

July 6, 1994

SENT BY FACSIMILE

(510)-286-5642

APEX Project No. 153DT

JD 4901

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

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

Dear Mr. Baradar,

On May 25, 1994, APEX Environmental Recovery, Inc. (APEX) under the direction of Caltrans, installed three groundwater monitoring wells at the Oakland Bay Bridge Project (Figure 1: Site Location Map). The purpose of the wells was to investigate the quality of groundwater below the site. Groundwater samples were collected from each well and a water sample was collected the San Francisco Bay adjacent to the project site. Monitoring well MW 1 was installed between bents B24 and B25 on the north side, MW 2 was installed adjacent to Bent 36 on the north side, and MW 3 was installed adjacent to Bent 27 on the south side (Figures 2 and 3: Groundwater Monitoring Well Location Map). Monitoring wells MW 1 and MW 2 were installed to 22 feet below ground surface (bgs), and monitoring well MW 3 was installed to 24 feet bgs. The wells were constructed with schedule 40 PVC slotted screen installed from 2 feet to 22 feet bgs in MW 1 and MW 2 and from 4 feet to 24 feet in MW 3. The wells were topped with approximately 5 feet of blank casing and enclosed in above-ground monument boxes.

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, and Title 22 Metals by EPA method 6010. Laboratory reports and chain of custody forms are presented in Appendix A.

The results of the analyses for TRPH indicates the presence of TRPH in four samples collected. TRPH was detected in the groundwater samples from MW-1 at 0.40 parts per million (ppm), MW-2 at 0.21 ppm, and MW-3 at 0.25 ppm. Concentrations for TRPH were also detected in the water sample collected from the San Francisco Bay

(Bay) at 0.16 ppm (Table 1: Analytical Summary for Groundwater - Total Recoverable Petroleum Hydrocarbons).

Concentrations for Organochlorine Pesticides and PCB's were not detected in any samples collected (Table 2: Analytical Summary for Groundwater - Organochlorine Pesticides and PCB's).

The results of analyses for Title 22 Metals indicates the presence of antimony in one sample (Bay) at 0.17 ppm. Concentrations of barium were detected in three samples (MW-1 at 0.47 ppm, MW-2 at 0.38 ppm, MW-3 at 0.14 ppm). Total chromium concentrations were detected in three samples (MW-1 at 0.07 ppm, MW-2 at 0.22 ppm, MW-3 at 0.06 ppm). Concentrations of copper were detected in three samples (MW-1 at 0.07 ppm, MW-2 at 0.06 ppm, MW-3 at 0.09 ppm). Lead was present in one sample, MW 3 at 0.2 ppm. Nickel concentrations were detected in three samples (MW-1 at 0.06 ppm, MW-2 at 0.18 ppm, MW-3 at 0.05 ppm). Vanadium concentrations were detected in three samples (MW-1 at 0.09 ppm, MW-2 at 0.16 ppm, MW-3 at 0.06 ppm). Zinc concentrations were detected in three samples (MW-1 at 0.13 ppm, MW-2 at 0.22 ppm, MW-3 at 0.24 ppm) (Table 3: Analytical Summary for Groundwater - Title 22 Metals).

The metals concentrations were below the maximum contaminant levels (MCL) for water except for chromium concentrations in samples MW 1, MW 2, and MW 3. MW 3 contained lead over the MCL of 0.05 ppm and MW 2 contained nickel over the MCL of 0.1 ppm.

Laboratory analyses of the open borehole samples collected during the initial site investigation in December 1993 are presented in Table 4: Analytical Summary for Groundwater - Total Recoverable Petroleum Hydrocarbons and Table 5: Analytical Summary for Groundwater - Title 22 Metals. TRPH concentrations of the samples collected from the open borehole are lower than the concentrations of TRPH of the samples collected from the groundwater monitoring wells. Metals concentrations of the samples collected from the open borehole are generally higher than the metals concentrations from the groundwater monitoring wells except barium, vanadium, and zinc concentrations are greater in the groundwater monitoring well samples. Copper concentrations are approximately the same in both open borehole samples and groundwater monitoring well samples.

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

Sincerely,

Tom Campbell for Gerald Kirkpatrick

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 Groundwater - Total Recoverable
Petroleum Hydrocarbons

Table 2: Analytical Summary for Groundwater - Organochlorine Pesti-
cides and PCB's

Table 3: Analytical Summary for Groundwater - Title 22 Metals

Table 4: Analytical Summary for Groundwater - Total Recoverable
Petroleum Hydrocarbons

Table 5: Analytical Summary for Groundwater - Title 22 Metals

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

copy to: file
Gerald Kirkpatrick

TABLE 1
ANALYTICAL SUMMARY FOR GROUNDWATER
TOTAL RECOVERABLE PETROLEUM HYDROCARBONS
San Francisco - Oakland Bay Bridge
East Bay Spans

Groundwater monitoring well samples

Sample No.	Sample Date	418.1 (ppm)
MW 1	6/1/94	0.4
MW 2	6/1/94	0.21
MW 3	6/1/94	0.25
Bay	6/1/94	0.16

ND = Not Detected

TABLE 2
ANALYTICAL SUMMARY FOR GROUNDWATER
ORGANOCHLORINE PESTICIDES AND PCB'S
San Francisco - Oakland Bay Bridge
East Bay Spans

8080 ANALYTE (ppb)	Sample Number and Sample Date					
	MW 1	MW 2	MW 3	Bay		
	6/1/94	6/1/94	6/1/94	6/1/94		
Alpha-BHC	ND	ND	ND	ND		
Gamma-BHC (Lindane)	ND	ND	ND	ND		
Beta-BHC	ND	ND	ND	ND		
Heptachlor	ND	ND	ND	ND		
Delta-BHC	ND	ND	ND	ND		
Aldrin	ND	ND	ND	ND		
Heptachlor Epoxide	ND	ND	ND	ND		
Endosulfan I	ND	ND	ND	ND		
4,4'-DDE	ND	ND	ND	ND		
Dieldrin	ND	ND	ND	ND		
Endrin	ND	ND	ND	ND		
4,4'-DDD	ND	ND	ND	ND		
Endosulfan II	ND	ND	ND	ND		
4,4'-DDT	ND	ND	ND	ND		
Endrin Aldehyde	ND	ND	ND	ND		
Endosulfan Sulfate	ND	ND	ND	ND		
Methoxychlor	ND	ND	ND	ND		
Chlordane	ND	ND	ND	ND		
Toxaphene	ND	ND	ND	ND		
Aroclor-1016	ND	ND	ND	ND		
Aroclor-1221	ND	ND	ND	ND		
Aroclor-1232	ND	ND	ND	ND		
Aroclor-1242	ND	ND	ND	ND		
Aroclor-1248	ND	ND	ND	ND		
Aroclor-1254	ND	ND	ND	ND		
Aroclor-1260	ND	ND	ND	ND		
Aroclor-1262	ND	ND	ND	ND		

NOTE: ND=Not Detected, NA=Not Analyzed

TABLE 3
ANALYTICAL SUMMARY FOR GROUNDWATER
TITLE 22 METALS
San Francisco - Oakland Bay Bridge
East Bay Spans

Metal (ppm)	Maximum Contaminant Level (ppm)	Sample Number and Sample Date					
		MW 1 6/1/94	MW 2 6/1/94	MW 3 6/1/94	Bay 6/1/94		
Antimony	*	ND	ND	ND	0.17		
Arsenic	0.05	ND	ND	ND	ND		
Barium	1	0.47	0.38	0.14	ND		
Beryllium	*	ND	ND	ND	ND		
Cadmium	0.01	ND	ND	ND	ND		
Chromium (Total)	0.05	0.07	0.22	0.06	ND		
Cobalt	*	ND	ND	ND	ND		
Copper	1	0.07	0.06	0.09	ND		
Lead	0.05	ND	ND	0.2	ND		
Mercury	0.002	ND	ND	ND	ND		
Molybdenum	*	ND	ND	ND	ND		
Nickel	0.1	0.06	0.18	0.05	ND		
Selenium	0.01	ND	ND	ND	ND		
Silver	0.05	ND	ND	ND	ND		
Thallium	*	ND	ND	ND	ND		
Vanadium	*	0.09	0.16	0.06	ND		
Zinc	5	0.13	0.22	0.24	ND		

NOTE: ND = Not Detected

TABLE 4
ANALYTICAL SUMMARY FOR GROUNDWATER
TOTAL RECOVERABLE PETROLEUM HYDROCARBONS
San Francisco - Oakland Bay Bridge
East Bay Spans
Open borehole samples

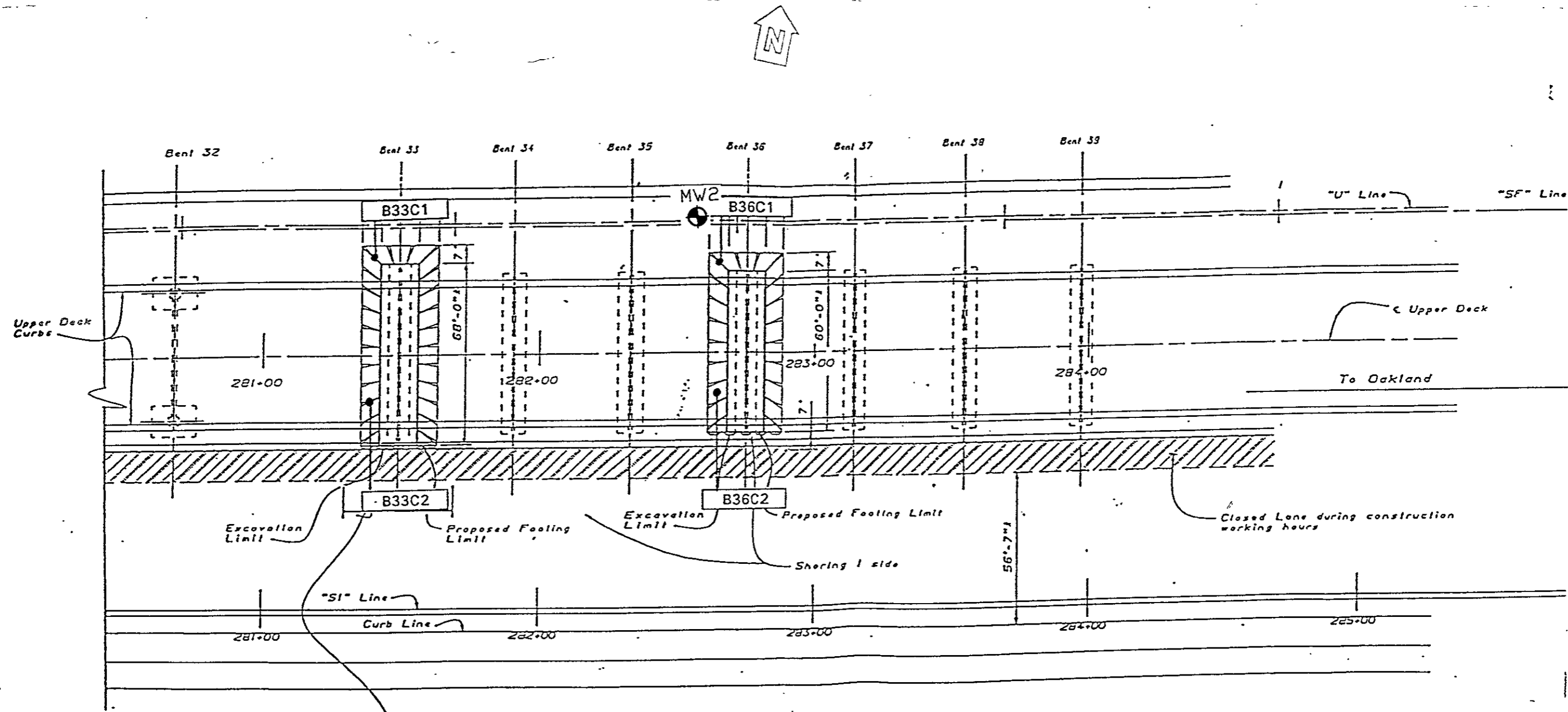
Sample No.	Sample Date	418.1 (ppm)
B24C1W	12/30/93	0.2
B25C1W	12/30/93	0.14
B27C2W	12/30/93	ND

ND = Not Detected

TABLE 5
ANALYTICAL SUMMARY FOR GROUNDWATER
TITLE 22 METALS
San Francisco - Oakland Bay Bridge
East Bay Spans
Open Borehole Samples

Metal (ppm)	Maximum Contaminant Level (ppm)	Sample Number and Sample Date					
		B24C1W 12/30/94	B24C1W 12/30/94	B27C2W 12/30/94			
Antimony	*	0.75	0.35	0.57			
Arsenic	0.05	0.001	ND	ND			
Barium	1	ND	ND	ND			
Beryllium	*	ND	ND	ND			
Cadmium	0.01	0.08	0.08	0.06			
Chromium (Total)	0.05	0.2	0.21	0.17			
Cobalt	*	0.59	0.57	0.39			
Copper	1	0.08	0.07	0.05			
Lead	0.05	0.27	0.21	0.11			
Mercury	0.002	ND	ND	ND			
Molybdenum	*	0.22	0.17	ND			
Nickel	0.1	0.61	0.59	0.36			
Selenium	0.01	0.002	ND	ND			
Silver	0.05	0.08	0.07	0.05			
Thallium	*	0.76	0.74	0.54			
Vanadium	*	ND	ND	ND			
Zinc	5	ND	ND	ND			

NOTE: ND = Not Detected



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
 T.O.#04-04343K-01

NOT TO SCALE			DRAWING NO. 153DF4
DRAWN BY	N. PATEL	01/17/94	
CHECKED BY	N. MURTHA	01/17/94	
APPROVED BY	G. KIRKPATRICK	01/17/94	

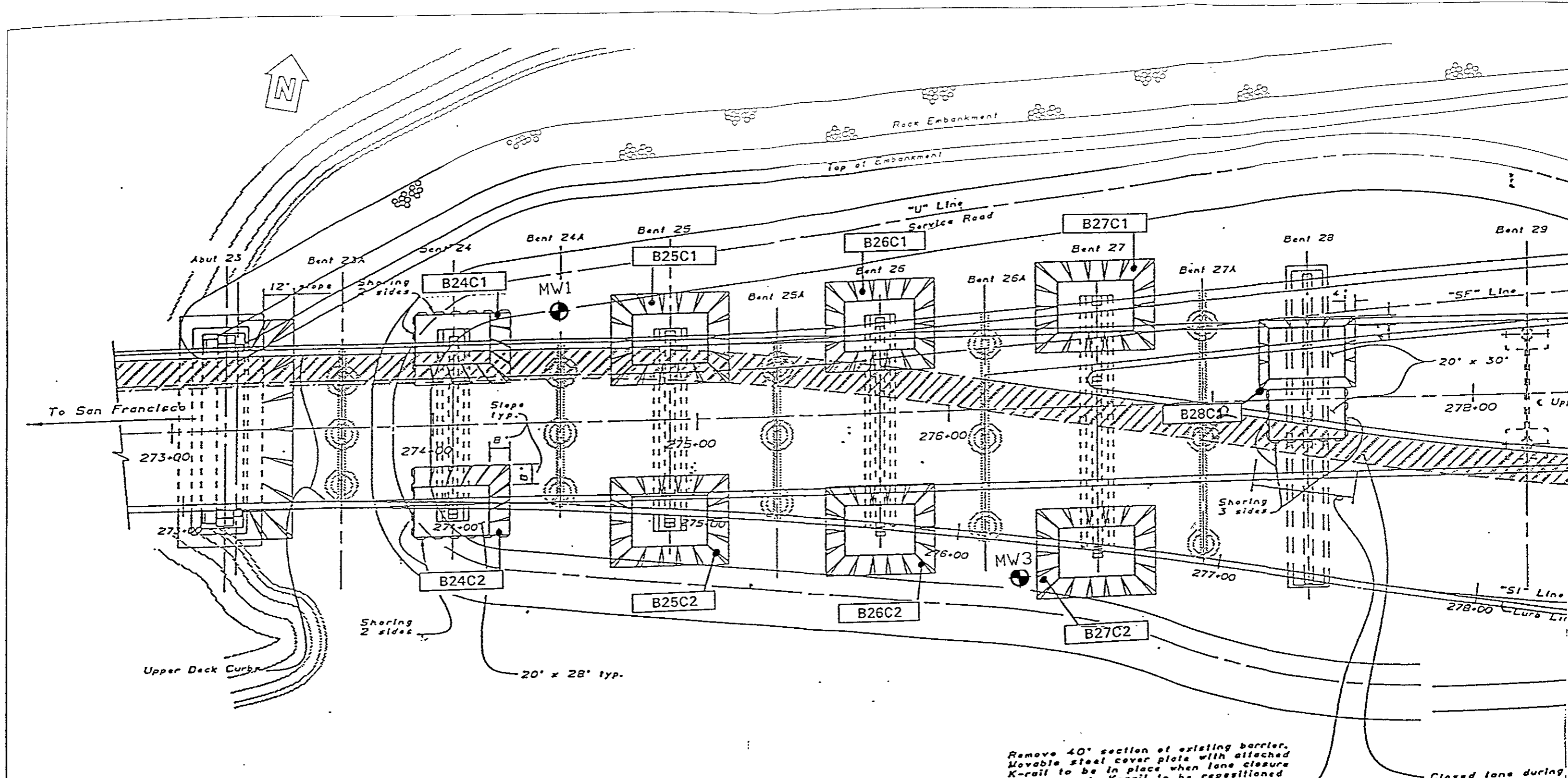
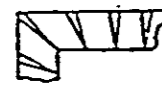


FIGURE 2

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

LEGEND

MW1
MONITORING WELL LOCATION

 Limits of Excavation

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	

