

November 14, 1994

ALCO
HAZMAT

95 JAN 31 PM 1:56

APEX Project No. 153DT

Mr. Allen Baradar
Environmental Engineering Branch
Department of Transportation, District 4
111 Grand Avenue
Oakland, CA 94623

*when were
MWS installed?*

Subject: Letter Report for Oakland Bay Bridge Project
T.O. #04-04343K-01
Tidal Influence Monitoring

Dear Mr. Baradar,

At Caltrans request, APEX conducted tidal influence monitoring at the three ground-water monitoring wells present at the Oakland Bay Bridge (Figure 1: Site Location Map). On July 21, 1994, the three wells were sampled at high tide. On July 28, 1994, the wells were sampled at low tide. On August 5, 1994, the wells were sampled at mid-tide. On each of the sampling dates, water from the San Francisco Bay was also collected for analysis. On July 21, the Bay sample was collected near Monitoring Well MW1; on July 28, the Bay sample was collected near MW3; and on August 5, the Bay sample was collected near MW2.

The monitoring well and Bay water samples were analyzed for total recoverable petroleum hydrocarbons (TRPH) using EPA method 418.1, organochlorine pesticides and PCB's using EPA method 8080, arsenic, cadmium, chromium, lead and zinc by EPA method 6010, and for hardness. Laboratory reports and chain of custody forms are presented in Appendix A.

TRPH was detected in MW1 at low and mid tide, and in MW3 at low and mid tide. TRPH was not detected in MW2 or in any of the wells at the high tide sampling interval (Table 1 - Analytical Summary for Water).

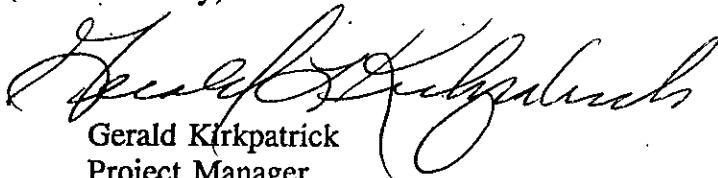
Arsenic, cadmium and zinc were detected in all wells at all sampling intervals in concentrations below the maximum concentration limit (MCL) for each of the metals. Chromium was detected in concentrations above the MCL of 0.05 mg/L in MW1 at low tide; MW2 at low, mid and high tide; in MW3 in low and mid tide; and was not detected in any of the Bay samples. Lead was detected in concentrations above the

MCL of 0.05 mg/L in MW1 at low and high tide; in MW2 at high tide; and in MW3 at low, mid and high tide. Lead was not detected in any of the Bay samples.

Pesticides and PCB's were not detected in any of the samples at any of the sampling intervals. Hardness increased from the low tide samples to the high tide samples in MW1, MW3 and the Bay sample. Hardness decreased from the low tide sample to the high tide sample in MW2.

If you have any questions, or if we may be of further service, please call.

Sincerely,



Gerald Kirkpatrick
Project Manager
Registered Civil Engineer
(C-18500)

enclosures: Figure 1: Site Location Map
Figure 2: Groundwater Monitoring Well Location Map
Figure 3: Groundwater Monitoring Well Location Map

Table 1: Analytical Summary for Water

Appendix A: Laboratory Reports and Chain-of-Custody Records

copy to: file
Jane Campbell

FIGURES

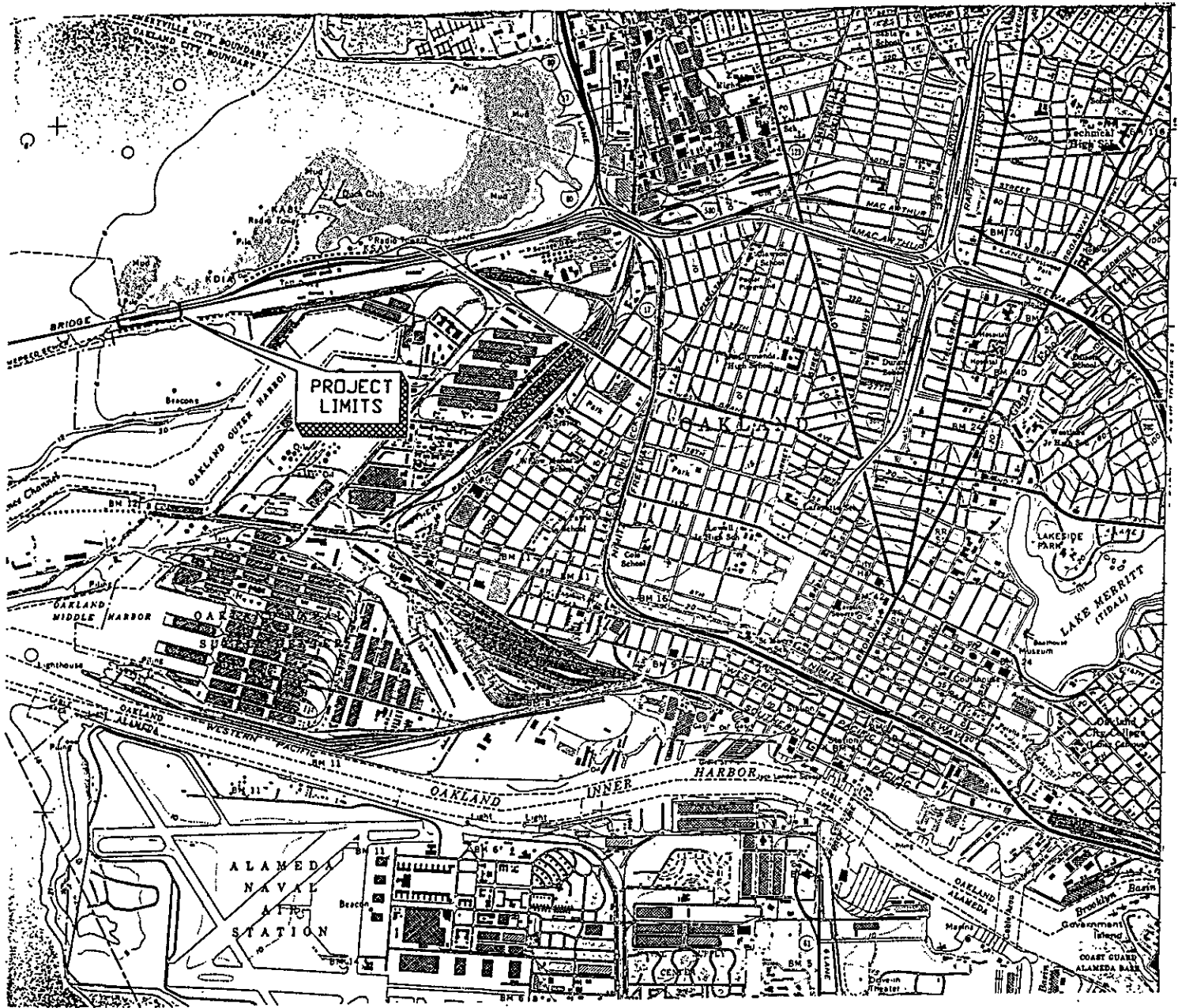


FIGURE 1


**SITE LOCATION MAP
OAKLAND BAY BRIDGE**

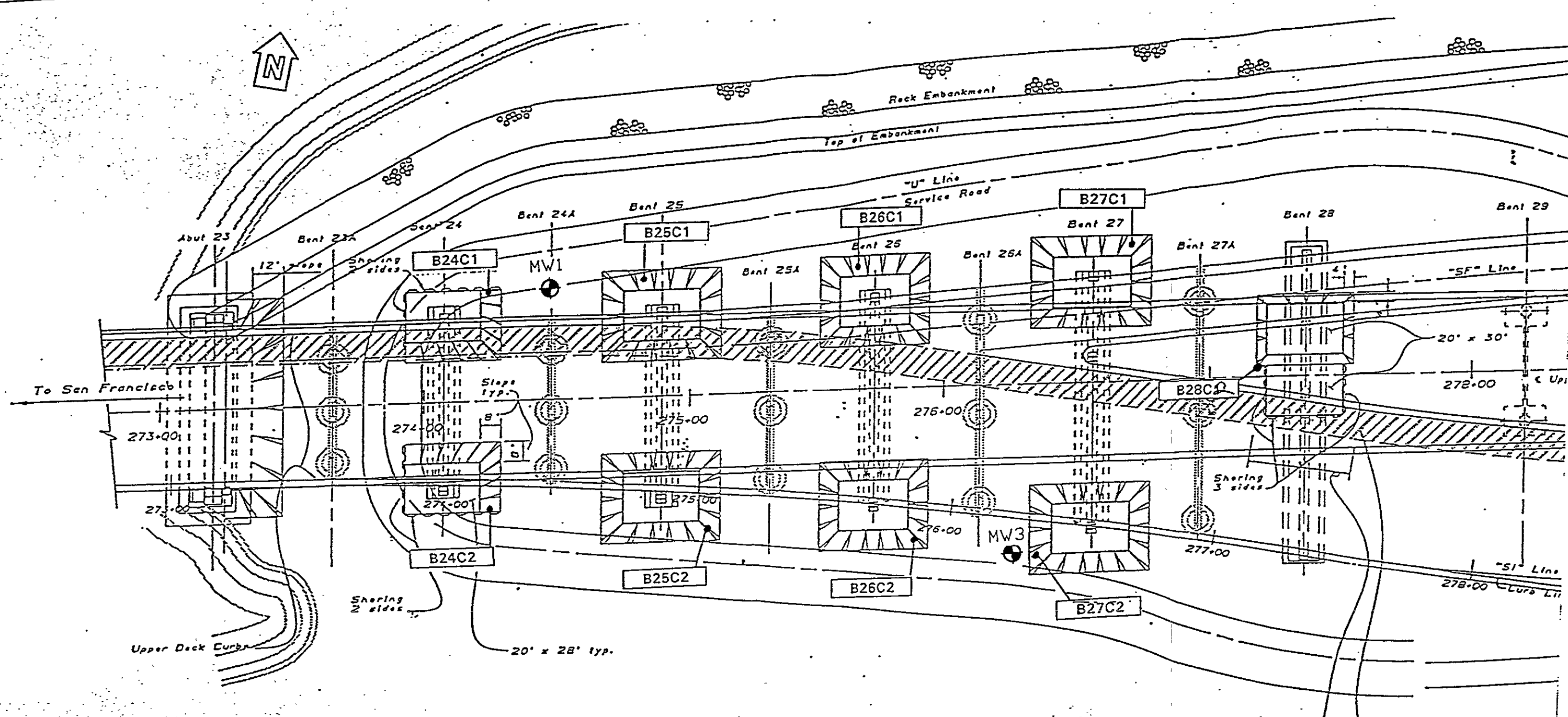
USGS MAP
OAKLAND WEST, QUADRANGLE

PREPARED FOR
CAL. DEPARTMENT OF TRANSPORTATION
DISTRICT 4
OAKLAND, CALIFORNIA



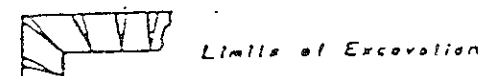
QUADRANGLE LOCATION

SCALE 1:3000	APPROXIMATE SCALE IN FEET		NORTH	DRAWING NO. 153DTF1
	0 3000 6000			
	DRAWN BY	N. MURTHA		
CHECKED BY	N. MURTHA	01/19/94		
APPROVED BY	G. KIRKPATRICK	01/19/94		



Remove 40' section of existing barrier. Movable steel cover plate with attached K-rail to be in place when lane closure not present. K-rail to be repositioned to protect work area when lane closure present and cover plate is removed.

Closed lane during working hours



LEGEND
 MW1 MONITORING WELL LOCATION

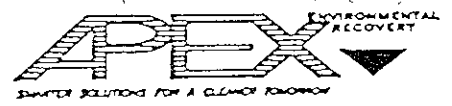
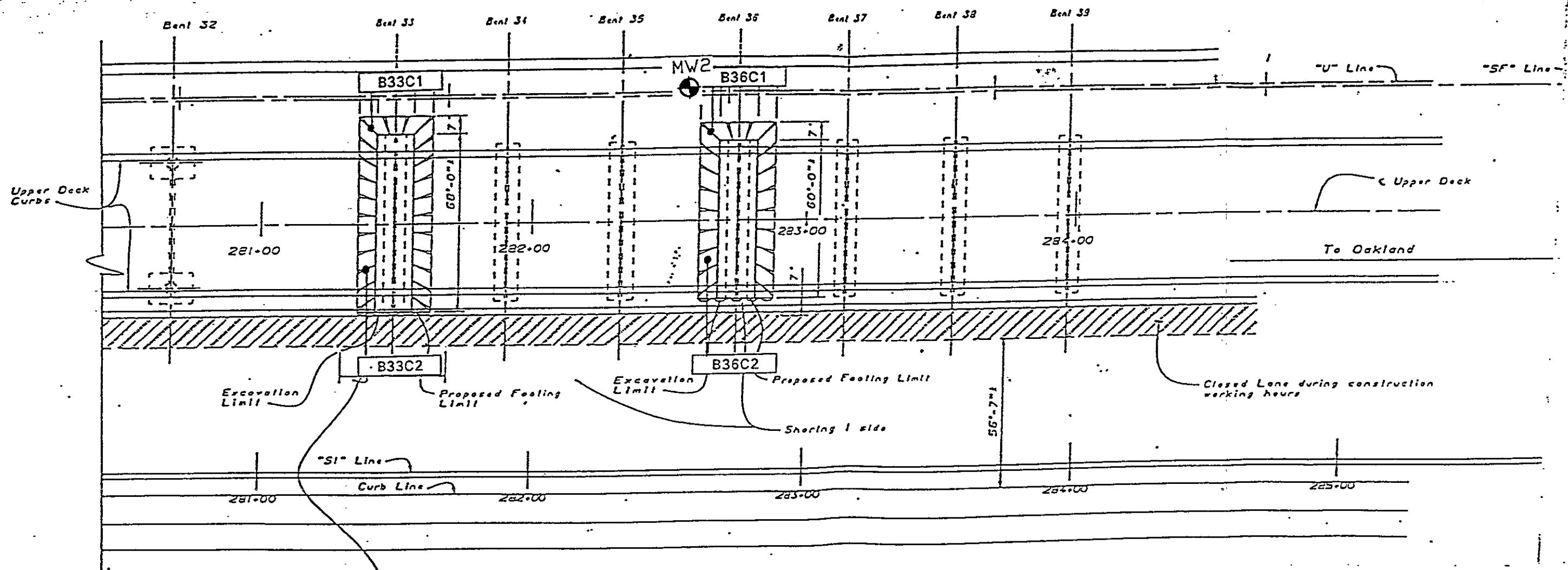


FIGURE 2
 GROUNDWATER MONITORING
 WELL LOCATION MAP
 OAKLAND BAY BRIDGE (EAST BAY SPANS)
 OAKLAND, CALIFORNIA


PREPARED FOR
 CALIFORNIA DEPARTMENT OF TRANSPORTATION
 DISTRICT 4
 T.O #04-04343K-01

NOT TO SCALE			DRAWING NO. 153DF2
DRAWN BY	N. PATEL	01/17/94	
CHECKED BY	N. MURTHA	01/17/94	
APPROVED BY	G. KIRKPATRICK	01/17/94	



Remove 40' section of existing barrier. Movable steel cover plate with attached K-roll to be in place when lane closure not present. K-roll to be repositioned to protect work area when lane closure present and cover plate is removed.

LEGEND

MW1
 MONITORING WELL LOCATION

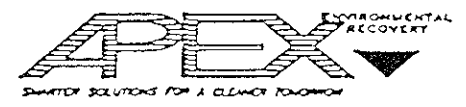


FIGURE 3
 GROUNDWATER MONITORING
 WELL LOCATION MAP
 OAKLAND BAY BRIDGE (EAST BAY SPANS)
 OAKLAND, CALIFORNIA

PREPARED FOR
 CALIFORNIA DEPARTMENT OF TRANSPORTATION
 DISTRICT 4
 TO J04-04343K-01

NOT TO SCALE			DRAWING NO. 1530F4
DRAWN BY	N. PATEL	01/17/94	
CHECKED BY	N. MURTHA	01/17/94	
APPROVED BY	G. KIRKPATRICK	01/17/94	

TABLE

APPENDIX A: Laboratory Reports and Chain-of-Custody Records

Applied P & Ch Laboratory

4088 E. Marston Blvd., Pomona, CA 91768

Tel: (909) 822-5148 Fax: (909) 822-3199

APCL Analytical Report

Submitted to:

Apex Environmental Recovery

Attention: Gerry Kirkpatrick

5772 Bolsa Ave.

Huntington Beach, CA 92649

Tel: (714)890-6551 Fax: (714)890-6555

Service ID #: 801-943389

Received : 07/22/94

Collected by:

Tested : 07/25/94

Collected on: 07/21/94 ✓

Reported : 07/26/94

Sample description:

Water from East Anchorage

Project: Bay Bridge/No.153DT

Caltrans TO#: 04-04343K-01

bay?

Analysis of Water

801-943389 Page 1 of 2

Component Analyzed	Method	Unit	PQL	Concentration			
				MW1 94-3389-1	MW2 94-3389-2	MW3 94-3389-3	Bay 94-3389-4
Hardness (Ca and Mg) by Titration	130.1	mgCaCO ₃ /L	1	5,570	499	6,000	--
TRPH	418.1	µg/L	1	N.D.	N.D.	N.D.	N.D.
Arsenic, As By GFAA	206.2	mg/L	0.002	0.013	0.022	0.019	0.019
Cadmium, Cd	6010	mg/L	0.01	N.D.	N.D.	N.D.	N.D.
Chromium, Total	6010	mg/L	0.02	0.03	0.15	0.04	N.D.
Lead, total	6010	mg/L	0.05	0.10 ✓	0.14 ✓	0.30 ✓	0.09 ✓
Zinc, Zn	6010	mg/L	0.005	0.084	0.16	0.19	0.011
Organochlorine pesticides & PCBs							
α-BHC	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
γ-BHC (Lindane)	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
β-BHC	8080	µg/kg	2	N.D.	N.D.	N.D.	N.D.
Heptachlor	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
δ-BHC	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
Aldrin	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
Heptachlor epoxide	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
Endosulfan I	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
4,4'-DDE	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
Dieldrin	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
Endrin	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
4,4'-DDD	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
Endosulfan II	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
4,4'-DDT	8080	µg/kg	2	N.D.	N.D.	N.D.	N.D.
Endrin aldehyde	8080	µg/kg	1	N.D.	N.D.	N.D.	N.D.
Endosulfan Sulfate	8080	µg/kg	5	N.D.	N.D.	N.D.	N.D.
Methoxychlor	8080	µg/kg	10	N.D.	N.D.	N.D.	N.D.
Toxaphene	8080	µg/kg	5	N.D.	N.D.	N.D.	N.D.
Chlordane	8080	µg/kg	5	N.D.	N.D.	N.D.	N.D.

APCL Analytical Report

Analysis of Water

801-943389 Page 2 of 2

Component Analyzed	Method	Unit	PQL	Concentration			
				MW1 94-3389-1	MW2 94-3389-2	MW3 94-3389-3	Bay 94-3389-4
PCB 1016	8080	µg/kg	50	N.D.	N.D.	N.D.	N.D.
PCB 1221	8080	µg/kg	50	N.D.	N.D.	N.D.	N.D.
PCB 1232	8080	µg/kg	50	N.D.	N.D.	N.D.	N.D.
PCB 1242	8080	µg/kg	20	N.D.	N.D.	N.D.	N.D.
PCB 1246	8080	µg/kg	20	N.D.	N.D.	N.D.	N.D.
PCB 1254	8080	µg/kg	10	N.D.	N.D.	N.D.	N.D.
PCB 1260	8080	µg/kg	10	N.D.	N.D.	N.D.	N.D.

PQL : Practical Quantitation Limit

- : Analysis not requested.

N.D. : Not Detected or less than the quantitation limit.

Respectfully submitted,

Jack Y. Zhang, Ph. D.,
Director
Applied P & Ch Laboratory

Ship To: APCL
 Attn: Geo Hardy

Page 1 of 1
 Project Name: Baylands
 Project No.: 153 DT
 Site Location: East Ave. Baylands
 Date: 7/21/94

CHAIN OF CUSTODY RECORD

Analysis
 4/8/1
 8080
 6010 *
 H.O. Analyzers

Callions TO
 04-04343K-01

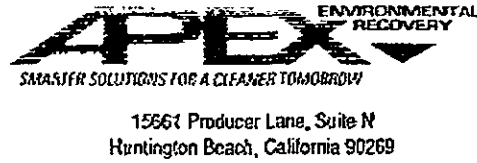
Boring/Well No.	Sample No.	Depth	Date	Time	Sample Type			Comp.	Grab.	Sample Containers				Remarks
					Water	Solid	Other			Vol.	No.	Type	Pres	
MW1	1		7/21	1230	X					3				* Smetals As, Cd, Cr, Pb, Zn
MW2	1		7/21	1305	X					3				2-1 Hr. Gls & 1-1/2 Hr. Pks.
MW3	1		7/21	1330	X					3				
Bay	1		7/21	1255	X					3				2 VO'

Total Number of Samples Shipped:

Shipper's Signature: A.J. Kurland

Signature	Company	Date	Time
Relinquished by: <u>APEX [Signature]</u>	<u>APEX</u>	<u>7-21-94</u>	
Received by:	<u>Fed Ex</u>	<u>7-21-94</u>	
Relinquished by:			
Received by:			
Relinquished by:			
Received by:			

Special Instructions / Shipment / Handling / Storage Requirements:
48 hour Rush on all samples



SEP-01-94 THU 14:55 ILEX ENVIRONMENTAL

Applied P & Ch Laboratory

4088 E. Mission Blvd., Pomona, CA 91768

Tel: (909) 622-5148

Fax: (909) 622-3199

APCL Analytical Report

Submitted to:

Apex Environmental Recovery

Attention: David Aronne

5772 Bolsa Ave.

Huntington Beach, CA 92649

Tel: (714)890-6551 Fax: (714)890-6555

Service ID #: 801-943457

Collected by:

Collected on: 07/28/94

Sample description:

Water from E. Anchorage

Project: Bay Bridge; Job#: 153DT

Caltrans TO-04-04343K-01

Received : 07/29/94

Tested : 08/02-05/94

Reported : 08/09/94

Analysis of Water

801-943457 Page 1 of 2

Component Analyzed	Method	Unit	PQL	Concentration				
				MW 1 94-3457-2	MW 2 94-3457-3	MW 3 94-3457-4	Bay 94-3457-1	
TRPH	418.1/SM50	mg/L	1	2	N.D.	2	N.D.	
Hardness by Titration	130.2	mgCaCO ₃ /L	1	5,250	825	4,850	5,350	
Arsenic, Total, by GFAA	206.2/7060	mg/L	0.002	0.020	0.017	0.010	0.006	
Cadmium, Cd, by ICP	200.7/6010	mg/L	0.01	N.D.	N.D.	N.D.	N.D.	
Chromium, Total, by ICP	200.7/6010	mg/L	0.02	0.24	0.34	0.06	N.D.	
Lead, Total, by ICP	200.7/6010	mg/L	0.05	0.47	N.D.	0.37	N.D.	
Zinc, Zn, by ICP	200.7/6010	mg/L	0.005	0.61	0.27	0.28	0.018	
Organochlorine pesticides & PCBs								
α-BHC	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
γ-BHC (Lindane)	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
β-BHC	8080	µg/L	0.1	N.D.	N.D.	N.D.	N.D.	
Heptachlor	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
δ-BHC	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
Aldrin	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
Heptachlor epoxide	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
Endosulfan I	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
4,4'-DDE	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
Dieldrin	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
Endrin	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
4,4'-DDD	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
Endosulfant II	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
4,4'-DDT	8080	µg/L	0.1	N.D.	N.D.	N.D.	N.D.	
Endrin aldehyde	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.	
Endosulfan Sulfate	8080	µg/L	0.5	N.D.	N.D.	N.D.	N.D.	
Methoxychlor	8080	µg/L	2	N.D.	N.D.	N.D.	N.D.	
Toxaphene	8080	µg/L	0.5	N.D.	N.D.	N.D.	N.D.	
Chlordane	8080	µg/L	0.5	N.D.	N.D.	N.D.	N.D.	
PCB 1016	8080	µg/L	5	N.D.	N.D.	N.D.	N.D.	
PCB 1221	8080	µg/L	5	N.D.	N.D.	N.D.	N.D.	

APCL Analytical Report

Analysis of Water

801-943457 Page 2 of 2

Component Analyzed	Method	Unit	PQL	Concentration			
				MW 1	MW 2	MW 3	Bay
				94-3457-2	94-3457-3	94-3457-4	94-3457-1
PCB 1232	8080	µg/L	5	N.D.	N.D.	N.D.	N.D.
PCB 1242	8080	µg/L	2	N.D.	N.D.	N.D.	N.D.
PCB 1248	8080	µg/L	2	N.D.	N.D.	N.D.	N.D.
PCB 1254	8080	µg/L	1	N.D.	N.D.	N.D.	N.D.
PCB 1260	8080	µg/L	1	N.D.	N.D.	N.D.	N.D.

PQL : Practical Quantitation Limit

SM : Standard Methods for Examination of Water and Waste Water.

N.D. : Not Detected or less than the quantitation limit.

Respectfully submitted,



Jack Y. Zhang, Ph.D.,

Director

Applied P & Ch Laboratory

Ship To: A P C L

Attn: Joyce G.

Page 1 of 1

Project Name: Bay Bridge

Project No.: 153 DT

Site Location: East Anchorage

Date: 7/28/94

CHAIN OF CUSTODY RECORD

Analysis

Caltrans TO
04-04343K-01

418.1
8080
6010 *
H2O Handlers

Boring/Well No.	Sample No.	Depth	Date	Time	Sample Type			Comp.	Grab.	Sample Containers				Remarks
					Water	Solid	Other			Vol.	No.	Type	Pros	
MW1	2		7/28		X						3			* 5 metals As, Cd, Cr, Pb, Zn
MW2	2		7/28		X						3			
MW3	2		7/28		X						3			2-1 Hr gls; 1 1/2 Hr plate
Bay	2		7/28		X						3			
Blanks			7/28		X						2			2-VOA

Total Number of Samples Shipped: 4

Shipper's Signature: [Signature]

Signature	Company	Date	Time
Relinquished by: <u>[Signature]</u>	<u>APEX</u>	<u>7-28-94</u>	
Received by:	<u>Fed Ex</u>	<u>7-28-94</u>	
Relinquished by:			
Received by:			
Relinquished by:			
Received by:			

Special Instructions / Shipment / Handling/ Storage Requirements:

3457



15661 Producer Lane, Suite N
Huntington Beach, California 90269

Applied P & Ch Laboratory

4088 E. Mission Blvd., Pomona, CA 91766

Tel: (909) 822-5148 Fax: (909) 822-3199

APCL Analytical Report

Submitted to:
 Apex Environmental Recovery
 Attention: David Aronne
 5772 Bolsa Ave.
 Huntington Beach, CA 92649
 Tel: (714)890-6551 Fax: (714)890-6555

Service ID #: 801-943547 Received : 08/06/94
 Collected by: Tested : 08/08-09/94
 Collected on: 08/05/94 Reported : 08/09/94
 Sample description:
 Water from E. Anchorage
 Project: Bay Bridge; 153DT
 Caltran TO-04-04343K-01

Analysis of Water

801-943547 Page 1 of 2

Component Analyzed	Method	Unit	PQL	Concentration			
				MW1 94-3547-2	MW2 94-3547-3	MW3 94-3547-4	Bay 94-3547-1
TRPH	418.1/SM50	mg/L	1	2	N.D.	1	N.D.
Hardness by Titration	130.2	mgCaCO ₃ /L	1	5,420	710	5,580	5,960
Arsenic, Total, by GFAA	206.2/7060	mg/L	0.002	0.004	0.008	0.009	0.007
Cadmium, Cd, by ICP	200.7/6010	mg/L	0.01	N.D.	N.D.	N.D.	N.D.
Chromium, Total, by ICP	200.7/6010	mg/L	0.02	N.D.	0.11	0.07	N.D.
Lead, Total, by ICP	200.7/6010	mg/L	0.05	N.D.	N.D.	0.30	N.D.
Zinc, Zn, by ICP	200.7/6010	mg/L	0.005	0.03	0.20	0.39	0.015
Organochlorine pesticides & PCBs							
α-BHC	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
γ-BHC (Lindane)	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
β-BHC	8080	µg/L	0.1	N.D.	N.D.	N.D.	N.D.
Heptachlor	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
δ-BHC	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
Aldrin	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
Heptachlor epoxide	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
Endosulfan I	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
4,4'-DDE	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
Dieldrin	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
Endrin	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
4,4'-DDD	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
Endosulfant II	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
4,4'-DDT	8080	µg/L	0.1	N.D.	N.D.	N.D.	N.D.
Endrin aldehyde	8080	µg/L	0.05	N.D.	N.D.	N.D.	N.D.
Endosulfan Sulfate	8080	µg/L	0.5	N.D.	N.D.	N.D.	N.D.
Methoxychlor	8080	µg/L	2	N.D.	N.D.	N.D.	N.D.
Toxaphene	8080	µg/L	0.5	N.D.	N.D.	N.D.	N.D.
Chlordane	8080	µg/L	0.5	N.D.	N.D.	N.D.	N.D.
PCB 1016	8080	µg/L	5	N.D.	N.D.	N.D.	N.D.
PCB 1221	8080	µg/L	5	N.D.	N.D.	N.D.	N.D.

APCL Analytical Report

Analysis of Water

Component Analyzed	Method	Unit	PQL	Concentration			
				MW1 94-3547-2	MW2 94-3547-3	MW3 94-3547-4	Bay 94-3547-1
PCB 1232	8080	µg/L	5	N.D.	N.D.	N.D.	N.D.
PCB 1242	8080	µg/L	2	N.D.	N.D.	N.D.	N.D.
PCB 1248	8080	µg/L	2	N.D.	N.D.	N.D.	N.D.
PCB 1254	8080	µg/L	1	N.D.	N.D.	N.D.	N.D.
PCB 1260	8080	µg/L	1	N.D.	N.D.	N.D.	N.D.

PQL : Practical Quantitation Limit

SM : Standard Methods for Examination of Water and Waste Water.

N.D. : Not Detected or less than the quantitation limit.

Respectfully submitted,



Jack Y. Zhang, Ph. D.,

Director

Applied P & Ch Laboratory

Ship To: APCL
 Attn: Joyce

Page 1 of 1
 Project Name: Bay Bridge
 Project No.: IS3DT
 Site Location: East Anchorage
 Date: 8.5.94

CHAIN OF CUSTODY RECORD

Analysis				Remarks
48.1	8080	6010 *	H ₂ O Hardness	
Catrans TO 04-04343K-01				

Boring/Well No.	Sample No.	Depth	Date	Time	Sample Type			Comp.	Grab.	Sample Containers				Remarks
					Water	Solid	Other			Vol.	No.	Type	Pros	
MW1	3		8/5		X					3				* 5 metals As, Cd, Cr, Pb, Zn
MW2	3		8/5		X					3				
MW3	3		8/5		X					3				2 Hr glass 1/2 Hr Plus.
BAY	3		8/5		X					3				
Blanks			8/5		X					2				Blank (Gravel) 2 VOA

Total Number of Samples Shipped: 4 Shipper's Signature: [Signature]

Signature	Company	Date	Time
Relinquished by: <u>[Signature]</u>	<u>APEX</u>	<u>8-5-94</u>	
Received by:	<u>Fed Ex</u>	<u>8-5-94</u>	
Relinquished by:			
Received by:			
Relinquished by:			
Received by:			

Special Instructions / Shipment / Handling/ Storage Requirements:
48 hour Rush on all samples

3547

APEX ENVIRONMENTAL RECOVERY
 SMARTER SOLUTIONS FOR A CLEANER TOMORROW
 15661 Producer Lane, Suite N
 Huntington Beach, California 90269