



April 5, 2005

Mr. Robert Schultz, R.G.
Hazardous Services Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Alameda County
APR 07 2005
Environmental Health

**Re: Conduit and Well Survey Report and Work Plan Addendum for Offsite Investigation
Atlantic Richfield Company Service Station #2107
3310 Park Boulevard
Oakland, California
Alameda County Case No. RO-0002526**

Dear Mr. Schultz:

At the request of Atlantic Richfield Company, Remediation Management (RM- a BP affiliated company), URS Corporation (URS) is pleased to submit this *Conduit and Well Survey Report and Work Plan Addendum for Offsite Investigation* (Report) for ARCO Service Station #2107, located at 3310 Park Boulevard in Oakland, California (the Site, Figures 1 and 2). URS submitted an *Additional Site Investigation Report and Work Plan for Offsite Investigation* on November 30, 2004. In response, URS received a directive letter from Alameda County Environmental Health (ACEH), dated January 10, 2005 (Attachment A) pursuant to the Regional Water Quality Control Board's authority under Section 13267 of the California Water Code. This Report addresses the technical comments included the January 10, 2005 ACEH letter.

1.0 SITE BACKGROUND

The background information and previous work conducted on and off Site was furnished to URS by RM. URS has relied on the information provided to prepare this document and is neither responsible for, nor has confirmed the accuracy of the information contained in the documents reviewed.

1.1 Site Description

The Site is located at 3310 Park Boulevard in Oakland, California (Figures 1 and 2) and is an active gasoline service station. The Site is bound by East 34th Street to the northeast, Park Boulevard to the north, and commercial buildings to the south and west. The majority of the property is concrete and asphalt paved.



Current Site structures include three double-walled fiberglass underground gasoline storage tanks (USTs); two pump islands with a total of eight dispensers, and a convenience store.

1.2 Previous Work

A detailed site history prior to 2002 can be found in the previous report, *Additional Site Investigation Report and Work Plan for Offsite Investigation*, submitted on November 30, 2004 to ACEH. In a letter dated July 11, 1997, ACEH confirmed no further action was required at the Site. All remediation and monitoring equipment (nine monitoring wells and one remediation well) were removed from the Site, except remediation piping, which was left under the main driveway.

In November 2002, URS oversaw a product line upgrade at the Site. Environmental soil samples collected along the product lines during the construction activities indicated a potential release and an Unauthorized Release Report was issued for the Site on January 21, 2003. Field activities are summarized in the *URS Product Line Removal and Upgrade Soil Sampling Report* dated January 31, 2003.

Following the Unauthorized Release Report (Fuel Leak Case # RO0002526), ACEH sent a letter to RM on April 25, 2003 requesting a soil and groundwater investigation at the Site. URS submitted a *Work Plan for Additional Investigation* on June 11, 2003 proposing the installation of four groundwater monitoring wells at the Site. URS received a voicemail directive from ACEH to complete a soil and groundwater investigation prior to the installation of monitoring wells at the Site. In response, URS submitted an *Addendum to Work Plan for Additional Investigation* on October 29, 2003 proposing 10 soil borings. ACEH requested several modifications to the *Addendum to Work Plan for Additional Investigation* in a letter dated January 9, 2004. URS submitted a *Second Addendum to Work Plan for Additional Investigation* at the site on March 11, 2004.

URS began fieldwork at the Site on March 30, 2004. Due to adverse drilling conditions, only three soil borings were advanced (SB-1, SB-2, and SB-5) and fieldwork was rescheduled. URS returned to the Site on May 7, 2004 and advanced three additional borings at the site (SB-3, SB-4, and SB-6) (Attachment B). A *Site Investigation Report and Well Installation Work Plan* was submitted on behalf of RM to ACEH on August 12, 2004. On August 30, 2004, URS received a letter from ACEH requesting additional fieldwork at the site to complete the scope of work proposed in the original work plan and addendum. ACEH additionally requested depth discrete groundwater sampling.

These requests by ACEH were addressed in fieldwork conducted in October 2004. To date, URS has collected twelve depth-discrete groundwater samples from six locations (HP-3 through HP-8) and four grab groundwater samples (SB-1 through SB-3 and SB-5). URS has also collected 46 soil samples from eight onsite (SB-1 through SB-3 and SB-8 through SB-11) borings and three offsite (SB-4 through SB-6) soil borings.

1.3 Site Hydrogeology

Regionally, the site lies within the hydrogeologic feature known as the East Bay Plain Groundwater Basin (CRWQCB, 1999). Deep groundwater occurs in mostly confined aquifers consisting of unconsolidated Tertiary to Quaternary age deposits. Some unconfined shallow water bearing deposits of Quaternary age exist within this basin, including under the subject property. The consolidated basement rocks underlying the Quaternary and Tertiary age deposits are considered to be non-water bearing due to their poor yields.

The Site lies within the Oakland sub-area of the San Francisco Basin. The San Francisco Basin is one of two basins that occupy the East Bay Plain Groundwater Basin. The water bearing deposits are composed of coalescing alluvial fans sloping westward from the Diablo Range to the east (CRWQCB, 1999). The alluvial deposits range from 300 to 700 ft in thickness, and the sequence lacks any well-defined aquitards. The primary shallow, water-bearing formation is the Merritt Sand. The Merritt Sand is a discontinuous formation with an approximate thickness of 65 ft. Below the Merritt Sand are a series of thin alternating aquifers and aquitards (Muir, 1993).

The Site is underlain by gravel, gravelly clay, and silt fill from 0 to 5 feet below ground surface (ft bgs). From 5 to 30 ft bgs, the site consists primarily of silty clay and clayey silt with lenses of silty sand, sand, and gravelly sand. From approximately 15 to 25 ft bgs in the northwest part of the Site is a large lense of fine sands and silty sands (Figures 4, 5, and 6). Based on historic monitoring well data, groundwater has been encountered at depths of 5.31 to 9.32 ft bgs. Historically, the groundwater flow direction beneath the Site has been to the northwest at a gradient of approximately 0.09 feet per foot (Attachment C).

The Site has been leveled by cutting into the hillside. There is a cement retaining wall along the south side of the property with weep holes for run-off from the hillside. It is possible that the backfilled UST cavity, which is down gradient from the retaining wall, may be collecting run-off water. This water collecting in the UST cavity may be running out of the cavity and down gradient, which is likely the cause of the shallow first encountered water at boring locations along the north side of the property.

1.4 Surface Water

Based on the review of area topographic maps produced by the United States Geological Survey, two surface water bodies were located within a two-mile radius of the Site. Lake Merritt and the San Francisco Bay are located approximately 1.1 miles and 1.8 miles to the west of the Site, respectively.

2.0 CONDUIT STUDY AND WELL SURVEY

URS performed a conduit study and well survey for the Site as requested under technical comment #4 in the January 10, 2005 ACEH letter.

2.1 Well Survey

URS requested well logs from the California Department of Water Resources (DWR) to assess potential impact on water producing wells within a 1/2-mile radius of the site. The well locations are shown on Figure 1 and well details are presented in Table 1. DWR well completion reports are classified as confidential, thus URS will retain these reports in our files.

During a review of available DWR files, 11 wells were identified within the one-half mile survey radius (Six monitoring wells and five cathode protection wells). No domestic or municipal supply wells were located within the one-half mile survey radius. The domestic water well located outside of the 1/2-mile radius from the site (well 4, Table 1) is screened from 100-160 ft bgs and is crossgradient of the site. Based on distance, gradient direction, and contaminant concentrations, it is unlikely that petroleum releases at the site have impacted this domestic water well.

2.2 Conduit Study

URS reviewed City of Oakland Public Works Department, East Bay Municipal Utility District, and PG&E maps to evaluate potential pathways for groundwater. The utility lines are shown on Figure 3. Two gas lines, a 16-inch line and a 1.25-inch line, run beneath Park Boulevard. PG&E was not able to provide URS with exact depths for any of their utilities, but suggested that depths may range from one to six ft bgs. The 16-inch gas main running below the westbound lane of Park Boulevard was installed in 1945. According to PG&E engineer Jerry Cabrell, PG&E did not begin using backfill (sand or gravel) until the early sixties. Therefore, the line is surrounded by native soil. The 1.25- inch line runs west down the south side of Park Boulevard beginning at 33rd Street. PG&E also has two 6-inch 110 kilovolt (kV) lines below Park Boulevard. PG&E was unable to provide precise depth information for these lines, but suggested that they may 2-10 ft bgs.

Two sanitary sewer lines, one 10-inch, and one 8-inch run parallel beneath Park Boulevard. Based on curb heights and flow line depths from maps provided by the City of Oakland Public Works Department, the depths to the bottom of the pipe for these lines range from 3.6 to 7.6 ft bgs between East 34th Street and MacArthur Boulevard (parallel to East 34th Street to the northeast). No data is available for sections further west on Park Boulevard.

Two storm conduits, one 12-inch and one 30-inch, also run parallel beneath Park Boulevard. Based on curb heights and flow line depths from maps provided by the City of Oakland Public Works Department, the depths to the bottom of the pipe for these lines range from 4 to 5.7 ft bgs between MacArthur and East 34th Street. No data is available for sections further west on Park Boulevard.

One 8-inch water line runs below the eastbound lane of Park Boulevard. East Bay Municipal Utility District (EBMUD) was unable to provide precise depth information for these lines.

Utility conduits found in the area surrounding the site range in known depths of 3.6 to 7.6 ft bgs, with potential depths ranging from 1 to 10 ft bgs. Depth to first encountered groundwater from

the former monitoring wells located on the north side of Park Boulevard ranges from approximately 6 ft bgs (MW-8) to 10 ft bgs (MW-9) (Attachment C). First encountered groundwater at former offsite well MW-7, which was located on the south side of Park Boulevard, was at approximately 12.5 ft bgs. Therefore, it is possible that the utility conduits are providing preferential pathways for off-site contaminant migration. However, based on historic groundwater gradient maps for previous wells (Attachment C), there does not appear to be any deflection in the groundwater elevation contours as they cross Park Boulevard.

3.0 FIELD ACTIVITIES

Prior to initiating field activities, URS will obtain the necessary Alameda County Public Works soil boring permit, prepare a Site-specific Health and Safety Plan (HASP) for the proposed work, clear the Site for subsurface utilities, and complete the URS pre-drilling checklist. Utility clearance includes notifying Underground Service Alert (USA) a minimum of 48 hours prior to initiating the field investigation and securing the services of Cruz Brothers, a private utility locating company, to confirm the absence of underground utilities at each boring location.

The HASP is provided to all personnel and a copy of the HASP will be on-site at all times. A safety tailgate meeting is conducted daily to review the hazards and the daily scope of work, including but not limited to drilling, utility clearance, and general safety.

3.1 Soil Borings and Hydropunches

The proposed soil borings and hydropunches will be advanced to approximately 30 ft bgs. Soil and groundwater sampling procedures will follow the procedures used in this investigation as outlined in Section 2 of the *Additional Site Investigation Report and Work Plan for Offsite Investigation* on November 30, 2004. Sample handling, equipment decontamination, and surveying procedures are will also follow the procedures used in the previous investigation.

The January 10, 2005 ACEH letter requested that RM submit a Work Plan Addendum for Offsite Investigation addressing the following technical comments related to the proposed offsite soil and groundwater investigation:

- 1) Technical Comment #1: Clarification of target sampling depths for proposed offsite borings (SB-12/HP-9 through SB-15/HP-12).
 - 2) Technical Comment #2: Further vertical definition of contamination near SB-10/ HP-7.
 - 3) Technical Comment #3: Rationale for proposed boring locations SB-12/HP-9 through SB-15/HP-12.
 - 4) Technical Comment #5: Shallow groundwater sampling at SB-10/HP-7 and SB-11/HP-8
- 1) As stated in the *Additional Site Investigation Report and Work Plan for Offsite Investigation* on November 30, 2004, a soil boring will be advanced first and then a hydropunch will be advanced next to it. The rationale for this method is that the lithology and moisture content of the soil encountered in the continuously cored boring will clearly define and indicate discrete lithological

zones and water-bearing intervals for collecting soil and depth discrete groundwater samples. Additionally, well logs from former offsite monitoring wells (Attachment B), indicate a permeable layer starting at approximately 10 ft bgs and extends down to 24 ft bgs (on the west bound side of Park Boulevard). URS proposes sampling soil and groundwater in this zone and continuing soil and groundwater sampling until there is a change in lithology to a soil type with lower permeability. The approximate depth of these borings will be 30 ft bgs.

- 2) Contamination at SB-10/HP-7 has been defined to 30 ft bgs (95.8 ft mean sea level (msl)). MTBE concentrations of 1,200 µg/L at 105.8-101.8 ft msl (HP-7-20) and 3,700 µg/L at 95.8-91.8 ft msl (HP-7-30) indicate concentrations increasing with depth. The ACEH letter dated January 10, 2005 requested that the vertical extent of contamination be further investigated. Groundwater samples HP-8-27 and HP-8-34, which were collected from a boring approximately 25 ft directly downgradient from HP-7, capture the decreasing trend in MTBE (Table 2, Figure 4). The MTBE concentration of 2,100 µg/L at 97.2-93.2 ft msl (HP-8-27) is consistent with MTBE concentration of 3,700 µg/L from 95.8-91.8 ft msl at HP-7. The deeper groundwater sample (HP-8-34) collected from 90.2-86.2 ft msl has an MTBE concentration of 880 µg/L. Conditions permitting, URS will attempt to collect groundwater samples downgradient of SB-10/HP-7 (proposed locations SB-15/HP-12 and SB-14/HP-11)(Figure 2), from an interval deeper than 86 ft msl to further define the extent of vertical contamination.
- 3) URS has revised the locations and the number of proposed borings at the site. URS proposes advancing four soil borings and four hydropunches (SB-12/HP-9 through SB-15/HP-12) along the north side of Park Boulevard to approximately 30 ft bgs. Boring locations are shown on Figure 2. URS proposes offsite boring locations SB-15/HP-12, SB-14/HP-11, and SB-13/HP-10 to be located downgradient from onsite locations SB-9/HP-6, SB-10/HP-7, and SB-11/HP-8. Proposed boring SB-12/HP-9 is intended to define the edge of the potential contaminant plume. Actual boring locations will be assessed by site conditions and underground utilities. Sampling procedures for both soil and groundwater and decontamination procedures are presented in section 2.0 of the *Additional Site Investigation Report and Work Plan for Offsite Investigation* that was submitted to ACEH on November 30, 2004. As technical comment #6 in the ACEH letter dated January 10, 2005 requests, all samples will be analyzed for lead scavengers (1,2 DCA, EDB) and ethanol.
- 4) Groundwater samples were not collected from first water encountered SB-10/HP-7 and SB-11/HP-8 in the previous onsite investigation due to sloughing of fill material in the borehole at shallow depths.

4.0 RECOMMENDATIONS

4.1 Offsite Investigation Report

Upon completion of field activities and receipt of all laboratory analytical data, URS will prepare and provide ACEH with a Conceptual Site Model that will include the following: new boring logs, updated cross sections, isoconcentration maps, analytical results, and interpretation and recommendations for additional work, if necessary.

4.2 Proposed Schedule

Upon receiving written approval of this Work Plan from the ACEH, URS will proceed with the proposed work. URS will obtain all necessary permits to complete the proposed work. URS anticipates submitting the Offsite Investigation Report to the ACEH within 60 days of receipt of all laboratory analytical results from drilling activities.


We appreciate the opportunity to submit this *Conduit and Well Survey Report and Work Plan Addendum for Offsite Investigation* to the ACEH and trust that this document meets with your approval. Please notify us of your approval as soon as practical. If you have any questions or concerns, feel free to contact us at (510) 893-3600.

Sincerely,

URS CORPORATION



Scott Robinson
Project Manager



Robert Horwath, R.G.
Portfolio Manager





Enclosures:

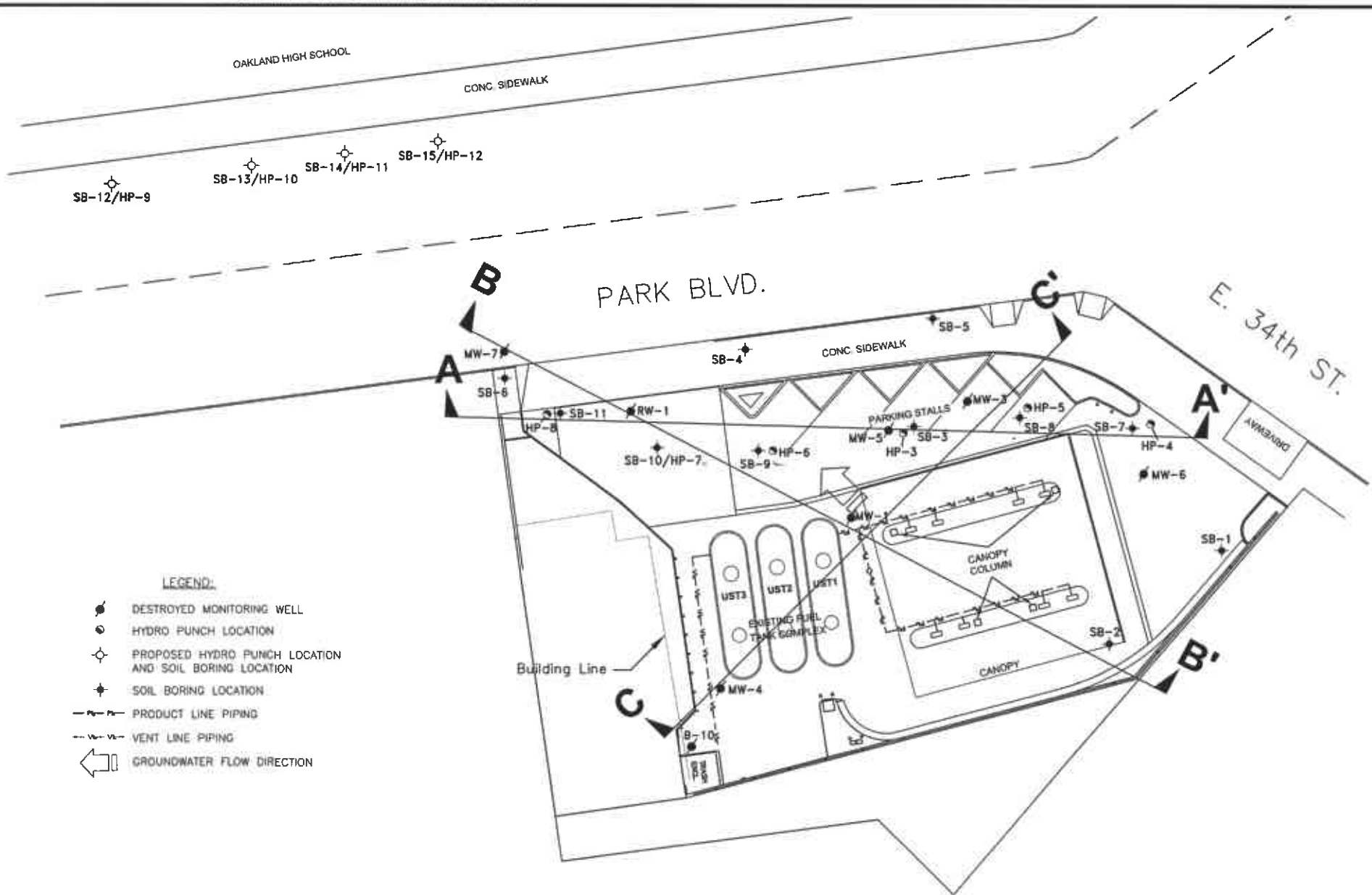
Table 1	Well Survey Inventory
Table 2	Groundwater Analytical Data
Figure 1	Well Survey Map
Figure 2	Site Map with Proposed Soil Boring and Hydropunch Locations
Figure 3	Utility Map
Figure 4	Cross Section A-A'
Figure 5	Cross Section B-B'
Figure 6	Cross Section C-C'
Attachment A	Alameda County Environmental Health Agency Letter (January 10, 2005)
Attachment B	Soil Borings Logs and Historical Analytical Data
Attachment C	Historical Groundwater Gradient Maps

References:

California Regional Water Quality Control Board (CRWQCB), San Francisco Bay Region, 1999. East Bay Plain Groundwater Basin Beneficial Use Evaluation Report, June 1999.

Muir, Kenneth, 1993. Geologic Framework of the East Bay Plain Groundwater Basin, prepared for the Alameda County Flood Control and Water Conservation District, Alameda County, California.

cc: Mr. Paul Supple, RM (Electronic uploaded to ENFOS)



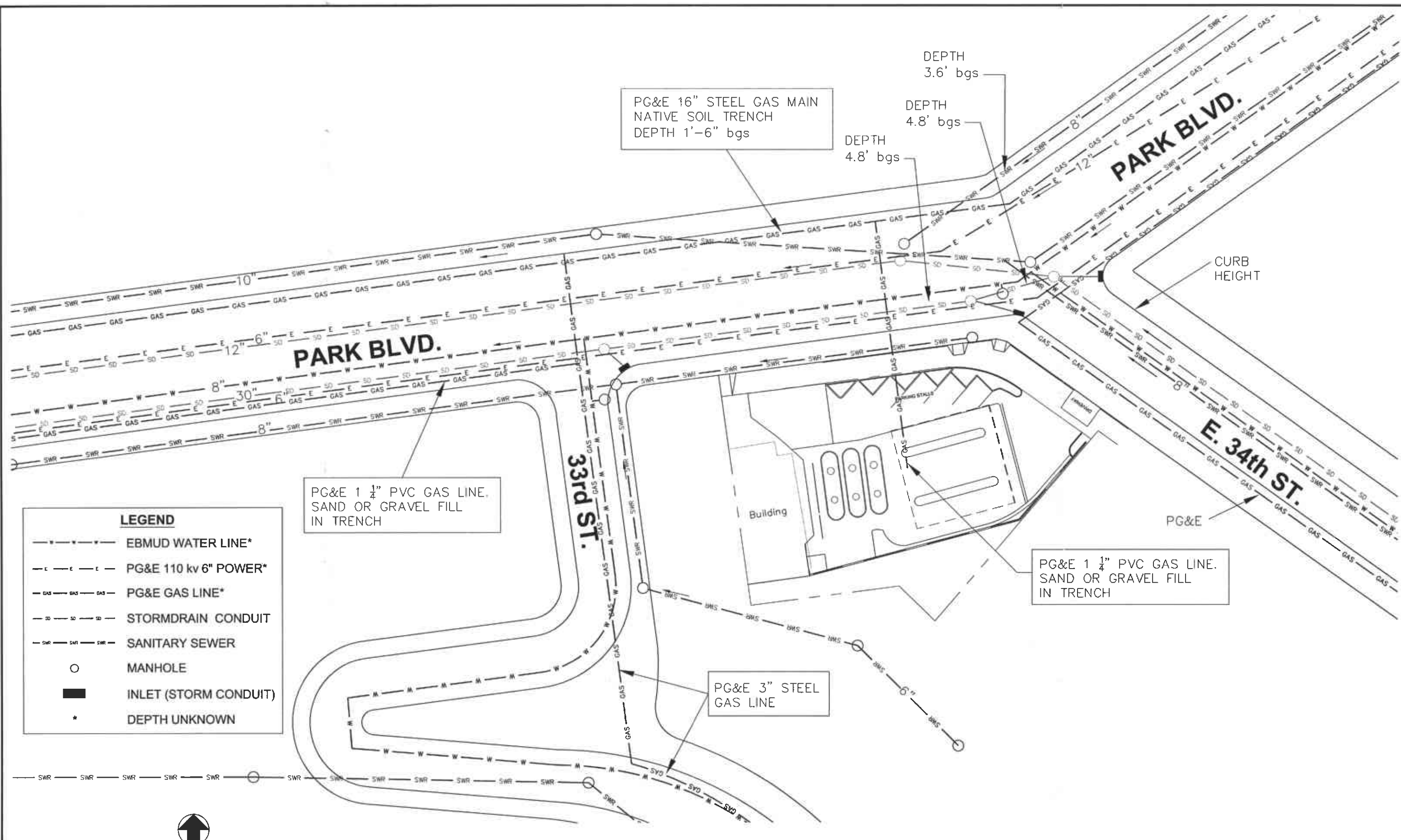
LEGEND:

- DESTROYED MONITORING WELL
- HYDRO PUNCH LOCATION
- ◇ PROPOSED HYDRO PUNCH LOCATION AND SOIL BORING LOCATION
- ◆ SOIL BORING LOCATION
- PRODUCT LINE PIPING
- - - VENT LINE PIPING
- ← GROUNDWATER FLOW DIRECTION

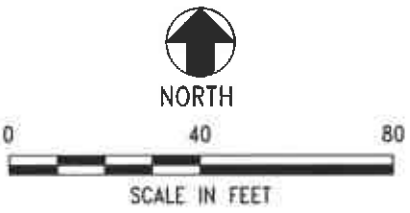


URS	Project No. 38487287	PROPOSED OFFSITE SOIL BORING HYDROPUNCH LOCATIONS	FIGURE 2
	ARCO Service Station #2107 3310 Park Boulevard Oakland, California		

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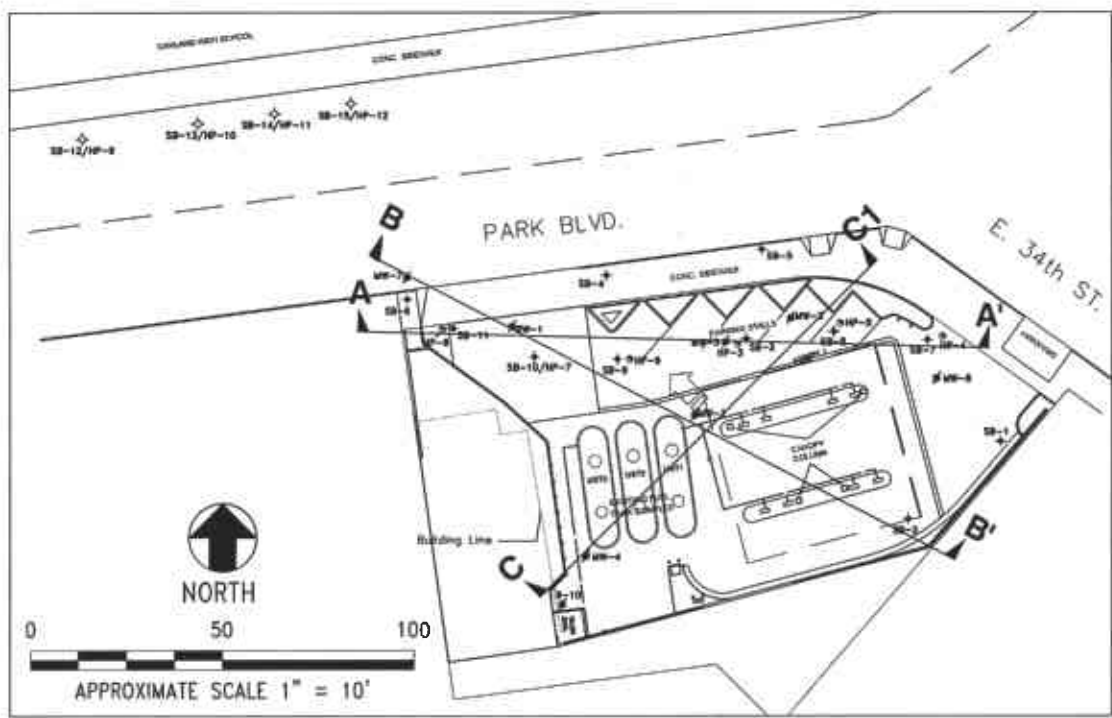
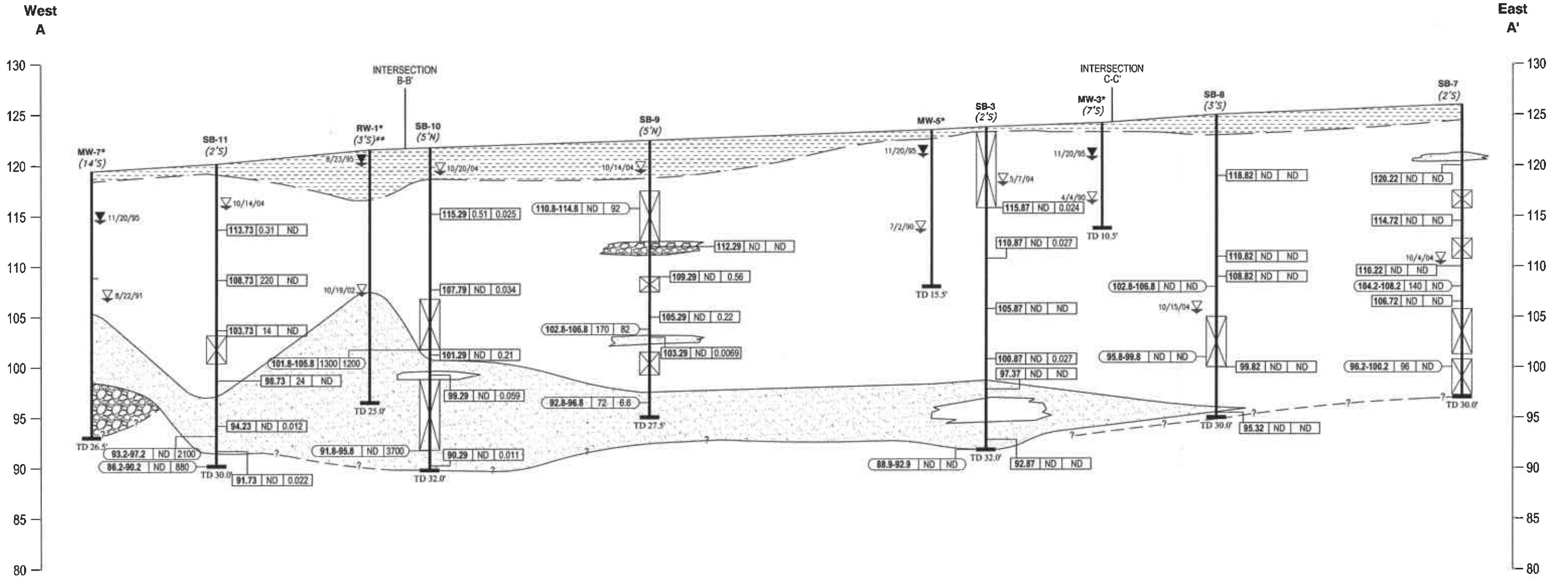


LEGEND	
	EBMUD WATER LINE*
	PG&E 110 kv 6" POWER*
	PG&E GAS LINE*
	STORMDRAIN CONDUIT
	SANITARY SEWER
	MANHOLE
	INLET (STORM CONDUIT)
	DEPTH UNKNOWN



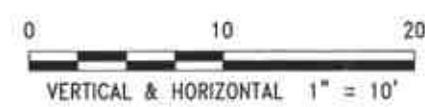
URS	Project No. 38487287	CONDUIT STUDY	FIGURE 3
	ARCO Service Station #2107 3310 Park Boulevard Oakland, California		

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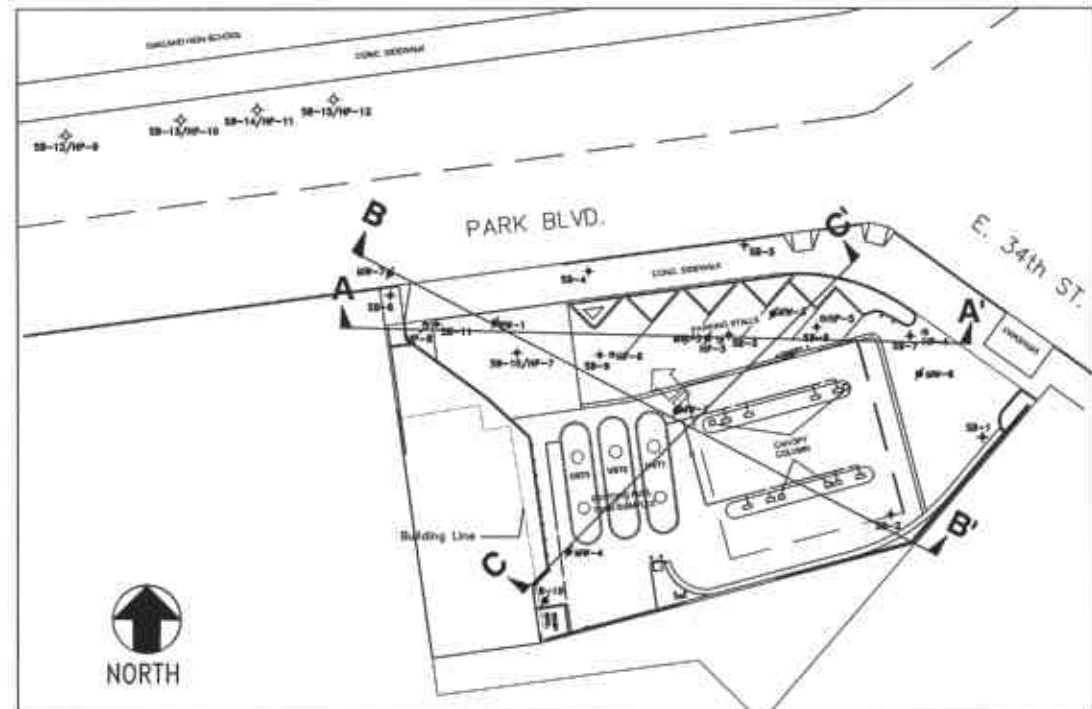
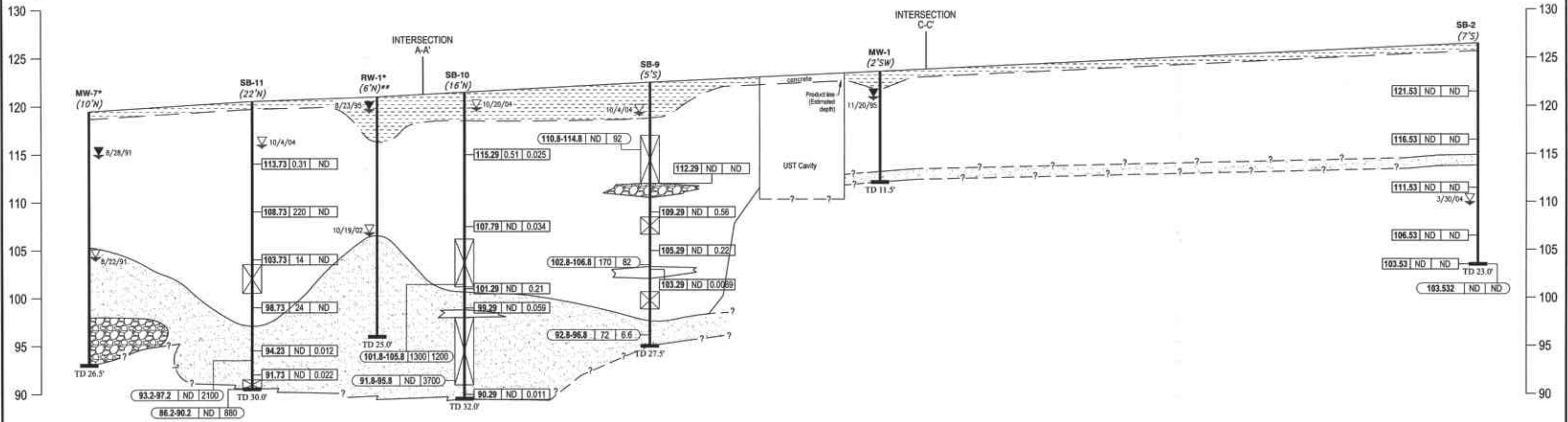
SP/SW/SC/SM		Well to poorly graded sands or gravely sands, minor to no fines.	MW-7 (10'N)		Well or soil boring number
MU/CL		Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays.			Distance in feet and direction of projection
GM/GP/GW		Well to poorly graded gravel-sand mixtures, little to no fines.			No recovery
		Fill/Asphalt			Total depth 26.5 feet below ground surface
		First encountered groundwater			MTBE (mg/kg)
		Static water level			GRO (mg/kg)
		Wells MW-7 and RW-1 were destroyed in 1997			Soil sample elevation (RMSL)
		RW-1 depth to water not measured 11/25/98			MTBE (mg/kg)
					GRO (mg/kg)
					Groundwater sample elevation (f/MSL)



URS	Project No. 38487194	GEOLOGIC CROSS SECTION A - A'	FIGURE 4
	ARCO Service Station #2107		

Northwest
B

Southeast
B'



LEGEND

- SP/SW/SC/SM: Well to poorly graded sands or gravelly sands, minor to no fines.
- ML/CL: Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
- GM/GP/GW: Well to poorly graded gravel-sand mixtures, little to no fines.
- Fill/Asphalt: Fill/Asphalt.
- ▽: First encountered groundwater.
- ▽: Static water level.
- : Wells MW-7 and RW-1 were destroyed in 1997.
- ** : RW-1 depth to water not measured 11/25/98.

Well or soil boring number
 — Distance in feet and direction of projection

MTBE (mg/kg)
GRO (mg/kg)
 — Soil sample elevation (ft/MSL)

MTBE (mg/kg)
GRO (mg/kg)
 — Groundwater sample elevation (ft/MSL)

— Well or soil boring number
 — Distance in feet and direction of projection

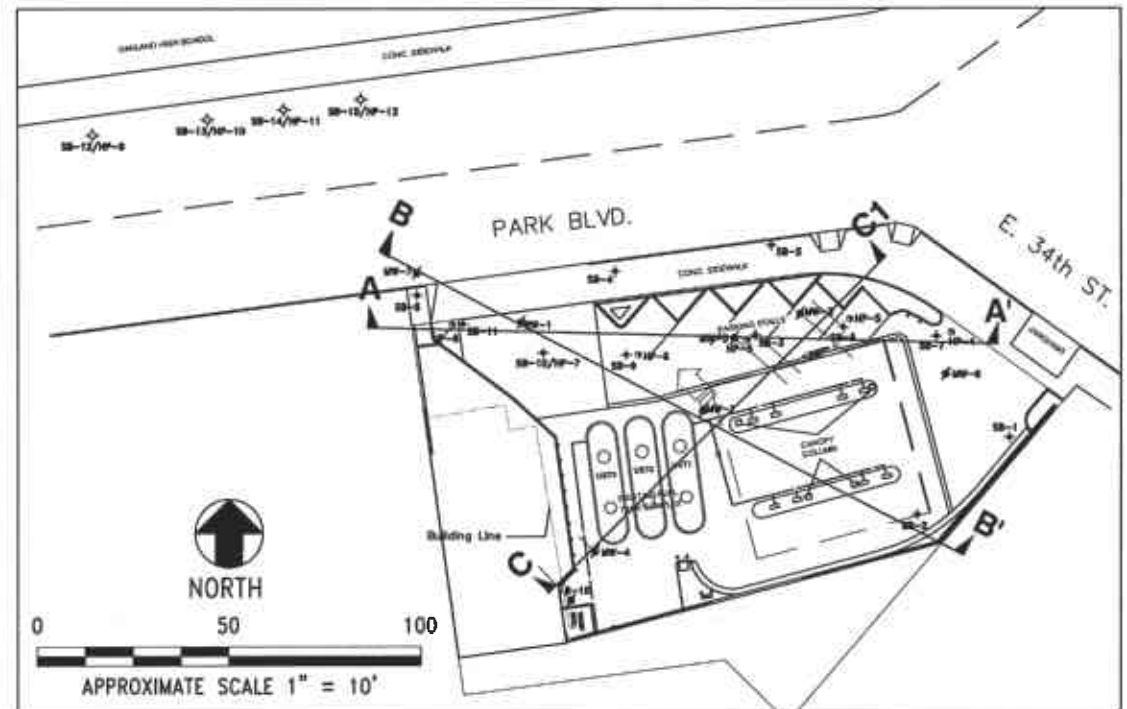
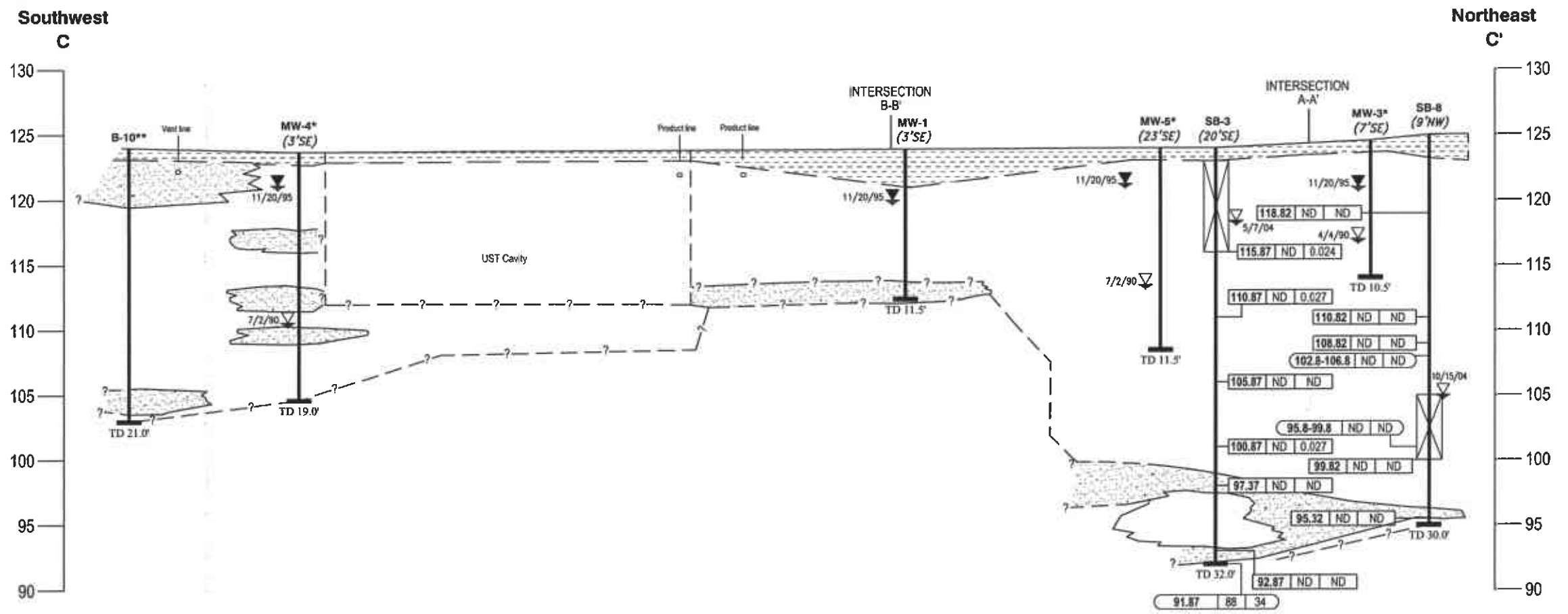
— No recovery

— Total depth 26.5 feet below ground surface



	Project No. 38487287	GEOLOGIC CROSS SECTION B - B'	FIGURE 5
	ARCO Service Station #2107 3310 Park Boulevard Oakland, California		

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LEGEND

- SP/SW/SC/SM: Well to poorly graded sands or gravelly sands, minor to no fines.
- ML/CL: Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
- Fill/Asphalt: Fill/Asphalt
- ▽: First encountered groundwater
- ▽: Static water level
- : Wells MW-7 and RW-1 were destroyed in 1997
- ** : Lithology adapted from previous cross section (Resna, 1992)
- SB-3 (20'SE): Well or soil boring number
- (20'SE): Distance in feet and direction of projection
- ⊗: No recovery
- TD 32.0': Total depth 32 feet below ground surface
- 100.87 | ND | ND: MTBE (mg/kg), GRO (mg/kg), Soil sample elevation (f/MSL)
- 91.87 | 88 | 34: MTBE (mg/kg), GRO (mg/kg), Groundwater sample elevation (f/MSL)

	Project No. 38487287 ARCO Service Station #2107 3310 Park Boulevard Oakland, California	GEOLOGIC CROSS SECTION C - C'	FIGURE 6

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Table 1
Inventory of Water Wells Within 1/2 Mile of Site
 Atlantic Richfield Company Service Station #2107
 3310 Park Blvd, Oakland, CA

Site Map Location	State Well I.D.	Well Location	Date Drilled	Well Type	Total Depth (ft. bgs)	Screened Interval (ft. bgs)	Notes
1a	IS/3W31E1	2838 Park Blvd.	11/06/91	Monitoring well	35	20-35	
1b	IS/3W31E2	2838 Park Blvd.	11/06/91	Monitoring well	34	19-34	
1c	IS/3W31E3	2838 Park Blvd.	11/07/91	Monitoring well	42	17-22; 32-42	
2a	IS/3W31A1	4035 Park Blvd.	12/11/89	Monitoring well	30	5-30	RS-1
2b	IS/3W31A2	4035 Park Blvd.	12/11/89	Monitoring well	20	5-20	RS-2
2c	IS/3W31A3	4035 Park Blvd.	12/12/89	Monitoring well	39	14-39	RS-5
2d	IS/3W31A4	4035 Park Blvd.	12/13/89	Monitoring well	34	9-34	RS-6
3a	IS/3W31H04	1499 MacArthur Ave.	01/07/93	Monitoring well	20	10-20	
3b	IS/3W31H05	1499 MacArthur Ave.	01/07/93	Monitoring well	20	10-20	
3c	IS/3W31H06	1499 MacArthur Ave.	01/07/93	Monitoring well	20	10-20	
4	IS/3W31N1	2049 10th Ave.	11/07/77	Domestic	160	100-160	
5	IS/3W31H2	1465 MacArthur	06/24/81	Cathodic	50	NA	
6	IS/3W31H1	On Excelsior E of Brighton Ave.	12/17/75	Cathodic	95	NA	
7	IS/3W31Q1	On 14th Ave., E of Vallecito Pl.	01/02/76	Cathodic	95	NA	
8	IS/3W31F2	E of E 28th St.on Bayview Ave.	12/29/75	Cathodic	120	NA	
9	IS/3W31G1	In street at 1171 MacArthur	10/06/75	Cathodic	53	NA	
10	IS/3W31F1	On E 28th St at Park Blvd.	05/31/73	Cathodic	120	NA	
11	IS/3W31L1	On Calmar Ave. E of Paloma Ave.	01/16/75	Cathodic	120	NA	
12	IS/3W31	169 ft W of 10th Ave on E 22nd St.	12/23/75	Cathodic	120	NA	

Notes:

bgs = below ground surface

Source: The information in this table was provided by the Department of Water Resources. URS has not verified the current status of the wells above.

Table 2
Groundwater Analytical Data

ARCO Service Station #2107
3310 Park Blvd, Oakland, CA

Sample ID	Elevation (msl)	Sample Depth/ Interval (feet bgs)	Sample elevation (msl)	Date Sampled	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	t-Butyl Alcohol (TBA) (µg/L)	MTBE (µg/L)	Di-isopropal ether (DIPE) (µg/L)	Ethyl-t-Butyl-Ether (ETBE) (µg/L)	tert-Amyl Methyl Ether (TAME) (µg/L)	Ethanol (µg/L)
SB-1	128.26	18.5	109.8	03/30/04	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<5.0	ND<0.50	ND<1.0	ND<0.50	ND<0.50	ND<50
SB-2	126.532	23	103.532	03/30/04	ND<50	ND<0.50	1.4	ND<0.50	ND<1.0	ND<5.0	ND<0.50	ND<1.0	ND<0.50	ND<0.50	ND<50
SB-3	123.867	32	91.867	05/07/04	88	ND<0.50	ND<0.50	ND<0.50	ND<1.0	110	34	ND<1.0	ND<0.50	1.1	ND<50
SB-5	122.964	19.5	103.464	03/30/04	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	45	34	ND<1.0	ND<0.50	ND<0.50	ND<50
HP-3-35	123.867	31-35	88.9- 92.9	10/15/04	ND<50	0.64	10	1.5	8.9	ND<5.0	3.8	ND<1.0	ND<0.50	ND<0.50	ND<50
HP-4-18	126.217	18-22	104.2- 108.2	10/14/04	140	1.6	38	5.4	27	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	NA
HP-4-30	126.217	26-30	96.2- 100.2	10/14/04	96	0.91	23	3.5	17	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	NA
HP-5-18	124.821	18-22	102.8- 106.8	10/20/04	ND<50	ND<0.50	7	0.94	6.2	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	NA
HP-5-29	124.821	25-29	95.8- 99.8	10/20/04	ND<50	ND<0.50	9.2	1.2	7	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	NA
HP-6-8	122.792	8-12	110.8- 114.8	10/14/04	ND<250	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<100	92	ND<2.5	ND<2.5	ND<2.5	NA
HP-6-20	122.792	16-20	102.8- 106.8	10/14/04	170	ND<1.0	15	2.9	16	76	82	ND<1.0	ND<1.0	ND<1.0	NA
HP-6-30	122.792	26-30	92.8- 96.8	10/14/04	72	ND<0.50	13	2.2	13	ND<20	6.6	ND<0.50	ND<0.50	ND<0.50	NA
HP-7-20	121.791	16-20	101.8- 105.8	10/20/04	1300	ND<10	ND<10	ND<10	ND<10	ND<400	1200	ND<10	ND<10	ND<10	NA
HP-7-30	121.791	26-30	91.8- 95.8	10/20/04	ND<5,000	ND<50	ND<50	ND<50	ND<50	ND<2,000	3700	ND<50	ND<50	ND<50	NA
HP-8-27	120.229	23-27	93.2- 97.2	10/15/04	ND<2,500	ND<25	28	ND<25	28	ND<1,000	2100	ND<25	ND<25	ND<25	NA
HP-8-34	120.229	30-34	86.2- 90.2	10/15/04	ND<2,500	ND<25	ND<25	ND<25	ND<25	ND<1,000	880	ND<25	ND<25	ND<25	NA

Notes:

- 1) Groundwater samples analyzed by EPA method 8260B.
- 2) Concentrations above laboratory reporting limits in **bold**.
- 3) SB- indicates groundwater grab sample from bottom of soil boring. HP- indicates depth distrete groundwater sample using a hydropunch.

bgs = below ground surface
 ESL =Environmental Screening Level
 GRO = Gasoline Range Organics
 (mg/L) = micrograms per litre
 msl =Mean sea level
 MTBE = methyl tertiary butyl ether.
 NA = Not Analyzed
 ND< = Not detected below stated laboratory reporting limit
 TPH-g = Total petroleum hydrocarbons as gasoline

Attachment A
Alameda County Environmental Health Agency
(January 10, 2005)

ALAMEDA COUNTY
HEALTH CARE SERVICES



AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

January 10, 2005

Paul Supple
Atlantic Richfield Company
P.O. Box 6549
Moraga, CA 94570

Subject: Fuel Leak Case No. RO0002526, ARCO #2107, Active Service Station at 3100 Park Blvd., Oakland, California – Response to Report and Workplan

Dear Mr. Supple:

Alameda County Environmental Health (ACEH) has reviewed your November 30, 2004, *Additional Site Investigation Report and Workplan for Offsite Investigation* prepared by URS Corporation for the above-referenced site. Up to 1,300 ug/L TPHg, 1.6 ug/L benzene and 3,700 ug/L MTBE have been detected in groundwater beneath your site. The lateral and vertical extent of contamination is currently undefined. URS proposes installation of 5 additional soil boring/hydropunch pairs to further delineate the vertical and downgradient extent of VOCs in groundwater. We request that you modify your workplan to address the technical comments below. Please submit your addendum following the schedule specified below.

TECHNICAL COMMENTS

1. Target Sampling Depths

Please state the target groundwater sampling depths for your proposed borings, and please state the rationale supporting your target depths. Based on your understanding of the regional geology, please state whether or not your targeted water-bearing zones are likely to be laterally continuous, and whether you anticipate the depth of the target zones beneath ground surface to increase or decrease downgradient of the site. Please amend your sampling plan in the workplan addendum requested below.

2. Vertical Definition

The highest MTBE concentration was detected in boring SB-10/HP-7 between 26 and 30 ft bgs. Concentrations appear to increase with depth in this boring. In accordance with 23 CCR 2725(a), we require that you define the likely vertical extent of contamination. Please propose additional investigation tasks to satisfy this requirement. Please revise your sampling plan in the workplan addendum requested below.

3. Lateral Definition

URS provided no rationale supporting location of borings SB-15/HP-12 and SB-16/HP-13 in the apparent crossgradient direction. Based on the groundwater flow direction, and the groundwater analytical results for previous borings, these sampling locations are not likely to be necessary to define the lateral extent of contamination. In addition, URS proposes locating borings SB-12/HP-9 and SB-13/HP-10 approximately 10 ft apart, and boring SB-14/HP-11 approximately 20 ft from boring SB-13/HP-10. No rationale was provided to support the close spacing of these borings. Further, we are concerned that changes in topography and irrigation of the adjacent

athletic fields at Oakland High School could influence groundwater flow and cause groundwater downgradient of the site to flow increasingly towards the west. Please revise your sampling plan and provide rationale supporting your revised sampling locations in the workplan addendum requested below.

4. Conduit and Well Surveys

URS proposes a preferential pathway assessment as part of the final investigation report. Due to the shallow depth to groundwater in several of the previous borings and the potential presence of storm drains and other subsurface utilities downgradient of the site, beneath Park Blvd., we request that you complete the preferential pathway survey, and consider the potential influence on contaminant migration, prior to proposing additional offsite investigation. The objectives of the conduit study are to 1) locate potential migration pathways, and 2) evaluate the potential for contaminant migration via the identified pathways. We request that you perform a conduit study that details the potential migration pathways and potential conduits (utilities, storm drains, etc.) that may be present in the vicinity of the site. Provide a map showing the location and depth of all utility lines and trenches, including sewers and storm drains, within and near the plume area.

In addition, we request that you locate all wells (monitoring and production wells: active, inactive, standby, decommissioned, abandoned and dewatering, drainage and cathodic protection wells) within 2,000 ft of the subject site. We recommend that you obtain well information from both Alameda County Public Works Agency and the State of California Department of Water Resources, at a minimum. Submittal of maps showing the location of all wells identified in your study, and the use of tables to report the data collected as part of your survey are required. We require that you provide location addresses and copies of DWR driller's reports for all wells identified in your survey. Please include an analysis and interpretation of your findings, and report the results of your conduit and well surveys in the workplan addendum requested below.

5. Groundwater Sampling From Borings SB-10/HP-7 and SB-11/HP-8

In borings SB-10/HP-7 and SB-11/HP-8, first groundwater was reported at 1.3 and 3.8 ft bgs, respectively; however, initial samples were collected at depths of 16 to 20 ft bgs in boring SB-10/HP-7 and 23 to 27 ft bgs in boring SB-11/HP-8. Please state why samples were not collected from more shallow water in the workplan addendum requested below.

6. Sample Analysis

ACEH requested in our January 9, 2004 letter to ARCO that you analyze samples for 1,2 DCA, EDB and ethanol. These analyses do not appear to have been performed. We request that you evaluate the potential presence of these lead scavengers and oxygenate. Please revise your sampling plan in the workplan addendum requested below.

REPORT REQUEST

Please submit your *Workplan Addendum*, which addresses the comments above by **March 30, 2005**. ACEH makes this request pursuant to California Health & Safety Code Section 25296.10, 23 CCR Sections 2652 through 2654, and 2721 through 2778 outline the responsibilities of a responsible party for an unauthorized release from an UST system, and require your compliance with this request.

Professional Certification and Conclusions/Recommendations

The California Business and Professions Code (Sections 6735 and 7835.1) requires that workplans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

Perjury Statement

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

UNDERGROUND STORAGE TANK CLEANUP FUND

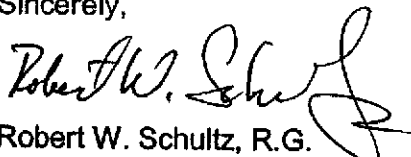
Please note that delays in investigation, late reports or enforcement actions by ACEH may result in you becoming ineligible to receive cleanup cost reimbursement from the state's Underground Storage Tank Cleanup Fund (senate Bill 2004).

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested we will consider referring your case to the County District Attorney or other appropriate agency, for enforcement. California Health and Safety Code, Section 25299.76 authorizes ACEH enforcement including administrative action or monetary penalties of up to \$10,000 per day for each day of violation.

Please call me at (510) 567-6719 with any questions regarding this case.

Sincerely,



Robert W. Schultz, R.G.
Hazardous Materials Specialist

cc: ✓ Scott Robinson, URS Corporation, 500 12th St., Ste. 200, Oakland, CA 94607-4014
Donna Drogos, ACEH
Robert W. Schultz, ACEH

Attachment B
Soil Boring Logs and Historical Analytical Data



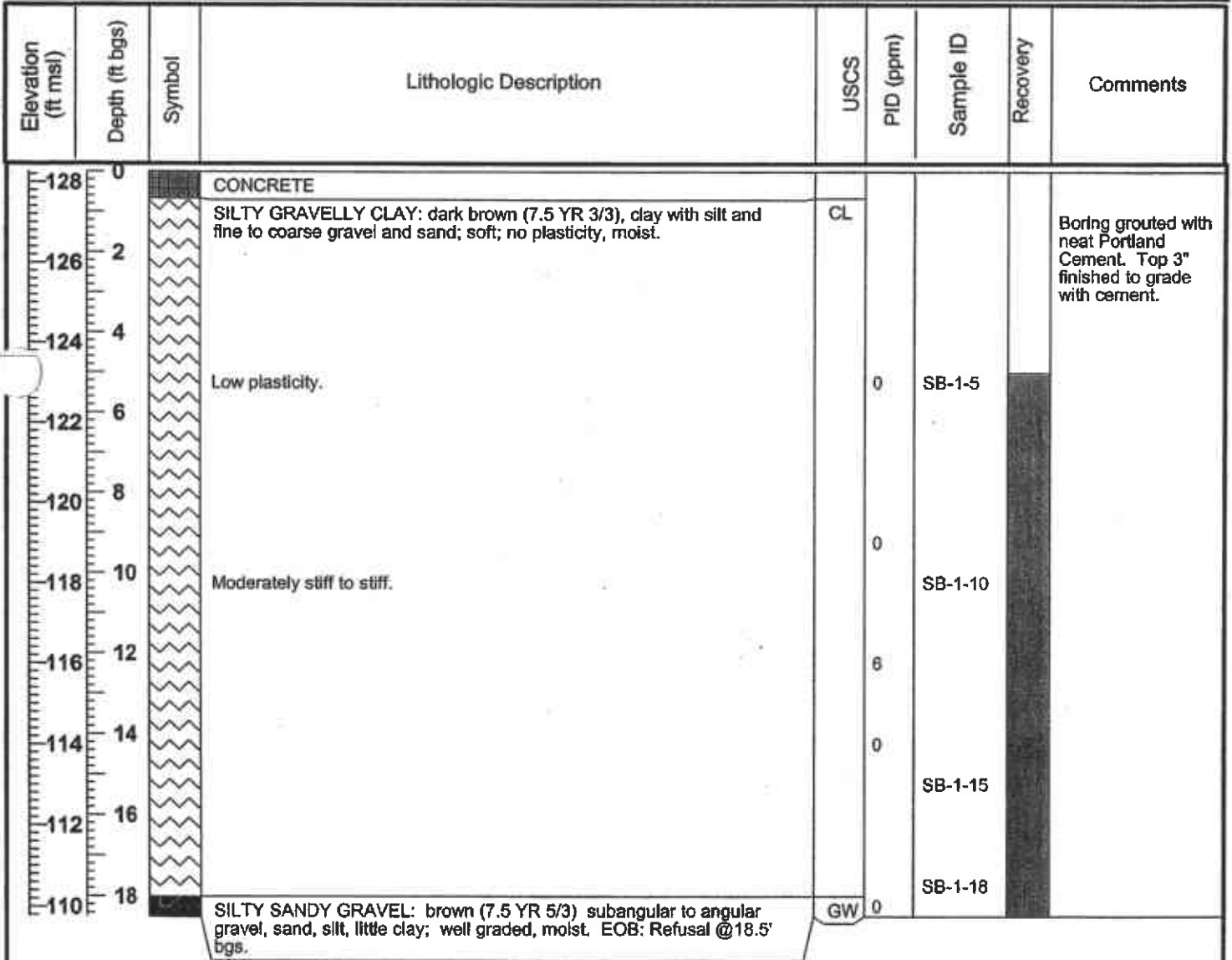
1333 Broadway, Suite 800
Oakland, California 94612

LOG OF BORING

Borehole ID: SB-1

Total Depth: 18.5'

PROJECT INFORMATION		DRILLING INFORMATION	
Project: Soil and Water Investigation		Drilling Company: Gregg Drilling and Testing, Inc.	
Site Location: 3310 Park Blvd., Oakland, CA		Driller: Paul Rogers	
Project Manager: Scott Robinson		Type of Drilling Rig: Geoprobe	
RG: James Durkin		Drilling Method: 2" Direct Push	
Geologist: Chris Sheridan		Sampling Method: Continuous Core	
Job Number: 38486908.0013601		Date(s) Drilled: 3/30/04	
BORING INFORMATION			
Groundwater Depth: NA		Boring Location: East corner of property, near entrance on East 34th St.	
Air Knife or Hand Auger Depth: 5.0 feet		Boring Diameter: 2"	
Coordinates: X -122.2344641 Y 37.8031429		Boring Type: Exploratory	





1333 Broadway, Suite 800
Oakland, California 94612

LOG OF BORING

Borehole ID: SB-2

Total Depth: 23.0'

PROJECT INFORMATION		DRILLING INFORMATION	
Project: Soil and Water Investigation		Drilling Company: Gregg Drilling and Testing, Inc.	
Site Location: 3310 Park Blvd., Oakland, CA		Driller: Paul Rogers	
Project Manager: Scott Robinson		Type of Drilling Rig: Geoprobe	
RG: James Durkin		Drilling Method: 2" Direct Push	
Geologist: Chris Sheridan		Sampling Method: Continuous Core	
Job Number: 38486908.0013601		Date(s) Drilled: 3/30/04	
BORING INFORMATION			
Groundwater Depth: 16'		Boring Location: Under east corner of canopy	
Air Knife or Hand Auger Depth: 5 feet		Boring Diameter: 2"	
Coordinates: X -122.2345458 Y 37.8030865		Boring Type: Exploratory	

Elevation (ft msl)	Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Sample ID	Recovery	Comments
0	0		CONCRETE					Borehole grouted with neat Portland Cement. Top 3" finished to grade with cement.
-126	2		Air knifed to 5' bgs		0			
-124	4							
-122	6		SILTY CLAY: brown (7.5 YR 4/3) clay with silt and fine to coarse sand; soft, moist, low plasticity.	CL	0	SB-2-5		
-120	8				6			
-118	10		CLAYEY SILT: brown (7.5 YR 4/3), silt with clay and trace fine to coarse gravel and sand; moist, slight plasticity.	ML	0	SB-2-10		
-116	12		SAND: brown, fine; moist.	SP	0			
-114	14		SILTY CLAY: brown (7.5 YR 3/4), clay with silt; moist, low plasticity.	CL	0			
-112	16		Wet.		0	SB-2-15		
-110	18				0			
-108	20		Some gravel.		0	SB-2-20		
-106	22				0			
-104			EOB: Refusal @23.0' bgs.			SB-2-23		Groundwater grab sample SB-2.



1333 Broadway, Suite 800
Oakland, California 94612

LOG OF BORING

Borehole ID: SB-3

Total Depth: 32.0 ft. bgs

PROJECT INFORMATION		DRILLING INFORMATION	
Project: Soil and Water Investigation		Drilling Company: Gregg Drilling and Testing, Inc.	
Site Location: 3310 Park Blvd., Oakland, CA		Driller: Paul Rogers	
Project Manager: Scott Robinson		Type of Drilling Rig: Geoprobe	
RG: James Durkin		Drilling Method: 2" Direct Push	
Geologist: Kevin Uno		Sampling Method: Continuous Core	
Job Number: 38486908.0013601		Date(s) Drilled: 5/7/04	
BORING INFORMATION			
Groundwater Depth: 5.5 ft. bgs		Boring Location: Parking stall across from pump #6.	
Air Knife or Hand Auger Depth: 5 feet		Boring Diameter: 2"	
Coordinates: X -122.2347087 Y 37.8032083		Boring Type: Exploratory	

Elevation (ft msl)	Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Sample ID	Recovery	Comments
0	0		ASPHALT: 3"	FILL				Boring grouted with neat Portland Cement. Top 3" finished to grade with cement.
-122	2		NO RECOVERY: Air knifed to 5'bgs.					
-120	4							
-118	6			NR				
-116	8		SILTY CLAY: Grey, mottled light brown clay with little silt, little rounded fine gravel, and trace sand; stiff, wet, medium plasticity.	CL	9.9	SB-3-8		
-114	10							
-112	12				7.7	SB-3-13		
-110	14		Black, round clasts (1.0-3.0 mm).					Groundwater samples were collected from boring HP-3.
-108	16							
-106	18			no odor		SB-3-18		
-104	20							
-102	22		SILTY SANDY CLAY: light brown clay, silt with fine to medium sand; rootlets, trace organic material. Stiff, wet; medium plasticity.					
-100	24				12.2	SB-3-23		

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comment
98 26		SILTY SAND: light brown, fine to coarse sand with little silt, loose, saturated.	SM			
96 28		CLAYEY SANDY SILT: grey, mottled light brown, silt, some clay and little fine to coarse sand and trace gravel, moderately stiff, wet, medium plasticity.	ML	12.1	SB-3-26	
94 30						
92 32		SAND: light brown, mostly coarse sand, little silt, trace gravel. Moderately dense, saturated. EOB: 32.0 ft. bgs.	SM	no odor	SB-3-31	



1333 Broadway, Suite 800
Oakland, California 94612

LOG OF BORING

Borehole ID: SB-4

Total Depth: 2.0 ft. bgs

PROJECT INFORMATION

DRILLING INFORMATION

Project: Soil and Water Investigation
Site Location: 3310 Park Blvd., Oakland, CA
Project Manager: Scott Robinson
RG: James Durkin
Geologist: Kevin Uno
Job Number: 38486908.0013601

Drilling Company: Gregg Drilling and Testing, Inc.
Driller: Paul Rogers
Type of Drilling Rig: Hand Auger
Drilling Method: Hand Auger
Sampling Method: Hand packed brass tube.
Date(s) Drilled: 5/7/04

BORING INFORMATION

Groundwater Depth: 2.0 ft. bgs
Boring Location: Sidewalk along Park Blvd.
Air Knife or Hand Auger Depth: NA
Boring Diameter: 2 inch
Coordinates: X NA Y NA
Boring Type: Exploratory

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Sample ID	Recovery	Comments
0		CONCRETE: 9"					
		SAND: FILL, dark gray, sand with silt. Strong hydrocarbon odor. Wet.	SP	HC odor	SB-4-1.0		Boring grouted with neat Portland Cement. Top 3" finished to grade with cement. ▽
2		EOB 2.0 ft' bgs. Boring abandoned when sloughing prevented air-knifing or hand augering to 5 ft. bgs.					



1333 Broadway, Suite 800
Oakland, California 94612

LOG OF BORING

Borehole ID: SB-5

Total Depth: 19.5'

PROJECT INFORMATION

DRILLING INFORMATION

Project: Soil and Water Investigation

Drilling Company: Gregg Drilling and Testing, Inc.

Site Location: 3310 Park Blvd., Oakland, CA

Driller: Paul Rogers

Project Manager: Scott Robinson

Type of Drilling Rig: Geoprobe

RG: James Durkin

Drilling Method: 2" Direct Push

Geologist: Chris Sheridan

Sampling Method: Continuous Core

Job Number: 38486908.0013601

Date(s) Drilled: 3/30/04

BORING INFORMATION

Groundwater Depth: 4.0'

Boring Location: Sidewalk along Park Blvd near intersection w/E 34th St

Air Knife or Hand Auger Depth: 5 feet

Boring Diameter: 2"

Coordinates: X -122.2346814 Y 37.8032765

Boring Type: Exploratory

Elevation (ft msl)	Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Sample ID	Recovery	Comments
0	0		ASPHALT: 3"					Boring grouted with neat Portland Cement. Top 3" finished to grade with cement.
-122	2		Air knifed to 5'bgs.					
-120	4		5.0-8.0' bgs: No Recovery.					
-118	6							
-116	8		SILTY CLAY: brown to dark brown (5Y 3/1) clay with some silt and few fine to medium sand, soft, wet, low to moderate plasticity.	CL	0	SB-5-8		
-114	10				0			
-112	12		12.0-16.0' bgs: No Recovery.		6			
-110	14							
-108	16		First two feet of sample were slough (16.0-18.0').			SB-5-16		
-106	18				0			
-104	19.5		SANDY GRAVEL: brown (5Y 3/3) angular to subangular fine gravel with some sand, few clay and silt, stiff, wet. EOB: Refusal @ 19.5 ft. bgs	GW	0	SB-5-19		Groundwater grab sample at 19.5' bgs.



1333 Broadway, Suite 800
Oakland, California 94612

LOG OF BORING

Borehole ID: SB-6

Total Depth: 2.0 ft. bgs

PROJECT INFORMATION		DRILLING INFORMATION	
Project: Soil and Water Investigation		Drilling Company: Gregg Drilling and Testing, Inc.	
Site Location: 3310 Park Blvd., Oakland, CA		Driller: Paul Rogers	
Project Manager: Scott Robinson		Type of Drilling Rig: Hand Auger	
RG: James Durkin		Drilling Method: Hand Auger	
Geologist: Kevin Uno		Sampling Method: Hand packed brass tube.	
Job Number: 38486908.0013601		Date(s) Drilled: 5/7/04	
BORING INFORMATION			
Groundwater Depth: 2.0 ft. bgs		Boring Location: Sidewalk along Park Blvd.	
Air Knife or Hand Auger Depth: NA		Boring Diameter: 2 inch	
Coordinates: X NA Y NA		Boring Type: Exploratory	

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Sample ID	Recovery	Comments
0		CONCRETE: 9"					Boring grouted with neat Portland Cement. Top 3" finished to grade with cement.
		SAND: (FILL), dark gray sand with slit. Strong hydrocarbon odor, wet.	SP	HC odor	SB-6-1.0		
2		EOB: 2.0 ft. bgs. Boring abandoned when sloughing prevented air-knifing or hand augering to 5 ft. bgs.					



1333 Broadway, Suite 800
Oakland, California 94612

LOG OF BORING

Borehole ID: SB-7

Total Depth: 30 ft

PROJECT INFORMATION		DRILLING INFORMATION	
Project: Soil and Water Investigation		Drilling Company: Vironex	
Site Location: 3310 Park Blvd., Oakland, CA		Driller: Paul White	
Project Manager: Scott Robinson		Type of Drilling Rig: Geoprobe 6610DT	
RG: Bob Horwath		Drilling Method: 2" Direct Push	
Geologist: Kevin Uno		Sampling Method: Continuous Core	
Job Number: 38486908.0013601		Date(s) Drilled: 10/14/04	
BORING INFORMATION			
Groundwater Depth: 16'		Boring Location: Along curb at E 34th St. entrance to Site.	
Air Knife or Hand Auger Depth: Air knife to 5' bgs		Boring Diameter: 2"	
Coordinates: X -122.2345316 Y 37.8032140		Boring Type: Exploratory	

Elevation (ft msl)	Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Sample ID	Recovery	Comments
-126	0		ASPHALT: 3"	GP				Boring grouted with neat Portland Cement. Top 3" finished to grade with cement.
	2		SANDY CLAYEY GRAVEL: (2.5Y 3/3) Dark olive brown. 60% gravel, 25% sand, 10 silt, 5% clay. Loose, moist, low plasticity.	ML				
-124	4		CLAYEY SILT: (2.5Y 2.5/1) Black. 75% silt, 25% clay. Moderately stiff, moist, low to medium plasticity.					
-122	6		60% silt, 40% clay. Medium plasticity.					
	6		SILTY SAND: (2.5Y 3/2) Very dark greyish brown. 65% fine sand, 30% silt, 5% clay. Loose, moist to wet, low plasticity.	SM ML		SB-7-6.0		
-120	8		SANDY SILT: (2.5Y 4/2) Dark grayish brown. 65% silt, 20% sand, 15% clay, trace gravel. Stiff, moist, low plasticity.					
-118	10		NO RECOVERY		0			
-116	12		CLAYEY SILT: (2.5Y 4/2) Dark grayish brown. 75% silt, 15% clay, 10% sand. Stiff, moist, medium plasticity.	ML		SB-7-11.5		
-114	14		Oxidation, mottling (Very dark gray and olive).					
-112	16		NO RECOVERY					
	16		SANDY CLAYEY SILT: (2.5Y 4/2) Dark grayish brown. 65% silt, 25% sand, 10% clay. Mottling (Very dark gray and olive), stiff, moist to wet, medium plasticity.		0	SB-7-16.0		
-110	18				No Odor			Groundwater samples were collected from boring HP-4.
-108	20				No Odor	SB-7-19.5		
-106	22		NO RECOVERY					
-104	24							

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
102						
100		CLAYEY SILT: Recovered cutting shoe: Olive. 85% silt, 15% clay, trace sand and clay. NO RECOVERY	ML			
98						
30		GRAVELLY SILTY SAND: Recovered cutting shoe: Olive brown. 65% fine to coarse sand, 25% gravel, 10% silt. Moist to wet, no plasticity. EOB: Refusal @30.0' bgs.	SW			



1333 Broadway, Suite 800
Oakland, California 94612

LOG OF BORING

Borehole ID: SB-8

Total Depth: 30 ft

PROJECT INFORMATION	DRILLING INFORMATION
Project: Soil and Water Investigation	Drilling Company: Vironex
Site Location: 3310 Park Blvd., Oakland, CA	Driller: Paul White
Project Manager: Scott Robinson	Type of Drilling Rig: Geoprobe 6610 DT
RG: Bob Horwath	Drilling Method: 2" Direct Push
Geologist: Kevin Uno	Sampling Method: Continuous Core
Job Number: 38486908.0013601	Date(s) Drilled: 10/15/04

BORING INFORMATION	
Groundwater Depth: 20'	Boring Location: Located in parking stall closest to E 34th St. entrance.
Air Knife or Hand Auger Depth: Hand auger to 5' bgs	Boring Diameter: 2"
Coordinates: X -122.2346152 Y 37.8032190	Boring Type: Exploratory

Elevation (ft msl)	Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Sample ID	Recovery	Comments
	0		ASPHALT: 2"					
124	2		SANDY CLAYEY GRAVEL: (2.5Y 3/3) Dark olive brown. 60% gravel, 25% sand, 10 silt, 5% clay. Loose, moist, low plasticity.	GM				Boring grouted with neat Portland Cement. Top 3" finished to grade with cement.
122	4		CLAYEY SILT: (2.5Y 2.5/1) Black. 88% silt, 10% clay, 2% sand. Moderately stiff, moist, low to medium plasticity.	ML				
120	6		SANDY SILT: 70% silt, 20% fine sand, 10% clay. Stiff, moist to wet, low plasticity.			SB-8-6.0		
118	8		CLAYEY SILT: (10Y 4/1) Dark greenish gray. 85% silt, 15% clay. Stiff, moist, medium plasticity.					
116	10							Groundwater samples were collected from boring HP-5.
114	12							
112	14					SB-8-14		
110	16		CLAYEY SANDY SILT: (2.5Y 4/3) Olive brown. 70% silt, 15% clay, 15% sand. Stiff, moist to wet, medium plasticity. Mottling: Dark olive brown and olive brown.			SB-8-16.0		
108	18							
106	20							
104	22		NO RECOVERY			SB-8-19.5		
102	24							

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
		CLAYEY SILT: 75% silt, 20% clay, 5% fine sand. Moderately stiff, moist, low to medium plasticity.	ML			
	SILTY SAND: 65% fine sand, 30% silt, 5% clay. Moist to wet, no to low plasticity.	SM ML		SB-8-29.5	30 ft. bgs: End of Boring	
		CLAYEY SILT: 70% silt, 30% clay. Very stiff, moist, medium plasticity.				



1333 Broadway, Suite 800
Oakland, California 94612

LOG OF BORING

Borehole ID: SB-9



Total Depth: 27.5 ft.

PROJECT INFORMATION		DRILLING INFORMATION	
Project: Arco Site 2107 Soil and Water Investigation		Drilling Company: Vironex	
Site Location: 3310 Park Blvd., Oakland, CA		Driller: Paul White	
Project Manager: Scott Robinson		Type of Drilling Rig: Geoprobe 6610 DT	
RG: Bob Horwath		Drilling Method: 2" Direct Push	
Geologist: Kevin Uno		Sampling Method: Continuous Core	
Job Number: 38486908.0013601		Date(s) Drilled: 10/14/04	
BORING INFORMATION			
Groundwater Depth: 2.5 ft. bgs		Boring Location: Parking stall closest to Park Blvd..	
Air Knife or Hand Auger Depth: Airknife to 5' bgs		Boring Diameter: 2"	
Coordinates: X -122.2348093 Y 37.8031964		Boring Type: Exploratory	

Elevation (ft msl)	Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Sample ID	Recovery	Comments
0	0		ASPHALT: 4"					
-122	2		SANDY GRAVEL: (2.5Y 3/3) Dark olive brown. 60% gravel, 25% sand, 10 silt, 5% clay. Loose, moist, low plasticity.	GM				
-120	4		GRAVELLY CLAY: (10GY 4/1) Dark greenish gray. 60% clay, 25% gravel, 15% silt. Stiff, wet, high plasticity.	CL				
-118	6		NO RECOVERY					
-116	8		NO RECOVERY					
-114	10		SANDY GRAVEL: (2.5Y 3/1) Very dark gray. 55% fine to medium subangular gravel, 30% fine to coarse sand, 10% silt, 5% clay. Stiff, wet, low plasticity.	ML		SB-9-10.5		
-112	12		CLAYEY SILT: (2.5Y 5/3) Light olive brown. 80% silt, 20% clay. Mottling, stiff, wet, medium plasticity.			SB-9-13.0		
-110	14		NO RECOVERY					
-108	16		CLAYEY SILT: (2.5Y 5/3) Light olive brown. 80% silt, 20% clay. Mottling, stiff, wet, medium plasticity.	ML				
-106	18		GRAVELLY SANDY SILT: 40% silt, 30% gravel, 25% sand, 5% clay. Mottling, stiff, wet, no to low plasticity.			SB-9-17.5		
-104	20		SANDY SILT: 90% silt, 10% fine sand. Wet; low plasticity. Grades to silty sand.			SB-9-19.5		
-102	22		SILT SAND: 60% fine sand, 40% silt. Wet; low plasticity. Grades to silty sand.	SM				
-100	24		SANDY GRAVELLY SILT: 50% silt, 25% sand, 15% gravel, 10% clay. Wet, no to low plasticity.	ML				
	26		NO RECOVERY					
	27.5		GRAVELLY SILT: 50% silt, 25% gravel, 10% fine sand, 15% clay.	ML				

Boring grouted with neat Portland Cement. Top 3" finished to grade with cement.

Groundwater samples were collected from boring HP-6.

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
98		Wet, no to low plasticity.				
26		SILTY SAND: 2.5Y 4/3 Olive brown. 70% sand, 30% silt. Moist, no plasticity.	SM			
96						



1333 Broadway, Suite 800
Oakland, California 94612

LOG OF BORING

Borehole ID: SB-10

Total Depth: 32 ft.

PROJECT INFORMATION		DRILLING INFORMATION	
Project: Arco Site 2107 Soil and Water Investigation		Drilling Company: Vironex	
Site Location: 3310 Park Blvd., Oakland, CA		Driller: Paul White	
Project Manager: Scott Robinson		Type of Drilling Rig: Geoprobe 6610 DT	
RG: Bob Horwath		Drilling Method: 2" Direct Push	
Geologist: Kevin Uno		Sampling Method: Continuous Core	
Job Number: 38486908.0013601		Date(s) Drilled: 10/20/04	
BORING INFORMATION			
Groundwater Depth: 1.3 ft. bgs		Boring Location: Middle of driveway on Park Blvd..	
Air Knife or Hand Auger Depth: Hand auger to 5' bgs		Boring Diameter: 2"	
Coordinates: X -122.2348842 Y 37.8031970		Boring Type: Exploratory	

Elevation (ft msf)	Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Sample ID	Recovery	Comments
0	0		ASPHALT: 3"	GM				
120	2		SANDY GRAVEL: (2.5Y 3/3) Dark olive brown. Gravel and concrete pieces (to 1.0 ft. bgs), sand, and clay. Loose, moist to wet, low plasticity.	GM				
118	4		CLAYEY SILT: (10Y 2.5/1) Greenish black. 70% silt, 20% clay, 5% fine to coarse rounded sand and gravel. Stiff, moist, medium plasticity.	ML				
116	6		(2.5Y 4/3) Olive brown.			SB-10-6.5		Boring grouted with neat Portland Cement. Top 3" finished to grade with cement.
114	8							
112	10		Core sample sleeve destroyed from 10-13.5 ft. bgs.					
110	12							
108	14		Mottling.			SB-10-14.0		
106	16		NO RECOVERY					Groundwater samples collected from boring labeled as HP-7.
104	18		NO RECOVERY: Hydropunch: HP-7-20					
102	20		CLAYEY SANDY SILT: (5Y 4/2) Olive gray. 70% silt, 20% clay, 10% sand. Moderately stiff to stiff, moist, medium plasticity.	ML		SB-10-20.5		
100	22		SILTY SAND: (2.5Y 5/4) Light olive brown. 45% sand, 40% silt, 15% clay. Moist, dense, no to low plasticity.	SM				
98	24		CLAYEY SANDY SILT: (5Y 4/2) Olive gray. 70% silt, 20% clay, 10% sand. Moderately stiff to stiff, moist, medium plasticity.	ML		SB-10-22.5		

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
96	26	NO RECOVERY				
94	28	NO RECOVERY: Hydropunch: HP-7-30				
92	30	GRAVELLY SILTY SAND: (2.5Y 4/3) Olive brown. 45% sand, 30% subangular to angular gravel, 20% silt, 5% clay. Moderately dense, moist, no plasticity.	SM			
90	32	Refusal: End of Boring at 32' bgs		SB-10-31.5		



1333 Broadway, Suite 800
Oakland, California 94612


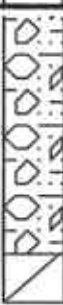
LOG OF BORING

Borehole ID: SB-11

Total Depth: 30 ft.

PROJECT INFORMATION		DRILLING INFORMATION	
Project: Arco Site 2107 Soil and Water Investigation		Drilling Company: Vironex	
Site Location: 3310 Park Blvd., Oakland, CA		Driller: Paul White	
Project Manager: Scott Robinson		Type of Drilling Rig: Geoprobe 6610 DT	
RG: Bob Horwath		Drilling Method: 2" Direct Push	
Geologist: Kevin Uno		Sampling Method: Continuous Core	
Job Number: 38486908.0013601		Date(s) Drilled: 10/14/04	
BORING INFORMATION			
Groundwater Depth: 3.8 ft. bgs		Boring Location: W side of driveway on Park Blvd..	
Air Knife or Hand Auger Depth: Airknife to 5' bgs		Boring Diameter: 2"	
Coordinates: X -122.2349568 Y 37.8032163		Boring Type: Exploratory	

Elevation (ft msl)	Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Sample ID	Recovery	Comments
120	0		ASPHALT: 6"					
118	2		SANDY GRAVEL: (2.5Y 3/3) Dark olive brown. 60% gravel, 25% sand, 10 silt, 5% clay. Loose, moist, low plasticity.	GM ML				
116	4		CLAYEY SILT: (10Y 2.5/1) Greenish black. 70% silt, 20% clay, 10% fine to coarse rounded gravel. Moderately stiff, moist, medium plasticity.					
114	6		2.5Y 2.5/1 Black Increase to 10% fine to coarse sand; decrease clay.			SB-11-6.5		Boring grouted with neat Portland Cement. Top 3" finished to grade with cement.
112	8		(5Y 4/2) Olive gray. 75% silt, 15% clay, 10% fine to coarse sand. Moist; Low to medium plasticity.					
110	10		(2.5Y 5/1) Gray. Wet, soft.			SB-11-11.5		
108	12							
106	14							
104	16		SANDY CLAYEY SILT: (5Y 4/2) Olive gray. 70% silt, 25% sand, 5% clay. Stiff, moist to wet, low plasticity.					
102	18		(2.5Y 2.5/1) Black			SB-11-16.5		Groundwater samples were collected from boring HP-8.
100	20		NO RECOVERY					
98	22		SANDY CLAYEY SILT: (5Y 4/2) Olive gray. 65% silt, 20% fine to coarse sand, 10% clay. Low plasticity.	ML				
	24		(2.5Y 2.5/1) Black			SB-11-21.5		
	24		SILTY SAND: (5Y 5/3) Olive. 70% sand, 30% silt, trace gravel. Low plasticity.	SM				

Depth (ft bgs)	Symbol	Lithologic Description	USCS	PID (ppm)	Recovery	Sample ID / Comments
		<p>23.5 ft. Color change to (5G 4/1) dark greenish gray. GRAVELLY SILTY SAND: 65% sand, 20% gravel, 15% silt. Dense, wet, no plasticity.</p>				<p>SB-11-26</p> <p>SB-11-28.5</p>
		<p>NO RECOVERY</p>				

(9) **CONFIDENTIAL**

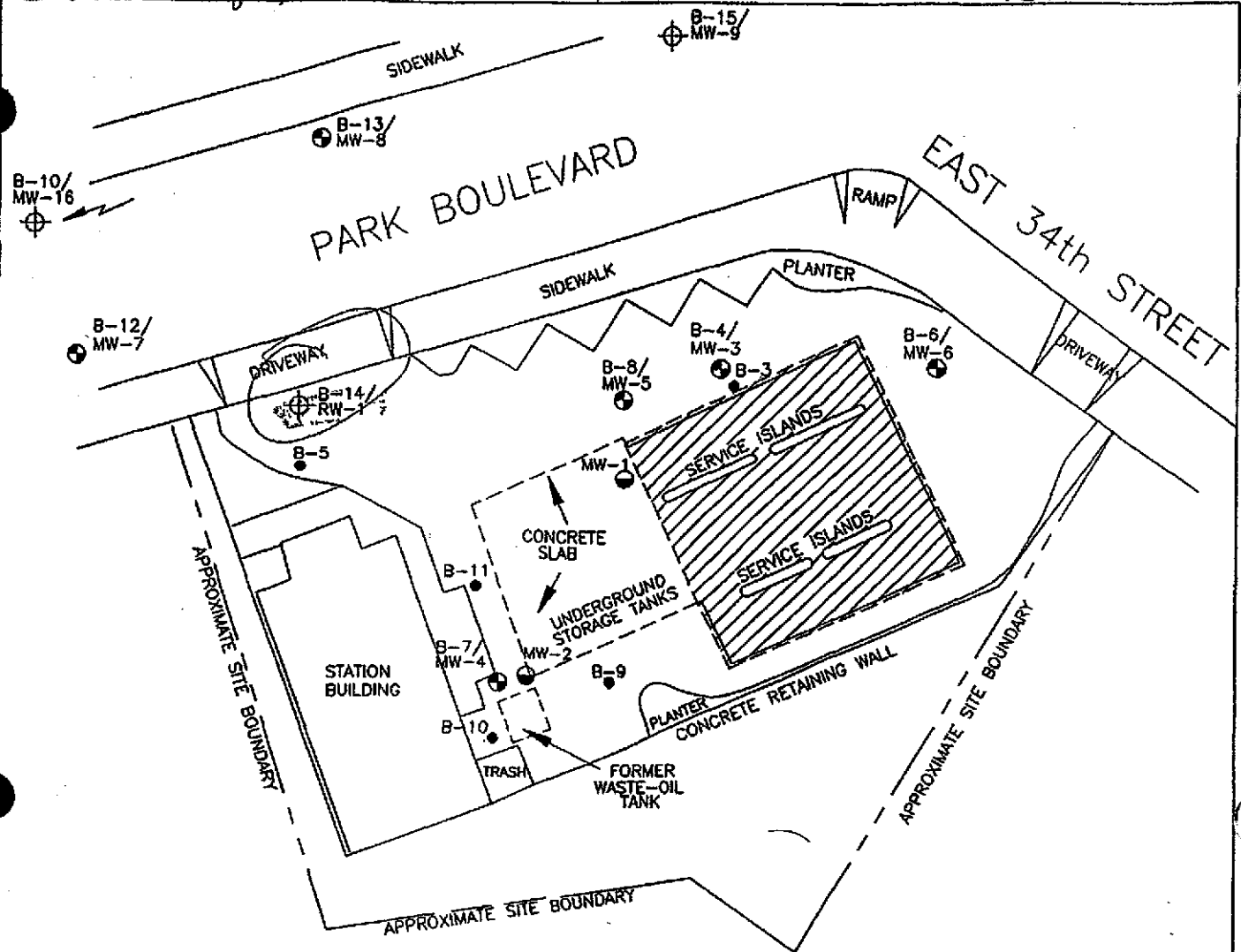
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WELL COMPLETION REPORT
(WELL LOGS)

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272

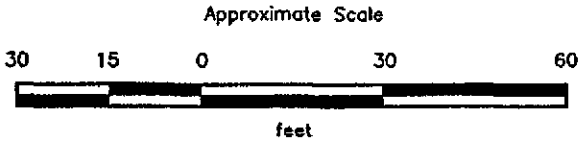
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EXPLANATION

-  = Former underground fuel storage tanks
- B-11 ● = Soil boring (RESNA, April 1990 and May 1991)
- B-13/MW-8 ● = Monitoring well (RESNA, April and July 1990, August 1991)
- MW-2 ● = Tank pit observation well (S.C.S. Engineers, January 1987)
- B-14/RW-1 ⊕ = Proposed soil boring/recovery well
- B-10/MW-16 ⊕ = Proposed soil boring/monitoring well



Source: Surveyed by Ron Archer, Civil Engineer, Inc., dated July 20, 1990.

RESNA

GENERALIZED SITE PLAN
ARCO Station 2107
3310 Park Boulevard
Oakland, California

PLATE
2

PROJECT 69021.10

Table 1
Soil Analytical Data
 ARCO Service Station #2107
 3310 Park Blvd, Oakland, CA

Soil Sample ID	Sample Depth (feet bgs)	Sample Elevation (feet msl)	Date Sampled	GRO/ TPH-g (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	t-Butyl Alcohol (TBA) (mg/kg)	Methyl-tert butyl-ether (MTBE) (mg/kg)	Di-isopropal ether (DIPE) (mg/kg)	Ethyl-t-Butyl-Ether (ETBE) (mg/kg)	t-Amyl Methyl Ether (TAME) (mg/kg)	Ethanol (mg/kg)
SB-1-5	5	123.26	3/30/04	ND<1.2	ND<0.0061	0.096	ND<0.0061	0.016	ND<0.012	ND<0.0061	ND<0.012	ND<0.0061	ND<0.0061	ND<0.1
SB-1-10	10	118.26	3/30/04	ND<1.3	ND<0.0063	ND<0.0063	ND<0.0063	ND<0.0063	ND<0.013	ND<0.0063	ND<0.013	ND<0.0063	ND<0.0063	ND<0.1
SB-1-15	15	113.26	3/30/04	ND<1.2	ND<0.0059	ND<0.0059	ND<0.0059	ND<0.0059	ND<0.012	ND<0.0059	ND<0.012	ND<0.0059	ND<0.0059	ND<0.1
SB-1-18	18	110.26	3/30/04	ND<1.2	ND<0.0059	ND<0.0059	ND<0.0059	ND<0.0059	ND<0.012	ND<0.0059	ND<0.012	ND<0.0059	ND<0.0059	ND<0.1
SB-2-5	5	121.53	3/30/04	ND<1.3	ND<0.0067	ND<0.0067	ND<0.0067	ND<0.0067	ND<0.013	ND<0.0067	ND<0.013	ND<0.0067	ND<0.0067	ND<0.1
SB-2-10	10	116.53	3/30/04	ND<1.2	ND<0.0061	ND<0.0061	ND<0.0061	ND<0.0061	ND<0.012	ND<0.0061	ND<0.012	ND<0.0061	ND<0.0061	ND<0.1
SB-2-15	15	111.53	3/30/04	ND<1.2	ND<0.0060	ND<0.0060	ND<0.0060	ND<0.0060	ND<0.012	ND<0.0060	ND<0.012	ND<0.0060	ND<0.0060	ND<0.1
SB-2-20	20	106.53	3/30/04	ND<1.2	ND<0.0062	ND<0.0062	ND<0.0062	ND<0.0062	ND<0.012	ND<0.0062	ND<0.012	ND<0.0062	ND<0.0062	ND<0.1
SB-2-23	23	103.53	3/30/04	ND<1.2	ND<0.0060	ND<0.0060	ND<0.0060	ND<0.0060	ND<0.012	ND<0.0060	ND<0.012	ND<0.0060	ND<0.0060	ND<0.1
SB-3-8.0	8	115.87	5/7/04	ND< 1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	0.024	ND<0.01	ND<0.0050	ND<0.0050	ND<0.1
SB-3-13	13	110.87	5/7/04	ND< 1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	0.027	ND<0.01	ND<0.0050	ND<0.0050	ND<0.1
SB-3-18	18	105.87	5/7/04	ND< 1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	0.19	ND<0.0050	ND<0.01	ND<0.0050	ND<0.0050	ND<0.1
SB-3-23.0	23	100.87	5/7/04	ND< 1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	0.29	0.027	ND<0.01	ND<0.0050	ND<0.0050	ND<0.1
SB-3-26.5	26.5	97.37	5/7/04	ND< 1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.0050	ND<0.01	ND<0.0050	ND<0.0050	ND<0.1
SB-3-31.0	31	92.87	5/7/04	ND< 1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.0050	ND<0.01	ND<0.0050	ND<0.0050	ND<0.1
HP-3-39.5	39.5	84.37	10/15/04	ND<0.1	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
HP-3-46	46	77.87	10/15/04	ND<0.1	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-4-1.0	1	NM	5/7/04	350	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<2.5	ND<0.50	ND<1.0	ND<0.50	ND<0.50	ND<25
SB-5-8	8	114.96	3/30/04	ND<1.1	ND<0.0056	ND<0.0056	ND<0.0056	ND<0.0056	ND<0.011	ND<0.0056	ND<0.011	ND<0.0056	ND<0.0056	ND<0.1
SB-5-16	16	106.96	3/30/04	ND<1.3	ND<0.0065	ND<0.0065	ND<0.0065	ND<0.0065	0.016	ND<0.0065	ND<0.013	ND<0.0065	0.0066	ND<0.1
SB-5-19	19	103.96	3/30/04	ND<1.2	ND<0.0059	ND<0.0059	ND<0.0059	ND<0.0059	ND<0.012	ND<0.0059	ND<0.012	ND<0.0059	ND<0.0059	ND<0.1
SB-6-1.0	1	NM	5/7/04	ND< 1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.0050	ND<0.01	ND<0.0050	ND<0.0050	ND<0.1
SB-7- 6.0	6	120.22	10/14/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-7- 11.5	11.5	114.72	10/14/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-7- 16.0	16	110.22	10/14/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	ND<0.0050	0.0056	ND<0.0050	ND<0.0050	NA
SB-7- 19.5	19.5	106.72	10/14/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-8-6.0	6	118.82	10/15/04	ND<0.1	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	0.048	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-8-14.0	14	110.82	10/15/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-8-16.0	16	108.82	10/15/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-8-25.0	25	99.82	10/15/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA

Table 1
Soil Analytical Data
 ARCO Service Station #2107
 3310 Park Blvd, Oakland, CA

Soil Sample ID	Sample Depth (feet bgs)	Sample Elevation (feet msl)	Date Sampled	GRO/ TPH-g (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	t-Butyl Alcohol (TBA) (mg/kg)	Methyl-tert butyl-ether (MTBE) (mg/kg)	Di-isopropal ether (DIPE) (mg/kg)	Ethyl-t-Butyl-Ether (ETBE) (mg/kg)	t-Amyl Methyl Ether (TAME) (mg/kg)	Ethanol (mg/kg)
SB-8-29.5	29.5	95.32	10/15/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	0.011	ND<0.020	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-9-10.5	10.5	112.29	10/14/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-9-13.5	13.5	109.29	10/14/04	ND<2.5	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<5.0	0.56	ND<0.025	ND<0.025	ND<0.025	NA
SB-9-17.5	17.5	105.29	10/14/04	ND<0.50	ND<0.025	ND<0.025	ND<0.025	ND<0.025	ND<0.10	0.22	ND<0.025	ND<0.025	ND<0.025	NA
SB-9-19.5	19.5	103.29	10/14/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	0.026	0.0069	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-10-6.5	6.5	115.29	10/20/04	0.51	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	0.025	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-10-14.0	14	107.79	10/20/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	0.048	0.034	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-10-20.5	20.5	101.29	10/20/04	ND<2.5	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<5.0	0.21	ND<0.025	ND<0.025	ND<0.025	NA
SB-10-22.5	22.5	99.29	10/20/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	0.059	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-10-31.5	31.5	90.29	10/20/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	0.011	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-11-6.5	6.5	113.73	10/14/04	0.31	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-11-11.5	11.5	108.73	10/14/04	220	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.25	ND<0.12	ND<0.12	ND<0.12	ND<0.12	NA
SB-11-16.5	16.5	103.73	10/14/04	14	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<5.0	ND<0.025	ND<0.025	ND<0.025	ND<0.025	NA
SB-11-21.5	21.5	98.73	10/14/04	24	ND<0.050	ND<0.050	ND<0.050	ND<0.050	ND<5.0	ND<0.025	ND<0.025	ND<0.025	ND<0.025	NA
SB-11-26.0	26	94.23	10/14/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020	0.012	ND<0.0050	ND<0.0050	ND<0.0050	NA
SB-11-28.5	28.5	91.73	10/14/04	ND<0.10	ND<0.0050	ND<0.0050	ND<0.0050	0.012	ND<0.020	0.022	ND<0.0050	ND<0.0050	ND<0.0050	NA

Notes:

- 1) Samples analyzed by EPA method 8260B.
- 2) Concentrations above laboratory reporting limits in bold.

bgs = below ground surface

GRO = Gasoline Range Organics

mg/kg = milligrams per kilogram

msl = mean sea level

NA = Not analyzed

ND< = Not detected below stated laboratory reporting limit

NM = Not measured

TPH-g = Total petroleum hydrocarbons as gasoline

Table 2
Groundwater Analytical Data

ARCO Service Station #2107
3310 Park Blvd, Oakland, CA

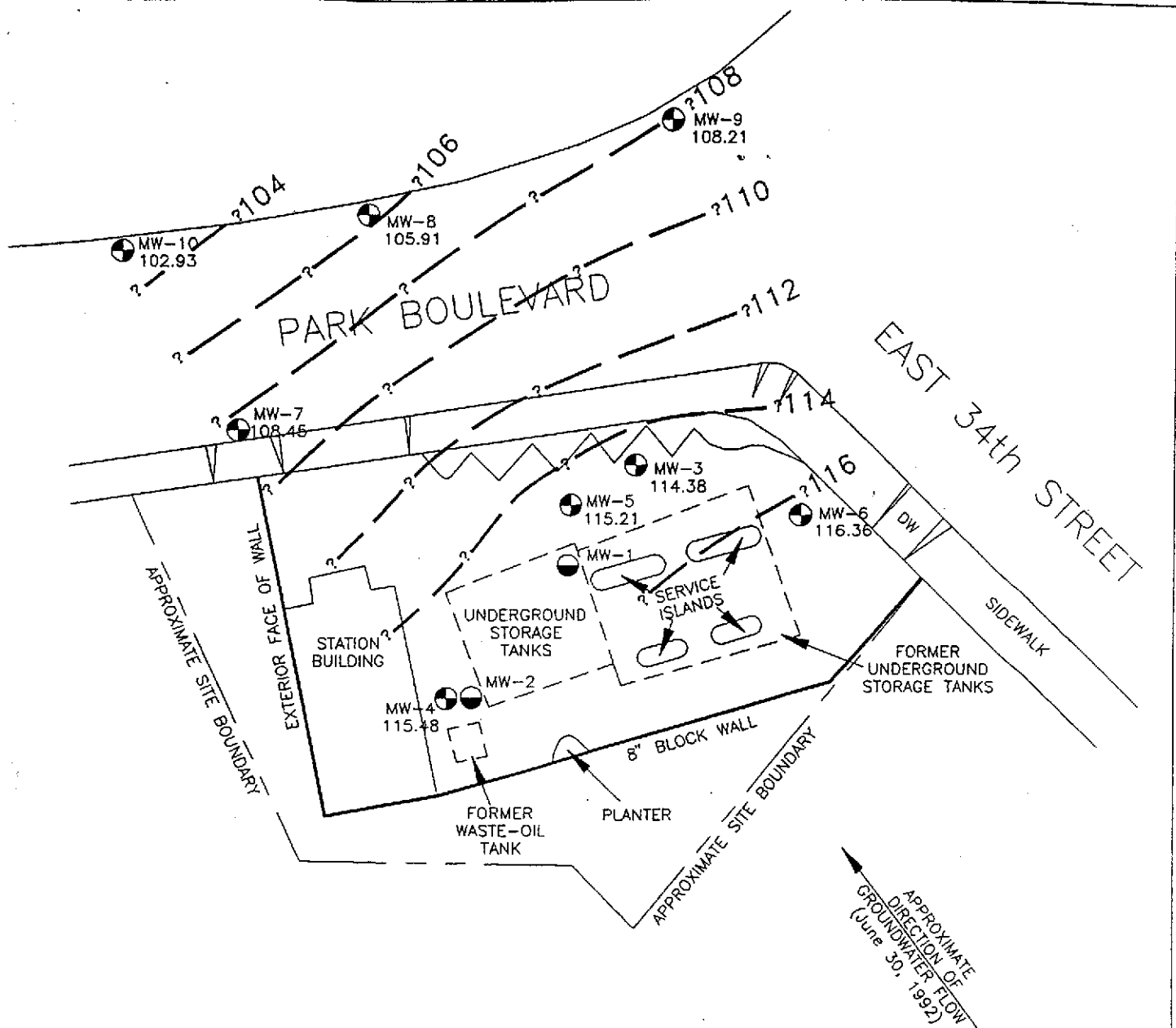
Sample ID	Elevation (msl)	Sample Depth/ Interval (feet bgs)	Sample elevation (msl)	Date Sampled	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	t-Butyl Alcohol (TBA) (µg/L)	MTBE (µg/L)	Di-isopropal ether (DIPE) (µg/L)	Ethyl-t-Butyl-Ether (ETBE) (µg/L)	tert-Amyl Methyl Ether (TAME) (µg/L)	Ethanol (µg/L)
SB-1	128.26	18.5	109.8	03/30/04	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<5.0	ND<0.50	ND<1.0	ND<0.50	ND<0.50	ND<50
SB-2	126.532	23	103.532	03/30/04	ND<50	ND<0.50	1.4	ND<0.50	ND<1.0	ND<5.0	ND<0.50	ND<1.0	ND<0.50	ND<0.50	ND<50
SB-3	123.867	32	91.867	05/07/04	88	ND<0.50	ND<0.50	ND<0.50	ND<1.0	110	34	ND<1.0	ND<0.50	1.1	ND<50
SB-5	122.964	19.5	103.464	03/30/04	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	45	34	ND<1.0	ND<0.50	ND<0.50	ND<50
HP-3-35	123.867	31-35	88.9- 92.9	10/15/04	ND<50	0.64	10	1.5	8.9	ND<5.0	3.8	ND<1.0	ND<0.50	ND<0.50	ND<50
HP-4-18	126.217	18-22	104.2- 108.2	10/14/04	140	1.6	38	5.4	27	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	NA
HP-4-30	126.217	26-30	96.2- 100.2	10/14/04	96	0.91	23	3.5	17	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	NA
HP-5-18	124.821	18-22	102.8- 106.8	10/20/04	ND<50	ND<0.50	7	0.94	6.2	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	NA
HP-5-29	124.821	25-29	95.8- 99.8	10/20/04	ND<50	ND<0.50	9.2	1.2	7	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	NA
HP-6-8	122.792	8-12	110.8- 114.8	10/14/04	ND<250	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<100	92	ND<2.5	ND<2.5	ND<2.5	NA
HP-6-20	122.792	16-20	102.8- 106.8	10/14/04	170	ND<1.0	15	2.9	16	76	82	ND<1.0	ND<1.0	ND<1.0	NA
HP-6-30	122.792	26-30	92.8- 96.8	10/14/04	72	ND<0.50	13	2.2	13	ND<20	6.6	ND<0.50	ND<0.50	ND<0.50	NA
HP-7-20	121.791	16-20	101.8- 105.8	10/20/04	1300	ND<10	ND<10	ND<10	ND<10	ND<400	1200	ND<10	ND<10	ND<10	NA
HP-7-30	121.791	26-30	91.8- 95.8	10/20/04	ND<5,000	ND<50	ND<50	ND<50	ND<50	ND<2,000	3700	ND<50	ND<50	ND<50	NA
HP-8-27	120.229	23-27	93.2- 97.2	10/15/04	ND<2,500	ND<25	28	ND<25	28	ND<1,000	2100	ND<25	ND<25	ND<25	NA
HP-8-34	120.229	30-34	86.2- 90.2	10/15/04	ND<2,500	ND<25	ND<25	ND<25	ND<25	ND<1,000	880	ND<25	ND<25	ND<25	NA

Notes:



- 1) Groundwater samples analyzed by EPA method 8260B.
- 2) Concentrations above laboratory reporting limits in **bold**.
- 3) SB- indicates groundwater grab sample from bottom of soil boring. HP- indicates depth distrete groundwater sample using a hydropunch.

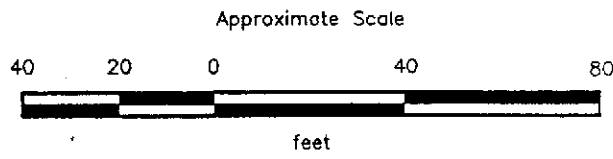
bgs = below ground surface
 ESL =Environmental Screening Level
 GRO = Gasoline Range Organics
 (mg/L) = micrograms per litre
 msl =Mean sea level
 MTBE = methyl tertiary butyl ether.
 NA = Not Analyzed
 ND< = Not detected below stated laboratory reporting limit
 TPH-g = Total petroleum hydrocarbons as gasoline

Attachment C
Historical Groundwater Gradient Maps



EXPLANATION

- 116 = Line of equal elevation of groundwater in feet above mean sea level (MSL)
- 116.36 = Elevation of groundwater in feet above MSL, June 30, 1992
- * = Not used for groundwater gradient interpretation
- MW-10  = Groundwater monitoring well (RESNA, 04/90, 07/90, 08/91, and 06/92)
- MW-2  = Tank pit observation well (S.C.C. Engineers, 01/87)



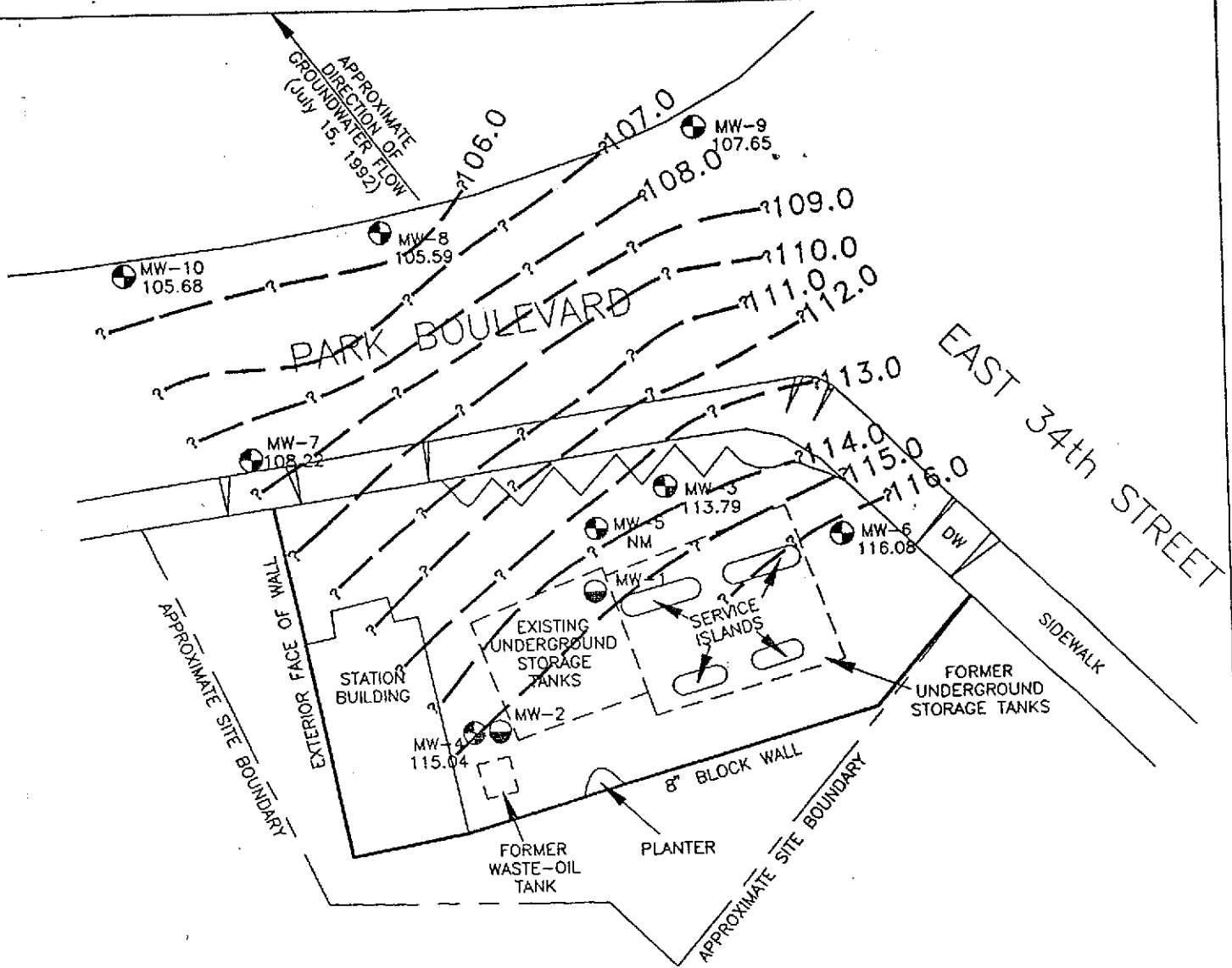
SOURCE: Modified from plan supplied by John E. Koch, Land Surveyor, July 27, 1992.

RESNA
Working to Restore Nature

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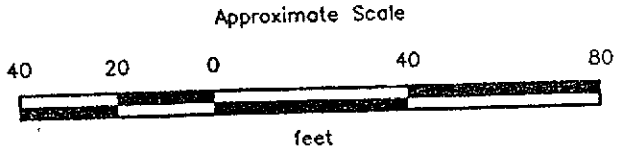
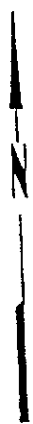
GROUNDWATER GRADIENT MAP
ARCO Station 2107
3310 Park Boulevard
Oakland, California

PLATE
5



EXPLANATION

- 116.0 = Line of equal elevation of groundwater in feet above mean sea level (MSL)
- 116.08 = Elevation of groundwater in feet above MSL, July 15, 1992
- NM = Not measured
- MW-10 = Groundwater monitoring well (RESNA, 04/90, 07/90, 08/91, and 06/92)
- MW-2 = Tank pit observation well (S.C.S. Engineers, 01/87)

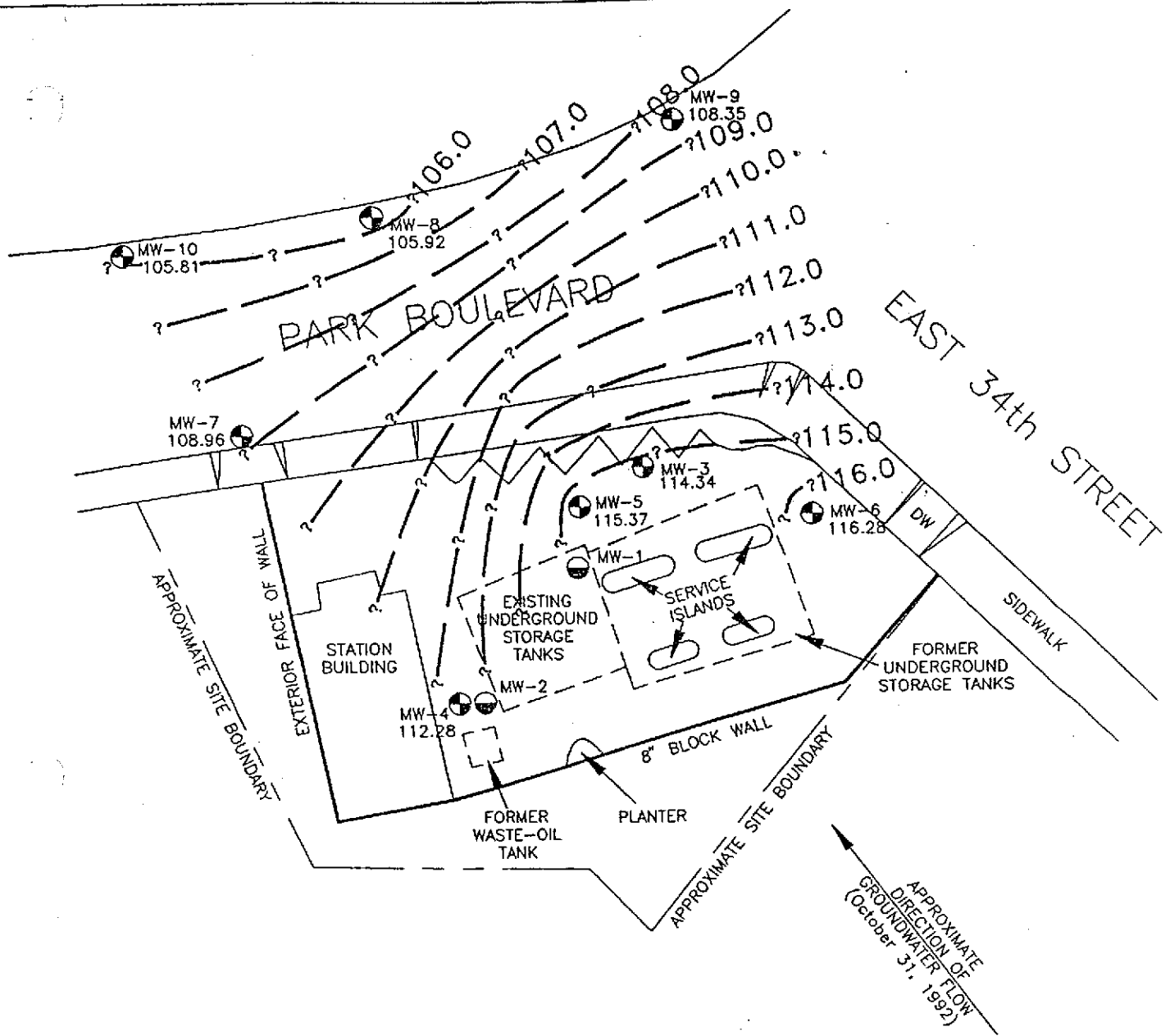


SOURCE: Modified from plan supplied by John E. Koch, Land Surveyor, July 27, 1992.



GROUNDWATER GRADIENT MAP
ARCO Station 2107
3310 Park Boulevard
Oakland, California

PLATE
15



EXPLANATION

- 116.0 = Line of equal elevation of groundwater in feet above mean sea level (MSL)
- 116.28 = Elevation of groundwater in feet above MSL, October 31, 1992
- MW-10 = Groundwater monitoring well (RESNA, 04/90, 07/90, 08/91, and 06/92)
- MW-2 = Tank pit observation well (S.C.S. Engineers, 01/87)

SOURCE: Modified from plan supplied by John E. Koch, Land Surveyor, July 27, 1992.



GROUNDWATER GRADIENT MAP
ARCO Station 2107
3310 Park Boulevard
Oakland, California

PLATE
18

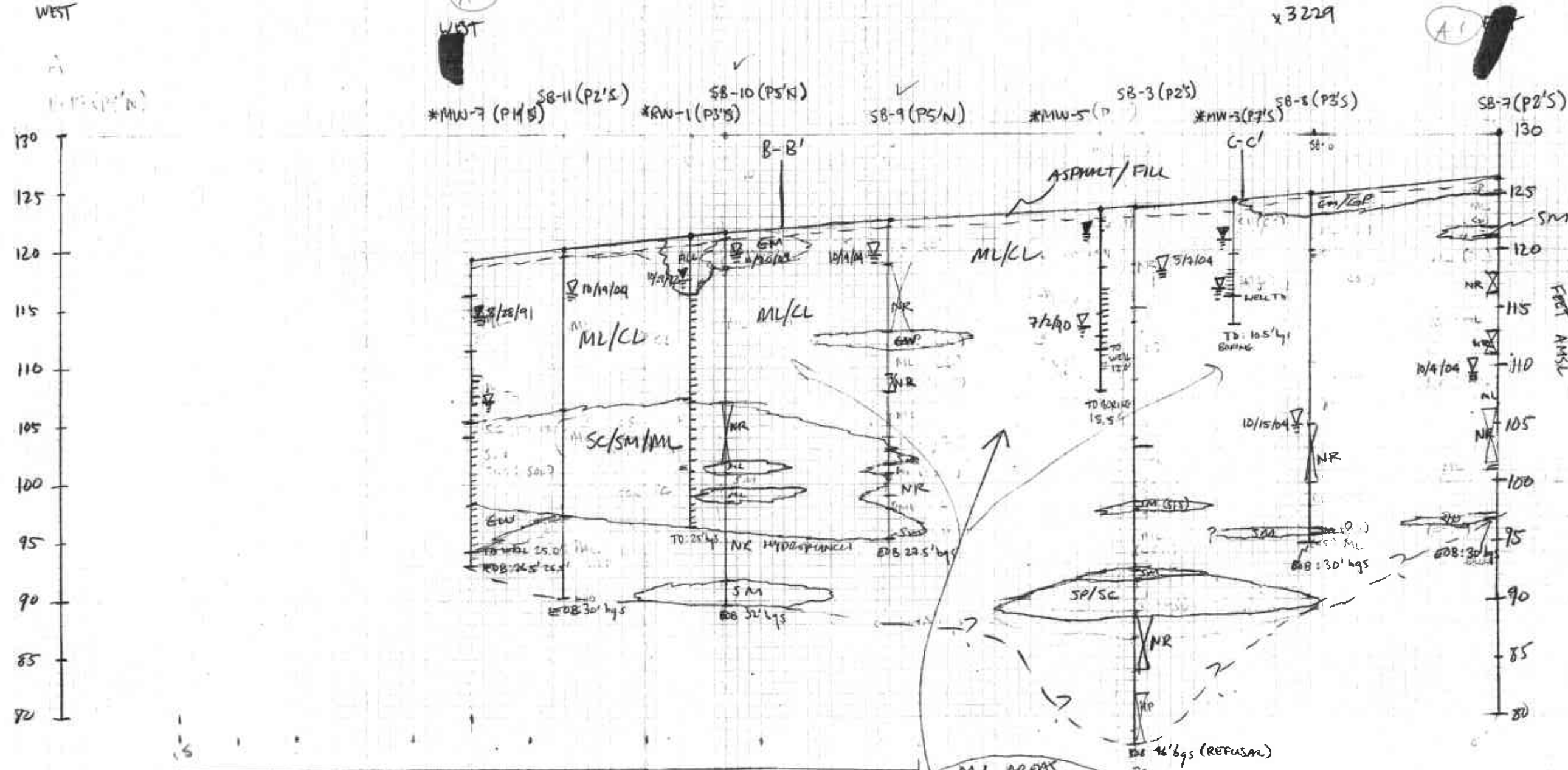
PROJECT **69021.10** 90211004

SECOR

International Incorporated

JOB NAME ARLD 2107 X-SXN.
 JOB NO. 38487287
 CALCULATED BY K UND DATE 2/22/05
 CHECKED BY _____ DATE _____
 SHEET 1 OF 2

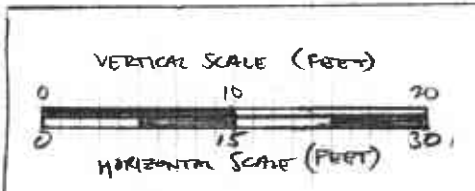
WEST
 WEST
 A
 *MW-7 (P1'S) SB-11 (P2'S) *RW-1 (P3'S) SB-10 (P5'N) SB-9 (P5'N) *MW-5 (P) SB-3 (P2'S) *MW-3 (P2'S) SB-8 (P3'S) SB-7 (P2'S)



JOB NAME _____
 JOB NO. _____
 CALCULATED BY _____ DATE _____
 CHECKED BY _____ DATE _____
 SHEET _____ OF _____

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 International Incorporated

SYMBOLS & SCALE ARE THE SAME PER FIGS 3-5.



- ▽ INITIAL WATER IN BORING
- ▽ STATIC WATER LEVEL (11/1/92)
- ▮ NR = NO RECOVERY
- ▮ (P5'N) = PROJECTED 5 FEET NORTH
- * DESTROYED WELL. LITHOLOGY TAKEN FROM DWR WELL COMPLETION REPORTS. ELEVATIONS DERIVED FROM AVERAGE SLOPE BASED ON SB ELEVATION DATA.
- WELL SCREEN
- WELL CASING
- BORING

FIG. 4

JOB NAME _____
 JOB NO. _____
 CALCULATED BY _____ DATE _____
 CHECKED BY _____ DATE _____
 SHEET _____ OF _____

SECOR
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CALCULATED BY _____ DATE _____
 CHECKED BY _____ DATE _____
 SHEET 12 OF 2

