

BSK JOB NUMBER P92057.3

~~OFF-SITE SOIL & GROUNDWATER~~
~~CONTAMINATION CHARACTERIZATION~~
AND SEVENTH QUARTERLY GROUNDWATER
MONITORING REPORT
UNOCAL 76 SERVICE STATION
20405 AND 20629 REDWOOD ROAD
CASTRO VALLEY, CALIFORNIA



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revised 7/16/92
SD

May 29, 1992

BSK Job No. P92057.3

R.T. Nahas Company/Eden Managements
20630 Patio Drive
Castro Valley, CA 94546

Attention: Mr. Randy T. Nahas

Subject: Off-Site Soil & Groundwater Lateral Contamination Characterization
and Seventh Quarterly Groundwater Monitoring Report
Unocal 76 Service Station
20405 and 20629 Redwood Road
Castro Valley, California

Dear Mr. Nahas:

As requested and authorized, BSK & Associates has performed work further defining the extent and character of motor fuel contamination of shallow soil and groundwater in the vicinity of the Unocal Service Station indicated above.

The work was performed in general conformance with the tasks described in our Work Plan, Proposal PR92001 of January 14, 1992, which was approved by the Alameda County Department of Environmental Health (ACEH). The Work Plan was developed in response to ACEH's letter to R.T. Nahas Company of December 10, 1991, requesting further action regarding the characterizatoin of the contaminant plume.

Also included in this report is the Seventh Quarterly Monitoring Report for Wells MW-2, MW-3, and MW-4 at the Unocal 76 service station.

BSK & Associates appreciates this opportunity to continue to be of service to you in this matter. If there are questions or concerns regarding the content of this report, please contact us.

Respectfully submitted,
BSK & Associates

Alex Y. Eskandari, C.E. 38101
Project Manager

Tim W. Berger, R.G. 5225
Project Geologist

AYE/TWB:hbc (RPTS/ENV/M04)

Distribution: R.T. Nahas (5 copies)

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SECTION 1 - OFF-SITE SOIL AND GROUNDWATER LATERAL CONTAMINATION CHARACTERIZATION

INTRODUCTION

This study has been performed in order to further characterize the lateral extent of shallow soil and groundwater contamination by motor fuel, that apparently emanates from within the boundaries of the Unocal Service Station located at 20405 Redwood Road in Castro Valley, California. This study supplements previous characterizations and groundwater monitoring performed by BSK at this site since December 1989. Prior to this study, an assessment of the type and extent of shallow soil and groundwater contamination occurring on Nahas Company property adjoining the Service Station had been made. Previous work indicated that shallow soil and groundwater contamination extended off-site to the south, onto property located at 20629 Redwood Road (not held by the Nahas Company). As such, the lateral extent of the soil and groundwater degradation was not established.

SITE CONDITIONS

The present study area is comprised of the driveway and parking areas of a Safeway grocery store, and a small, single-story retail building housing a liquor store, dry cleaner, clothing and sporting goods stores. The driveway and parking areas are paved in asphaltic concrete. The surface gradient is to the south and east. **No storm drain system was observed in the area.** Drainage is apparently to Redwood Road. The grocery and retail stores are heavily used. The grocery is open 24-hours a day. The retail building and attendant parking to the middle of the access driveway is owned by a private party other than R.T. Nahas Company. Safeway owns the remainder of the site.

The project site location is shown in Figure 1-1, Site Location Map. A diagram of the project area is provided in Figure 1-2, Site Plan.

PURPOSE AND SCOPE

As stated in our Work Plan, Proposal PR92001 dated January 14, 1992, this study was performed in order to further define the lateral extent of motor fuel contamination of shallow soil and groundwater to the east, west and south, on the properties south of the Unocal Service Station.

In order to assess the lateral boundaries of contamination, five tasks were performed, as proposed in the Work Plan.

Task 1 consisted of the advancement and sampling of five borings to observe and sample shallow soils. Task 2 involved the installation of three shallow groundwater monitoring wells at locations considered to be near the outside edges of the contaminant plume, as defined by the Task 1 borings. Tasks 3 and 4 consisted of the development, sampling, and horizontal and vertical location of the three new wells and the three previously installed wells in the Service Station area. Preparation of a report summarizing the work performed and findings of the investigation was Task 5.

FIELD WORK

Field work was performed during the period of March 30 to April 27, 1992. During that period, five borings were advanced, three shallow groundwater monitoring wells were installed, developed, logged and sampled, and a licensed surveyor located the new and existing wells horizontally and vertically.

Borings were advanced using a Mobile Drill B-53 truck mounted rotary rig and 8 inch O.D. hollow-stem auger. The boring locations are shown on Figure 2, Site Plan. The borings were logged and sampled by a registered geologist. Soil classification was performed in accordance with the Unified Soil Classification System. The soil classification system and boring logs are presented in Appendix A, Figures A-1 through A-6. Soil samples were obtained every 5 feet, or as necessary to describe the soil and contaminant profiles. Samples were obtained for chemical analysis using a 2.0 inch I.D. split spoon sampler, housing three stainless-steel, 2x6-inch sample liners. The sampler was driven into the desired soil ahead of the auger using a 140 pound slide hammer. Upon sampler withdrawal, the liners were recovered, and the selected soil-filled liner capped at each end with Teflon® sheeting and pressure-fitted plastic caps, taped, labeled and refrigerated for delivery to our State-certified analytical laboratory. Samples obtained for observation and/or classification were sampled using a Standard Penetration Sampler of 1.4-inch I.D.

A Photoionization Detector (PID) was used in the field to screen soil and borehole gasses for hydrocarbons. The PID was calibrated at the beginning and end of each field day using a 100 ppm isobutylene standard. The PID uses a 10.0 ev lamp.

Groundwater monitoring wells were installed in three of the five borings, as shown on the Site Plan. The wells were constructed of two inch I.D. PVC screen and casing. The details of each well construction are given in the Well Construction Diagrams, Appendix A,

Figures A-7 through A-9. The wells were constructed in accordance with state and local monitoring well construction requirements.

The three new Monitoring Wells, MW-5, MW-6 and MW-7, were developed by surging and pumping with a 1.7 inch O.D. PVC hand pump. The wells were developed until free sediment was removed and the water achieved a degree of clarity. Approximately 50 gallons of water were removed from each well. The wells were developed after three days following well installation.

Groundwater samples were obtained from each well. Prior to sampling, each well was purged of four to ten volumes of water and allowed to equilibrate. The water samples were then obtained in the order of the desired analytes volatility, using a Teflon® bladder pump or bailer. During purging and sampling, a record of the temperature, pH and conductivity of the well water was obtained. In addition, observations of the water quality, sample containers and preservatives, and other pertinent data were recorded. These records are shown in Appendix A, Figures A-10 through A-12, Well Field Logs.

A licensed land surveyor determined the location and elevation of the new and existing wells. The locations were determined with respect to existing property boundaries. Elevations were determined with respect to an Alameda County benchmark (Red-Jami; 1977) at the southwest return of Redwood Road and Jamison Way, Castro Valley. Elevations were shot at the center of each well cover.

Drilling and soil and water sampling equipment used at the site were cleaned prior to introduction to the site, and between samples and borings to reduce the possibility of cross-contamination of site soil and water from off-site, and between contaminated and clean areas on-site.

Drilling and sampling spoils, and waste water generated during well development, purging and sampling activities were contained at the site in DOT-approved 55-gallon waste drums. The drums were labeled with respect to the origin and type of the contents, date of waste generation and type of suspected waste. The drums were stored behind the Unocal Service Station.

Each soil boring not used for monitoring well emplacement was sealed to the surface with 11-sack cement/sand slurry. The sanitary surface seal for each monitoring well is composed of neat cement to a depth in excess of 10 feet. Each well head is encased in a flush-mounted traffic-worthy well box with tamper resistant lid. Each casing top is fitted with a locking well plug and padlock. In addition, each well box contains a tag describing the construction, type and date of the well installation.

SUBSURFACE CONDITIONS

As observed and recorded during field activities, subsurface conditions as explored by our 21.5 to 36.5 foot borings consist of 10 to 20 feet of dark gray to yellow-gray silty clay, the upper 10 feet of which may be fill. ~~The silty clay is underlain by 4 to 5 feet of orange-brown clayey silt to silty sand. This unit often contains fine, wet to saturated pores.~~ At fifteen to twenty feet in depth, a silty to sandy grayish clay is encountered. This clay is very stiff to hard, often porous, and contains thin saturated lenses of fine sand and silt. At approximately 25 feet, clayey sand to sand was encountered. ~~This unit is soft to firm and contains many fine lenses of sand, silt and clay. The sand and silt are typically saturated.~~

First groundwater was encountered from [REDACTED]. Water appeared to emanate from thin silt and sand lenses. ~~Water does not appear to be from one particular sedimentary unit. The reason for the disparity in the initial depths of encounter is unknown. However, the piezometric surface determined from the new and existing wells indicates that the water bearing strata are connected.~~ As determined from all the wells at the site, groundwater flow in the project area is essentially due south at a gradient of 0.7 percent at the time of measurement. A map illustrating the potentiometric surface and flow direction is presented in Figure 1-3, Potentiometric Surface Map.

Capillary fringe
As observed in the field and based on analytical test results, [REDACTED]. ~~The greatest concentrations were observed at or near the level of first encountered groundwater. Contamination was observed to be in wet pores and vertical seams in clay horizons. A representation of the assessed approximate limits of the contamination is presented in Figure 1-4, Extent of Shallow Soil and Groundwater Contamination.~~

CHEMICAL ANALYSES

Five soil samples and two sets of three water samples were obtained during this investigation. The soil and water samples were analyzed for gasoline related compounds. The tests prescribed by the Tri-Regional Water Quality Control Board (RWQCB) are GCFID(5030) for Total Petroleum Hydrocarbons as Gasoline (TPH-G), and EPA Methods 8020 and 602 for Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) for soil and water, respectively. TPH for diesel (TPH-D) by GCFID (3550) was also run on all samples in case of aged product or additional waste streams. ~~No lead testing was performed due to the negative results of previous investigations.~~

The results of the soil and water analyses are summarized in the following tables. The Chemical Test Data Sheets are presented in Appendix B with project Chain-of-Custody Documentation.

SUMMARY OF CHEMICAL TEST DATA - SOIL

Units are in mg/kg (ppm) unless otherwise stated

TABLE 1
BTEX, TPH-G and TPH-D

<u>Sample Designation</u> (Action Level)	C o n s t i t u e n t s					
	<u>B</u>	<u>T</u>	<u>E</u>	<u>X</u>	<u>TPH-G</u>	<u>TPH-D</u>
	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
SB-14 at 21'	ND	ND	ND	ND	ND	ND
SB-15 at 20.5'	ND	0.007	ND	0.008	ND	3.0
MW-5 at 21'	ND	ND	ND	ND	ND	ND
MW-6 at 16'	ND	ND	ND	ND	ND	ND
MW-7 at 15.5'	ND	ND	ND	ND	ND	ND

ND - None Detected
NA - Not Available

SUMMARY OF CHEMICAL TEST DATA - WATER

Units are in ug/l (ppb) unless otherwise stated

TABLE 2
BTEX and TPH-G

<u>Sample Designation</u> (Action Level)	C o n s t i t u e n t s				
	<u>B</u>	<u>T</u>	<u>E</u>	<u>X</u>	<u>TPH-G</u>
	(1)+	(100)+	(680)+	(1750)+	(100)*
<u>4/13/92</u>					
MW-5	ND	ND	ND	ND	ND
MW-6	ND	0.3	ND	ND	ND
MW-7	0.4	0.3	0.3	0.9	1100
<u>4/27/92</u>					
MW-5	ND	ND	ND	ND	ND
MW-6	ND	ND	ND	ND	ND
MW-7	ND	ND	ND	ND	1100

ND - None Detected

* - Action Levels are informal, but are often used to indicate the need for further or continued assessment.

+ - Action Levels are California Department of Health Services Drinking Water Standards, except Toluene, which is a Recommended Drinking Water Action Level (CaDHS).

retest -> looking for x-contamination.

R.T. NAHAS COMPANY *Since 1947*

REAL ESTATE DEVELOPERS AND INVESTORS

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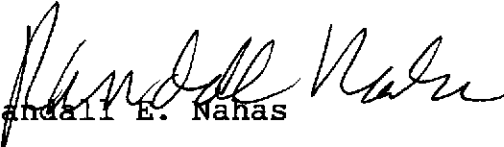
June 5, 1992

Mr. Scott Seery
Hazardous Materials Specialist
Alameda County Health Care Services
80 Swan Way, Room 220
Oakland, CA 94621

Dear Scott:

Enclosed is the most recent Off-Site Soil and
Groundwater Contamination Report for the Unocal 76
service station on Redwood Road in Castro Valley.

Sincerely,


Randall E. Nahas

REN/hrs

Enclosure

02 JUN 1992 10:18 AM

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The following conclusions are interpreted from information obtained during this investigation as well as previous investigations at the site.

1. Shallow soil and groundwater contamination by gasoline type motor fuel exists within the present study area, south of the R.T. Nahas property/Unocal Service Station. Contamination extends beneath the retail building and continues into the Safeway parking lot, as shown on Figure 1-4, Extent of Shallow Soil and Groundwater Contamination.
2. The western lateral limit of significant soil contamination appears to be east of the MW-5 boring location. The eastern limit is likely in close proximity to Well MW-6. The southern limit likely extends south of Well MW-7.
3. The vertical limit of soil contamination is unknown, however, significant contamination is likely relegated to within a few feet of the first encountered groundwater surface.
4. The western lateral limit of shallow groundwater contamination appears to lie east of Well MW-5. The eastern limit may be in close proximity to Well MW-6. The southern extent of groundwater contamination is south of Well MW-7.
5. The vertical limit of groundwater contamination is unknown. The vertical limit of the shallowest aquifer has not been explored. Underlying aquifers have not been located. Gasoline related contamination in what is likely a discharge portion of the water basin is likely to remain shallow. With increasing distance from the source, however, the depth of contamination will likely increase.
6. The assessment of risk to the public from the contaminant plume is outside the scope of this study. The entrapment of volatile vapors within the aggregate base rock beneath the asphalt pavement was not noted on the project site.

Recommendations

Based upon the foregoing conclusions, the following recommendations are considered appropriate at this time.

1. **Define The Southern Limit of Shallow Groundwater Contamination.**

To define the southern limit of contamination, a monitoring well should be located such that contamination is not yet encountered in the well. The location of the "limiting" well could be determined by the installation of wells at regular intervals along the plume axis until a well sample reads non-detect. **The limiting well may also be located by obtaining groundwater "grab samples" along the plume axis using a HydroPunch II or similar groundwater sampling system, which would likely be more economical than the previous method.**

2. **Regular Monitoring Of Existing Groundwater Monitoring Wells.**

Quarterly monitoring of the new and existing wells should be performed. Current quarterly monitoring reports would be expanded to include the additional monitoring wells.

The recommendations made in BSK Report P90165 of April 29, 1991 which have not been wholly addressed by this study, are still considered valid and appropriate.

* * * * *

The following Figures are attached and complete this report:

- | | |
|----------|------------------------------------------------------|
| Figure 1 | Site Location Map |
| Figure 2 | Site Plan |
| Figure 3 | Potentiometric Surface Map |
| Figure 4 | Extent of Shallow Soil and Groundwater Contamination |

CHECKED BY

DATE 5/27/92

BY TUD

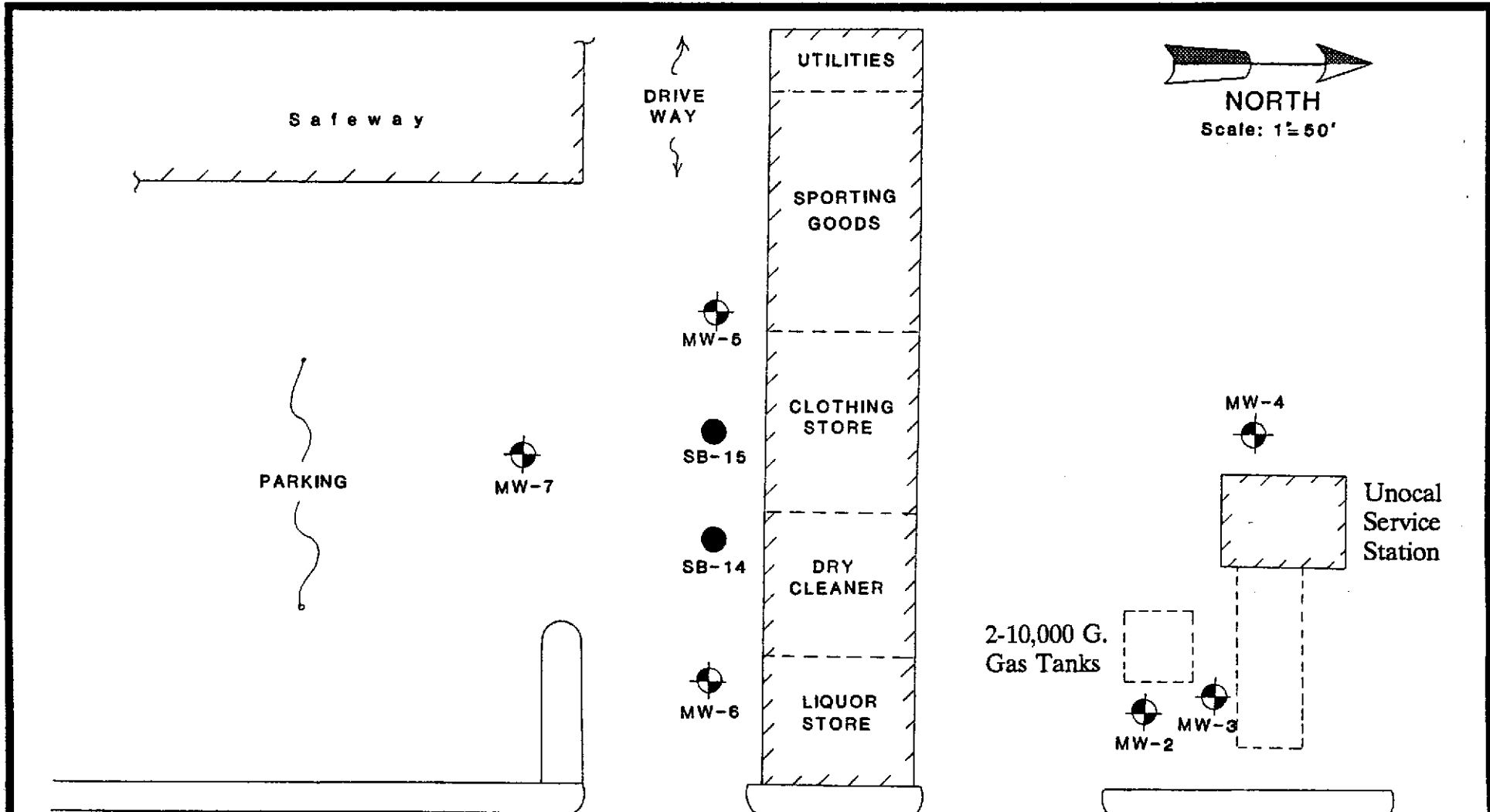


VICINITY MAP



SOIL AND GROUNDWATER
 LATERAL PLUME CHARACTERIZATION
 UNOCAL 76 SERVICE STATION
 20405 AND 20629 REDWOOD ROAD
 CASTRO VALLEY, CALIFORNIA

Job No. P92057.3
 May 1992
 FIGURE: 1-1

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 & Associates



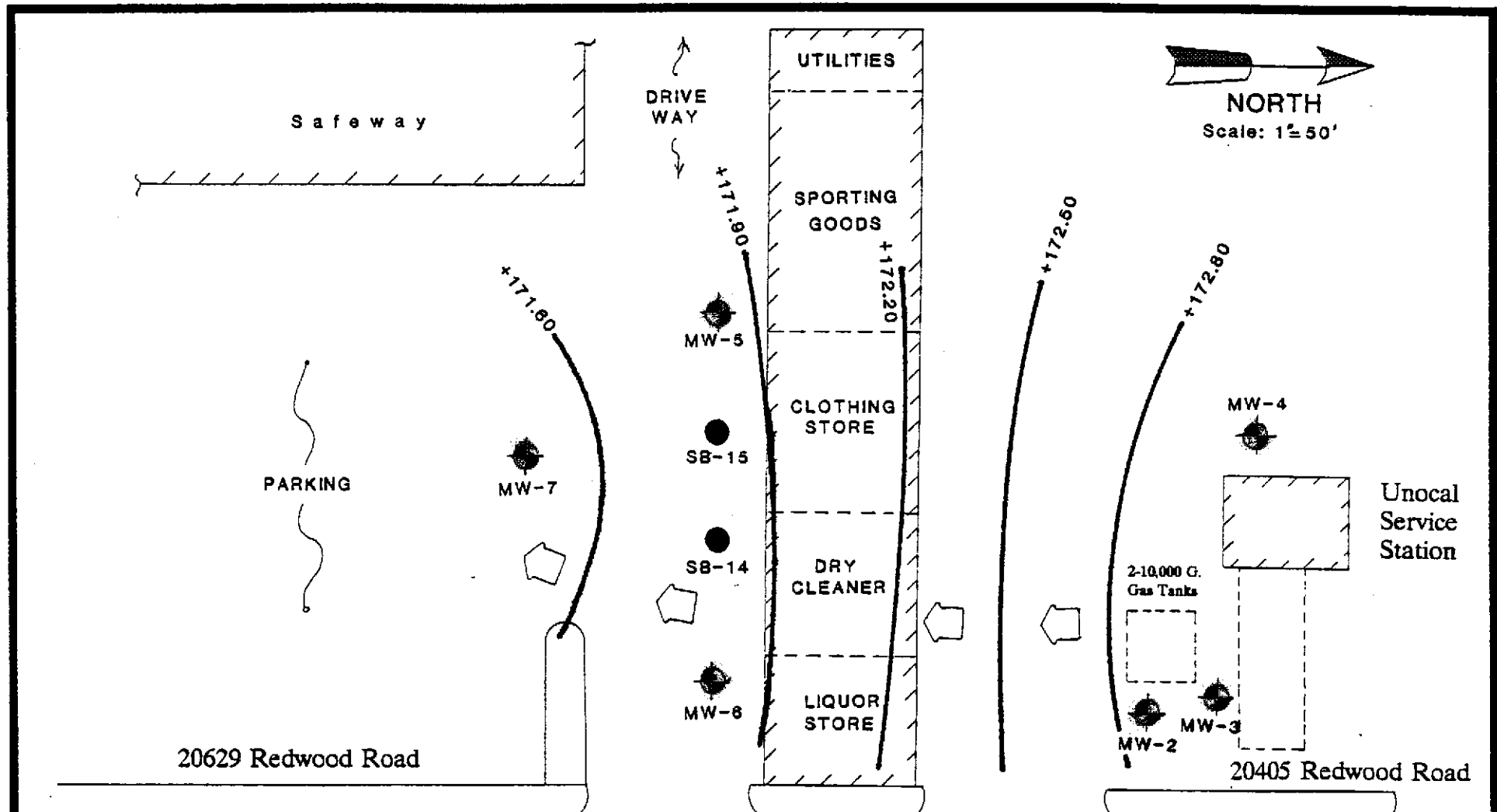
LEGEND:

- 
 - Location And Designation Of Groundwater Monitoring Well
- 
 - Location And Designation Of Shallow Soil Boring

SITE PLAN





Job No. P92057.3
 May 1992
 FIGURE: 1-2





NORTH
Scale: 1" = 50'

LEGEND:

-  - Location And Designation Of Groundwater Monitoring Well
-  - Location And Designation Of Shallow Soil Boring
-  - Line Of Equal Potentiometric Surface Elevation (5/3/92)
-  - Groundwater Flow Direction (5/3/92)

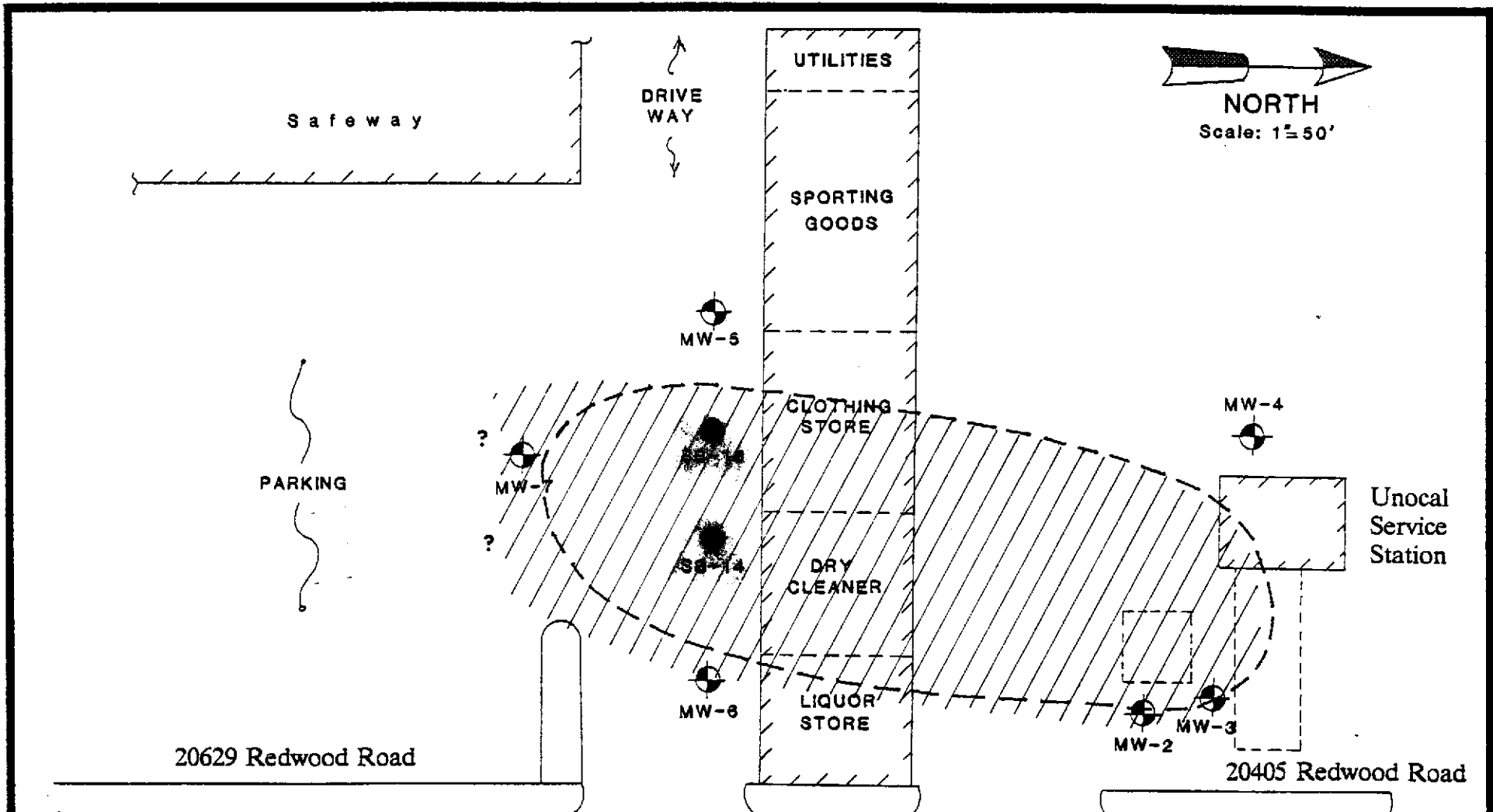
REDWOOD ROAD

Gradient Is Approximately 0.7%





POTENTIOMETRIC SURFACE MAP

Job No. P92057.3
May 1992
FIGURE: 1-3

BSK
& ASSOCIATES



LEGEND:

-  - Location And Designation Of Groundwater Monitoring Well
-  - Location And Designation Of Shallow Soil Boring
-  - Approximate Limit Of Shallow Soil Contamination
-  - Approximate Limit Of Known Shallow Groundwater Contamination

EXTENT OF SHALLOW SOIL AND GROUNDWATER CONTAMINATION

Job No. P92057.3
 May 1992
 FIGURE: 1-4

BSK
 & ASSOCIATES

SECTION 2 - SEVENTH QUARTERLY GROUNDWATER MONITORING REPORT
WELLS MW-2, 3 AND 4

INTRODUCTION

As requested and authorized, we have performed groundwater monitoring well quarterly sampling on April 20, 1992 at the above-referenced facility. This quarterly report presents the project background, groundwater data obtained during this sampling event, conclusions based on this quarter's data, and recommendations for further action.

BACKGROUND

BSK & Associates installed three groundwater monitoring wells in December 1989, at the Unocal 76 Service Station located at 20405 Redwood Road, Castro Valley, California. The service station location is shown on Figure 1, Vicinity Map. The monitoring facilities were installed in order to comply with the California UST Monitoring requirements of Alternative 6, Subchapter 16, Title 23, California Code of Regulations. Initially, the plan included four monitoring wells with at least one well (MW-1) to be located down-gradient of the existing tank cluster. However, due to the encounter of fuel contamination of soil from approximately 10 to 13 feet below grade during boring for monitoring well installation, the down-gradient borings (MW-1 and MW-1A) were backfilled with 11-sack cement-sand grout following soil sampling in order to avoid further groundwater contamination. The results of well installations, soil sampling and chemical testing of the soil and water samples were summarized in Our Report P89134, dated February 5, 1990. The installed and attempted groundwater monitoring well locations are shown in Figure 2-2, Site Plan.

Following a subsequent meeting with Eden Managements and Mr. Scott Seery on April 24, 1990, and receipt of the Alameda County Environmental Health letter dated April 24, 1990, we prepared and submitted our Proposal PR90066 to provide quarterly monitoring services for one year, and to assess the extent of soil contamination at the subject site. A Soil Contamination Assessment Work Plan was also prepared in accordance with Appendix "A" of the Regional Board Staff Recommendations.

The first quarterly groundwater monitoring report was submitted on August 30, 1990. The first quarterly report concluded that an apparent unauthorized petroleum release had occurred at the site, based on groundwater data adjacent to, but up-gradient from the UST group. This report also reiterated that a down-gradient well does not exist at the site.

BSK & Associates submitted the second quarterly groundwater monitoring report in January 1991. The second quarterly report verified that motor fuel hydrocarbons were present in groundwater at the site. Benzene and TVH concentrations remained above primary drinking water and informal action levels, respectively.

BSK performed an assessment of the lateral extent of shallow soil contamination in April 1991 (see our Report P90165, dated April 1991). During this investigation, shallow soil contamination was observed to occur from the pump islands to the south property boundary, and within the east and west property boundaries.

The third quarterly monitoring report was submitted contemporaneously with the soil contamination assessment. A large increase in contaminant concentrations in Wells MW-2 and MW-3 was reported in conjunction with water level increase due to March precipitation. Toluene levels were observed to exceed recommended limits, in addition to Benzene and Total Petroleum Hydrocarbons.

A fourth quarterly groundwater monitoring report was submitted on July 30, 1991. In this report, contaminant levels are shown to be sharply reduced to below previously recorded levels. Benzene, however, remained above recommended allowable levels.

The fifth quarterly groundwater monitoring report of November 12, 1991 showed a continued decrease in contaminant concentration, likely resultant of a further decrease of groundwater levels. No contaminants were detected in Well MW-3.

The sixth quarterly monitoring of January 30, 1992 revealed increases in all the constituents tested in Wells MW-2 and 3. The increases were likely in response to the increase in groundwater level due to winter precipitation.

Review of Subsurface Conditions

The site subsurface soil conditions, as exposed by Well Borings MW-1A, MW-2, MW-3, and MW-4 of our previous investigation (P89134), consist primarily of silty and sandy clays. Four to five feet of black organic-rich silty clay fill are found immediately below the ground surface, followed by three to five feet of greenish-gray sandy/silty clay native material. In the western portion of the study area, the greenish clay is underlain by seven to eleven feet of yellow-brown sandy clay, grading to a clayey sand with depth. In the eastern portion of the tank area, the sandy clay and clayey sand are split by a six foot layer of silty clay. Light brown silty clay was encountered in each boring between 17 and 24 feet, and continued to the final depth explored. It is apparent from the boring logs that this lowermost clay layer slopes to the northeast. For additional subsurface detail, see Subsurface Profile, Figure 2-3.

Groundwater within the site has been encountered at both 13 to 15 feet and 19 to 23 feet. The lower water levels occur in clayey sands along the east and west boundaries of the site, and likely in its northern one-third. This water horizon is considered the first primary aquifer. A shallow "perched" water is found in clayey sand at 13 to 15 feet, occurring throughout the south-central portion of the site. Hydrostatic pressure in both units results in a piezometric surface at 10 to 12 feet below ground surface. The similar piezometric surface suggests that the "perched" water is connected to the underlying aquifer. Additional evidence for this connection is the lack of a confining layer below the upper clayey sand in several borings in the south-central portion of the site.

Groundwater flow direction at the site has been towards the southwest since December 1989. Gradient has varied at the site from 2.0% to 0.4%. Electrical conductivity is a relatively low 500 to 1,000 micromhos, and pH has generally been slightly acidic. Seasonal precipitation appears to have resulted in a more southerly flow, a flatter gradient, and 1 to 2 feet higher water levels in early spring. This data is derived from measurements made of the lower groundwater unit.

Soil contamination by petroleum hydrocarbons was observed olfactorily and by Photoionization Detector (PID) in 11 borings in the south-central portion of the site. Hydrocarbons were detected at depths ranging from just below the asphalt pavement to 16 feet (the greatest depth of several borings in the area of high hydrocarbon contamination). PID values reached 3,600 ppm total ionizable hydrocarbons in soil (the PID was calibrated daily to a 100 ppm isobutylene standard with a 10.6 eV lamp). The greatest concentrations were observed between 10 feet in depth and first encountered groundwater (where encountered). It was noted that contamination was not always accompanied by soil staining, and volatilization was rapid upon exposure to air.

Groundwater contamination has been encountered at the site in samples obtained quarterly from Wells MW-2 and MW-3 in the lower water horizon. These wells are considered to be up and cross-gradient to what is believed to be the contaminant source area. Sheen and possible free product were observed on "perched" water in the exploratory soil borings, and on auger and soil removed from the boreholes.

SEVENTH QUARTERLY MONITORING ACTIVITIES

General

Quarterly monitoring and/or observation of Underground Storage Tank (UST) groundwater monitoring wells (MW-2, MW-3 and MW-4) were performed on April 20, 1992. Field procedures and observations are provided in the following text and figures.

Field Work

Wells MW-2, MW-3 and MW-4 were purged using a PVC bailer or Teflon® bladder pump. Four well volumes were removed from each well. Purge effluent was field monitored for pH, Conductivity and Temperature during purging, to assess the influx of fresh formational water into the well. Purged water was then transferred to a 55-gallon DOT-approved steel drum for holding. The drum was labeled according to its contents, suspected contaminants, content source, date, etc.

Prior to purging, the depth to water in each well was measured using a Solinst electric sounding tape, marked in twentieths of a foot. The water depth was then interpolated to a hundredth of a foot increment from the tape. Each well was subsequently examined for floating and sinking immiscible product layers, sheen and odor, using a clean PVC bailer having dual check valves for point source sampling. Groundwater flow direction and gradient data were determined from the depth measurements, and are presented in Figure 2-4, Potentiometric Surface Map. Upon purge completion, each well was again measured to confirm a minimum of 80% well recovery prior to sampling. Water sampling was then performed with a Teflon® bailer or bladder pump. Sampling for contaminants was done in the order of their volatility, with the most volatile constituents sampled first. Sampling for contaminants known to have densities greater than water were sampled at the bottom of the well. Each water sample obtained for a specific contaminant, or contaminants, was placed into the appropriate receptacle, sealed, labeled and refrigerated for delivery to our State-certified laboratory.

A Well Field Log was prepared for each well sampled, recording the water depth, well volume, water temperature and other data. The Well Field Logs are shown as Figures 5.1 through 5.3.

Site Hydrology

In conjunction with the investigation of lateral contamination in the first section of this submittal, groundwater measurements were made of all six wells on May 5, 1992, in order to better assess the flow and gradient in the area. On this date, groundwater flow is nearly due south at a gradient of 0.7 percent. This flow is more southerly than the previous quarter. The gradient is 0.3 percent less than the previous quarter. Groundwater levels have dropped 0.29 to 0.50 feet in Wells MW-3 and MW-2, respectively, and risen 0.14 feet in Well MW-4 since January 1992. Groundwater flow direction and gradient are shown on Figure 4, Potentiometric Surface Map.

Conductivity, pH and temperature data are presented in the Well Field Logs, Figures 5.1 through 5.3. Little significant change has occurred in these parameters.

The changes in flow direction and water level since October 1991 are likely the result of a rising water table due to winter precipitation.

Chemical Analyses

The water samples obtained from Wells MW-2 and MW-3 were analyzed for constituents related to gasoline, since the wells are located adjacent to two 10,000 gallon underground gasoline tanks. Well MW-4 is located adjacent to a waste oil tank. The samples were tested for the following contaminants: Total Volatile Hydrocarbons (TVH) and Benzene, Toluene, Xylene and Ethylbenzene (BTXE) and Oil and Grease.

The contaminants tested are those specified by the Tri-Regional Water Quality Control Board Recommendations of August 10, 1990 and listed in the Alameda County Department of Environmental Health letter, dated April 26, 1990 to R.T. Nahas Co. Current and former analyses results are presented for comparison in the following tables. The Chemical Test Data Sheets are presented in Appendix C, Figures C-1 and C-5. Project Chain-of-Custody record is shown as Figure C-6.

WATER ANALYSES

TABLE 1

(Results in ppb)

<u>Sampling Date</u>	<u>Sample Location</u>	<u>Benzene (1)*</u>	<u>Toluene (100)+</u>	<u>Xylene (1750)*</u>	<u>Ethylbenzene (680)*</u>
October 1990	Well MW-2	64	30	160	35
	Well MW-3	18	ND	5.6	3.8
	Well MW-4	ND	ND	ND	ND
December 1990	Well MW-2	17	10	59	13
	Well MW-3	7	2	5	2
January 1991	Well MW-2	50	33	110	22
	Well MW-3	29	3.3	34	9.7
April 1991	Well MW-2	640	520	790	170
	Well MW-3	450	270	760	150
	Well MW-4	ND	ND	ND	ND
July 1991	Well MW-2	14	1	17	8
	Well MW-3	14	14	33	8
October 1991	Well MW-2	2.9	ND	6	2.5
	Well MW-3	ND	ND	ND	ND
	Well MW-4	ND	ND	ND	ND
January 1992	Well MW-2	480	870	860	160
	Well MW-3	4	10	8	2
April 1992	Well MW-2	70	0.3	7.0	15
	Well MW-3	1.0	0.4	0.9	ND
	Well MW-4	ND	ND	ND	ND

ND = None Detected

*DHS: Primary Drinking Water Standard (3/89)

+DHS: Action Level

TABLE 2
(Results in ppb)

<u>Sampling Date</u>	<u>Sample Location</u>	<u>TPH (100)*</u>	<u>TVH (100)*</u>	<u>Oil and Grease (100)*</u>
October 1990	Well MW-2	--	740	--
	Well MW-3	--	87	--
	Well MW-4	ND	ND	ND
December 1990	Well MW-2	--	370	--
	Well MW-3	--	76	--
January 1990	Well MW-2	--	430	--
	Well MW-3	--	110	--
April 1991	Well MW-2	--	4800	--
	Well MW-3	--	3600	--
	Well MW-4	ND	ND	ND
July 1991	Well MW-2	--	220	--
	Well MW-3	--	220	--
October 1991	Well MW-2	--	170	--
	Well MW-3	--	150	--
	Well MW-4	ND	ND	ND
January 1992	Well MW-2	--	5200	--
	Well MW-3	--	60	--
April 1992	Well MW-2	--	300	--
	Well MW-3	--	ND	--
	Well MW-4	ND	ND	ND

-- = Not Tested
ND = None Detected

*Quantified Action Levels are not provided for these parameters.
The amount given is often informally used by regulatory agencies as a threshold value to assess the need for further action.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

On the basis of our findings to date, an unauthorized fuel release to soil and groundwater has occurred at the site, in the vicinity of the two 10,000-gallon underground gasoline storage tanks.

Contaminants associated with gasoline have decreased in Monitoring Wells MW-2 and MW-3 since the last quarterly sampling event (January 1992). At this time, Benzene concentrations meet or exceed State and Federal Standards in Wells MW-2 and MW-3. The Toluene concentration in Well MW-2 does not exceed Standards this quarter. Although no Standard has been devised for Total Volatile Hydrocarbon concentration, the quantity observed in Well MW-2 exceeds general informal regulatory action levels.

The decrease in contaminant concentrations is likely related to falling groundwater levels.

There are now three groundwater monitoring wells located down-gradient from the source of contamination area (see Section 1 of this report).

Recommendations

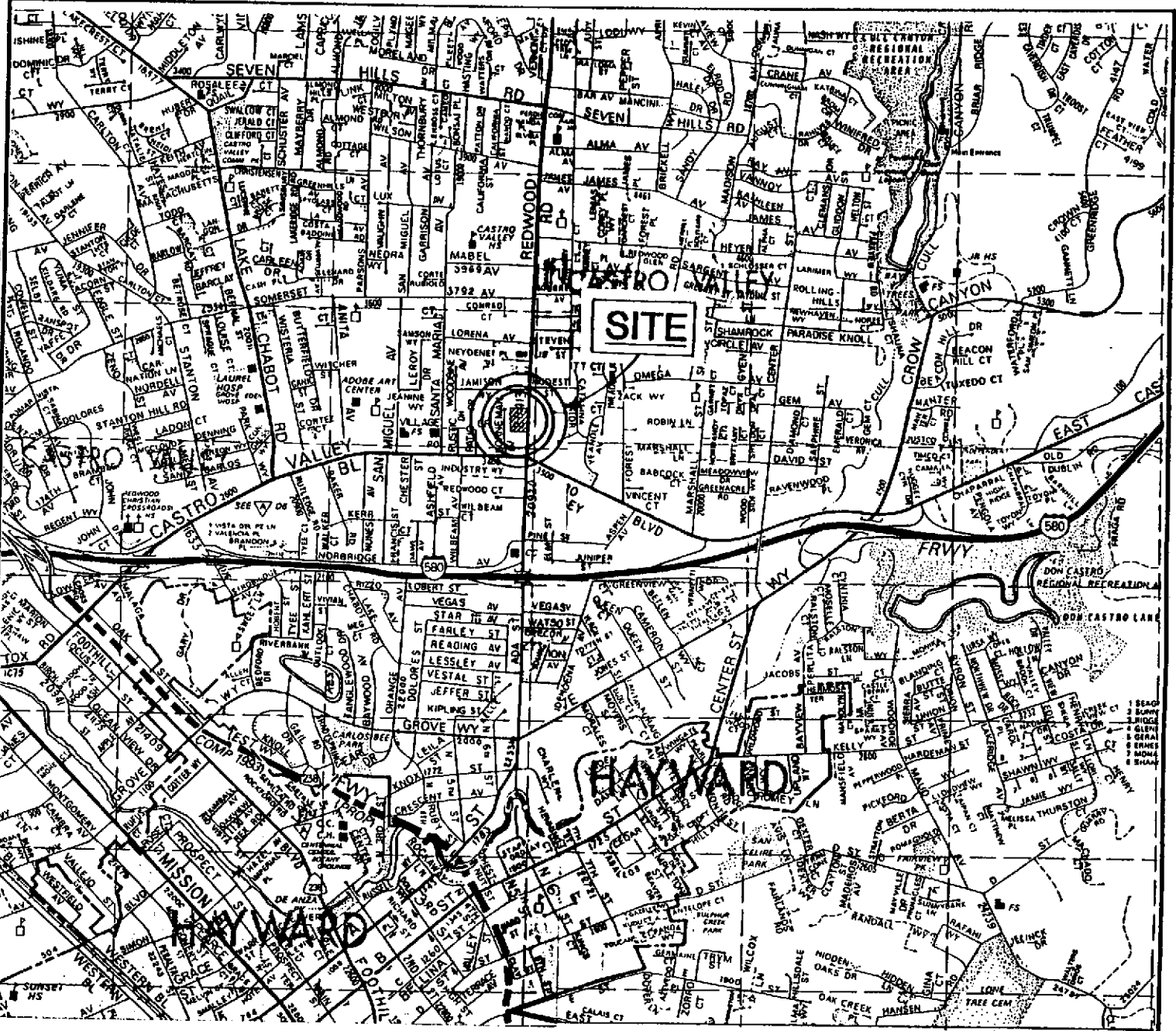
With respect to the findings of this quarterly sampling and the previous section of this report, it is recommended that quarterly groundwater monitoring continue, and include the six wells now existing at the site.

* * * *

The following Figures are attached and complete this section of the report:

FIGURE 2-1	Vicinity Map
FIGURE 2-2	Site Plan
FIGURE 2-3	Subsurface Profile
FIGURE 2-4	Potentiometric Surface Map
FIGURES 2-5.1 through 2-5.3	Well Field Logs

CHECKED BY
DATE 5/27/92

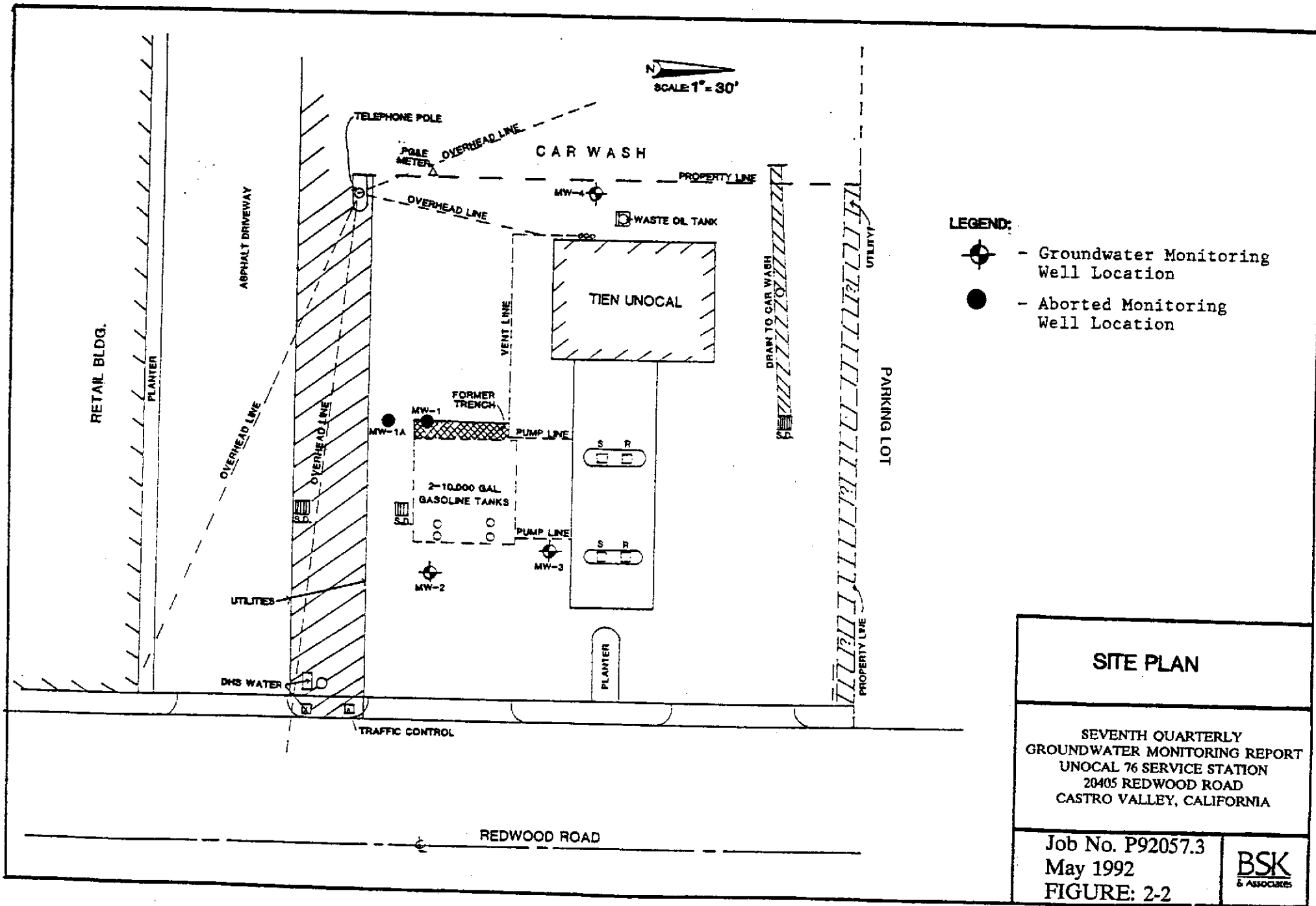


VICINITY MAP



SEVENTH QUARTERLY
GROUNDWATER MONITORING REPORT
UNOCAL 76 SERVICE STATION
20405 REDWOOD ROAD
CASTRO VALLEY, CALIFORNIA

Job No. P92057.3
May 1992
FIGURE: 2-1

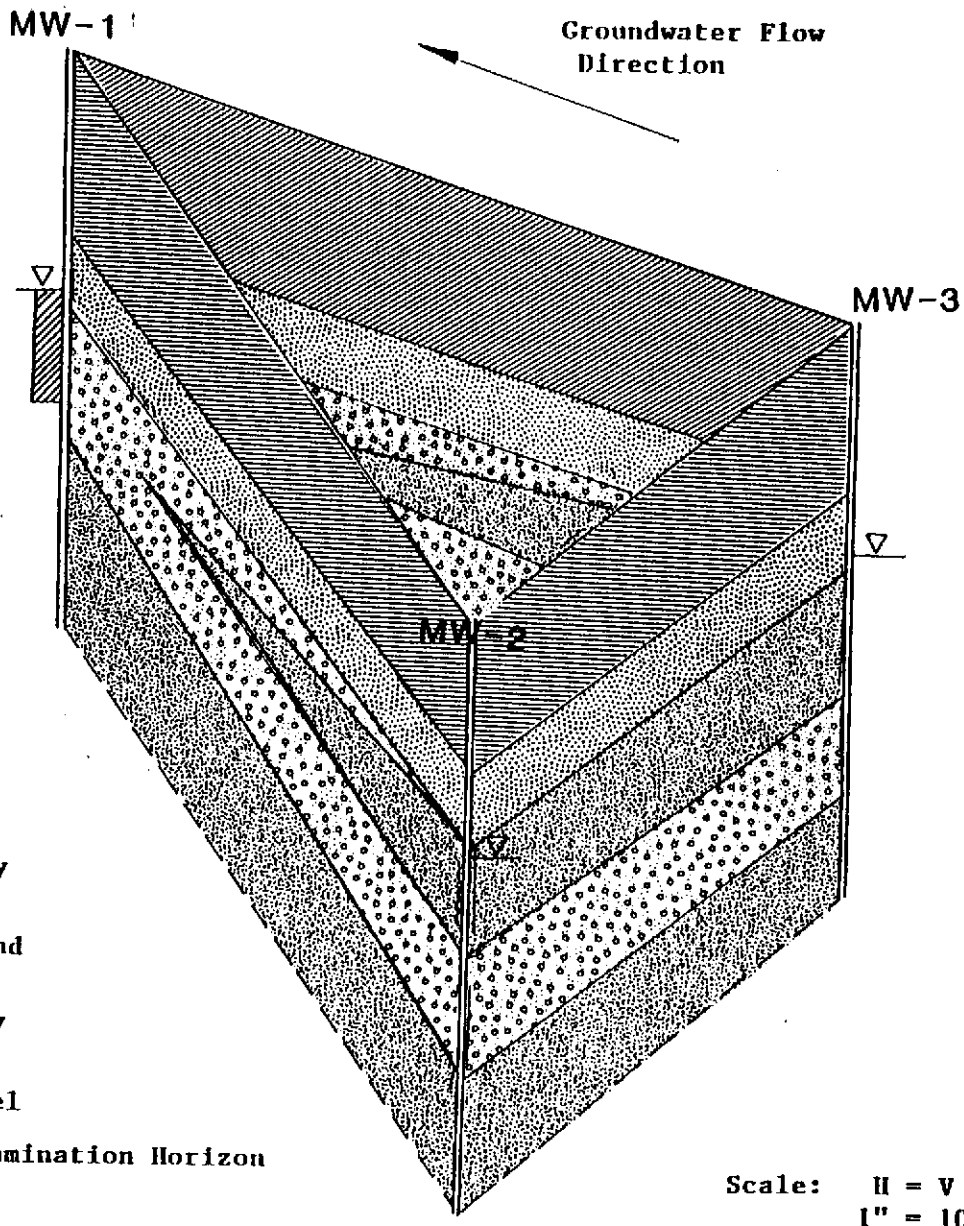










LEGEND:

-  - Groundwater Monitoring Well Location
-  - Aborted Monitoring Well Location

SITE PLAN	
SEVENTH QUARTERLY GROUNDWATER MONITORING REPORT UNOCAL 76 SERVICE STATION 20405 REDWOOD ROAD CASTRO VALLEY, CALIFORNIA	
Job No. P92057.3 May 1992 FIGURE: 2-2	BSK & ASSOCIATES



LEGEND:

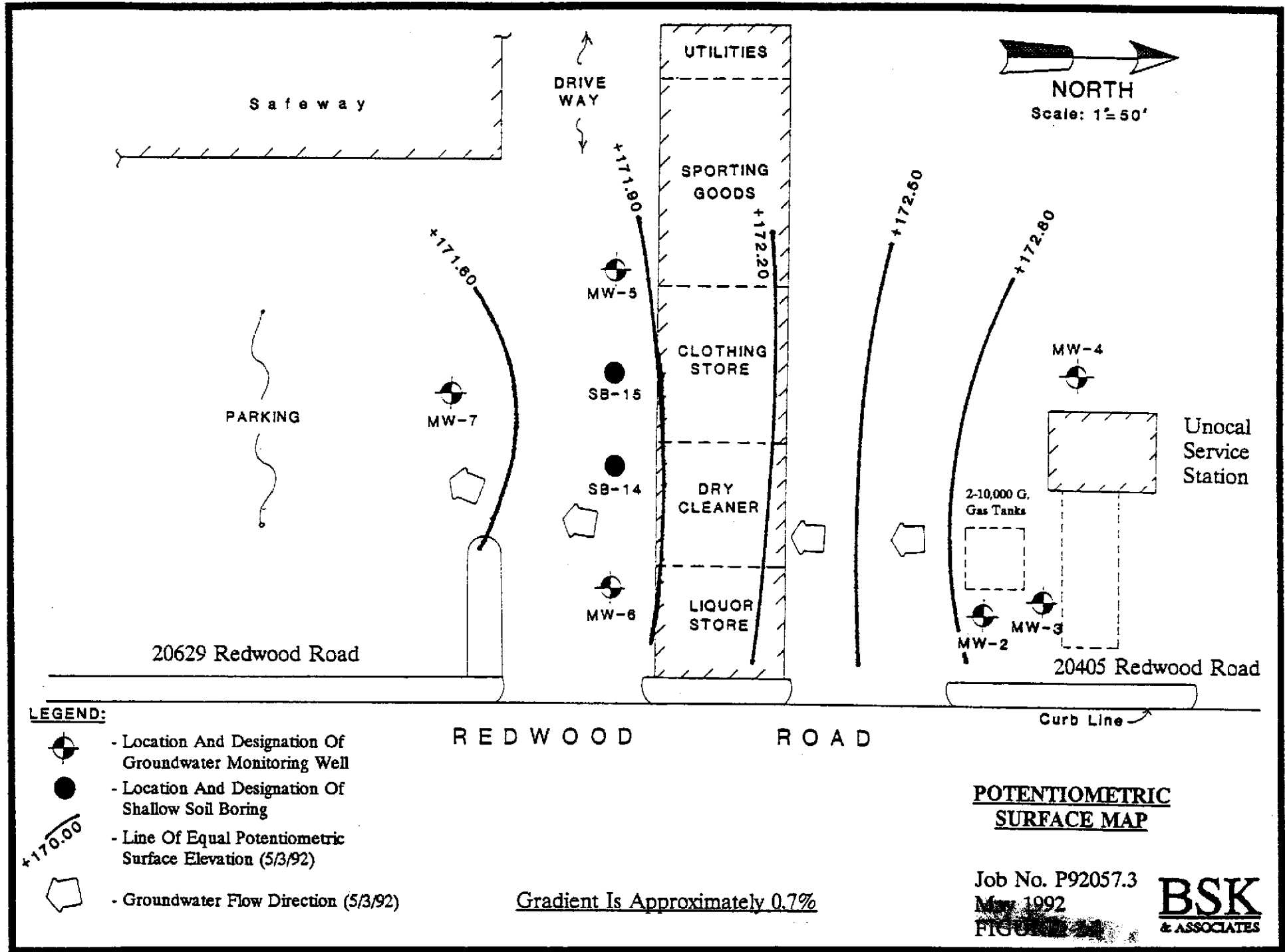
-  Clay
-  Sandy Clay
-  Clayey Sand
-  Silty Clay
-  Water Level
-  Soil Contamination Horizon

Scale: H = V
1" = 10'

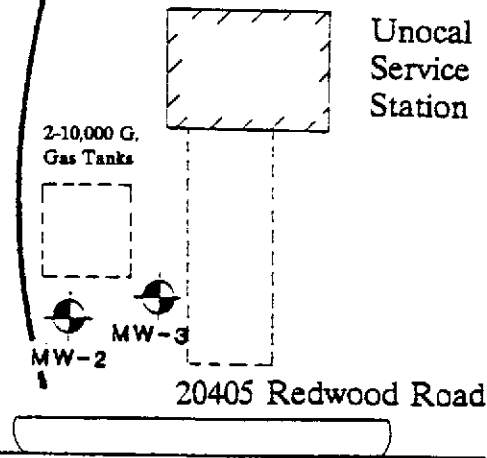
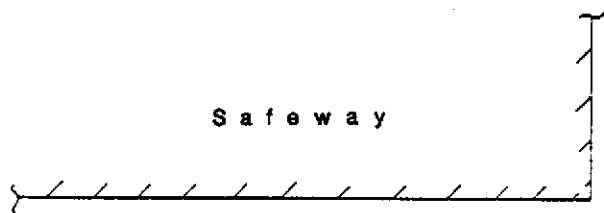
SUBSURFACE PROFILE

Job No. P92057.3
May 1992
FIGURE: 2-3





NORTH
Scale: 1" = 50'







20629 Redwood Road

20405 Redwood Road

REDWOOD ROAD

Curb Line

LEGEND:

-  - Location And Designation Of Groundwater Monitoring Well
-  - Location And Designation Of Shallow Soil Boring
-  - Line Of Equal Potentiometric Surface Elevation (5/3/92)
-  - Groundwater Flow Direction (5/3/92)

Gradient Is Approximately 0.7%

POTENTIOMETRIC SURFACE MAP

Job No. P92057.3
May 1992
FIGURE 2

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WELL FIELD LOG

PROJECT NAME AND LOCATION: Unocal 76, Service Station

20405 Redwood Road, Castro Valley, CA. 94546

PERSONNEL: M. Cline

WEATHER: Clear, Mild

WELL INFORMATION:

Well No.: MW-2

Depth to Water: 10.36 feet

Water Volume: 3.1 gallons

Reference Elevation: 183.10 (MSL)

Groundwater Elevation: 172.74 (MSL)

Measurement Technique: Electric Well Sounder

Date Purged: 4/20/91

Purge Method: Bladder Pump

Purge Rate: 0.7 gpm

IMMISCIBLE LAYERS:

Top: None Observed, Slight Odor

Bottom: Trace Fine Sand Slight Indistinct Odor

Detection Method: Visual, Olfactory

Collection Method: Clear PVC Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	Volume Removed (gallons)	Electrical Conductivity (uS/cm)	pH	Temperature (degrees F)	Remarks
12:22	--	--	--	--	
12:26	3.0	853	5.7	76	
12:31	6.0	757	5.8	73	
12:35	9.0	732	5.7	73	
12:40	12.0	727	5.7	73	

SAMPLE COLLECTION DATA

Sampling Equipment: Teflon Point Source Bailer

TIME	ANALYSIS	CONTAINER USED	SAMPLE INTERVAL
12:45	TVH & BTXE	2-40 ml vials with HCL	12 feet

UNOCAL 76, SERVICE STATION
QUARTERLY GROUNDWATER
SAMPLING AND ANALYSIS

Job No. P92057.3
May 1992
FIGURE: 2-5.1

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WELL FIELD LOG

PROJECT NAME AND LOCATION: Unocal 76, Service Station

20405 Redwood Road, Castro Valley, CA. 94546

PERSONNEL: M. Cline

WEATHER: Clear, mild

WELL INFORMATION:

Well No.: MW-3

Depth to Water: 10.34 feet

Water Volume: 3.1 gallons

Reference Elevation: 183.52 (MSL)

Groundwater Elevation: 173.69 (MSL)

Measurement Technique: Electric Well Sounder

Date Purged: 4/20/91

Purge Method: Bladder pump

Purge Rate: 0.6 gpm

IMMISCIBLE LAYERS:

Top: None Observed, No Odor

Bottom: None Observed, No Odor

Detection Method: Visual, Olfactory

Collection Method: Clear PVC Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	Volume Removed (gallons)	Electrical Conductivity (uS/cm)	pH	Temperature (degrees F)	Remarks
11:35	--	--	--	--	
11:39	3.0	685	7.6	77	
11:45	6.0	646	6.4	73	
11:50	9.0	637	6.3	72	
11:55	12.0	635	6.2	72	

SAMPLE COLLECTION DATA

Sampling Equipment: Teflon Point Source Bailer

TIME	ANALYSIS	CONTAINER USED	SAMPLE INTERVAL
12:01	TVH & BTXE	2-40 ml vials with HCL	12 feet

UNOCAL 76, SERVICE STATION
QUARTERLY GROUNDWATER
SAMPLING AND ANALYSIS

Job No. P92057.3
May 1992
FIGURE: 2-5.2

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WELL FIELD LOG

PROJECT NAME AND LOCATION: Unocal 76, Service Station

20405 Redwood Road, Castro Valley, CA. 94546

PERSONNEL: M. Cline

WEATHER: Clear, Mild

WELL INFORMATION:

Well No.: MW-4

Depth to Water: 10.89 feet

Water Volume: 2.1 gallons

Reference Elevation: 184.33(MSL)

Groundwater Elevation: 173.44(MSL)

Measurement Technique: Electric Well Sounder

Date Purged: 4/20/92

Purge Method: Bladder Pump

Purge Rate: 0.6 gpm

IMMISCIBLE LAYERS:

Top: None Observed, No Odor

Bottom: None Observed, No Odor

Detection Method: Visual, Olfactory

Collection Method: Clear PVC Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	Volume Removed (gallons)	Electrical Conductivity (uS/cm)	pH	Temperature (degrees F)	Remarks
10:38	--	--	--	--	
10:41	2.0	799	8.1	70	
10:44	4.0	779	7.5	69	
10:47	6.0	755	7.3	69	
10:51	8.0	754	7.7	69	

SAMPLE COLLECTION DATA

Sampling Equipment: Teflon Point Source Bailer

TIME	ANALYSIS	CONTAINER USED	SAMPLE INTERVAL
10:58	TVH&BTXE	2-40 ml. vials with HCl	13 ft
11:00	TPH Diesel	1-1000 ml. Amber Flask	13 ft
11:02	Oil&Grease	1-1000 ml. Amber Flask w/H2SO4	13 ft

UNOCAL 76, SERVICE STATION
QUARTERLY GROUNDWATER
SAMPLING AND ANALYSIS

Job No. P92057.3
May 1992
FIGURE: 2-5.3

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& ASSOCIATES

SECTION 3 - REPORT DISTRIBUTION AND LIMITATIONS

Report Distribution

Copies of this report should be submitted to the ACEH for their review. We are providing you with extra copies for this purpose. We understand that copies of the report may be forwarded by ACEH to the Regional Water Quality Control Board for their review.

Limitations

This report has been prepared for the exclusive use of R.T. Nahas Company/Eden Managements. Unauthorized use of or reliance on the information contained in this report, without express written consent by BSK & Associates, is strictly prohibited.

The findings and conclusions presented in this report are based on field review and observations, and from the limited testing program described in this report. This report has been prepared in accordance with generally accepted methodologies and standards of practice of the area. No other warranty, expressed or implied, is made as to the findings, conclusions and recommendations included in the report.

The findings of this report are valid as of the present. The passage of time, natural processes, or human intervention on the property or an adjacent property, and changes in the regulations may cause changed conditions which can invalidate the findings and conclusions presented in this report.

* * * *

The following are attached and complete this report:

- APPENDIX "A" Section 1 - Unified Soil Classification Chart, Boring Logs, Well Construction Diagrams, and Well Field Logs
- APPENDIX "B" Section 1 - Chemical Test Data Sheets and Project Chain-of-Custody Records
- APPENDIX "C" Section 2 - Chemical Test Data Sheets and Project Chain-of-Custody Records

APPENDIX A

SECTION - 1

UNIFIED SOIL CLASSIFICATION CHART

BORING LOGS

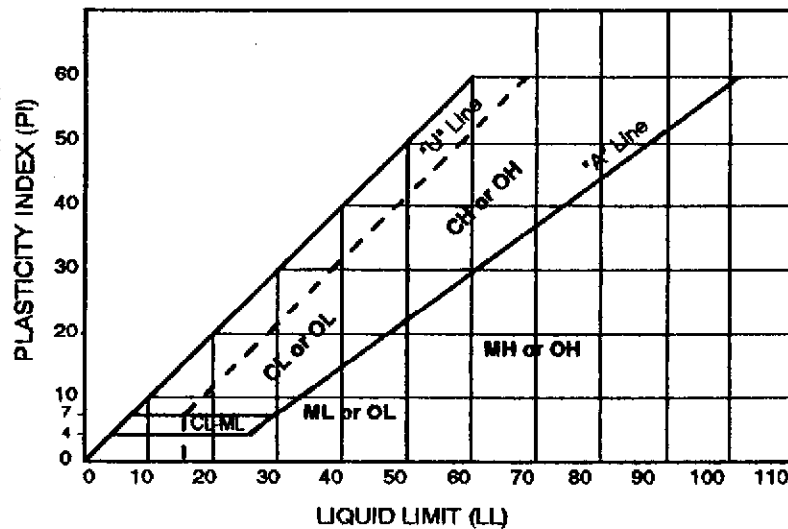
WELL CONSTRUCTION DIAGRAMS

WELL FIELD LOGS

UNIFIED SOIL CLASSIFICATION CHART

SYMBOL	LETTER	DESCRIPTION	MAJOR DIVISIONS				
	GW	WELL-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	CLEAN GRAVELS (LITTLE OR NO FINES)	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO.4 SIEVE SIZE	COARSE-GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO.200 SIEVE SIZE		
	GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES					
	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	FOR VISUAL CLASSIFICATION, THE 1/4" SIZE MAY BE USED AS EQUIVALENT TO THE NO.4 SIEVE SIZE			
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES					
	SW	WELL-GRADED SAND OR GRAVELLY SANDS, LITTLE OR NO FINES	CLEAN SANDS (LITTLE OR NO FINES)			SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO.4 SIEVE SIZE	
	SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES					
	SM	SILTY SANDS, SAND-SILT MIXTURES	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)			FINE-GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO.200 SIEVE SIZE THE NO.200 U.S. STANDARD SIEVE IS ABOUT THE SMALLEST PARTICLE VISIBLE TO THE NAKED EYE	
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES					
	ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	SILTS & CLAYS LIQUID LIMIT LESS THAN 50				
	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS					
	OL	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY					
	MH	ORGANIC SILTS AND ORGANIC SILT-CLAYS OF LOW PLASTICITY	SILTS & CLAYS LIQUID LIMIT GREATER THAN 50				
	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS					
	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS					
	PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	HIGHLY ORGANIC SOILS				

SOIL PLASTICITY CHART



TYPES OF SAMPLERS

- SPT--Standard Penetration 1.4" ID Split Spoon Sampler
- CS--2" ID Split Spoon Sampler
- MC--2.4" ID California Sampler
- SH--3.0" ID Thin-Wall (Shelby Tube)
- CC--2.7" ID Double Tube Continuous Coring Sampler

NOTES

- ND Denotes concentration below the test detection limits
- Denotes not analysed
- PID-Photoionization Detector

20629 REDWOOD ROAD
CASTRO VALLEY,
CALIFORNIA

Job No. P92057.3
FIGURE A-1
MAY 1992

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Chemical Analysis						Field Data		
TPH-Diesel (mg/Kg)	TPH-Gasoline (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylenes (mg/Kg)	PID READING	TYPE OF SAMPLER	BLOWS/FOOT
						0.0		
						0.0		
						0.0		
--	--	--	--	--	--	0.0	CS	60
--	--	--	--	--	--	0.0	CS	49
--	--	--	--	--	--	13	CS	62
--	--	--	--	--	--	1.5	CS	63
ND	ND	ND	ND	ND	ND	20	CS	55
--	--	--	--	--	--	2.0	CS	22

LOG DESIGNATION

DATE: 3/30/92
 LOGGED BY: Tim Berger
 WATER LEVEL: First Encountered -23' bpg
 ELEVATION: Approximately 184' MSL
 EQUIPMENT: Mobile Drill, 8" Diameter Hollow Stem Auger

SYMBOLS	DESCRIPTION
PMT CL	2" Asphaltic Concrete, 8"-12" Aggregate base Yellow to gray brown (10YR 4/1), moist, firm, sandy grades yellow gray (2.5 Y 6/4)
ML/ CL	CLAYEY SILTY CLAY Orange brown (10 YR 5/8), damp to moist, hard, with fine grained sand, trace fine pores (gray), small black mottles grades damp, harder, sand sand lense at sampler end
SC	CLAYEY SAND, Medium dense

Boring off-gases at surface to 9.0 on PID

NOTES:

1. WELL BORE COMPLETED AT A DEPTH OF 23 FEET 3/30/92.
2. WELL BORE INDICATES INTERPRETED SUBSURFACE CONDITIONS ONLY AT THE TIME THE BORING WAS DRILLED.
3. FOR AN EXPLANATION OF SOIL SYMBOLS SEE THE SOIL CLASSIFICATION CHART, PLATE 1.

20629 REDWOOD ROAD
 CASTRO VALLEY,
 CALIFORNIA

Job No. P92057.3
 FIGURE A-2
 MAY 1992

BSK
 & ASSOCIATES

Chemical Analysis						Field Data		
TPH-Diesel (mg/Kg)	TPH-Gasoline (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylenes (mg/Kg)	PID READING	TYPE OF SAMPLER	BLOWS/FOOT
						50	CS	55
3	ND	ND	.007	ND	.008	51	CS	50

LOG DESIGNATION

DATE: 3/30/92
 LOGGED BY: Tim Berger
 WATER LEVEL: None Encountered at time of drilling
 ELEVATION: Approximately 184' MSL
 EQUIPMENT: Mobile Drill, 8" Diameter Hollow Stem Auger

SYMBOLS	DESCRIPTION
EMT CL	2" Asphaltic Concrete, 8"-12" Aggregate base Gray to dark gray (10YR 3/1), moist grades medium brown gray to light reddish gray (10 YR 5/3), siltier, some fine sand grades moister, olive yellow (2.5 Y 5/4) grades grayish orange brown (10 YR 5/3), damp to moist, hard, blue streaks, some fine sand and silt,
CL/SC	SANDY CLAY / CLAYEY SAND Grayish orange brown, damp, hard, blue mottles, vertical seams and pores are

NOTES:

1. WELL BORE COMPLETED AT A DEPTH OF 21.5 FEET 3/30/92.
2. WELL BORE INDICATES INTERPRETED SUBSURFACE CONDITIONS ONLY AT THE TIME THE BORING WAS DRILLED.
3. FOR AN EXPLANATION OF SOIL SYMBOLS SEE THE SOIL CLASSIFICATION CHART, PLATE 1.

20629 REDWOOD ROAD
 CASTRO VALLEY,
 CALIFORNIA

Job No. P92057.3
 FIGURE A-3
 MAY 1992

BSK
 & ASSOCIATES

Chemical Analysis						Field Data		
TPH-Diesel (mg/Kg)	TPH-Gasoline (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylenes (mg/Kg)	PID READING	TYPE OF SAMPLER	BLOWS/FOOT
						0.0	CS	55
ND	ND	ND	ND	ND	ND		CS	62
							SPT	34
							SPT	13
							SPT	17

LOG DESIGNATION

DATE: 3/31/92

LOGGED BY: Tim Berger

WATER LEVEL: First Encountered -22.5' bpg

ELEVATION: 183.92' MSL

EQUIPMENT: Mobile Drill, 8" Diameter Hollow Stem Auger

SYMBOLS

DESCRIPTION

PMT	2" Asphaltic Concrete, 8"-12" Aggregate base
CL	Olive gray (2.5 YR 5/2), moist, firm, sandy grades medium to dark gray (7.5 YR 4/0), with granular material
	grades medium gray brown to light gray yellow brown (2.5 Y 6/4), less moist, no sand
	grades moist, brown to dark brown, ?
CL/ML	SILTY CLAY/CLAYEY SILT Orange (10 YR 5/6) with blue streaks, damp, hard, some trace coarse grains, some pores
CL	SILTY CLAY Blue gray (2.5 Y 4/2), moist, stiff grades medium gray brown (10YR 4/4), hard, damp, trace organics, very few 1 mm pores
CL/SC	CLAYEY SAND/SANDY CLAY Yellow to orange brown (10 YR 5/4), clay is bedded with medium grained, angular sand with some clay binder, clay is moist to
	clay grades firm to soft, sticky, moist, silt lenses moist to some clayey medium sand, silt and sand occur in beds of ± 6 inches
	grades light gray to yellow brown (10 YR 6/3 to 5/6), firm to stiff, loose to medium dense

NOTES:

1. WELL BORE COMPLETED AT A DEPTH OF 36.5 FEET 3/30/92.
2. GROUNDWATER MONITORING WELL INSTALLED, SEE WELL CONSTRUCTION DIAGRAM.
3. WELL BORE INDICATES INTERPRETED SUBSURFACE CONDITIONS ONLY AT THE TIME THE BORING WAS DRILLED.
4. FOR AN EXPLANATION OF SOIL SYMBOLS SEE THE SOIL CLASSIFICATION CHART, PLATE 1.

20629 REDWOOD ROAD
CASTRO VALLEY,
CALIFORNIA

Job No. P92057.3
FIGURE A-4
MAY 1992

BSK
& ASSOCIATES

Chemical Analysis						Field Data		
TPH-Diesel (mg/Kg)	TPH-Gasoline (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylenes (mg/Kg)	PID READING	TYPE OF SAMPLER	BLOWS/FOOT
ND	ND	ND	ND	ND	ND		CS	30
							CS	49
							SPT	27

LOG DESIGNATION

DATE: 4/1/92
 LOGGED BY: Tim Berger
 WATER LEVEL: First Encountered -16' bpg
 ELEVATION: 183.926' MSL
 EQUIPMENT: Mobile Drill, 8" Diameter Hollow Stem Auger

SYMBOLS	DESCRIPTION
PMT	2" Asphaltic Concrete, 8"-12" Aggregate base
CL	Dark to medium gray, moist, firm to stiff trace to some sand grades silty, yellow brown (10 YR 5/6), damp
ML	Orange brown (10 YR 5/6), stiff, damp, trace sand
CL	Gray brown (10 YR 5/5), moist, saturated in pores, very porous, very stiff, pores horizontal with gray linings, some... grades hard, mottled... and silty... and silty...
SP	Yellow brown (10 YR 6/4) medium dense, medium to coarse grained sand, few pebbles, some clay binder, few thin clay lenses, can be flowing

- NOTES:**
1. WELL BORE COMPLETED AT A DEPTH OF 29 FEET 4/1/92.
 2. GROUNDWATER MONITORING WELL INSTALLED, SEE WELL CONSTRUCTION DIAGRAM.
 3. WELL BORE INDICATES INTERPRETED SUBSURFACE CONDITIONS ONLY AT THE TIME THE BORING WAS DRILLED.
 4. FOR AN EXPLANATION OF SOIL SYMBOLS SEE THE SOIL CLASSIFICATION CHART, PLATE 1.

Chemical Analysis						Field Data		
TPH-Diesel (mg/Kg)	TPH-Gasoline (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylenes (mg/Kg)	PID READING	TYPE OF SAMPLER	BLOWS/FOOT
ND	ND	ND	ND	ND	ND	8.0	CS	22
						0.0	SPT	43
						1.0	SPT	34
							SPT	14

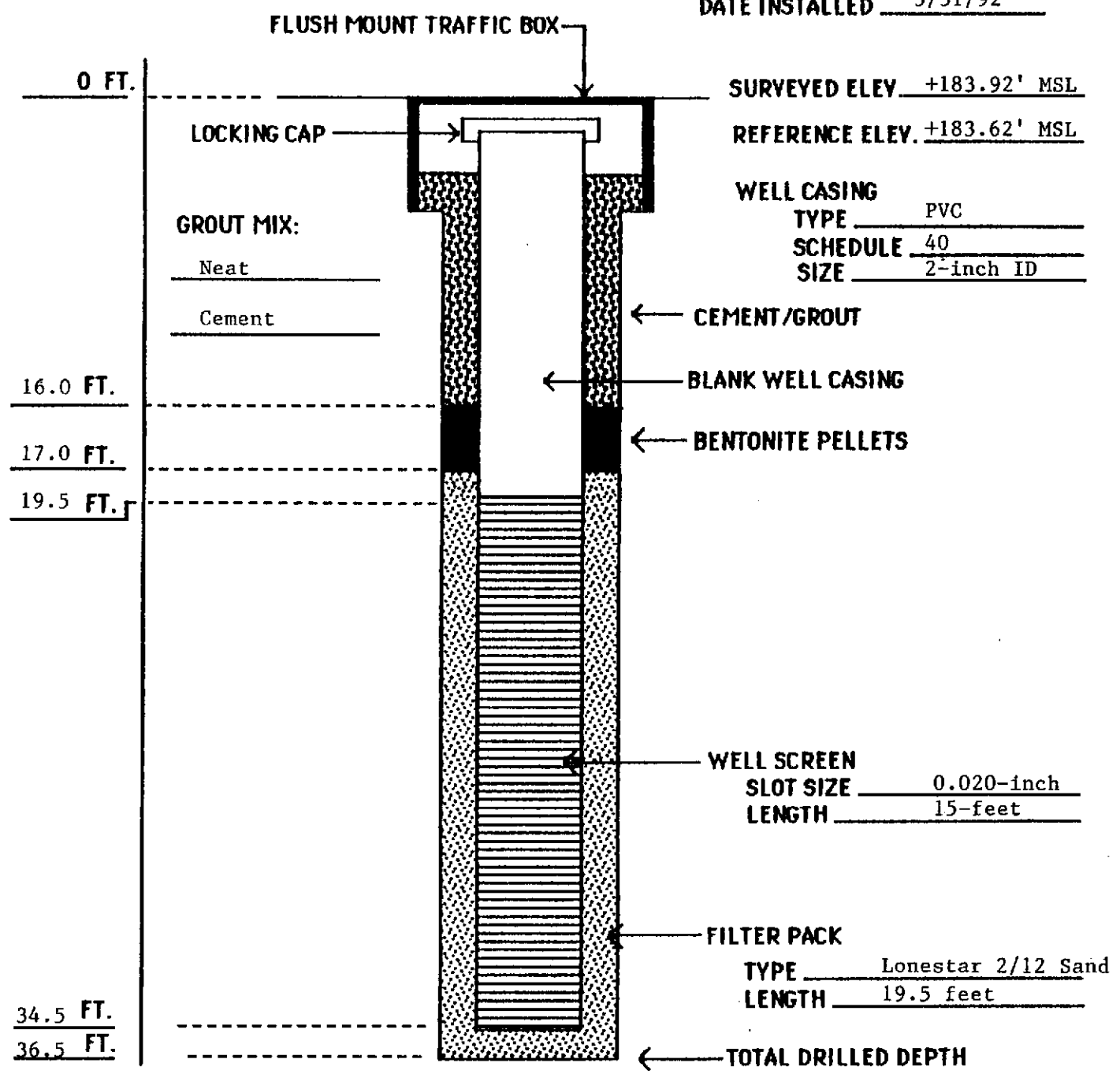
LOG DESIGNATION

DATE: 4/2/92
 LOGGED BY: Tim Berger
 WATER LEVEL: First Encountered -15' bpg
 ELEVATION: 182.78' MSL
 EQUIPMENT: Mobile Drill, 8" Diameter Hollow Stem Auger

SYMBOLS	DESCRIPTION
PMT	2" Asphaltic Concrete, 8"-12" Aggregate base
CL	Dark gray, moist, firm grades yellow gray, less moist grades gray brown, moister grades orange brown (10 YR 5/8), less moist grades moist
SM	Silty sand, Orange brown, medium dense low blue and black mottles, fine grained sand, side of string
CL	CLAY, Gray brown (10 YR 6/4), damp to moist, grading less moist with depth, clayey sand at sampler tip, hard, no odor
SP/CL	SANDY SILTY CLAY, Gray brown, wet to saturated, dense occasional thin (< 6 inches) clay lenses grades medium dense, lining sand encountered

- NOTES:**
1. WELL BORE COMPLETED AT A DEPTH OF 31 FEET 4/2/92.
 2. GROUNDWATER MONITORING WELL INSTALLED, SEE WELL CONSTRUCTION DIAGRAM.
 3. WELL BORE INDICATES INTERPRETED SUBSURFACE CONDITIONS ONLY AT THE TIME THE BORING WAS DRILLED.
 4. FOR AN EXPLANATION OF SOIL SYMBOLS SEE THE SOIL CLASSIFICATION CHART, PLATE 1.

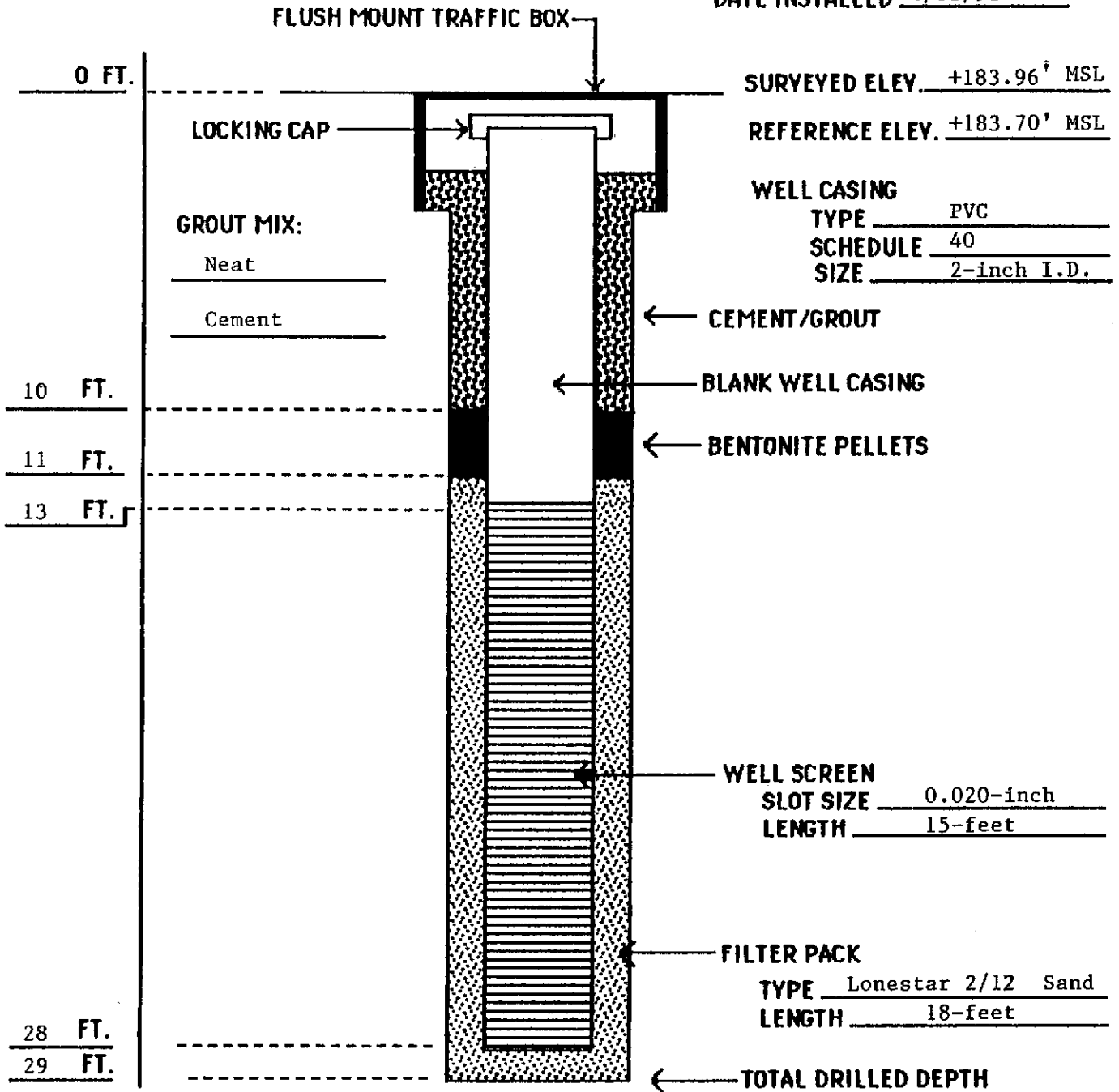
WELL NO. MW-5
 PROJECT NO. P92057.3
 DATE INSTALLED 3/31/92



REMARKS: Well developed 4/07/92 by surging and pumping,
50 gallons removed.

PROJECT NO. P92057.3	MONITORING WELL INSTALLATION DIAGRAM	BSK & ASSOCIATES
FIGURE: A-7		

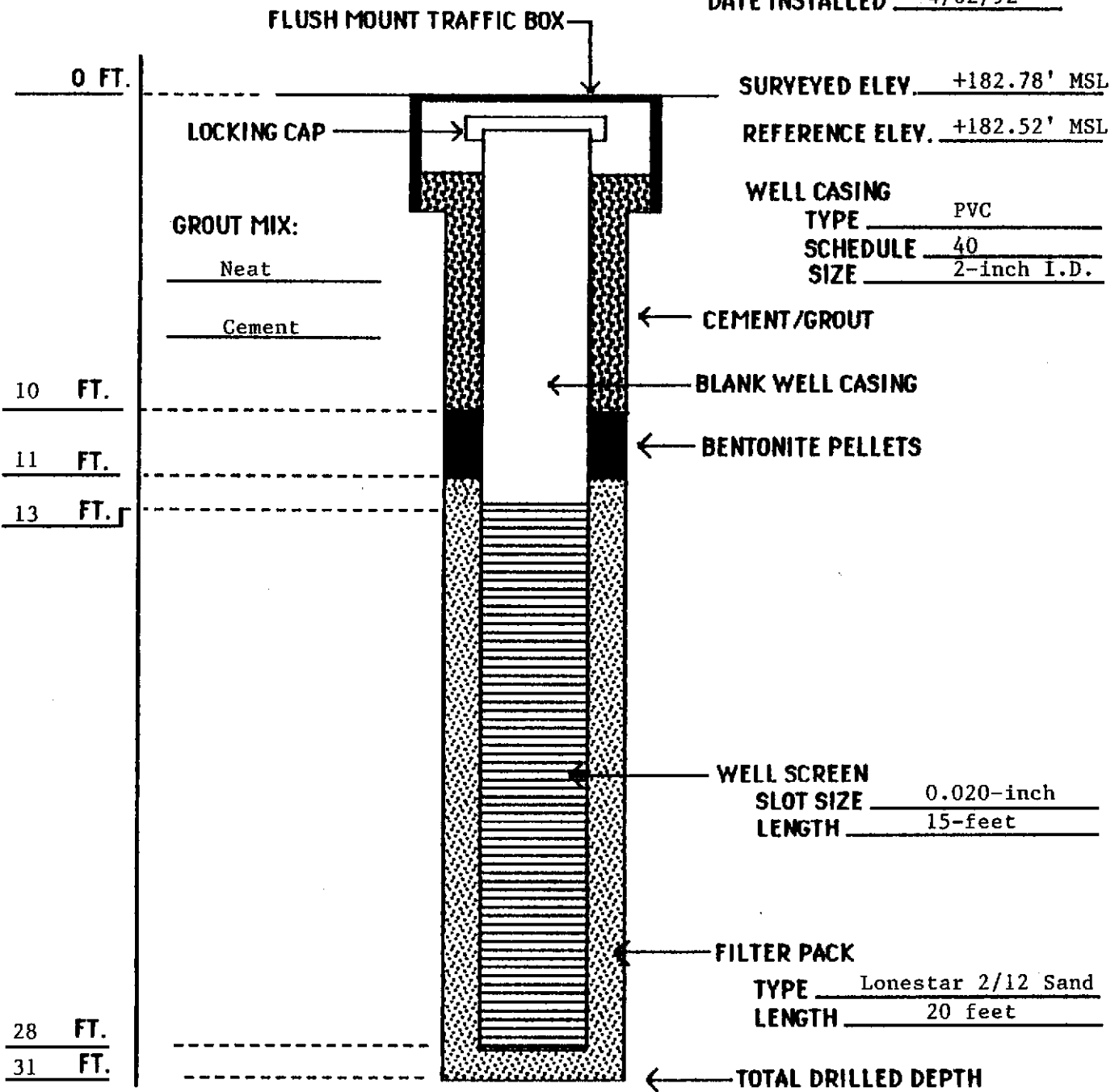
WELL NO. MW-6
 PROJECT NO. P92057.3
 DATE INSTALLED 4/01/92



REMARKS: Well developed 4/06/92 by surging and pumping,
50 gallons removed.

PROJECT NO. <u>P92075.3</u>	MONITORING WELL INSTALLATION DIAGRAM	BSK & ASSOCIATES
FIGURE: <u>A-8</u>		

WELL NO. MW-7
 PROJECT NO. P92057.3
 DATE INSTALLED 4/02/92



REMARKS: Well developed 4/07/92 by surging and pumping,
50 gallons removed.

PROJECT NO. P92057.3	MONITORING WELL INSTALLATION DIAGRAM	BSK & ASSOCIATES
FIGURE: A-9		

WELL FIELD LOG

PROJECT NAME AND LOCATION: Unocal 76, Service Station

20405 Redwood Road, Castro Valley, CA. 94546

PERSONNEL: M. Cline

WEATHER: Clear, Warm

WELL INFORMATION:

Well No.: MW-5

Depth to Water: 11.72 feet

Water Volume: 3.6 gallons

Reference Elevation: 183.62(MSL)

Groundwater Elevation: 171.90 (MSL)

Measurement Technique: Electric Well Sounder

Date Purged: 4/27/91 ⁹²

Purge Method: Bladder Pump

Purge Rate: 0.6 gpm

IMMISCIBLE LAYERS:

Top: None Observed, No Odor

Bottom: Brown Clay -Silt, No Odor

Detection Method: Visual, Olfactory

Collection Method: Clear PVC Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	Volume Removed (gallons)	Electrical Conductivity (uS/cm)	pH	Temperature (degrees F)	Remarks
11:42	--	--	--	--	
11:49	4.0	825	5.5	81	
11:54	7.0	782	5.4	76	
12:00	10.5	768	5.3	74	
12:04	14.0	763	5.3	74	

SAMPLE COLLECTION DATA

Sampling Equipment: Teflon Point Source Bailer

TIME	ANALYSIS	CONTAINER USED	SAMPLE INTERVAL
12:11	TVH & BTXE	2-40 ml vials with HCL	13 feet

20629 REDWOOD ROAD
CASTRO VALLEY,
CALIFORNIA

Job No. P92057.3
FIGURE A-10
MAY 1992

BSK
& ASSOCIATES

WELL FIELD LOG

PROJECT NAME AND LOCATION: Unocal 76, Service Station
20405 Redwood Road, Castro Valley, CA. 94546

PERSONNEL: M. Cline

WEATHER: Clear, Warm

WELL INFORMATION:

Well No.: MW-6

Depth to Water: 11.90 feet

Water Volume: 2.4 gallons

Reference Elevation: 183.70 (MSL)

Groundwater Elevation: 171.80 (MSL)

Measurement Technique: Electric Well Sounder

Date Purged: 4/27/91

Purge Method: Bladder Pump

Purge Rate: 0.7 gpm

IMMISCIBLE LAYERS:

Top: None Observed, No Odor

Bottom: Brown Clay -Silt, No Odor

Detection Method: Visual, Olfactory

Collection Method: Clear PVC Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	Volume Removed (gallons)	Electrical Conductivity (uS/cm)	pH	Temperature (degrees F)	Remarks
10:59	--	--	--	--	
11:02	2.5	742	6.5	77	
11:07	5.0	760	6.3	75	
11:10	7.5	756	6.1	75	
11:14	10.0	761	6.0	75	

SAMPLE COLLECTION DATA

Sampling Equipment: Teflon Point Source Bailer

TIME	ANALYSIS	CONTAINER USED	SAMPLE INTERVAL
11:22	TVH & BIXE	2-40 ml vials with HCL	13 feet

20629 REDWOOD ROAD
CASTRO VALLEY,
CALIFORNIA

Job No. P92057.3
FIGURE A-11
MAY 1992

BSK
& ASSOCIATES

WELL FIELD LOG

PROJECT NAME AND LOCATION: Unocal 76, Service Station
20405 Redwood Road, Castro Valley, CA. 94546

PERSONNEL: M. Cline
 WEATHER: Clear, Warm

WELL INFORMATION:

Well No.: <u>MW-7</u>	Date Purged: <u>4/27/91</u>
Depth to Water: <u>10.97 feet</u>	Purge Method: <u>Bladder Pump</u>
Water Volume: <u>2.6 gallons</u>	Purge Rate: <u>0.8 gpm</u>
Reference Elevation: <u>182.52(MSL)</u>	
Groundwater Elevation: <u>171.55 (MSL)</u>	
Measurement Technique: <u>Electric Well Sounder</u>	

IMMISCIBLE LAYERS:

Top: <u>None Observed, No Odor</u>	Bottom: <u>Brown Clay -Silt, No Odor</u>
Detection Method: <u>Visual, Olfactory</u>	
Collection Method: <u>Clear PVC Bailer</u>	

WELL DEVELOPMENT/PURGE DATA:

TIME	Volume Removed (gallons)	Electrical Conductivity (uS/cm)	pH	Temperature (degrees F)	Remarks
12:27	--	--	--	--	
12:30	2.5	1003	5.3	77	
12:34	5.0	1006	5.3	75	
12:37	7.5	1003	5.3	73	
12:40	10.0	1003	5.3	73	

SAMPLE COLLECTION DATA

Sampling Equipment: Teflon Point Source Bailer

TIME	ANALYSIS	CONTAINER USED	SAMPLE INTERVAL
12:46	TVH & BTXE	2-40 ml vials with HCL	13 feet

20629 REDWOOD ROAD CASTRO VALLEY, CALIFORNIA	Job No. P92057.3 FIGURE A-12 MAY 1992	
----------------------------------------------------	---------------------------------------------	--

APPENDIX B

SECTION - 1

CHEMICAL TEST DATA SHEETS

AND

PROJECT CHAIN-OF-CUSTODY RECORD



Environmental Services

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1-800-877-8310

BSK-Pleasanton
Nahas

Date Sampled : 03/30/92
Time Sampled : 0747
Date Received : 04/01/92
Date of Analysis : 04/13/92
Report Issue Date: 04/13/92

Case Number : Ch920878
Lab ID Number : 0878-1
Project Number : P92057.3
Sample Description: EB-1 #5 at 21'

Sample Type: SOLID

Analyses for Total Petroleum Hydrocarbons as Diesel [TPH(D)]
by Method DHS GC/FID

Results Reported in Milligrams per Kilogram (mg/Kg)

Analyte	Results	DLR
TPH(D)	ND	1

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.

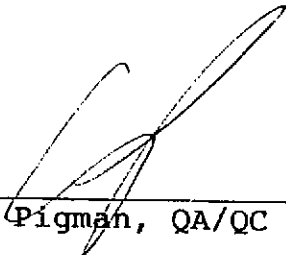
Exceptional sample conditions or matrix interferences
may result in higher detection limits.

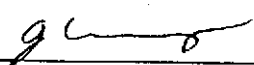
ND: None Detected

* - This sample contains lower molecular weight hydrocarbons.

** - This sample contains higher molecular weight hydrocarbons.

***-This sample contains both higher and lower molecular weight hydrocarbons.


Cynthia Pigman, QA/QC Supervisor


Jeffrey Creager, Organics Manager



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BSK-Pleasanton
Nahas

Date Sampled : 03/30/92
Time Sampled : 0747
Date Received : 04/01/92
Date of Analysis : 04/08/92
Report Issue Date: 04/13/92

Case Number : Ch920878
Lab ID Number : 0878-1
Project Number : P92057.3
Sample Description: EB-1 #5 at 21'

Sample Type: SOLID

Analyses for BTEX by EPA Method 8020
and TPH (G) by EPA Method 8015

Results Reported in Milligrams per Kilogram (mg/kg)

Compound	Results	DLR
Benzene	ND	0.005
Toluene	ND	0.005
Ethylbenzene	ND	0.005
Total Xylene Isomers	ND	0.005
Total Petroleum Hydrocarbons (G)	ND	1.

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.
Exceptional sample conditions or matrix interferences
may result in higher detection limits.
ND: None Detected

Cynthia Pigman, QA/QC Supervisor

910701 BTFS.t

Jeffrey Creager, Organics Manager



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Date Sampled : 03/30/92
 Time Sampled : 0915
 Date Received : 04/01/92
 Date of Analysis : 04/13/92
 Report Issue Date: 04/13/92

Case Number : Ch920878
 Lab ID Number : 0878-2
 Project Number : P92057.3
 Sample Description: EB-2 #2 at 20.5'

Sample Type: SOLID

Analyses for Total Petroleum Hydrocarbons as Diesel [TPH(D)]
by Method DHS GC/FID

Results Reported in Milligrams per Kilogram (mg/Kg)

Analyte	Results	DLR
TPH(D)	3	1

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.

Exceptional sample conditions or matrix interferences
 may result in higher detection limits.

ND: None Detected

* - This sample contains lower molecular weight hydrocarbons.

** - This sample contains higher molecular weight hydrocarbons.

***-This sample contains both higher and lower molecular weight hydrocarbons.

Cynthia Pigman, QA/QC Supervisor

Jeffrey Creager, Organics Manager



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Date Sampled : 03/30/92
 Time Sampled : 0915
 Date Received : 04/01/92
 Date of Analysis : 04/08/92
 Report Issue Date: 04/13/92

Case Number : Ch920878
 Lab ID Number : 0878-2
 Project Number : P92057.3
 Sample Description: EB-2 #2 at 20.5'

Sample Type: SOLID

Analyses for BTEX by EPA Method 8020
and TPH (G) by EPA Method 8015

Results Reported in Milligrams per Kilogram (mg/kg)

Compound	Results	DLR
Benzene	ND	0.005
Toluene	0.007	0.005
Ethylbenzene	ND	0.005
Total Xylene Isomers	0.008	0.005
Total Petroleum Hydrocarbons (G)	ND	1.

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.
 Exceptional sample conditions or matrix interferences
 may result in higher detection limits.
 ND: None Detected

Cynthia Pigman, QA/QC Supervisor

9910701 BTPS.t

Jeffrey Creager, Organics Manager



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BSK-Pleasanton
Nahas

Date Sampled : 03/31/92
Time Sampled : 0650
Date Received : 04/01/92
Date of Analysis : 04/13/92
Report Issue Date: 04/13/92

Case Number : Ch920878
Lab ID Number : 0878-3
Project Number : P92057.3
Sample Description: EB-3 #2 at 21'

Sample Type: SOLID

Analyses for Total Petroleum Hydrocarbons as Diesel [TPH(D)]
by Method DHS GC/FID

Results Reported in Milligrams per Kilogram (mg/Kg)

Analyte	Results	DLR
TPH(D)	ND	1

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.

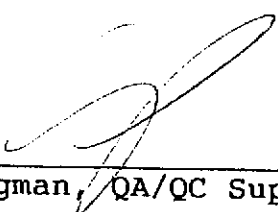
Exceptional sample conditions or matrix interferences
may result in higher detection limits.

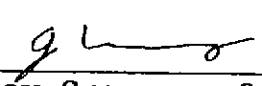
ND: None Detected

* - This sample contains lower molecular weight hydrocarbons.

** - This sample contains higher molecular weight hydrocarbons.

***-This sample contains both higher and lower molecular weight hydrocarbons.


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BSK-Pleasanton
Nahas

Date Sampled : 03/31/92
Time Sampled : 0650
Date Received : 04/01/92
Date of Analysis : 04/08/92
Report Issue Date: 04/13/92

Case Number : Ch920878
Lab ID Number : 0878-3
Project Number : P92057.3
Sample Description: EB-3 #2 at 21'

Sample Type: SOLID

Analyses for BTEX by EPA Method 8020
and TPH (G) by EPA Method 8015

Results Reported in Milligrams per Kilogram (mg/kg)

Compound	Results	DLR
Benzene	ND	0.005
Toluene	ND	0.005
Ethylbenzene	ND	0.005
Total Xylene Isomers	ND	0.005
Total Petroleum Hydrocarbons (G)	ND	1.

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.
Exceptional sample conditions or matrix interferences
may result in higher detection limits.
ND: None Detected

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Jeffrey Creager, Organics Manager



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 Nahas

Date Sampled : 04/01/92
 Time Sampled : 0620
 Date Received : 04/03/92
 Date of Analysis : 04/13/92
 Report Issue Date: 04/16/92

Case Number : Ch920907
 Lab ID Number : 0907-1
 Project Number : P92057.3
 Sample Description: MW-2, No.1 @ 16'

Sample Type: SOLID

Analyses for Total Petroleum Hydrocarbons as Diesel [TPH(D)]
by Method DHS GC/FID

Results Reported in Milligrams per Kilogram (mg/Kg)

Analyte	Results	DLR
TPH(D)	ND	1

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

- DLR: Detection Limit for the Purposes of Reporting.
- Exceptional sample conditions or matrix interferences may result in higher detection limits.
- ND: None Detected
- * - This sample contains lower molecular weight hydrocarbons.
- ** - This sample contains higher molecular weight hydrocarbons.
- ***-This sample contains both higher and lower molecular weight hydrocarbons.

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Jeffrey Creager, Organics Manager



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BSK-Pleasanton
Nahas

Date Sampled : 04/01/92
Time Sampled : 0620
Date Received : 04/03/92
Date of Analysis : 04/07/92
Report Issue Date: 04/16/92

Case Number : Ch920907
Lab ID Number : 0907-1
Project Number : P92057.3
Sample Description: MW-2, No.1 @ 16'

Sample Type: SOLID

Analyses for BTEX by EPA Method 8020
and TPH (G) by EPA Method 8015

Results Reported in Milligrams per Kilogram (mg/kg)

Compound	Results	DLR
Benzene	ND	0.005
Toluene	ND	0.005
Ethylbenzene	ND	0.005
Total Xylene Isomers	ND	0.005
Total Petroleum Hydrocarbons (G)	ND	1.

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.
Exceptional sample conditions or matrix interferences
may result in higher detection limits.
ND: None Detected

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Jeffrey Creager, Organics Manager



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Environmental Services

BSK-Pleasanton
 Nahas

Date Sampled : 04/02/92
 Time Sampled : 0654
 Date Received : 04/03/92
 Date of Analysis : 04/13/92
 Report Issue Date: 04/16/92

Case Number : Ch920907
 Lab ID Number : 0907-2
 Project Number : P92057.3
 Sample Description: MW-3, No.1 @ 15.5'

Sample Type: SOLID

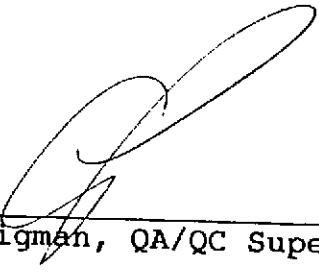
Analyses for Total Petroleum Hydrocarbons as Diesel [TPH(D)]
by Method DHS GC/FID

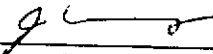
Results Reported in Milligrams per Kilogram (mg/Kg)

Analyte	Results	DLR
TPH(D)	ND	1

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

- DLR: Detection Limit for the Purposes of Reporting.
 Exceptional sample conditions or matrix interferences
 may result in higher detection limits.
- ND: None Detected
- * - This sample contains lower molecular weight hydrocarbons.
- ** - This sample contains higher molecular weight hydrocarbons.
- ***-This sample contains both higher and lower molecular weight hydrocarbons.


 Cynthia Pigman, QA/QC Supervisor


 Jeffrey Creager, Organics Manager



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FIGURE: B-10

Environmental Services

BSK-Pleasanton
 Nahas

Date Sampled : 04/02/92
 Time Sampled : 0654
 Date Received : 04/03/92
 Date of Analysis : 04/08/92
 Report Issue Date: 04/16/92

Case Number : Ch920907
 Lab ID Number : 0907-2
 Project Number : P92057.3
 Sample Description: MW-3, No.1 @ 15.5'

Sample Type: SOLID

Analyses for BTEX by EPA Method 8020
and TPH (G) by EPA Method 8015

Results Reported in Milligrams per Kilogram (mg/kg)

Compound	Results	DLR
Benzene	ND	0.005
Toluene	ND	0.005
Ethylbenzene	ND	0.005
Total Xylene Isomers	ND	0.005
Total Petroleum Hydrocarbons (G)	ND	1.

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.
 Exceptional sample conditions or matrix interferences
 may result in higher detection limits.
 ND: None Detected

Cynthia Pigman, QA/QC Supervisor

10701 BTPS.t

Jeffrey Creager, Organics Manager



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FIGURE: B-11

Environmental Services

BSK-Pleasanton
 R.T. Nahas

Date Sampled : 04/13/92
 Time Sampled : 1156
 Date Received : 04/15/92
 Date of Analysis : 04/21/92
 Report Issue Date: 04/24/92

Case Number : Ch921034
 Lab ID Number : 1034-2
 Project Number : P92057.3
 Sample Description: ~~20~~-5 #1

Sample Type: LIQUID

Analyses for BTEX by EPA Method 8020
and TPH(G) by EPA Method 8015
Prepared by Method 5030

Results Reported in Micrograms per Liter (ug/L)

Compound	Results	DLR
Benzene	ND	0.3
Toluene	ND	0.3
Ethylbenzene	ND	0.3
Total Xylene Isomers	ND	0.3
Total Petroleum Hydrocarbons (G)	ND	50

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.
 Exceptional sample conditions or matrix interferences
 may result in higher detection limits.
 ND: None Detected

Cynthia Pigman, QA/QC Supervisor

Jeffrey Creager, Organics Manager



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 FAX (209) 485-6935
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Environmental Services

BSK-Pleasanton
 R.T. Nahas

Date Sampled : 04/13/92
 Time Sampled : 1111
 Date Received : 04/15/92
 Date of Analysis : 04/21/92
 Report Issue Date: 04/24/92

Case Number : Ch921034
 Lab ID Number : 1034-1
 Project Number : P92057.3
 Sample Description: ~~MW-6~~ #1

Sample Type: LIQUID


Analyses for BTEX by EPA Method 8020
and TPH(G) by EPA Method 8015
Prepared by Method 5030

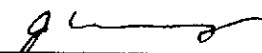
Results Reported in Micrograms per Liter (ug/L)

Compound	Results	DLR
Benzene	ND	0.3
Toluene	0.3	0.3
Ethylbenzene	ND	0.3
Total Xylene Isomers	ND	0.3
Total Petroleum Hydrocarbons (G)	ND	50

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.
 Exceptional sample conditions or matrix interferences
 may result in higher detection limits.
 ND: None Detected


 Cynthia Pigman, QA/QC Supervisor


 Jeffrey Creager, Organics Manager



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Environmental Services

BSK-Pleasanton
 R.T. Nahas

Date Sampled : 04/13/92
 Time Sampled : 1235
 Date Received : 04/15/92
 Date of Analysis : 04/21/92
 Report Issue Date: 04/24/92

Case Number : Ch921034
 Lab ID Number : 1034-3
 Project Number : P92057.3
 Sample Description: #1

Sample Type: LIQUID

Analyses for BTEX by EPA Method 8020
and TPH(G) by EPA Method 8015
Prepared by Method 5030

Results Reported in Micrograms per Liter (ug/L)

Compound	Results	DLR
Benzene	0.4	0.3
Toluene	0.3	0.3
Ethylbenzene	0.3	0.3
Total Xylene Isomers	0.3	0.3
Total Petroleum Hydrocarbons (G)	50	50

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.
 Exceptional sample conditions or matrix interferences
 may result in higher detection limits.
 ND: None Detected

Cynthia Pigman, QA/QC Supervisor

Jeffrey Creager, Organics Manager

Client Name <u>Nahais</u>			Project or P.O.# <u>728165 P70873</u>			Lab Use Only in this section <u>BTAE-TVH (M-3020)</u> <u>TPH-D (M-3550)</u>		Analysis required						
Address <u>1181 Quarry Lane, Bldg. 300</u>			Phone # <u>510 462 4000</u>					Hazardous sample Special handling required						
City, State, Zip <u>Pleasanton, CA 94566</u>			Report, attention <u>Tim Berger</u>											
Date sampled	Time sampled	Type (See key below)	Sampled by <u>Tim Berger</u>	Sample description	Number of containers	Lab Sample number	Sample Seals (See key below)	Remarks						
<u>3/30/92</u>	<u>07:47</u>	<u>SO</u>		<u>EB-1 #5 at 21'</u>	<u>1</u>	<u>1</u>	<u>P</u>	<u>X</u>	<u>X</u>	<u>4-13-92</u>				
<u>"</u>	<u>09:15</u>	<u>SO</u>		<u>EB-2 #2 at 20.5'</u>	<u>1</u>	<u>2</u>	<u>P</u>	<u>X</u>	<u>X</u>	<u>1x.50:1 Tube</u>				
<u>3/31/92</u>	<u>06:50</u>	<u>SO</u>		<u>EB-3 #2 at 21'</u>	<u>1</u>	<u>3</u>	<u>P</u>	<u>X</u>	<u>X</u>	<u>↓</u>				

IMPORTANT NOTICE: No samples will be analyzed without an authorized signature in this section.

I am hereby requesting BSK's Normal Chain-of-Custody Procedures for the above samples. I understand that these procedures are generally consistent with those outlined in the U.S. E.P.A. SW 846 and that there is no extra charge for this service.

By: Tim Berger
Authorized Signature

I am hereby requesting BSK's Formal Chain-of-Custody Procedures for the above samples. I understand that these procedures are generally consistent with those outlined in U.S. EPA Contract Laboratory Program Statement of Work, Section F, and that there is a charge of \$50.00 per work order or \$5.00 a bottle, whichever is greater.

By: _____
Authorized Signature

Signature	Print Name	Company	Date	Time
<u>Tim Berger</u>	<u>Tim Berger</u>	<u>BSK-P</u>	<u>3/31/92</u>	<u>13:30</u>
<u>J. A. Z...</u>	<u>T. D. VELA</u>	<u>BSK</u>	<u>4/1/92</u>	<u>0826</u>
Relinquished by				
Received by				
Relinquished by				
Received by				
Relinquished by				
Received by				

BSK & Associates Chemical Laboratories

1414 Stanislaus Street Fresno, California 93706
Telephone (209) 485-8310 • Fax (209) 485-7427

KEY: Type: AQ-Aqueous SL-Sludge SO-Soil PE-Petroleum OT-Other
Seals: P-Present A-Absent B-Broken
DISTRIBUTION: WHITE, CANARY - LABORATORY PINK - ORIGINATOR
Note:
Samples are discarded 14 days after results are reported unless other arrangements are made.
Hazardous samples will be returned to client or disposed of at client expense.

Client Name <u>Nahas</u>			Project or P.O.# <u>7418</u> <u>990165 P20573</u>			Analysis required						
Address <u>1181 Quany Ln. Bldg 300</u>			Phone # <u>(510) 462 4000</u>			Lab Use Only in this section						
City, State, Zip <u>Pleasanton, CA 94566</u>			Report, attention <u>Tim Berger</u>			<div style="border: 1px solid black; padding: 5px; transform: rotate(-45deg); display: inline-block;"> BTR-FTVH (M5028) </div> <div style="border: 1px solid black; padding: 5px; transform: rotate(-45deg); display: inline-block; margin-left: 10px;"> TPH-D (M3550) </div>						
Sampled by <u>Tim Berger</u>												
Date sampled	Time sampled	Type (See key below)	Sample description	Number of containers	Lab Sample number	Sample Seals (See key below)	Hazardous sample Special handling required				Remarks	
<u>4/1/92</u>	<u>6:20 AM</u>	<u>SO</u>	<u>MW-2, No. 1 @ 16'</u>	<u>1</u>	<u>1</u>	<u>P</u>	<u>X</u>	<u>X</u>				<u>4-15-92</u>
<u>4/2/92</u>	<u>6:54</u>	<u>SO</u>	<u>MW-3 #1 @ 15 1/2'</u>	<u>1</u>	<u>2</u>	<u>P</u>	<u>X</u>	<u>X</u>				<u>14 Soil Tube</u> ↓

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I am hereby requesting BSK's Normal Chain-of-Custody Procedures for the above samples. I understand that these procedures are generally consistent with those outlined in the U.S. E.P.A. SW 846 and that there is no extra charge for this service.

By: Tim Berger
Authorized Signature

I am hereby requesting BSK's Formal Chain-of-Custody Procedures for the above samples. I understand that these procedures are generally consistent with those outlined in U.S. EPA Contract Laboratory Program Statement of Work, Section F, and that there is a charge of \$50.00 per work order or \$5.00 a bottle, whichever is greater.

By: _____
Authorized Signature

Signature	Print Name	Company	Date	Time
Relinquished by <u>Tim Berger</u>	<u>Tim Berger</u>	<u>BSK-P</u>	<u>4/2/92</u>	<u>1430</u>
Received by <u>J.A. Verz</u>	<u>T.A. Verz</u>	<u>BSK</u>	<u>4/3/92</u>	<u>0815</u>
Relinquished by				
Received by				
Relinquished by				
Received by				

BSK & Associates Chemical Laboratories

1414 Stanislaus Street Fresno, California 93706
Telephone (209) 485-8310 • Fax (209) 485-7427

KEY: Type: AQ-Aqueous SL-Sludge SO-Soil PE-Petroleum OT-Other
 Seals: P-Present A-Absent B-Broken
 DISTRIBUTION: WHITE, CANARY - LABORATORY PINK - ORIGINATOR
 Note:
 Samples are discarded 14 days after results are reported unless other arrangements are made.
 Hazardous samples will be returned to client or disposed of at client expense.

FIGURE: B-15

Client Name R.T. Nahas (BSK Pleasanton)			Project or P.O.# P92057.3			Lab Use Only in this section IVH F B T X E		Analysis required								
Address 1181 Quarry Ln			Phone # 510 462-4000					Hazardous sample Special handling required								
City, State, Zip Pleasanton			Report, attention Tim Berger													
Date sampled	Time sampled	Type (See key below)	Sampled by M. Cline	Number of containers	Lab Sample number	Sample Seals (See key below)	4-27-92									
			Sample description									Remarks				
4/13/92	11:11	L	MW-6 #1	2	1	P						2x40ml				
	11:56		MW-5 #1	2	2	✓						↓				
	12:35		MW-7 #1	2	3	✓										

IMPORTANT NOTICE: No samples will be analyzed without an authorized signature in this section.

I am hereby requesting BSK's Normal Chain-of-Custody Procedures for the above samples. I understand that these procedures are generally consistent with those outlined in the U.S. E.P.A. SW 846 and that there is no extra charge for this service.

By: Marty Cline
Authorized Signature

I am hereby requesting BSK's Formal Chain-of-Custody Procedures for the above samples. I understand that these procedures are generally consistent with those outlined in U.S. EPA Contract Laboratory Program Statement of Work, Section F, and that there is a charge of \$50.00 per work order or \$5.00 a bottle, whichever is greater.

By: _____
Authorized Signature

Signature	Print Name	Company	Date	Time
Relinquished by <u>Marty Cline</u>	<u>Martin Cline</u>	<u>BSK Pleasanton</u>	<u>4/14/92</u>	<u>8:21</u>
Received by <u>Marti Hill</u>	<u>S. Hill</u>	<u>BSK</u>	<u>4-15-92</u>	<u>0821</u>
Relinquished by				
Received by				
Relinquished by				
Received by				

BSK & Associates Chemical Laboratories

1414 Stanislaus Street Fresno, California 93706
Telephone (209) 485-8310 • Fax (209) 485-7427

KEY: Type: AQ-Aqueous SL-Sludge SO-Soil PE-Petroleum OT-Other
Seals: P-Present A-Absent B-Broken
DISTRIBUTION: WHITE, CANARY - LABORATORY PINK - ORIGINATOR
Note:
Samples are discarded 14 days after results are reported unless other arrangements are made.
Hazardous samples will be returned to client or disposed of at client expense.

APPENDIX C

SECTION - 2

CHEMICAL TEST DATA SHEETS

AND

PROJECT-CHAIN-OF-CUSTODY RECORD



1414 Stanislaus Street
 Fresno, California 93706
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 FAX (209) 485-6935
 1-800-877-8310

FIGURE: C-1

Environmental Services

BSK-Pleasanton
 Unocal (R.T. Nahas)

Date Sampled : 04/20/92
 Time Sampled : 1245
 Date Received : 04/22/92
 Date of Analysis : 04/22/92
 Report Issue Date: 04/30/92

Case Number : Ch921100
 Lab ID Number : 1100-3
 Project Number : P92057.3
 Sample Description: MW-2 #1

Sample Type: LIQUID

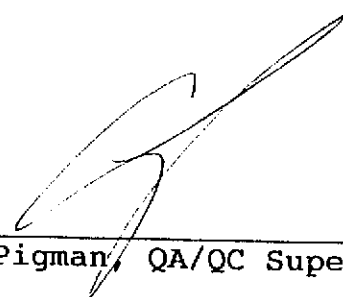
Analyses for BTEX by EPA Method 8020
and TPH(G) by EPA Method 8015
Prepared by Method 5030

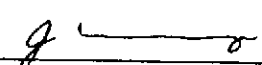
Results Reported in Micrograms per Liter (ug/L)

Compound	Results	DLR
Benzene	70	0.3
Toluene	0.3	0.3
Ethylbenzene	15	0.3
Total Xylene Isomers	7.0	0.3
Total Petroleum Hydrocarbons (G)	300	50

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.
 Exceptional sample conditions or matrix interferences
 may result in higher detection limits.
 ND: None Detected


 Cynthia Pigman, QA/QC Supervisor


 Jeffrey Creager, Organics Manager



Environmental Services

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FAX (209) 485-6935
1-800-877-8310

BSK-Pleasanton
Unocal (R.T. Nahas)

Date Sampled : 04/20/92
Time Sampled : 1201
Date Received : 04/22/92
Date of Analysis : 04/22/92
Report Issue Date: 04/30/92

Case Number : Ch921100
Lab ID Number : 1100-2
Project Number : P92057.3
Sample Description: MW-3 #1

Sample Type: LIQUID

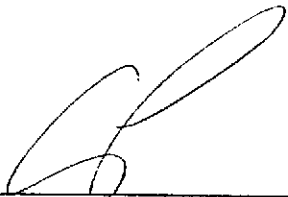
Analyses for BTEX by EPA Method 8020
and TPH(G) by EPA Method 8015
Prepared by Method 5030

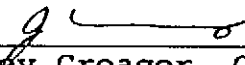
Results Reported in Micrograms per Liter (ug/L)

Compound	Results	DLR
Benzene	1.0	0.3
Toluene	0.4	0.3
Ethylbenzene	ND	0.3
Total Xylene Isomers	0.9	0.3
Total Petroleum Hydrocarbons (G)	ND	50

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.
Exceptional sample conditions or matrix interferences
may result in higher detection limits.
ND: None Detected


Cynthia Pigman, QA/QC Supervisor


Jeffrey Creager, Organics Manager

BSK-Pleasanton
 Unocal (R.T. Nahas)

Date Sampled : 04/20/92
 Time Sampled : 1058
 Date Received : 04/22/92
 Date of Analysis : 04/22/92
 Report Issue Date: 04/30/92

Case Number : Ch921100
 Lab ID Number : 1100-1
 Project Number : P92057.3
 Sample Description: MW-4 #1, #2, #3

Sample Type: LIQUID

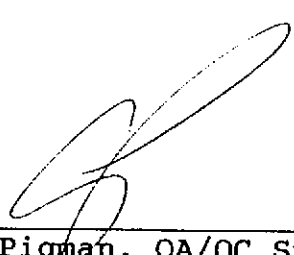
Analyses for BTEX by EPA Method 8020
and TPH(G) by EPA Method 8015
Prepared by Method 5030

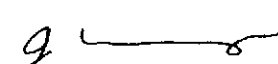
Results Reported in Micrograms per Liter (ug/L)

Compound	Results	DLR
Benzene	ND	0.3
Toluene	ND	0.3
Ethylbenzene	ND	0.3
Total Xylene Isomers	ND	0.3
Total Petroleum Hydrocarbons (G)	ND	50

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.
 Exceptional sample conditions or matrix interferences
 may result in higher detection limits.
 ND: None Detected


 Cynthia Pigman, QA/QC Supervisor


 Jeffrey Creager, Organics Manager



Environmental Services

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FAX (209) 485-6935
1-800-877-8310

BSK-Pleasanton
Unocal (R.T. Nahas)

Date Sampled : 04/20/92
Time Sampled : 1058
Date Received : 04/22/92
Date of Analysis : 04/28/92
Report Issue Date: 04/30/92

Case Number : Ch921100
Lab ID Number : 1100-1
Project Number : P92057.3
Sample Description: MW-4 #1, #2, #3

Sample Type: LIQUID

Analyses for TPH (Total Petroleum Hydrocarbons) as Diesel
by Method DHS GC/FID.

Results Reported in Micrograms per Liter (µg/L)

Analyte	Results	DLR
TPH(D)	ND	50

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.

Exceptional sample conditions or matrix interferences
may result in higher detection limits.

ND: None Detected

*-This sample contains lower molecular weight hydrocarbons.

** -This sample contains higher molecular weight hydrocarbons.

***-This sample contains both higher and lower molecular weight hydrocarbons.

Cynthia Pigman, QA/QC Supervisor

Jeffrey Creager, Organics Manager



Environmental Services

1414 Stanislaus Street
Fresno, California 93706
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FAX (209) 485-6935
1-800-877-8310

BSK-Pleasanton
Unocal (R.T. Nahas)

Date Sampled : 04/20/92
Time Sampled : 1058
Date Received : 04/22/92
Date of Analysis : 04/24/92
Report Issue Date: 04/30/92

Case Number : Ch921100
Lab ID Number : 1100-1
Project Number : P92057.3
Sample Description: MW-4 #1, #2, #3

Sample Type: LIQUID

Analyses for Hydrocarbon Oil & Grease by Standard Method 503E

Results Reported in Milligram per Liter (mg/L)

Analyte	Results	DLR
Hydrocarbon Oil and Grease	ND	1

Sample DLR = DLR x DLR Multiplier, DLR Multiplier = 1

DLR: Detection Limit for the Purposes of Reporting.
Exceptional sample conditions or matrix interferences
may result in higher detection limits.
ND: None Detected
---: Not Analyzed

Cynthia Pigman, QA/QC Supervisor

920302 OGHL503

Jeffrey Creager, Organics Manager

Client Name <i>UNOCAL (R.T. Nabes) (BSK P)</i>			Project or P.O.# <i>P92057.3</i>			Lab Use Only in this section <i>INHIBITRE</i> <i>TPH Diesel</i> <i>Oil/Grease Hxd.</i> Analysis required Hazardous sample Special handling required 5-4-92							
Address <i>1181 Quarry Ln</i>			Phone # <i>(510) 462-4000</i>										
City, State, Zip <i>Pleasanton, CA</i>			Report, attention <i>Tim Berger</i>										
Date sampled	Time sampled	Type (See key below)	Sampled by	Number of containers	Lab Sample number	Sample Seals (See key below)	Remarks						
			<i>M. Cline</i>										
<i>4/21/92</i>	<i>10:58</i>	<i>L</i>	<i>MW-4 #1</i>	<i>2</i>	<i>1</i>	<i>A/P</i>	<i>X</i>					<i>No seal 2x1L</i>	<i>Seals 2x40ml</i>
	<i>11:06</i>		<i>MW-4 #2</i>	<i>1</i>	<i>1</i>	<i>↓</i>		<i>X</i>					
	<i>11:02</i>		<i>MW-4 #3</i>	<i>1</i>	<i>1</i>	<i>↓</i>			<i>X</i>				
	<i>12:01</i>		<i>MW-3 #1</i>	<i>2</i>	<i>-2</i>	<i>P</i>	<i>X</i>					<i>2x40ml</i>	
<i>↓</i>	<i>12:45</i>	<i>↓</i>	<i>MW-2 #1</i>	<i>2</i>	<i>-3</i>	<i>↓</i>	<i>X</i>						<i>↓</i>

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By: *Marty Cline*
Authorized Signature

I am hereby requesting BSK's Formal Chain-of-Custody Procedures for the above samples. I understand that these procedures are generally consistent with those outlined in U.S. EPA Contract Laboratory Program Statement of Work, Section F, and that there is a charge of \$50.00 per work order or \$5.00 a bottle, whichever is greater.

By: _____
Authorized Signature

Signature	Print Name	Company	Date	Time
Relinquished by <i>Marty Cline</i>	<i>Martin Cline</i>	<i>BSK P</i>	<i>4/21/92</i>	<i>8:20</i>
Received by <i>Cecil Harris</i>	<i>C. Harris</i>	<i>BSK Lab</i>	<i>4-22-92</i>	<i>0845</i>
Relinquished by				
Received by				
Relinquished by				
Received by				

BSK & Associates Chemical Laboratories

1414 Stanislaus Street Fresno, California 93706

Telephone (209) 485-8310 • Fax (209) 485-7427

KEY: Type: AQ-Aqueous SL-Sludge SO-Soil PE-Petroleum OT-Other

Seals: P-Present A-Absent B-Broken

DISTRIBUTION: WHITE, CANARY - LABORATORY PINK - ORIGINATOR

Note:

Samples are discarded 14 days after results are reported unless other arrangements are made.

Hazardous samples will be returned to client or disposed of at client expense.