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SSIC NO. 5090.3.A

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21 JUN 2007

Mr. Brian Thompson, CHG, CEG
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

SUBJECT: RESPONSE TO COMMENTS ON REQUEST FOR CLOSURE OF UNDERGROUND STORAGE TANK SITE A195 IN INVESTIGATION AREA G AND SITE A266-S IN INVESTIGATION AREA F1, FORMER MARE ISLAND NAVAL SHIPYARD, VALLEJO.

Dear Mr. Thompson:

This letter is in response to your letter dated May 22, 2007 stating your non-concurrence with Navy's requests to close underground storage tanks (USTs) A195 and A266-S based on your review of the following documents:

- A Request for Closure of UST A195 and A230 at Mare Island, Vallejo, California letter, dated February 12, 1999
- A Submittal of Site Investigation Report for Suspect Underground Storage Tanks, Mare Island Naval Complex. (Former Mare Island, Shipyard), Vallejo, California Part II of III, Final; Dated June 10, 1998 letter, dated August 4, 1998

As you requested, the Navy has added information regarding the sites in the response section to your comments for your reconsideration.

Comment 1: UST Site A195 is not sufficiently characterized. Provide dimensions of UST A195 and report its burial depth to demonstrate that soil sample results characterize soil conditions beneath the former UST. We request additional investigation at depths greater than 4 feet below the ground surface, as discussed in the tri-regional board recommendations, if this information is not provided.

Response: Navy believes that UST Site A195 is sufficiently characterized. Although the dimensions of the tanks are not available in documents reviewed by the Navy, the Report on Abandoned Underground Storage Tank Investigation (Investigation Report), Mare Island Naval Shipyard, Vallejo, California, dated September 1988, (Enclosure 1) and Final Summary Report Removal and/or Abandonment of Underground Storage Tanks

5090

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2 1 JUN 2007

(Removal Report) at the Mare Island Naval Shipyard, Vallejo, California, undated, (Enclosure 2) indicated the tank size as 500 to 1000 gallons. The Investigation Report shows 500 gallons (Table 3, Tank Summary Data), while the Removal Report shows conflicting sizes. In section 2.0 of the Removal Report, Tank Activity Checklist, UST A195 is indicated as 500 gallons in size. However, section 3.1, Vallejo Fire Department Log Sheets, of the same report, indicates UST A195 to be 750-1000 gallons in size (please see hand written field notes). Navy believes that UST A195 was a 500-gallon capacity tank.

The exact burial depth of the tank is not explicitly stated in the Investigation Report or in the Removal Report. However, both reports suggest the bottom of the tank is to a depth of about 3 feet below ground level. Appendix C, Drilling Logs, of the Investigation Reports shows a sketch that the tank is not fully submerged. That same drilling log for A195-1 borehole also indicated that there was refusal at 36 inches below ground level. Navy believes that the refusal is explained in the Removal Report. Section 3.1, Vallejo Fire Department Log Sheets, of the Removal Report indicated that there is a concrete slab that was laid down for the tank. Notes prepared by Gregory A. White, Fire Prevention Inspector, Vallejo Fire Department, who was present when the tank was removed on July 17, 1990 at 1142 Hours, states "Due to a concrete slab that was laid down for the tank, the soil sample that was taken at this time is a side wall sample 3'5" below grade as indicated in the accompanying sketch". Navy believes that it is because of this concrete slab that the drilling operation reported in the Investigation Report met refusal at 36 inches below ground level.

Regarding your request for additional investigation at depths greater than 4 feet below ground surface, Navy believes that this is unnecessary and somewhat problematic to do. Firstly, as mentioned above, there is a concrete slab that was laid down for the tank. Navy believes it is this concrete slab that prevented advancement of the bore hole to more than 36 inches below grade level while attempting to take soil samples during the investigation phase. It is also because of this concrete slab that a soil sample was taken at 3'5" inches below grade when the tank was removed. Secondly, the hand written field note of the Fire Prevention Inspector of the Vallejo Fire Department, who was present during the tank removal, indicated that the "Tank appears clean". The Investigation Report stated that results from the analysis of an A195 soil sample was less than the detection limit of 10 mg/kg for TPH. This finding is confirmed by the soil analysis reported in the Removal Report (non-detect with detection limit of 10 mg/kg). Also, because of the presence of the concrete slab that was laid down for the tank, taking a soil

sample greater than 4 feet below ground level will be difficult. The Navy also believes that it is unnecessary because there was no evidence that the tank leaked. The tank appeared clean when it was removed and soil sample analysis before and after the tank removal showed no soil contamination at a detection level of 10 mg/kg for TPH. The tank removal and subsequent soil sampling were witnessed by a representative from the Vallejo Fire Department. Page 1 of Section 1, Project Summary, of the Removal Report stated that tank sites A715, A191, A195 and A230 were not contaminated and were backfilled with excavated soil or drain rock, or if groundwater was encountered, lined with two layers of 10 mil polyethylene sheet overlapped 6" at seams, and backfilled with clean import.

Comment 2: We do not concur that investigation for "not located" UST A266-S is complete. No investigation was conducted within the footprint of the former gas station, as shown on Figure B-11-1. We request additional investigation of subsurface conditions where the former gas station was located.

Response: Please note that the footprint of the identified "gas station" on a 1931-1938 map is under Building A-266 as stated on page B-2 of Table I of the Site Investigation Report for Suspect Underground Storage Tanks, Mare Island Naval Complex, (Former Mare Island Shipyard), Vallejo, CA Part II of III, Final; dated June 10, 1998. Building A-266 is still in existence. Therefore, additional investigation of subsurface conditions where the former gas station was located is not feasible unless Building A-266 is demolished. Table I further states that the structure was probably just a roofed or fenced area since it was never assigned a building number. The gas station was carried on maps through 1944 until Building A266 was constructed in 1946. Table II of the same report stated that the tank, if it ever existed, was most likely removed during construction of Building A-266 since the new building displaced the indicated gas station structure on the 1931-1938 map.

Comment 3: Information on the presence or absence of abrasive blast material (ABM, or "green sand") and chlorinated solvents is requested for UST sites as part of our collaborative working relationship with the Department of Toxic Substance Control. ABM was used as fill material at Mare Island and was placed around some utility installations (tanks, pipelines, etc). Chlorinated solvents have been detected as accessory chemicals at some UST sites.

5090

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2 1 JUN 2007

Response: Information on the presence or absence of abrasive blast material and chlorinated solvents has been provided for tank site A-195. In the Removal Report, page 2 of Section 1, Project Summary stated that "Approximately 180 tons pf metals' contaminated soil (containing sandblast grit) from Tanks 565, 637 and 577 backfill and contents, and concrete from Tank 866 were disposed at Chemical Waste Management's Kettleman Hills Class 1 Facility". Tank Site A195 was not one of the listed sources of the sandblast grit. The Investigation Report indicated that soil analysis for purgable halocarbons and purgable aromatics at tank site A195 were non-detect.

Based on the information provided above, Navy believes that UST Sites A195 and A266-S have been adequately characterized and requests that you reconsider your position regarding the closure for these tank sites.

Should you have any questions concerning this matter or if you need additional information, please contact Mr. Arturo Tamayo at (619) 532-0981, or you can contact me at (619) 532-0967.

Sincerely,



MICHAEL S. BLOOM
BRAC Environmental Coordinator
By direction of the Director

- Enclosures:
1. Report on Abandoned Underground Storage Tank Investigation (Investigation Report), Mare Island Naval Shipyard, Vallejo, California, dated September 1988.
 2. Final Summary Report Removal and/or Abandonment of Underground Storage Tanks (Removal Report) at the Mare Island Naval Shipyard, Vallejo, California, undated.

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Email/Mare Island letter Re_RWQCB Comments on UST Site A195 Site 266-5.doc

*Reference
AAA*

DO 47

REPORT
ON
ABANDONED UNDERGROUND STORAGE TANK
INVESTIGATION
MARE ISLAND NAVAL SHIPYARD
VALLEJO, CALIFORNIA

Prepared For:

DEPARTMENT OF THE NAVY
WESTERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
Delivery Order N62474-85-D-5627-0047

Prepared By:

ERM-WEST
1777 Botelho Drive
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September, 1988

ENCLOSURE 1

TABLE OF CONTENTS

	<u>Page</u>
List of Figures	ii
List of Tables	iv
SECTION ONE INTRODUCTION	1-1
Scope	1-1
Report Organization	1-2
Laboratory Analyses	1-2
SECTION TWO TANK CONTENTS	2-1
SECTION THREE SOIL AND GROUNDWATER ANALYSES	3-1
Soil	3-1
Groundwater	3-7
Tank Site 637	3-7
Tank Site 993	3-10
SECTION FOUR CONCLUSIONS AND RECOMMENDATIONS	4-1
Conclusions	4-1
Recommendations	4-3
APPENDIX A DRILLING AND SAMPLING PROCEDURES	
APPENDIX B BASE MAPS AND TANK/BOREHOLE LOCATION MAPS	
APPENDIX C DRILLING LOGS	
APPENDIX D TEMPORARY WELL COMPLETION FORMS	
APPENDIX E CHAIN OF CUSTODY FORMS	
APPENDIX F LABORATORY DATA SHEETS	

LIST OF FIGURES
IN APPENDIX B

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1	Mare Island Naval Shipyard	B-1
2	Tank Location Map A	B-2
3	Tank Location Map B	B-3
4	Tank Location Map C	B-4
5	Tanks A-71 (North) & A-71 (South)	B-5
6	Tank A-194	B-6
7	Tank A-195	B-7
8	Tank A-226	B-8
9	Tanks A-230 & A-231	B-9
10	Tank A-259	B-10
11	Tank A-914	B-11
12	Bridgeview Tank	B-12
13	Tank 505	B-13
14	Tank 521	B-14

LIST OF TABLES

<u>Table</u>	Title	<u>Page</u>
1	Analyses Selected for Tank Contents, Soil & Water Samples	1-3
2	Tank Contents Characterization	2-2
3	Tank Summary Data	2-3
4	Tank Contents Samples: Total Petroleum Hydrocarbons, Purgeable Aromatics & Halocarbons	2-4 thru 2-7
5	Priority Pollutant Metal Concentrations: Tank A-71 (North) Tank Contents	2-8
6	Total Petroleum Hydrocarbons, Purgeable Aromatics and Halocarbons in Soil Samples	3-2 thru 3-5
7	Priority Pollutant Concentrations in Soil Samples	3-6
8	Total Petroleum Hydrocarbons, Oil & Grease, Purgeable Aromatics & Halocarbons in Groundwater	3-8
9	Priority Pollutant Metal Concentrations in Groundwater Samples	3-9

SECTION ONE

INTRODUCTION

A total of 19 abandoned underground storage tanks (AUSTs) were identified and recommended for removal and closure in a May 1987 "Tank Testing Study" at Mare Island Naval Shipyard. The report was prepared by ERM-West for the U.S. Navy Western Division Naval Facility Engineering Command (WESDIV) under delivery order N-62474-85-D-5627-0019.

As a preliminary step in the closure of these tanks, this pre-closure sampling effort was authorized by delivery order N-6247-85-D-5627-0047. The goals of the sampling effort were to 1) identify the tank contents so that proper disposal can be made, and 2) determine if the soil or shallow groundwater surrounding the tanks has been contaminated.

Scope

The scope of the pre-abandonment tank services consisted of the following:

- o Sample and analyze AUST contents, if possible.
- o If unable to sample tank contents, identify probable contents based on available information.
- o Drill two soil borings at each AUST and, from each boring, obtain one soil sample from a depth equal to the bottom of the tank.

- o Where groundwater is encountered, obtain a water sample from one boring.
- o Analyze soil and groundwater samples based on the known or probable tank contents.
- o Prepare a report summarizing the results of the AUST investigation, including: location of AUSTs, sampling locations at each tank site, field notes and boring logs, results of analyses, observation and comments, and study conclusions and recommendations.

Report Organization

The report has been divided into four sections. Section One outlines the project scope, report organization and summarizes the study findings. Section Two presents the results of the tank contents analyses. Section Three contains the analyses of soil and groundwater samples. Section Four presents the study conclusions and recommendations. Appendix A describes the sampling procedures and methods used in the investigation. Appendix B contains site maps showing the location of tanks and placement of borings. Appendix C contains drilling logs. Appendix D contains chain-of-custody forms. Appendix E contains temporary well completion forms. Appendix F contains laboratory data sheets.

Laboratory Analyses

The analyses performed on soil and groundwater samples adjacent to the AUSTs were selected based on the known or probable tank contents. The selected analytical suites for different types of tank contents are listed in Table 1.

TABLE 1
ANALYSES SELECTED FOR TANK CONTENTS,
SOIL AND WATER SAMPLES

Tank Contents	Analyses	Analytical Method
Gasoline/Diesel/ Mineral Spirits	Total Petroleum Hydrocarbon (TPH) Benzene/Toluene/Xylenes/Ethylbenzene (BTXE)	8015-Modified 8020 (Soil, Tank Contents), 602 (Water)
Solvents	TPH BTXE Purgeable Halocarbons	8015-Modified 8020 (Soil, Tank Contents), 602 (Water) 8010 (Soil, Tank Contents), 601 (Water)
Waste Oil	TPH Purgeable Halocarbons and Aromatics Priority Pollutant Metals Oil and Grease Polychlorinated Biphenyls (PCBs)	8015-Modified 8010/8020 (Soil, Tank Contents), 601/602 (Water) 6000 and 7000 Series 503E 8080 (Soil, Tank Contents), 608 (Water)

SECTION TWO

TANK CONTENTS

A total of 19 AUSTs were identified for closure during the May 1987 "Tank Testing Study" conducted at the Mare Island Naval Shipyard. The locations of these tanks are shown on the Figures contained in Appendix B. Out of this total, 14 tanks were sampled and analyzed to confirm the tank contents. The tank sampling methods and procedures utilized are described in Appendix A. The remaining five tanks were not sampled for the following reasons. Tank A-267 could not be located and was assumed to have been removed prior to this investigation. The accessway and fill pipe for Tank 637-2 had been paved over with asphalt. The fill pipe for Tank A-194 was found to be too small in diameter to permit sampling. The two remaining tanks, 637-1 and 993, were currently being used to hold waste oil from the Public Works and Exchange Service Station facilities. The tank contents based on chemical analyses, observation and other available information have been summarized in Table 2.

Prior to actual sampling, the tank location and dimensions were established using surface electromagnetic survey methods. The fluid level in the tank was then measured in order to calculate the fluid volume in each tank. This information is presented in Table 3. Summary results from analyses of the sampled tank contents are contained in Table 4. Priority pollutant metal concentrations in a sample of tank A-71 contents are presented in Table 5.

TABLE 2
TANK CONTENTS CHARACTERIZATION

TANK NO.	TOTAL PETROLEUM HYDROCARBONS (TPH)		CHARACTERIZATION BASED ON TPH	CHARACTERIZATION BASED ON OTHER ANALYSES	CHARACTERIZATION BASED ON OBSERVATION	CHARACTERIZATION BASED ON OTHER INFORMATION	OVERALL CHARACTERIZATION OF TANK CONTENTS
	(mg/l)	(mg/kg)					
✓ A-71 (North)		97,000	Diesel	Waste Oil (Oil and Grease - 94%) Tetrachloroethene (35,000 ug/l)	Waste Oil	Paint Residue	Waste Oil, Diesel & Paint Residues
✓ A-71 (South)	110		Gasoline & Diesel	-----	Water	Gasoline	Water, Gasoline & Diesel
A-194	Not Sampled			-----	Water, Oil, Sludge	Waste Oil	Water, Waste Oil?
✓ A-195		360,000	Diesel	-----	Solvent?	Solvent	Diesel
✓ A-226	8		Diesel	-----	Water	Diesel	Water & Diesel
✓ A-230		320,000	Diesel	-----	Diesel	Diesel	Diesel
✓ A-231		310,000	Diesel	-----	Diesel	Diesel	Diesel
✓ A-259		330,000	Diesel	-----	Diesel	Diesel	Diesel
✓ A-267	Removed			-----	---	Mineral Spirits	Removed
✓ A-914	200		Diesel	-----	Water & Diesel	Mineral Spirits	Water, Diesel & Mineral Spirits ?
✓ BV		470,000	Diesel	-----	Diesel	Diesel	Diesel
✓ 505-1		780,000	Gasoline	-----	Gasoline	Gasoline	Gasoline
✓ 505-2	27		Gasoline	Bromodichloromethane (5.3 ug/l) 1,2-Dichloroethane (380 ug/l) Tetrachloroethene (16 ug/l)	Water	Solvent	Water, Gasoline & Degradated Solvent
✓ 521	30		Gasoline	-----	Water	Oily Water	Water & Gasoline
✓ 627-1	4		Diesel	-----	Water	Diesel	Water & Diesel
✓ 627-2	<1		-----	-----	Water	Oily Water	Water
✓ 637-1	Not Sampled		-----	-----	Waste Oil	Originally Diesel Fuel Tank- Presently Used to Store Waste Oil	Waste Oil
✓ 637-2	Not Sampled		-----	-----	-----	Former Diesel Fuel Tank. Reportedly Abandoned In-Place by Filling with Sand Blast Grit	Sand Blast Grit ?
✓ 993	Not Sampled		-----	-----	Waste Oil	Base Exchange Service Station Waste Oil Tank	Waste Oil

TABLE 3
TANK SUMMARY DATA

Tank No.	Appendix B Figure No.s	Tank Contents	Approximate Tank Capacity (Gal)	Percent Full
A-71 (North)	2,5	Diesel Waste Oil & Paint Residue	500	100
A-71 (South)	2,5	Water, Gasoline & Diesel	2,000	50
A-194	2,6	Not Sampled (Water & Waste Oil?)	200	20
A-195	2,7	Diesel	500	90
A-226	2,8	Water & Diesel	500	40
A-230	2,9	Diesel	500	100
A-231	2,9	Diesel	500	50
A-259	2,10	Diesel	1,000	80
A-267		Removed		
A-914	2,11	Water, Diesel & Mineral Spirits	1,000	100
BV	2,12	Diesel	500	40
505-1	4,13	Gasoline	500	20
505-2	4,13	Water, Gasoline & Degraded Solvents	500	40
521	3,14	Water & Gasoline	200	50
627-1	4,15	Water & Diesel	500	100
627-2	4,15	Water	400	50
637-1	3,16	Waste Oil (Not Sampled)	16,000	100
637-2	3,16	Sand Blast Grit? (Not Sampled)	16,000	Unknown
993	4,17	Waste Oil (Not Sampled)	500	100

TABLE 4
TANK CONTENTS SAMPLES:
TOTAL PETROLEUM HYDROCARBONS
PURGEABLE AROMATICS AND HALOCARBONS

Constituent	Concentrations (ug/L)			
	A-71 (North)	A-71 (South)	A-195	A-226
Total Petroleum Hydrocarbons (mg/kg) (8015 Modified)	97,000 mg/Kg	110 mg/L	360,000 mg/Kg	8 mg/L
Oil and Grease	94 percent	---	---	---
Polychlorinated Biphenyls (PCBs) (8080)	---	---	---	---
Purgeable Aromatics (8020)				

Benzene	43,000	180,000	12,000	2.5
Chlorobenzene	ND <3,000	---	ND <1,000	---
1,2-Dichlorobenzene	ND <3,000	---	ND <1,000	---
1,3-Dichlorobenzene	ND <3,000	---	ND <1,000	---
1,4-Dichlorobenzene	ND <3,000	---	ND <1,000	---
Ethylbenzene	85,000	26,000	24,000	1.5
Toluene	66,000	440,000	75,000	25
Xylenes	640,000	180,000	190,000	8.6
Purgeable Halocarbons (8010)				

Bromodichloromethane	ND <10,000	---	ND <25	---
Bromoform	ND <10,000	---	ND <25	---
Bromomethane	ND <10,000	---	ND <25	---
Carbon Tetrachloride	ND <10,000	---	ND <25	---
Chlorobenzene	ND <10,000	---	ND <25	---
Chloroethane	ND <10,000	---	ND <25	---
2-Chloroethylvinyl Ether	ND <20,000	---	ND <50	---
Chloroform	ND <10,000	---	ND <25	---
Chloromethane	ND <10,000	---	ND <25	---
Dibromochloromethane	ND <10,000	---	ND <25	---
1,2-Dichlorobenzene	ND <10,000	---	ND <25	---
1,3-Dichlorobenzene	ND <10,000	---	ND <25	---
1,4-Dichlorobenzene	ND <10,000	---	ND <25	---
Dichlorodifluoromethane	ND <10,000	---	ND <25	---
1,1-Dichloroethane	ND <10,000	---	ND <25	---
1,2-Dichloroethane	ND <10,000	---	ND <25	---
1,1-Dichloroethene	ND <4,000	---	ND <10	---
1,2-Dichloroethene	ND <10,000	---	ND <25	---
1,2-Dichloropropane	ND <10,000	---	ND <25	---
1,3-Dichloropropene (cis)	ND <10,000	---	ND <25	---
1,3-Dichloropropene (trans)	ND <10,000	---	ND <25	---
Methylene Chloride	ND <10,000	---	ND <25	---
1,1,2,2-Tetrachloroethane	ND <10,000	---	ND <25	---
Tetrachloroethene	35,000	---	ND <25	---
1,1,1-Trichloroethane	ND <10,000	---	ND <25	---
1,1,2-Trichloroethane	ND <10,000	---	ND <25	---
Trichloroethene	ND <10,000	---	ND <25	---
Trichlorofluoromethane	ND <10,000	---	ND <25	---
Vinyl Chloride	ND <20,000	---	ND <50	---

SECTION THREE

SOIL AND GROUNDWATER ANALYSES

This section describes the results of analyses of soil and groundwater samples obtained adjacent to the AUSTs.

Soil

Field observations made by ERM-West personnel during drilling indicated the presence of contaminated soil adjacent to Tanks A-259, BV, 521, 637-1, 637-2 and 993. These observations were confirmed by the analytical results of samples presented in Tables 5 and 6. The Total Petroleum Hydrocarbon (TPH) concentrations at these five tank sites were: 3,400 mg/kg (Tank A-259), 1,600 mg/kg (Tank BV), 80 mg/kg (Tank 521), 5,000 mg/kg (Tank 637-1), 5,900 mg/kg (Tank 637-2) and 10,000 mg/kg (Tank 993). Soil analyses from the remaining 13 tank sites exhibited TPH concentrations less than the detection limit of 10 mg/kg. Soil samples adjacent to four tank sites also indicated the presence of low concentrations of several BTXE compounds, including the sample from Tank A-914, at which no detectable levels of TPH were found. Analyses for Purgeable Halocarbons performed on soil samples from tank sites A-195 and A-267 found all constituent concentrations to be below detection limits. In addition, Priority Pollutant Metal analyses for soil samples from tank sites A-71 (North), 637 and 993 yielded constituent concentrations well below applicable STLC and TTLC limit concentrations. A summary of the analyses for tank sites A-71 (North), 637, and 993 is presented in Table 7.

Three Purgeable Halocarbon compounds were also found above detection limit concentrations. These compounds were 1,4-dichlorobenzene (950 ug/L), tetrachloroethene (37 ug/L), and

TABLE 6
TOTAL PETROLEUM HYDROCARBONS,
PURGEABLE AROMATICS AND HALOCARBONS
IN SOIL SAMPLES

Constituent	Concentrations (mg/kg)							
	A-194		A-195		A-226	A-226		
Tank Site								
Boring No.	1	2	1	2	1	1	2	
Sample Depth (ft)	6.0-6.5	7.0-7.5	2.5-3.0	3.5-4.0	5.0-5.5	7.5-8.0	6.5-7.0	
					Individual	Composite		
Total Petroleum Hydrocarbons (TPH) (8015 - Modified)	ND <10		ND <10		ND <10	ND <10		
Purgeable Aromatics (8020)	-----							
Benzene								
Chlorobenzene	ND <0.03		ND <0.03		ND <0.03	ND <0.03		
1,2-Dichlorobenzene	ND <0.03		ND <0.03		ND <0.03	ND <0.03		
1,3-Dichlorobenzene	ND <0.03		ND <0.03		ND <0.03	ND <0.03		
1,4-Dichlorobenzene	ND <0.03		ND <0.03		ND <0.03	ND <0.03		
Ethylbenzene	ND <0.03		ND <0.03		ND <0.03	ND <0.03		
Toluene	ND <0.03		ND <0.03		ND <0.03	ND <0.03		
Xylenes	ND <0.03		ND <0.03		ND <0.03	ND <0.03		
	ND <0.03		ND <0.03		ND <0.03	ND <0.03		
Purgeable Halocarbons (8010)	-----							
Bromodichloromethane	---		ND <0.03					
Bromoform	---		ND <0.03		---	---		
Bromomethane	---		ND <0.03		---	---		
Carbon Tetrachloride	---		ND <0.03		---	---		
Chlorobenzene	---		ND <0.03		---	---		
Chloroethane	---		ND <0.03		---	---		
2-Chloroethylvinyl Ether	---		ND <0.05		---	---		
Chloroform	---		ND <0.03		---	---		
Chloromethane	---		ND <0.03		---	---		
Dibromochloromethane	---		ND <0.03		---	---		
1,2-Dichlorobenzene	---		ND <0.03		---	---		
1,3-Dichlorobenzene	---		ND <0.03		---	---		
1,4-Dichlorobenzene	---		ND <0.03		---	---		
Dichlorodifluoromethane	---		ND <0.03		---	---		
1,1-Dichloroethane	---		ND <0.03		---	---		
1,2-Dichloroethane	---		ND <0.03		---	---		
1,1-Dichloroethene	---		ND <0.01		---	---		
1,2-Dichloroethene	---		ND <0.03		---	---		
1,2-Dichloropropane	---		ND <0.03		---	---		
1,3-Dichloropropene (cis)	---		ND <0.03		---	---		
1,3-Dichloropropene (trans)	---		ND <0.03		---	---		
Methylene Chloride	---		ND <0.03		---	---		
1,1,2,2-Tetrachloroethane	---		ND <0.03		---	---		
Tetrachloroethene	---		ND <0.03		---	---		
1,1,1-Trichloroethane	---		ND <0.03		---	---		
1,1,2-Trichloroethane	---		ND <0.03		---	---		
Trichloroethene	---		ND <0.03		---	---		
Trichlorofluoromethane	---		ND <0.03		---	---		
Vinyl Chloride	---		ND <0.05		---	---		

1,1,1-trichloroethane (21 ug/L). No PCB compounds were found to be present in excess of the detection limit concentration of 20 mg/L. Cadmium, chromium, and lead concentrations were found to exceed Primary Drinking Water Standards. However, lead (4.1 mg/L) was the only Priority Pollutant Metal constituent approaching the STLC value (5 mg/L) for classification as a hazardous waste.

Groundwater

Groundwater was encountered in borings at three AUST tank sites, 637-1 and 2, and 993. Water samples obtained from temporary wells at these sites were analyzed for TPH, Oil & Grease, Purgeable Aromatics, Purgeable Halocarbons, PCBs and Priority Pollutant Metals. A summary of these analyses is presented in Tables 8 and 9.

Tank Site 637

The groundwater sample from tank site 637 was found to contain 870 mg/L TPH, characterized primarily as diesel fuel. The sample also contained an Oil and Grease concentration of 14,000 mg/L as well as high levels of several Purgeable Aromatic compounds, including benzene (11,000 ug/L), ethylbenzene (5,000 ug/L) and xylenes (16,000 ug/L). Lesser concentrations of several Purgeable Halocarbons were also detected, including 1,1-Dichloroethane (15 ug/L), 1,2-dichloroethene (18 ug/L) and tetrachloroethene (2.1 ug/L). Analyses for Priority Pollutant Metals indicated that arsenic, chromium, and lead concentrations exceed Primary Drinking Water Standards. However, these values occur well below the STLC for these constituents.

SECTION FOUR

CONCLUSIONS AND RECOMMENDATIONS

This section presents the conclusions and recommendations based on the field and laboratory analytical data collected during this investigation.

Conclusions

- 1) The contents of the AUSTs investigated during this study were characterized as follows:

<u>Tank No.</u>	<u>Contents</u>	<u>Tank No.</u>	<u>Contents</u>
A-71 (N)	Waste Oil & Diesel Paint Residue	BV	Diesel
A-71 (S)	Water, Gasoline & Diesel	505-1	Gasoline
A-194	Water, Oil Sludge	505-2	Water, Gasoline & Degraded Solvent
A-195	Diesel	521	Water & Gasoline
A-226	Water & Diesel	627-1	Water & Diesel
A-230	Diesel	627-2	Water
A-231	Diesel	637-1	Waste Oil
A-259	Diesel	637-2	Sand Blast Grit
A-914	Water, Diesel & Mineral Spirits	993	Waste Oil

Recommendations

- 1) Closure plans for the 18 remaining AUSTs identified in this investigation should be executed in accordance with the provisions of Section Four of the May 1987 "Tank Testing Study" at the Mare Island Naval Shipyard.
- 2) The soil TPH concentrations at tank sites A-259 and BV exceed allowable limits as defined in the May 1988 "California Leaking Underground Fuel Tank (LUFT) Field Manual". Additional soil sampling and characterization will be required at these AUSTs following tank removal.
- 3) The soil TPH concentrations found in samples from tank site 521 appear to indicate only a minor degree of soil contamination at this location. Depending upon the results of analyses obtained during tank removal, additional characterization may not be required.
- 4) Further investigation should be conducted at tank sites 637 and 993 to determine the extent of soil and groundwater contamination at these locations.

APPENDIX A

DRILLING AND SAMPLING PROCEDURES

The field data collection phase of this project involved the collection of soil, groundwater, and tank content samples. The sampling procedures and methodology are described in this section.

Soil Borings

The subsurface drilling and sampling program was conducted during the period May 24-27 and June 14-16, 1988. Drilling was accomplished utilizing both a truck-mounted drilling rig and a modified backhoe equipped with six-inch diameter hollow-stem augers. Relatively undisturbed soil samples were collected adjacent to the tank bottoms in Shelby tubes approximately 30 inches in length and two inches in diameter. In some instances where loose sandy soils were encountered, a California modified sampler containing brass sleeves and a "sand catcher" insert was used in place of the Shelby tube. The sample collection procedure consisted of: drilling to the top of the interval to be sampled, removing the plug at the bottom of the auger, inserting the Shelby tube (sampler) on the end of the drill rod to the bottom of the auger, pushing the Shelby tube (sampler) its full length into the undisturbed soil, and retrieving the Shelby tube (sampler). The Shelby tube was then cut into six-inch lengths, or, in the case of the California modified sampler, the three six-inch brass tubes were removed. The exposed soil at the end of each section was then lithologically described by a qualified geologist in accordance with the Unified Soil Classification System (USCS). Boring log descriptions are contained in Appendix C. The ends of those samples selected for laboratory analyses were immediately sealed with Teflon film and plastic end caps. The samples were

then labeled to designate the sample number, location, depth, date, time, and collection personnel. After labeling, the samples were double-sealed in plastic freezer bags and stored on ice in a cooler to 4°C until delivered to the state-certified analytical laboratory performing the analyses. Completed chain-of-custody forms for all soil samples are contained in Appendix D.

Groundwater Samples

At tank sites where shallow groundwater was encountered in the soil borings, one boring at each tank site was then completed as a temporary monitoring well. The wells were constructed using two-inch diameter Schedule 40 flush-threaded PVC casing and screen. The casing/screen sections were installed in the borehole through the center of the hollow-stem auger to the desired depth. Filter pack sand (Lonestar #030) was then placed in the remaining annular space concurrent with removal of the auger flights. The sand pack extended to approximately one foot below ground. The remaining annular space was sealed with a bentonite slurry. Due to the temporary nature of these monitoring wells, no permanent surface completion was installed. Well completion forms for these temporary wells are contained in Appendix E.

Groundwater samples were obtained on June 16, 1988 utilizing small diameter Teflon bailers. All sample bottles were provided by the laboratory performing the analyses. During sample collection the bottles were labeled to designate the well number, location, date, time, and collection personnel. After labeling, the sample bottles were double-sealed in zip-lock freezer bags and stored on ice in a cooler to 4°C until delivery to Anlab, the state-certified laboratory performing the analyses. Completed chain-of-custody forms are contained in Appendix D.

Tank Content Samples

Samples of tank liquid/sludge contents were obtained from 15 of the 19 tanks under investigation during the period of June 14-16, 1988. Of the remaining four tanks, two (637-1 and 993) were being used to store waste oil for which recent analyses were available. One tank (637-2) had been paved over and no access was available. The last tank (627) could not be located and was believed to have been removed prior to the start of the field program.

In all cases the tank fill pipe provided only a small diameter accessway to the tank for sample collection purposes. This necessitated the fabrication of a small diameter sampling device. The samplers utilized consisted of pre-cleaned 3/4-inch diameter PVC casing from 6 to 18 inches in length. The bottom of the casing lengths were sealed with PVC and caps. The tubes were then attached to 1/4-by-3/4-inch wooden dowels using nylon friction ties. In order to minimize the potential for cross-contamination, a separate sampler was utilized for each tank. The tank contents were then transferred to the appropriate sample bottle.

All sample bottles were provided by the laboratory performing the analyses. During sample collection, the sample bottles were labeled to designate the sample and tank number, location, date, time, analyses requested, and collection personnel. After labeling, the sample bottles were double-sealed in zip-lock bags and stored on ice in a cooler until delivery to the laboratory performing the analyses. All samples were accompanied by completed chain-of-custody forms. These forms are contained in Appendix D.

APPENDIX B

TABLE OF CONTENTS

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1	Mare Island Naval Shipyard	B-1
2	Tank Location Map A	B-2
3	Tank Location Map B	B-3
4	Tank Location Map C	B-4
5	Tanks A-71 (North) & A-71 (South)	B-5
6	Tank A-194	B-6
7	Tank A-195	B-7
8	Tank A-226	B-8
9	Tanks A-230 & A-231	B-9
10	Tank A-259	B-10
11	Tank A-914	B-11
12	Bridgeview Tank	B-12
13	Tank 505	B-13
14	Tank 521	B-14

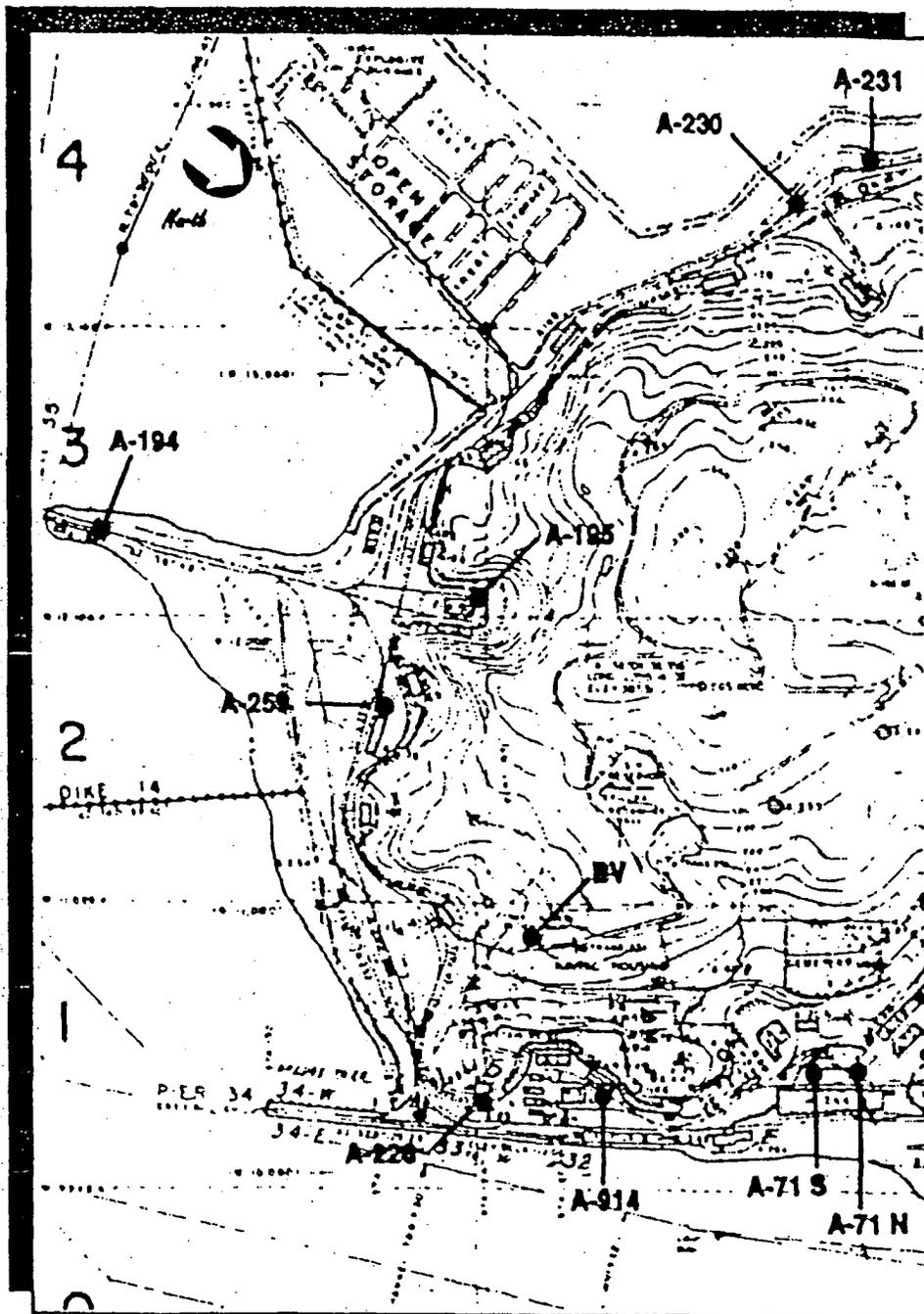
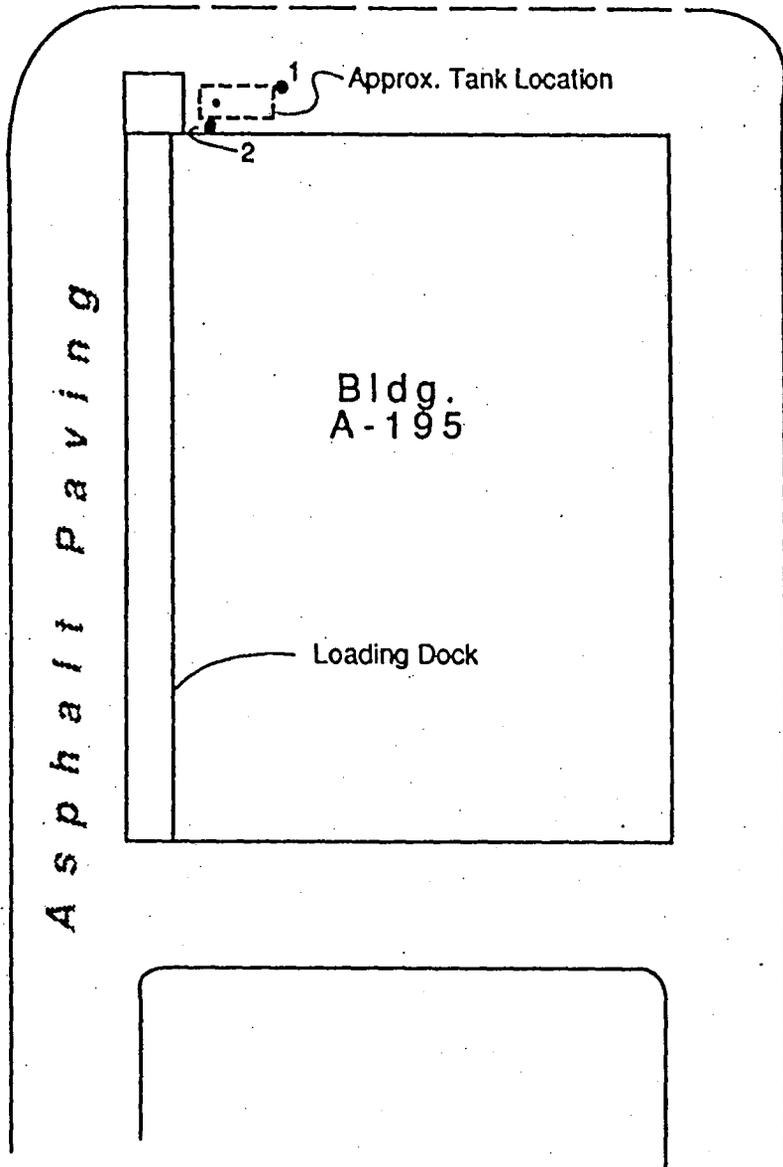


Figure 2
Tank Location Map A

North



● Soil Boring Location and Number

Approx. Scale in Feet

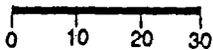


Figure 7
Tank A-195

APPENDIX C

DRILLING LOGS

Environmental Resources Management

Drilling Log

Project: 4804 Owner _____
 Location _____ W.O. Number _____
 Number A-195-3 Total Depth 22" Diameter 6"
 Surface Elevation _____ Water Level Initial _____ 24-hrs _____
 Screen Dia. _____ Length _____ Slot Size _____
 Casing Dia. _____ Length _____ Type _____
 Drilling Company Enesco Drilling Method Stem Auger
 Dr. by Bill Marquis Log By RL Date Drilled 2/1/88

Sketch Map
*See 195-1
 for site map*

Notes

Depth (ft)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
12:05				Grossy Vegetation and silt at surface. Excavation in bedrock (ss)
1	ML			
2				Silt w/ some f. gr sand and clay, buff, slightly moist, H _v =0 in hole at 22". Recovered 24/24"
3				
4				Sample taken from 3 1/2 - 4' at 12:10

12:10

CHAIN OF CUSTODY AND SAMPLE IDENTIFICATION RECORD

ERM-West
Environmental
Resources
Management

Client: U.S. NAVY Job Location: MARE ISLAND, CA
 Sampler (S): R. HARDING Job No: 40047
 Date: 16 JUNE 1988 No. of Samples Collected: 5
 Weather: PT CLOUDY, BREEZY LOW TO'S

page 3 of 3

1777 Botelho Drive
Suite 260
Walnut Creek, CA 94596
(415) 946-0455

Sample ID #	Time	Sample Type		Volume	No. of Contnrs. Contnr. Type	Preservative	Iced (Y/N)	Sampling Method	Analyses
		Water Comp. Grab	Soil Comp. Grab						
195		✓	TANK CONTENTS	80 ml 1 l	2- 40ml VOA 1- Amber	NONE	Y	PVC SAMPLER	TPH 601/602
71 N	1315	✓	TANK CONTENTS	80 ml 1 l	2- 40ml VOA 1- Amber 1- Plastic	-	-	"	TPH, Metals 601/602 Oil & Grease
637-1	1440	✓	GROUNDWATER	160 ml 2 l	4- 40ml VOA 2- Amber 1- Plastic	-	-	TEFLON BAILER	TPH Metals PCB 601/602 Oil & Grease
* 607-2	1550	✓	TANK CONTENTS	80 ml 1 l	2- 40ml VOA 1- Amber 1- Plastic	7-	-	PVC SAMPLER	TPH Metals PCB 603/602 Oil & Grease
993-1	1720	✓	GROUNDWATER	160 ml 2 l	4- 40ml VOA 2- Amber 1- Plastic	-	-	TEFLON BAILER	TPH Metals PCB 601/602 Oil & Grease
993+		✓	GROUNDWATER						

Comments: * Hold Sample

Custody Record
Signature, Date/Time

Relinquished: R. Harding 6/17/88 #12011
 Received: _____
 Relinquished: _____
 Received: _____
 Relinquished: _____
 Received: _____
 Relinquished: _____
 Received: F. Hayward 6/17/88 1410

Name and Address of Receiving Laboratory

ANLAB
1914 S STREET
SACRAMENTO, CA

CHAIN OF CUSTODY AND SAMPLE IDENTIFICATION RECORD

ERM-West
Environmental
Resources
Management

Client: U.S. NAVY
 Sampler (#): RSH/RLL
 Date: 01 JUNE 1988
 Weather: Clear Sunny High 70s

Job Location: MARE ISLAND
 Job No: 40347
 No. of Samples Collected: 8

page 1 of 1

1777 Botelho Drive
 Suite 260
 Walnut Creek, CA 94596
 (415) 946-0455

Sample ID #	Time	Sample Type		Volume	No. of Contnrs. Contnr. Type	Preservative	Iced (Y/N)	Sampling Method	Analyses
		Water Comp.	Soil Grab						
226-1	1120		✓	~ 300ml	1 - Shelby	None	Y	shelby Tube	TPH
195-1	1155		✓	"	"	"	"	"	TPH
195-2	1210		✓	"	"	"	"	"	8010/8020
RV-1	1350		✓	"	"	"	"	"	TPH
BV-2	1405		✓	"	"	"	"	"	BTXE (Kul Chem)
267-1	1510		✓	"	"	"	"	"	TPH 8010/8020
S21-1	1700		✓	"	"	"	"	"	TPH
S21-2	1725		✓	"	"	"	"	"	BTXE (Kul Chem)

Comments: _____

Custody Record

Signature, Date/Time

Relinquished: [Signature] 6/1/88 1250 hrs

Received: Elaine M. Moez 6/6/88 1110 hrs

Relinquished: _____

Received: _____

Relinquished: _____

Received: _____

Relinquished: _____

Received: _____

Name and Address of Receiving Laboratory

ANLAB
 1914 S St.
 Sacramento, CA 95814

Purgable Halocarbons
EPA #8010

Client: ERM-WEST - Robert Harding

Report # 116721

Page 2

Sample Description: Composite #1 - 195-1
 195-2

Anlab ID# 116721-2
 116721-3

Units: mg/kg

Date Sampled
 Collected: 06/01/88
 Project: Job #40047

Date Received
 @Lab: 06/06/88

Date Analysis
 Completed: 06/16/88

COMPOUND	CONCENTRATION	
Bromdichloromethane	<0.03	(AKA: Dichlorobromomethane)
Bromoform	<0.03	
Bromomethane	<0.03	
Carbon tetrachloride	<0.03	
Chlorobenzene	<0.03	
Chloroethane	<0.03	
2-Chloroethylvinyl ether	<0.05	
Chloroform	<0.03	
Chloromethane	<0.03	
Dibromochloromethane	<0.03	(AKA: Chlorodibromomethane)
1,1-Dichlorobenzene	<0.03	
1,3-Dichlorobenzene	<0.03	
1,4-Dichlorobenzene	<0.03	
Dichlorodifluoromethane	<0.03	
1,1-Dichloroethane	<0.03	
1,2-Dichloroethane	<0.03	
1,1-Dichloroethene	<0.01	
1,2-Dichloroethene	<0.03	(AKA: trans-1,2-Dichloroethylene)
1,2-Dichloropropane	<0.03	
1,3-Dichloropropene	<0.03	(AKA: cis-1,3-Dichloropropylene)
1,3-Dichloropropene	<0.03	(AKA: trans-1,3-Dichloropropylene)
Methylene chloride	<0.03	(AKA: Dichloromethane)
1,1,2,2-Tetrachloroethane	<0.03	
Tetrachloroethene	<0.03	(AKA: Tetrachloroethylene, PCE)
1,1,1-Trichloroethane	<0.03	
1,1,2-Trichloroethane	<0.03	
1,1,2-Trichloroethene	<0.03	(AKA: Trichloroethylene, TCE)
Tetrachlorofluoromethane	<0.03	
Vinyl Chloride	<0.05	

OTHER COMPOUNDS DETECTED OR REQUESTED
 N/A = not analyzed

CONCENTRATION

Certified by Karin Harris

Report Approved By Franklin Hayward



ANALYTICAL LABORATORY
 DIVISION OF DEWANTE & STOWELL

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2945

Purgable Aromatics
 EPA #8020

Client: ERM-WEST - Robert Harding

Report #: 116721

Page 4

Sample Description: Composite #1 - 195-1
 195-2

Anlab ID #: 116721-2
 116721-3

Units: mg/kg

Date Sample

Date Received

Date Analysis

Collected: 06/01/88

@Lab: 06/06/88

Completed: 06/15/88

Project: Job #40047

<u>COMPOUND</u>	<u>CONCENTRATION</u>
Benzene	<0.03
Chlorobenzene	<0.03
1,2 - Dichlorobenzene	<0.03
1,3 - Dichlorobenzene	<0.03
1,4 - Dichlorobenzene	<0.03
Ethylbenzene	<0.03
Toluene	<0.03
Xylenes	<0.03

OTHER COMPOUNDS DETECTED OR REQUESTED

CONCENTRATION

n/a = not analyzed

nd = none detected as specified in the EPA method

Certified by

Karin Harris

Report Approved by

Franklin J. Hayward

Applicable only to the sample received by the laboratory. The liability of the laboratory is limited to the amount paid for this report. This report is for the use of the client to whom it is addressed and upon the condition that the client assumes all liability for the further distribution of the report or its contents.



ANALYTICAL LABORATORY

A DIVISION OF DEWANTE & STOWELL

1914 S STREET, SACRAMENTO, CALIFORNIA 95814 • 916-447-2946

Purgable Aromatics
EPA #8020*

Client: ERM-WEST - Robert Harding

Report #: 116877

Page 21

Sample Description: 195

Anlab ID #: 116877-13b** Units: ug/l

Date Sample Collected: 06/14-15-16/88
Project: Job #40047

Date Received @Lab: 06/17/88

Date Analysis Completed: 06/29/88

<u>COMPOUND</u>	<u>CONCENTRATION</u>
Benzene	12000
Chlorobenzene	<1000
1,2 - Dichlorobenzene	<1000
1,3 - Dichlorobenzene	<1000
1,4 - Dichlorobenzene	<1000
Ethylbenzene	24000
Toluene	75000
Xylenes	190000

OTHER COMPOUNDS DETECTED OR REQUESTED

CONCENTRATION

*Sample matrix, made it necessary for this sample to be analyzed as an 8020 not a 602.
**Increased detection limit due to dilution, sample matrix interfered with analyte quantitation when analyzed straight.

Data Certified by Tom King

Report Approved by Frank J. Haywood

505.1, 2
521
565.1, 2, 3, 4
577B
627.1, 2
637.1, 2
866
993-4
A 71 N, S
A 191
A 194
A 195
A 225
A 226
A 230
A 231
A 259
A 267
A 914.1, 2
BV

*Reference
Ull*

FINAL SUMMARY REPORT
REMOVAL AND/OR ABANDONMENT OF
UNDERGROUND STORAGE TANKS
at the
MARE ISLAND NAVAL SHIPYARD
VALLEJO, CALIFORNIA
Contract No: N62474-90-C-1366

Prepared by:
REMEDICATION SERVICES, INC.

ENCLOSURE 2

TABLE OF CONTENTS

Section

- 1.0 Summary of Work
- 2.0 Tank Activity Checklists
- 3.0 Logs
 - 3.1 Vallejo Fire Department
- 4.0 Analytical Results
 - 4.1 Tank Contents
 - 4.2 Rinsate
 - 4.3 Soil/Grit
- 5.0 Hazardous Waste Manifests
- 6.0 Compaction Tests
- 7.0 Photographs
- 8.0 As-Built Drawings

PROJECT SUMMARY - R90011

REMOVAL OF UNDERGROUND STORAGE TANKS
MARE ISLAND NAVAL SHIPYARD
VALLEJO, CALIFORNIA
CONTRACT NO. N62472-90-C-1366

BY
REMEDATION SERVICES, INC.
1181 QUARRY LANE, BLDG. 350
PLEASANTON, CALIFORNIA

The project scope included removal and disposal of 26 underground storage tanks and associated piping, in-place closure of 2 tanks, abandonment of one monitoring well and disposal of 163 cubic yards of petroleum contaminated soil.

Submittal and approval of the various plans (Environmental, Health & Safety, Contractor's Inspection), removal of tank contents and in-place tank washing occurred during the months of May and June 1990. Contents of the tanks were either recycled for fuel for on-site use in mobile equipment or disposed at Gibson Oil in Bakersfield, California (refer to tank activity checklists). Tank removal work began on July 17, 1990. Tank removals proceeded intermittently through November 2, 1990 at which time the last tank, 866, was removed. Refer to Section 3.1 which contains detailed notes of the tank removals, recorded by Inspector Gregory White of the Vallejo Fire Department.

In all, 24 tanks were emptied, washed in place, removed and cut-up onsite. The resultant scrap metal was recycled to Levins Metals in Richmond. Tank A-94 was never located although the piping was excavated for approximately 100 feet to the north. At the site of Tanks 505-1 & 505-2, one 3000-gallon tank was found instead of the two 1500-gallon tanks shown on Drawing C-1. Soil sampling and analyses were not part of this contract; they were performed by ERM-West of Sacramento. Tanks 627-1 and 627-2 were not permitted to be closed in-place by the Vallejo Fire Department due to contamination detected in soil boring samples from beneath the tanks. Soil borings and analyses were taken by ERM-West.

Based on analyses from soil samples taken beneath the tanks, the Vallejo Fire Inspector determined that sites where TPH concentrations were detected were contaminated. Tank sites A71S, A191, A195, and A230 were not contaminated and were backfilled according to the original contract. Contaminated tanks sites 505, 577S, 914, 993-4, A71N, A225, A226, A231, A259, A267, BV, 521, 565, 637, and 866 were allowed by the Vallejo Fire Department to be backfilled with excavated soil or drain rock, if groundwater was encountered, lined with two layers of 10 mil polyethylene sheet overlapped 6" at seams, and backfilled with

clean import. Surfaces were finished to match existing. The locations of contaminated sites were marked with white paint and metal plates were placed at the corners.

Disposal of 163 yards of petroleum contaminated soil was deleted from the original contract because the soil was also contaminated with metals. Approximately 180 tons of metals contaminated soil (containing sandblast grit) from Tanks 565, 667 and 577, backfill and contents, and concrete from Tank 866 were disposed at Chemical Waste Management's Kettleman Hills Class 1 Facility.

The following sections of this report include activity logs, hazardous waste manifests, laboratory reports of tank contents and rinsate, field notes by the Vallejo Fire Department Inspector, and as-built drawings.

This report has been prepared to document the services performed under this contract, namely removal of the underground fuel tanks. It forms the basis for the underground storage tank closure report for submittal by the government to the appropriate agency. No remedial activities were included under this contract.

Section 2.0

TANK ACTIVITY CHECKLISTS

THE ISLAND NAVAL SHIPYARD
 FY 90 ABANDONED UNDERGROUND STORAGE TANK REMOVAL
 CONTRACT N62474-90-C-1366

TANK ACTIVITY CHECKLIST (1)

TANK NO.: A195 SIZE: 500 Gallons MATERIAL: STEEL DWG. REF. NO.: C-3

ACTIVITY	DATE	INITIALS	COMMENTS
1 Pump out contents <i>Full</i> Material as noted on dwg. <u>SOLVENT/DIESEL</u> Quantity as noted on dwg. <u>450 GAL.</u>	5-22-90 5-30-90 6-30-90	<i>FD</i> <i>FD</i> <i>FD</i>	<i>Stick Tank.</i> <i>SAMPLE FOR GIBSON</i> <i>PUMP BULK</i>
2 Dispose contents to: <i>GIBSON OIL</i> Recycle <u>Class I</u> Other	6-20-90	<i>FD</i>	<i>IND. INC. TRUCK PUMPS BULK.</i>
3 Determine if utility shutdown necessary and give appropriate notice		<i>FD</i>	<i>NO</i>
4 Disconnect and cap fittings			<i>ALL PIPING REMOVED.</i>
5 Wash out tank	6-22	<i>FD</i>	<i>WASH IT SAMPLE</i>
6 Remove cover <i>SOIL</i>	7-9	<i>FD</i>	<i>Remove Soil Ready to pull</i>
7 Remove tank	7-15-90 7-19-90	<i>FD</i> <i>FD</i>	<i>Tank Removed ^{SOIL} Sample Taken</i> <i>Put into Bin</i>
8 Cut up tank for disposal, if required	7-15-90	<i>FD</i>	<i>Tank cut up</i> <i>Heckman</i>
9 Inspect excavation	7-18-90	<i>FD</i>	<i>Done BY F.D.</i>
10 Backfill excavation		<i>FD</i>	<i>Done</i>
11 Cover with: <i>SOIL</i>		<i>FD</i>	<i>Done</i>
12 Disposal of tank to:			<i>Heckman Metals</i>

NA - Not Applicable

(1) Note all differences from information on drawings under Comments

Section 3.0

LOG SHEETS

3.1 Vallejo Fire Department

August 15, 1990

SUBJECT: Tank Removals at Mare Is. Naval Shipyard
FROM: Gregory A. White, Fire Prevention Inspector, Vallejo Fire Dept.

July 17, 1990:

1013 Hours:

I am presently at Mare Is. for the removal of eight underground storage tanks. At this time I have been informed that plans are under way to close a total of two (namely, 627-1 and 627-2) of the 28 tanks to be removed in place. I will forward guidelines to David Bustamante concerning the proper procedures and permitting of tanks to be closed in place. The following persons are also present for the removals:

Agustin Rodriguez of Mare Is.
Lee Davis of Bay Area Tank and Marine.
Anne Cahn of Remediation Services
William A. Spong, Senior Geologist of ERM-West, Inc.
Brian Pletcher of Remediation Services
Forrest G. Canutt, President of Bay Area Tank and Marine
Loris Bertoncello, Civil Eng. of ERM-West, Inc.

1036-1045 Hours:

A safety meeting is held for all personnel present in order to assure that safety procedures are followed at all times.
(R S Remediation is going to photograph all tanks upon removal. A set of all photos taken will be forwarded to me.)

1053 Hours:

Tank A231 is tested for LEL and oxygen levels at this time. It has already been inerted with 15 pounds of dry ice. The LEL registers 0 % on two different combustible gas meters. Oxygen is registered at approximately 20.4 %. Permission is given by me to remove this 500 gal. Diesel Tank.

1102 Hours:

The tank has been removed. There are obvious holes in the tank. Pictures are taken. The soil in the excavation pit appears to be significantly contaminated.

1113 Hours:

Soil Sample (SS#) 1 is taken at midpoint in the pit at a depth of 8 feet 10 inches below grade. No ground water is present. See

sketch for further details.

1122-1125 Hours:

We are now at tank **A230** (A 500 gal. Diesel tank.). The LEL is registered at 0 %. The Oxygen is down to 5.5 %. Permission is given to remove the tank.

1130 Hours:

Tank **A230** has been removed, no visible holes are present. Pictures taken.

1137 Hours:

Soil Sample is taken in clay soil at 9 feet below grade as indicated in the accompanying sketch.

1142 Hours:

We depart in order to go to tank **A195** which is a 1,000 gal. Solvent/Diesel tank.

1151 Hours:

Readings are taken on **A195** Oxygen is 3.2 %. LEL is 1 %. Permission is given to remove the tank.

1154 Hours:

Tank is removed, an identifying picture of the tank is taken.

1202 Hours:

Due to a concrete slab that was laid down for the tank, the soil sample that is taken at this time is a side wall sample 3'5" below grade as indicated in the accompanying sketch.

1207 Hours:

We depart the scene at this time and head to tank A259.

1212 Hours:

We arrive at tank **A259** which is a 500 gal. Diesel tank.

1213 Hours:

Readings are taken. Oxygen is registered at 12.5 % in the tank. LEL is registered at 2 %. Permission is given to remove the tank.

1226 hours:

The tank has been removed at this time. A picture has been taken.

The soil sample was also taken at 6'8" below grade at the sludge box and fill end as per indicated in the sketch.

1228 Hours:

We depart the scene to go tank A226.

1232 Hours:

We arrive at A226 which is a 600 gal. Diesel/Water tank.

1235 Hours:

Readings are taken at this time. LEL reads at 0 %. Oxygen reads at 20 %. Permission is given to remove the tank.

1241 Hours:

The tank is removed at this time. There are obvious holes in the tank on both ends at the seams (at least a dozen holes). An identifying picture is taken.

1248 Hours:

A soil sample is taken at 8 feet below grade as indicated in the sketch.

1251 Hours:

We depart the scene and head for tank A914-1 and A914-2.

1254 Hours:

We are at the tank site of tank A914-1 and A914-2; A914-1 is the northern most tank. Contrary to map indication provided by Mare Is., each tank is approximately of the 1,000 gal. capacity size.

1259 Hours:

Readings are taken at this time. LEL is 0 %. Oxygen is 15.7 % for A914-2. Permission is given to remove this tank.

1300 Hours:

A914-2 has been removed. There are no visible holes in the tank.

1304 Hours:

Soil Sample #1 of A914-2 is taken at midpoint of previous tank placement at 8 ft. 2 in. below grade.

1311 Hours:

Readings were taken for tank A914-1. LEL is 0 %. Oxygen is 1.6 %.

Permission is given to remove the tank.

1317 Hours:

Tank A914-1 is removed. There are no visible holes.

1326 Hours:

Soil Sample #1 of tank A914-1 is taken at 9 ft. 3 in. below grade as indicated in the sketch.

1335 Hours:

We are now at tank A267 which is a 500 gal. diesel tank.

1337 Hours:

Readings are taken. Oxygen is 1.8 %. LEL is 0 %. Permission is given to remove the tank.

1340 Hours:

The tank is removed. There are no visible holes in the tank. Slight water is found at the bottom of the excavation pit, but not enough to merit nor permit the taking of a water sample. Identifying picture is taken.

1347 Hours:

A soil sample is taken at 6 1/2 ft. below grade as indicated in the accompanying sketch.

1354 Hours:

Tank removals are complete for the day.

July 18, 1990:

1033 Hours:

I arrive at Mare Is. and meet the crew at the BV underground storage tank, which is a 500 gal. diesel tank.

1054 Hours:

Readings are taken on the tank. LEL is 0 %. Oxygen is 17.4 %. Permission is given to remove the tank.

1056 Hours:

The tank is removed and there are visible holes in the tank. At least 17 counted. An identifying picture is taken.

1100 Hours:

A soil sample is taken at the fill end of the tank at 7 ft. below grade.

1105 Hours:

We depart the scene to head to tank A71N which is a 1,000 gal. Diesel tank.

1109 Hours:

We arrive at A71N.

1113 Hours:

Readings are taken. LEL is 0 %. Oxygen is 3.1 %. Permission is given to remove the tank.

1117 Hours:

Tank removed and examined. No visible holes. Identifying picture was taken.

1127 Hours:

A soil sample was taken at the fill end of tank as indicated in the sketch. The sample was taken at 10 ft. 9 in. below grade.

1135 Hours:

We depart to head to tank A225.

1138 Hours:

We are at A225 which is a 200 gal. fuel oil tank.

1139 Hours:

Readings are taken. LEL is 0 %. Oxygen is 19.8 %. Permission is given to remove the tank.

1144 Hours:

The tank is removed. No visible holes observed. Identifying picture is taken.

1150 Hours:

A soil sample is taken at 8 ft. below grade at the fill end. See accompanying sketch.

1206 Hours:

We arrive at tank 993-4 which is a 500 waste oil tank.

1209 Hours:

Readings are taken. LEL is at 0 %. Oxygen is at 0.6 %. Permission is given to remove the tank.

1214 Hours:

The tank is removed. There are visible holes in the tank. Identifying picture is taken as with all the rest.

1220 Hours:

A soil sample is taken as indicated in the sketch. The sample is obtained at a depth of 7 ft. below grade.

1232 Hours:

We leave the scene and head for tank 505-1.

1236 Hours:

We arrive at tank 505-1 which is a 1750 gal. gasoline tank.

1238 Hours:

Readings are taken. LEL is 0 %. Oxygen is 2.6 %. Permission is given to remove the tank.

1247 Hours:

The tank is removed. There are no visible holes. Ground water is present. An identifying picture is taken.

1258 Hours:

Soil sample #1 is a sidewall sample and is taken at 8 ft. below grade. It is a sidewall sample.

1310 Hours:

Soil sample #2 is a sidewall sample taken at 10 ft. below grade.

1333 Hours:

At this time a bailer has been used in order to obtain a sample of the ground water. There are three 40 ml vials with absorbic acid as a preservative used in order to test for BTX & E. Also a one liter bottle sample of the ground water is taken in order to test for total petroleum hydrocarbons as gasoline.

1345 Hours:

We depart and head for tank 577S.

1349 Hours:

We arrive at tank 577S which is a 2,000 gal. oily water tank. The tank, which is top heavy, is at this time floating in water and the bottom can be observed while still in the pit. There are no visible holes in the tank.

1353 Hours:

Readings are taken at this time. Oxygen is at 19.7 %. LEL is 0 %. Permission is given to remove the tank. Due to angle and weight of the partially filled tank with ground water, the backhoe cannot pull the tank out of the pit.

1416 Hours:

The tank is pulled partially out of the pit, or in other words, one end of the tank is pulled out with the other end still in. Plan of action: We will take water and soil samples for this waste oil tank and they can pull it out at their convenience since it has already been determined by me that the atmosphere as it exists in the tank is suitable for removal. LELs are non existent according to the reliable instruments that we were using.

1430 Hours:

Ground water is measured at 4 ft. 8 in. depth below grade. We obtain a water sample at this time to be tested for TOG, TPH-G & D, EPA 602 (metals), and BTX & E. For this purpose three 40 ml vials, two 1 liter bottles and one 500 ml container of ground water was obtained.

1437 Hours:

Soil sample #1 which is a sidewall sample was obtained just above the water line at a depth of 4 ft. 5 in. on the north end of the west side wall. See sketch.

1445 Hours:

Soil sample #2 is a sidewall sample which was obtained at a depth of 4 ft. 5 in. on the south end of the west side wall. See sketch. (Note that a green layer exists in the sidewall which is indicative of some type of sandblast grit which may have been used as backfill material.)

1454 Hours:

Tank removals are complete for today. We all depart the scene with the agreement that I will be contacted at a later date for future removals.

Gregory A. White

L. BERGONCELO
B. SPONG

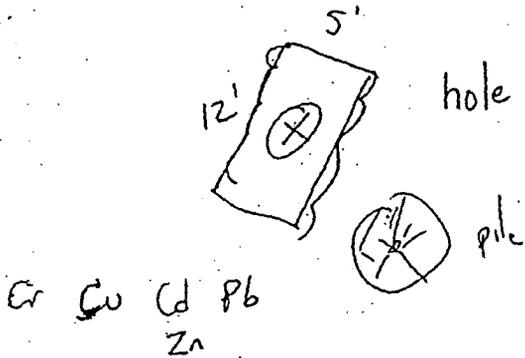
Final site

FIELD NOTES

PROJECT: 490.2

1) A-231 diesel fuel 550 gallon
one sample → @ middle
note 3, 4 → 1" φ holes throughout

TPH-D
DXTE

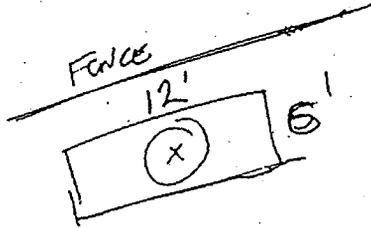


ROAD

sample 2 feet down
centre
≈ 8 10" ft deep
sample at 11:13:00

clayey black contaminated material

2)



A-230 Diesel fuel
9' Deep
11:37 (1130)

TPH
BXTE

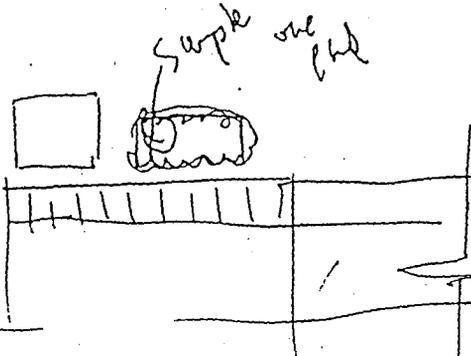
3)

A195 1000 gallon Diesel fuel
4' x 10' dia

sample time 12:05

Tank
appears
clean

TPH
BTXE



Side wall - W side
3.5' below grade

4N sample of clean

4)

A-259 500 Diesel
Sludge box ruptured

12:26



TPH
AXTE

Section 4.0

ANALYTICAL RESULTS

- 4.1 Tank Contents
- 4.2 Rinsate
- 4.3 Soil/Grit

August 7, 1990
 Sample Date: 07/17/90
 Sample Rec'd Date: 07/17/90
 Report #: 128633
 Page 1 of 11

ERM-West
 2001 "P" Street, Suite #200
 Sacramento, CA 95814-5213
 Attn: Bill Spong

Location: U.S. Navy - Mins
 ERM West Job #: 490.20

<u>SAMPLE DESCRIPTION</u>	<u>ANLAB ID#</u>	<u>TIME SAMPLED</u>	<u>TOTAL PETROLEUM HYDROCARBONS, BY 8015 MODIFIED, (mg/kg)</u>	<u>MDL</u>
A-231	128633-1	1115	79* ✓	10
A-230	128633-2	1130	ND	10
A-235	128633-3	1205	ND ✓	10
A-259	128633-4	1226	1800* ✓	10
A-226	128633-5	1248	1600* ✓	10
A-914-2	128633-6	1304	ND ✓	10
A-914-1	128633-7	1326	ND ✓	10
A-267	128633-8	1347	440* ✓	10

* Characterized as diesel.

ND = Not Detected

Data Certified by Kimberly J. Polz
 Report Approved by Franklin J. Hayward

:kad

SUPERIOR ANALYTICAL LABORATORY, INC.

1555 BURKE, UNIT I • SAN FRANCISCO, CA 94124 • PHONE (415) 647-2081

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 81057
CLIENT: Bay Area Tank & Marine
CLIENT JOB NO.: 2040

DATE RECEIVED: 06/22/90
DATE REPORTED: 06/28/90

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS by Modified EPA SW-846 Method 8015

LAB #	Sample Identification	Concentration (mg/L)	
		Gasoline Range	Diesel Range
1	A195	30	250
2	A230	120	1000
3	A231	220	820
4	A259	ND<1	1400

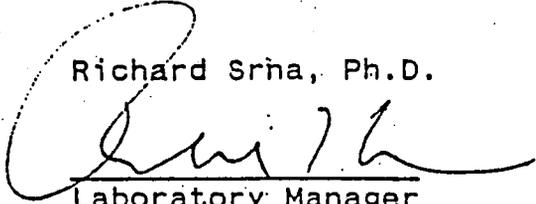
mg/L - parts per million (ppm)

Method Detection Limit for Gasoline and Diesel in Water: 1 mg/Kg

QAQC Summary:

Daily Standard run at 200mg/L: RPD Gasoline = 4%
RPD Diesel = 15%
MS/MSD Average Recovery = 103%: Duplicate RPD = .1%

Richard Srna, Ph.D.


Laboratory Manager

JUL

JUL 9 RECD.

JUL 15 RECD

OUTSTANDING QUALITY AND SERVICE