R.T. NAHAS COMPANY
REAL ESTATE DEVELOPERS AND INVESTORS

20630 PATIO DRIVE
CASTRO VALLEY, CALIFORNIA 94546
TELEPHONE (510) 538 9600
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November 13, 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 Ninth Quarterly Groundwater Monitoring Report for the Unocal 76 Service Station on Redwood Road in Castro Valley.

Sincerely,

Randall E. Nahas

REN/hrs

Enclosure

BSK & ASSOCIATES

GEOTECHNICAL CONSULTANTS, INC.

BSK JOB NO. P92057.3

NINTH QUARTERLY GROUNDWATER MONITORING REPORT UNOCAL 76 SERVICE STATION 20405 AND 20629 REDWOOD ROAD CASTRO VALLEY, CALIFORNIA NOVEMBER 1992

BSK & Associates

BSK & Associates
1181 Quarry Lane
Building 300
Pleasanton, CA 94566
(510) 462-4000
(510) 462-6283 FAX

Received 11/16/92

November 10, 1992

BSK JOB P92057.3

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

Subject: Ninth Quarterly Groundwater Monitoring Report
Unocal 76 Service Station
20405 and 20629 Redwood Road
Castro Valley, California

Gentlemen:

As requested and authorized, we performed groundwater monitoring well quarterly sampling on October 8, 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. 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 groundwater monitoring well locations are shown on Figure 2, Site Plan.

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 seventh quarterly monitoring report was included with the results of additional lateral contamination characterization in the off-site area to the south (BSK Report P92057.3, dated May 29, 1992). The report indicated a decrease in contaminant concentration in water near the UST group, and extension of the groundwater contaminant plume south of the site, between Wells MW-6 and MW-5, and south of MW-7.

Review of Subsurface Conditions

The site subsurface soil conditions, as exposed by 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.

In the areas of Wells MW-5 through MW-7, subsurface conditions comprised 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.

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 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 result in 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 Photo-Ionization Detector (PID) in 13 borings in the project area. Hydrocarbons were detected at depths ranging from just below the asphalt pavement to 17 feet (the greatest depth of several borings in the area of greatest 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, and in Well MW-7. Wells MW-2 and MW-3 are adjacent, and up and cross-gradient to what is believed to be the contaminant source area. Well MW-7 is down gradient from the source area. No evidence of hydrocarbons has been noted during observation of this well.

NINTH QUARTERLY MONITORING ACTIVITIES

General

Quarterly monitoring and/or observation of Underground Storage Tank (UST) groundwater monitoring wells (MW-2, MW-3, MW-4, MW-5, MW-6 and MW-7) were performed on October 8, 1992. Field procedures and observations are provided in the following text and figures.

Field Work

Wells MW-2, MW-3, MW-4, MW-5, MW-6 and MW-7 were purged by bailing. Four to five well casing 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. Each drum was labeled according to its contents, content source, and date of accumulation.

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 3, Groundwater Flow Direction and Gradient. 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® point-source bailer. Sampling for contaminants was performed in the order of their volatility, with the most volatile constituents sampled first. 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 presented as Figures 4.1 through 4.6.

Site Hydrology

Groundwater measurements were made of the six existing wells on October 8, 1992, in order to assess the flow and gradient in the area. **On this date, groundwater flow is generally south to south-southwest. The gradient is 0.6 percent. This flow is slightly more southerly than the previous quarter. The gradient is 0.5 percent less than the previous quarter.** Groundwater levels **have dropped 0.61 to 1.85 feet since July 1992.** Groundwater flow direction and gradient are shown on Figure 3, Potentiometric Surface Map.

Conductivity, pH and temperature data are presented in the Well Field Logs, Figures 4.1 through 4.6, little significant change has occurred in these parameters. Electrical conductivity is essentially the same, and **the water slightly less acidic than July 1992.**

The changes in flow direction and water level since July 1992 are likely the result of a falling water table due to seasonal dry weather.

Chemical Analyses

The water samples obtained from Wells MW-2, MW-3 and MW-5 through MW-7, were analyzed for constituents related to gasoline, since the wells are located adjacent to and downgradient from two 10,000 gallon underground gasoline tanks. The samples were tested for the following contaminants: Total Petroleum Hydrocarbons as Gasoline (TPH-G) and Benzene, Toluene,

Xylene and Ethylbenzene (BTXE). Well MW-4 is adjacent to a 500-gallon waste oil tank, and was tested for Oil & Grease, Total Petroleum Hydrocarbons as Diesel (TPH-D), Total Petroleum Hydrocarbons as Gasoline and BTXE.

The contaminants tested for 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 A, Figures A-1 and A-8. Project Chain-of-Custody record is shown as Figure A-9.

WATER ANALYSES

TABLE 1

(Results in ppb)

Sampling Date	Sample Location	Benzene (1)*	Toluene (100)+	Xylene (1750)*	Ethylbenzene (680)*
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

WATER ANALYSES

TABLE 1 (Continued)

(Results in ppb)

Sampling Date	Sample Location	Benzene (1)*	Toluene (100)+	Xylene (1750)*	Ethylbenzene (680)*
January 1992	Well MW-2	480	870	860	160
	Well MW-3	4	10	82	
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
	Well MW-5	ND	ND	ND	ND
	Well MW-6	ND	0.3	ND	ND
	Well MW-7	0.4	0.3	0.9	0.3
July 1992	Well MW-2	10	ND	2.3	0.6
	Well MW-3	1.3	0.4	1.3	ND
	Well MW-5	ND	ND	ND	ND
	Well MW-6	ND	ND	ND	ND
	Well MW-7	ND	ND	ND	ND
October 1992	Well MW-2	2.3	ND	3.0	2.3
	Well MW-3	2.1	ND	0.3	ND
	Well MW-4	ND	ND	ND	ND
	Well MW-5	ND	0.4	ND	ND
	Well MW-6	ND	ND	ND	ND
	Well MW-7	ND	ND	ND	ND

ND = None Detected
*DHS: Primary Drinking Water Standard (3/89)
+DHS: Action Level

WATER ANALYSES

TABLE 2
(Results in ppb)

Sampling Date	Sample Location	TPH (100)*	TVH (100)*	Oil and Grease (100)*
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 1991	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	--	ND	ND
	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
	Well MW-5	--	--	--
	Well MW-6	--	--	--
	Well MW-7	--	1300	--

WATER ANALYSES

TABLE 2 (Continued)
(Results in ppb)

Sampling Date	Sample Location	TPH (100)*	TVH (100)*	Oil and Grease (100)*
July 1992	Well MW-2	--	84	--
	Well MW-3	--	ND	--
	Well MW-5	--	ND	--
	Well MW-6	--	ND	--
	Well MW-7	--	830	--
October 1992	Well MW-2	--	ND	--
	Well MW-3	--	ND	--
	Well MW-4	120	ND	ND
	Well MW-5	--	ND	--
	Well MW-6	--	ND	--
	Well MW-7	--	3900	--

-- = 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.

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 not changed significantly in Monitoring Wells MW-2 and MW-3, MW-5, and MW-6 since the last quarterly sampling event (July 1992). At this time, Benzene concentrations meet or exceed State and Federal Standards in Wells MW-2 and MW-3. **The TPH-G concentration measured at well MW-7 is 3 times the highest previous value.** Although no standard has been devised for Total Petroleum Hydrocarbon concentrations as Gasoline or Diesel, the quantities observed in Wells MW-4 and MW-7 exceed general informal regulatory action levels. **The presence of TPH-D in MW-4 is a first time event.**

* **According to the chromatogram for well MW-7, the TPH-G value of 3900 ppb is attributable to one peak very close to the vicinity of toluene, but is not toluene.**

Recommendations

With respect to the findings of this quarterly sampling and the conclusions of this report, it is recommended that quarterly groundwater monitoring continue. **It is further recommended that the southern limit of the groundwater contaminant plume be located, and monitored.**

Due to the anomolous peak at well MW-7, and the presence of a dry cleaning establishment directly up-gradient, we recommend testing this well for volatile organic compounds, by EPA Method 502.2, in order to determine the contaminant, and its likely source.

REPORT DISTRIBUTION

Copies of this report should be submitted to the Alameda County Department of Environmental Health 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 in Oakland for their review.

LIMITATIONS

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 in the area. No other warranties, expressed or implied, are 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 adjacent property can cause changed conditions which can invalidate the findings and conclusions presented in this report.

BSK is pleased to continue to be of service to you during this project. If you have questions concerning the contents of the report, please do not hesitate to contact us.

The following are attached and complete this report:

FIGURE 1	Vicinity Map
FIGURE 2	Site Plan
FIGURE 3	Potentiometric Surface Map
FIGURES 4.1 through 4.6	Well Field Logs

APPENDIX "A"

FIGURES A-1 through A-8	Ninth Quarterly Laboratory Chemical Test Data Sheets
FIGURE A-9	Project Chain-of-Custody Record

Respectfully submitted,
BSK & Associates

Alex Y. Eskandari, P.E.
Project Manager
C.E. #038101, R.E.A. #01528

Tim W. Berger, R.G. #05225
Project Geologist

AYE/TWB:kl(prts\env.Q9)

Distribution:
R.T. Nahas Co. (4 copies)

WELL FIELD LOG

Well Development: Date:
Sample Collection: x Date: 10/08/92

Project Name: Ninth Quarterly Sampling
Location: Nahas/Union 76
Personnel: TWB
Weather: Clear, 80 to 85 F., Light breeze

WELL INFORMATION:

Well Number	MW-2	Date Purged	10/08/92
Depth to Water - feet(TOC)	11.60	Purge Method	PVC Bailer
Well Depth (feet)	30		
Water Volume (gallons)	2.9	Purge Begin	16:55
Reference Elevation - feet(TOC)	183.47	Purge End	17:26
Groundwater Elevation (feet)	+171.87	Purge Rate	0.4 gal/min.
Measurement Technique	Solinst Electric Well Sounder		

IMMISCIBLE LAYERS:

Top: None, no odor Bottom: Clear, fine gray sand settling out
Detection Method: Visual, olfactory
Collection Method: Clear PVC Point-Source Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	VOLUME REMOVED (gallons)	ELECTRICAL CONDUCTIVITY (Ec/Range)	pH	TEMP. (°F)	COLOR/COMMENTS
16:59	2.5	805	6.35	77.4	Clear, lt. gray
17:05	5.0	758	5.99	77.8	"
17:13	7.5	727	5.98	77.8	Sand and orange sed. at bot.
17:20	10.0	712	6.01	77.0	"
17:26	12.5	694	5.97	76.6	"

SAMPLE COLLECTION DATA

Sampling Equipment: Teflon Point Source Bailer

TIME	ANALYSIS	AMOUNT/CONTAINER USED	SAMPLE INTERVAL
17:35	BTEX & TPH-G	2-40ml glass VOA with HCl	

Field Observations: Well plug with lock had been pried off.

BSK Job No.: P92057.3
Date: November 1992
Figure No.: 4.1

BSK & Associates

WELL FIELD LOG

Well Development: Date:
Sample Collection: x Date: 10/08/92

Project Name: Ninth Quarterly Sampling
Location: Nahas/Union 76
Personnel: TWB
Weather: Clear, 80 to 85 F., Light breeze

WELL INFORMATION:

Well Number	MW-3	Date Purged	10/08/92
Depth to Water - feet(TOC)	11.96	Purge Method	PVC Bailer
Well Depth (feet)	30		
Water Volume (gallons)	2.9	Purge Begin	15:30
Reference Elevation - feet(TOC)	184.03	Purge End	16:08
Groundwater Elevation (feet)	172.07	Purge Rate	0.3 gal/min.
Measurement Technique	Solinst Electric Well Sounder		

IMMISCIBLE LAYERS:
Top: None, no odor Bottom: Clear, no odor, thin coat of seds. on bottom
Detection Method: Visual, olfactory
Collection Method: Clear PVC Point-Source Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	VOLUME REMOVED (gallons)	ELECTRICAL CONDUCTIVITY (Ec/Range)	pH	TEMP. (°F)	COLOR/COMMENTS
15:38	2.5	615	6.44	78.5	Clear, dk. brown
15:44	5.0	611	6.15	78.1	"
15:54	7.5	605	6.11	77.3	"
16:00	10.0	606	6.10	77.2	"
16:08	12.0	597	6.08	77.4	"

SAMPLE COLLECTION DATA
Sampling Equipment: Teflon Point Source Bailer

TIME	ANALYSIS	AMOUNT/CONTAINER USED	SAMPLE INTERVAL
16:15	BTEX & TPH-G	2-40ml glass VOA with HCl	

Field Observations: Six feet from active gas pump island

BSK Job No.: P92057.3
Date: November 1992
Figure No.: 4.2

BSK & Associates

WELL FIELD LOG

Well Development: Date:
Sample Collection: x Date: 10/08/92

Project Name: Ninth Quarterly Sampling
Location: Nahas/Union 76
Personnel: TWB
Weather: Clear, 80 to 85 F., Light breeze

WELL INFORMATION:

Well Number	MW-4	Date Purged	10/08/92
Depth to Water - feet(TOC)	12.78	Purge Method	PVC Bailer
Well Depth (feet)	25		
Water Volume (gallons)	2.0	Purge Begin	14:10
Reference Elevation - feet(TOC)	184.61	Purge End	14:37
Groundwater Elevation (feet)	+171.83	Purge Rate	0.3 gal/min.
Measurement Technique	Solinst Electric Well Sounder		

IMMISCIBLE LAYERS:

Top: None, no odor Bottom: Clear, no odor
Detection Method: Visual, olfactory
Collection Method: Clear PVC Point-Source Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	VOLUME REMOVED (gallons)	ELECTRICAL CONDUCTIVITY (Ec/Range)	pH	TEMP. (°F)	COLOR/COMMENTS
14:16	2.5	555	6.62	76.1	Very light orange gray
14:22	5.0	612	6.21	75.1	"
14:29	7.0	604	6.11	75.0	"
14:36	9.0	609	6.06	75.9	"

SAMPLE COLLECTION DATA

Sampling Equipment: Teflon Point Source Bailer

TIME	ANALYSIS	AMOUNT/CONTAINER USED	SAMPLE INTERVAL
14:45	BTEX & TPH-G	2-40ml glass VOA with HCl	
14:45	TPH-D	1 Litre Amber Glass, R&B	
14:45	Oil & Grease	1 Liter Amber Glass w/H_2SO_4	

Field Observations:

BSK Job No.: P92057.3
Date: November 1992
Figure No.: 4.3

BSK & Associates

WELL FIELD LOG

Well Development: Date:
Sample Collection: x Date: 10/08/92

Project Name: Ninth Quarterly Sampling
Location: Nahas/Union 76
Personnel: TWB
Weather: Clear, 80 F., Light breeze

WELL INFORMATION:

Well Number	MW-5	Date Purged	10/08/92
Depth to Water - feet(TOC)	13.24	Purge Method	PVC Bailer
Well Depth (feet)	34.5		
Water Volume (gallons)	3.4	Purge Begin	10:45
Reference Elevation - feet(TOC)	183.92	Purge End	11:18
Groundwater Elevation (feet)	+170.68	Purge Rate	0.4 gal/min.
Measurement Technique	Solinst Electric Well Sounder		

IMMISCIBLE LAYERS:

Top: None, no odor Bottom: Clear, no odor
Detection Method: Visual, olfactory
Collection Method: Clear PVC Point-Source Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	VOLUME REMOVED (gallons)	ELECTRICAL CONDUCTIVITY (Ec/Range)	pH	TEMP. (°F)	COLOR/COMMENTS
10:52	2.5	710	6.60	75.5	Very light brown to clear
10:57	5.0	724	6.48	75.3	Clear
11:04	7.5	702	6.39	75.3	"
11:10	10.0	697	6.41	74.8	"
11;18	12.5	700	6.27	75.0	"

SAMPLE COLLECTION DATA

Sampling Equipment: Teflon Point Source Bailer

TIME	ANALYSIS	AMOUNT/CONTAINER USED	SAMPLE INTERVAL
11:25	BTEX & TPH-G	2-40ml glass VOA with HCl	

Field Observations: Well in busy parking lot, recently top-coated - including well.

BSK Job No.: P92057.3
Date: November 1992
Figure No.: 4.4

BSK & Associates

WELL FIELD LOG

Well Development: Date:
Sample Collection: x Date: 10/08/92

Project Name: Ninth Quarterly Sampling
Location: Nahas/Union 76
Personnel: TWB
Weather: Clear, 70+ F., Light breeze

WELL INFORMATION:

Well Number	MW-6	Date Purged	10/08/92
Depth to Water - feet(TOC)	13.30	Purge Method	PVC Bailer
Well Depth (feet)	29.0		
Water Volume (gallons)	2.5	Purge Begin	09:02
Reference Elevation - feet(TOC)	183.96	Purge End	09:37
Groundwater Elevation (feet)	+170.64	Purge Rate	0.4 gal/min.
Measurement Technique	Solinst Electric Well Sounder		

IMMISCIBLE LAYERS:

Top: Layer of black dust Bottom: 2" suspended yellow-brown sediment
Detection Method: Visual, olfactory
Collection Method: Clear PVC Point-Source Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	VOLUME REMOVED (gallons)	ELECTRICAL CONDUCTIVITY (Ec/Range)	pH	TEMP. (°F)	COLOR/COMMENTS
09:09	2.5	640	7.51	73.8	Opaque yel-brn, sticky
09:16	5.0	613	7.00	74.0	"
09:22	7.5	605	7.37	73.7	"
09.29	10.0	663	7.74	73.1	Clearer
09;37	12.5	664	7.55	73.2	"

SAMPLE COLLECTION DATA

Sampling Equipment: Teflon Point Source Bailer

TIME	ANALYSIS	AMOUNT/CONTAINER USED	SAMPLE INTERVAL
09:47	BTEX & TPH-G	2-40ml glass VOA with HCl	

Field Observations: Well in busy parking lot, recently top-coated - including well.

BSK Job No.: P92057.3
Date: November 1992
Figure No.: 4.5

BSK & Associates

WELL FIELD LOG

Well Development: Date:
Sample Collection: x Date: 10/08/92

Project Name: Ninth Quarterly Sampling
Location: Nahas/Union 76
Personnel: TWB
Weather: Clear, 85 F., Light breeze

WELL INFORMATION:

Well Number	MW-7	Date Purged	10/08/92
Depth to Water - feet(TOC)	12.40	Purge Method	PVC Bailer
Well Depth (feet)	28.0		
Water Volume (gallons)	2.5	Purge Begin	12:22
Reference Elevation - feet(TOC)	182.78	Purge End	12:46
Groundwater Elevation (feet)	+170.38	Purge Rate	0.4 gal/min.
Measurement Technique	Solinst Electric Well Sounder		

IMMISCIBLE LAYERS:
Top: Clear, no odor Bottom: Thin layer sediment
Detection Method: Visual, olfactory
Collection Method: Clear PVC Point-Source Bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	VOLUME REMOVED (gallons)	ELECTRICAL CONDUCTIVITY (Ec/Range)	pH	TEMP. (°F)	COLOR/COMMENTS
12:28	2.5	795	6.15	80.4	Light orange-brown
12:33	5.0	790	6.06	79.5	", some fine sed.
12:40	7.5	808	6.09	78.6	", becomes more brown
12:46	10.0	800	6.09	78.6	"

SAMPLE COLLECTION DATA
Sampling Equipment: Teflon Point Source Bailer

TIME	ANALYSIS	AMOUNT/CONTAINER USED	SAMPLE INTERVAL
12:51	BTEX & TPH-G	2-40ml glass VOA with HCl	

Field Observations:

BSK Job No.: P92057.3
Date: November 1992
Figure No.: 4.6

BSK & Associates

APPENDIX A

CHEMICAL TEST DATA SHEETS

AND

PROJECT-CHAIN-OF-CUSTODY RECORD

ANALYTICAL BSK LABORATORIES
Environmental Services

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

FIGURE: A-1

BSK-Pleasanton
Nahas

Date Sampled : 10/08/92
Time Sampled : 1735
Date Received : 10/09/92
Date of Analysis : 10/13/92
Report Issue Date: 10/15/92

Case Number : Ch922674
Lab ID Number : 2674-3
Project Number : P92057.3
Sample Description: MW-2

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	2.3	0.3
Toluene	ND	0.3
Ethylbenzene	2.3	0.3
Total Xylene Isomers	3.0	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

ANALYTICAL BSK LABORATORIES
Environmental Services

1414 Stanislaus Street
Fresno, California 93706
Telephone (209) 485-8310
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FIGURE: A-2

BSK-Pleasanton
Nahas

Date Sampled : 10/08/92
Time Sampled : 1615
Date Received : 10/09/92
Date of Analysis : 10/13/92
Report Issue Date: 10/15/92

Case Number : Ch922674
Lab ID Number : 2674-5
Project Number : P92057.3
Sample Description: MW-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	2.1	0.3
Toluene	ND	0.3
Ethylbenzene	ND	0.3
Total Xylene Isomers	0.3	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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FIGURE: A-3

BSK-Pleasanton
Nahas

Date Sampled : 10/08/92
Time Sampled : 1445
Date Received : 10/09/92
Date of Analysis : 10/13/92
Report Issue Date: 10/15/92

Case Number : Ch922674
Lab ID Number : 2674-6
Project Number : P92057.3
Sample Description: MW-4 No's 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

R91 1009 BTPL.t

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FIGURE: A-4

BSK-Pleasanton
Nahas

Date Sampled : 10/08/92
Time Sampled : 1445
Date Received : 10/09/92
Date of Analysis : 10/13/92
Report Issue Date: 10/15/92

Case Number : Ch922674
Lab ID Number : 2674-6
Project Number : P92057.3
Sample Description: MW-4 No's 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)	120	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

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FIGURE: A-5

BSK-Pleasanton
Nahas

Date Sampled : 10/08/92
Time Sampled : 1445
Date Received : 10/09/92
Date of Analysis : 10/14/92
Report Issue Date: 10/15/92

Case Number : Ch922674
Lab ID Number : 2674-6
Project Number : P92057.3
Sample Description: MW-4 No's 1,2,& 3

Sample Type : LIQUID

Analyses For Total Oil and Grease by EPA Method 413.2

Results Reported in Milligrams per Liter (mg/L)

Analyte	Results	DLR
Total 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

Cynthia Pigman, QA/QC Supervisor

Jeffrey Creager, Organics Manager

R920302 OGL.T

ANALYTICAL BSK LABORATORIES
Environmental Services

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FIGURE: A-6

BSK-Pleasanton
Nahas

Date Sampled : 10/08/92
Time Sampled : 1125
Date Received : 10/09/92
Date of Analysis : 10/13/92
Report Issue Date: 10/15/92

Case Number : Ch922674
Lab ID Number : 2674-1
Project Number : P92057.3
Sample Description: MW-5

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	0.4	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

R91 1009 BTPL.t

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Environmental Services

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1-800-877-8310

FIGURE: A-7

BSK-Pleasanton
Nahas

Date Sampled : 10/08/92
Time Sampled : 0947
Date Received : 10/09/92
Date of Analysis : 10/13/92
Report Issue Date: 10/15/92

Case Number : Ch922674
Lab ID Number : 2674-2
Project Number : P92057.3
Sample Description: MW-6

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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Environmental Services

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

FIGURE: A-8

BSK-Pleasanton
Nahas

Date Sampled : 10/08/92
Time Sampled : 1251
Date Received : 10/09/92
Date of Analysis : 10/13/92
Report Issue Date: 10/15/92

Case Number : Ch922674
Lab ID Number : 2674-4
Project Number : P92057.3
Sample Description: MW-7

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)	3900	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 Log Number 2674

ANALYSIS REQUEST/CHAIN OF CUSTODY RECORD

1000-4643

Client Name [redacted] Nahas	Project or P.O.# P92057.3
Address 1181 Quarry Lane Bldg. 300	Phone # 510 462 4000
City, State, Zip Pleasanton, CA 94566	Report attention Tim Berger

Sampled by Tim Berger

Date sampled	Time sampled	Type (See key below)	Sample description	Number of containers	Lab Sample number	Sample Seals (See key below)	BTEX + TPH-G	Cd & Cr	TPH-D	Hazardous sample Special handling required	Remarks
							Lab Use Only in this section	Analysis required			10-15-92
10/8/92	11:25	AQ	MW-5	2	1	P	x				2x 40ml
	09:47		MW-6	2	2		x				
	17:35		MW-2	2	3		x				
	12:51		MW-7	2	4		x				
~~10/8/92~~	~~11:25~~		~~MW-5~~	~~2~~			~~x~~				
	16:15		MW-3	2	5	P	x				2x 40ml
	14:45		MW-4, Nos 1, 2 & 3	4	6	P	x	x	x		2x 40ml 2x 1L

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
Relinquished by	Tim Berger	Tim Berger	BSK-P	10/9/92	0900
Received by	D. Fillio	D. Fillio	BSK-P	10/9/92	1747
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: A-9