CAMBRIA

August 25, 2000

Ms. eva chu
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: **BP/ARCO Service Station # 6041**
7249 Village Parkway
Dublin, California
Cambria Project #436-1610

Dear Ms. chu:

On behalf of BP/ARCO, Cambria Environmental Technology, Inc. (Cambria) is pleased to submit this response to the Alameda County Health Care Services Agency's (ACHCSA) June 13, 2000 correspondence. Cambria previously addressed ACHCSA's concerns related to UST monitoring records and monitoring well sampling frequency in a July 14, 2000 submittal. This letter report addresses the site hydrogeology, presents a work plan for downgradient plume delineation and for site remediation, items discussed during our meeting on July 25, 2000.

HYDROGEOLOGIC INTERPRETATION

As you have requested, a geologic fence diagram, showing the main lithologic units beneath and downgradient of the subject site, is presented as Figure 2. Soil boring logs from BP wells AW-5 and AW-6, and well MW-7 from the former Shell service station, were incorporated into the fence diagram and are included in Attachment A. As shown in this diagram, the shallow sandy/silt unit beneath the site does not appear to extend very far beyond Amador Valley Boulevard. This suggests that dissolved constituents in ground water originating at the ARCO site should not migrate significantly to the south beyond Amador Valley Boulevard.

PROPOSED SCOPE OF WORK

On behalf of BP/ARCO, Cambria proposes the following scope of work to complete the horizontal delineation of the methyl tertiary butyl ether (MTBE) plume and to reduce the mass of MTBE in ground water at the site:

- Improve the seals around the tank pit backfill well vaults,
- Analyze groundwater samples for ethanol by EPA Method 8260,

Oakland, CA
San Ramon, CA
Sonoma, CA
Portland, OR

Cambria Environmental Technology, Inc.

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- Incorporate wells MW-6 and MW-7, from the former Shell service station on the opposite corner from the BP/ARCO site, into the groundwater monitoring program for the subject site, and
- Implement dual phase vacuum extraction (DVE) from source area wells to remove dissolved phase hydrocarbons.

Secure Tank Pit Well Vaults: Cambria will improve the seals around the tank pit backfill well heads by installing either locking well caps or slip caps.

Analyze groundwater samples for ethanol: Cambria conducted the third quarter sampling event on August 20, 2000. At that time groundwater samples were collected from site wells MW-1, MW-2, MW-3 and VW-2. Groundwater samples will be analyzed for total petroleum hydrocarbons as gasoline (TPHg) by EPA Method 8015, benzene, toluene, ethylbenzene, and xylenes (BTEX), MTBE and ethanol by EPA Method 8260.

Downgradient Monitoring: The ACHCSA June 13, 2000 letter requested installation of off site downgradient monitoring wells for delineation of ARCO's dissolved hydrocarbon plume. To meet this requirement, Cambria proposes incorporating wells MW-6 and MW-7 from the former Shell service station into ARCO's groundwater monitoring program for the subject site.

Gasoline service stations once occupied all four corners of the intersection of Village Parkway and Amador Valley Boulevard, and all of the stations have had groundwater monitoring wells installed. Based on field reconnaissance, the closest of the off site downgradient wells, BP wells AW-5 and AW-6, have been abandoned, therefore, former Shell wells MW-6 and MW-7 will serve as the downgradient monitoring wells for ARCO's dissolved hydrocarbon plume.

Cambria has initiated contact with Equiva Services LLC (the management entity resulting from the 1999 merger between Texaco and Shell) to gaining permission from Equiva to develop, survey and sample wells MW-6 and MW-7. We anticipate sampling these wells during the fourth quarter, 2000 and quarterly thereafter. Groundwater samples from MW-6 and MW-7 will be analyzed for TPHg, BTEX and MTBE.

Mobile DVE Remediation: Cambria will implement source removal remediation at the BP/ARCO site using a series of dual-phase vacuum extraction (DVE) mobile treatment events. DVE is the process of applying high vacuum (up to 29 inches of mercury) to simultaneously extract both vapors and groundwater. DVE allows for removal of soil vapors and SPH within the vadose zone and enhances groundwater extraction from the saturated zone by applying a high vacuum on remediation or monitoring wells.

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Mobile DVE equipment will consist of dedicated extraction "stingers" installed in the two source area wells, a vacuum truck, and a carbon vapor treatment system. A process flow diagram of the mobile DVE system is shown in Figures 3.

Mobile DVE Mobile treatment events will be conducted once a month for six months with each event consisting of four hours of extraction from each of the wells containing the highest MTBE concentrations. Details of mobile DVE treatment events and hydrocarbon mass removal calculations will be presented in forthcoming groundwater monitoring reports.

MW-1 and MW-3 ? Will extraction be conducted from VW-2? or MW-2? MW-2 + MW-3, possible MW-1

CLOSING

Will vapor + or GW samples be collected pre + post treatment Yes in field and for lab analysis Mthrough extraction

We trust the above information and the work plan items outlined above meet the requirements of the ACHCSA's July 13, 2000 letter. Please call Darryk Ataide at (510) 420-3339 if you have any questions or comments. Thank you for your assistance.

Sincerely,
Cambria Environmental Technology, Inc.

Darryk Ataide (by JPT)

Darryk Ataide, REA I
Project Manager

Joseph P. Theisen, C.E.G.
Principal Hydrogeologist

REGISTERED GEOLOGIST
JOSEPH P. THEISEN
No. EG-1645
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Attachments: A – Soil Boring Logs

cc: Paul Supple, BP/ARCO, P.O. Box 6549 Moraga, California 94570

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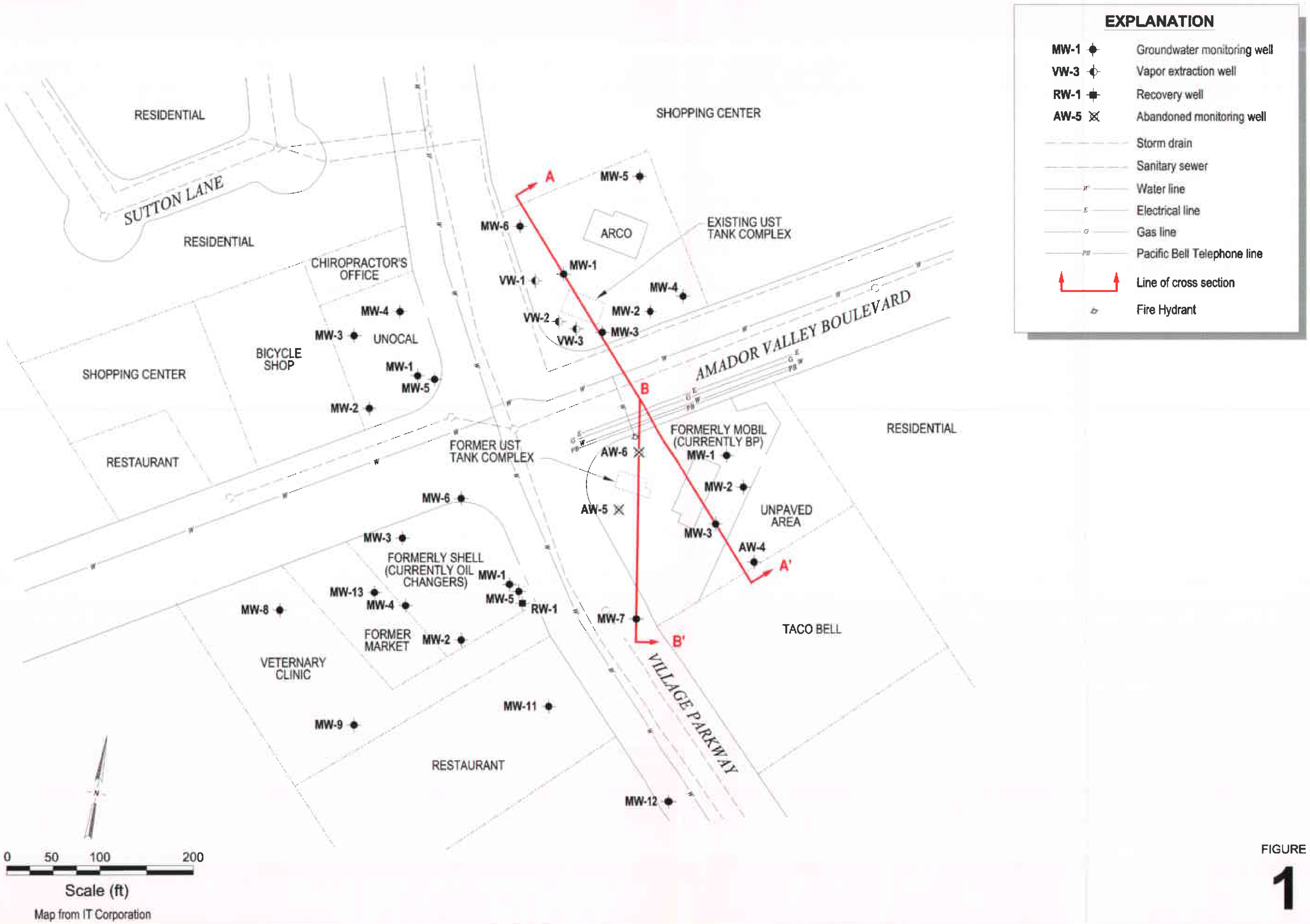
EXPLANATION
MW-1 Groundwater monitoring well
VW-3 Vapor extraction well
RW-1 Recovery well
AW-5 Abandoned monitoring well
Storm drain
Sanitary sewer
Water line
Electrical line
Gas line
Pacific Bell Telephone line
Line of cross section
Fire Hydrant
RESIDENTIAL
SUTTON LANE
RESIDENTIAL
SHOPPING CENTER
ARCO
EXISTING UST TANK COMPLEX
A
MW-5
MW-6
MW-1
VW-1
MW-4
MW-2
VW-2
VW-3
MW-3
AMADOR VALLEY BOULEVARD
B
CHIROPRACTOR'S OFFICE
MW-4
MW-3
UNOCAL
BICYCLE SHOP
MW-1
MW-5
MW-2
SHOPPING CENTER
RESTAURANT
FORMER UST TANK COMPLEX
AW-6
FORMERLY MOBIL (CURRENTLY BP)
MW-1
MW-2
AW-5
MW-3
UNPAVED AREA
AW-4
A'
RESIDENTIAL
MW-6
MW-3
FORMERLY SHELL (CURRENTLY OIL CHANGERS)
MW-1
MW-5
RW-1
MW-13
MW-4
MW-8
FORMER MARKET
MW-2
MW-7
B'
TACO BELL
VETERNARY CLINIC
MW-11
MW-9
RESTAURANT
VILLAGE PARKWAY
MW-12
N
0 50 100 200
Scale (ft)
Map from IT Corporation

FIGURE
1

Site Plan

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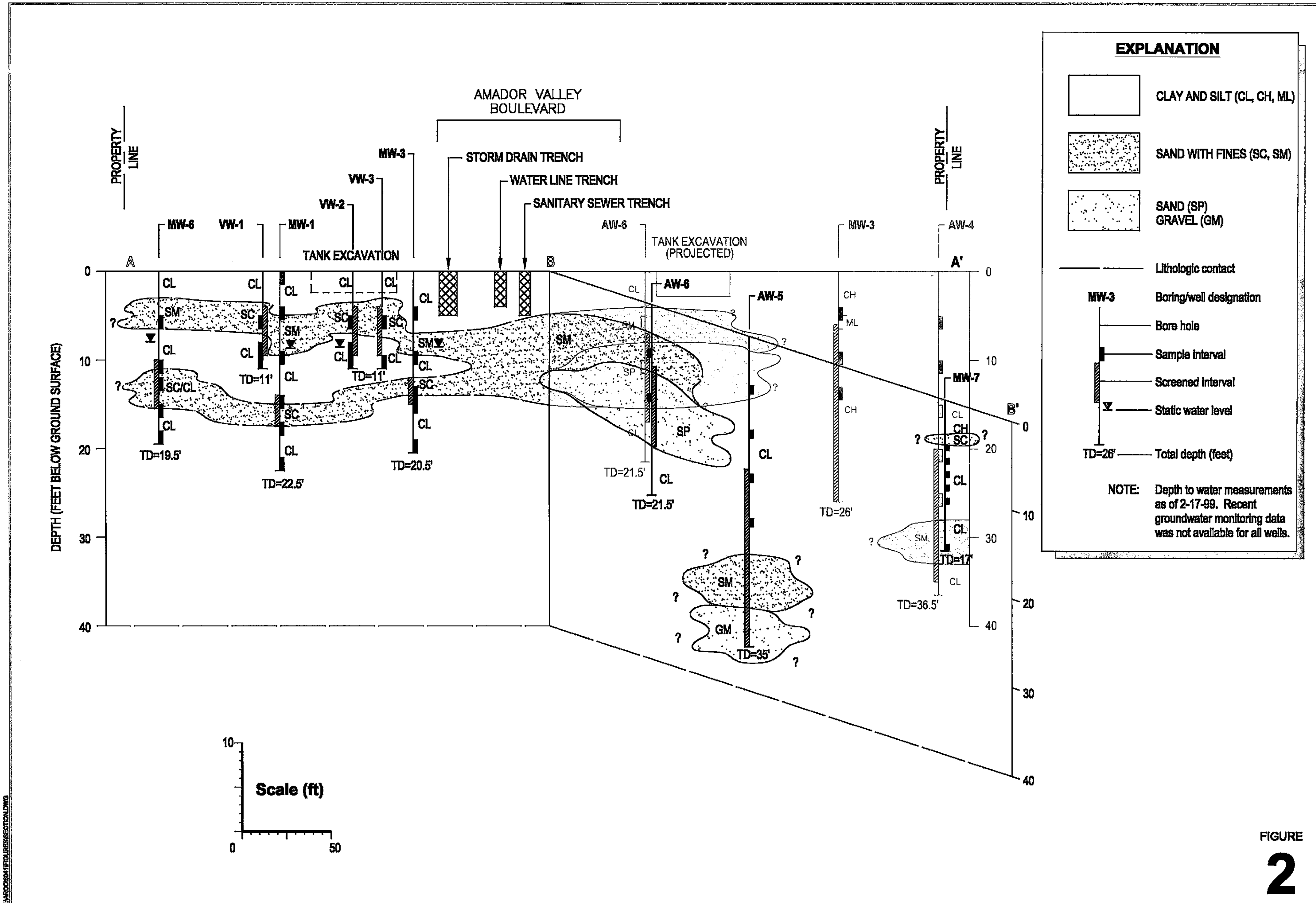
ARCO Products Company Station 6041
7249 Village Parkway
Dublin, California



AMADOR VALLEY BOULEVARD
PROPERTY LINE
MW-3
STORM DRAIN TRENCH
WATER LINE TRENCH
SANITARY SEWER TRENCH
VW-3
VW-2
MW-6
VW-1
MW-1
TANK EXCAVATION
AW-6
TANK EXCAVATION (PROJECTED)
MW-3
AW-4
A
B
A'
B'
DEPTH (FEET BELOW GROUND SURFACE)
AW-5
MW-7
TD=19.5'
TD=11'
TD=11'
TD=22.5'
TD=20.5'
TD=21.5'
TD=21.5'
TD=35'
TD=26'
TD=36.5'
TD=17'
Scale (ft)
EXPLANATION
CLAY AND SILT (CL, CH, ML)
SAND WITH FINES (SC, SM)
SAND (SP)
GRAVEL (GM)
Lithologic contact
MW-3 Boring/well designation
Bore hole
Sample interval
Screened interval
Static water level
TD=26' Total depth (feet)
NOTE: Depth to water measurements as of 2-17-99. Recent groundwater monitoring data was not available for all wells.

Fence Diagram from Cross Section A-A' and B-B'

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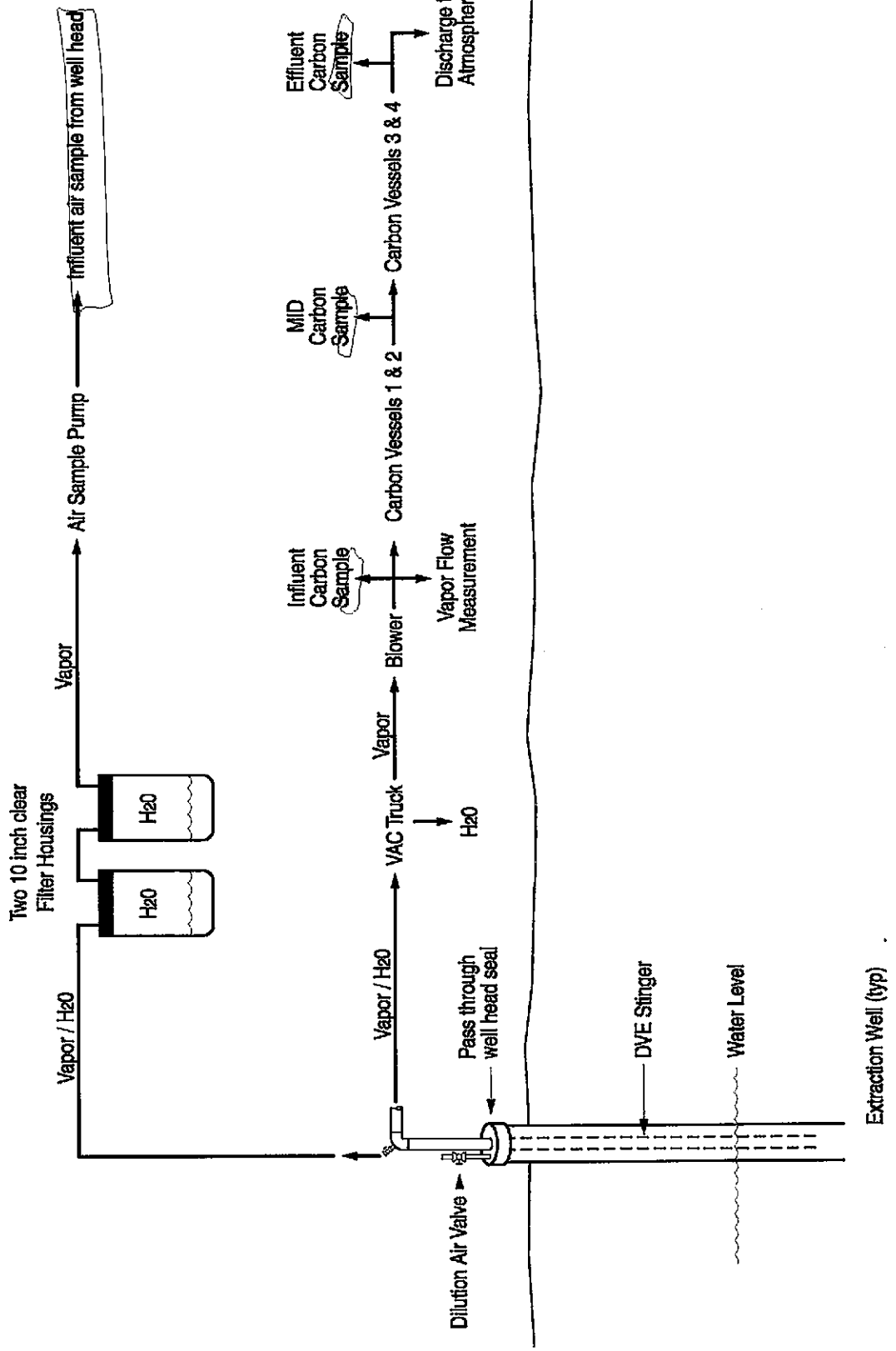
ARCO Products Company Station 6041
7249 Village Parkway
Dublin, California

FIGURE
2



G:\O-MGMT\VAC OPS\FIGURES\MOBILE-DVE.AI

FIGURE

3

Mobile Dual Phase Vacuum Extraction (DVE) System

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ATTACHMENT A
Soil Boring Logs

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-095 DATE DRILLED 11/6/90
CLIENT Mobil Oil Corporation
LOCATION 7197 Village Pkwy, Dublin
LOGGED BY B. Nagle APPROVED BY

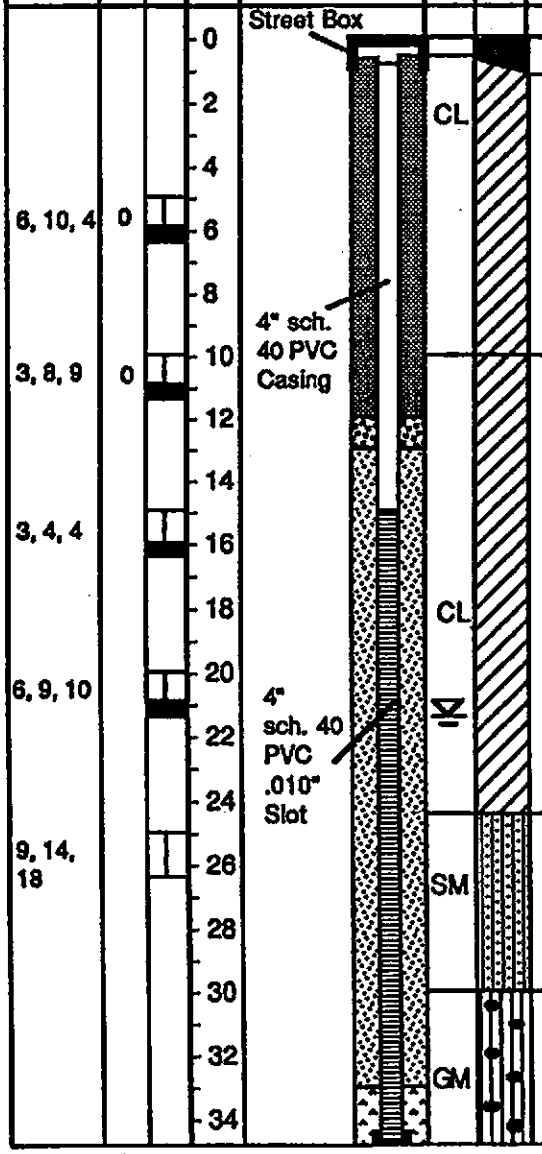
BORING NO. AW-5
WELL NO. AW-5
Page 1 of 1

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 334.81

DRILLING METHOD Hollow stem auger HOLE DIAM. 10"
SAMPLER TYPE Modified split spoon
CASING DATA Perforations: 15-35'
DRILLER West Hazmat

WATER LEVEL	21.5	9.67'	
DATE	11/6/90	11/15/90	
TIME	1200	–	



DESCRIPTION

4" asphalt; 4" base material

SANDY CLAY; dark grayish brown, damp, moderate plasticity, very stiff

SILTY CLAY; very dark brown to black, damp, high plasticity, stiff

Color change to tan; minor coarse sand and rootlets

Color change to dark gray, moisture change to wet at 21.5 feet below grade

SILTY SAND; light brown, wet, medium dense

Unable to sample below 26.5 feet due to flowing sand; abundant gravel in cuttings from below 30 feet

Boring terminated at 35 feet below grade
Free ground water encountered at appoximately 21.5 feet below grade

Portland Cement | Bentonite Pellets | Sample
Sand #3 Lonestar | Native Soil | Driven Interval

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-095 DATE DRILLED 11/6/90
CLIENT Mobil Oil Corporation
LOCATION 7197 Village Pkwy, Dublin
LOGGED BY B. Nagle APPROVED BY

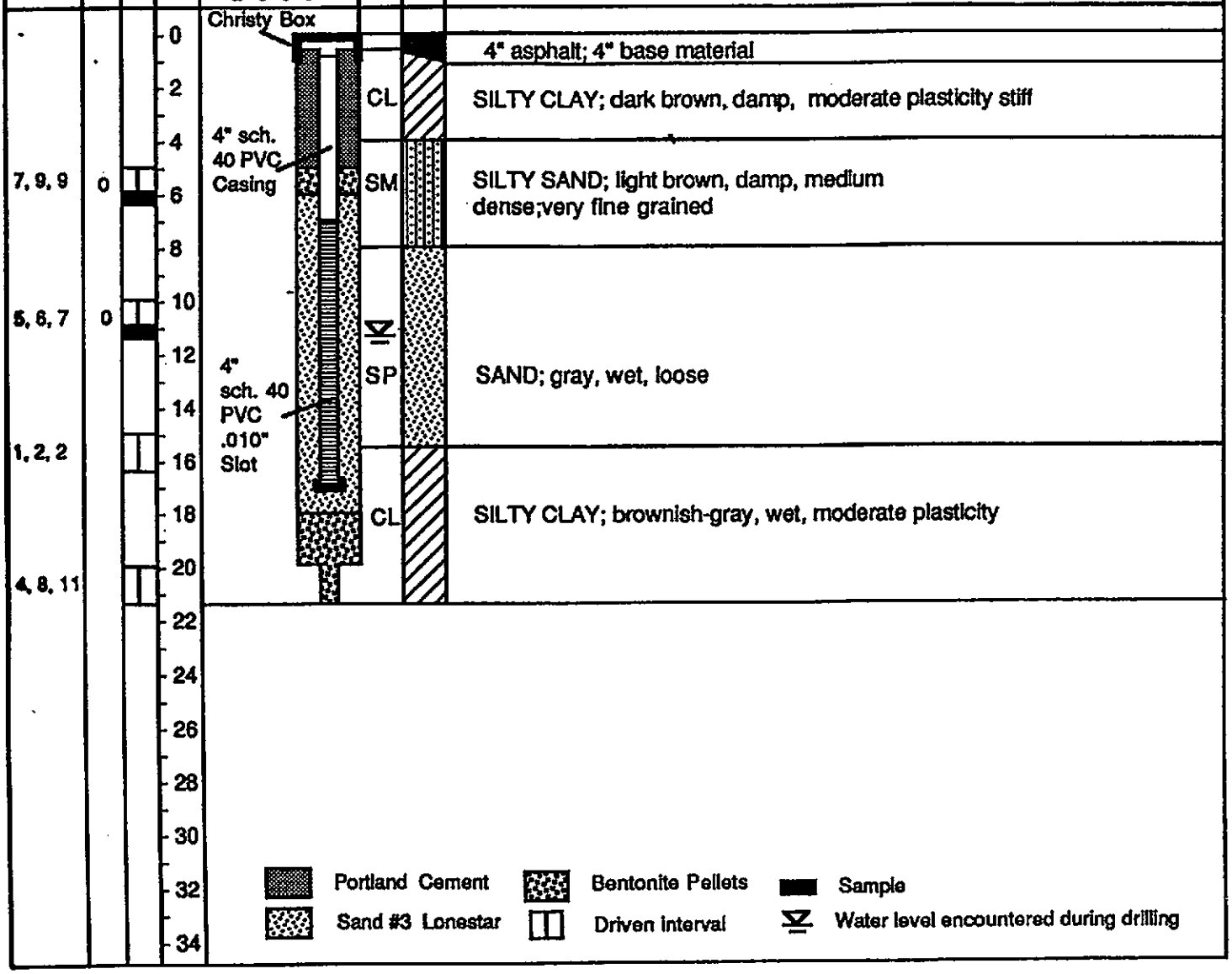
BORING NO. AW-6
WELL NO. AW-6

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 334.93

DRILLING METHOD Hollow stem auger HOLE DIAM. 10"
SAMPLER TYPE Modified split spoon
CASING DATA Perforations: 7-17'
DRILLER West Hazmat

WATER LEVEL	11.5'	9.58'	
DATE	11/6/90	11/15/90	
TIME	1400	-	



EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: FORMER SHELL STATION 7194 AMADOR VALLEY BLVD., DUBLIN, CA

BORING NO. MW-7

DATE DRILLED: 8/11-12/88

PROJECT NUMBER: 1826G

LOGGED BY: RAG

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT 140 ft/lbs.	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	OVA READING ppm
				Asphalt - 3", baserock -11"		
1-2			CL	SANDY CLAY, dark grayish brown (10YR 4/2), fine grained sands up to 40%, no petroleum odor, moderate plasticity, stiff, moist		
3-4			CH	SILTY CLAY, very dark grayish brown (10YR 3/2), some fine to medium grained sands, no petroleum odor, moderately high plasticity, stiff, moist		
5-6	MW-7-1	9	SC	CLAYEY SAND, light brownish gray (10YR 6/2), fine grained sands up to 50%, rounded gravels up to 0.5" across, no petroleum odor, stiff, moist		0
7	MW-7-2	7	CL	SANDY CLAY, light brown (10YR 5/3), fine to medium sands up to 40%, rounded gravels up to 0.5" across, no petroleum odor, stiff, moist	▼	0
8	MW-7-3	9	CL	SILTY CLAY, very dark gray (10YR 3/1) with light gray to white claystone/ siltstone fragments, roots and root holes, no petroleum odor, moderate plasticity, stiff, moist to very moist, some root holes contain "free" water. 8/26/88, Groundwater level - 7.94 ft.		0
9-10	MW-7-4	14				0
11	MW-7-5	11				0
12-13-14			CL	SILTY CLAY, mottled gray to strong brown (7.5YR 5/0 to 7.5YR 5/6), roots and root holes, no petroleum odor, moderate plasticity, stiff, moist, some root holes contain "free" water. 8/11/88, Groundwater encountered - 14 ft.	▽	
15-16						0
17	MW-7-6	12				
18-19-20-21				Bottom of boring =17 feet		

SUPERVISED AND APPROVED BY R.G./C.E.G. RGP