WESTERN GEOLOGIC RESOURCES INC.

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OFF-SITE

SUBSURFACE INVESTIGATION

Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California

Prepared For

Chevron USA
2410 Camino Ramon
San Ramon, California 94583

July 1990

COLORADO SPRINGS
SALT LAKE CITY
SAN DIEGO
VENTURA

Chevron U.S.A. Inc.
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September 10, 1990

Mr. Rafat Shahid
Alameda County
Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Re: Former Chevron Service Station #9-0020
1633 Harrison Street
Oakland, CA

612

Dear Mr. Shahid:

Enclosed we are forwarding the Off-Site Subsurface Investigation Report dated July, 1990, conducted by our consultant, Western Geologic Resources, Inc., for the above referenced site.

As indicated in the report, a total of four (4) borings have been advanced and completed into groundwater monitoring wells. Hydrocarbon contaminants were detected in only groundwater samples collected from Monitoring Well MW-9. Chlorinated solvents were detected in groundwater samples collected from Monitoring Wells MW-10, MW-11, and MW-12. The chlorinated solvents appear to be emanating from an off-site source upgradient from the above referenced site based on the highest concentrations of these solvents having only been detected in the most upgradient on-site and off-site wells and the lack of solvents in the soil boring samples analyzed. No detectable hydrocarbon contaminants were detected in the soil samples analyzed from the four (4) borings.

Chevron has instructed Western Geologic Resources, Inc. to permit and install an additional groundwater monitoring well east of and downgradient from the site to delineate the maximum extent of the petroleum hydrocarbon plume in the groundwater and to conduct an investigation of the Cleaners located upgradient to the referenced site to access if any discharges have been reported.

I declare under penalty of perjury that the information contained in the attached report is true and correct, and that any recommended actions are appropriate under the circumstances, to the best of my knowledge.

If you have any questions or comments please do not hesitate to call me at (415) 842 - 9581.

Very truly yours,
C. G. Trimbach

By Nancy Vukelich
Nancy Vukelich

NLV/jmr
Enclosure

cc: Mr. Lester Feldman
RWQCB-Bay Area
1800 Harrison Street
Suite # 700
Oakland, CA 94612

OFF-SITE

SUBSURFACE INVESTIGATION

Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California

Prepared For

Chevron USA
2410 Camino Ramon
San Ramon, California 94583

Prepared By

Western Geologic Resources, Inc.
2169 East Francisco Boulevard
San Rafael, California

July 1990

Leonard P. Niles
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REGISTERED GEOLOGIST
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STATE OF CALIFORNIA

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EXECUTIVE SUMMARY

A subsurface investigation was conducted by Western Geologic Resources, Inc. (WGR) in the vicinity of the former Chevron service station #90020 located at 1633 Harrison Street (17th Street and Harrison Street) in Oakland, California. Four exploratory soil borings, B-13 through B-16, were drilled to a maximum depth of 29.5 feet (ft) below ground surface in the 17th Street and Harrison Street right-of-ways cross-gradient and downgradient from the Chevron site from 18 to 21 June 1990. Unconfined groundwater was first encountered at depths ranging from 19.46 ft to 21.2 ft below grade. Borings B-13, B-14, B-15 and B-16 were completed as 2-inch diameter groundwater monitor wells MW-11, MW-12, MW-10 and MW-9, respectively. The newly installed monitor wells MW-9 through MW-12 were developed and groundwater samples were collected on 21 and 22 June 1990, respectively. Static water levels in the newly completed wells MW-9 through MW-12 ranged from 20.45 ft to 21.03 ft below grade.

Analytic Results: Soil

Total purgeable petroleum hydrocarbons (TPPH), benzene, toluene, ethylbenzene and total xylenes (BTEX) and halocarbons were not detected in any soil samples collected and analyzed from borings B-13 through B-16.

Analytic Results: Groundwater

TPPH and BTEX were detected only in groundwater samples collected from well MW-9, downgradient from the site, at concentrations of 5,700 parts-per-billion (ppb) TPPH characterized as gasoline, 47 ppb benzene, 31 ppb toluene, 280 ppb ethylbenzene and 530 ppb total xylenes. Halocarbons including carbon tetrachloride, chloroform, tetrachloroethene (PCE), trichloroethene (TCE) and cis-1,2-dichloroethene (c-1,2-DCE) were detected in groundwater samples collected from wells MW-10, MW-11 and MW-12 at a maximum concentration of 73 ppb PCE in MW-11 cross-

gradient from the site. The halocarbon plume appears to be emanating from a source upgradient from the Chevron site.

Groundwater Flow and Well Search

The estimated direction of groundwater flow on 22 June 1990 was to the east at a gradient of 0.39% on-site, steepening to 1.15% in the vicinity of the off-site wells. Flow direction and gradient were consistent with past sampling events.

A search of registered wells conducted by the Alameda County Department of Public Works revealed 96 wells within a one-half mile radius of the site.

1 INTRODUCTION

This report presents the results of the off-site subsurface investigation conducted in June 1990 by Western Geologic Resources, Inc. (WGR) in the vicinity of the former Chevron service station #90020 located at 1633 Harrison Street (at the intersection of 17th and Harrison Streets) in Oakland, California (Figure 1). This investigation was designed to further delineate the extent of petroleum hydrocarbons in the soil and groundwater downgradient from the Chevron site and to investigate the possibility of an off-site source, upgradient from the site, of halocarbons detected in groundwater samples collected from monitor wells at the site.

The scope of work for the subsurface investigation included the following:

1. Drill four exploratory soil borings in the off-site area adjacent to the former Chevron service station including two borings in the 17th Street right-of-way northwest and cross-gradient from the site, two borings in the Harrison Street right-of-way southeast of and downgradient from the site and collect soil samples at a maximum of five foot (ft) intervals;

2. Analyze selected soil samples or total purgeable petroleum hydrocarbons (TPPH) as gasoline by EPA Method 8015, benzene, toluene, ethylbenzene and total xylenes (BTEX) by EPA Method 8020 and halocarbons by EPA Method 8010.

3. Complete the four borings as 2-inch diameter groundwater monitor wells;

4. Develop and sample the new monitor wells and analyze the groundwater samples for TPPH as gasoline by EPA Method 8015, BTEX by EPA Method 8020, halocarbons by EPA Method 8010, oil and grease by Standard Method 503A and E, cadmium (Cd), chromium (Cr) and zinc (Zn) by EPA Method 6010 and lead (Pb) by EPA Method 7421;

5. Survey top-of-casing (TOC) elevations and locations, of the new monitor wells, measure depths-to-water and determine groundwater elevations of all monitor wells at the site and produce a potentiometric surface map for shallow groundwater;

6. Perform a well search within a one-half mile radius of the site; and

7. Review all field and laboratory data and prepare a report of this investigation.

2 BACKGROUND

2.1 SITE SETTING

Former Chevron service station #90020 is located in a residential and commercial district on 1633 Harrison Street at the west corner of the intersection of 17th Street and Harrison Street in Oakland, California (Figure 2). The site is presently used as a commercial parking lot. A commercial dry cleaner is located three buildings to the northwest of the site on 17th Street, and a transmission repair shop is located three building southeast of the site on Harrison Street. The nearest surface water feature is Lake Merritt, a tidal lake draining into San Francisco Bay, 1,200 ft east of the site. The elevation of the site is approximately 30 ft above sea level.

2.2 SITE HISTORY

Information concerning the operation of the site and the removal of tanks and structures was not available to WGR as of this report writing. The following site history is referenced in the WGR Subsurface Investigation report to Chevron dated June 1989.

In January of 1988, EA Engineering, Science and Technology of Lafayette, California, performed a soil vapor survey on the site. Total volatile hydrocarbons were detected in concentrations ranging from 1 to 140 parts-per-million-volume (ppmv) in 22 samples from 11 locations.

WGR installed 3 groundwater monitor wells on-site in October 1988. Aromatic hydrocarbons were not detected in any soil samples analyzed from any borings. Total fuel hydrocarbons (TFH) were detected at 12 parts-per-million (ppm) in one soil sample collected at a depth of 19 ft from boring B-2 located on the western portion of the site near the former waste oil tank. Total fuel hydrocarbons were not detected in groundwater samples from monitor wells MW-1, MW-2 and MW-3, however various halocarbons, including tetrachloroethene (PCE), carbon tetrachloride,

chloroform, trichloroethene (TCE) and trans-1,2-dichloroethene (t-1,2-DCE), were detected in groundwater samples from all 3 wells at concentrations up to 84 ppb tetrachlorethene (PCE) in a sample from well MW-3. Estimated groundwater flow was to the east at a gradient of 0.41%.

Monitor wells MW-1, MW-2 and MW-3 were resampled by WGR in February 1989. Halocarbons, including carbon tetrachloride, chloroform, PCE, TCE and cis-1,2-dichloroethene (c-1,2-DCE), at concentrations of up to 53 ppb PCE in a sample from well MW-3, were detected in groundwater samples from all 3 monitor wells. WGR has conducted a quarterly groundwater monitoring program since that time. Historic depth-to-water and groundwater elevation data are presented in Table 1. Historic groundwater analytic data are presented in Tables 2 and 3.

In April 1989, an additional subsurface investigation was performed at the site by WGR. Four soil borings B-4 through B-7 were drilled to first groundwater at a depth of approximately 22 ft to 24 ft below ground surface. The borings were abandoned and grouted to the surface with neat cement. An additional five borings B-8 through B-12 were drilled to depths of approximately 31 ft to 36 ft below ground surface and completed as groundwater monitor wells MW-4 through MW-8, respectively.

TPPH as diesel and 1,1,1-trichroethane (TCA) were detected in soil samples collected from borings B-8 and B-11. A maximum concentration of 50,000 ppm TPPH and 0.2 ppm TCA were detected in a soil sample from a depth of 23.5 ft in boring B-11 located in the east corner of the site. Aromatic hydrocarbons were also detected in soil samples collected at a depth of 23.5 ft from boring B-11 at maximum concentrations of 4.1 ppm toluene, 5.0 ppm ethylbenzene and 20 ppm total xylenes. Toluene was detected at 0.003 ppm in soil samples collected from boring B-12 located in the northeast portion of the site, at depths of 9.5 ft and 21.0 ft. Chlorobenzene was detected at 0.070 ppm in a soil sample collected from a depth of 23.5 ft in boring B-11. Oil and grease at 80 ppm, Cd at 27 ppm and Zn at 17 ppm were detected in a soil sample collected from 21.0 ft in boring B-9.

TPPH, characterized as gasoline, at 8,400 ppb, benzene at 100 ppb, toluene at 260 ppb, ethylbenzene at 1,300 ppb and total xylenes at 160 ppb were detected in a groundwater sample collected from well MW-7 located in the east corner of the site, downgradient from the former underground fuel

tanks. Various halocarbons were detected in groundwater samples from all monitor wells, including carbon tetrachloride, chloroform, 1,2-dichloroethene (1,2-DCE), trichloroethene (TCE) and PCE, with a maximum concentration of 110 ppb PCE in the sample from well MW-3. Oil and grease were detected in groundwater samples from wells MW-7 and MW-8, both at 3 ppm. Cr and Zn were detected in groundwater samples from all wells at concentrations up to 0.031 ppm and 140 ppm, respectively. Pb was detected in groundwater samples from wells MW-1, MW-7 and MW-8 at up to 0.18 ppm and Cd was detected at 0.008 ppm in a sample from well MW-7. Average direction of groundwater flow was to the east at a gradient of 0.4%. This direction of flow and gradient has remained consistent during subsequent sampling periods.

3 SUBSURFACE INVESTIGATION

3.1 SOIL BORINGS AND HYDROGEOLOGY

From 18 to 21 June 1990, four exploratory borings B-13 through B-16 were drilled by B&F Drilling Co., Inc. of Rancho Cordova, California, using a Mobile B-61 truck-mounted hollow-stem auger drill rig to a maximum depth of 29.5 ft below ground surface. Drilling, soil logging and soil sampling was supervised by WGR geologist David Reichard. Boring and monitor well locations, shown on Figure 3, were selected at various locations cross-gradient and downgradient from the site based on estimated direction of groundwater flow, analytical results from soil and groundwater samples collected from previous borings at the site and feasibility of access. Two borings, B-15 and B-16, were located on the Harrison Street right-of-way southeast and downgradient of the site. Two additional borings, B-13 and B-14, were located on the 17th Street right-of-way northwest and cross-gradient of the site. Prior to drilling the proper well permits were obtained from the Zone 7 Alameda County Flood Control and Water Conservation District and the proper encroachment, street excavation and street obstruction permits were acquired from the City of Oakland.

Soil samples were collected at 1.5 ft to 5 ft depth intervals for lithologic and hydrogeologic description and chemical analysis. Soil was classified in accordance with the Unified Soil Classification System (USCS). Field estimates of permeability are based on grain size, sorting, sedimentary fabric and cementation. The WGR operating procedure for soil sampling is included in Appendix A. A photoionization detector (PID) was used at the site to screen soil samples for the presence of volatile hydrocarbons. Boring logs are included in Appendix B. On 18, 19, 20 and 21 of June 1990, twenty-two soil samples were collected. The samples were subsequently stored and sent in a refrigerated environment under chain-of-custody to Pace, Inc. (Pace) of Novato, California, a state-certified laboratory. Fifteen of these samples were selected for laboratory analysis.

Figure 3 shows the locations of generalized hydrogeologic cross-sections X-X' and Y-Y'. Figures 4 and 5 show generalized hydrogeologic cross-sections X-X' and Y-Y' along and across the estimated

direction of groundwater flow, respectively. Soil encountered during drilling in the unsaturated zone included sandy clay of low-estimated permeability extending from below the asphalt and concrete surface pavement to a depth of approximately 12 ft to 14.5 ft below ground surface. A layer of clayey sand of low-estimated permeability was encountered in B-13 at a depth of between 12.2 ft and 14 ft below ground surface. The sandy clay-clayey sand may be fill since utility lines adjacent to the borings extend to a depth of approximately 15 ft below ground surface according to the City of Oakland Construction Division. In addition, the materials do not correlate with soils encountered at equivalent depths in on-site borings. This clayey sand and sandy clay was underlain in all borings by well-sorted fine sand of moderate-estimated permeability extending into the saturated zone to a depth of approximately 24 ft to 26 ft.

Unconfined groundwater was first encountered at depths ranging from approximately 19.5 ft to 21 ft below ground surface. A thin bed of clay of low-estimated permeability with a thickness of less than 0.5 ft was encountered at or slightly below first groundwater in borings B-15 and B-16. This was underlain by the sand described above. Saturated clayey sand of low-estimated permeability was encountered in boring B-14 from approximately 23.5 ft to 25.8 ft in depth. An unsaturated zone consisting of silty to sandy clay of low-estimated permeability was encountered in all borings from approximately 24 ft to 29 ft in depth. This was underlain by saturated well-sorted sand of moderate estimated permeability in boring B-15 and poorly-sorted sand of high-estimated permeability in boring B-13 to a maximum depth of 29.5 ft below ground surface.

All soil cuttings were temporarily stored on-site in bins pending laboratory analysis.

3.2 MONITOR WELL INSTALLATION AND DEVELOPMENT

Soil borings B-13, B-14, B-15 and B-16 were completed as 2-inch diameter groundwater monitor wells MW-11, MW-12, MW-10 and MW-9, respectively, from 18 to 21 June 1990. The monitor wells were installed and developed according to WGR standard operating procedure included in Appendix A. Well construction details are included on the boring logs in Appendix B.

Figures 4 and 5 include the screen and sand pack intervals of wells MW-1, MW-4, MW-5, MW-6, MW-7, MW-9 and MW-12, estimated permeability of soils intersected by the well borings and static water levels in the completed wells. The screened interval of each well was chosen to conform with the moderate- to high-permeability saturated zone, while avoiding penetration of the low-permeability unsaturated zone below. Below the well-casings, the borings were sealed with bentonite pellets. The new monitor wells MW-9 through MW-12 were constructed with 5 ft to 7.5 ft of screened interval. The tops of the well screens ranged from 18.5 ft to 20 ft below ground surface. The tops of the screened intervals were extended from approximately 1 ft to 2.5 ft above the static water levels to allow for water table fluctuations.

Monitoring wells MW-9 through MW-12 were developed on 21 June 1990 by WGR environmental technicians until relatively silt- and sand-free water was produced. Development was performed using a combination of surge-block, bailing and air-lift methods. The wells produced about 0.13 gallons-per-minute (gpm) to 0.39 gpm. Development logs are included in Appendix C.

3.3 GROUNDWATER SAMPLING

Groundwater samples were collected from monitor wells MW-9 through MW-12 by WGR environmental technicians on 22 June 1990, using steam-cleaned PVC bailers according to the WGR standard operating procedure for groundwater sampling (SOP-4) included in Appendix A. Groundwater sampling logs are included in Appendix C. Prior to collecting groundwater samples, each well was purged of three well-casing volumes. A total of 66 gallons of purged groundwater from the well development and sampling processes were temporarily stored on-site in a portable liquid-containment tank pending laboratory analysis. The refrigerated groundwater samples were sent under chain-of-custody to Pace for analysis.

4 GROUNDWATER FLOW

4.1 WELL ELEVATION SURVEY

The new monitor wells MW-9 through MW-12 were surveyed for location and top-of-casing (TOC) elevations above mean sea level to within 0.01 ft accuracy on 26 July 1990 by John E. Koch, a state-licensed land surveyor of Oakland, California. The previously installed well MW-6 was re-surveyed as a quality control measure. The well was found to have a TOC elevation within 0.01 ft of the previous measurement. TOC elevations are included in Table 1.

4.2 GROUNDWATER FLOW

Groundwater elevation data are presented in Table 1. Figure 6 is potentiometric surface map of the shallow groundwater on 22 June 1990. Depth-to-water measurements were taken of all wells on- and off-site and ranged from 20.34 ft to 22.12 ft below TOC. The depth-to-water measurement for well MW-8 is probably erroneous and is not used in contouring. The average direction of groundwater flow was to the east at a gradient of 0.39% on-site, steepening to 1.15% in the vicinity

of the off-site wells. Sample calculation A shows how the gradient was derived.[1] The direction of groundwater flow and gradient on-site were consistent with past sampling events.

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[1] SAMPLE CALCULATION A: GROUNDWATER GRADIENT CALCULATION

From Figure 6; reference line a-a'

$$\text{Gradient} = \frac{h}{l} = \frac{0.3 \text{ ft}}{77 \text{ ft}} = 0.0039$$

or 0.39%

h = 9.0 ft - 8.7 ft = 0.3 ft
l = 77 ft (distance along a-a')

5 ANALYTIC RESULTS

5.1 SOIL

Analytic results for soil samples are presented in Table 4. Chain-of-custody forms and laboratory analytical and quality assurance/quality control reports are included in Appendices D and E, respectively. Selected soil samples were analyzed by Pace for TPPH by EPA Method 8015, BTEX by EPA Method 8020 and halocarbons by EPA Method 8010.

TPPH, BTEX and halocarbons were not detected in any soil samples collected and analyzed from borings B-13 through B-16.

5.2 GROUNDWATER

Analytic results for groundwater samples are presented in Tables 2 and 3. Chain-of-custody forms and laboratory analytical and quality assurance/quality control reports are included in Appendices D and E, respectively. Concentrations of TPPH and benzene, and PCE in groundwater are indicated on Figures 7 and 8, respectively. Analytic results for the 18 April 1990 sampling rounds of on-site wells are included for comparison.

All groundwater samples collected from wells MW-9 through MW-12 were analyzed by Pace for TPPH by EPA Method 8015, BTEX by EPA Method 8020, halocarbons by EPA Method 8010, oil and grease by Standard Method 503A & E, Cd, Cr and Zn by EPA Method 6010 and Pb by EPA Method 7421. Groundwater samples from well MW-12 were not analyzed for Cd, Cr, Pb and Zn due to breakage of a sample container during transport to Pace.

TPPH and BTEX were detected only in groundwater samples collected from well MW-9, directly downgradient from the site at concentrations of 5,700 ppb TPPH characterized as gasoline, 47 ppb benzene, 31 ppb toluene, 280 ppb ethylbenzene and 530 ppb total xylenes.

Halocarbons were detected in groundwater samples from wells MW-10, MW-11 and MW-12. Carbon tetrachloride and chloroform were detected in samples from wells MW-10, MW-11 and MW-12. Maximum concentrations of 9.6 ppb carbon tetrachloride and 8.9 ppb chloroform were detected in samples from MW-10. PCE was detected in samples from wells MW-11 and MW-12 at 73 ppb and 7.4 ppb, respectively. TCE was detected at 1.3 ppb in a sample from well MW-11. Cis-1,2-dichloroethene (c-1,2-DCE) was detected in samples from wells MW-11 and MW-12 at 8.9 ppb and 13 ppb, respectively.

The metals Cd, Cr, Pb and Zn were not detected in any groundwater samples analyzed.

6 WELL SEARCH

A search of registered wells within one-half mile of the site was conducted by the County of Alameda Public Works Agency using their computer database. A total of 96 wells were located within a one-half mile radius of the site. The owners, well locations and uses are listed in Table 5 and location of the wells is indicated in Figure 9.

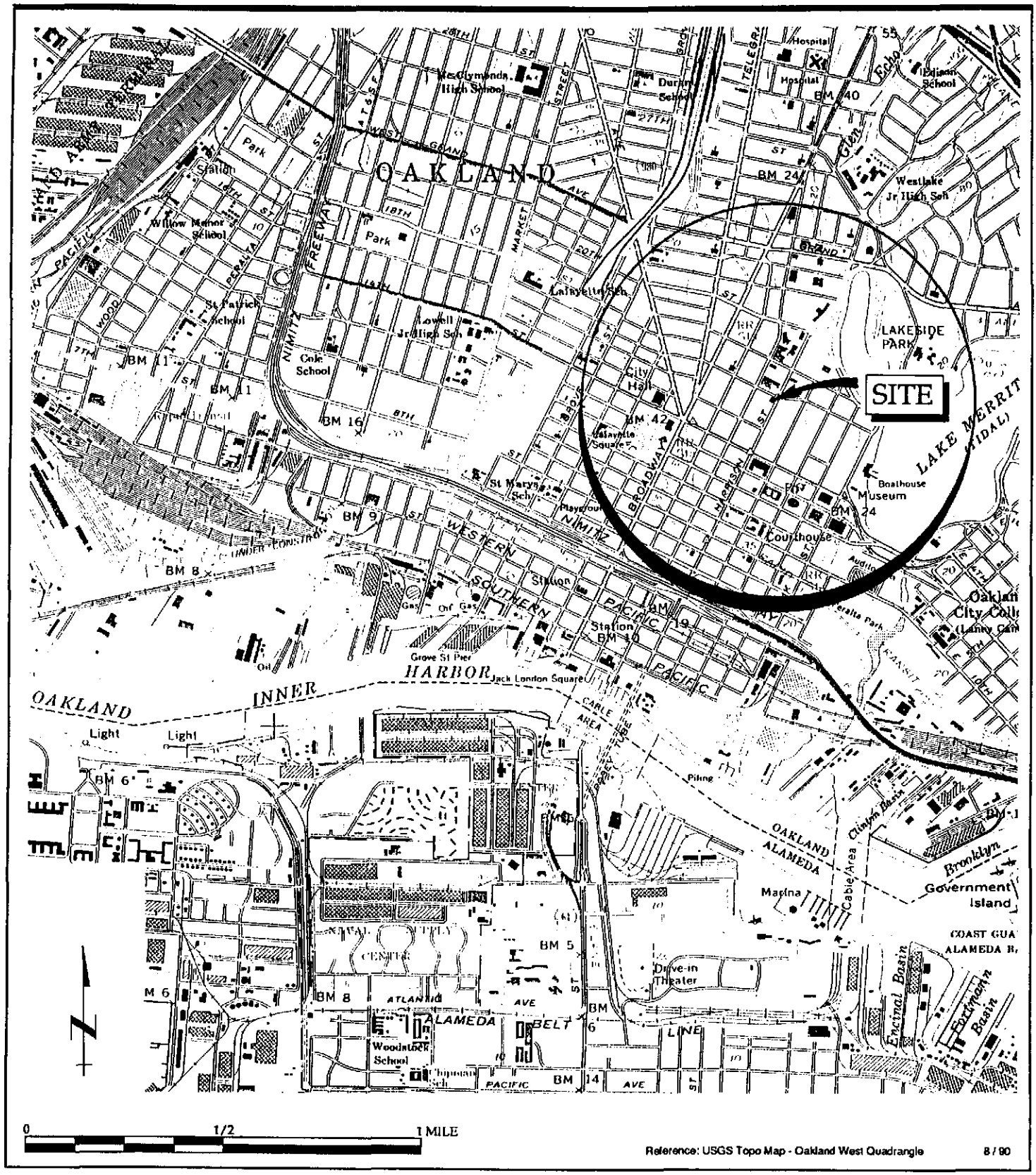
7 DISCUSSIONS

After evaluating all available field and analytical data, it is the opinion of WGR that the petroleum hydrocarbons detected in groundwater samples collected from well MW-9 are migrating from an on-site source located upgradient. Well MW-9 is located directly downgradient from well MW-7, which is the only on-site well in which petroleum hydrocarbons have been historically detected in groundwater samples. Because no petroleum hydrocarbons were detected in groundwater samples from other on-site wells downgradient from the former underground tanks, it is likely that the source of the petroleum hydrocarbon plume may have been a former product line or pump island location.

It is the opinion of WGR that the halocarbons detected in groundwater samples collected from most on-site and off-site wells are emanating from an off-site source upgradient from the site. This is based on the fact that the highest concentrations have been detected in samples from the on-site and off-site wells farthest upgradient, the shape of the halocarbon isoconcentration contour maps in past reports and the almost total lack of halocarbons detected in soil samples from on-site borings.

A self-service dry cleaning establishment, Hallmark Cleaners, is located 3 buildings northwest of the Chevron site at 331 17th Street. This is directly upgradient from the Chevron site. Because the halocarbons detected in groundwater samples at the Chevron site are similar to those used as solvents in the dry cleaning industry, it is likely that Hallmark Cleaners may be the source of the halocarbon plume.

FIGURES

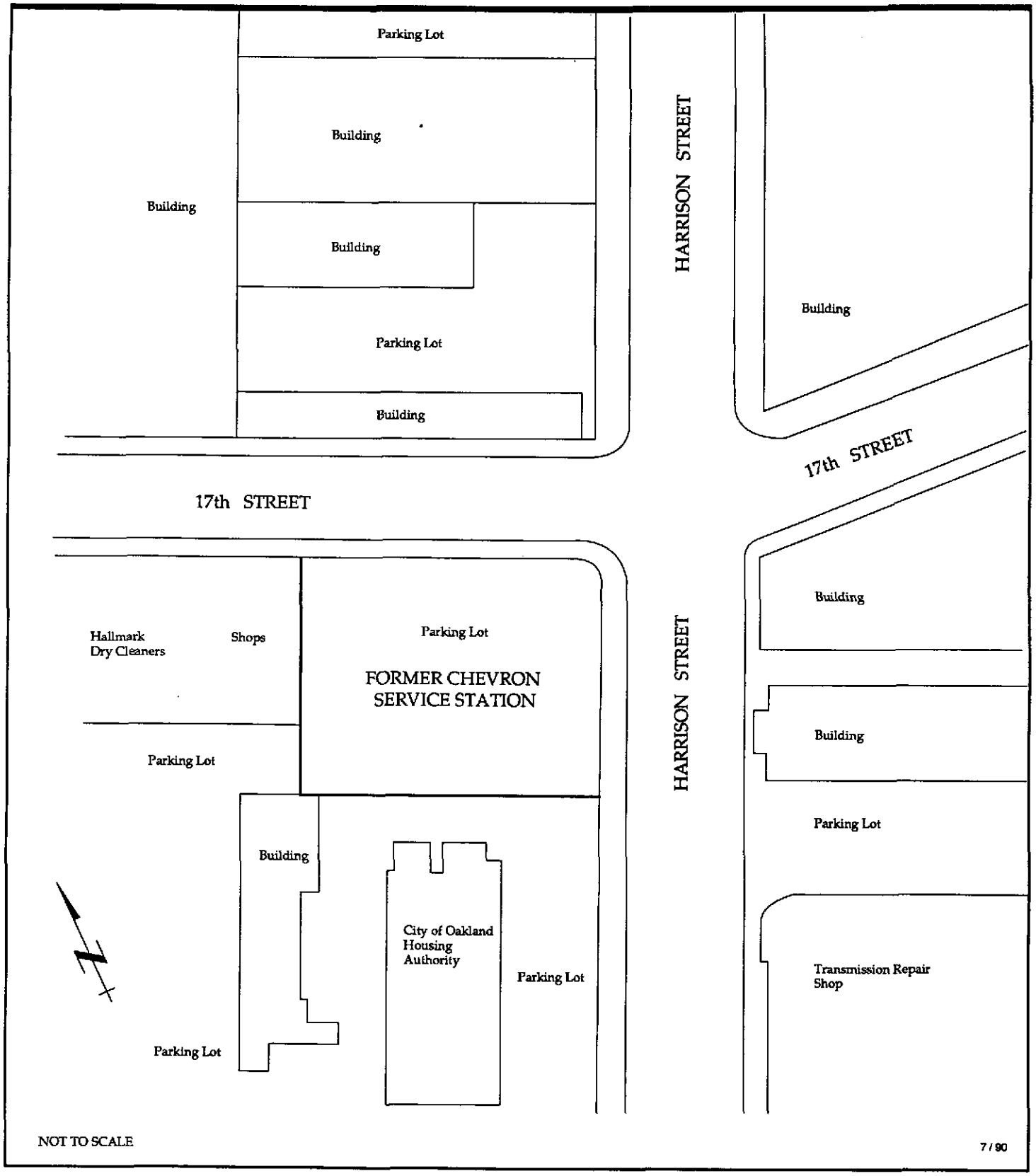


Site Location Map
Former Chevron Service Statin #90020
1633 Harrison Street
Oakland, California

FIGURE
1

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04

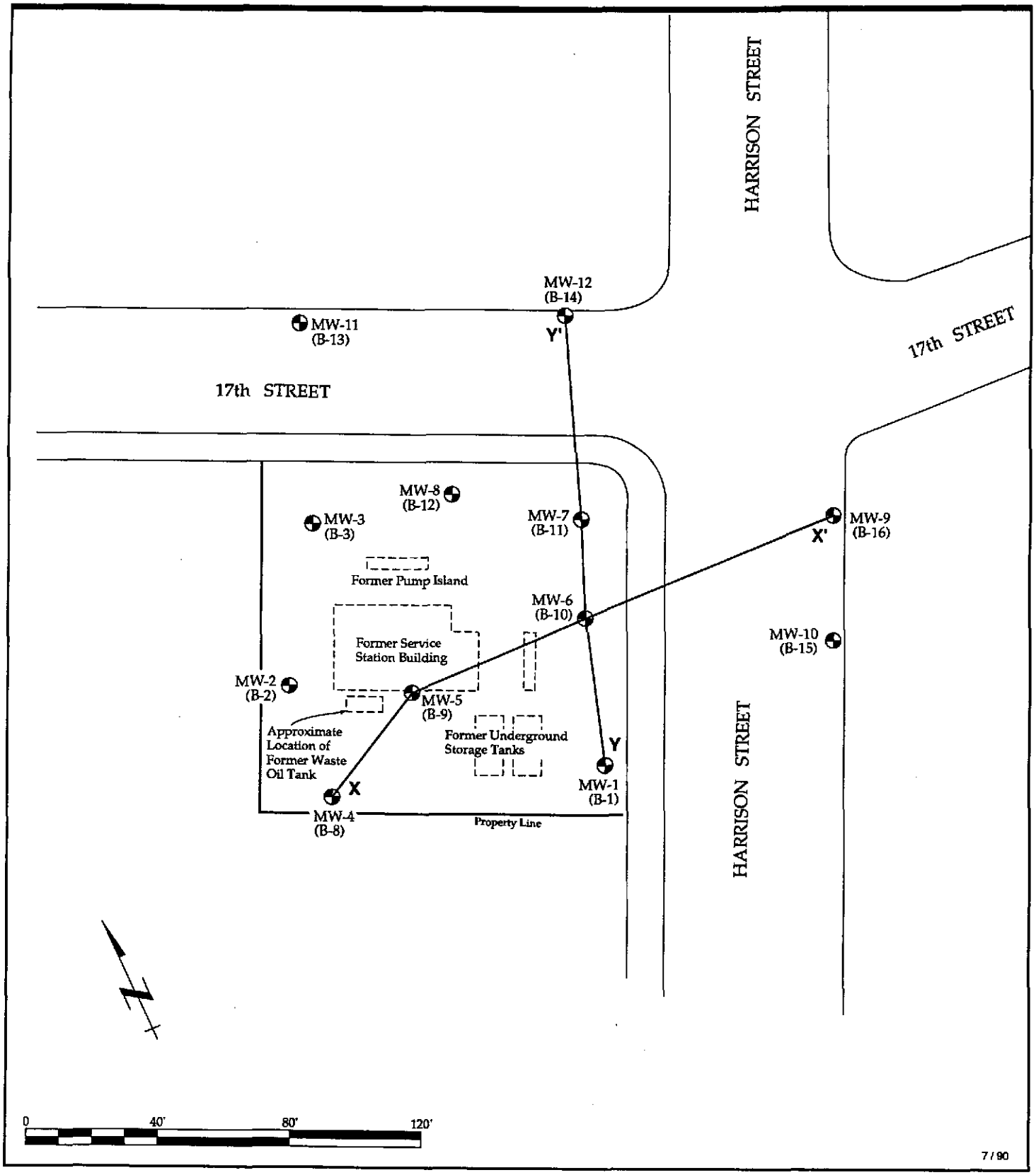


Vicinity Map
Former Chevron Service Station #90020
1633 Harrison Street,
Oakland, California

FIGURE
2

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04



EXPLANATION

MW-1 (B-1) Monitor Well (Boring) location

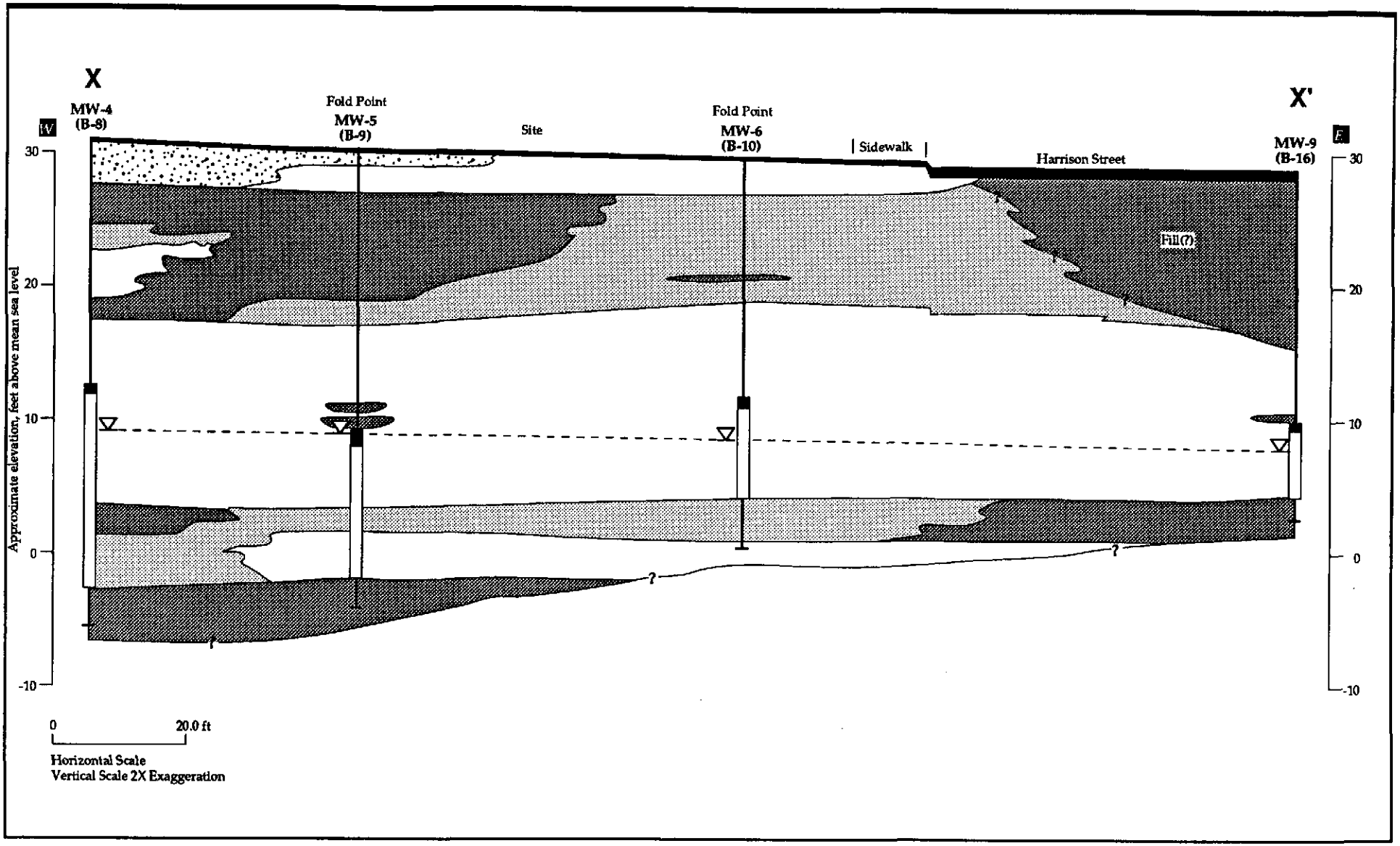
X — X' Generalized hydrogeologic cross-section location

Site Map with Monitor Well and Generalized Hydrogeologic Cross-Section X-X' and Y-Y' Locations
Former Chevron Service Station #90020
1633 Harrison Street,
Oakland, California

FIGURE
3

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04



EXPLANATION

- Low permeability soils; sandy and silty clays
- Low to moderate permeability soils; silty and clayey sands
- Moderate to high permeability soils; gravelly sands
- Fill
- Asphalt/Concrete

MW-4 (B-8) Monitor Well Location (Boring Location)

Sand pack
Screen interval
Boring

Static water level, 22 June 1990

Potentiometric Surface

Generalized Hydrogeologic Cross-Section X-X'
Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California

FIGURE
4

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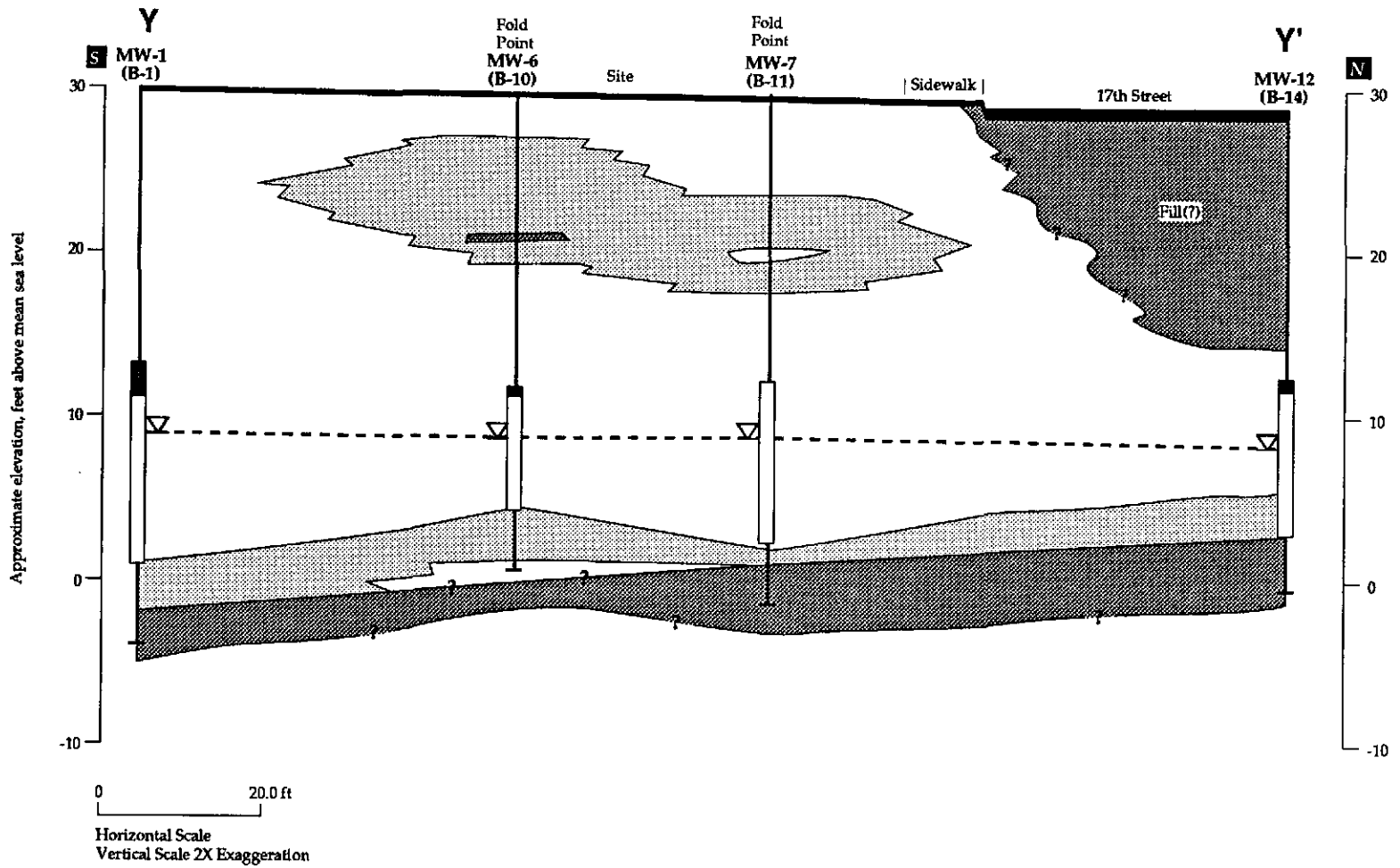
1-012.04



EXPLANATION

- Low permeability soils; sandy and silty clays; clayey silts
- Low to moderate permeability soils; silty and clayey sands
- Moderate to high permeability soils; sands; gravelly sands
- Asphalt/Concrete

MW-1 (B-1) Monitor Well Location (Boring Location)

Sand pack
Screen interval

Boring

Static water level, 22 June 1990

Potentiometric Surface

Generalized Hydrogeologic Cross-Section Y-Y'
Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California

FIGURE
5

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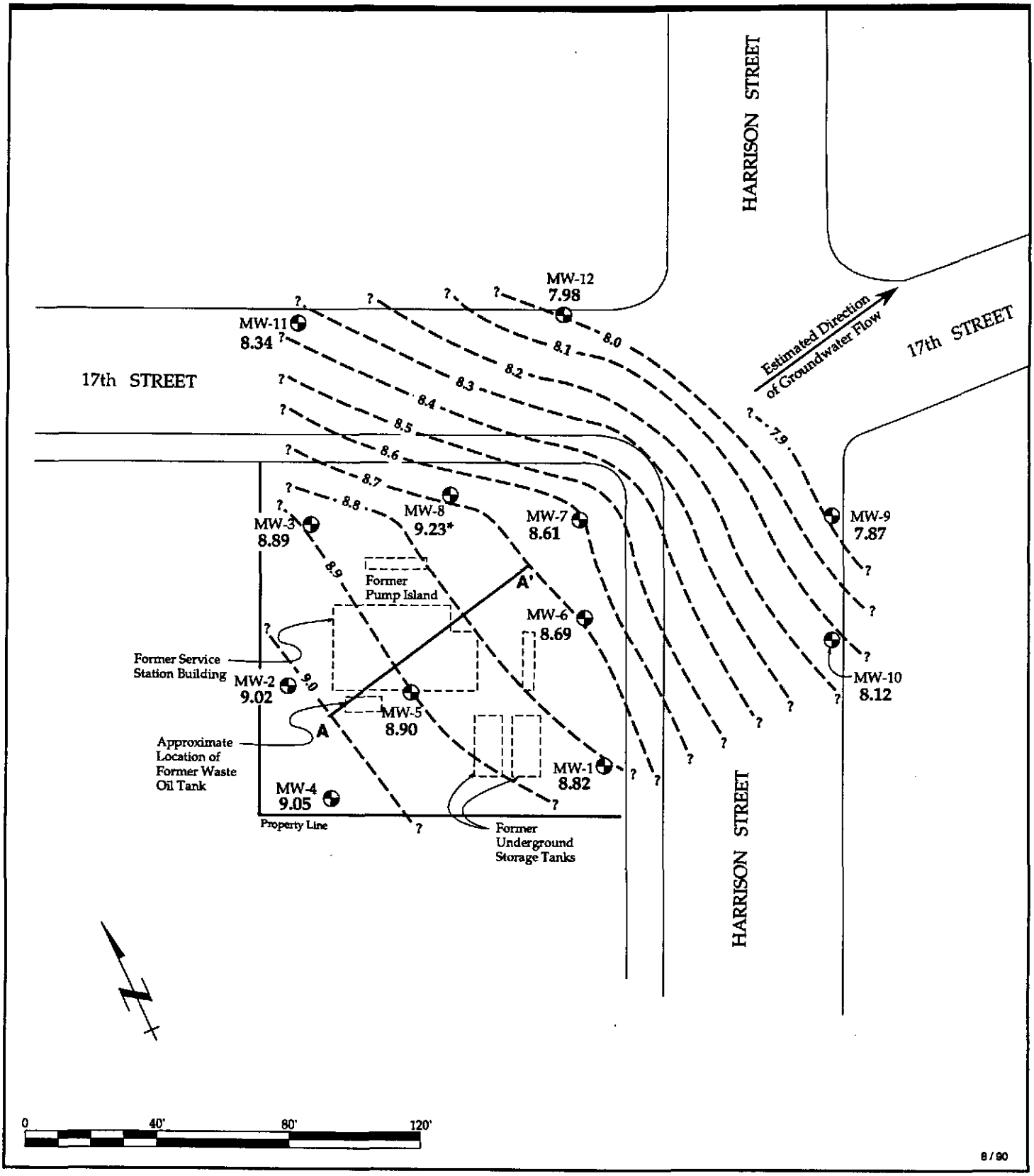
1-012.04



EXPLANATION

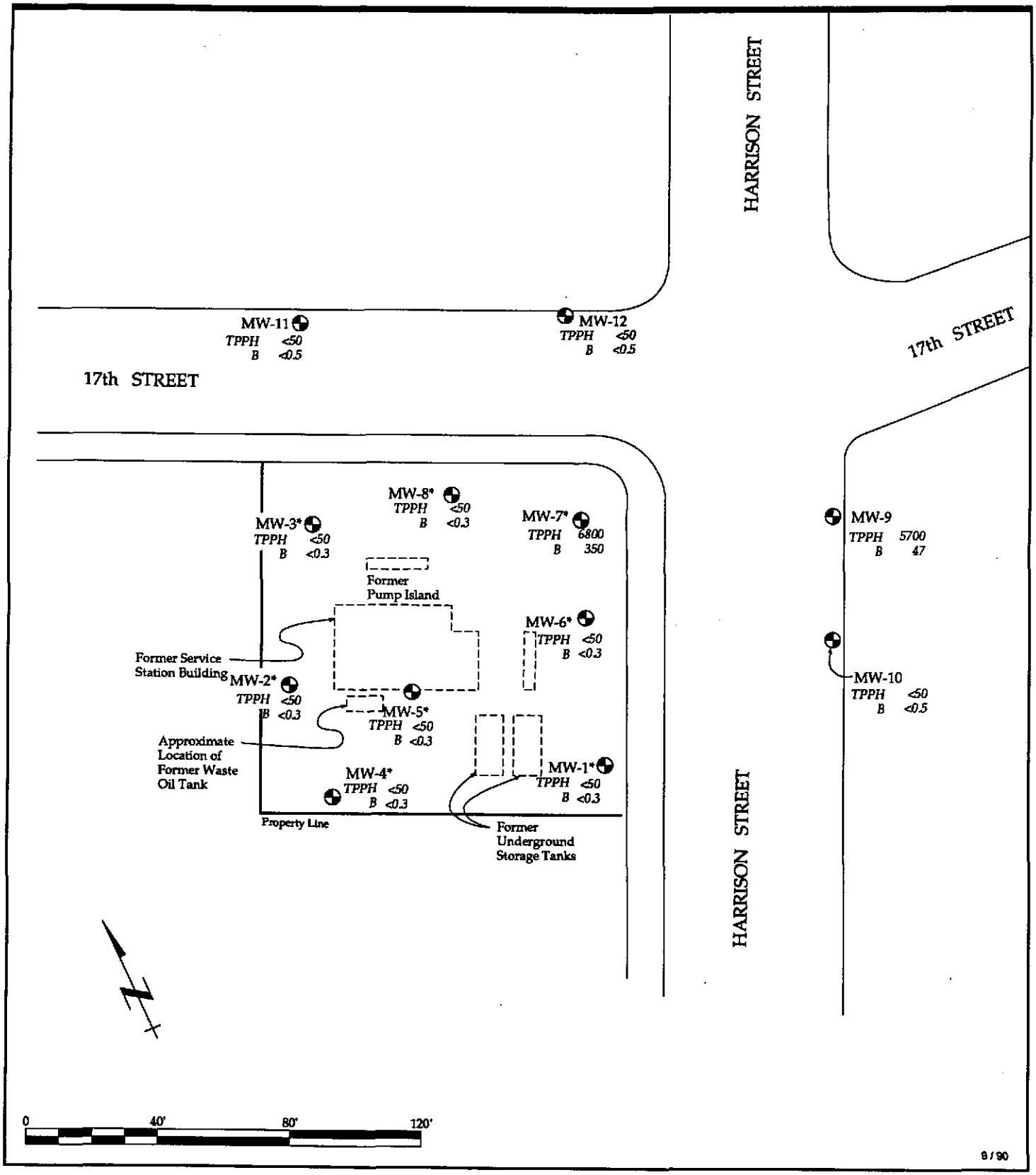
- MW-1 / 8.82 — Monitor Well location and Groundwater elevation, in feet above mean sea level
- 9.23* — Anomalous elevation, not used in contouring
- 9.0 — — — ? — Groundwater elevation contour, in feet above mean sea level, dashed where inferred, queried where uncertain

Potentiometric Surface of Shallow Groundwater
Former Chevron Service Station #90020
1633 Harrison Street,
Oakland, California

FIGURE
6

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04



EXPLANATION

MW-11 Monitor Well sampled 22 June 1990
TPPH <50 with TPPH and
B <0.5 Benzene concentrations in parts-per-billion (ppb)

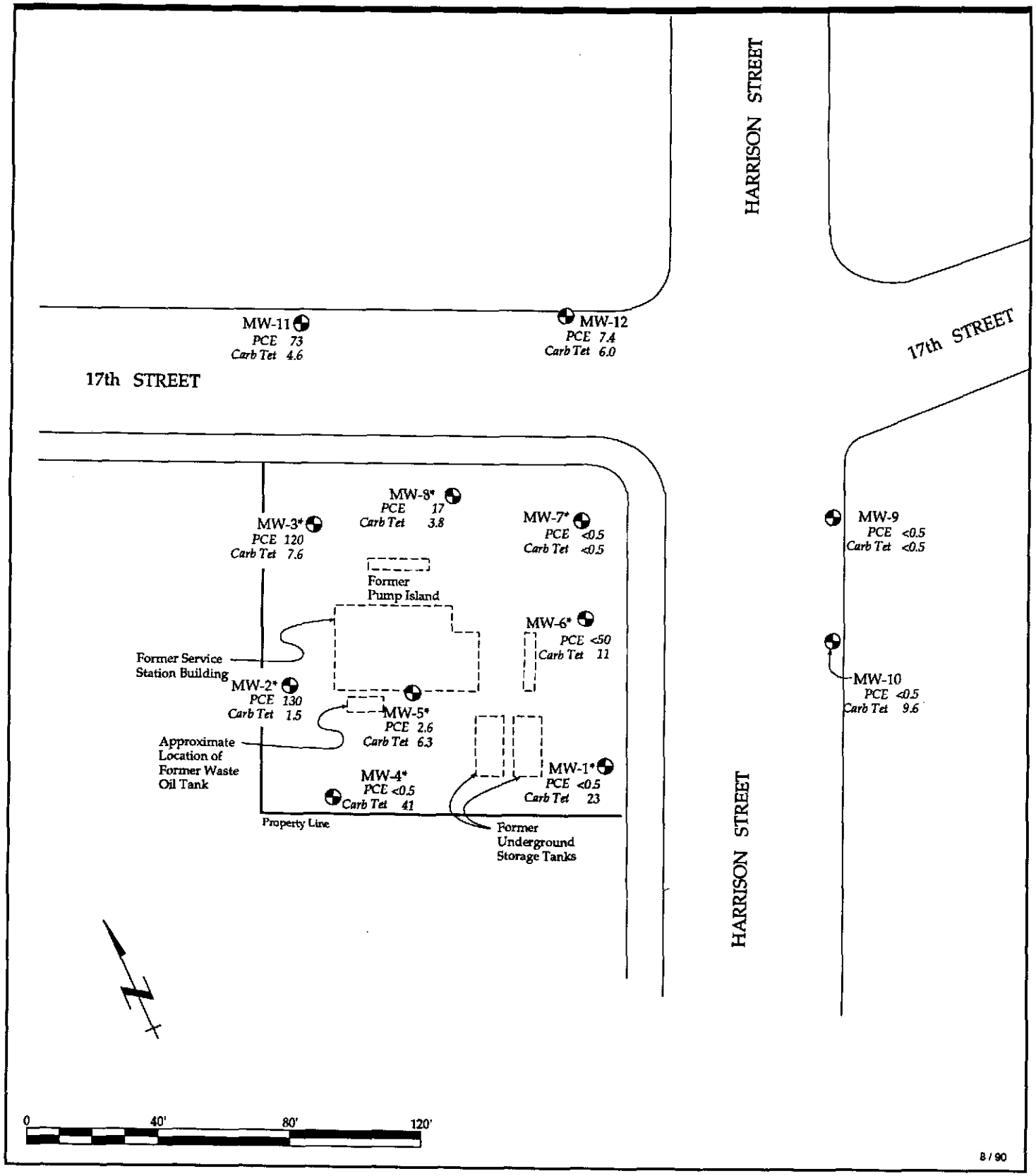
MW-1* Sampled 18 April 1990

Concentrations of Total Purgeable Petroleum Hydrocarbons (TPPH) and Benzene (B) in Shallow Groundwater
18 April 1990 and 22 June 1990
Former Chevron Service Station #90020
1633 Harrison Street,
Oakland, California

FIGURE 7

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04



EXPLANATION

MW-11 Monitor Well sampled 22 June 1990
PCE <50 with PCE and
Carb Tet <0.5 Carb Tet concentrations in parts-per-billion (ppb)

MW-1* Sampled 18 April 1990

Concentrations of Tetrachloroethene (PCE) and Carbon Tetrachloride (Carb Tet) in Shallow Groundwater
18 April 1990 and 22 June 1990
Former Chevron Service Station #90020
1633 Harrison Street,
Oakland, California

FIGURE 8

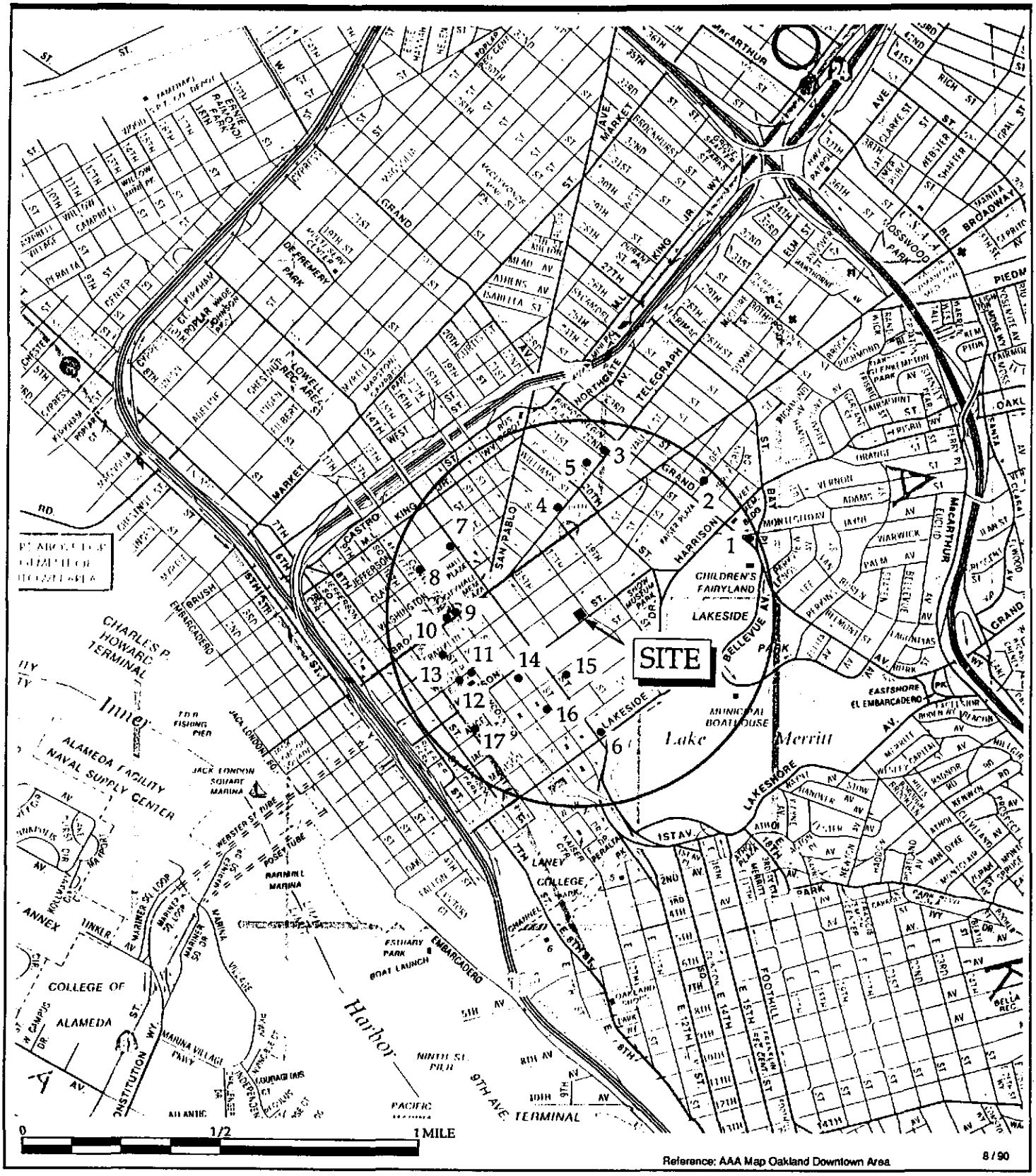
WESTERN GEOLOGIC RESOURCES, INC.

1-012.04

D 610 Title 22

MCL's

PCE = tricloroethylene .005 mg/l
Carbon tetrachloride .0005
PCE = tetrachloroethylene .005



Reference: AAA Map Oakland Downtown Area

8/90

LEGEND

• 1 Map Location Number keyed to Table 5

Wells Located Within One-Half Mile Radius of
Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California

FIGURE

9

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04

TABLES

Table 1. Groundwater and Top-of-Casing Elevations
Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California

Well ID #	Date	TOC	DTW	Elev.-W
MW-1	3 Nov 88	29.82	20.40	9.42
MW-1	2 Feb 89	29.82	20.71	9.11
MW-1	23 Apr 89	29.82	20.34	9.48
MW-1	28 Jul 89	29.82	20.58	9.24
MW-1	30 Oct 89	29.82	20.52	9.30
MW-1	9 Jan 90	29.82	20.77	9.05
MW-1	18 Apr 90	29.82	20.95	8.87
MW-1	22 Jun 90	29.82	21.00	8.82
MW-1	9 Aug 90	29.82	20.94	8.88
MW-2	3 Nov 88	30.59	20.89	9.70
MW-2	2 Feb 89	30.59	21.21	9.38
MW-2	23 Apr 89	30.59	20.82	9.77
MW-2	28 Jul 89	30.59	21.02	9.57
MW-2	30 Oct 89	30.59	20.96	9.63
MW-2	9 Jan 90	30.59	21.25	9.34
MW-2	18 Apr 90	30.59	21.53	9.06
MW-2	22 Jun 90	30.59	21.57	9.02
MW-2	9 Aug 90	30.59	21.55	9.04
MW-3	3 Nov 89	30.09	20.54	9.55
MW-3	2 Feb 89	30.09	20.85	9.24
MW-3	23 Apr 89	30.09	20.43	9.66
MW-3	28 Jul 89	30.09	20.64	9.45
MW-3	30 Oct 89	30.09	20.61	9.48
MW-3	9 Jan 90	30.09	20.88	9.21
MW-3	18 Apr 90	30.09	21.15	8.94
MW-3	22 Jun 90	30.09	21.20	8.89
MW-3	9 Aug 90	30.09	21.18	8.91
MW-4	23 Apr 89	31.17	21.33	9.84
MW-4	28 Jul 89	31.17	21.58	9.59
MW-4	30 Oct 89	31.17	21.54	9.63
MW-4	9 Jan 90	31.17	21.82	9.35
MW-4	18 Apr 90	31.17	22.09	9.08
MW-4	22 Jun 90	31.17	22.12	9.05
MW-4	9 Aug 90	31.17	22.11	9.06

Table 1. Groundwater and Top-of-Casing Elevations (continued)
Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California

Well ID #	Date	TOC	DTW	Elev.-W
MW-5	23 Apr 89	30.28	20.62	9.66
MW-5	28 Jul 89	30.28	20.86	9.42
MW-5	30 Oct 89	30.28	20.82	9.46
MW-5	9 Jan 90	30.28	21.07	9.21
MW-5	18 Apr 90	30.28	21.35	8.93
MW-5	22 Jun 90	30.28	21.38	8.90
MW-5	9 Aug 90	30.28	21.36	8.92
MW-6	23 Apr 89	29.46	20.05	9.41
MW-6	28 Jul 89	29.46	20.30	9.16
MW-6	30 Oct 89	29.46	20.32	9.14
MW-6	9 Jan 90	29.46	20.51	8.95
MW-6	18 Apr 90	29.46	20.72	8.74
MW-6	22 Jun 90	29.46	20.77	8.69
MW-6	9 Aug 90	29.46	20.74	8.72
MW-7	23 Apr 89	29.01	18.99	10.02
MW-7	28 Jul 89	29.01	19.94	9.07
MW-7	30 Oct 89	29.01	19.97	9.04
MW-7	9 Jan 90	29.01	20.15	8.86
MW-7	18 Apr 90	29.01	20.37	8.64
MW-7	22 Jun 90	29.01	20.40	8.61
MW-7	9 Aug 90	29.01	20.38	8.63
MW-8	23 Apr 89	29.57	20.14	9.43
MW-8	28 Jul 89	29.57	20.37	9.20
MW-8	30 Oct 89	29.57	20.32	9.25
MW-8	9 Jan 90	29.57	20.60	8.97
MW-8	18 Apr 90	29.57	20.87	8.70
MW-8	22 Jun 90	29.57	20.34*	9.23*
MW-8	9 Aug 90	29.57	20.89	8.68
MW-9	22 Jun 90	28.67	20.80	7.87
MW-9	9 Aug 90	28.67	20.74	7.93
MW-10	22 Jun 90	28.60	20.48	8.12
MW-10	9 Aug 90	28.60	20.45	8.15
MW-11	22 Jun 90	29.37	21.03	8.34
MW-11	9 Aug 90	29.37	21.02	8.35

Table 1. Groundwater and Top-of-Casing Elevations (continued)
Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California

Well ID #	Date	TOC	DTW	Elev.-W
MW-12	22 Jun 90	28.43	20.45	7.98
MW-12	9 Aug 90	28.43	20.43	8.00

NOTES:

TOC = Top-of-Casing elevation, feet above mean sea level
DTW = Depth-to-Water, feet
Elev.W = Elevation of Water, feet above mean sea level
* = Anolmalous data, not used in contouring

TABLE 2. Analytic Results: Groundwater Samples - Petroleum Hydrocarbons
Former Chevron Service Station 90020
1633 Harrison Street
Oakland, California

Well ID #	Date	EPA Method	Lab	FC	TFH	TPH/TPPH	Benzene	Toluene	E-Benzene	Xylenes	O&G
					<----------ppb---------->						<---ppm--->
MW-1	03 Nov 88	624/8015	BC	---	<1000	---	<1.0	<1.0	<1.0	<1.0	---
MW-1	10 Feb 89	524.2/8240	CCAS	---	---	<100	<0.2	<0.2	<0.2	<0.4	---
MW-1	24 Apr 89	524.2/8260	CCAS	---	---	<50	<0.5	<1.0	<1.0	<1.0	<3
MW-1	28 Jul 89	8260	CCAS	---	---	<50	<0.1	<0.5	<0.2	<0.5	<3
MW-1	30 Oct 89	8015/8020	GTEL	---	---	<500	<0.3	<0.3	<0.3	<0.6	---
MW-1	09 Jan 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-1	18 Apr 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-2	03 Nov 88	624/8015	BC	---	<1000	---	<1.0	<1.0	<1.0	<1.0	---
MW-2	10 Feb 89	524.2/8240	CCAS	---	---	<100	<0.2	<0.2	<0.2	<0.4	---
MW-2	24 Apr 89	524.2/8260	CCAS	---	---	<50	<0.5	<1.0	<1.0	<1.0	<3
MW-2	28 Jul 89	8260	CCAS	---	---	<100	<0.2	<1.0	<0.2	<0.4	<3
MW-2	30 Oct 89	8015/8020	GTEL	---	---	<500	<0.3	<0.3	<0.3	<0.6	---
MW-2	09 Jan 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-2	18 Apr 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-3	03 Nov 88	624/8015	BC	---	<1000	---	<1.0	<1.0	<1.0	<1.0	---
MW-3	10 Feb 89	524.2/8240	CCAS	---	---	<100	<0.2	<0.2	<0.2	<0.4	---
MW-3	24 Apr 89	524.2/8260	CCAS	---	---	<50	<0.5	<1.0	<1.0	<1.0	<3
MW-3	28 Jul 89	8260	CCAS	---	---	<100	<0.2	<1.0	<0.2	<0.4	<3
MW-3	30 Oct 89	8015/8020	GTEL	---	---	<500	<0.3	<0.3	<0.3	<0.6	---
MW-3	09 Jan 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-3	18 Apr 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---

TABLE 2. Analytic Results: Groundwater Samples - Petroleum Hydrocarbons (continued)
Former Chevron Service Station 90020
1633 Harrison Street
Oakland, California

Well ID #	Date	EPA Method	Lab	FC	TFH	TPH/TPPH	Benzene	Toluene	E-Benzene	Xylenes	O&G
					<----------ppb---------->						<---ppm--->
MW-4	24 Apr 89	524.2/8260	CCAS	---	---	<50	<0.5	<1.0	<1.0	<1.0	<3
MW-4	28 Jul 89	8260	CCAS	---	---	<50	<0.1	<0.5	<0.1	<0.2	<3
MW-4	30 Oct 89	8015/8020	GTEL	---	---	<500	<0.3	<0.3	<0.3	<0.6	---
MW-4	09 Jan 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-4	18 Apr 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-5	24 Apr 89	524.2/8260	CCAS	---	---	<50	<0.5	<1.0	<1.0	<1.0	<3
MW-5	28 Jul 89	8260	CCAS	---	---	<100	<0.2	<1.0	<0.2	<0.4	<3
MW-5	30 Oct 89	8015/8020	GTEL	---	---	<500	<0.3	<0.3	<0.3	<0.6	---
MW-5	09 Jan 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-5	18 Apr 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-6	24 Apr 89	524.2/8260	CCAS	---	---	<50	<0.5	<1.0	<1.0	<1.0	<3
MW-6	28 Jul 89	8260	CCAS	---	---	<100	<0.2	<1.0	<0.2	<0.4	<3
MW-6	30 Oct 89	8015/8020	GTEL	---	---	<500	<0.3	<0.3	<0.3	<0.6	---
MW-6	09 Jan 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-6	18 Apr 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-7	24 Apr 89	524.2/8260	CCAS	Gas	---	8400	100	260	160	1300	3*
MW-7	28 Jul 89	8260	CCAS	Gas	---	7000	230	90	70	440	<3
MW-7D	28 Jul 89	8260	CCAS	Gas	---	6000	280	180	58	430	---
MW-7	30 Oct 89	8015/8020	GTEL	Gas	---	10000	570	55	160	400	---
MW-7D	30 Oct 89	8015/8020	GTEL	Gas	---	9900	520	82	180	410	---
MW-7	09 Jan 90	8015/8020	GTEL	Gas	---	3400	290	72	9	200	---
MW-7	18 Apr 90	8015/8020	GTEL	Gas	---	6800	350	140	110	400	---

TABLE 2. Analytic Results: Groundwater Samples - Petroleum Hydrocarbons (continued)
Former Chevron Service Station 90020
1633 Harrison Street
Oakland, California

Well ID #	Date	EPA Method	Lab	FC	TFH	TPH/TPPH	Benzene	Toluene	E-Benzene	Xylenes	O&G
					<----------ppb---------->						<---ppm--->
MW-8	24 Apr 89	524.2/8260	CCAS	---	---	<50	<0.5	<1.0	<1.0	<1.0	3
MW-8D	24 Apr 89	524.2/8260	CCAS	---	---	<50	<0.5	<1.0	<1.0	<1.0	---
MW-8	28 Jul 89	8260	CCAS	---	---	<100	<0.2	<1.0	<0.2	<0.4	<3
MW-8	30 Oct 89	8015/8020	GTEL	---	---	<500	<0.3	<0.3	<0.3	<0.6	---
MW-8	09 Jan 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-8	18 Apr 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
MW-9	22 Jun 90	8015/8020	PACE	Gas	---	5700	47	31	280	530	<1
MW-10	22 Jun 90	8015/8020	PACE	Gas	---	<50	<0.5	<0.5	<0.5	<0.5	<1
MW-11	22 Jun 90	8015/8020	PACE	Gas	---	<50	<0.5	<0.5	<0.5	<0.5	<1
MW-12	22 Jun 90	8015/8020	PACE	Gas	---	<50	<0.5	<0.5	<0.5	<0.5	<1
TB	03 Nov 88	624/8015	BC	---	---	---	<1.0	<1.0	<1.0	<1.0	---
TB	10 Feb 89	524.2/8240	CCAS	---	---	<50	<0.1	<0.1	<0.1	<0.2	---
TB	24 Apr 89	524.2/8260	CCAS	---	---	<50	<0.5	<1.0	<1.0	<1.0	---
TB	28 Jul 89	8260	CCAS	---	---	<50	<0.1	<0.5	<0.1	<0.2	---
TB	30 Oct 89	8015/8020	GTEL	---	---	<500	<0.3	<0.3	<0.3	<0.6	---
TB	09 Jan 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
TB	18 Apr 90	8015/8020	GTEL	---	---	<50	<0.3	<0.3	<0.3	<0.6	---
TB	22 Jun 90	8015/8020	PACE	---	---	<50	<0.5	<0.5	<0.5	<0.5	---

TABLE 2. Analytic Results: Groundwater Samples - Petroleum Hydrocarbons (continued)
Former Chevron Service Station 90020
1633 Harrison Street
Oakland, California

FC	= Fuel characterization
TFH	= Total Fuel Hydrocarbons
TPH/TPPH	= Total Petroleum Hydrocarbons/Total Purgeable Petroleum Hydrocarbons
E-Benzene	= Ethyl Benzene
O&G	= Oil and Grease by California Standard Method 503E
*	= Acetone 50 ppb, 2-butanone 160 ppb
ppb	= parts-per-million
ppm	= parts-per-million
GAS	= Gasoline
D	= Duplicate analysis
BC	= Brown Caldwell Laboratories
CCAS	= Central Coast Analytical Services
GTEL	= Groundwater Technology Environmental Laboratories
Pace	= Pace, Inc.
TB	= Travel Blank
<	= Less than listed detection limit
---	= Not analyzed or charactrized

TABLE 3. Analytic Results: Groundwater Samples - Selected Halocarbons
Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California

Well ID #	Date	EPA Method	LAB	Carb Tet	Chlor	PCE	TCE	1,2-DCE*	t-1,2-DCE	c-1,2-DCE	TCA	1,2-DCA	1,2-DCP	M-C
				<----------ppb---------->										
MW-1	03 Nov 88	624/8015	BC	18.0	7.0	<1.0	<1.0	---	<1.0	---	<1.0	<1.0	---	---
MW-1	10 Feb 89	524.2/8240	CCAS	17.0	6.0	<0.2	<0.2	---	<0.2	<0.2	<0.2	<0.2	---	---
MW-1	24 Apr 89	524.2/8260	CCAS	16.0	6.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---
MW-1	28 Jul 89	8260	CCAS	20.0	6.4	<0.1	<0.1	---	<0.1	<0.1	0.3	<0.1	---	---
MW-1	30 Oct 89	601	GTEL	11.0	4.9	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	---	---
MW-1	09 Jan 90	601	GTEL	24.0	7.2	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	---	---
MW-1	18 Apr 90	601	GTEL	23.0	5.5	<0.5	<0.5	---	<0.5	---	1.4	<0.5	<0.5	<0.5
MW-2	03 Nov 88	624/8015	BC	3.0	2.0	34.0	3.0	---	10.0	---	<1.0	<1.0	---	---
MW-2	10 Feb 89	524.2/8240	CCAS	1.4	1.0	17.2	<0.2	---	<0.2	6.3	<0.2	<0.2	---	---
MW-2	24 Apr 89	524.2/8260	CCAS	2.0	2.0	38.0	3.0	9.0	---	---	<1.0	<1.0	---	---
MW-2	28 Jul 89	8260	CCAS	3.7	2.0	46.0	2.6	---	<0.2	<0.2	<0.2	<0.2	---	---
MW-2	30 Oct 89	601	GTEL	1.4	2.6	53.0	1.1	---	14.0	---	<0.5	<0.5	---	---
MW-2	09 Jan 90	601	GTEL	3.6	3.9	78.0	5.3	---	16.0	---	<0.5	<0.5	---	---
MW-2	18 Apr 90	601	GTEL	1.5	2.7	130.0	3.9	---	19.0	---	<0.5	<0.5	<0.5	<0.5
MW-3	03 Nov 88	624/8015	BC	8.0	6.0	84.0	3.0	---	5.0	---	<1.0	<1.0	---	---
MW-3	10 Feb 89	524.2/8240	CCAS	5.8	4.0	53.0	1.9	---	<0.2	9.0	<0.2	<0.2	---	---
MW-3	24 Apr 89	524.2/8260	CCAS	7.0	6.0	110.0	3.0	11.0	---	---	<1.0	<1.0	---	---
MW-3	28 Jul 89	8260	CCAS	8.6	5.0	49.0	2.1	---	<0.2	11.0	<0.2	<0.1	---	---
MW-3	30 Oct 89	601	GTEL	5.6	5.3	62.0	0.77	---	8.2	---	<0.5	<0.5	---	---
MW-3	09 Jan 90	601	GTEL	8.6	6.1	81.0	3.8	---	8.7	---	<0.5	<0.5	---	---
MW-3	18 Apr 90	601	GTEL	7.6	5.8	120.0	2.4	---	11.0	---	<0.5	<0.5	<0.5	<0.5

TABLE 3. Analytic Results: Groundwater Samples - Selected Halocarbons (continued)
Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California

Well ID #	Date	EPA Method	LAB	Carb Tet	Chlor	PCE	TCE	1,2-DCE*	t-1,2-DCE	c-1,2-DCE	TCA	1,2-DCA	1,2-DCP	M-C
				<----------ppb---------->										
MW-4	24 Apr 89	524.2/8260	CCAS	35.0	11.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---
MW-4	28 Jul 89	8260	CCAS	32.0	9.3	<0.1	<0.1	---	<0.1	<0.1	<0.1	<0.1	---	---
MW-4	30 Oct 89	601	GTEL	32.0	8.5	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	---	---
MW-4	09 Jan 90	601	GTEL	36.0	9.8	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	---	---
MW-4	18 Apr 90	601	GTEL	41.0	9.5	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	<0.5	<0.5
MW-5	24 Apr 89	524.2/8260	CCAS	4.0	5.0	4.0	<1.0	2.0	---	---	<1.0	<1.0	---	---
MW-5	28 Jul 89	8260	CCAS	5.6	4.0	5.3	0.3	---	0.2	2.3	0.5	<0.2	---	---
MW-5	30 Oct 89	601	GTEL	2.9	2.0	2.7	<0.5	---	0.86	---	<0.5	<0.5	---	---
MW-5	09 Jan 90	601	GTEL	8.2	4.6	7.8	0.6	---	3.1	---	<0.5	<0.5	---	---
MW-5	18 Apr 90	601	GTEL	6.3	2.8	2.6	<0.5	---	1.7	---	<0.5	<0.5	<0.5	<0.5
MW-6	24 Apr 89	524.2/8260	CCAS	13.0	7.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---
MW-6	28 Jul 89	8260	CCAS	9.6	4.0	<0.2	<0.2	---	<0.2	<0.2	0.5	0.6	---	---
MW-6	30 Oct 89	601	GTEL	8.2	3.6	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	---	---
MW-6	09 Jan 90	601	GTEL	10.0	4.2	<0.5	<0.5	---	<0.5	---	<0.5	1.8	---	---
MW-6	18 Apr 90	601	GTEL	11.0	3.8	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	<0.5	<0.5
MW-7	24 Apr 89	524.2/8260	CCAS	3.0	9.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---
MW-7	28 Jul 89	8260	CCAS	<2.0	<10.0	<2.0	<2.0	---	<2.0	<2.0	<10.0	6.0	---	---
MW-7D	28 Jul 89	8260	CCAS	<5.0	<20.0	<5.0	<5.0	---	<5.0	<5.0	<5.0	<5.0	---	---
MW-7	30 Oct 89	601	GTEL	<1.0	3.9	<1.0	<1.0	---	<1.0	---	<1.0	6.4	---	---
MW-7D	30 Oct 89	601	GTEL	<1.0	3.1	<1.0	<1.0	---	<1.0	---	<1.0	6.2	---	---
MW-7	09 Jan 90	601	GTEL	<0.5	3.0	<0.5	<0.5	---	<0.5	---	<0.5	8.4	---	---
MW-7	18 Apr 90	601	GTEL	<0.5	3.2	<0.5	<0.5	---	<0.5	---	<0.5	7.7	0.6	0.6

TABLE 3. Analytic Results: Groundwater Samples - Selected Halocarbons (continued)
Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California

Well ID #	Date	EPA Method	LAB	Carb Tet	Chlor	PCE	TCE	1,2-DCE*	t-1,2-DCE	c-1,2-DCE	TCA	1,2-DCA	1,2-DCP	M-C
				<----------ppb---------->										
MW-8	24 Apr 89	524.2/8260	CCAS	2.0	3.0	6.0	<1.0	4.0	---	---	<1.0	<1.0	---	---
MW-8D	24 Apr 89	524.2/8260	CCAS	2.0	2.0	6.0	<1.0	3.0	---	---	<1.0	<1.0	---	---
MW-8	28 Jul 89	8260	CCAS	2.3	2.0	5.6	<0.2	---	<0.2	3.8	<0.2	<0.2	---	---
MW-8	30 Oct 89	601	GTEL	2.5	2.6	8.0	<0.5	---	5.5	---	<0.5	<0.5	---	---
MW-8	09 Jan 90	601	GTEL	4.9	3.9	19.0	0.9	---	6.6	---	<0.5	<0.5	---	---
MW-8	18 Apr 90	601	GTEL	3.8	2.8	17.0	0.6	---	5.7	---	<0.5	<0.5	<0.5	<0.5
MW-9	22 Jun 90	8010	PACE	<0.5	<0.5	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	<0.5	<0.5
MW-10	22 Jun 90	8010	PACE	9.6	8.9	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	<0.5	<0.5
MW-11	22 Jun 90	8010	PACE	4.6	6.5	73	1.3	---	<0.5	8.9	<0.5	<0.5	<0.5	<0.5
MW-12	22 Jun 90	8010	PACE	6.0	7.3	7.4	<0.5	---	<0.5	13	<0.5	<0.5	<0.5	<0.5
TB	03 Nov 88	624/8015	BC	<1.0	<1.0	<1.0	<1.0	---	<1.0	000	<1.0	<1.0	---	---
TB	10 Feb 89	524.2/8240	CCAS	<0.1	<0.5	<0.1	<0.1	---	<0.1	<0.1	<0.1	<0.1	---	---
TB	24 Apr 89	524.2/8260	CCAS	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---
TB	28 Jul 89	8260	CCAS	<0.1	<0.5	<0.1	<0.1	---	<0.1	<0.1	<0.1	<0.1	---	---
TB	30 Oct 89	601	GTEL	<0.5	<0.5	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	---	---
TB	09 Jan 90	601	GTEL	<0.5	<0.5	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	---	---
TB	18 Apr 90	601	GTEL	<0.5	<0.5	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	<0.5	<0.5
TB	22 Jun 90	8010	GTEL	<0.5	<0.5	<0.5	<0.5	---	<0.5	---	<0.5	<0.5	<0.5	<0.5

TABLE 3. Analytic Results: Groundwater Samples - Selected Halocarbons (continued)
Former Chevron Service Station #90020
1633 Harrison Street
17th/Harrison, Oakland, California

NOTES:

Carb Tet	= Carbon tetrachloride
Chlor	= Chloroform
PCE	= Tetrachloroethene
TCE	= Trichloroethene
1,2 DCE	= 1,2-Dichloroethene
*	= cis and trans isomers
t	= trans
c	= cis
TCA	= 1,1,1-Trichloroethane
1,2 DCA	= 1,2-Dichloroethane
1,2 DCP	= 1,2-Dichloropropane
M-C	= Methylene Chloride
ppb	= parts-per-billion
D	= Duplicate analysis
TB	= Travel blank
<	= Less than listed detection limit
---	= Not analyzed or characterized
BC	= Brown and Caldwell Laboratories
CCAS	= Central Coast Analytical Services
GTEL	= Groundwater Technology Environmental Laboratories
PACE	= Pace Laboratory, Inc.

TABLE 4. Analytic Results: Soil Samples
Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California

Boring ID #	Date	EPA Method	Depth (ft)	FC	TPPH	Benzene	Toluene	E-Benzene	Xylenes
				<--------		ppm			-------->
B-13-16.0	18 Jun 90	8015/8020	16.0	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-13-21.0	18 Jun 90	8015/8020/8010	21.0	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-13-28.0	18 Jun 90	8015/8020	28.0	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-14-16.0	19 Jun 90	8015/8020	16.0	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-14-21.5	19 Jun 90	8015/8020/8010	21.5	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-14-29.5	19 Jun 90	8015/8020	29.5	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-15-16.0	20 Jun 90	8015/8020	16.0	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-15-19.5	20 Jun 90	8015/8020/8010	19.5	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-15-25.2	20 Jun 90	8015/8020	25.2	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-16-6.2	21 Jun 90	8015/8020	6.2	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-16-10.6	21 Jun 90	8015/8020	10.6	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-16-15.6	21 Jun 90	8015/8020	15.6	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-16-18.8	21 Jun 90	8015/8020/8010	18.8	---	<1.0	<0.005	<0.005	<0.005	<0.005
B-16-25.6	21 Jun 90	8015/8020	25.6	---	<1.0	<0.005	<0.005	<0.005	<0.005

NOTES:

FC = Fuel Characterization
TPPH = Total Purgeable Petroleum Hydrocarbons
E-Benzene = Ethylbenzene
Xylenes = Total Xylenes
ft = feet
ppm = parts-per-million
< = Less than listed detection limit
--- = Not characterized
All samples analyzed by Pace, Inc., Novato, California

TABLE 5. Wells Located Within One-Half Mile Radius Of
Former Chevron Service Station #90020
1633 Harrison Street
Oakland, California
(See Figure 9 for Well Locations)

Map Location No.	Owner	Well Location	Number of Wells	Year Drilled	Use
1	Chevron USA	210 Grand Ave. Oakland	9	1989-90	Monitor
2	Morrison & Forester	2302 Valdez St. Oakland	4	1989	Monitor
3	Texaco	2225 Telegraph Ave. Oakland	9	1989	Monitor
4	Carter-Hawley-Hale	1911 Telegraph Ave. Oakland	1	1988	Test
5	Bank of America	21st & Broadway Oakland	1	1988	Monitor
6	Lakeside Corp. (Bechtel)	244 Lakeside Dr. Oakland	1	1977	Irrigation
7	Five City Center, City of Oakland	14th & Clay Sts. Oakland	3	1988	Destroyed
8	General Services Administration	12th & Clay Sts. Oakland	3	1989	Monitor
9	APC Building	12th & Broadway Oakland	3	1988	Monitor
10	Bramalea-APC	1111 Broadway Oakland	3	1988	Monitor
11	City of Oakland	11th & Webster Sts. Oakland	5	1987-88	Monitor, Test

TABLE 5. Wells Located Within One-Half Mile Radius Of
Former Chevron Service Station #90020 (continued)
1633 Harrison Street
Oakland, California

Map Location No.	Owner	Well Location	Number of Wells	Year Drilled	Use
12	City of Oakland, Oakland Redevelopment Agency	10th & Webster Sts. Oakland	7	1987-88	Monitor, Test
13	City of Oakland	10th & Franklin Sts. Oakland	2	1988	Test
14	City of Oakland, Frank Mar Comm. Housing	Pacific Renaissance Plaza 13th & Harrison Sts. Oakland	39	1989	Monitor, Injection, Extraction
15	Moose Club	14th & Alice Sts. Oakland	1	1927	Abandoned 1984
16	Alameda County Services	165 13th St. Oakland	4	1989	Monitor
17	Fire Station #12	9th & Alice Sts. Oakland	1	1989	Monitor

NOTES:

Total Number of Wells = 96

APPENDIX A

STANDARD OPERATING PROCEDURES

STANDARD OPERATING PROCEDURES
RE: SOIL SAMPLING
SOP-2

Soil samples for chemical analysis are collected in thin-walled brass tubes, 4-inches long by 2-inches outside diameter. Four of these tubes and a spacer tube are set in a 2-inch inside diameter 18-inch split-barrel sampler.

The split-barrel sampler is driven its entire length either hydraulically or using a 140-pound drop hammer. The sampler is extracted from the borehole and the brass tubes, containing the soil samples, are removed. Upon removal from the sampler, the selected brass tubes are immediately trimmed and capped with aluminum foil and plastic caps. They are then hermetically sealed with duct tape, labeled and refrigerated for delivery, under chain-of-custody, to the analytic laboratory. These procedures minimize the potential for cross-contamination and volatilization of volatile organic compounds (VOC) prior to chemical analysis.

One soil sample collected at each sampling interval is analyzed in the field using either a photoionization detector (PID), a flame ionization detector (FID), or an explosimeter. The purpose of this field analysis is to qualitatively determine the presence or absence of hydrocarbons and to establish which soil samples will be analyzed at the laboratory. The soil sample is sealed in a zip-lock plastic bag and placed in the sun to enhance volatilization of the hydrocarbons from the sample. The data is recorded on the drill logs at the depth corresponding to the sampling point.

Other soil samples are collected to document the stratigraphy and estimate relative permeability of the subsurface materials. All drilling and sampling equipment are steam-cleaned prior to use at each site and between boreholes to minimize the potential for cross-contamination.

STANDARD OPERATING PROCEDURES
RE: HOLLOW-STEM AUGER MONITOR WELL INSTALLATION AND DEVELOPMENT
SOP-3

The boreholes for monitor wells are drilled using a truck-mounted hollow-stem auger drill rig. The diameter of the borehole will be a minimum of four inches larger than the outside diameter (OD) of the casing when installing well screen. The hollow-stem auger provides minimal interruption of drilling while permitting soil sampling at desired intervals. Soil samples are collected by hammering a conventional split-barrel sampler containing pre-cleaned 2-inch brass sample tubes. A geologist from Western Geologic Resources continuously logs each borehole during drilling and constantly checks drill cuttings for odors. The sampler is rinsed between samples and steam-cleaned with all other drilling equipment between borings to prevent cross-contamination.

Monitor wells are cased with threaded, factory-perforated and blank Schedule 40 PVC. The perforated interval consists of slotted casing, generally 0.020-inch wide by 1.5-inch long slot size, with 42 slots per foot. A PVC cap is fastened to the bottom of the casing with stainless steel screws; no solvents or cements are used. Centering devices may be fastened to the casing to assure even distribution of filter material and grout within the borehole annulus. The well casing is thoroughly washed and steam-cleaned prior to installation.

After setting the casing inside the hollow stem, sand or gravel filter material is poured into the annular space to fill from the bottom of the boring to 1 foot above the perforated interval. A 1- to 2-foot thick bentonite plug is placed above this filter material to prevent grout from infiltrating down into the filter material. Neat cement, containing about 5% bentonite, is then tremied into the annular space from the top of the bentonite plug to the surface. A lockable PVC cap is placed on each wellhead. Traffic-rated Christy boxes are installed around the wellhead for wells in parking lots and driveways while steel stove pipes are usually set over wellheads in landscaped areas.

After installation, the wells are thoroughly developed to remove residual drilling materials from the wellbore, and to improve well performance by removing any fine material in the filter pack that can pass from the formation into the well. Well development techniques used include pumping, bailing, surging, swabbing, jetting, flushing, and airlifting. All development water is collected in 55-gallon drums for temporary storage, and is then disposed of properly depending on analytic results. To assure that cross-contamination does not occur between wells during drilling and development, all development equipment is steam-cleaned.

STANDARD OPERATING PROCEDURES
RE: GROUNDWATER PURGING AND SAMPLING
SOP-4

Prior to water sampling, each well is purged by evacuating a minimum of three well-casing volumes of groundwater or until the discharge water temperature, conductivity, and pH stabilize. The groundwater sample should be taken when the water level in the well recovers to 80% of its static level.

The sampling equipment used consists of either a teflon bailer or a stainless steel bladder pump with a teflon bladder. If the sampling system is dedicated to the well, then the bailer is made of teflon, but the bladder pump is PVC with a polypropylene bladder. Forty milliliter (ml) glass volatile-organic-analysis (VOA) vials, with teflon septa, are used as sample containers.

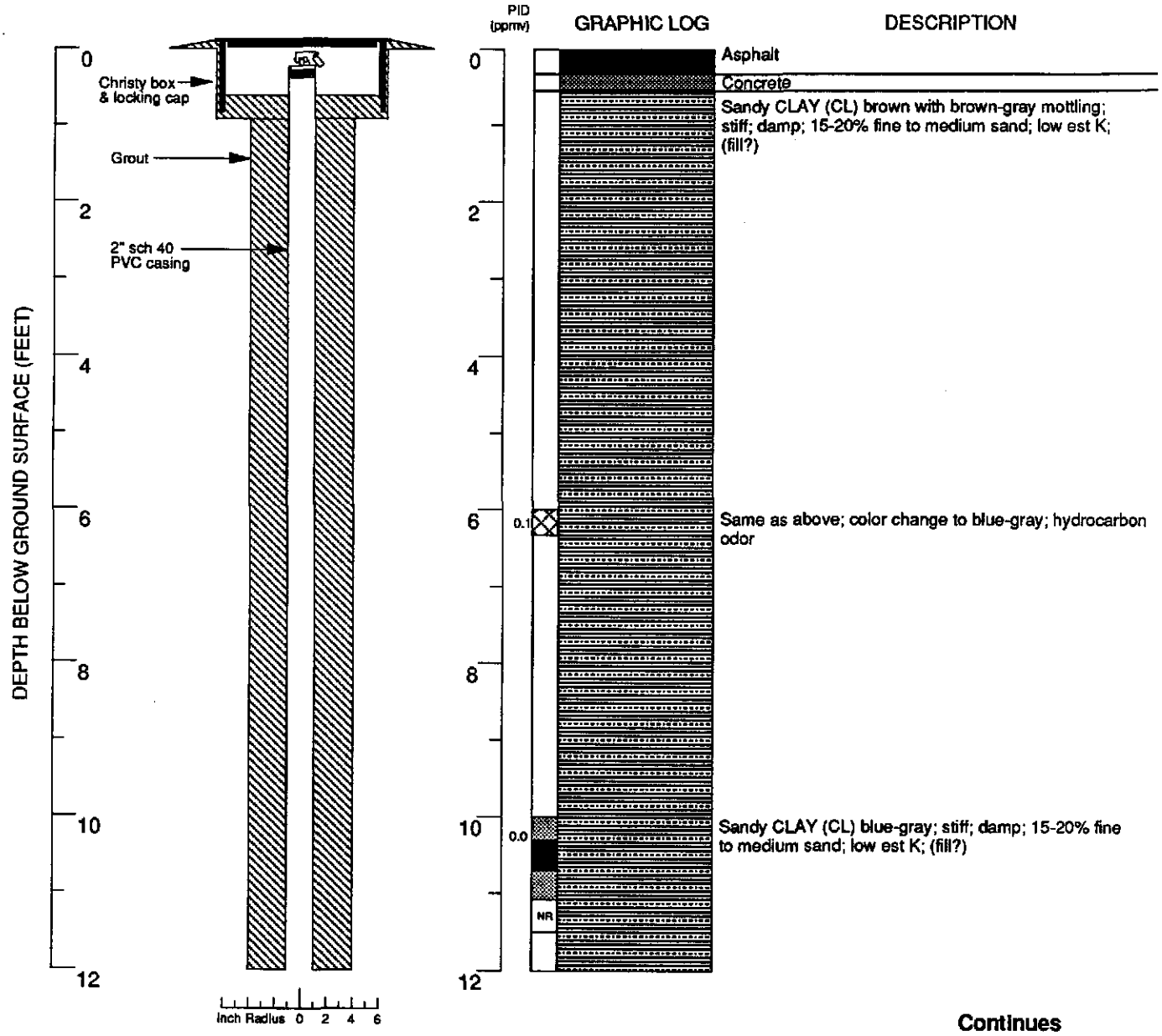
The groundwater sample is decanted into each VOA vial in such a manner that there is a meniscus at the top of the vial. The cap is quickly placed over the top of the vial and securely tightened. The VOA vial is then inverted and tapped to see if air bubbles are present. If none are present, the sample is labeled and refrigerated for delivery under chain-of-custody to the laboratory. Label information should include a sample identification number, job identification number, date, time, type of analysis requested, and the sampler's name.

For quality control purposes, a duplicate water sample is collected from each well. This sample is put on hold at the laboratory. A trip blank is prepared at the laboratory and placed in the transport cooler. It remains with the cooler and is analyzed by the laboratory along with the groundwater samples. A field blank is prepared in the field when sampling equipment is not dedicated. The field blank is prepared after a pump or bailer has been steam-cleaned, prior to use in a second well, and is analyzed along with the other samples. The field blank demonstrates the quality of in-field cleaning procedures to prevent cross-contamination.

To minimize the potential for cross-contamination between wells, all the well-development and water-sampling equipment that is not dedicated to a well is steam-cleaned between each well. As a second precautionary measure, wells will be sampled in order of least to highest concentrations as established by previous analyses.

APPENDIX B

BORING LOGS AND WELL CONSTRUCTION DETAILS



Logged by:	Julie Noffke	Drilling Company:	B & F Drilling Co., Inc.	Well Head Completion:	Christy box & locking cap
Project Mgr:	Len Niles	Drilling Method:	8" Hollow stem auger	Type of Sampler:	2" split barrel
Dates Drilled:	6/20/90	Driller:	Bruce Cox	TD (Total Depth):	27.5 ft.

EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

Contacts:
- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

- est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR — No recovery

Boring Log and Well Completion Details
MW-9 (Boring B-16)

Chevron Service Station #90020
Oakland, California

MONITOR WELL
9

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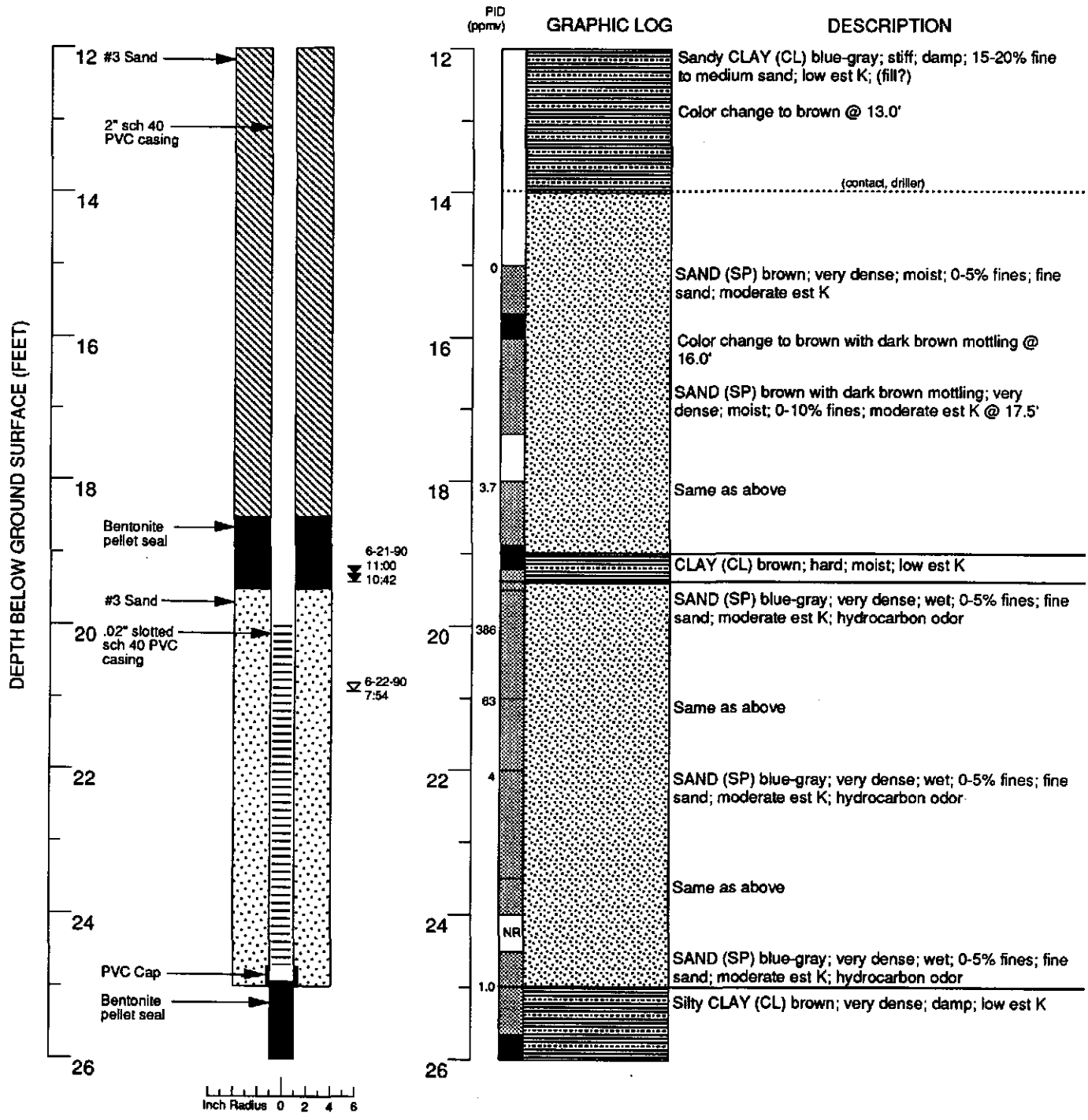
1-012.04



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EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- Contacts: Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational
- est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR — No recovery

Boring Log and Well Completion Details
MW-9 (Boring B-16)

Chevron Service Station #90020
Oakland, California

MONITOR WELL
9

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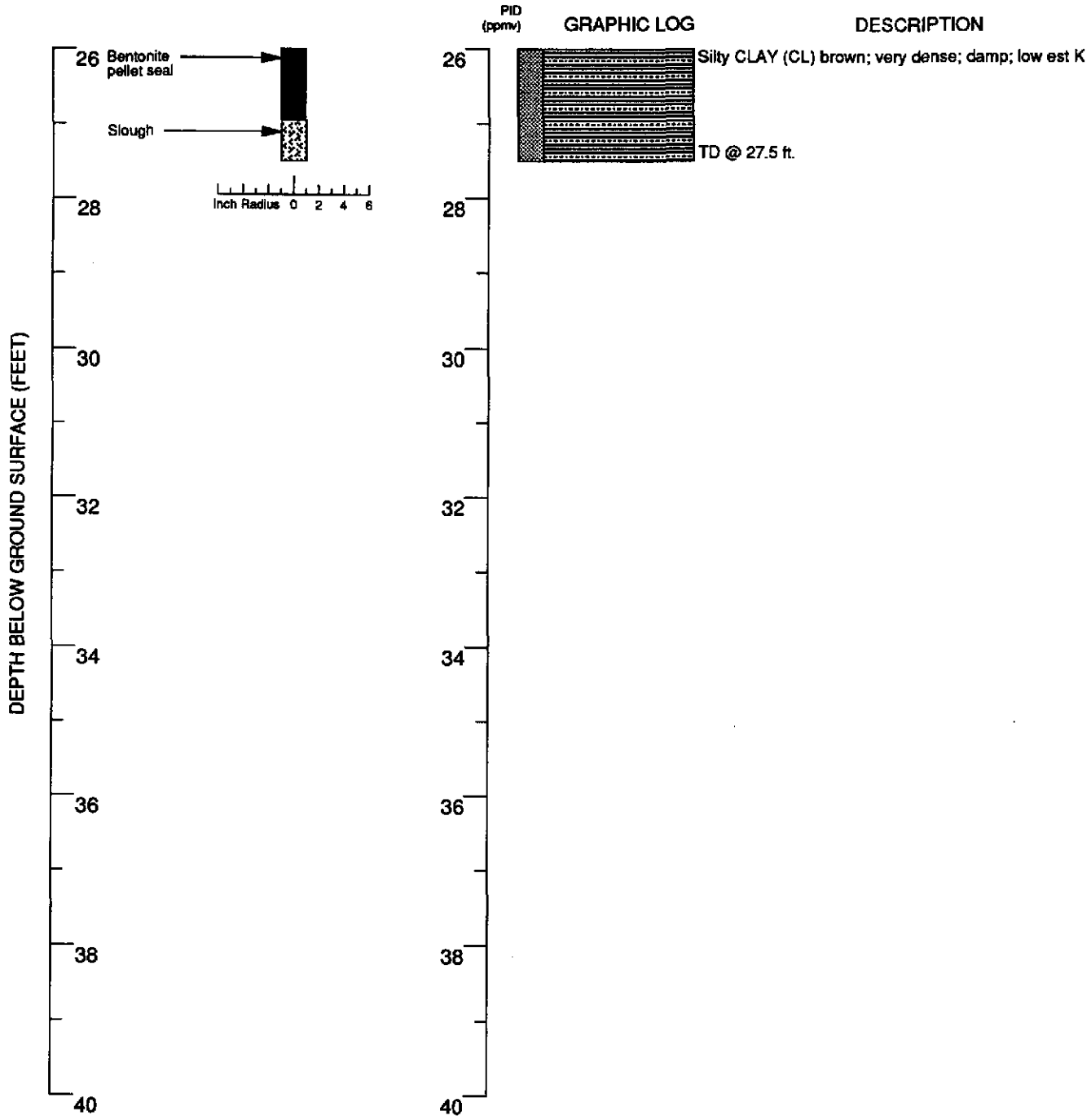
1-012.04



EXPLANATION

- Water level during drilling
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Boring Log and Well Completion Details
MW-9 (Boring B-16)

Chevron Service Station #90020
Oakland, California

MONITOR WELL
9

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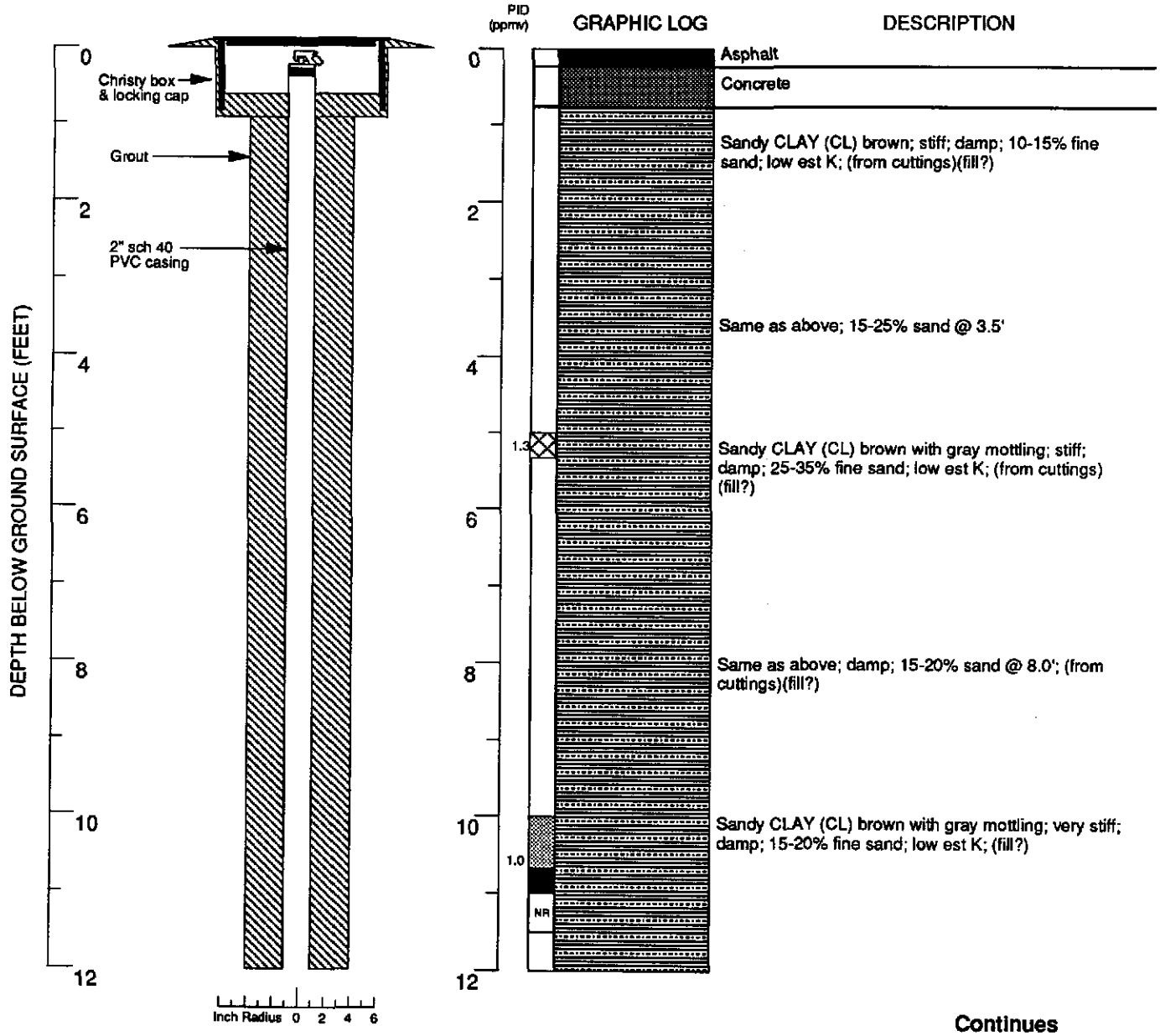


Logged by:	Justin Power	Drilling Company:	B & F Drilling Co., Inc.	Well Head Completion:	Christy box & locking cap
Project Mgr:	Len Niles	Drilling Method:	8" Hollow stem auger	Type of Sampler:	2" split barrel
Dates Drilled:	6/20/90	Driller:	Bruce Cox	TD (Total Depth):	27.0 ft.

EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- Contacts: Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational
- est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR — No recovery

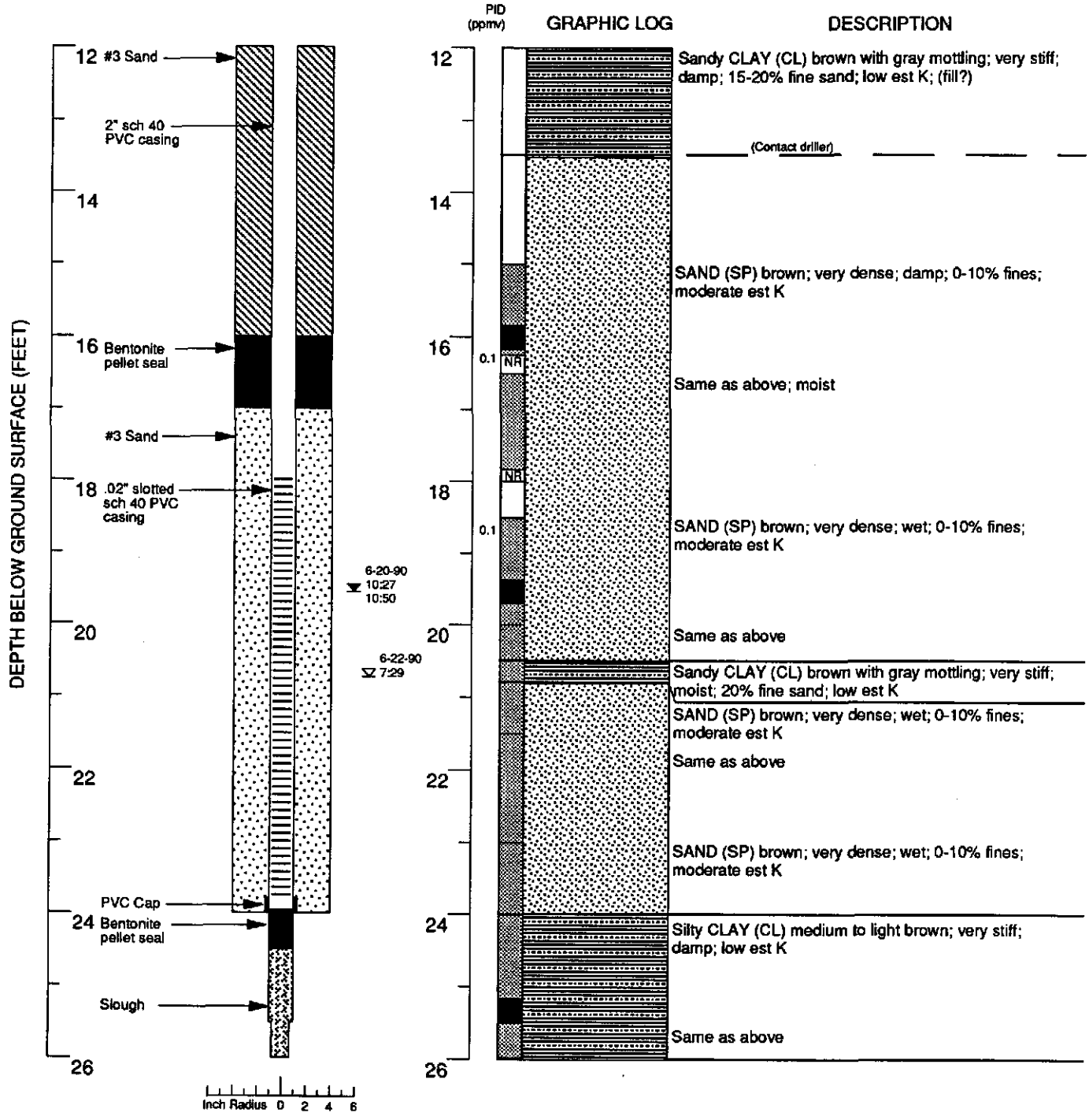
Boring Log and Well Completion Details
MW-10 (Boring B-15)

Chevron Service Station #90020
Oakland, California

MONITOR WELL
10

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04



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EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

Contacts:
- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

- est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR — No recovery

Boring Log and Well Completion Details
MW-10 (Boring B-15)

Chevron Service Station #90020
Oakland, California

MONITOR WELL **10**

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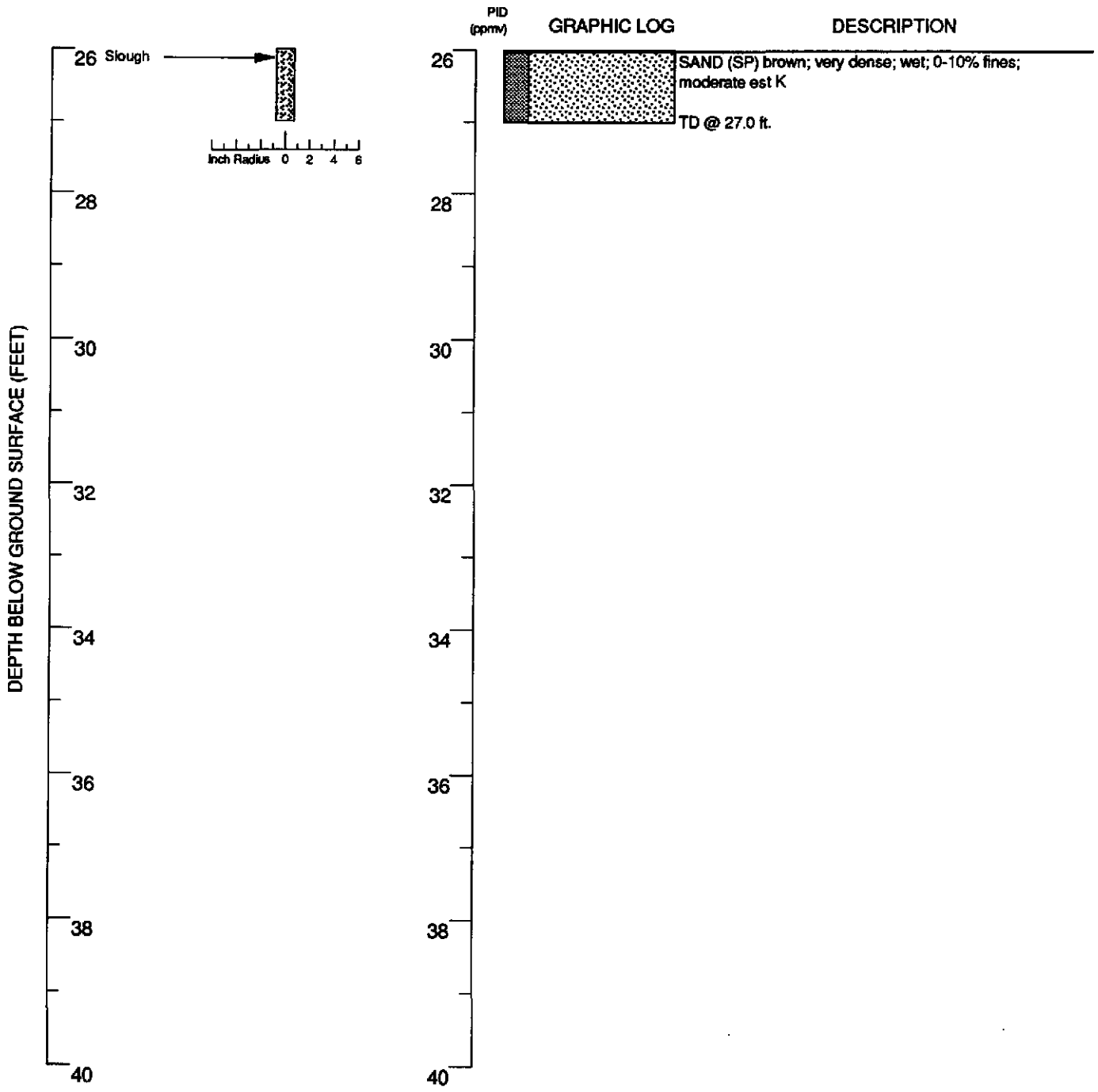

EXPLANATION

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- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

Contacts:
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- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

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- NR — No recovery

Boring Log and Well Completion Details
MW-10 (Boring B-15)

Chevron Service Station #90020
Oakland, California

MONITOR WELL
10

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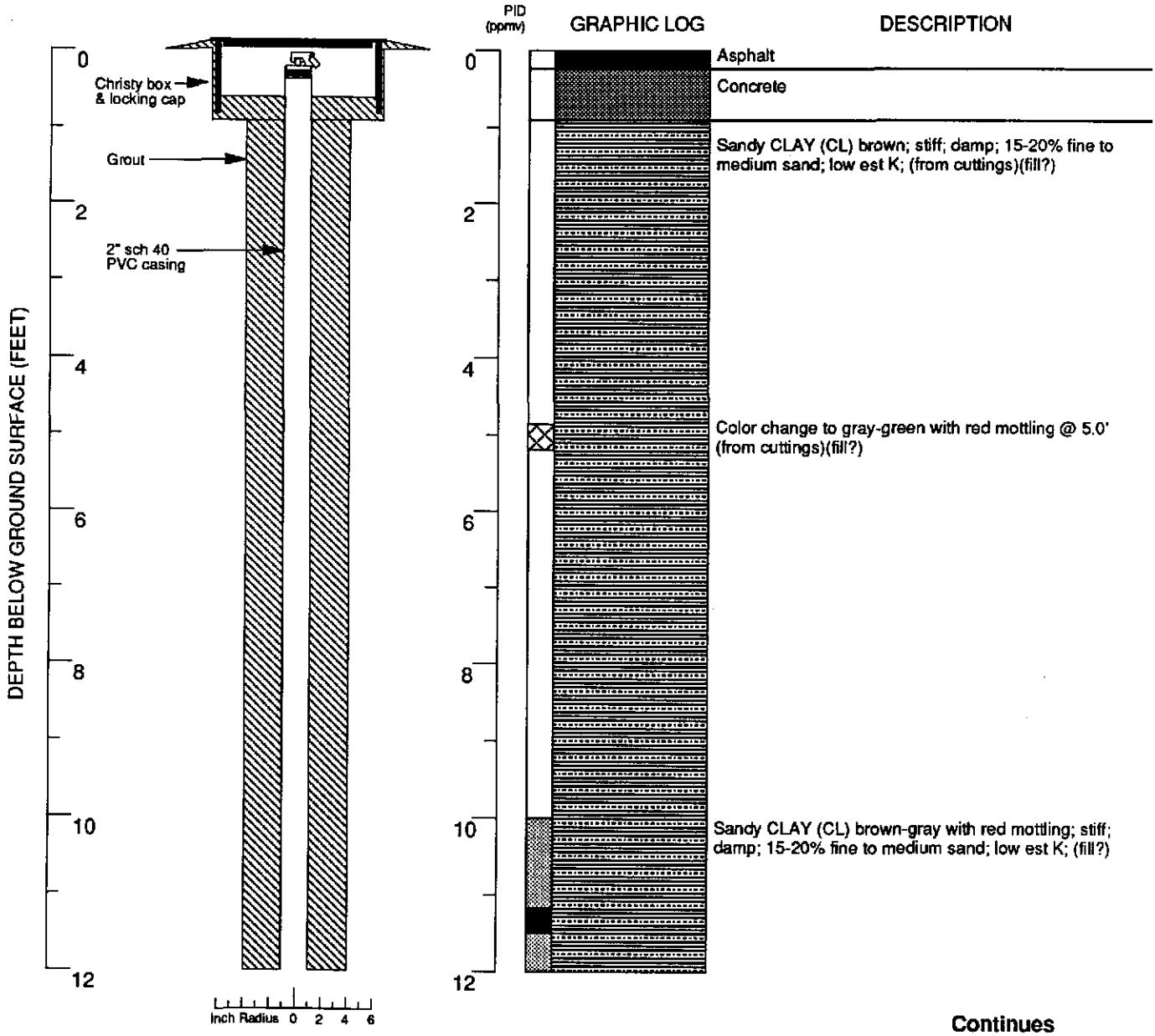


Logged by:	Julie Noffke	Drilling Company:	B & F Drilling Co., Inc.	Well Head Completion:	Christy box & locking cap
Project Mgr:	Len Niles	Drilling Method:	8" Hollow stem auger	Type of Sampler:	2" split barrel
Dates Drilled:	6/18/90	Driller:	Bruce Cox	TD (Total Depth):	29.5 ft.

EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

Contacts:
- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

- est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR — No recovery

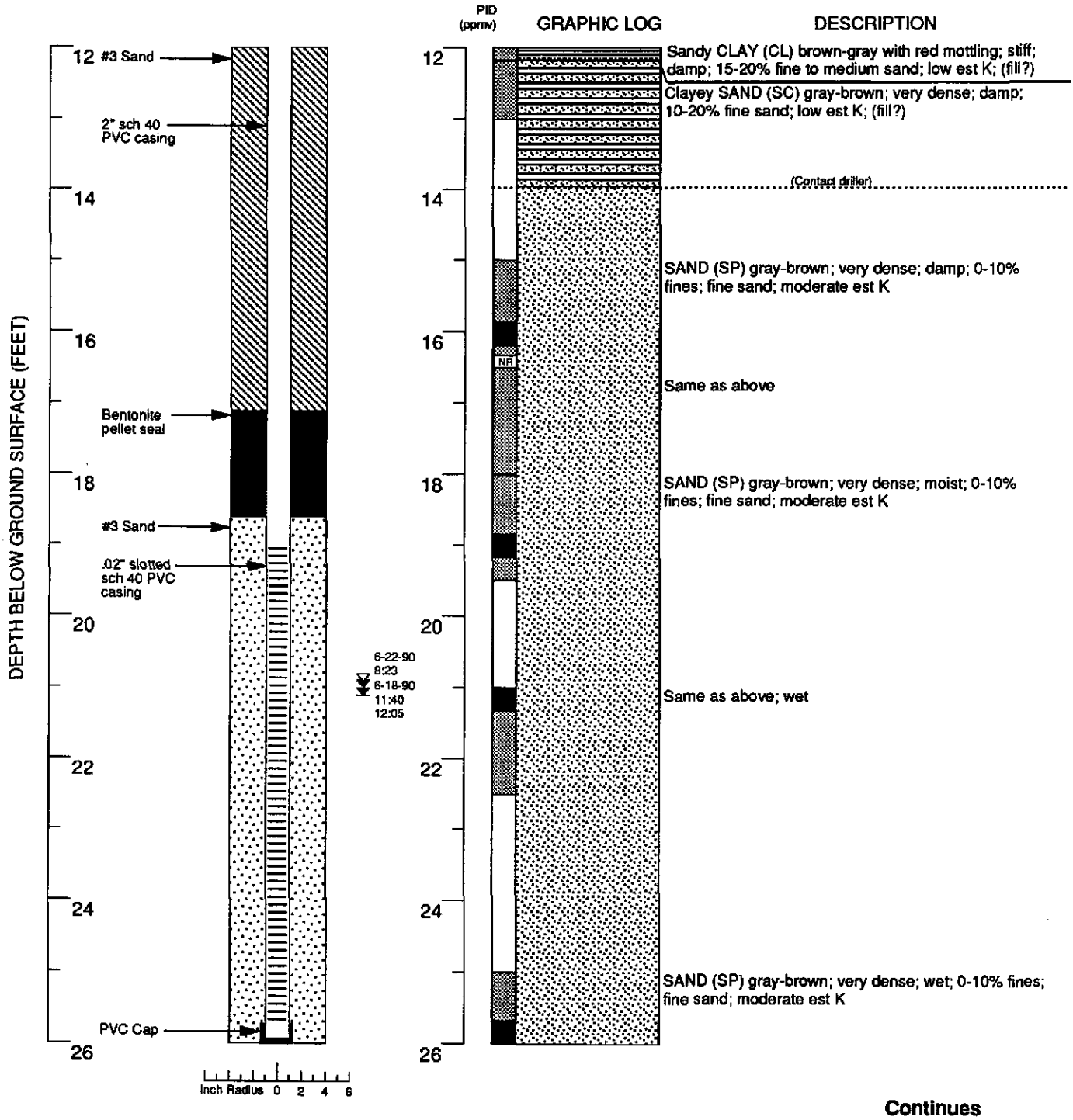
Boring Log and Well Completion Details
MW-11 (Boring B-13)

Chevron Service Station #90020
Oakland, California

MONITOR WELL **11**

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04



Continues

EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

Contacts:
- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

- est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR — No recovery

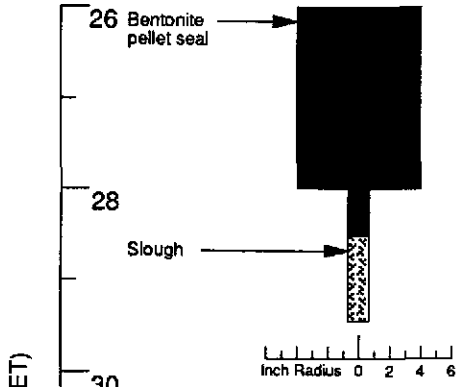
Boring Log and Well Completion Details
MW-11 (Boring B-13)

Chevron Service Station #90020
Oakland, California

MONITOR WELL **11**

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04



DEPTH BELOW GROUND SURFACE (FEET)

PID (ppmv)	GRAPHIC LOG	DESCRIPTION
26		SAND (SP) gray-brown; very dense; wet; 0-10% fines; fine sand; moderate est K
28		Sandy CLAY (CL) gray-brown; hard; damp; 0-10% fine sand; low est K
30		SAND (SW) brown; wet; fine to coarse sand; high est K
32		TD @ 29.5 ft.
34		
36		
38		
40		

EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

Contacts:
- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

- est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR — No recovery

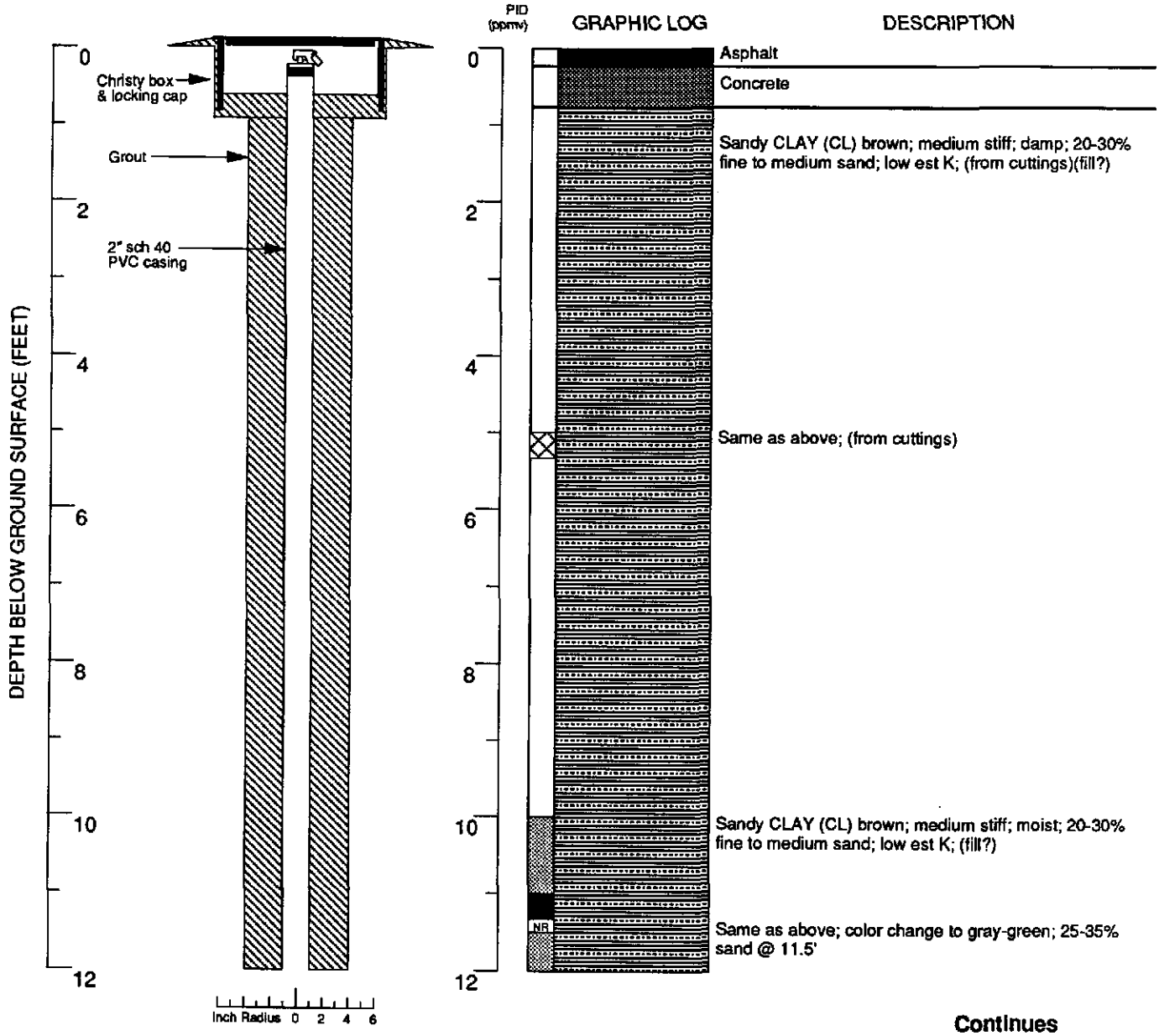
Boring Log and Well Completion Details
MW-11 (Boring B-13)

Chevron Service Station #90020
Oakland, California

MONITOR WELL
11

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04



Logged by:	Joel Coffman	Drilling Company:	B & F Drilling Co., Inc.	Well Head Completion:	Christy box & locking cap
Project Mgr:	Len Niles	Drilling Method:	8" Hollow stem auger	Type of Sampler:	2" split barrel
Dates Drilled:	6/19/90	Driller:	Bruce Cox	TD (Total Depth):	29.5 ft.

EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- Contacts: Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational
- est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR — No recovery

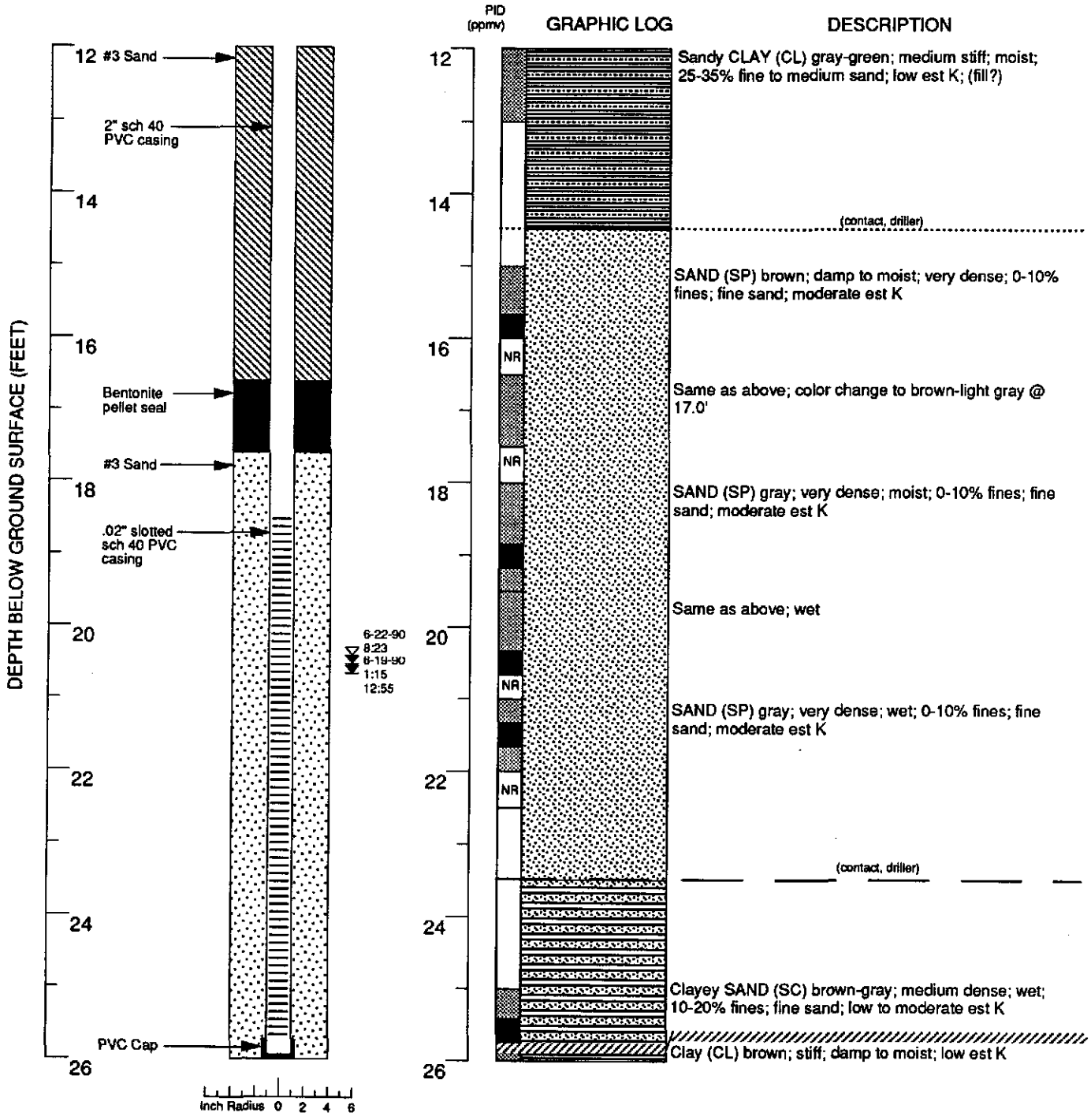
Boring Log and Well Completion Details
MW-12 (Boring B-14)

Chevron Service Station #90020
Oakland, California

MONITOR WELL
12

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04



Continues

EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- Contacts: Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational
- est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR — No recovery

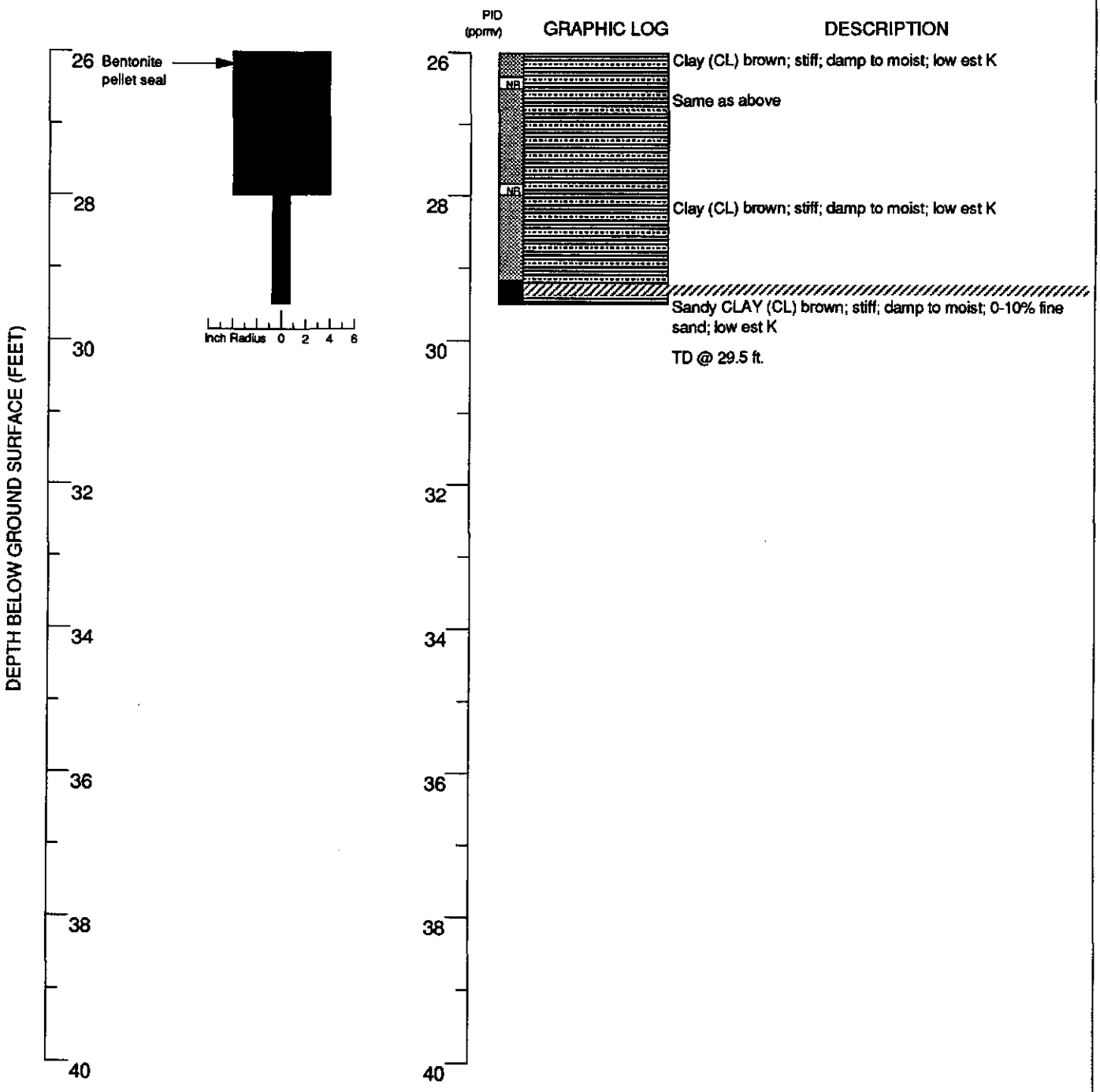
Boring Log and Well Completion Details
MW-12 (Boring B-14)

Chevron Service Station #90020
Oakland, California

MONITOR WELL
12

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04



EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

Contacts:
- Solid where certain
- ..... Dotted where approximate
- – – – Dashed where uncertain
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Boring Log and Well Completion Details
MW-12 (Boring B-14)

Chevron Service Station #90020
Oakland, California

MONITOR WELL
12

WESTERN GEOLOGIC RESOURCES, INC.

1-012.04

APPENDIX C

FIELD DEVELOPMENT AND SAMPLING LOGS

WELL DEVELOPMENT / WATER MONITORING DATA

Project No.	Project Name	Well No.	By	Date
1-612.01	17TH HARRISON	MW-9	DEAN OSAKI	6/22/90

Development Method	Depth to Water Before Development (ft.)	Sounded Depth (ft.)
SURGE BLOCK / BAILING	20.25	23.52

Time 6/21	Depth to Water (ft.)	Gallons Pumped	Flow Rate (gpm)	Depth to Water (ft.)	Comments (water clarity, odor, methods, sounded depth, etc.)	FID Reading (ppm)
15:20					START BAILING #I	
15:45		9			STOP BAILING #I 1/4" OF SAND AT BOTTOM OF BOTTOM BUCKET OF CASE	
15:46				22.34	DTW	
				21.77	5 MIN R.R.	
15:50		5/14			START BAILING II	
16:05					STOP BAILING II - WATER: DARK GRAY/ STILL CLOUDY/ MUDDY.	
				22.20	DTW	
				21.85	DTW	
6/22	9.54			20.80		
8:05					START SURGING I	
8:10					STOP SURGING I	
8:12					START BAILING	
8:30		8/22			STOP BAILING STILL VERY MUDDY, LOTS OF SAND STILL COMING UP	
8:30				22.22	DTW	
8:35				21.54	5 MIN RECOVERY	

Well Development Summary

22.22	Depth to Water During Pumping (ft.)	84	Total Pumping Time (min.)	.59	Average Pumping Rate (gpm)
22.32	Depth to Water After Development	33	Total Amount Evacuated (gals.)		Pumping Rate Range (gpm)
24.11	Sounded Depth After Development	—	Approximate Yield	0	Total Water Injected (gals.)

WELL DEVELOPMENT / WATER MONITORING DATA

Project No.	Project Name	Well No.	By	Date
1-012.04	7TH HARRISON	MW-9	DEAN OSAKI	6/22/90

Development Method	Depth to Water Before Development (ft.)	Sounded Depth (ft.)
SURGE BLOCK / BAILING	20.95	25.93

Time	Depth to Water (ft.)	Gallons Pumped	Flow Rate (gpm)	Depth to Water (ft.)	Comments (water clarity, odor, methods, sounded depth, etc.)	FID Reading (ppm)
6-22						
8:40					START SURGING II	
~~8:45~~					STOP SURGING II	
8:50					START BAILING	
9:06		6/22			STOP BAILING A LOT LESS SAND COMING UP! ONE MORE SURGE & BAIL SHOULD DO IT.	
9:10					START SURGING III	
9:15					STOP SURGING III - HARD BOTTOM	
9:20					START BAILING	
9:30		5/33			STOP BAILING WATER HAS CLEARED	
9:30				22.32	FINAL DTW	

Well Development Summary

—	Depth to Water During Pumping (ft.) SEE PAGE # → 2	~~2~~	Total Pumping Time (min.)
22.32	Depth to Water After Development	~~4~~ 0P	Total Amount Evacuated (gals.) 6-22
24.11	Sounded Depth After Development	—	Approximate Yield
~~1.62~~	Average Pumping Rate (gpm)		
	Pumping Rate Range (gpm)		
0	Total Water Injected (gals.)		

WELL DEVELOPMENT / WATER MONITORING DATA

Project No.	Project Name	Well No.	By	Date
1-012.04	17TH + HARRISON	MW-10	MCG + D.J.	6-24-97

Development Method: SURGE BLOCK + AIR LIFT

Depth to Water Before Development (ft.): 20.44 @ 12:10 PM

Sounded Depth (ft.): 23.45 @ 12:40 PM

Time	Depth to Water (ft.)	Gallons Pumped	Flow Rate (gpm)	Depth to Water (ft.)	Comments (water clarity, odor, methods, sounded depth, etc.)	FID Reading (ppm)
					40FT BOTTOM BEFORE SURGING/AIRLIFT	
12:45					START SURGING I BOTTOM FEELS HARD.	
12:~~57~~					START AIRLIFT I/DON'T KNOW WHAT TO EXPECT, NOT MUCH WATER IN WELL STILL AIR LIFTING.	
1303	20.73				AIR LIFTING DOESN'T SEEM TO BE BRING MUCH WATER UP.	
1310		~1.5			STOP AIRLIFT I.	
13:15					START SURGING II	
					STOP SURGING II	
13:30					START BAILING II (WE SWITCHED OVER TO BAILING SINCE AIRLIFT ENOUGH WAS NOT PRODUCING WATER.) 1/4" INCH OF SAND AT TIME BOTTOM OF A 4 GALLON BUCKET OF WATER	
13:42		4/5.5			STOP BAILING II	
13:45				22.28	DTW	
13:50				21.29	5 MIN. R.R.	
13:55					START SURGING III	
14:00					STOP SURGING III	
14:02					START BAILING III	
14:16		4/9.5			STOP BAILING III 1/8" of SAND AT THE BOTTOM OF A 4 GALLON BUCKET.	

Well Development Summary

22.28	Depth to Water During Pumping (ft.)	49	Total Pumping Time (min.)	.30	Average Pumping Rate (gpm)
~~21.87~~	Depth to Water After Development	14.5	Total Amount Evacuated (gals.)		Pumping Rate Range (gpm)
23.39	Sounded Depth After Development	—	Approximate Yield	Ø	Total Water Injected (gals.)

WELL DEVELOPMENT / WATER MONITORING DATA

Project No.	Project Name	Well No.	By	Date
1-012.01	17TH HARRISON	MW-10	DON OSAKI	6/27/90

Development Method	Depth to Water Before Development (ft.)	Sounded Depth (ft.)
SURGE BLOCK & AIRLIFT	20.44	23.45

Time	Depth to Water (ft.)	Gallons Pumped	Flow Rate (gpm)	Depth to Water (ft.)	Comments (water clarity, odor, methods, sounded depth, etc.)	PID Reading (ppm)
14:20	[illegible]				START SURGING	
14:25	[illegible]				STOP SURGING →	
14:27	[illegible]				START BAILING	
14:46	21.87	5.0/14.5			STOP BAILING	
1455	21.31					

Well Development Summary

SEE PAGE 1

_____	Depth to Water During Pumping (ft.)	_____	Total Pumping Time (min.)	_____	Average Pumping Rate (gpm)
_____	Depth to Water After Development	_____	Total Amount Evacuated (gals.)	_____	Pumping Rate Range (gpm)
_____	Sounded Depth After Development	_____	Approximate Yield	_____	Total Water Injected (gals.)

WELL DEVELOPMENT / WATER MONITORING DATA

Project No.	Project Name	Well No.	By	Date
1-012.04	17 & HARRISON	11	MBG DB.	6/21/90

Development Method	Depth to Water Before Development (ft.)	Sounded Depth (ft.)
SURGE BLOCK AND AIR LIFT	21.00	25.35

Time	Depth to Water (ft.)	Gallons Pumped	Flow Rate (gpm)	Depth to Water (ft.)	Comments (water clarity, odor, methods, sounded depth, etc.)	PID Reading (ppm)
8:25	21.00					
8:30					START SURGE BLOCK	
8:35					STOP SURGE BLOCK	
8:55					START AIR LIFT	
09-4		≈ 2.0			STOP AIR LIFT.	
0909	21.42				AFTER 1st AIR LIFT / GOOD RECOVERY	
09:2	21.26				WATER VERY CLOUDY BROWN. NO NOTICABLE ODOR.	
0913	[redacted]				SD = 25.35 MUCH FIRMER BOTTOM.	
0932					START SURGE BLOCK.	
0938					STOP " "	
094-					START AIR LIFT.	
0950					CONTINUING TO ~~SURGE~~ AIR LIFT. TRYING TO MOVE AS MUCH WATER AS POSSIBLE THRU WELL.	
0956					WELL MAKE PLENTY OF WATER, VERY SOLID BOTTOM.	
1002		3.0			STOP AIR LIFT. WATER LOOKS CLOUDY BUT NOT SANDY AT ALL.	
1006	21.67				SD = 25.35 FIRM Bottom	
1009	21.45				WATER IS NOT NEAR AS CLOUDY AS BEFORE. FIRM BOTTOM. I DON'T THINK IT'S GOING TO GET MUCH BETTER.	

Well Development Summary

21.26	Depth to Water During Pumping (ft.)	31	Total Pumping Time (min.)	.16	Average Pumping Rate (gpm)
21.19	Depth to Water After Development	5.0	Total Amount Evacuated (gals.)		Pumping Rate Range (gpm)
25.35	Sounded Depth After Development	—	Approximate Yield	ϕ	Total Water Injected (gals.)

WELL DEVELOPMENT / WATER MONITORING DATA

Project No.	Project Name	Well No.	By	Date
1-012.04	17TH & HARRISON	12	DEAN OSAKI	6/28/90

Development Method	Depth to Water Before Development (ft.)	Sounded Depth (ft.)
SURGE BLOCK/AIRLIFT	20.45	25.38

Time	Depth to Water (ft.)	Gallons Pumped	Flow Rate (gpm)	Depth to Water (ft.)	Comments (water clarity, odor, methods, sounded depth, etc.)	PID Reading (ppm)
9:00					START SURGE BLOCK	
9:05					STOP SURGE BLOCK - VERY HARD BOTTOM	
9:17					START AIR LIFT	
9:32		2.0			STOP " " HARD BOTTOM - VERY LITTLE SAND COMING UP. WATER IS A CLOUDY BROWN.	
9:35	20.95				DTW AFTER 1st AIR LIFT	
9:40	20.65				5MN R.R.	
9:45					START SURGE BLOCK	
9:55					STOP SURGING	
9:59					START AIR LIFT II	
10:14		2.0/4.0			STOP AIR LIFT II - HARD BOTTOM - NO SAND COMING UP, TAN COLOR.	
10:16					START SURGING III	
10:22					STOP SURGING III	
10:25					START AIRLIFT III	
10:34		1.0/5.0			STOP AIRLIFT III HARD BOTTOM - WATER SEEMS TO HAVE CLEARED UP A LITTLE MORE (LIGHT TAN)	
10:38	21.02					
10:40	25.38					

Well Development Summary

20.95 Depth to Water During Pumping (ft.)	39 Total Pumping Time (min.)	.13 Average Pumping Rate (gpm)	
21.02 Depth to Water After Development	5.0 Total Amount Evacuated (gals.)	Pumping Rate Range (gpm)	
25.38 25.38 Sounded Depth After Development	— Approximate Yield	0 Total Water Injected (gals.)	

LIQUID-LEVEL DATA SHEET

Project No.	Project Name	Date	Initials
1-012.04	17TH + HARRISON	6-22-90	MBG

Well No.	HISTORIC DATA/DATE: DTLH	DTW	LHT	Sounded Depth	CURRENT DATA: DTLH	DTW	LHT	Sounded Depth	Method WLP / PB / IP*	Time	Comments
MW-1					—	21.00	—			0817	
MW-2					—	21.57	—			0808	
MW-3					—	21.20	—			0805	
MW-4					—	22.12	—			0810	
MW-5					—	21.38	—			0802	
MW-6					—	20.77	—			0820	
MW-7					—	20.40	—			0823	
MW-8					—	20.34	—			0757	
MW-9					—	20.60	—			0754	
MW-10					—	20.48	—			0729	
MW-11					—	21.03	—			0830	
MW-12					—	20.45	—		↓	0823	

* WLP = Water-Level Probe
PB = Product Bailer
IP = Interface Probe

#3

WGR

WATER SAMPLING DATA Well Name MW-9 Date 10/22/90 Time 9:45
Job Name 17TH & HARRISON - OAKLAND Job Number 1-012.04 Initials D.O.
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 20.80 ft.
Well Depth 24.11 ft. (spec.) Sounded Depth _____ ft.
Well Diameter 2 in. Date _____ Time _____

EVACUATION: Sampling Equipment:
PVC Bailer: 1¼ in. Dedicated: Bladder Pump _____ ;Bailer _____
Sampling Port:Number — Rate — gpm. Volume — gal.
Other —
Initial Height of Water in Casing 3.31 ft; Volume .5395 gal.
Volume To Be Evacuated = 1.62 gal. (initial volume x3 ✓, x4 ___)

	Evacuated	Evacuated	Evacuated
Time: Stop	10:00		
Start	9:55		
Total minutes	5		
Amount Evacuated	2.0		
Total Evacuated	2.0 gal.		
Evacuation Rate	.40 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
2" casing = 0.163 gal/ft
3" casing = 0.367 gal/ft
4" casing = 0.653 gal/ft
5" casing = 0.826 gal/ft
6" casing = 1.47 gal/ft
8" casing = 2.61 gal/ft

Depth to water during pumping N/A ft. — time
Pumped dry? NO After — gal. Recovery rate —
Depth to water for 80% recovery — ft.

CHEMICAL DATA: Temp. Probe # ___ Ph Probe # ___ Cond. Probe # ___

Time		°C	umhos
	1		
	2		
	3		
	4		

SAMPLING: Point of collection: PE Hose ___; End of bailer ✓; Other _____
Samples taken 10:15 time Depth to water 21.38' ft. Refrigerated: ✓
Sample description: Water color Cloudy Odor MILD
Sediment/Foreign matter _____

Sample ID no.		Container VOA / other	Preservative NaHSO4/Azide/other	Analysis	Lab
CC220-09A	40 ml		HCl	EPA 602/8015	FTC
09B	ml		"	"	
09C	ml		NONE	EPA 601	
09D	ml		"	"	
09E	1000 ml	POLY	H2SO4	503E CEG	
09F	500 ml	✓	NONE	4 Dil. METALS	
	ml				
	ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: _____

#4

WGR

WATER SAMPLING DATA Well Name MW-10 Date 6/22 Time 10:40
Job Name 19TH & HARRISON Job Number 1-02.04 Initials D.O.
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 20.48 ft.
Well Depth 23.39 ft. (spec.) Sounded Depth _____ ft.
Well Diameter 2 in. Date _____ Time _____

EVACUATION: Sampling Equipment:
PVC Bailer: ✓ 1¼" in. Dedicated: Bladder Pump _____ ;Bailer _____
Sampling Port:Number – Rate – gpm. Volume – gal.
Other –
Initial Height of Water in Casing 2.91 ft; Volume .47433 gal.
Volume To Be Evacuated = 1.42 gal. (initial volume x3 ✓, x4 _____)

	Evacuated	Evacuated	Evacuated
Time: Stop	10:59		
Start	10:55		
Total minutes	4 MIN		
Amount Evacuated	1.5		
Total Evacuated	1.5 gal.		
Evacuation Rate	.375 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
¾" casing = 0.163 gal/ft
1" casing = 0.367 gal/ft
1¼" casing = 0.653 gal/ft
1½" casing = 0.826 gal/ft
2" casing = 1.47 gal/ft
3" casing = 3.61 gal/ft

Depth to water during pumping 21.41 ft. _____ time
Pumped dry? NO After – gal. Recovery rate –
Depth to water for 80% recovery – ft.

CHEMICAL DATA: Temp. Probe # _____ Ph Probe # _____ Cond. Probe # _____

Time		°C		umhos
	1			
	2			
	3			
	4			

SAMPLING: Point of collection: PE Hose ___; End of bailer ✓; Other _____
Samples taken 10:10 time Depth to water 21.19 ft. Refrigerated: ✓
Sample description: Water color Cloudy Odor None
Sediment/Foreign matter SMALL AMOUNTS OF SAND IN VOAS

Sample ID no.			Container VOA / other	Preservative NaHSO₄/Azide/other	Analysis	Lab
060220-10A	40	ml		HCl	EPA 602/8015	PACE
-10B		ml		"	"	
-10C		ml		NONE	EPA 601	
-10D	✓	ml	✓	"	"	
-10E	1000	ml	BOTTLE	H₂SO₄	503E CEC	
-10F	500	ml	BOTTLE	NONE	SOL METALS	✓
		ml				
		ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: _____

WGR

#1

WATER SAMPLING DATA Well Name MW-11 Date 6-22-90 Time 0839
Job Name 17TH HARRISON Job Number 1-012.04 Initials MB
WELL DATA: Well type M (M=monitoring well; Describe —)
Depth to Water 21.03 ft.
Well Depth 25.35 ft. (spec.) Sounded Depth — ft.
Well Diameter 2 in. Date — Time —

EVACUATION: Sampling Equipment:
PVC Bailer: 1¼ in. Dedicated: Bladder Pump — ;Bailer —
Sampling Port: Number — Rate — gpm. Volume — gal.
Other —
Initial Height of Water in Casing 4.32 ft; Volume .704 gal.
Volume To Be Evacuated = 2.1 gal. (initial volume x3 X, x4 —)

	Evacuated	Evacuated	Evacuated
Time: Stop	0904		
Start	0859		
Total minutes	5		
Amount Evacuated	2.5		
Total Evacuated	2.5 gal.		
Evacuation Rate	.50 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V,," casing = 0.163 gal/ft
V,," casing = 0.367 gal/ft
V,," casing = 0.653 gal/ft
V,," casing = 0.826 gal/ft
V,," casing = 1.47 gal/ft
V,," casing = 2.61 gal/ft

Depth to water during pumping — ft. — time
Pumped dry? NO After — gal. Recovery rate —
Depth to water for 80% recovery — ft.

CHEMICAL DATA: Temp. Probe # — Ph Probe # — Cond. Probe # —

Time		°C		umhos
	1			
	2			
	3			
	4			

SAMPLING: Point of collection: PE Hose —; End of bailer ✓; Other —
Samples taken 0904 time Depth to water 21.80 ft. Refrigerated: ✓
Sample description: Water color CLOUDY BROWN Odor NONE
Sediment/Foreign matter BROWN SEDIMENT

Sample ID no.		Container VOA / other	Preservative NaHSO₄/Azide/other	Analysis	Lab
06210-11A	40 ml		HCl	EPA 602/8015	PACE
-11B	ml				
-11C	ml		NONE	EPA 601	
-11D	ml				
-11E	1000 ml	B	H_2SO_4	O+G by SOXHLET	
-11E	500 ml	B	NONE	SOL METALS BY AA	
	ml			FOR Pb, Zn, Cd, Cr	
	ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: —

#2

WGR

WATER SAMPLING DATA Well Name MW-12 Date 6-22-96 Time 9:25
Job Name 17th & Harrison Job Number 1-012.04 Initials KWS
WELL DATA: Well type M (M=monitoring well; Describe —)
Depth to Water 20.45 ft.
Well Depth 25.28 ft. (spec.) Sounded Depth — ft.
Well Diameter 2 in. Date — Time —

EVACUATION: Sampling Equipment:
PVC Bailer: ✓ in. Dedicated: Bladder Pump ____ ;Bailer ____
Sampling Port:Number — Rate — gpm. Volume ____ gal.
Other
Initial Height of Water in Casing 4.73 ft; Volume 0.804 gal.
Volume To Be Evacuated = 2.41 gal. (initial volume x3 ✓, x4 ____)

	Evacuated	Evacuated	Evacuated
Time: Stop	0952		
Start	0947		
Total minutes	5		
Amount Evacuated	2.5		
Total Evacuated	____ gal.		
Evacuation Rate	.5 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V_{1}" casing = 0.163 gal/ft
V_{2}" casing = 0.367 gal/ft
V_{4}" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_{6}" casing = 1.47 gal/ft
V_{8}" casing = 2.61 gal/ft

Depth to water during pumping — ft. ____ time
Pumped dry? No After — gal. Recovery rate —
Depth to water for 80% recovery — ft.

CHEMICAL DATA: Temp. Probe # ____ Ph Probe # ____ Cond. Probe # ____

Time		°C		umhos
	1			
	2			
	3			
	4			

SAMPLING: Point of collection: PE Hose ___; End of bailer ✓; Other ____
Samples taken 1005 time Depth to water 20.75 ft. Refrigerated: ✓
Sample description: Water color cloudy Odor none
Sediment/Foreign matter LT. BROWN SEDIMENT

Sample ID no.		Container VOA / other	Preservative $NaHSO_4$/Azide/other	Analysis	Lab
062110-12A	40 ml		HCl	EPA 602/8015	ACE
-12B	ml		✓	✓	
-12C	ml		None	EPA 60	
-12D	ml		✓	✓	
-12E	1000 ml	B	H_2SO_4	O+G by 503 E+A	
-12F	500 ml	B	None	Sol Metals - Pb, Zn, Cd, Cr	
	ml				
	ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS:

WGR

WATER SAMPLING DATA Well Name DRAIN BANK Date 6/22/90 Time —
Job Name DOE HANFORD Job Number 1-012-04 Initials DO.
WELL DATA: Well type — (M=monitoring well; Describe _____)
Depth to Water — ft.
Well Depth — ft. (spec.) Sounded Depth _____ ft.
Well Diameter — in. Date _____ Time _____

EVACUATION: Sampling Equipment:
PVC Bailer: — in. Dedicated: Bladder Pump —; Bailer —
Sampling Port: Number _____ Rate — gpm. Volume — gal.
Other _____
Initial Height of Water in Casing _____ ft; Volume _____ gal.
Volume To Be Evacuated = _____ gal. (initial volume x3 ___, x4 ___)

	Evacuated	Evacuated	Evacuated
Time: Stop			
Start			
Total minutes			
Amount Evacuated			
Total Evacuated	gal.		
Evacuation Rate	gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
2" casing = 0.163 gal/ft
3" casing = 0.367 gal/ft
4" casing = 0.653 gal/ft
4.5" casing = 0.826 gal/ft
6" casing = 1.47 gal/ft
8" casing = 2.61 gal/ft

Depth to water during pumping ___ ft. ___ time
Pumped dry? ___ After ___ gal. Recovery rate _____
Depth to water for 80% recovery _____ ft.

CHEMICAL DATA: Temp. Probe # ___ Ph Probe # ___ Cond. Probe # ___

Time		°C		umhos
	1			
	2			
	3			
	4			

SAMPLING: Point of collection: PE Hose ___; End of bailer ___; Other _____
Samples taken _____ time Depth to water _____ ft. Refrigerated: _____
Sample description: Water color _____ Odor _____
Sediment/Foreign matter _____

Sample ID no.		Container VOA / other	Preservative NaHSO₄/Azide/other	Analysis	Lab
DG 220-13A	40 ml	✓	~~None~~ None	TPH 418.1/8015 & EPA 601	✓
13B	✓ ml	✓	"	✓	
	ml				
	ml				
	ml				
	ml				
	ml				
	ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: _____

Chain-of-Custody Record

Chevron U.S.A. Inc.
P.O. Box 5004
San Ramon, CA 94583
FAX (415) 842-9591

Chevron Facility Number 90020
Consultant Release Number —
Consultant Project Number 1-012.04
Consultant Name WESTERN GEOLOGIC RES
Address 2169 E. FRANCISCO BLVD. SUITE B
San Rafael, Ca. 94901
Fax Number (415) 457-8521
Project Contact (Name) Glen Dukes
(Phone) (415) 457-7595

Chevron Contact (Name) JOHN RANDALL
(Phone) 842-9625
Laboratory Name PACE
Contract Number 24840701
Samples Collected by (Name) D. OSAKI / M. CROSCLOSE
Collection Date 6/22/90
Signature Dean T Osaki

Sample Number	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Analyses To Be Performed: Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTXE Soil: 8020/Wtr.: 602	Arom. Volatiles - BTXE Soil: 8240/Wtr.: 624	Total Lead DHS-Luft	EDB DHS-AB 1803	EPA 601	601 Methods TPH, Pb, 2,4 DCE	Remarks
06220-	09 ABCD	4	W		10:15		YES	X			X				X		Samples A & B
-10	A,B,C,D	↓			11:10		↓	↓			↓				↓		for EPA 602/8015
-11	A,B,C,D				9:10												HCl Preserv.
-12	A,B,C,D	↓			10:05			↓			↓				↓		
-09	E,F	2			10:15					X						X	C,D Samples
-10	E,F	↓			11:10					↓						↓	for EPA 601
-11	E,F				9:10												No Preserv.
-12	E,F				10:05					↓						↓	E Sample
-13	A,B	↓			—		↓	X			X				X	↓	(503 O&G H2SO4 pres.)
										06220-12F, received broken (10)							F Sample (SOL metals Please filter and Preserve

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Dean T Osaki	WGR	6/22/90			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time
			Tina Jaime Pace		6/22 16:00

Turn Around Time (Circle Choice)
24 Hrs
48 Hrs
5 Days
(10 Days)

Printed in U.S.A.

White / Project File Canary / Sampler Pink / Lab

DRUM & SUPPLY INVENTORY FORM

Project Manager LEN NILES
Project # 1-012.04
Site Location 17TH+HARRISON
Inventory By M.B. GROSECLOSE

INVENTORY FORM

DATE	QUANTITY DRUMS	DRUMS WITH H2O	DRUMS WITH SOIL	EMPTYS	COMMENTS
6-25-90	Ø	Ø	Ø	Ø	1 TANK 1/2 FULL 2 SOIL BERMS

APPENDIX D

CHAIN-OF-CUSTODY FORMS

400622 · 508

Chain-of-Custody Record

Chevron U.S.A. Inc.
P.O. Box 5004
San Ramon, CA 94583
FAX (415) 842-9591

Chevron Facility Number 90020
Consultant Release Number 2329530
Consultant Project Number 1-012.04
Consultant Name Western Geologic Resources
Address 2169 E. Francisco Blvd.
Fax Number 415-457-8521
Project Contact (Name) Leonard Niles
(Phone) 415-457-7595

Chevron Contact (Name) Nancy Vukelich
(Phone) (415) 842-9581
Laboratory Name Pace
Contract Number 2484070
Samples Collected by (Name) David Reichard
Collection Date 6-18, 19, 20, 21-90
Signature David D. Reichard

Sample Number	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Analyses To Be Performed: Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTXE Soil: 8020/Wtr.: 602	Arom. Volatiles - BTXE Soil: 8240/Wtr.: 624	Total Lead DHS-Luft	EDB DHS-AB 1803	Halocarbons 8010			Remarks
B13/5.0'	77444	1	S				X											6/18
~~B13/11.1'~~	45	1	S															6/18
B13/16.0'	46	1	S					X			X							6/18
~~[illegible]~~		~~[illegible]~~	~~[illegible]~~															~~[illegible]~~
B13/21.0'	47	1	S					X			X				X			6/18
B13/26.0'	48	1	S															6/18
B13/28.0'	49	1	S					X			X							6/18
B14/5.0'	50	1	S															6/19
B14/11.0'	51	1	S															6/19
B14/16.0'	52	1	S					X			X							6/19
~~[illegible]~~		~~[illegible]~~	~~[illegible]~~															~~[illegible]~~
~~[illegible]~~		~~[illegible]~~	~~[illegible]~~															~~[illegible]~~
B14/21.5'	53	1	S					X			X				X			6/19

Make sure holding time since sample date is not exceeded.

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
David D. Reichard	WGR				
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time
			Gina Ame	Pace	6/22 16:00

Turn Around Time (Circle Choice)
24 Hrs
48 Hrs
5 Days
(10 Days)

Printed in U.S.A.

J/S

White / Project File Canary / Sampler Pink / Lab

400622 · 508

Chain-of-Custody Record

Chevron U.S.A. Inc.
P.O. Box 5004
San Ramon, CA 94583
FAX (415) 842-9591

Chevron Facility Number 90020
Consultant Release Number 2329530
Consultant Project Number 1-012.04
Consultant Name Western Geologic Resources
Address 2169 E. Francisco Blvd.
Fax Number 415-457-8521
Project Contact (Name) Leonard Niles
(Phone) 415-457-7595

Chevron Contact (Name) Nancy Vukelich
(Phone) (415) 842-9381
Laboratory Name Pace
Contract Number 2484070
Samples Collected by (Name) David Reichard
Collection Date 6-18, 19, 20, 21-90
Signature David D. Reichard

Sample Number	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTXE Soil: 8020/Wtr.: 602	Arom. Volatiles - BTXE Soil: 8240/Wtr.: 624	Total Lead DHS-Luft	EDB DHS-AB 1803	Halocarbons 8010			Remarks
B14/25.4'	77454	1	S				X											6/19
B14/29.2'	55	1						X			X							6/19
B15/5.0'	56	1																6/20
B15/11.2'	57	1																6/20
B15/16.0'	58	1						X			X				Wash			6/20
B15/19.5'	59	1						X			X				X			6/20
B15/25.2'	60	1						X			X							6/21
B16/6.2'	61	1						X			X							6/21
B16/10.6'	62	1						X			X							6/21
B16/18.8'	63	1						X			X				X			6/21
B16/15.6'	64	1						X			X							6/21
B16/25.6'	65	1						X			X							6/21
QC#	66																	

Make sure holding times are not exceeded since sample date.

items circled out are to be placed on Hold

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
David D. Reichard	WGR				
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time
			Gina Lowe	Pace	6/22 16:00

Turn Around Time (Circle Choice)
24 Hrs
48 Hrs
5 Days
(10 Days)

Printed in U.S.A.

J/S

White / Project File Canary / Sampler Pink / Lab

400622 · 504

Chain-of-Custody Record

Chevron U.S.A. Inc.
P.O. Box 5004
San Ramon, CA 94583
FAX (415) 842-9591

Chevron Facility Number 90020
Consultant Release Number —
Consultant Project Number 1-012.04
Consultant Name WESTERN GEOLOGIC RES.
Address 2169 E. FRANCISCO BLVD STE B SAN RAFAEL, CA 94901
Fax Number (415) 457-8521
Project Contact (Name) CEDRIC LEE
(Phone) (415) 457-7595

Chevron Contact (Name) JOHN RANDALL
(Phone) 842-9625
Laboratory Name PACE
Contract Number 24840701
Samples Collected by (Name) D. OSAKI / M. GRESCLOSE
Collection Date 6/22/90
Signature DUANE OSAKI

Sample Number	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTXE Soil: 8020/Wtr: 602	Arom. Volatiles - BTXE Soil: 8240/Wtr.: 624	Total Lead DHS-Luft	EDB DHS-AB 1803	EPA 601	See notes 11, Pb, 21, GC	Remarks
062220	C9A3CD	4	W		10:15	77413	YES	X			X				X		Samples A & B
-10	A,B,C,D	↓			11:10	14		↓			↓				↓		for EPA 602/8015
-11	A,B,C,D				9:10	15											HCl preserv.
-12	A,B,C,D	↓			10:05	16		↓			↓				↓		
-09	E,F	2			10:15	77413				X						X	C,D Samples
-10	E,F				11:10	14											for EPA 601
-11	E,F				9:10	15											No Preserv.
-12	E,F				10:05	16				↓						↓	E Sample
-13	A,B	↓			—	18	↓	X			X				X	↓	(SOIL ONLY 12 SEPARATES)
																	F Sample
QC#						77417				(062220-12F received by OSAKI 16)							(SOIL metals Please filter AND Preserve
6/12, A13																	

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
DUANE OSAKI	WGR	6/22/90			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time
			Tina Jaime Pace		6/22 16:00

Turn Around Time (Circle Choice)
24 Hrs
48 Hrs
5 Days
(10 Days)

Printed in U.S.A.

White / Project File Canary / Sampler Pink / Lab

APPENDIX E

LABORATORY ANALYTICAL REPORTS WITH
QUALITY ASSURANCE/QUALITY CONTROL DOCUMENTS

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

July 05, 1990

Mr. Leonard Niles
Western Geologic Resources
2169 E. Francisco Blvd. Suite B
San Rafael, CA 94901

RE: PACE Project No. 400622.508
Ch90020/WGR1-012.04

Dear Mr. Niles:

Enclosed is the report of laboratory analyses for samples received June 22, 1990.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Stephen Nackord

Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Western Geologic Resources
2169 E. Francisco Blvd. Suite B
San Rafael, CA 94901

July 05, 1990
PACE Project
Number: 400622508

Attn: Mr. Leonard Niles

Ch90020/WGR1-012.04

PACE Sample Number:			774460	
Date Collected:			06/18/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B13/16.0	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/29/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/29/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/29/90
Benzene	mg/kg wet	0.005	ND	06/29/90
Ethylbenzene	mg/kg wet	0.005	ND	06/29/90
Toluene	mg/kg wet	0.005	ND	06/29/90
Xylenes, Total	mg/kg wet	0.005	ND	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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FAX: 415-883-2673

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REPORT OF LABORATORY ANALYSIS

Mr. Leonard Niles
Page 2

July 05, 1990
PACE Project Number: 400622508

Ch90020/WGR1-012.04

PACE Sample Number:			774470	
Date Collected:			06/18/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B13/21.0	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/28/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/28/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/28/90
Benzene	mg/kg wet	0.005	ND	06/28/90
Ethylbenzene	mg/kg wet	0.005	ND	06/28/90
Toluene	mg/kg wet	0.005	ND	06/28/90
Xylenes, Total	mg/kg wet	0.005	ND	06/28/90
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/kg	20	ND	06/29/90
Chloromethane	ug/kg	20	ND	06/29/90
Vinyl Chloride	ug/kg	20	ND	06/29/90
Bromomethane	ug/kg	20	ND	06/29/90
Chloroethane	ug/kg	20	ND	06/29/90
Trichlorofluoromethane	ug/kg	20	ND	06/29/90
1,1-Dichloroethene	ug/kg	5.0	ND	06/29/90
Methylene Chloride	ug/kg	5.0	ND	06/29/90
trans-1,2-Dichloroethene	ug/kg	5.0	ND	06/29/90
1,1-Dichloroethane	ug/kg	5.0	ND	06/29/90
Chloroform	ug/kg	5.0	ND	06/29/90
1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND	06/29/90
Carbon Tetrachloride	ug/kg	5.0	ND	06/29/90
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND	06/29/90
Trichloroethene (TCE)	ug/kg	5.0	ND	06/29/90
1,2-Dichloropropane	ug/kg	5.0	ND	06/29/90
Bromodichloromethane	ug/kg	5.0	ND	06/29/90
2-Chloroethylvinyl ether	ug/kg	5.0	ND	06/29/90
trans-1,3-Dichloropropene	ug/kg	5.0	ND	06/29/90
cis-1,3-Dichloropropene	ug/kg	5.0	ND	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Mr. Leonard Niles
Page 3

July 05, 1990
PACE Project Number: 400622508

Ch90020/WGR1-012.04

PACE Sample Number:			774470	
Date Collected:			06/18/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B13/21.0	DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
1,1,2-Trichloroethane	ug/kg	5.0	ND	06/29/90
Tetrachloroethene	ug/kg	5.0	ND	06/29/90
Dibromochloromethane	ug/kg	5.0	ND	06/29/90
Chlorobenzene	ug/kg	5.0	ND	06/29/90
Bromoform	ug/kg	5.0	ND	06/29/90
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND	06/29/90
1,3-Dichlorobenzene	ug/kg	5.0	ND	06/29/90
1,4-Dichlorobenzene	ug/kg	5.0	ND	06/29/90
1,2-Dichlorobenzene	ug/kg	5.0	ND	06/29/90
Bromochloromethane (Surrogate Recovery)			113%	06/29/90
1,4-Dichlorobutane (Surrogate Recovery)			91%	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Mr. Leonard Niles
Page 4

July 05, 1990
PACE Project Number: 400622508

Ch90020/WGR1-012.04

PACE Sample Number:			774490	
Date Collected:			06/18/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B13/28.0	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/29/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/29/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/29/90
Benzene	mg/kg wet	0.005	ND	06/29/90
Ethylbenzene	mg/kg wet	0.005	ND	06/29/90
Toluene	mg/kg wet	0.005	ND	06/29/90
Xylenes, Total	mg/kg wet	0.005	ND	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Mr. Leonard Niles
Page 5

July 05, 1990
PACE Project Number: 400622508

Ch90020/WGR1-012.04

PACE Sample Number:			774520	
Date Collected:			06/19/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B14/16.0	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/29/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/29/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/29/90
Benzene	mg/kg wet	0.005	ND	06/29/90
Ethylbenzene	mg/kg wet	0.005	ND	06/29/90
Toluene	mg/kg wet	0.005	ND	06/29/90
Xylenes, Total	mg/kg wet	0.005	ND	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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REPORT OF LABORATORY ANALYSIS

Mr. Leonard Niles
Page 6

July 05, 1990
PACE Project Number: 400622508

Ch90020/WGR1-012.04

Parameter	Units	MDL	774530 B14/21.5	DATE ANALYZED
PACE Sample Number:			774530	
Date Collected:			06/19/90	
Date Received:			06/22/90	
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/29/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/29/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/29/90
Benzene	mg/kg wet	0.005	ND	06/29/90
Ethylbenzene	mg/kg wet	0.005	ND	06/29/90
Toluene	mg/kg wet	0.005	ND	06/29/90
Xylenes, Total	mg/kg wet	0.005	ND	06/29/90
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/kg	20	ND	06/28/90
Chloromethane	ug/kg	20	ND	06/28/90
Vinyl Chloride	ug/kg	20	ND	06/28/90
Bromomethane	ug/kg	20	ND	06/28/90
Chloroethane	ug/kg	20	ND	06/28/90
Trichlorofluoromethane	ug/kg	20	ND	06/28/90
1,1-Dichloroethene	ug/kg	5.0	ND	06/28/90
Methylene Chloride	ug/kg	5.0	ND	06/28/90
trans-1,2-Dichloroethene	ug/kg	5.0	ND	06/28/90
1,1-Dichloroethane	ug/kg	5.0	ND	06/28/90
Chloroform	ug/kg	5.0	ND	06/28/90
1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND	06/28/90
Carbon Tetrachloride	ug/kg	5.0	ND	06/28/90
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND	06/28/90
Trichloroethene (TCE)	ug/kg	5.0	ND	06/28/90
1,2-Dichloropropane	ug/kg	5.0	ND	06/28/90
Bromodichloromethane	ug/kg	5.0	ND	06/28/90
2-Chloroethylvinyl ether	ug/kg	5.0	ND	06/28/90
trans-1,3-Dichloropropene	ug/kg	5.0	ND	06/28/90
cis-1,3-Dichloropropene	ug/kg	5.0	ND	06/28/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Mr. Leonard Niles
Page 7

July 05, 1990
PACE Project
Number: 400622508

Ch90020/WGR1-012.04

PACE Sample Number:			774530	
Date Collected:			06/19/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B14/21.5	DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
1,1,2-Trichloroethane	ug/kg	5.0	ND	06/28/90
Tetrachloroethene	ug/kg	5.0	ND	06/28/90
Dibromochloromethane	ug/kg	5.0	ND	06/28/90
Chlorobenzene	ug/kg	5.0	ND	06/28/90
Bromoform	ug/kg	5.0	ND	06/28/90
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND	06/28/90
1,3-Dichlorobenzene	ug/kg	5.0	ND	06/28/90
1,4-Dichlorobenzene	ug/kg	5.0	ND	06/28/90
1,2-Dichlorobenzene	ug/kg	5.0	ND	06/28/90
Bromochloromethane (Surrogate Recovery)			118%	06/28/90
1,4-Dichlorobutane (Surrogate Recovery)			99%	06/28/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

pace INCORPORATED
THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Mr. Leonard Niles
Page 8

July 05, 1990
PACE Project
Number: 400622508

Ch90020/WGR1-012.04

PACE Sample Number:			774550	
Date Collected:			06/19/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B14/29.2	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/30/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/30/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/30/90
Benzene	mg/kg wet	0.005	ND	06/30/90
Ethylbenzene	mg/kg wet	0.005	ND	06/30/90
Toluene	mg/kg wet	0.005	ND	06/30/90
Xylenes, Total	mg/kg wet	0.005	ND	06/30/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

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July 05, 1990
PACE Project
Number: 400622508

Ch90020/WGR1-012.04

PACE Sample Number:			774580	
Date Collected:			06/20/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B15/16.0	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/30/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/30/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/30/90
Benzene	mg/kg wet	0.005	ND	06/30/90
Ethylbenzene	mg/kg wet	0.005	ND	06/30/90
Toluene	mg/kg wet	0.005	ND	06/30/90
Xylenes, Total	mg/kg wet	0.005	ND	06/30/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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July 05, 1990
PACE Project Number: 400622508

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PACE Sample Number:			774590	
Date Collected:			06/20/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B15/19.5	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/30/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/30/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/30/90
Benzene	mg/kg wet	0.005	ND	06/30/90
Ethylbenzene	mg/kg wet	0.005	ND	06/30/90
Toluene	mg/kg wet	0.005	ND	06/30/90
Xylenes, Total	mg/kg wet	0.005	ND	06/30/90
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/kg	20	ND	06/28/90
Chloromethane	ug/kg	20	ND	06/28/90
Vinyl Chloride	ug/kg	20	ND	06/28/90
Bromomethane	ug/kg	20	ND	06/28/90
Chloroethane	ug/kg	20	ND	06/28/90
Trichlorofluoromethane	ug/kg	20	ND	06/28/90
1,1-Dichloroethene	ug/kg	5.0	ND	06/28/90
Methylene Chloride	ug/kg	5.0	ND	06/28/90
trans-1,2-Dichloroethene	ug/kg	5.0	ND	06/28/90
1,1-Dichloroethane	ug/kg	5.0	ND	06/28/90
Chloroform	ug/kg	5.0	ND	06/28/90
1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND	06/28/90
Carbon Tetrachloride	ug/kg	5.0	ND	06/28/90
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND	06/28/90
Trichloroethene (TCE)	ug/kg	5.0	ND	06/28/90
1,2-Dichloropropane	ug/kg	5.0	ND	06/28/90
Bromodichloromethane	ug/kg	5.0	ND	06/28/90
2-Chloroethylvinyl ether	ug/kg	5.0	ND	06/28/90
trans-1,3-Dichloropropene	ug/kg	5.0	ND	06/28/90
cis-1,3-Dichloropropene	ug/kg	5.0	ND	06/28/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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July 05, 1990
PACE Project
Number: 400622508

Ch90020/WGR1-012.04

PACE Sample Number:			774590	
Date Collected:			06/20/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B15/19.5	DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
1,1,2-Trichloroethane	ug/kg	5.0	ND	06/28/90
Tetrachloroethene	ug/kg	5.0	ND	06/28/90
Dibromochloromethane	ug/kg	5.0	ND	06/28/90
Chlorobenzene	ug/kg	5.0	ND	06/28/90
Bromoform	ug/kg	5.0	ND	06/28/90
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND	06/28/90
1,3-Dichlorobenzene	ug/kg	5.0	ND	06/28/90
1,4-Dichlorobenzene	ug/kg	5.0	ND	06/28/90
1,2-Dichlorobenzene	ug/kg	5.0	ND	06/28/90
Bromochloromethane (Surrogate Recovery)			117%	06/28/90
1,4-Dichlorobutane (Surrogate Recovery)			88%	06/28/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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July 05, 1990
PACE Project
Number: 400622508

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PACE Sample Number:			774600	
Date Collected:			06/20/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B15/25.2	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/30/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/30/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/30/90
Benzene	mg/kg wet	0.005	ND	06/30/90
Ethylbenzene	mg/kg wet	0.005	ND	06/30/90
Toluene	mg/kg wet	0.005	ND	06/30/90
Xylenes, Total	mg/kg wet	0.005	ND	06/30/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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PACE Project Number: 400622508

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PACE Sample Number:			774610	
Date Collected:			06/21/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B16/6.2	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/30/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/30/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/30/90
Benzene	mg/kg wet	0.005	ND	06/30/90
Ethylbenzene	mg/kg wet	0.005	ND	06/30/90
Toluene	mg/kg wet	0.005	ND	06/30/90
Xylenes, Total	mg/kg wet	0.005	ND	06/30/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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July 05, 1990
PACE Project Number: 400622508

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PACE Sample Number:			774620	
Date Collected:			06/21/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B16/10.6	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/03/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	07/03/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/03/90
Benzene	mg/kg wet	0.005	ND	07/03/90
Ethylbenzene	mg/kg wet	0.005	ND	07/03/90
Toluene	mg/kg wet	0.005	ND	07/03/90
Xylenes, Total	mg/kg wet	0.005	ND	07/03/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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July 05, 1990
PACE Project Number: 400622508

Ch90020/WGR1-012.04

Parameter	Units	MDL	B16/18.8	DATE ANALYZED
PACE Sample Number:			774630	
Date Collected:			06/21/90	
Date Received:			06/22/90	
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/30/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/30/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/30/90
Benzene	mg/kg wet	0.005	ND	06/30/90
Ethylbenzene	mg/kg wet	0.005	ND	06/30/90
Toluene	mg/kg wet	0.005	ND	06/30/90
Xylenes, Total	mg/kg wet	0.005	ND	06/30/90
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/kg	20	ND	06/28/90
Chloromethane	ug/kg	20	ND	06/28/90
Vinyl Chloride	ug/kg	20	ND	06/28/90
Bromomethane	ug/kg	20	ND	06/28/90
Chloroethane	ug/kg	20	ND	06/28/90
Trichlorofluoromethane	ug/kg	20	ND	06/28/90
1,1-Dichloroethene	ug/kg	5.0	ND	06/28/90
Methylene Chloride	ug/kg	5.0	ND	06/28/90
trans-1,2-Dichloroethene	ug/kg	5.0	ND	06/28/90
1,1-Dichloroethane	ug/kg	5.0	ND	06/28/90
Chloroform	ug/kg	5.0	ND	06/28/90
1,1,1-Trichloroethane (TCA)	ug/kg	5.0	ND	06/28/90
Carbon Tetrachloride	ug/kg	5.0	ND	06/28/90
1,2-Dichloroethane (EDC)	ug/kg	5.0	ND	06/28/90
Trichloroethene (TCE)	ug/kg	5.0	ND	06/28/90
1,2-Dichloropropane	ug/kg	5.0	ND	06/28/90
Bromodichloromethane	ug/kg	5.0	ND	06/28/90
2-Chloroethylvinyl ether	ug/kg	5.0	ND	06/28/90
trans-1,3-Dichloropropene	ug/kg	5.0	ND	06/28/90
cis-1,3-Dichloropropene	ug/kg	5.0	ND	06/28/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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July 05, 1990
PACE Project Number: 400622508

Ch90020/WGR1-012.04

PACE Sample Number:			774630	
Date Collected:			06/21/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B16/18.8	DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
1,1,2-Trichloroethane	ug/kg	5.0	ND	06/28/90
Tetrachloroethene	ug/kg	5.0	ND	06/28/90
Dibromochloromethane	ug/kg	5.0	ND	06/28/90
Chlorobenzene	ug/kg	5.0	ND	06/28/90
Bromoform	ug/kg	5.0	ND	06/28/90
1,1,2,2-Tetrachloroethane	ug/kg	5.0	ND	06/28/90
1,3-Dichlorobenzene	ug/kg	5.0	ND	06/28/90
1,4-Dichlorobenzene	ug/kg	5.0	ND	06/28/90
1,2-Dichlorobenzene	ug/kg	5.0	ND	06/28/90
Bromochloromethane (Surrogate Recovery)			109%	06/28/90
1,4-Dichlorobutane (Surrogate Recovery)			92%	06/28/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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July 05, 1990
PACE Project
Number: 400622508

Ch90020/WGR1-012.04

PACE Sample Number:			774640	
Date Collected:			06/21/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B16/15.6	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/30/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/30/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/30/90
Benzene	mg/kg wet	0.005	ND	06/30/90
Ethylbenzene	mg/kg wet	0.005	ND	06/30/90
Toluene	mg/kg wet	0.005	ND	06/30/90
Xylenes, Total	mg/kg wet	0.005	ND	06/30/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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July 05, 1990
PACE Project
Number: 400622508

Ch90020/WGR1-012.04

PACE Sample Number:			774650	
Date Collected:			06/21/90	
Date Received:			06/22/90	
Parameter	Units	MDL	B16/25.6	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/30/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	ND	06/30/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/30/90
Benzene	mg/kg wet	0.005	ND	06/30/90
Ethylbenzene	mg/kg wet	0.005	ND	06/30/90
Toluene	mg/kg wet	0.005	ND	06/30/90
Xylenes, Total	mg/kg wet	0.005	ND	06/30/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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July 05, 1990
PACE Project Number: 400622508

Ch90020/WGR1-012.04

PACE Sample Number:	774660
Date Collected:	06/21/90
Date Received:	06/22/90

Parameter	Units	MDL	Q.C.Batch No.	DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/28/90
Purgeable Fuels, as Gasoline (EPA 8015)	mg/kg wet	1.0	Q6088	06/28/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/28/90
Benzene	mg/kg wet	0.005	Q6089	06/28/90
Ethylbenzene	mg/kg wet	0.005	Q6090	06/28/90
Toluene	mg/kg wet	0.005	Q1137	06/28/90
Xylenes, Total	mg/kg wet	0.005	Q1139	06/28/90
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/kg	20	Q3107	06/28/90
Chloromethane	ug/kg	20	Q3108	06/28/90

MDL Method Detection Limit

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my supervision.

Ruth J. Siegmund
Organic Chemistry Manager

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REPORT OF LABORATORY ANALYSIS

July 13, 1990

Mr. Leonard Niles
Western Geologic Resources
2169 E. Francisco Blvd. Suite B
San Rafael, CA 94901

RE: PACE Project No. 400622.504
Ch 90020/1-012.04

Dear Mr. Niles:

Enclosed is the report of laboratory analyses for samples received June 22, 1990.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Stephen F. Nackord
Director, Sampling and Analytical Services

Enclosures

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REPORT OF LABORATORY ANALYSIS

Western Geologic Resources
2169 E. Francisco Blvd. Suite B
San Rafael, CA 94901

July 13, 1990
PACE Project
Number: 400622504

Attn: Mr. Leonard Niles

Ch 90020/1-012.04

PACE Sample Number:			70 0774136	
Date Collected:			06/22/90	
Date Received:			06/22/90	
			06220-09 A,B,C,D,E, F	
Parameter	Units	MDL		DATE ANALYZED
INORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Cadmium (EPA 6010/200.7, ICP)	mg/L	0.005	ND	07/11/90
Chromium (EPA 6010/200.7)	mg/L	0.01	ND	07/11/90
Lead (EPA Method 7421, Graphite Furnace)	mg/L	0.003	ND	07/09/90
Zinc (EPA Method 6010/200.7, ICP-AES)	mg/L	0.01	ND	07/11/90
ORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Oil and Grease, Gravimetric (503A&E)	mg/L	1	ND	07/03/90
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/03/90
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	50	5700	07/03/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/03/90
Benzene	ug/L	0.5	47	07/03/90
Ethylbenzene	ug/L	0.5	280	07/03/90
Toluene	ug/L	0.5	31	07/03/90
Xylenes, Total	ug/L	0.5	530	07/03/90
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/L	2.0	ND	06/29/90
Chloromethane	ug/L	2.0	ND	06/29/90
Vinyl Chloride	ug/L	2.0	ND	06/29/90
Bromomethane	ug/L	2.0	ND	06/29/90
Chloroethane	ug/L	2.0	ND	06/29/90
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND	06/29/90
1,1-Dichloroethene	ug/L	0.5	ND	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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July 13, 1990
PACE Project Number: 400622504

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PACE Sample Number:			70 0774136	
Date Collected:			06/22/90	
Date Received:			06/22/90	
			06220-09 A,B,C,D,E, F	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Methylene Chloride	ug/L	0.5	ND	06/29/90
trans-1,2-Dichloroethene	ug/L	0.5	ND	06/29/90
1,1-Dichloroethane	ug/L	0.5	ND	06/29/90
Chloroform	ug/L	0.5	ND	06/29/90
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND	06/29/90
Carbon Tetrachloride	ug/L	0.5	ND	06/29/90
1,2-Dichloroethane (EDC)	ug/L	0.5	ND	06/29/90
Trichloroethene (TCE)	ug/L	0.5	ND	06/29/90
1,2-Dichloropropane	ug/L	0.5	ND	06/29/90
Bromodichloromethane	ug/L	0.5	ND	06/29/90
2-Chloroethylvinyl ether	ug/L	0.5	ND	06/29/90
trans-1,3-Dichloropropene	ug/L	0.5	ND	06/29/90
cis-1,3-Dichloropropene	ug/L	0.5	ND	06/29/90
1,1,2-Trichloroethane	ug/L	0.5	ND	06/29/90
Tetrachloroethene	ug/L	0.5	ND	06/29/90
Dibromochloromethane	ug/L	0.5	ND	06/29/90
Chlorobenzene	ug/L	0.5	ND	06/29/90
Bromoform	ug/L	0.5	ND	06/29/90
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	06/29/90
1,3-Dichlorobenzene	ug/L	0.5	ND	06/29/90
1,4-Dichlorobenzene	ug/L	0.5	ND	06/29/90
1,2-Dichlorobenzene	ug/L	0.5	ND	06/29/90
Bromochloromethane (Surrogate Recovery)			105%	06/29/90
1,4-Dichlorobutane (Surrogate Recovery)			101%	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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July 13, 1990
PACE Project Number: 400622504

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PACE Sample Number:			70 0774144	
Date Collected:			06/22/90	
Date Received:			06/22/90	
			06220-10	
			A,B,C,D,E,	
Parameter	Units	MDL	F	DATE ANALYZED
INORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Cadmium (EPA 6010/200.7, ICP)	mg/L	0.005	ND	07/11/90
Chromium (EPA 6010/200.7)	mg/L	0.01	ND	07/11/90
Lead (EPA Method 7421, Graphite Furnace)	mg/L	0.003	ND	07/09/90
Zinc (EPA Method 6010/200.7, ICP-AES)	mg/L	0.01	ND	07/11/90
ORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Oil and Grease, Gravimetric (503A&E)	mg/L	1	ND	07/03/90
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/02/90
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	50	ND	07/02/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/02/90
Benzene	ug/L	0.5	ND	07/02/90
Ethylbenzene	ug/L	0.5	ND	07/02/90
Toluene	ug/L	0.5	ND	07/02/90
Xylenes, Total	ug/L	0.5	ND	07/02/90
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/L	2.0	ND	06/29/90
Chloromethane	ug/L	2.0	ND	06/29/90
Vinyl Chloride	ug/L	2.0	ND	06/29/90
Bromomethane	ug/L	2.0	ND	06/29/90
Chloroethane	ug/L	2.0	ND	06/29/90
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND	06/29/90
1,1-Dichloroethene	ug/L	0.5	ND	06/29/90
Methylene Chloride	ug/L	0.5	ND	06/29/90
trans-1,2-Dichloroethene	ug/L	0.5	ND	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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July 13, 1990
PACE Project Number: 400622504

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PACE Sample Number:	70 0774144
Date Collected:	06/22/90
Date Received:	06/22/90
	06220-10
	A,B,C,D,E,

Parameter	Units	MDL	F	DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
1,1-Dichloroethane	ug/L	0.5	ND	06/29/90
Chloroform	ug/L	0.5	8.9	06/29/90
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND	06/29/90
Carbon Tetrachloride	ug/L	0.5	9.6	06/29/90
1,2-Dichloroethane (EDC)	ug/L	0.5	ND	06/29/90
Trichloroethene (TCE)	ug/L	0.5	ND	06/29/90
1,2-Dichloropropane	ug/L	0.5	ND	06/29/90
Bromodichloromethane	ug/L	0.5	ND	06/29/90
2-Chloroethylvinyl ether	ug/L	0.5	ND	06/29/90
trans-1,3-Dichloropropene	ug/L	0.5	ND	06/29/90
cis-1,3-Dichloropropene	ug/L	0.5	ND	06/29/90
1,1,2-Trichloroethane	ug/L	0.5	ND	06/29/90
Tetrachloroethene	ug/L	0.5	ND	06/29/90
Dibromochloromethane	ug/L	0.5	ND	06/29/90
Chlorobenzene	ug/L	0.5	ND	06/29/90
Bromoform	ug/L	0.5	ND	06/29/90
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	06/29/90
1,3-Dichlorobenzene	ug/L	0.5	ND	06/29/90
1,4-Dichlorobenzene	ug/L	0.5	ND	06/29/90
1,2-Dichlorobenzene	ug/L	0.5	ND	06/29/90
Bromochloromethane (Surrogate Recovery)			121%	06/29/90
1,4-Dichlorobutane (Surrogate Recovery)			103%	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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PACE Project Number: 400622504

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PACE Sample Number:			70 0774152	
Date Collected:			06/22/90	
Date Received:			06/22/90	
			06220-11 A,B,C,D,E,	
Parameter	Units	MDL	F	DATE ANALYZED
INORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Cadmium (EPA 6010/200.7, ICP)	mg/L	0.005	ND	07/11/90
Chromium (EPA 6010/200.7)	mg/L	0.01	ND	07/11/90
Lead (EPA Method 7421, Graphite Furnace)	mg/L	0.003	ND	07/09/90
Zinc (EPA Method 6010/200.7, ICP-AES)	mg/L	0.01	ND	07/11/90
ORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Oil and Grease, Gravimetric (503A&E)	mg/L	1	ND	07/03/90
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/02/90
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	50	ND	07/02/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/02/90
Benzene	ug/L	0.5	ND	07/02/90
Ethylbenzene	ug/L	0.5	ND	07/02/90
Toluene	ug/L	0.5	ND	07/02/90
Xylenes, Total	ug/L	0.5	ND	07/02/90
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/L	2.0	ND	06/29/90
Chloromethane	ug/L	2.0	ND	06/29/90
Vinyl Chloride	ug/L	2.0	ND	06/29/90
Bromomethane	ug/L	2.0	ND	06/29/90
Chloroethane	ug/L	2.0	ND	06/29/90
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND	06/29/90
1,1-Dichloroethene	ug/L	0.5	ND	06/29/90
Methylene Chloride	ug/L	0.5	ND	06/29/90
trans-1,2-Dichloroethene	ug/L	0.5	ND (*)	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.
(*) cis-1,2-Dichloroethene detected at 8.9 ug/L via GC/MS.

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PACE Sample Number:	70 0774152
Date Collected:	06/22/90
Date Received:	06/22/90
	06220-11 A,B,C,D,E,F

Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
1,1-Dichloroethane	ug/L	0.5	ND	06/29/90
Chloroform	ug/L	0.5	6.5	06/29/90
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND	06/29/90
Carbon Tetrachloride	ug/L	0.5	4.6	06/29/90
1,2-Dichloroethane (EDC)	ug/L	0.5	ND	06/29/90
Trichloroethene (TCE)	ug/L	0.5	1.3	06/29/90
1,2-Dichloropropane	ug/L	0.5	ND	06/29/90
Bromodichloromethane	ug/L	0.5	ND	06/29/90
2-Chloroethylvinyl ether	ug/L	0.5	ND	06/29/90
trans-1,3-Dichloropropene	ug/L	0.5	ND	06/29/90
cis-1,3-Dichloropropene	ug/L	0.5	ND	06/29/90
1,1,2-Trichloroethane	ug/L	0.5	ND	06/29/90
Tetrachloroethene	ug/L	0.5	73	06/29/90
Dibromochloromethane	ug/L	0.5	ND	06/29/90
Chlorobenzene	ug/L	0.5	ND	06/29/90
Bromoform	ug/L	0.5	ND	06/29/90
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	06/29/90
1,3-Dichlorobenzene	ug/L	0.5	ND	06/29/90
1,4-Dichlorobenzene	ug/L	0.5	ND	06/29/90
1,2-Dichlorobenzene	ug/L	0.5	ND	06/29/90
Bromochloromethane (Surrogate Recovery)			118%	06/29/90
1,4-Dichlorobutane (Surrogate Recovery)			104%	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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PACE Sample Number:			70 0774160	
Date Collected:			06/22/90	
Date Received:			06/22/90	
			06220-12	
Parameter	Units	MDL	A,B,C,D,E	DATE ANALYZED
ORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Oil and Grease, Gravimetric (503A&E)	mg/L	1	ND	07/03/90
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/02/90
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	50	ND	07/02/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/02/90
Benzene	ug/L	0.5	ND	07/02/90
Ethylbenzene	ug/L	0.5	ND	07/02/90
Toluene	ug/L	0.5	ND	07/02/90
Xylenes, Total	ug/L	0.5	ND	07/02/90
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/L	2.0	ND	06/29/90
Chloromethane	ug/L	2.0	ND	06/29/90
Vinyl Chloride	ug/L	2.0	ND	06/29/90
Bromomethane	ug/L	2.0	ND	06/29/90
Chloroethane	ug/L	2.0	ND	06/29/90
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND	06/29/90
1,1-Dichloroethene	ug/L	0.5	ND	06/29/90
Methylene Chloride	ug/L	0.5	ND	06/29/90
trans-1,2-Dichloroethene	ug/L	0.5	ND (*)	06/29/90
1,1-Dichloroethane	ug/L	0.5	ND	06/29/90
Chloroform	ug/L	0.5	7.3	06/29/90
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND	06/29/90
Carbon Tetrachloride	ug/L	0.5	6.0	06/29/90
1,2-Dichloroethane (EDC)	ug/L	0.5	ND	06/29/90
Trichloroethene (TCE)	ug/L	0.5	ND	06/29/90
1,2-Dichloropropane	ug/L	0.5	ND	06/29/90
Bromodichloromethane	ug/L	0.5	ND	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.
(*) cis-1,2-Dichloroethene detected at 13 ug/L via GC/MS analysis.

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PACE Sample Number:			70 0774160	
Date Collected:			06/22/90	
Date Received:			06/22/90	
			06220-12	
Parameter	Units	MDL	A,B,C,D,E	DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
2-Chloroethylvinyl ether	ug/L	0.5	ND	06/29/90
trans-1,3-Dichloropropene	ug/L	0.5	ND	06/29/90
cis-1,3-Dichloropropene	ug/L	0.5	ND	06/29/90
1,1,2-Trichloroethane	ug/L	0.5	ND	06/29/90
Tetrachloroethene	ug/L	0.5	7.4	06/29/90
Dibromochloromethane	ug/L	0.5	ND	06/29/90
Chlorobenzene	ug/L	0.5	ND	06/29/90
Bromoform	ug/L	0.5	ND	06/29/90
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	06/29/90
1,3-Dichlorobenzene	ug/L	0.5	ND	06/29/90
1,4-Dichlorobenzene	ug/L	0.5	ND	06/29/90
1,2-Dichlorobenzene	ug/L	0.5	ND	06/29/90
Bromochloromethane (Surrogate Recovery)			130%	06/29/90
1,4-Dichlorobutane (Surrogate Recovery)			113%	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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PACE Sample Number:	70 0774187
Date Collected:	06/22/90
Date Received:	06/22/90
	06220-13

Parameter	Units	MDL	A,B	DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/L	2.0	ND	06/29/90
Chloromethane	ug/L	2.0	ND	06/29/90
Vinyl Chloride	ug/L	2.0	ND	06/29/90
Bromomethane	ug/L	2.0	ND	06/29/90
Chloroethane	ug/L	2.0	ND	06/29/90
Trichlorofluoromethane (Freon 11)	ug/L	2.0	ND	06/29/90
1,1-Dichloroethene	ug/L	0.5	ND	06/29/90
Methylene Chloride	ug/L	0.5	ND	06/29/90
trans-1,2-Dichloroethene	ug/L	0.5	ND	06/29/90
1,1-Dichloroethane	ug/L	0.5	ND	06/29/90
Chloroform	ug/L	0.5	ND	06/29/90
1,1,1-Trichloroethane (TCA)	ug/L	0.5	ND	06/29/90
Carbon Tetrachloride	ug/L	0.5	ND	06/29/90
1,2-Dichloroethane (EDC)	ug/L	0.5	ND	06/29/90
Trichloroethene (TCE)	ug/L	0.5	ND	06/29/90
1,2-Dichloropropane	ug/L	0.5	ND	06/29/90
Bromodichloromethane	ug/L	0.5	ND	06/29/90
2-Chloroethylvinyl ether	ug/L	0.5	ND	06/29/90
trans-1,3-Dichloropropene	ug/L	0.5	ND	06/29/90
cis-1,3-Dichloropropene	ug/L	0.5	ND	06/29/90
1,1,2-Trichloroethane	ug/L	0.5	ND	06/29/90
Tetrachloroethene	ug/L	0.5	ND	06/29/90
Dibromochloromethane	ug/L	0.5	ND	06/29/90
Chlorobenzene	ug/L	0.5	ND	06/29/90
Bromoform	ug/L	0.5	ND	06/29/90
1,1,2,2-Tetrachloroethane	ug/L	0.5	ND	06/29/90
1,3-Dichlorobenzene	ug/L	0.5	ND	06/29/90
1,4-Dichlorobenzene	ug/L	0.5	ND	06/29/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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PACE Sample Number:			70 0774187	
Date Collected:			06/22/90	
Date Received:			06/22/90	
			06220-13	
Parameter	Units	MDL	A,B	DATE ANALYZED
ORGANIC ANALYSIS				
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
1,2-Dichlorobenzene	ug/L	0.5	ND	06/29/90
Bromochloromethane (Surrogate Recovery)			117%	06/29/90
1,4-Dichlorobutane (Surrogate Recovery)			102%	06/29/90
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/26/90
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	50	ND	06/26/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/26/90
Benzene	ug/L	0.5	ND	06/26/90
Ethylbenzene	ug/L	0.5	ND	06/26/90
Toluene	ug/L	0.5	ND	06/26/90
Xylenes, Total	ug/L	0.5	ND	06/26/90

MDL Method Detection Limit
ND Not detected at or above the MDL.

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PACE Sample Number:	70 0774179
Date Collected:	06/22/90
Date Received:	06/22/90

Parameter	Units	MDL	Q.C.Batch No.	DATE ANALYZED
INORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Cadmium (EPA 6010/200.7, ICP)	mg/L	0.005	N1579/M972	07/11/90
Chromium (EPA 6010/200.7)	mg/L	0.01	N1579/M972	07/11/90
Lead (EPA Method 7421, Graphite Furnace)	mg/L	0.003	N2563/M968	07/07/90
Zinc (EPA Method 6010/200.7, ICP-AES)	mg/L	0.01	N1579/M972	07/11/90
ORGANIC ANALYSIS				
INDIVIDUAL PARAMETERS				
Oil and Grease, Gravimetric (503A&E)	mg/L	1	P976	07/03/90
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/26/90
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	50	Q2139	06/26/90
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	06/26/90
Benzene	ug/L	0.5	Q2142	06/26/90
HALOGENATED VOLATILE COMPOUNDS EPA 8010				
Dichlorodifluoromethane	ug/L	2.0	Q3108	06/29/90

MDL Method Detection Limit

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The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my supervision.

Robert P. Chrin
Inorganic Chemistry Manager

Ruth J. Siegmund
Organic Chemistry Manager

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