBER: 5869
DATE SAMPLED: 09/29/95
DATE RECEIVED: 09/29/95
DATE ANALYZED: 10/04/95, 10/08/95, and 10/13/95
DATE REPORTED: 10/30/95
PAGE: Three

Sample Type: Water

Method and Constituent	Units	MW-1 Concentration	MW-1 Reporting Limit	MW-2 Concentration	MW-2 Reporting Limit	MW-3 Concentration	MW-3 Reporting Limit
EPA Method 8010:							
Benzyl Chloride	ug/l	ND	120	ND	15,000	ND	120
Bromobenzene	ug/l	ND	120	ND	15,000	ND	120
Bromodichloromethane	ug/l	ND	0.50	ND	62	ND	0.50
Bromoform	ug/l	ND	0.50	ND	62	ND	0.50
Bromomethane	ug/l	ND	6.0	ND	750	ND	6.0
Carbon Tetrachloride	ug/l	ND	6.0	ND	750	ND	6.0
Chlorobenzene	ug/l	1.5	0.50	940	62	ND	0.50
Chloroethane	ug/l	ND	6.0	ND	750	ND	6.0
2-Chloroethyl Vinyl Ether	ug/l	ND	6.0	ND	750	ND	6.0
Chloroform	ug/l	ND	0.50	ND	62	ND	0.50
Chloromethane	ug/l	ND	6.0	ND	750	ND	6.0
Dibromochloromethane	ug/l	ND	0.50	ND	62	ND	0.50
Dibromomethane	ug/l	ND	120	ND	15,000	ND	120
1,2-Dichlorobenzene	ug/l	ND	6.0	ND	750	ND	6.0
1,3-Dichlorobenzene	ug/l	ND	6.0	ND	750	ND	6.0
1,4-Dichlorobenzene	ug/l	ND	6.0	ND	750	ND	6.0
Dichlorodifluoromethane	ug/l	ND	6.0	ND	750	ND	6.0
1,1-Dichloroethane	ug/l	ND	0.50	ND	62	ND	0.50
1,2-Dichloroethane	ug/l	ND	0.50	ND	62	ND	0.50
1,1-Dichloroethene	ug/l	ND	0.50	ND	62	ND	0.50

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

LOG NUMBER: 5869
DATE SAMPLED: 09/29/95
DATE RECEIVED: 09/29/95
DATE ANALYZED: 10/04/95, 10/08/95, and 10/13/95
DATE REPORTED: 10/30/95
PAGE: Four

Sample Type: Water

Method and Constituent	Units	MW-1 Concentration	MW-1 Reporting Limit	MW-2 Concentration	MW-2 Reporting Limit	MW-3 Concentration	MW-3 Reporting Limit
EPA Method 8010 (Continued):							
cis and trans-1,2-Dichloroethene	ug/l	ND	0.50	ND	62	ND	0.50
Dichloromethane	ug/l	ND	120	ND	15,000	ND	120
1,2-Dichloropropane	ug/l	ND	0.50	ND	62	ND	0.50
cis-1,3-Dichloropropene	ug/l	ND	0.50	ND	62	ND	0.50
trans-1,3-Dichloropropene	ug/l	ND	0.50	ND	62	ND	0.50
1,1,2,2-Tetrachloroethane	ug/l	ND	0.50	ND	62	ND	0.50
1,1,1,2-Tetrachloroethane	ug/l	ND	120	ND	15,000	ND	120
Tetrachloroethene	ug/l	ND	0.50	ND	62	ND	0.50
1,1,1-Trichloroethane	ug/l	ND	0.50	ND	62	ND	0.50
1,1,2-Trichloroethane	ug/l	ND	0.50	ND	62	ND	0.50
Trichloroethene	ug/l	ND	0.50	ND	62	ND	0.50
Trichlorofluoromethane	ug/l	ND	6.0	ND	750	ND	6.0
1,2,3-Trichloropropane	ug/l	ND	120	ND	15,000	ND	120
Vinyl Chloride	ug/l	ND	6.0	ND	750	ND	6.0

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

LOG NUMBER: 5869
DATE SAMPLED: 09/29/95
DATE RECEIVED: 09/29/95
DATE ANALYZED: 10/04/95, 10/08/95, and 10/13/95
DATE REPORTED: 10/30/95
PAGE: Five

Sample Type: Water

Method and Constituent	Units	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 8010:			
Benzyl Chloride	ug/l	ND	120
Bromobenzene	ug/l	ND	120
Bromodichloromethane	ug/l	ND	0.50
Bromoform	ug/l	ND	0.50
Bromomethane	ug/l	ND	6.0
Carbon Tetrachloride	ug/l	ND	6.0
Chlorobenzene	ug/l	ND	0.50
Chloroethane	ug/l	ND	6.0
2-Chloroethyl Vinyl Ether	ug/l	ND	6.0
Chloroform	ug/l	ND	0.50
Chloromethane	ug/l	ND	6.0
Dibromochloromethane	ug/l	ND	0.50
Dibromomethane	ug/l	ND	120
1,2-Dichlorobenzene	ug/l	ND	6.0
1,3-Dichlorobenzene	ug/l	ND	6.0
1,4-Dichlorobenzene	ug/l	ND	6.0
Dichlorodifluoromethane	ug/l	ND	6.0
1,1-Dichloroethane	ug/l	ND	0.50
1,2-Dichloroethane	ug/l	ND	0.50
1,1-Dichloroethene	ug/l	ND	0.50

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

LOG NUMBER: 5869
DATE SAMPLED: 09/29/95
DATE RECEIVED: 09/29/95
DATE ANALYZED: 10/04/95, 10/08/95, and 10/13/95
DATE REPORTED: 10/30/95
PAGE: Six

Sample Type: Water

Method and Constituent	Units	Method Blank Concentration	Method Blank Reporting Limit
EPA Method 8010 (Continued):			
cis and trans-1,2-Dichloroethene	ug/l	ND	0.50
Dichloromethane	ug/l	ND	120
1,2-Dichloropropane	ug/l	ND	0.50
cis-1,3-Dichloropropene	ug/l	ND	0.50
trans-1,3-Dichloropropene	ug/l	ND	0.50
1,1,2,2-Tetrachloroethane	ug/l	ND	0.50
1,1,1,2-Tetrachloroethane	ug/l	ND	120
Tetrachloroethene	ug/l	ND	0.50
1,1,1-Trichloroethane	ug/l	ND	0.50
1,1,2-Trichloroethane	ug/l	ND	0.50
Trichloroethene	ug/l	ND	0.50
Trichlorofluoromethane	ug/l	ND	6.0
1,2,3-Trichloropropane	ug/l	ND	120
Vinyl Chloride	ug/l	ND	6.0

QC Summary:

% Recovery: 109, 107, 108
% RPD: 0.5, 2.5, 4.9

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

Louis W. DuPuis
Quality Assurance/Quality Control Manager

5869

Versar

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE	Y / N
2463-102	Crowley Yard II		N (circled)

SAMPLERS: (Signature) [signature]

(Printed) Patrick Soluri

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	HVOCs 8010	TPH-G/BTEX	TPH-D/MO	~~TOG~~ Initialed MO RPM 10/6/95 cancelled for PC	Metals (Cu, Pb) Initialed to 10/9/95 by PC Reg TAT				REMARKS
MW-1	9/29	11:55		X		7	X	X	X	X	X				water
MW-2	9/29	12:35		X		7	X	X	X	X	X				↓
MW-3	9/29	12:50		X		7	X	X	X	X	X				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	9/29/95 14:20				
(Printed) Patrick Soluri		(Printed)	(Printed)		(Printed)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks
		[signature]	9/29/95 14:20	Res TAT
(Printed)		(Printed) Scott T. Ferriman		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink). D/4 water, 2 L + 1-500ml, + 4 VOAs on ice, Green, Tray 6, Reg

Versar

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME
2463-102	Crowley Yard II

SAMPLERS: (Signature) Patrick Soluri (Printed) Patrick Soluri

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	HVOCs 8010	TPH-G/BTEX	TPH-D	TOG	Metals	PARAMETERS	INDUSTRIAL HYGIENE SAMPLE Y/N	REMARKS
MW-1	9/29	11:55		X		7	X	X	X	X[H]	X[H]			water
MW-2	9/29	12:35		X		7	X	X	X	X[H]	X[H]			↓
MW-3	9/29	12:50		X		7	X	X	X	X[H]	X[H]			

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
(Printed) Patrick Soluri	9/29/91 14:20	(Printed)	(Printed)		(Printed)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
(Printed)		(Printed) Scott T. Ferriman	9/29/91 14:20	Res TAT	

Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink)

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

October 23, 1995

Mr. Philip M. Cox
Versar, Inc.
7844 Madison Avenue, Suite 167
Fair Oaks, California 95628

Dear Mr. Cox:

Trace Analysis Laboratory received three water samples on September 29, 1995 for your Project No. 2463-102, Crowley Yard 2 (our custody log number 5869A).

These samples were analyzed for Total Copper, Lead, Mercury, and Zinc. 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,

Scott T. Ferriman
Project Specialist

Enclosures

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

LOG NUMBER: 5869A
DATE SAMPLED: 09/29/95
DATE RECEIVED: 09/29/95
DATE INITIATED: 10/09/95
DATE EXTRACTED: 10/10/95 and 10/12/95
DATE ANALYZED: 10/11/95, 10/12/95, and 10/20/95
DATE REPORTED: 10/23/95

CUSTOMER: Versar, Inc.

REQUESTER: Philip M. Cox

PROJECT: No. 2463-102, Crowley Yard 2

Sample Type: Water

Method and Constituent:	Units	MW-1 Concentration	MW-1 Reporting Limit	MW-2 Concentration	MW-2 Reporting Limit	MW-3 Concentration	MW-3 Reporting Limit
EPA Method 220.1:							
Copper	ug/l	ND	20	ND	20	ND	20
EPA Method 239.1:							
Lead	ug/l	ND	100	ND	100	ND	100
EPA Method 245.1:							
Mercury	ug/l	0.28	0.20	ND	0.20	ND	0.20
EPA Method 289.1:							
Zinc	ug/l	56	5.0	51	5.0	60	5.0

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

TAL Trace Analysis Laboratory, Inc.

LOG NUMBER: 5869A
DATE SAMPLED: 09/29/95
DATE RECEIVED: 09/29/95
DATE INITIATED: 10/09/95
DATE EXTRACTED: 10/10/95 and 10/12/95
DATE ANALYZED: 10/11/95, 10/12/95, and 10/20/95
DATE REPORTED: 10/23/95
PAGE: Two

Sample Type: Water

Method and Constituent:	Units	Method Blank Concentration	Method Blank Reporting Limit	QC Summary % Recovery	QC Summary % RPD
EPA Method 220.1:					
Copper	ug/l	ND	20	100	0.8
EPA Method 239.1:					
Lead	ug/l	ND	100	89	3.6
EPA Method 245.1:					
Mercury	ug/l	ND	0.20	99	4.7
EPA Method 289.1:					
Zinc	ug/l	ND	5.0	100	0.7

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

Louis W. DuPuis
Quality Assurance/Quality Control Manager

58604

Versar

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME	INDUSTRIAL HYGIENE SAMPLE Y / N
2463-102	Crowley Yard II	N (circled)

SAMPLERS: *(Signature)* Patrick Soluri — *(Printed)* Patrick Soluri

PARAMETERS

FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	HVOCs 8010	TPH-G / BTEX	TPH-D / MO	FOG (struck through)	Metals				REMARKS
MW-1	9/29	11:55		X		7	X	X	X	X	X				water
MW-2	9/29	12:35		X		7	X	X	X	X	X				↓
MW-3	9/29	12:50		X		7	X	X	X	X*	X*				

Initial no ... MO ... concept for ... Initiated ... 9/29/95 ... Reg TAT

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Patrick Soluri	9/29/95 14:20				
(Printed) Patrick Soluri		(Printed)	(Printed)		(Printed)

Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks
		Scott T. Ferriman	9/29/95 14:20	Res TAT
(Printed)		(Printed) Scott T. Ferriman		

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink). D/4, water, 2 L + 1-Sand, + 4 VOAs on ice, Green, Tray 6, Reg