AZTEC CONSULTANTS
Professional Construction Management

TEL (510) 837-1050
FAX (510) 837-1652

November 10, 1993

93 NOV 15 PM 3:33
ALCO HAZMAT

Eva Chew
ALAMEDA COUNTY HEALTH AGENCY
Division of Hazardous Materials
Department of Environmental Health
80 Sawn Way, Room 200
Oakland, CA 94621

Re: Groundwater Monitoring Wells
Fire Station No. 1
7494 Donohue Drive
Dublin, CA 94568
Groundwater Monitoring Report - Initial Sampling & Analysis

Ms. Chew,

In accordance with the accepted Remediation Plan (8/27/92) and Final Report (11/30/92) as prepared by BSK for the subject project, the 3 new monitoring wells have been installed. Attached are two copies of the initial sampling and analysis of thee wells recently completed by BSK. These wells will be monitored for a period of at least one-year at quarterly intervals in accordance with the ACDEH's requirements and reports covering the sampling and analysis will be forwarded to you as they are received.

We appreciate your continued efforts and positive response in this matter and Aztec will continue to serve as your contact regarding this matter as DRFA's representative. Please feel free to call with any questions or comments on this subject.

Very truly yours,

Glenn D. Miller
Construction Manager

cc: Karl Diekman/DRFA w/copy
Tim Berger/BSK

BSK & ASSOCIATES

GEOTECHNICAL CONSULTANTS, INC.

BSK JOB NO. P93156.3

OCTOBER 1993

REPORT
GROUNDWATER MONITORING FACILITIES INSTALLATION
D.R.F.A. FIRE STATION NO. 1
7494 DONOHUE DRIVE
DUBLIN, CALIFORNIA

BSK & Associates

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

October 31, 1993

BSK Job No.P93156.3

Dougherty Regional Fire Authority
c/o Aztec Consultants
Construction Managers
2110 Omega Road, Suite B
San Ramon, CA 94587

Attention: Mr. Glenn D. Miller, P.E.
Construction Manager

Subject: Report
Groundwater Monitoring Facilities Installation
Dougherty Regional Fire Authority - Station No. 1
7494 Donohue Drive
Dublin, California

As requested and authorized, BSK & Associates has prepared this report describing the installation and initial sampling and analysis of three shallow groundwater monitoring wells, MW-1 through MW-3, at the Dougherty Regional Fire District Fire Station No. 1, at 7494 Donohue Drive in Dublin, California (Site). The wells were installed in general accordance with the BSK Proposal/Work Plan of May 10, 1993 (Proposal No. P93129.3), which was accepted by the Alameda County Department of Environmental Health (ACDEH). The Site location is shown on the Vicinity Map, Figure 1.

BSK appreciates this opportunity to continue to be of service to the Dougherty Regional Fire District. If there are questions or comments regarding this report, please contact us.

Respectfully submitted,
BSK & Associates

Tim W. Berger, C.E.G. 1828
Project Geologist

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

AYE\TWB:ndp
(ENV\P93156.MFI)
Distribution: Aztec/DRFA (1 original + 3 copies)

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

REPORT
GROUNDWATER MONITORING
FACILITIES INSTALLATION
D.R.F.A FIRE STATION NO. 1
7494 DONOHUE DRIVE
DUBLIN, CALIFORNIA

INTRODUCTION

This report has been prepared to document the installation of three shallow groundwater monitoring wells, the observations made of soil and water during well installation, and the results of soil and groundwater analyses for residual contaminants associated with the contents of three Underground Storage Tanks (UST) formerly located within the Site.

Background

Three underground storage tanks (UST) containing gasoline and diesel were in use at the site in the 1960's. The tank group was located behind the former truck garage, in the northwestern portion of the site. The largest tank was 4000 gallons in capacity and was used to store gasoline. The two smaller tanks were each 550 gallons in capacity; one tank stored diesel fuel and the other stored gasoline.

At the time of tank removal in 1989, soil in close proximity to the tanks was observed to be contaminated with petroleum products. The contaminated soil was removed, aerated on-site under a permit from the Bay Area Air Quality Management District, and returned to the excavation with the approval of the Alameda County Department of Environmental Health (ACDEH).

As part of the site preparation for the construction of the new DRFA Station No. 1, hydrocarbon contaminated soil was removed from the subsurface to the depth of first encountered groundwater. The contaminated soil resulted from leakage of the underground fuel storage tanks at the station.

Specification 5.4 of the Soil Remediation and Groundwater Monitoring Plan prepared by RS for the contaminated soil removal, recommends as a confirmation of the remedial effort the installation of three shallow groundwater monitoring wells, and monitoring of those wells to assess the impact of the soil remediation activities at the site. ACDEH has requested the monitoring wells be monitored quarterly for a period of one years.

PURPOSE AND SCOPE

Purpose

The groundwater monitoring facilities were installed at the site in order to assess the impact to shallow groundwater of release of UST contents to subsurface, if any.

Scope

In order to meet our objective, the following tasks were performed:

1. Installation of three, two-inch diameter shallow groundwater monitoring wells;

2. Sampling of soil and groundwater from the monitoring well borings and wells for the contaminants of concern;

3. Analytical testing of soil and water samples by a California-certified analytical laboratory;

4. Assessment of the information obtained;

5. Preparation of a formal report presenting the observations, services performed, conclusions and recommendations based on our assessment of the data obtained.

Each task is described in detail in the following text.

Task 1 - GROUNDWATER MONITORING WELL INSTALLATION

Shallow groundwater monitoring well installation was performed September 22 through 24, 1993. Well locations were chosen with respect to the former UST location, existing buildings, and the predominant groundwater flow direction established at the Site during previous monitoring of former Site wells. The well locations were approved by the ACDEH with the Proposal/Work Plan mentioned previously. The Site Plan, Figure 2, indicates the location of the monitoring wells.

The wells were installed to depths of 24 to 25 feet below present grade and screen 15 feet of the initial encountered groundwater, with approximately three feet of screen above the water table to allow for water table fluctuation. Details of well construction are provided in the Boring Logs, Figures 3 through 5. Each well head was encased at the surface in either an Irrigation-Control box if within a planted landscape area, or a traffic-worthy, cast iron well box marked "Monitoring Well" if in a traffic area. The well casing head was further secured with an expanding-type, waterproof, padlocked well plug.

The monitoring wells were developed on September 28, 1993 by pumping and surging until coarse sediment was removed, a degree of clarity achieved, and parameters such as temperature, conductivity and pH stabilized.

Following installation, each well was located to within 1/100th vertical foot and 1 horizontal foot based on a standard Alameda County datum, referenced to USC&GS Mean Sea Level, by a California Licensed Surveyor.

Task 2 - SOIL AND WATER SAMPLING

Soil Samples

Soil samples were obtained a minimum of every five feet from the level of the former UST bottoms to first encountered groundwater, and as necessary due to soil conditions or contaminant encounter. A specimen from each sampled horizon was observed visually for contaminant, and by Photo-ionization Detector (PID). A minimum of one sample was obtained at the soil/groundwater interface from each well location for chemical analysis. Samples were tested for contaminants associated with the former UST contents, as specified in the Tri-Regional Water Board Staff Recommendations, and by the ACDEH.

Soil samples were obtained through hollow-stem auger by driving a Modified California split-barrel sampler housing three stainless steel sample liners into undisturbed soil at the selected interval ahead of the auger bit. Upon sampler retrieval, one or more of the soil-filled liners were capped with Teflon® sheeting and plastic caps, labeled, and refrigerated on-site in a cooler with dry ice to 4°C. The remaining soil was used to classify site soil by the Unified Soil Classification System. Field logging was performed by a California Registered Geologist. The Boring Logs are presented in Figures 3 through 5. The soil classification system, sampler and related data are shown in Figure 6, Unified Soil Classification Chart. The selection of soil samples and sampling horizons was aided in the field by the use of a PID, calibrated daily to an isobutylene standard. Soil samples obtained solely for classification of strata were obtained using a Standard Penetration Test split-spoon sampler.

Water Samples

Water samples from site wells were obtained after purging each well of three or more casing volumes, and allowing eighty percent recovery. Observation of water level, and for immiscible product was performed using an electric sounder and clear point-source bailer prior to purging. The water level was recorded to the nearest 1/100th of a foot. During the purge, the water parameters: pH, temperature and conductivity were monitored and recorded at regular intervals on a Well Field Log to assess the influx of fresh formation water; the Well Field Logs are presented in Figures 7 through 9. 'Water samples for analytical testing were obtained by Teflon bailer, and transferred to the appropriate sample container, with preservative as needed. The samples were labeled and refrigerated on-site using water-ice or blue ice, to 4°C.

Task 3 - ANALYTICAL TESTING

Analytical testing of soil and water samples obtained from the site was performed by the BSK State-certified analytical laboratory.

The analyses performed for each contaminant type are those specified by the Tri-Regional Water Board Staff Recommendations of August 10, 1992. The analyses performed were:

MW-1, MW-2, MW-3:	TPHg by GCFID-5030 (soil and water) TPHd by GCFID 3550 (soil and water) BTEX by Methods 8020 (soil) and 602 (water) Total Lead Concentration in soil and water

Samples were submitted to the laboratory with Chain-Of-Custody documentation and procedures. Project Chain-of-Custody documents are show in Appendix A, Figures A-12 & A-13 and A-22 & A-23.

The results of the chemical analyses of soil and groundwater are summarized in the following two tables: Table 1 - Soil Results, and Table 2 - Water Results. Soil results are reported in Parts Per Million-ppm (mg/kg); water results are reported in Parts Per Billion-ppb (ug/l).

TABLE 1A - SOIL RESULTS

BENZENE, TOLUENE, ETHYLBENZENE AND XYLENES
Results in Parts Per Million (ppm)

	CONSTITUENTS			
Sample Location	**Benzene**	**Toluene**	**Ethylbenzene**	**Xylenes**
MW-1 at 12.5'	ND	ND	ND	ND
MW-2 at 10.5'	ND	ND	ND	ND
MW-3 at 11'	ND	ND	ND	ND
MW-3 at 21'	ND	ND	ND	ND

ND - None Detected

TABLE 1B - SOIL RESULTS

TOTAL PETROLEUM HYDROCARBONS (TPH) AS GASOLINE AND DIESEL, AND TOTAL LEAD
Results in Parts Per Million (ppm)

	CONSTITUENTS		
Sample Location	**TPH Gasoline**	**TPH Diesel**	**Total Lead**
MW-1 at 12.5'	ND	ND	6.0
MW-2 at 10.5'	ND	ND	6.0
MW-3 at 11'	ND	ND	7.0
MW-3 at 21'	ND	ND	--

ND - None Detected
-- - Not Tested

TABLE 2A - WATER RESULTS

BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
Results in Parts Per Billion (ppb)

	CONSTITUENTS			
Sample Location (Action Level)	**Benzene $(1)_1$**	**Toluene $(100)_2$**	**Ethylbenzene $(680)_1$**	**Xylenes $(1750)_1$**
MW-1	ND	ND	ND	ND
MW-2	ND	ND	ND	ND
MW-3	ND	ND	ND	ND

ND - None Detected
1 - California Department Of Health Services Drinking Water Standard, Revised 10/23/91
2 - California DOHS Action Level, 7/1/92

TABLE 2B - WATER RESULTS

TOTAL PETROLEUM HYDROCARBONS (TPH) AS GASOLINE AND DIESEL, AND TOTAL LEAD
Results in Parts Per Billion (ppb)

	CONSTITUENTS		
Sample Location (Action Level)	**TPH Gasoline (NA)**	**TPH Diesel (NA)**	**Total Lead (50)**
MW-1	ND	ND	ND
MW-2	ND	61*	ND
MW-3	ND	58*	ND

ND - None Detected
-- - Not Tested
1 - California Department of Health Services Drinking Water Standards, Revised 10/23/91.
2 - EPA Drinking Water Standard, Revised 7/1/92
* - Sample contains higher molecular weight hydrocarbons than normally associated with Diesel fuel (see Chemical Test Data Sheet, Figures A-18 and A-21).

Tasks 4 & 5 - ANALYSIS AND REPORTING

REGIONAL HYDROLOGY

According to DWR Bulletin No. 118-2, "Evaluation of Groundwater Resources: Livermore and Sunol Valleys," the project site is located within the Dublin sub-basin of the Livermore Valley Groundwater Basin. There are two primary aquifers within the basin: the uppermost aquifer is semi- to un-confined, and occurs at a depth of 12 to 15 feet; the lower aquifer is confined, and is encountered at depths greater than 50 to 80 feet. The groundwater gradient in the upper aquifer is 0.5 percent (as determined in Spring 1992, ACFC Zone 7). The lower aquifer flow direction is reported to be similar to that of the upper aquifer, which is generally southeast, as measured in the Spring of 1992 and the Fall of 1990 (ACFC Zone 7). Mean annual precipitation in the Site vicinity, as measured from 1888 to 1977, was approximately 24-inches.

SUBSURFACE CONDITIONS

Subsurface conditions were explored to a maximum depth of 26 feet in the three borings performed for MW-1 through MW-3. The conditions described here are as observed in our borings. More detailed descriptions of the conditions at each boring are presented on the Boring Logs, Figures 3 through 5.

The first encountered material beneath the landscape planting soil or concrete section was 3 to 12 feet of fill soil, comprising clay and silt. The greater fill depth is resultant of remediation of contaminated soil at the Site. This initial material was dark gray to black, damp and organic near the surface, grading to gravelly, medium stiff and moist with depth. At MW-1 the initial fill comprised wet gravelly sand associated with the aggregate base of a nearby concrete driveway. Underlying the fill was stiff to very stiff olive-gray silty clay, containing minor to moderate amounts of carbonate. At all boring locations, a plastic clay/silty-clay was encountered from 18 to 23 feet in depth. The clay was lighter in color than overlying sediments, firm to stiff, damp to moist and contained manganese-oxide and carbonate. The final few feet of each boring comprised dark olive-brown stiff silty-clay. No obvious water-bearing units were observed, though fractures and thin sandy beds were observed to be wet to saturated within the second silty-clay sediment.

Hydrocarbon contamination was field detected in Boring MW-3, which is the nearest boring to the former UST group location. Contamination was evidenced by odor and PID response. The contamination was noted from approximately 16 to 20 feet in depth, as evidenced at the surface from soil cuttings. PID response values are noted in the Boring Logs, Figures 3 - 5.

SITE HYDROLOGY

The Site is paved in concrete. Perimeter areas are planted with shrubbery. The front of the Station contains planters of shrubbery and small lawn areas. Irrigation is automated drip and local spray. A regional concrete-lined drainage canal is located along the north property boundary, and is connected to stormdrain runoff from the western portion of the Site; the eastern portion drains to Donohue Drive, which also likely drains to the aforementioned drainage canal.

Groundwater at the Site was encountered in the well-installation borings at an approximate depth of 12 feet in silty-clay. Water levels in the installed wells rose to approximately 8½-feet from surface. Flow direction was found by three-point solution to be to the east-northeast on October 6, 1993, with a gradient of 0.8%. Groundwater flow direction and gradient are depicted in Figure 10, "Groundwater Flow Direction and Gradient - 10/06/93."

Contamination of groundwater by petroleum hydrocarbons was not observed olfactorally or visually in Wells MW-1, MW-2 and MW-3 during development, purging and sampling.

CONCLUSIONS

Conclusions

Based on chemical analyses of soil and water samples, field observation and measurement during the installation and initial sampling of groundwater monitoring wells, MW-1 through MW-3, there does not appear to be significant degradation of soil and/or water quality in the vicinity of Wells MW-1, MW-2 and MW-3.

A horizon of motor-fuel in soil evidenced in Boring MW-3 was bracketed above and beneath by soil samples analyzed for TPHd, BTEX and Lead. The analytical results indicated no motor-fuel contamination in soil at those locations.

Concentrations of TPHd range hydrocarbons were detected in Wells MW-2 and MW-3, which are adjacent to and downgradient from the former UST group location. The concentrations are below the informal regulatory "flag" level of 100 ppb for TPH. The presence of higher molecular weight hydrocarbons than normally associated with Diesel fuel may imply aged Motor-fuel as the contaminant; BTEX compounds were not detected.

REPORT DISTRIBUTION

A copy of this report should be forwarded to the Alameda County Department of Environmental Health (ACDEH) for their review. An extra copy of the report has been provided for this purpose. The ACDEH may in turn forward a copy of the report to the Regional Water Quality Control Board.

Alameda County Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Attention: Eva Chew

LIMITATIONS

This groundwater monitoring well installation report has been prepared for the exclusive use of Dougherty Regional Fire Authority (DRFA). Unauthorized use of or reliance on the information contained in this report by others, unless given express written consent by BSK & Associates, is strictly prohibited.

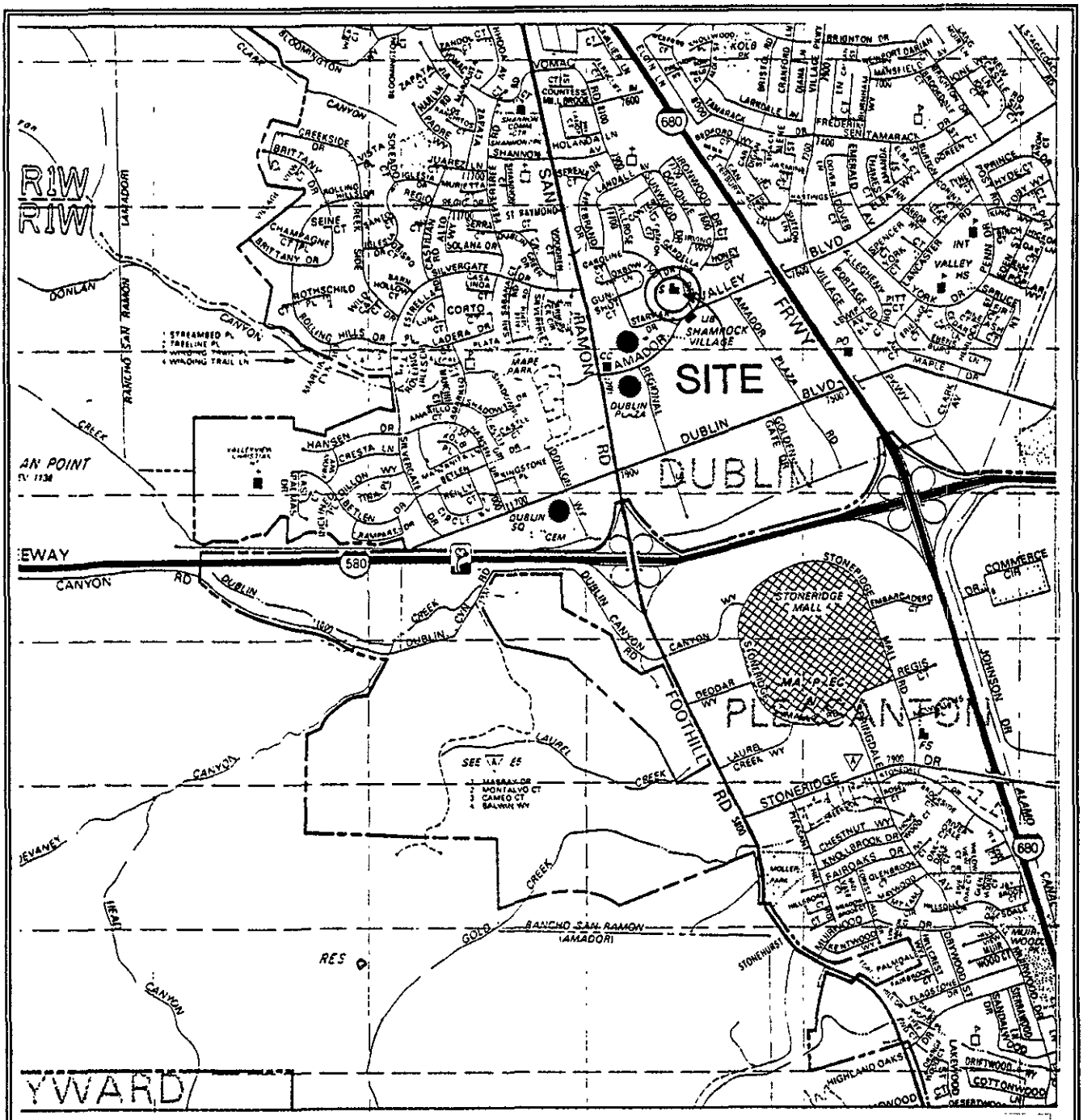
The findings and conclusions presented in this report are based on field observations, and on data obtained from the sources listed in this report. This report has been prepared in accordance with generally accepted methodologies and standards of practice for the area. No other warranty, either expressed or implied, is made as to the findings or conclusions included in this 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 properties, and changes in the regulations can cause changed conditions which can invalidate the findings and conclusions in this report.

This report is neither certification nor guarantee that the property is free of, or contains hazardous substance contamination, other than that mentioned in the report.

Respectfully submitted,

BSK & Associates



Source: Thomas Guide, 1992, Alameda and Contra Costa Counties

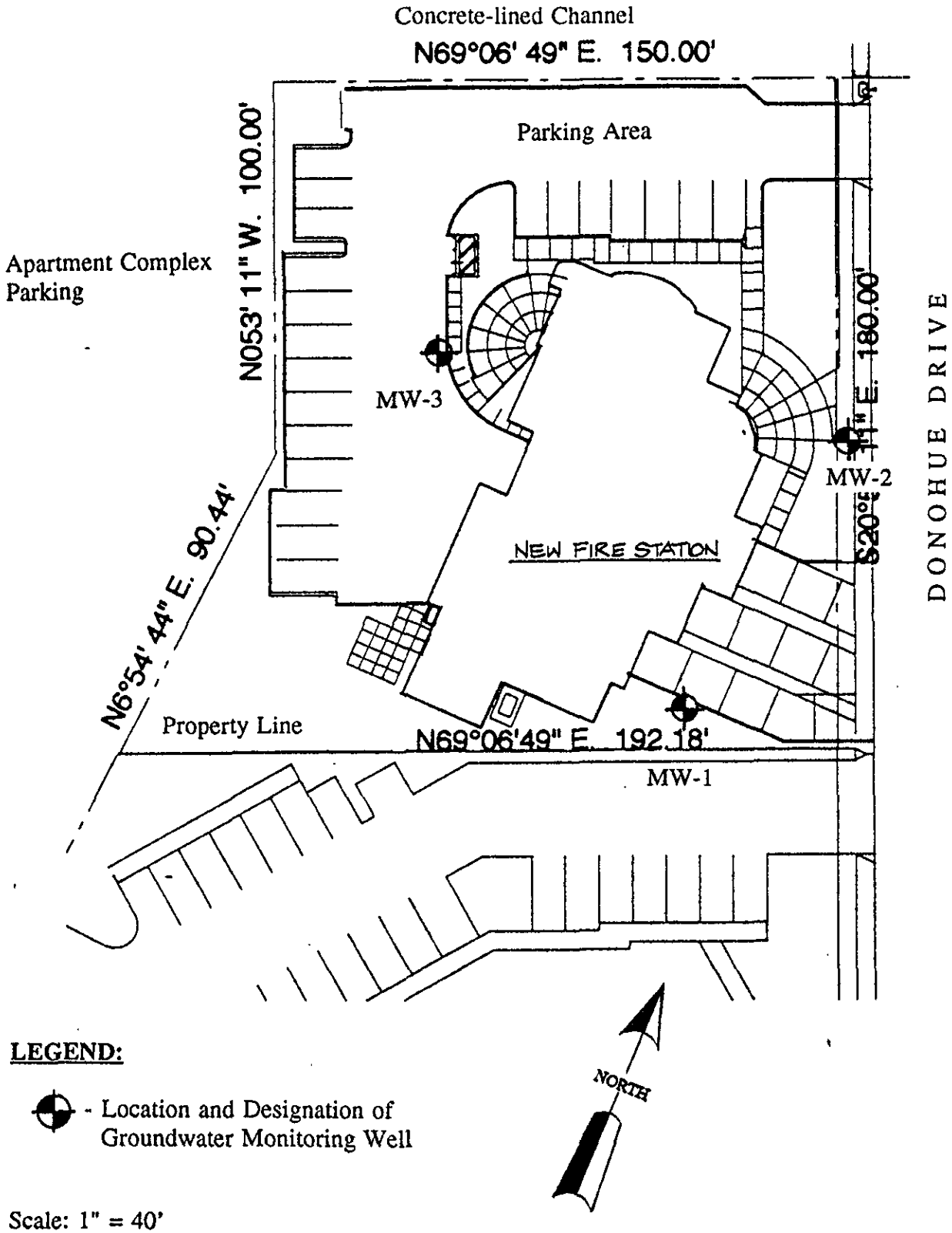
Scale: 1" = 2200'

GROUNDWATER MONITORING
FACILITIES INSTALLATION
STATION NO. 1
7494 DONOHUE DRIVE
DUBLIN, CALIFORNIA

VICINITY MAP

Job No. P93156.3
October 1993
FIGURE: 1

BSK
& ASSOCIATES



GROUNDWATER MONITORING
FACILITIES INSTALLATION
FIRE STATION NO. 1
7494 DONOHUE DRIVE
DUBLIN, CALIFORNIA

SITE PLAN

Job No. P93156.3
October 1993
FIGURE: 2

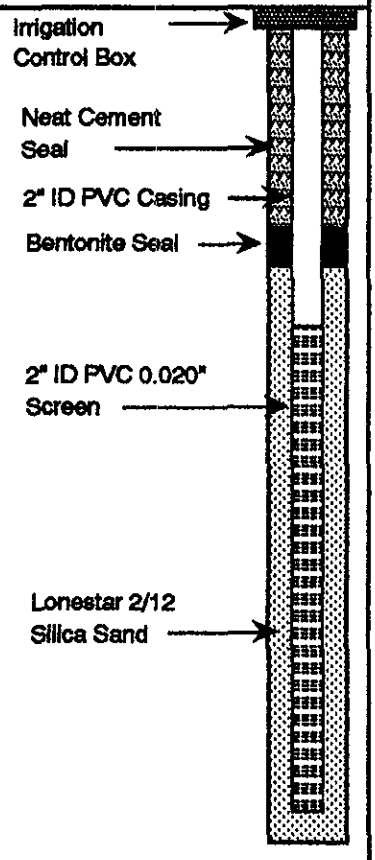
BSK
& ASSOCIATES

BORING LOG MW-1

DATE: 09/22/93
LOGGED BY: TWB
WATER LEVEL: 12.0' (First Encountered)
ELEVATION: +346.61' MSL (Top Of Casing)
EQUIPMENT: Mobile Drill B-53, 8" Hollow Stem Auger

	OVM READING (ppm)	SAMPLE INTERVAL & NUMBER	BLOWS/FOOT	TYPE OF SAMPLER	SYMBOLS	DESCRIPTION
0	-				OH (Fill)	Organic landscape planter topsoil, moist to wet, soft
					GP (Fill)	Gravelly sand, gray, moist to wet
					CL	SILTY CLAY: Olive-gray, moist, firm, trace medium sand
5	1.4	1	23	CS		Grades damp to moist, stage II to III carbonate
10	0	2	25	CS		
15	0		16	SPT		Grades medium gray to light gray, stage I to II carbonate (5%), moist, stiff
20	0		13	SPT	CH/CL	CLAY: Greenish-gray, moist, firm, sticky <5% manganese and iron oxide blebs
25	0		16	SPT	CL	SILTY CLAY: Dark olive-gray, damp to moist, stiff, stage I to II carbonate (3-5%), wet in horizontal fractures (1 in 18")

WELL CONSTRUCTION



▽ - Denotes stabilized water table.
▼ - Denotes water table as encountered during drilling.

NOTES:

1. Boring completed at a depth of 26 feet on 09/22/93.
2. Sampling resistance is measured in blows per foot required to drive the sampler 12-inches with a 140 lb. hammer falling 30 inches after sampler has been seated 6 inches.
3. Boring log indicates the interpreted subsurface conditions only at the location and time the boring was drilled.
4. For an explanation of terms used see the Soil Classification Chart, Figure 6.

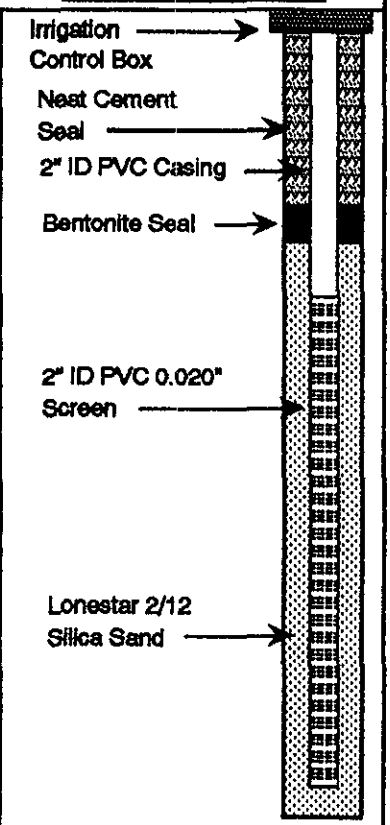
Groundwater Monitoring Facilities Installation 7494 Donohue Drive Dublin, California	BSK Job No. P931563 October 1993 FIGURE: 3	BSK & ASSOCIATES

BORING LOG MW-2

DATE: 09/23/93
LOGGED BY: TWB
WATER LEVEL: 12.0' (First Encountered)
ELEVATION: +337.92' MSL (Top Of Casing)
EQUIPMENT: Mobile Drill B-53, 8" Hollow Stem Auger

Depth	OVM READING (ppm)	SAMPLE INTERVAL & NUMBER	BLOWS/FOOT	TYPE OF SAMPLER	SYMBOLS	DESCRIPTION
0					OH (Fill)	Organic landscape planter topsoil, moist to wet, soft
					CL (Fill)	SILTY CLAY: Dark gray to black, organic
5	0		21	SPT	CL	SILTY CLAY: Dark brown, damp to moist, medium stiff, 3% stage II carbonate, fine roots and root pores
10	0	1	23	CS	▼	Grades olive-gray, stage II to III carbonate, moist, stiff
15	0		25	SPT		Grades very stiff, 25% stage II to III carbonate, damp, many fine pores, trace medium sand, light brown due to carbonate.
20	0		9	SPT	CH/CL	CLAY: Medium to light gray-brown, damp to moist, medium stiff, plastic, with silt, 3-5% carbonate, saturated in 3" lens of clayey fine sand
25	0		15	SPT	CL	SILTY CLAY: Dark olive-gray, damp to moist, medium stiff, trace coarse sand, 3% stage I to II carbonate

WELL CONSTRUCTION



NOTES:

▽ - Denotes stabilized water table.
▼ - Denotes water table as encountered during drilling.

1. Boring completed at a depth of 25 feet on 09/23/93.
2. Sampling resistance is measured in blows per foot required to drive the sampler 12 inches with a 140 lb. hammer falling 30 inches after sampler has been seated 6 inches.
3. Boring log indicates the interpreted subsurface conditions only at the location and time the boring was drilled.
4. For an explanation of terms used see the Soil Classification Chart, Figure 6.

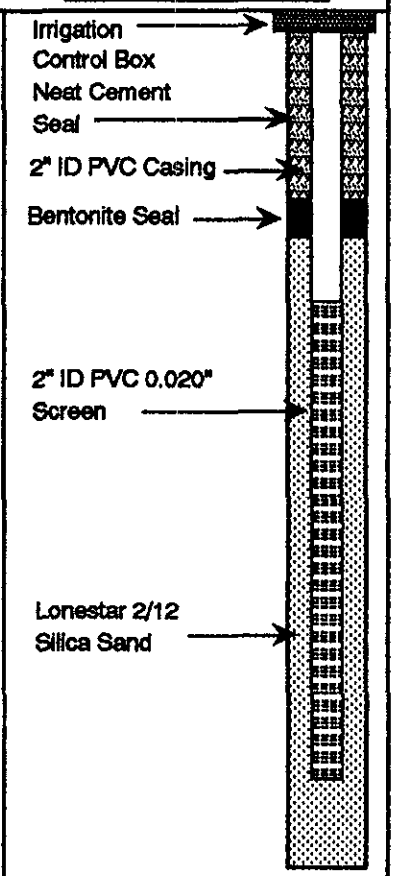
Groundwater Monitoring Facilities Installation 7494 Donohue Drive Dublin, California	BSK Job No. P931563 October 1993 FIGURE: 4	BSK & ASSOCIATES

BORING LOG MW-3

DATE: 09/24/93
LOGGED BY: TWB
WATER LEVEL: 12.0' (First Encountered)
ELEVATION: +338.87' MSL (Top Of Casing)
EQUIPMENT: Mobile Drill B-53, 8" Hollow Stem Auger

	OVM READING (ppm)	SAMPLE INTERVAL & NUMBER	BLOWS/FOOT	TYPE OF SAMPLER	SYMBOLS	DESCRIPTION
0	-				PVMT	CONCRETE: 7" steel reinforced, with 4-6" aggregate base rock
					CL (Fill)	SILTY CLAY: Dark brown, damp, very stiff, contains gravel, silt and sand
5	0		39	SPT		
						Grades dark olive-gray, with gravel, medium stiff, moist
10	8	1	12	CS		
					CL	SILTY CLAY: Olive-gray, to light olive -gray, damp to moist, very stiff, 5% stage I to II carbonate, many dry micr0-pores
15	0		24	SPT		
	40 (Cuttings)				CH/CL	SILTY CLAY/CLAY: Light gray-brown, moist, medium stiff to stiff, few manganese oxide blebs, 3% stage I carbonate, few dry small pores
20	0		20	SPT		
					CL	SILTY CLAY: Dark olive-brown, damp, stiff, few dry fine pores, 5-15% stage I to II carbonate, trace medium sand to fine gravel
25	0		16	SPT		

WELL CONSTRUCTION



▽ - Denotes stabilized water table.
▼ - Denotes water table as encountered during drilling.

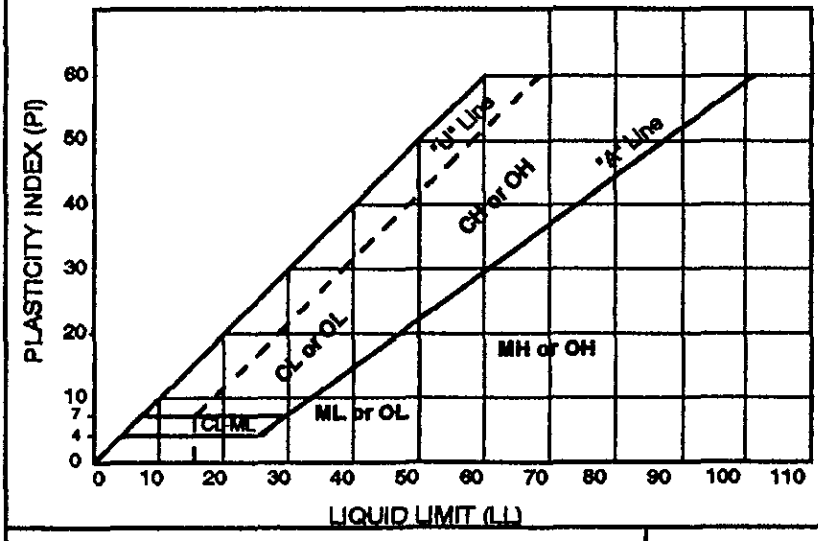
NOTES:
1. Boring completed at a depth of 26 feet on 09/24/93.
2. Sampling resistance is measured in blows per foot required to drive the sampler 12-inches with a 140 lb. hammer falling 30 inches after sampler has been seated 6 inches.
3. Boring log indicates the interpreted subsurface conditions only at the location and time the boring was drilled.
4. For an explanation of terms used see the Soil Classification Chart, Figure 6.

Groundwater Monitoring Facilities Installation 7494 Donohue Drive Dublin, California	BSK Job No. P93156.3 October 1993 FIGURE: 5	BSK & ASSOCIATES

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	FOR VISUAL CLASSIFICATION, THE 1/4" SIZE MAY BE USED AS EQUIVALENT TO THE 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)			
	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)			
	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			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
	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 Reading in ppm

Groundwater Monitoring
Facilities Installation
7494 Donohue Drive
Dublin, California

Job No. P93156.3
October 1993
FIGURE: 6

BSK & ASSOCIATES

BSK Job No.: P93156.3
Date: October 1993
Figure No.: 7

WELL FIELD LOG

Well Development: -- **Date:** --
Well Observation: x **Date:** 10/06/93
Sample Collection: x **Date:** 10/06/93

Project Name: DRFA MFI
Location: 7494 Donohue Drive, Dublin, CA
Personnel: TWB
Weather: Sunny, ±70° F.

WELL INFORMATION:

Well Number	MW-1	**Date Purged**	10/06/93
Depth to Water - feet(TOC)	8.44	**Purge Method**	Electric submersible pump
Well Depth (feet)	25		
Water Volume (gallons)	2.65	**Purge Begin**	12:23
Reference Elevation - feet(TOC)	346.61	**Purge End**	12:31
Groundwater Elevation (feet)	338.17	**Purge Rate**	0.80 GPM
Measurement Technique	Solinst Electric Well Sounder		

IMMISCIBLE LAYERS:

Top: None observed
Bottom: --
Detection Method: Visual
Collection Method: Clear point-source bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	VOLUME REMOVED (gallons)	ELECTRICAL CONDUCTIVITY (Ec/Range)	pH	TEMP. (°F)	COLOR/COMMENTS
12:23	0.5	907	7.11	74.5	Very light gray
12:25	2.5	878	7.09	71.9	"
12:27	5.0	864	7.06	70.8	"
12:29	7.5	852	7.06	69.7	"
12:31	10.0	852	7.07	69.4	Clearer
12:35	Depth to water (feet): 8.60				

SAMPLE COLLECTION DATA:

Sampling Equipment: Electric submersible pump

TIME	ANALYSIS	AMOUNT/CONTAINER USED	SAMPLE INTERVAL
12:43	TPHg, BTEX	2-40 ml glass VOC w/HCl	11-12'
"	TPHd	2-250 ml amber glass w/H_2SO_4	"
"	Total Lead	1-8 oz. plastic w/HNO_3	"

Field Observations: None

BSK Job No.: P93156.3
Date: October 1993
Figure No.: 8

WELL FIELD LOG

Well Development: -- **Date:** --
Well Observation: x **Date:** 10/06/93
Sample Collection: x **Date:** 10/06/93

Project Name: DRFA MFI
Location: 7494 Donohue Drive, Dublin, CA
Personnel: TWB
Weather: Overcast, ±65° F.

WELL INFORMATION:

Well Number	MW-2	**Date Purged**	10/06/93
Depth to Water - feet(TOC)	8.48	**Purge Method**	Electric submersible pump
Well Depth (feet)	25		
Water Volume (gallons)	2.64	**Purge Begin**	10:51
Reference Elevation - feet(TOC)	346.40	**Purge End**	11:01
Groundwater Elevation (feet)	337.92	**Purge Rate**	1.0 GPM
Measurement Technique	Solinst Electric Well Sounder		

IMMISCIBLE LAYERS:

Top: None observed
Bottom: --
Detection Method: Visual
Collection Method: Clear point-source bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	VOLUME REMOVED (gallons)	ELECTRICAL CONDUCTIVITY (Ec/Range)	pH	TEMP. (°F)	COLOR/COMMENTS
10:52	0.5	899	7.11	67.8	Very light gray
10:54	2.5	879	7.07	67.8	"
10:56	5.0	875	7.07	67.5	"
11:00	7.5	881	7.05	67.5	"
11:01	10.0	878	7.01	67.3	"
11:09	Depth to water (feet): 8.60				

SAMPLE COLLECTION DATA:

Sampling Equipment: Electric submersible pump

TIME	ANALYSIS	AMOUNT/CONTAINER USED	SAMPLE INTERVAL
11:15	TPHg, BTEX	2-40 ml glass VOC w/HCl	11-12'
"	TPHd	2-250 ml amber glass w/H_2SO_4	"
"	Total Lead	1-8 oz. plastic w/HNO_3	"

Field Observations: None

BSK Job No.: P93156.3
Date: October 1993
Figure No.: 9

WELL FIELD LOG

Well Development: -- **Date:** --
Well Observation: x **Date:** 10/06/93
Sample Collection: x **Date:** 10/06/93

Project Name: DRFA MFI
Location: 7494 Donohue Drive, Dublin, CA
Personnel: TWB
Weather: Overcast, ±60° F.

WELL INFORMATION:

Well Number	MW-3	**Date Purged**	10/06/93
Depth to Water - feet(TOC)	8.29	**Purge Method**	Electric submersible pump
Well Depth (feet)	24		
Water Volume (gallons)	2.51	**Purge Begin**	09:32
Reference Elevation - feet(TOC)	347.16	**Purge End**	09:40
Groundwater Elevation (feet)	338.87	**Purge Rate**	0.8 GPM
Measurement Technique	Solinst Electric Well Sounder		

IMMISCIBLE LAYERS:

Top: None observed
Bottom: --
Detection Method: Visual
Collection Method: Clear point-source bailer

WELL DEVELOPMENT/PURGE DATA:

TIME	VOLUME REMOVED (gallons)	ELECTRICAL CONDUCTIVITY (Ec/Range)	pH	TEMP. (°F)	COLOR/COMMENTS
09:32	0.0	845	6.93	66.0	Clear
09:36	4.0	866	6.97	66.3	Light gray
09:38	7.0	831	6.96	66.1	Very light gray
09:40	10.0	816	6.99	62.5	"
10:00	Depth to water (feet): 8.40				

SAMPLE COLLECTION DATA:

Sampling Equipment: Electric submersible pump

TIME	ANALYSIS	AMOUNT/CONTAINER USED	SAMPLE INTERVAL
10:00	TPHg, BTEX	2-40 ml glass VOC w/HCl	11-12'
"	TPHd	2-250 ml amber glass w/H_2SO_4	"
"	Total Lead	1-8 oz. plastic w/HNO_3	"

Field Observations: Drawdown to >9.45 feet during purge, slow recovery

APPENDIX "A"

CHEMICAL TEST DATA SHEETS

CHAIN-OF-CUSTODY RECORD

BSK & Associates

FIGURE: A-1

ANALYTICAL BSK LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA Fire Station #1

Date Sampled : 09/22/93
Time Sampled : 0947
Date Received : 09/24/93
Date of Analysis : 09/28/93
Report Issue Date: 10/06/93

Case Number : Ch932573
Lab ID Number : 2573-1
Project Number : P93156.3
Sample Description: MW-1 #2 @ 12.5'

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 Pilgman, QA/QC Supervisor

Jeffrey Creager, Organics Manager

FIGURE: A-2

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

BSK-Pleasanton
DRFA Fire Station #1

Date Sampled : 09/22/93
Time Sampled : 0947
Date Received : 09/24/93
Date of Analysis : 09/29/93
Report Issue Date: 10/06/93

Case Number : Ch932573
Lab ID Number : 2573-1
Project Number : P93156.3
Sample Description: MW-1 #2 @ 12.5'

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	1.0

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

P930311 TPHDS.T

FIGURE: A-3

ANALYTICAL
BSK
LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA Fire Station #1

Date Sampled : 09/22/93
Time Sampled : 0947
Date Received : 09/24/93
Report Issue Date: 10/06/93

Case Number : Ch932573
Lab ID Number : 2573-1
Project Number : P93156.3
Sample Description: MW-1 #2 @ 12.5'

Sample Type : SOLID

Analyses for Selected Inorganic Constituents

Analyte	Results	Units	DLR
Lead (Pb).....	6	mg/kg	2

ND: None Detected
--: Not Analyzed
mg/kg: Milligrams per Kilogram as Received
Std.: Standard Units
µmhos/cm: Micromhos per Centimeter at 25°C
DLR: Detection Limit for the Purposes of Reporting.
Exceptional sample conditions or matrix interferences may result in higher detection limits.

Cynthia Pigman, QA/QC Supervisor

Inorganics Manager

R920422 2a.t

FIGURE: A-4

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

BSK-Pleasanton
DRFA Fire Station #1

Date Sampled : 09/23/93
Time Sampled : 0928
Date Received : 09/24/93
Date of Analysis : 09/28/93
Report Issue Date: 10/06/93

Case Number : Ch932573
Lab ID Number : 2573-2
Project Number : P93156.3
Sample Description: MW2-1-10.5'

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

Jeffrey Creager, Organics Manager

R930106 BTPB.t

FIGURE: A-5

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

BSK-Pleasanton
DRFA Fire Station #1

Date Sampled : 09/23/93
Time Sampled : 0928
Date Received : 09/24/93
Date of Analysis : 09/29/93
Report Issue Date: 10/06/93

Case Number : Ch932573
Lab ID Number : 2573-2
Project Number : P93156.3
Sample Description: MW2-1-10.5'

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	1.0

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

FIGUIRE: A-6

ANALYTICAL
BSK
LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA Fire Station #1

Date Sampled : 09/23/93
Time Sampled : 0928
Date Received : 09/24/93
Report Issue Date: 10/06/93

Case Number : Ch932573
Lab ID Number : 2573-2
Project Number : P93156.3
Sample Description: MW2-1-10.5'

Sample Type : SOLID

Analyses for Selected Inorganic Constituents

Analyte	Results	Units	DLR
Lead (Pb).....	6	mg/kg	2

ND: None Detected
--: Not Analyzed
mg/kg: Milligrams per Kilogram as Received
Std.: Standard Units
µmhos/cm: Micromhos per Centimeter at 25°C
DLR: Detection Limit for the Purposes of Reporting.
Exceptional sample conditions or matrix interferences may result in higher detection limits.

Cynthia Pigman, QA/QC Supervisor

Inorganics Manager

FIGUIRE: A-7

ANALYTICAL
BSK
LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA Fire Station #1

Date Sampled : 09/24/93
Time Sampled : 0915
Date Received : 09/27/93
Date of Analysis : 09/28/93
Report Issue Date: 10/08/93

Case Number : Ch932592
Lab ID Number : 2592-1
Project Number : P93156.3
Sample Description: MW3-1-11.0

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

Jeffrey Creager, Organics Manager

R930106 BTPS.t

FIGURE: A-8

ANALYTICAL BSK LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA Fire Station #1

Date Sampled : 09/24/93
Time Sampled : 0915
Date Received : 09/27/93
Date of Analysis : 09/29/93
Report Issue Date: 10/08/93

Case Number : Ch932592
Lab ID Number : 2592-1
Project Number : P93156.3
Sample Description: MW3-1-11.0

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	1.0

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

R930311 TPHDS.T

FIGURE: A-9

ANALYTICAL
BSK
LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA Fire Station #1

Date Sampled : 09/24/93
Time Sampled : 0915
Date Received : 09/27/93
Report Issue Date: 10/08/93

Case Number : Ch932592
Lab ID Number : 2592-1
Project Number : P93156.3
Sample Description: MW3-1-11.0

Sample Type : SOLID

Analyses for Selected Inorganic Constituents

Analyte	Results	Units	DLR
Lead (Pb).....	7	mg/kg	2

ND: None Detected
--: Not Analyzed
mg/kg: Milligrams per Kilogram as Received
Std.: Standard Units
µmhos/cm: Micromhos per Centimeter at 25°C
DLR: Detection Limit for the Purposes of Reporting.
Exceptional sample conditions or matrix interferences may result in higher detection limits.

Cynthia Pigman, QA/QC Supervisor

Inorganics Manager

R920422 2s.t

FIGURE: A-10

ANALYTICAL BSK LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA Fire Station #1

Date Sampled : 09/24/93
Time Sampled : 0944
Date Received : 09/27/93
Date of Analysis : 09/28/93
Report Issue Date: 10/08/93

Case Number : Ch932592
Lab ID Number : 2592-2
Project Number : P93156.3
Sample Description: MW3-1-21.0

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

Jeffrey Creager, Organics Manager

R930106 BTPS.t

FIGURE: A -11

ANALYTICAL
BSK
LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA Fire Station #1

Date Sampled : 09/24/93
Time Sampled : 0944
Date Received : 09/27/93
Date of Analysis : 09/29/93
Report Issue Date: 10/08/93

Case Number : Ch932592
Lab ID Number : 2592-2
Project Number : P93156.3
Sample Description: MW3-1-21.0

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	1.0

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

ANALYTICAL
BSK
LABORATORIES
Environmental Services

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

Analyses Request / Chain of Custody

BSK Log Number: 2592

Analytical Due Date: 10-7-93

Shaded areas for LAB use only

Requested Analyses

Client Name	Report Attention	Phone #
DRFA FS. #1	Tim Berger	510 462 4000
Address	**Project, Quote or PO #**	**FAX #**
1181 Quarry Lane	P93156.3	510 462 6253
City, State, Zip	**Copy to:**	**System #**
Pleasanton CA 94566		

LAB use only Sample #	Type	# Cont.	Date Sampled	Time Sampled	Sampled by: Sample Description/Location	Comment or Station Code	TPH(g) + BTEX	TPH(d)	Total Lead								
1	S	1	09/24/93	09:15	MW3-1-11.0		X	X	X								
2	S	1	09/24/93	09:44	MW-3-1-21.0		X	X									

Matrix Type: L - Liquid S - Solid G - Gas
Type of Hazards Associated with Samples:

Additional Services:
Rush Priority: [ ] - 2 Day [ ] - 5 Day
[ ] - Formal Chain of Custody [ ] - QC Data package

Additional Services Authorized by:

(Signature)

Payment Received with Delivery
Date: _____ Amount: $ _____
Check # _____ Initials _____
Reciept # _____

Signature	Print Name	Company	Date	Time
Requested / Relinquished by: Tim Berger	Tim Berger	BSK-P	9/24/93	09:44
Received / Relinquished by:			9/27/93	08:41
Received / Relinquished by:				
Received / Relinquished by:				
Received for Laboratory by: Mel Aiello	Mel Aiello	BSK	9/27/93	1200

ANALYTICAL
BSK
LABORATORIES
Environmental Services

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

Analyses Request / Chain of Custody

BSK Log Number: 2573

Analytical Due Date: 10-6-93

Shaded areas for LAB use only

Requested Analyses

Client Name: DRFA Fire Station #1	Report Attention: Tim Berger	Phone#: 510 462 4000
Address: 1181 Quarry Lane	Project, Quote or PO #: P93156.3	FAX#: 462 6283
City, State, Zip: Pleasanton, CA 94566	Copy to:	System #:

LAB use only Sample #	Type	# Cont.	Date Sampled	Time Sampled	Sampled by: Tim Berger — Sample Description/Location	Comment or Station Code	TPH g + BTEX	TPH - diesel	Total Pb
-1	S	1	9/22/93	09:47	MW-1 #2 @ 12.5'		X	X	X
2	S	1	9/23/93	09:28	MW2-1-10.5		X	X	X

Matrix Type: L - Liquid S - Solid G - Gas
Type of Hazards Associated with Samples:

Additional Services:
Rush Priority: [ ] - 2 Day [ ] - 5 Day
[ ] - Formal Chain of Custody [ ] - QC Data package

Additional Services Authorized by: _____ (Signature)

Payment Received with Delivery
Date: _____ Amount: $ _____
Check # _____ Initials _____
Reciept # _____

Signature	Print Name	Company	Date	Time
Requested / Relinquished by: Tim Berger	Tim Berger	BSK-P	9/23/93	15:00
Received / Relinquished by:				
Received / Relinquished by:				
Received / Relinquished by:				9/24
Received for Laboratory by: Carol Harris	C Harris	BSK Lab	9-24-93	15:00 0830

FIGURE: A-13

FIGURE: A-14

BSK LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA

Date Sampled : 10/06/93
Time Sampled : 1243
Date Received : 10/07/93
Date of Analysis : 10/07/93
Report Issue Date: 10/28/93

Case Number : Ch932720
Lab ID Number : 2720-1
Project Number : P93156.3
Sample Description: MW1-1,2,3

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

FIGURE: A-15

ANALYTICAL BSK LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA

Date Sampled : 10/28/93
Time Sampled : 1405
Date Received : 10/29/93
Date of Analysis : 10/29/93
Report Issue Date: 11/01/93

Case Number : Ch932956
Lab ID Number : 2956-1
Project Number : P93156.3
Sample Description: MW-1

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.

RECEIVED 11/3/93

Cynthia Pigman, QA/QC Supervisor

Jeffrey Creager, Organics Manager

FIGURE: A-16

ANALYTICAL BSK LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA

Date Sampled : 10/06/93
Time Sampled : 1243
Date Received : 10/07/93
Report Issue Date: 10/28/93

Case Number : Ch932720
Lab ID Number : 2720-1
Project Number : P93156.3
Sample Description: MW1-1,2,3

Sample Type : LIQUID

Analyses for Selected Inorganic Constituents in Water

Method No.	Analyte	Results	Units	DLR
EPA 6010	Lead (Pb).....	ND	mg/L	0.005

ND: None Detected
--: Not Analyzed
mg/L: Milligrams Per Liter
Std: Standard Units
µmhos/cm: Micromhos per Centimeter at 25°C
DLR: Detection Limit for the Purposes of Reporting. Exceptional sample conditions or matrix interferences may result in higher detection limits.

Cynthia Pigman, QA/QC Supervisor

Inorganics Manager

910915 SICDW.t

FIGURE: A-17

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

BSK-Pleasanton
DRFA

Date Sampled : 10/06/93
Time Sampled : 1115
Date Received : 10/07/93
Date of Analysis : 10/07/93
Report Issue Date: 10/28/93

Case Number : Ch932720
Lab ID Number : 2720-2
Project Number : P93156.3
Sample Description: MW2-1,2,3

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

FIGURE: A-18

ANALYTICAL BSK LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA

Date Sampled : 10/28/93
Time Sampled : 1319
Date Received : 10/29/93
Date of Analysis : 10/29/93
Report Issue Date: 11/01/93

Case Number : Ch932956
Lab ID Number : 2956-2
Project Number : P93156.3
Sample Description: MW-2

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)	61**	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

FIGURE: A-19

ANALYTICAL BSK LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA

Date Sampled : 10/06/93
Time Sampled : 1115
Date Received : 10/07/93
Report Issue Date: 10/28/93

Case Number : Ch932720
Lab ID Number : 2720-2
Project Number : P93156.3
Sample Description: MW2-1,2,3

Sample Type : LIQUID

Analyses for Selected Inorganic Constituents in Water

Method No.	Analyte	Results	Units	DLR
EPA 6010	Lead (Pb).....	ND	mg/L	0.005

ND: None Detected
--: Not Analyzed
mg/L: Milligrams Per Liter
Std: Standard Units
µmhos/cm: Micromhos per Centimeter at 25°C
DLR: Detection Limit for the Purposes of Reporting. Exceptional sample conditions or matrix interferences may result in higher detection limits.

Cynthia Pigman, QA/QC Supervisor

Inorganics Manager

910915 SICDW.t

FIGURE: A-20

BSK LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA

Date Sampled : 10/06/93
Time Sampled : 1000
Date Received : 10/07/93
Date of Analysis : 10/07/93
Report Issue Date: 10/28/93

Case Number : Ch932720
Lab ID Number : 2720-3
Project Number : P93156.3
Sample Description: MW3-1,2,3

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

FIGURE: A-21

ANALYTICAL BSK LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA

Date Sampled : 10/28/93
Time Sampled : 1140
Date Received : 10/29/93
Date of Analysis : 10/29/93
Report Issue Date: 11/01/93

Case Number : Ch932956
Lab ID Number : 2956-3
Project Number : P93156.3
Sample Description: MW-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)	58**	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

FIGURE: A-22

ANALYTICAL BSK LABORATORIES
Environmental Services

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

BSK-Pleasanton
DRFA

Date Sampled : 10/06/93
Time Sampled : 1000
Date Received : 10/07/93
Report Issue Date: 10/28/93

Case Number : Ch932720
Lab ID Number : 2720-3
Project Number : P93156.3
Sample Description: MW3-1,2,3

Sample Type : LIQUID

Analyses for Selected Inorganic Constituents in Water

Method No.	Analyte	Results	Units	DLR
EPA 6010	Lead (Pb).....	ND	mg/L	0.005

ND: None Detected
--: Not Analyzed
mg/L: Milligrams Per Liter
Std: Standard Units
µmhos/cm: Micromhos per Centimeter at 25°C
DLR: Detection Limit for the Purposes of Reporting. Exceptional sample conditions or matrix interferences may result in higher detection limits.

Cynthia Pigman, QA/QC Supervisor

Inorganics Manager

R910915 SICDW.t

ANALYTICAL
BSK
LABORATORIES
Environmental Services

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

Analyses Request / Chain of Custody

BSK Log Number: 2120

Analytical Due Date: 10/26/93

Shaded areas for LAB use only

Requested Analyses 10/13/93

Client Name: DRFA (BSK-P)	Report Attention: Tim Berger	Phone #: 510 462 9001
Address: 1181 Quarry Lane, Bldg. 300	Project, Quote or PO #: 93156.3	FAX #: 516 462 6233
City, State, Zip: Pleasanton, CA 94566	Copy to: Tim Berger	System #:

LAB use only: Sample #	Type	# Cont.	Date Sampled	Time Sampled	Sampled by: Tim Berger Sample Description/Location	Comment or Station Code	BTEX TPH-g (SW 30)	TPH-d (3550)	Total Lead (CAM)
1	W	3	10/6/93	12:43	MW1 - 1,2,3		X	X	X
2	W	3	"	11:15	MW2 - 1,2,3		X	X	X
3	W	3	"	10:00	MW3 - 1,2,3		X	X	X

Matrix Type: L - Liquid S - Solid G - Gas
Type of Hazards Associated with Samples:

Additional Services:
Rush Priority: [ ] - 2 Day [ ] - 5 Day
[ ] - Formal Chain of Custody [ ] - QC Data package

Additional Services Authorized by:

(Signature)

Payment Received with Delivery
Date: Amount: $
Check # Initials
Reciept #

	Signature	Print Name	Company	Date	Time
Requested/Relinquished by:		Tim Berger	BSK-Pleasanton	10/6/93	17.00
Received/Relinquished by:					
Received/Relinquished by:					
Received/Relinquished by:		Tameca Green	BSK Labs	10/7/93	1030

ANALYTICAL BSK LABORATORIES
Environmental Services
1414 Stanislaus Street
Fresno, CA 93706
(209) 485-8310
(800) 877-8310
(209) 485-6935 FAX

Analyses Request / Chain of Custody

BSK Log Number: 2956

Analytical Due Date: ~~10-27-93~~

Shaded areas for LAB use only

Requested Analyses 11-1-93

Client Name: DRFA	Report Attention: Tim Berger	Phone #: 510 462 4000
Address: 1181 Quarry Lane, Bldg. 300	Project, Quote or PO #: P93156-3	FAX #: 510 462 6283
City, State, Zip: Pleasanton CA 94566	Copy to: Tim Berger	System #

LAB use only Sample #	Type	# Cont.	Date Sampled	Time Sampled	Sampled by: Tim Berger (TMB) Sample Description/Location	Comment or Station Code	TPH-d
1	L		10/28/93	14:05	MW-1	RUSH Hard copy	X
2	L		"	13:19	MW-2	to be delivered here	X
3	L		"	11:40	MW-3	by Tues 10 AM	X
						11/2/93	
						DRFA resample - ast	
						Diesel - TMB	
						* No Charge for	
						services!	

Matrix Type: (L) - Liquid S - Solid G - Gas
Type of Hazards Associated with Samples:

Additional Services:
(Rush Priority) [ ] - 2 Day [ ] - 5 Day
[ ] - Formal Chain of Custody [ ] - QC Data package

Additional Services Authorized by: Tim Berger (Signature)

Payment Received with Delivery
Date: _____ Amount: $ _____
Check # _____ Initials _____
Reciept # _____

Signature	Print Name	Company	Date	Time
Requested / Relinquished by: Tim Berger	Tim Berger	BST-P	10/28/93	15.00
Received / Relinquished by:				
Received / Relinquished by:				
Received / Relinquished by:				
Received for Laboratory by: [illegible]		BSK	10-28-93	1040

FIGURE: A-24