

GW - 72

**MONITORING
REPORTS**

DATE:

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B R O W N A N D C A L D W E L L

**JANUARY 2003 GROUNDWATER SAMPLING
REPORT
HOBBS, NEW MEXICO FACILITY**

BJ SERVICES COMPANY, U.S.A.

MAY 9, 2003

**JANUARY 2003 GROUNDWATER SAMPLING REPORT
HOBBS, NEW MEXICO FACILITY
BJ SERVICES COMPANY, U.S.A.**

Prepared for

BJ Services Company, U.S.A.
11211 FM 2920
Tomball, Texas 77375

BC Project Number: 12832.018



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May 9, 2003

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"This report was prepared in accordance with the standards of the environmental consulting industry at the time it was prepared. It should not be relied upon by parties other than those for whom it was prepared, and then only to the extent of the scope of work which was authorized. This report does not guarantee that no additional environmental contamination beyond that described in this report exists at this site."

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1.0 INTRODUCTION

Brown and Caldwell conducted a quarterly groundwater sampling event at the BJ Services Company, U.S.A. (BJ Services) facility located at 2708 West County Road in Hobbs, New Mexico in January 2003. This report presents a description of the groundwater sampling field activities, a summary and evaluation of the analytical results, and an evaluation of remedial technologies applied at the facility. A groundwater potentiometric surface map and a hydrocarbon distribution map are included.

A layout of the facility is shown in Figure 1. The facility formerly operated an on-site fueling system. Subsurface impact near the former diesel fueling system was detected by the New Mexico Oil Conservation Division (NMOCD) during an on-site inspection on February 7, 1991. The fueling system was taken out of operation in July 1995. The NMOCD has required a quarterly groundwater monitoring program to assess the concentration of hydrocarbon constituents in groundwater as a result of the diesel fuel release.

A biosparging system was activated in November 1995 and expanded in March/April 1997 and February/March 1998 to remediate soil and groundwater at the former fuel island area of the facility. The biosparging system was deactivated on November 1, 2000 after achieving cleanup goals for groundwater. The confirmation soil sampling program specified in the NMOCD-approved Remedial Action Plan (RAP) for the facility was conducted in July 2001. The results of the confirmation soil sampling program were presented to NMOCD in the report for the June 2001 groundwater sampling event. In accordance with the RAP for the facility, four additional groundwater sampling events were conducted following the confirmation soil sampling event. Hydrocarbon concentrations in groundwater samples from applicable monitor wells remained below the target concentrations specified in the RAP during each of these sampling events, so a request to decommission the biosparging system was submitted to NMOCD in the June 2002 Groundwater Sampling and Biosparging System Closure Report for the facility.

BJ Services removed three field waste tanks from the facility on March 6-7, 1997. The ongoing groundwater monitoring program was expanded to address both the former fuel island and the former field waste tanks areas of the facility, as directed by NMOCD in correspondence dated January 21, 1999.

Table 1 presents a site chronology detailing the history of investigations into and the remediation of soil and groundwater impacts in the areas of the former fueling system and the former field waste tanks at the facility.



2.0 FIELD ACTIVITIES AND RESULTS

Brown and Caldwell purged and sampled six monitor wells (MW-5, MW-10, MW-11A, MW-12D, MW-14, and MW-15) at the facility on January 9, 2003 to determine the concentrations of dissolved-phase hydrocarbons and/or chloride in groundwater and to evaluate general groundwater quality in the area of the facility. The monitor well locations are shown in Figure 1. In the March 2002 Groundwater Sampling Report for the facility, Brown and Caldwell recommended installation of a new monitor well (MW-16) to replace monitor well OW-4, which has gone dry. Brown and Caldwell plans to install monitor well MW-16 in March 2003 now that this activity has been approved by the NMOCD and access privileges have been granted by the off-site landowner.

The following subsections describe the field activities conducted by Brown and Caldwell during the January 2003 event and present the results from the associated groundwater analyses.

2.1 Groundwater Sampling Activities

Groundwater level measurements were obtained from all accessible monitor wells at the facility on January 9, 2003 prior to purging and sampling the subset of wells listed above. Groundwater levels were measured to the nearest 0.01 foot with a water-level indicator. Current and historical groundwater elevation data for each well are presented in Table 2. The groundwater elevation data indicate that the groundwater flow direction is to the east/northeast, with an overall hydraulic gradient of approximately 0.007 foot/foot. The groundwater elevation data presented in Table 2 indicate that groundwater levels have continued to decline in monitor wells at the facility since late 1995. A groundwater elevation map for January 9, 2003 is presented in Figure 2.

Monitor wells MW-5, MW-10, MW-11A, MW-14 and MW-15 were purged and sampled with previously unused disposable bailers and clean, previously unused nylon string. Three well volumes were purged from monitor wells MW-5, MW-11A, and MW-15. Monitor wells MW-10 and MW-14 were purged dry at 0.5 gallons and 1.5 gallons, respectively. A submersible pump fitted with disposable polyethylene tubing was used to purge monitor well MW-12D until

groundwater stabilization occurred, with stabilization defined as variation of less than 0.5°C for temperature, less than 0.1 unit for pH, and less than 10% for specific conductivity between three consecutive measurements of groundwater during the purging process. The wells were sampled in general order of least impacted to most impacted (based on analytical results from the September 2002 and preceding sampling events) to further mitigate the potential for cross-contamination between the wells.

Field parameter measurements for pH, specific conductivity, oxidation-reduction (redox) potential, dissolved oxygen content, and temperature were collected from wells containing an adequate volume of water during and upon completion of well purging. Ferrous iron and dissolved oxygen were measured in monitor wells MW-5, MW-11A, and MW-12D upon conclusion of purging activities; because it was purged dry, these field parameters were not measured for monitor well MW-10. Field parameter readings were recorded on the groundwater sampling forms included in Appendix A and the final values for each well sampled during the January 2003 event are summarized in Table 3.

With the exception of monitor well MW-12D, groundwater samples were collected by pouring recovered water from a bailer. For monitor well MW-12D, the groundwater sample was collected directly from the discharge line of the down-hole pump. Using these methods, each sample was transferred to laboratory-prepared, clean glass and/or plastic containers, sealed with Teflon[®]-lined lids, labeled, and placed on ice in an insulated cooler for delivery to Southern Petroleum Laboratory in Houston, Texas for analysis using standard chain-of-custody procedures.

Field measurement equipment was decontaminated prior to and following each use. Decontamination procedures consisted of washing with distilled water and a non-phosphate detergent, then rinsing with distilled water. The submersible pump used to sample monitor well MW-12D was decontaminated first by pumping distilled water with a non-phosphate detergent through it and then by rinsing it with distilled water using containers at the surface. Purge and decontamination waters were discharged to an on-site water reclamation system at the BJ Services facility.

2.2 Results of Groundwater Analyses

Groundwater samples from monitor wells MW-5, MW-10, MW-11A, MW-14 and MW-15 were analyzed for chloride content using Method E325.3. In addition, samples from monitor wells MW-5, MW-10, MW-11A, and MW-12D were analyzed for gasoline- and diesel-range total petroleum hydrocarbons (TPH-G and TPH-D) by EPA Method SW-8015B and for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method SW-8021B. Analyses of groundwater from these four wells for nitrate and sulfate (Method E300.0), dissolved methane (Method RSK 147), and alkalinity (Method E310.1) were performed to evaluate the potential for natural attenuation of hydrocarbons at the facility. The laboratory analytical report and chain-of-custody documentation for the groundwater samples collected during the January 2003 sampling event are provided in Appendix B.

Current and cumulative analytical results for BTEX constituents, TPH-D, and TPH-G are presented in Table 4. Figure 3 presents a hydrocarbon distribution map for the January 2003 sampling event. With the exception of the detection of benzene in monitor well MW-11A at 0.012 milligrams per liter (mg/L), all BTEX concentrations are less than the applicable New Mexico Water Quality Control Commission (NMWQCC) standards. The NMWQCC standard for benzene is 0.010 mg/L.

Table 5 presents current and cumulative results for chloride analyses performed on groundwater samples collected at the facility. Chloride concentrations in monitor wells MW-5, MW-12D and MW-15 remained less than the NMWQCC chloride standard of 250 mg/L in January 2003. The chloride concentration of 179 mg/L in downgradient monitor well MW-14 is also less than this standard.

The current and historical results for nitrate, sulfate, and dissolved methane analyses performed on groundwater samples from monitor wells MW-5, MW-10, MW-11A, MW-12, and MW-12D to assist in the evaluation of natural attenuation processes at the BJ Services facility are presented in Table 6. Groundwater alkalinity may also be indicative of natural attenuation processes.

Groundwater alkalinity values measured in the four wells of interest during the January 2003 sampling event are as follows:

- MW-5 (upgradient, background well): 222 mg/L;
- MW-10: 408 mg/L;
- MW-11A: 356 mg/L; and
- MW-12D: 225 mg/L.



3.0 EVALUATION OF REMEDIAL TECHNOLOGIES

The following subsections present evaluations of the remedial technologies applied at the former fueling system and former field waste tanks areas of the BJ Services facility in Hobbs, New Mexico.

3.1 Biosparging System at the Former Fueling System Area

Brown and Caldwell recommended installation of a biosparging system at the former fueling system area of the facility in the Remedial Action Plan (RAP) submitted to the NMOCD in May 1994. The NMOCD approved the RAP on August 11, 1994. The biosparging system was installed in August 1995, with expansions completed in April 1997 and March 1998. Operation of the biosparging system resulted in substantial decreases in hydrocarbon concentrations in applicable former fueling system area monitor wells. In accordance with the RAP, confirmation soil sampling activities were conducted at the former fueling system area in July 2001 to verify the effectiveness of the biosparging system in remediating vadose zone soils. The analytical results for these soil samples, as discussed in the report for the June 2001 groundwater sampling event, indicated that remediation goals for soil in this area had been achieved.

Following the confirmation soil sampling activities, hydrocarbon concentrations in groundwater remained below target cleanup goals for four successive quarters. In accordance with the RAP for the facility, a request to decommission the biosparging system was submitted to the NMOCD in the June 2002 Groundwater Sampling and Biosparging System Closure Report.

3.2 Natural Attenuation at the Former Field Waste Tanks Area

Natural attenuation is the primary remediation mechanism for the dissolved-phase hydrocarbon plume located in the area of the former field waste tanks (see Figure 1).

Plume behavior is the primary evidence of natural attenuation. Secondary evidence of natural attenuation can be obtained by the collection and evaluation of data relating to the concentrations of indigenous electron acceptors such as dissolved oxygen, nitrate, sulfate, and carbon dioxide. A plume is shrinking when the rate of hydrocarbon loading from a source area is less than the rate of natural degradation of hydrocarbons. Plume shrinkage in the absence of aggressive remediation is indicative of the occurrence of natural attenuation processes. Conversely, a plume is expanding if the rate of hydrocarbon loading from a source area is greater than the rate of natural degradation of hydrocarbons through natural attenuation processes.

The former field waste tanks in the eastern portion of the facility were removed in March 1997. Concentrations of total BTEX in monitor wells in the area of the former field waste tanks have been generally stable or declining subsequent to removal of these tanks. Sporadic increases in total BTEX concentrations between quarterly sampling events have been observed in monitor wells in this area since March 1997, however. These increases may be attributed to sporadic loading rates from the vadose zone in excess of the rate of natural attenuation in the area. The following subsections present primary and secondary evidence of natural attenuation of hydrocarbons in groundwater at the former field waste tanks area of the facility.

3.2.1 Primary Evidence

The benzene concentration in monitor well MW-10 has decreased from a maximum of 1.3 mg/L in August 1995 (prior to removal of the field waste tanks) to less than the NMWQCC standard of 0.01 mg/L for BTEX in the eight applicable groundwater sampling events between December 2000 and January 2003. Concentrations of toluene, ethylbenzene, and xylenes in monitor well MW-10 have undergone similar decreases over this time period. BTEX constituent concentrations have been less than 0.001 mg/L for the previous four successive quarters.

Benzene concentrations at the monitor well MW-11/11A location have generally decreased from a maximum of 0.970 mg/L in December 1996 (prior to removal of the field waste tanks). During the period from June 2001 through September 2002, benzene concentrations in six successive sampling

events were less than the applicable NMWQCC standard of 0.01 mg/L. However, the January 2003 benzene concentration of 0.012 mg/L in monitor well MW-11A slightly exceeds the NMWQCC standard for benzene.

Concentrations of each BTEX constituent at the monitor well MW-12/12D location have been below analytical detection limits for the past six sampling events.

3.2.2 Secondary Evidence

The following lines of geochemical evidence can also be used to suggest that intrinsic bioremediation (an important natural attenuation mechanism) of dissolved-phase hydrocarbons is occurring in the area of the former field waste tanks.

1. Dissolved oxygen may be utilized as an electron acceptor during intrinsic bioremediation. Dissolved oxygen concentrations should therefore be depressed in areas where intrinsic bioremediation is occurring.

Groundwater samples were collected primarily using bailers during the January 2003 sampling event due to low water levels in the wells. Measured dissolved oxygen concentrations in most wells at the facility were therefore artificially elevated. The use of bailers may cause groundwater samples to become oxygenated, thus precluding a meaningful comparison of dissolved oxygen data.

Historic evidence submitted to the NMOCD in previous quarterly groundwater monitoring reports for the facility when down-hole pumps were utilized has indicated that dissolved oxygen concentrations were typically depressed in hydrocarbon-impacted monitor wells relative to non-impacted wells at the facility (see the June 2001 Groundwater Sampling Report for BJ Services Hobbs, New Mexico Facility, for example).

2. Nitrate may be utilized as an electron acceptor during intrinsic bioremediation after dissolved oxygen is depleted. Therefore, nitrate concentrations may be depressed in areas where intrinsic bioremediation is occurring.

Nitrate was detected at a concentration of 2.1 mg/L in background monitor well MW-5 during the January 2003 sampling event. Although there was minimal to no hydrocarbon impact at former field waste tanks area wells MW-10, MW-11A, and MW-12D in January 2003 (see Table 4), nitrate concentrations were below analytical detection limits in each of

these wells. The non-detectable nitrate concentrations observed during this sampling event at former field waste tanks area wells MW-10, MW-11A, and MW-12D relative to the background nitrate concentration at the facility is likely due to residual effects from hydrocarbons.

3. When dissolved oxygen and nitrate are depleted, anaerobic microbes that utilize other electron acceptors may become active. Ferrous iron is the reduction product of ferric iron, a common electron acceptor. Therefore, ferrous iron concentrations should increase in areas where intrinsic bioremediation is occurring.

Ferrous iron was measured at 0.0 mg/L in background monitor well MW-5 during the January 2003 sampling event, but respective ferrous iron concentrations of 0.5 mg/L and 0.75 mg/L were measured in former field waste tanks area monitor wells MW-11A and MW-12D. The elevated ferrous iron concentrations in monitor wells MW-11A and MW-12D suggest that ferric iron has been used as an electron acceptor during natural attenuation of hydrocarbons at the former field waste tanks area of the facility.

4. Microbes that utilize sulfate may become active when dissolved oxygen, nitrate, and ferric iron are depleted. Sulfate concentrations should therefore decrease in areas where intrinsic bioremediation is occurring through the use of sulfate as an electron acceptor.

In January 2003, sulfate concentrations in the former field waste tanks area monitor wells MW-10, MW-11A, and MW-12D ranged from 150 mg/L to 290 mg/L whereas the concentration in background monitor well MW-5 was 97 mg/L. The fact that sulfate concentrations in the former source area monitor wells are greater than the sulfate concentration in the background monitor well suggests that sulfate is not being utilized as an electron acceptor in the former field waste tanks area.

5. Methane is a reaction product generated during utilization of carbon dioxide as an electron acceptor, so its concentration may increase in areas where concentrations of electron acceptors such as dissolved oxygen, nitrate, and ferric iron have diminished.

Dissolved methane was detected in background monitor well MW-5 at a concentration of 0.004 mg/L during the January 2003 groundwater sampling event. In the former field waste tanks area monitor wells MW-10, MW-11A, and MW-12D, dissolved methane ranged from 0.0024 mg/L to 0.0063 mg/L. The nominal differences in dissolved methane concentrations in these wells suggest that utilization of carbon dioxide as an electron acceptor is not presently occurring at the former field waste tanks area of the facility.

6. Redox potential is a measure of chemical energy in groundwater. The redox potential of groundwater from background monitor well MW-5 was measured at -158.1 mV in January 2003. Respective redox potentials of -172.8 mV, -165.1 mV, and -159.9 mV were measured in the former field waste tanks area monitor wells MW-10, MW-11A, and MW-12D in January 2003. These wells cannot be differentiated in terms of redox potential based

on the similarity of the values, so that this parameter does not provide evidence of natural attenuation of hydrocarbons at the former field waste tanks area.

7. Alkalinity is expected to increase during natural attenuation processes as a result of the leaching of carbonates from mineral substrates by microbially-produced organic acids.

Analytical method E310.1 was used to measure total alkalinity in January 2003. The alkalinity of groundwater from background monitor well MW-5 was 222 mg/L. A comparable alkalinity of 225 mg/L was measured in the deepest monitor well at the former field waste tanks area, MW-12D. Elevated alkalinities of 408 mg/L and 356 mg/L were measured in the shallower former field waste tanks area monitor wells MW-10 and MW-11A, respectively. Based on the elevated total alkalinity of groundwater in monitor wells MW-10 and MW-11A, it can be inferred that natural attenuation of hydrocarbons is occurring in the vicinity of these shallower wells at the former field waste tanks area.

In conclusion, current nitrate and historic dissolved oxygen data suggest that these electron acceptors are being utilized during intrinsic bioremediation processes in the vicinity of the former field waste tanks area of the facility. Data for ferrous iron may also indicate the utilization of ferric iron as an electron acceptor in this area of the facility. Current alkalinity data provide further evidence that natural attenuation of hydrocarbons is occurring in this area.

It is recommended that monitoring for natural attenuation evaluation parameters continue in the former field waste tank area monitor wells MW-10, MW-11A, and MW-12D and in the background well, MW-5. Redox potential, dissolved oxygen content, ferrous iron content, and alkalinity serve as good indicators of the occurrence of intrinsic bioremediation of hydrocarbons, so it is also recommended that field testing for these parameters be continued in all wells to be sampled during upcoming groundwater monitoring events.



4.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on information obtained during the January 2003 groundwater sampling event conducted at the BJ Services Hobbs, New Mexico facility.

4.1 Conclusions

- January 2003 benzene concentrations in the former field waste tanks area monitor wells MW-10 and MW-12D are less than the NMWQCC standard of 0.01 mg/L for benzene; however, monitor well MW-11A recorded a benzene concentration of 0.012 mg/L, which is slightly higher than the NMWQCC standard for benzene. Based on generally decreasing hydrocarbon concentrations in these monitor wells over time and as substantiated by geochemical data, natural attenuation processes appear to be occurring in the vicinity of the former field waste tanks which were removed in March 1997.
- The chloride concentration measured in downgradient monitor well MW-14 during the January 2003 groundwater sampling event is less than the NMWQCC standard of 250 mg/L.

4.2 Recommendations

- Continue the quarterly monitoring program for former field waste tank area monitor wells MW-10, MW-11A, and MW-12D. Continue monitoring for natural attenuation parameters in these wells and the background monitor well MW-5, including field-testing for natural attenuation indicator parameters.
- Based on the recent approval from the NMOCD and the acquisition of access privileges, complete installation and sampling of an off-site monitor well (MW-16) to further define the downgradient extent of chloride impact to groundwater in the area of the facility.
- Upon approval from the NMOCD, decommission the biosparging system at the former fuel island area.

DISTRIBUTION

January 2003 Groundwater Sampling Report
BJ Services Company, U.S.A.
Hobbs, New Mexico

May 9, 2003

Final Distribution as follows:

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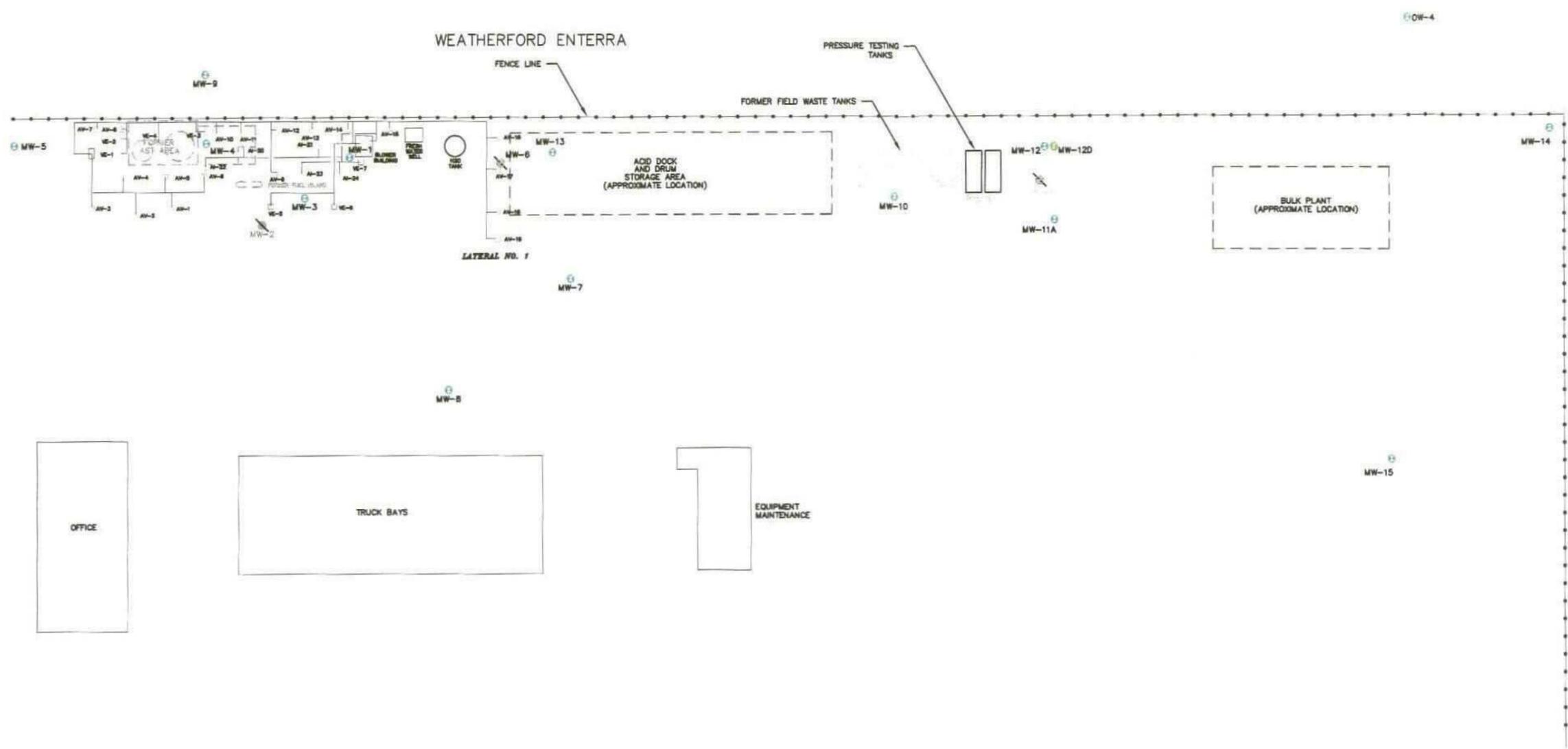


Lynn Wright
Principal Geologist

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FIGURES

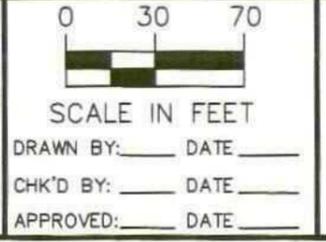


NOTE: DATUM FROM MONITOR WELL MW-12D NOT USED BECAUSE WELL IS SCREENED IN DEEPER PORTION OF THE AQUIFER THAN REMAINING WELLS.

BROWN AND CALDWELL
HOUSTON, TEXAS

SUBMITTED: _____ DATE: _____
PROJECT MANAGER

APPROVED: _____ DATE: _____
BROWN AND CALDWELL

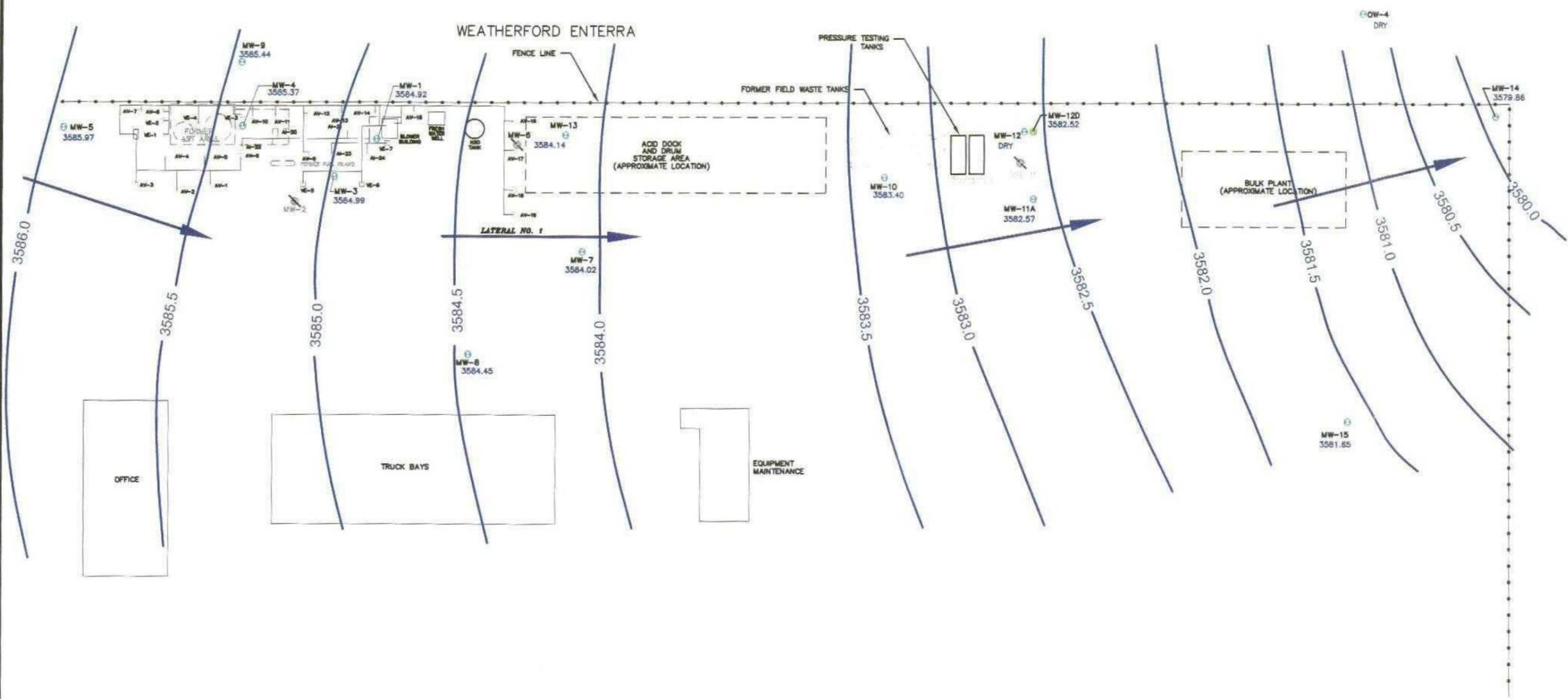


LEGEND

	MW-3	EXISTING MONITOR WELL LOCATION
		BIOSPARGING SYSTEM
	MW-2	MONITOR WELL (PLUGGED AND ABANDONED)
	MW-16	PROPOSED WELL LOCATION

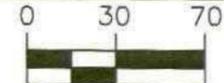
TITLE	SITE MAP	DATE	4/6/01
CLIENT	BJ SERVICES COMPANY, U.S.A.	PROJECT NUMBER	12832.017
SITE	HOBBS, NEW MEXICO	FIGURE NUMBER	1

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BROWN AND CALDWELL
HOUSTON, TEXAS



SCALE IN FEET
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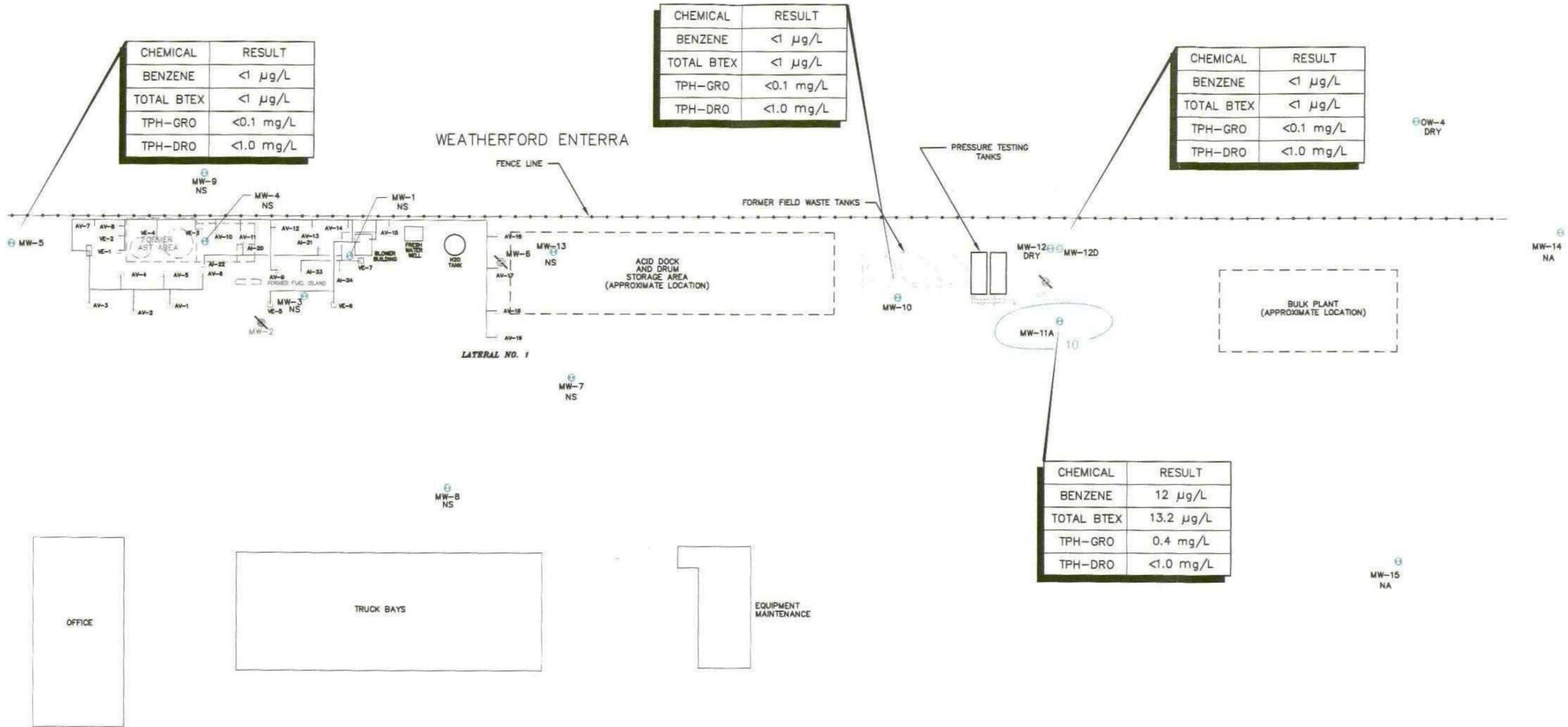
LEGEND

- MW-3 EXISTING MONITOR WELL LOCATION
- BIOSPARGING SYSTEM
- VE AV-10 MONITOR WELL (PLUGGED AND ABANDONED)
- MW-2 MW-16 PROPOSED WELL LOCATION
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER ELEVATION CONTOUR

TITLE	GROUNDWATER ELEVATION MAP FOR JANUARY 9, 2003
CLIENT	BJ SERVICES COMPANY, U.S.A.
SITE	HOBBS, NEW MEXICO

DATE	4/6/01
PROJECT NUMBER	12832.017
FIGURE NUMBER	2

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HOUSTON, TEXAS

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PROJECT MANAGER

APPROVED: _____ DATE: _____
BROWN AND CALDWELL

0 30 60
SCALE: 1" = 60'
DRAWN BY: CLK DATE 6/01
CHK'D BY: _____ DATE _____
APPROVED: _____ DATE _____

LEGEND

- MW-3 EXISTING MONITOR WELL LOCATION
- MW-2 MONITOR WELL (PLUGGED AND ABANDONED)
- NS WELL NOT SAMPLED
- NA WELL NOT ANALYZED FOR BTEX/TPH
- BIOSPARGING SYSTEM
- BENZENE ISOCONCENTRATION CONTOUR (in µg/L)

TITLE BENZENE ISOCONCENTRATION AND HYDROCARBON DISTRIBUTION MAP FOR JANUARY 9, 2003

CLIENT BJ SERVICES COMPANY, U.S.A.

SITE HOBBS, NEW MEXICO

DATE 4/6/01

PROJECT NUMBER 12832.018

FIGURE NUMBER 3

Tables



TABLES

Table 1
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
February 7, 1991	The New Mexico Oil Conservation Division (NMOCD) conducted an on-site inspection, including sampling of the on-site fresh water well.
August 6, 1991	The NMOCD requested submittal of an investigation work plan.
September 5, 1991	Roberts/Schornick and Associates, Inc. (RSA) submitted Technical Work Plan for soil and groundwater investigation to the NMOCD.
November 15, 1991	The NMOCD approved the Technical Work Plan submitted by RSA.
December 16, 1991	RSA sampled the fresh water well. The analytical results were submitted to the NMOCD.
February 21, 1992	Western sampled the fresh water well. The analytical results were submitted to the NMOCD.
July 29 - August 10, 1992	Brown and Caldwell conducted a soil and groundwater investigation according to the approved Technical Work Plan. The investigation included drilling and sampling nine soil borings, sampling six hand-augured soil borings, installation and sampling of five monitor wells, and sampling of the fresh water well.
October 12, 1992	Brown and Caldwell submitted a Soil and Groundwater Investigation Report to the NMOCD.
December 2, 1992	The NMOCD requested the installation and sampling of four additional monitor wells, including a monitor well on an adjacent property.
April 13, 1993	Brown and Caldwell conducted a vapor extraction pilot test on the existing monitor wells.
April 15, 1993	Brown and Caldwell installed off-site monitor well MW-9.
April 22, 1993	Brown and Caldwell sampled off-site monitor well MW-9.
May 27, 1993	Brown and Caldwell submitted a letter report documenting the installation and sampling of off-site monitor well MW-9 to the NMOCD.
June 2, 1993	Brown and Caldwell conducted a short-term aquifer test using the fresh water well at the facility.
June 8, 1993	USTank Management, Inc. conducted a non-volumetric tank system tightness test on the diesel and unleaded gasoline aboveground storage tanks at the facility.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
June 21, 1993	ENSR Consulting and Engineering (ENSR), the environmental consultant for the adjacent property owner on which off-site well MW-9 is located, submitted a request to sample monitor well MW-9.
July 15, 1993	ENSR split a groundwater sample collected from monitor well MW-9 with Brown and Caldwell.
July 30, 1993	USTank Management, Inc. submitted a tank tightness test report to Brown and Caldwell. The report indicated that both tanks and their associated piping passed.
August 16-19, 1993	Brown and Caldwell installed two additional downgradient monitor wells. Brown and Caldwell sampled each of the existing and newly installed monitor wells.
January 26, 1994	Brown and Caldwell performed a groundwater monitoring event; the existing monitor wells and the fresh water well were purged and sampled. The groundwater samples were analyzed for BTEX.
May 6, 1994	A Remedial Action Plan (RAP) was submitted to the NMOCD.
August 11, 1994	The RAP was approved by the NMOCD.
May 3, 1995	Brown and Caldwell conducted the May 1995 groundwater sampling event.
July 31, 1995	Brown and Caldwell conducted the July 1995 groundwater sampling event.
August 2-9, 1995	Installation of the biosparging system was initiated. Nineteen combined injection/extraction wells and three vacuum extraction wells were installed.
August 14-26, 1995	Remedial Construction Services, Inc. (RCS) constructed the initial design of the biosparging system.
September 19, 1995	Operation of the extraction portion of the biosparging system commenced.
November 13, 1995	Operation of the injection portion of the biosparging system commenced.
November 14, 1995	Brown and Caldwell conducted the November 1995 groundwater sampling event.
February 23, 1996	Brown and Caldwell conducted the February 1996 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
May 31, 1996	Brown and Caldwell conducted the May 1996 groundwater sampling event.
August 23, 1996	Brown and Caldwell conducted the August 1996 groundwater sampling event.
December 2, 1996	Brown and Caldwell conducted the December 1996 groundwater sampling event.
March 6-7, 1997	BJ Services removed three field waste tanks and associated hydrocarbon-impacted soil.
March 12, 1997	Brown and Caldwell conducted the March 1997 groundwater sampling event.
March 14, 1997	Vapor extraction well VE-4 was installed.
April 1997	Vapor extraction well VE-4 was connected to the vapor extraction system.
June 12, 1997	Brown and Caldwell conducted the June 1997 groundwater sampling event.
September 11-12, 1997	Brown and Caldwell conducted the September 1997 groundwater sampling event.
December 10, 1997	Brown and Caldwell conducted the December 1997 groundwater sampling event.
February 3-14, 1998	Air injection wells AI-20 through AI-24, vapor extraction wells VE-5 through VE-7, and monitor wells MW-11A and MW-12 were installed.
February 19, 1998	Operation of previously existing injection wells was suspended in preparation for start-up of new injection wells AI-20 through AI-24.
March 10, 1998	Operation of new air injection wells AI-20 through AI-24 and new vapor extraction wells VE-5 through VE-7 commenced.
March 23-24, 1998	Brown and Caldwell conducted the March 1998 groundwater sampling event.
March 24, 1998	Operation of previously existing injection wells and vapor extraction wells resumed.
June 23, 1998	Brown and Caldwell conducted the June 1998 groundwater sampling event.
September 30, 1998	Brown and Caldwell conducted the September 1998 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
December 9-10, 1998	Brown and Caldwell conducted the December 1998 groundwater sampling event.
January 21, 1999	The NMOCD requested submittal of a work plan by March 22, 1999 to perform additional groundwater delineation in the area of the former field waste tanks and the former AST/MW-6 area.
March 9-10, 1999	Brown and Caldwell conducted the March 1999 groundwater sampling event.
March 19, 1999	Brown and Caldwell submitted the work plan for groundwater delineation activities that was requested by the NMOCD.
May 19, 1999	The NMOCD approved the groundwater delineation work plan.
June 10, 1999	Brown and Caldwell performed sampling of existing monitor wells for the June /July 1999 groundwater sampling event.
July 2, 1999	Brown and Caldwell completed plugging and abandonment of monitor wells MW-2, MW-6, and MW-11; installed and developed monitor wells MW-12D and MW-13; and sampled monitor wells MW-12D and MW-13 to complete the June/July 1999 groundwater sampling event.
July 14, 1999	Brown and Caldwell redirected air discharge from the shallow injection well injection system to Lateral No. 1 and optimized air flow to injection wells AI-16 and AI-17 to apply increased remedial pressure to the eastern portion of the west plume.
September 13-14, 1999	Brown and Caldwell conducted the September 1999 groundwater sampling event.
December 9, 1999	Brown and Caldwell conducted the December 1999 groundwater sampling event.
March 9-10, 2000	Brown and Caldwell conducted the March 2000 groundwater sampling event and shut off air flow to biosparging system Lateral Nos. 4S, 5S, 6S, and 7S.
June 8, 2000	Brown and Caldwell conducted the June 2000 groundwater sampling event.
September 13, 2000	Brown and Caldwell conducted the September 2000 groundwater sampling event.
November 1, 2000	Brown and Caldwell deactivated the biosparging system.
December 7, 2000	Brown and Caldwell conducted the December 2000 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
January 2001	Brown and Caldwell installed and sampled monitor wells MW-14 and MW-15.
March 8-9, 2001	Brown and Caldwell conducted the March 2001 groundwater sampling event.
June 21-22, 2001	Brown and Caldwell conducted the June 2001 groundwater sampling event.
July 23, 2001	Brown and Caldwell collected soil samples from four soil borings installed at the former fueling system area of the facility to confirm the effectiveness of the biosparging system in remediating hydrocarbon impact to soil, as specified in the NMOCD-approved RAP.
September 10, 2001	Brown and Caldwell conducted the September 2001 groundwater sampling event.
December 6, 2001	Brown and Caldwell conducted the December 2001 groundwater sampling event.
February 26, 2002	Brown and Caldwell repaired the crushed well completion on monitor well MW-10.
February 28, 2002	NMOCD requested an evaluation of chloride content of groundwater at the facility.
March 11-12, 2002	Brown and Caldwell conducted the March 2002 groundwater sampling event. Groundwater samples from all water-producing wells at the facility were analyzed for chloride content.
May 21, 2002	Brown and Caldwell submitted the report for the March 2002 groundwater sampling event, including an evaluation of chloride content of groundwater at the facility and a recommendation for installation of a downgradient off-site well (MW-16) to replace off-site well OW-4, which has gone dry.
June 17-18, 2002	Brown and Caldwell conducted the June 2002 groundwater sampling event.
September 16, 2002	Brown and Caldwell conducted the September 2002 groundwater sampling event.
November 11, 2002	Brown and Caldwell submitted the June 2002 Groundwater Sampling Report and Biosparging System Closure Report.
January 9, 2003	Brown and Caldwell conducted the January 2003 groundwater sampling event.



Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-1	3,647.53	8/10/1992	53.22	0.00	3,594.31	(1)
		2/9/1993	53.03	0.00	3,594.50	
		8/18/1993	53.10	0.00	3,594.43	
		1/26/1994	53.31	0.00	3,594.22	
		5/3/1995	54.64	0.20	3,593.05	(2)
		7/31/1995	54.14	0.00	3,593.39	
		11/14/1995	53.69	0.00	3,593.84	
		2/23/1996	54.32	0.00	3,593.21	
		5/31/1996	54.14	0.00	3,593.39	
		8/23/1996	56.17	0.00	3,591.36	
		12/2/1996	55.27	0.00	3,592.26	
		3/12/1997	55.70	0.27	3,592.05	
		6/12/1997	55.08	0.02	3,592.47	
		9/12/1997	55.64	0.51	3,592.31	
		12/10/1997	55.46	0.00	3,592.07	PSH Sheen
		3/24/1998	55.81	0.00	3,591.72	PSH Sheen
		6/23/1998	56.38	0.06	3,591.20	
		9/30/1998	56.82	0.00	3,590.71	PSH Sheen
		12/9/1998	57.05	0.00	3,590.48	
		3/10/1999	57.45	0.00	3,590.08	
		6/10/1999	58.02	0.00	3,589.51	
		7/2/1999	57.90	0.00	3,589.63	
		9/14/1999	58.14	0.00	3,589.39	
		12/9/1999	-	-	-	(3)
		3/9/2000	58.99	0.00	3,588.54	
		06/00	-	-	-	
		09/00	-	-	-	
		12/7/00	-	-	-	
		3/8/2001	60.35	0.00	3,587.18	
		6/21/01	60.99	0.00	3,586.54	
9/10/01	61.17	0.00	3,586.36			
12/6/2001	-	not measured	-			
03/11/02	62.11	0.00	3,585.42			
6/17/02	62.53	0.00	3,585.00			
9/16/2002	62.43	0.00	3,585.10			
1/9/2003	62.61	0.00	3,584.92			
MW-2	3,644.84	8/10/1992	52.82	0.00	3,592.02	(1)
		2/9/1993	49.60	0.00	3,595.24	
		8/18/1993	49.71	0.00	3,595.13	
		1/26/1994	49.97	0.00	3,594.87	
		5/3/1995	-	-	-	(4),(5)
MW-3	3,645.00	8/10/1992	52.99	0.00	3,592.01	(1)
		2/9/1993	52.72	0.00	3,592.28	
		8/18/1993	52.82	0.00	3,592.18	
		1/26/1994	53.05	0.00	3,591.95	
		5/3/1995	54.31	0.00	3,590.69	
		7/31/1995	51.24	0.00	3,593.76	
		11/14/1995	51.10	0.00	3,593.90	
		2/23/1996	51.68	0.00	3,593.32	
		5/31/1996	51.45	0.00	3,593.55	
		8/23/1996	51.55	0.00	3,593.45	
		12/2/1996	52.23	0.00	3,592.77	
		3/12/1997	52.67	0.00	3,592.33	
		6/12/1997	52.68	0.00	3,592.32	
		9/11/1997	52.71	0.00	3,592.29	
		12/10/1997	52.89	0.00	3,592.11	
		3/23/1998	53.22	0.00	3,591.78	
		6/23/1998	53.66	0.00	3,591.34	
		9/30/1998	54.06	0.00	3,590.94	
		12/9/1998	54.36	0.00	3,590.64	
		3/10/1999	54.72	0.00	3,590.28	
		6/10/1999	55.17	0.00	3,589.83	
		7/2/1999	55.15	0.00	3,589.85	
		9/14/1999	55.42	0.00	3,589.58	
12/9/1999	55.78	0.00	3,589.22			
3/9/2000	56.23	0.00	3,588.77			
6/8/2000	56.66	0.00	3,588.34			
9/13/2000	56.77	0.00	3,588.23			

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-3 cont.	3,645.00	12/7/2000	57.15	0.00	3,587.85	
		3/8/2001	57.69	0.00	3,587.31	
		6/21/01	58.34	0.00	3,586.66	
		9/10/01	58.54	0.00	3,586.46	
		12/6/2001	59.04	0.00	3,585.96	
		3/11/2002	59.50	0.00	3,585.50	
		6/17/02	59.83	0.00	3,585.17	
		9/16/2002	59.80	0.00	3,585.20	
		1/9/2003	60.01	0.00	3,584.99	
MW-4	3,645.28	8/10/1992	50.55	0.00	3,594.73	(1)
		2/9/1993	50.26	0.00	3,595.02	
		8/18/1993	50.38	0.00	3,594.90	
		1/26/1994	50.90	0.30	3,594.63	
		5/3/1995	51.51	0.45	3,594.14	
		7/31/1995	51.74	0.26	3,593.75	
		11/14/1995	51.03	0.00	3,594.25	
		2/23/1996	51.65	0.01	3,593.64	
		5/31/1996	51.48	0.00	3,593.80	
		8/23/1996	53.49	0.00	3,591.79	
		12/2/1996	52.32	0.00	3,592.96	
		3/12/1997	52.74	0.05	3,592.58	
		6/12/1997	53.08	0.44	3,592.56	
		9/12/1997	52.60	0.15	3,592.80	
		12/10/1997	52.89	0.00	3,592.39	PSH Sheen
		3/24/1998	53.20	0.25	3,592.29	
		6/23/1998	53.82	0.22	3,591.64	
		9/30/1998	53.96	0.00	3,591.32	200 ml PSH
		12/9/1998	54.27	0.00	3,591.01	
		3/10/1999	54.69	0.04	3,590.62	
		6/10/1999	55.07	0.00	3,590.21	
		7/2/1999	55.10	0.00	3,590.18	
		9/14/1999	55.33	0.00	3,589.95	
		12/9/1999	55.79	0.00	3,589.49	
		3/10/2000	56.12	0.00	3,589.16	
		6/8/2000	56.67	0.00	3,588.61	
		9/13/2000	56.65	0.00	3,588.63	
		12/7/2000	57.05	0.00	3,588.23	
		3/8/2001	57.72	0.00	3,587.56	
		6/21/01	58.18	0.00	3,587.10	
		9/10/01	58.54	0.00	3,586.74	
		12/6/2001	58.88	0.00	3,586.40	
3/11/2002	59.41	0.00	3,585.87			
6/17/02	59.67	0.00	3,585.61			
9/16/2002	59.71	0.00	3,585.57			
1/9/2003	59.91	0.00	3,585.37			
MW-5	3,647.72	8/10/1992	52.38	0.00	3,595.34	(1)
		2/9/1993	52.06	0.00	3,595.66	
		8/18/1993	52.16	0.00	3,595.56	
		1/26/1994	52.50	0.00	3,595.22	
		5/3/1995	53.57	0.00	3,594.15	
		7/31/1995	53.27	0.00	3,594.45	
		11/14/1995	52.83	0.00	3,594.89	
		2/23/1996	53.57	0.00	3,594.15	
		5/31/1996	53.16	0.00	3,594.56	
		8/23/1996	53.41	0.00	3,594.31	
		12/2/1996	53.98	0.00	3,593.74	
		3/12/1997	54.44	0.00	3,593.28	
		6/12/1997	54.48	0.00	3,593.24	
		9/12/1997	54.29	0.00	3,593.43	
		12/10/1997	54.66	0.00	3,593.06	
		3/23/1998	55.05	0.00	3,592.67	
		6/23/1998	55.44	0.00	3,592.28	
		9/30/1998	55.65	0.00	3,592.07	
		12/9/1998	56.00	0.00	3,591.72	
		3/9/1999	56.45	0.00	3,591.27	
6/10/1999	56.91	0.00	3,590.81			
7/2/1999	56.93	0.00	3,590.79			
9/14/1999	57.12	0.00	3,590.60			

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-5 cont.	3,647.72	12/9/1999	57.41	0.00	3,590.31	
		3/9/2000	57.92	0.00	3,589.80	
		6/8/2000	58.32	0.00	3,589.40	
		9/13/2000	58.36	0.00	3,589.36	
		12/7/2000	58.71	0.00	3,589.01	
		3/8/2001	59.36	0.00	3,588.36	
		6/21/01	59.94	0.00	3,587.78	
		9/10/01	59.85	0.00	3,587.87	
		12/6/2001	60.56	0.00	3,587.16	
		3/11/02	61.12	0.00	3,586.60	
		6/17/02	61.43	0.00	3,586.29	
		9/16/2002	61.52	0.00	3,586.20	
		1/9/2003	61.75	0.00	3,585.97	
		MW-6	3,644.74	2/9/1993	50.58	0.00
8/18/1993	50.78			0.00	3,593.96	
1/26/1994	51.00			0.00	3,593.74	
5/3/1995	52.63			0.00	3,592.11	
7/31/1995	51.90			0.00	3,592.84	
11/14/1995	51.19			0.00	3,593.55	
2/23/1996	52.10			0.00	3,592.64	
5/31/1996	51.76			0.00	3,592.98	
8/23/1996	51.63			0.00	3,593.11	
12/2/1996	52.85			0.00	3,591.89	
3/12/1997	53.55			0.00	3,591.19	
6/12/1997	52.08			0.00	3,592.66	
9/11/1997	53.72			0.00	3,591.02	
12/10/1997	53.27			0.00	3,591.47	
3/23/1998	53.56			0.00	3,591.18	
6/23/1998	52.88			0.00	3,591.86	
9/30/1998	54.89			0.00	3,589.85	
12/9/1998	54.57			0.00	3,590.17	
3/10/1999	55.10			0.00	3,589.64	(5),(6)
MW-7	3,644.55	2/9/1993	50.53	0.00	3,594.02	(1)
		8/18/1993	50.74	0.00	3,593.81	
		1/26/1994	51.01	0.00	3,593.54	
		5/3/1995	52.25	0.00	3,592.30	
		7/31/1995	51.92	0.00	3,592.63	
		11/14/1995	51.48	0.00	3,593.07	
		2/23/1996	52.15	0.00	3,592.40	
		5/31/1996	51.78	0.00	3,592.77	
		8/23/1996	52.02	0.00	3,592.53	
		12/2/1996	52.52	0.00	3,592.03	
		3/12/1997	52.99	0.00	3,591.56	
		6/12/1997	53.08	0.00	3,591.47	
		9/11/1997	53.00	0.00	3,591.55	
		12/10/1997	53.28	0.00	3,591.27	
		3/23/1998	53.59	0.00	3,590.96	
		6/23/1998	54.20	0.00	3,590.35	
		9/30/1998	54.54	0.00	3,590.01	
		12/9/1998	54.74	0.00	3,589.81	
		3/9/1999	55.15	0.00	3,589.40	
		6/10/1999	55.66	0.00	3,588.89	
		7/2/1999	55.73	0.00	3,588.82	
		9/13/1999	55.94	0.00	3,588.61	
		12/9/1999	56.38	0.00	3,588.17	
		3/9/2000	56.74	0.00	3,587.81	
		6/8/2000	57.17	0.00	3,587.38	
		9/13/2000	57.40	0.00	3,587.15	
		12/7/2000	57.77	0.00	3,586.78	
		3/8/2001	58.29	0.00	3,586.26	
		6/21/01	58.91	0.00	3,585.64	
		9/10/01	59.25	0.00	3,585.30	
		12/6/2001	59.75	0.00	3,584.80	
		3/11/2002	60.03	0.00	3,584.52	
		6/17/02	60.39	0.00	3,584.16	
9/16/2002	60.39	0.00	3,584.16			
1/9/2003	60.53	0.00	3,584.02			

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-8	3,644.87	2/9/1993	50.48	0.00	3,594.39	(1)
		8/18/1993	50.67	0.00	3,594.20	
		1/26/1994	50.96	0.00	3,593.91	
		5/3/1995	52.15	0.00	3,592.72	
		7/31/1995	51.77	0.00	3,593.10	
		11/14/1995	51.37	0.00	3,593.50	
		2/23/1996	52.17	0.00	3,592.70	
		5/31/1996	51.55	0.00	3,593.32	
		8/23/1996	51.92	0.00	3,592.95	
		12/2/1996	52.43	0.00	3,592.44	
		3/12/1997	52.93	0.00	3,591.94	
		6/12/1997	53.96	0.00	3,590.91	
		9/11/1997	52.73	0.00	3,592.14	
		12/10/1997	53.15	0.00	3,591.72	
		3/23/1998	53.51	0.00	3,591.36	
		6/23/1998	54.01	0.00	3,590.86	
		9/30/1998	54.35	0.00	3,590.52	
		12/9/1998	54.60	0.00	3,590.27	
		3/9/1999	55.00	0.00	3,589.87	
		6/10/1999	55.56	0.00	3,589.31	
		7/2/1999	55.57	0.00	3,589.30	
		9/13/1999	55.72	0.00	3,589.15	
		12/9/1999	-	-	-	
		3/9/2000	56.52	0.00	3,588.35	(3)
		06/00	-	-	-	
		09/00	-	-	-	
		12/00	-	-	-	
		3/8/2001	58.11	0.00	3,586.76	
		6/21/01	58.72	0.00	3,586.15	
		9/10/01	58.94	0.00	3,585.93	
		12/6/2001	-	not measured	-	
3/11/2002	59.94	0.00	3,584.93			
6/17/02	60.22	0.00	3,584.65			
9/16/2002	60.24	0.00	3,584.63			
1/9/2003	60.42	0.00	3,584.45			
MW-9	3,644.78	4/22/1993	49.73	0.00	3,595.05	(1)
		7/15/1993	49.65	0.00	3,595.13	
		8/18/1993	49.85	0.00	3,594.93	
		1/26/1994	50.02	0.00	3,594.76	
		5/3/1995	51.35	0.00	3,593.43	
		7/31/1995	50.97	0.00	3,593.81	
		11/14/1995	50.43	0.00	3,594.35	
		2/23/1996	51.12	0.00	3,593.66	
		5/31/1996	50.89	0.00	3,593.89	
		8/23/1996	50.98	0.00	3,593.80	
		12/2/1996	51.58	0.00	3,593.20	
		3/12/1997	52.21	0.05	3,592.61	
		6/12/1997	52.10	0.00	3,592.68	
		9/12/1997	51.95	0.00	3,592.83	
		12/10/1997	52.37	0.00	3,592.41	
		3/23/1998	52.68	0.00	3,592.10	
		6/23/1998	53.08	0.00	3,591.70	
		9/30/1998	53.39	0.01	3,591.40	
		12/9/1998	53.68	0.00	3,591.10	
		3/10/1999	54.15	0.00	3,590.63	
		6/10/1999	54.68	0.00	3,590.10	
		7/2/1999	54.71	0.00	3,590.07	
		9/13/1999	54.71	0.00	3,590.07	
		12/9/1999	-	-	-	
		3/9/2000	55.69	0.00	3,589.09	(3)
		06/00	-	-	-	
		09/00	-	-	-	
12/00	-	-	-			
3/8/2001	57.03	0.00	3,587.75			
6/21/01	57.91	0.00	3,586.87			
9/10/01	57.95	0.00	3,586.83			
12/6/2001	-	not measured	-			

Table 2
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Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-9 cont.	3,644.78	3/11/2002	58.96	0.00	3,585.82	
		6/17/02	59.14	0.00	3,585.64	
		9/16/2002		not measured		
		1/9/2003	59.34	0.00	3585.44	
MW-10	3,644.47	8/18/1993	51.54	0.00	3,592.93	(1)
		1/26/1994	51.90	0.00	3,592.57	
		5/3/1995	52.97	0.00	3,591.50	
		7/31/1995	52.87	0.00	3,591.60	
		11/14/1995	52.51	0.00	3,591.96	
		2/23/1996	53.05	0.00	3,591.42	
		5/31/1996	52.79	0.00	3,591.68	
		8/23/1996	53.03	0.00	3,591.44	
		12/2/1996	53.41	0.00	3,591.06	
		3/12/1997	54.21	0.00	3,590.26	
		6/12/1997	53.99	0.00	3,590.48	
		9/12/1997	53.94	0.00	3,590.53	
		12/10/1997	54.12	0.00	3,590.35	
		3/23/1998	54.51	0.00	3,589.96	
		6/23/1998	55.12	0.00	3,589.35	
		9/30/1998	55.61	0.00	3,588.86	
		12/9/1998	55.80	0.00	3,588.67	
		3/9/1999	56.09	0.00	3,588.38	
		6/10/1999	56.60	0.00	3,587.87	
		7/2/1999	56.64	0.00	3,587.83	
		9/14/1999	56.91	0.00	3,587.56	
		12/9/1999	57.37	0.00	3,587.10	
		3/10/2000	57.71	0.00	3,586.76	
		6/8/2000	58.08	0.00	3,586.39	
		9/13/2000	58.44	0.00	3,586.03	
		12/7/2000	58.89	0.00	3,585.58	
		3/9/2001	59.31	0.00	3,585.16	
6/21/01	59.89	0.00	3,584.58			
9/10/01	61.34	0.00	3,583.13			
12/6/2001	60.65	0.00	3,583.82			
3/11/2002	60.69	0.00	3,583.78			
6/17/02	60.98	0.00	3,583.49			
9/16/2002	61.00	0.00	3,583.47			
1/9/2003	61.07	0.00	3,583.40			
MW-11	3,643.78	8/18/1993	51.92	0.00	3,591.86	(1)
		1/26/1994	52.32	0.00	3,591.46	
		5/3/1995	53.38	0.00	3,590.40	
		7/31/1995	53.35	0.00	3,590.43	
		11/14/1995	52.96	0.00	3,590.82	
		2/23/1996	53.50	0.00	3,590.28	
		5/31/1996	53.25	0.00	3,590.53	
		8/23/1996	53.49	0.00	3,590.29	
		12/2/1996	53.79	0.00	3,589.99	
		3/12/1997	53.81	0.00	3,589.97	
		6/12/1997	53.96	0.00	3,589.82	
		9/12/1997	52.93	0.00	3,590.85	
		12/10/1997				(5),(6)
MW-11A	3,644.24	3/23/1998	54.79	0.00	3,589.45	(7)
		6/23/1998	55.43	0.00	3,588.81	
		9/30/1998	55.96	0.00	3,588.28	
		12/9/1998	56.13	0.00	3,588.11	
		3/10/1999	56.43	0.00	3,587.81	
		6/10/1999	56.94	0.00	3,587.30	
		7/2/1999	57.01	0.00	3,587.23	
		9/14/1999	57.36	0.00	3,586.88	
		12/9/1999	57.72	0.00	3,586.52	
		3/9/2000	58.01	0.00	3,586.23	
		6/8/2000	58.40	0.00	3,585.84	
		9/13/2000	58.84	0.00	3,585.40	
		12/7/2000	59.29	0.00	3,584.95	
		3/8/2001	59.72	0.00	3,584.52	
		6/21/01	60.28	0.00	3,583.96	
9/10/01	60.69	0.00	3,583.55			
12/6/2001	60.88	0.00	3,583.36			

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-11A cont.	3,644.24	3/11/2002	61.42	0.00	3,582.82	
		6/17/02	61.55	0.00	3,582.69	
		9/16/2002	61.59	0.00	3,582.65	
		1/9/2003	61.67	0.00	3,582.57	
MW-12	3,644.29	3/23/1998	54.72	0.00	3,589.57	(7)
		6/23/1998	55.48	0.00	3,588.81	
		9/30/1998	56.02	0.00	3,588.27	
		12/9/1998	56.17	0.00	3,588.12	
		3/10/1999	56.45	0.00	3,587.84	
		6/10/1999	56.97	0.00	3,587.32	
		7/2/1999	56.99	0.00	3,587.30	
		9/14/1999	57.41	0.00	3,586.88	
		12/9/1999	57.76	0.00	3,586.53	
		3/10/2000	58.08	0.00	3,586.21	
		6/8/2000	58.42	0.00	3,585.87	
		9/13/2000	58.85	0.00	3,585.44	
		12/7/2000	59.31	0.00	3,584.98	
		3/8/2001	59.76	0.00	3,584.53	
		6/21/01	60.29	0.00	3,584.00	
		9/10/01	60.79	0.00	3,583.50	
				well dry during this and subsequent monitoring events		
MW-12D	3,644.38	7/2/1999	57.13	0.00	3,587.25	(8)
		9/14/1999	57.74	0.00	3,586.64	
		12/9/1999	57.86	0.00	3,586.52	
		3/9/2000	58.24	0.00	3,586.14	
		6/8/2000	58.56	0.00	3,585.82	
		09/00	-	-	-	
		12/00	-	-	-	
		3/8/2001	-	-	-	
		6/21/01	-	-	-	
		9/10/01	-	-	-	
		12/6/2001	61.30	0.00	3,583.08	
		3/11/2002	61.61	0.00	3,582.77	
		6/17/02	61.71	0.00	3,582.67	
		9/16/2002	61.75	0.00	3,582.63	
1/9/2003	61.86	0.00	3,582.52			
MW-13	3,645.52	7/2/1999	56.60	0.00	3,588.92	(9)
		9/14/1999	56.92	0.00	3,588.60	
		12/9/1999	57.28	0.00	3,588.24	
		3/10/2000	57.68	0.00	3,587.84	
		6/8/2000	58.04	0.00	3,587.48	
		9/13/2000	58.29	0.00	3,587.23	
		12/7/2000	58.68	0.00	3,586.84	
		3/8/2001	59.19	0.00	3,586.33	
		6/21/01	59.80	0.00	3,585.72	
		9/10/01	60.03	0.00	3,585.49	
		12/6/2001	60.59	0.00	3,584.93	
		3/11/2002	60.94	0.00	3,584.58	
		6/17/02	61.28	0.00	3,584.24	
		9/16/2002	61.23	0.00	3,584.29	
1/9/2003	61.38	0.00	3,584.14			
MW-14	3,642.45	3/8/2001	61.07	0.00	3,581.38	
		6/21/01	61.71	0.00	3,580.74	
		9/10/01	62.31	0.00	3,580.14	
		12/6/2001	62.80	0.00	3,579.65	
		3/11/2002	62.70	0.00	3,579.75	
		6/17/02	62.65	0.00	3,579.80	
		9/16/2002	62.55	0.00	3,579.90	
		1/9/2003	62.59	0.00	3,579.86	
MW-15	3,643.24	3/8/2001	59.79	0.00	3,583.45	
		6/21/01	60.49	0.00	3,582.75	
		9/10/01	61.02	0.00	3,582.22	
		12/6/2001	61.47	0.00	3,581.77	
		3/11/2002	61.65	0.00	3,581.59	
		6/17/02	61.68	0.00	3,581.56	
		9/16/2002	61.47	0.00	3,581.77	
		1/9/2003	61.59	0.00	3,581.65	

**Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.**

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments	
OW-4	3,644.06	7/2/1999	58.18	0.00	3,585.88	(8)	
		9/14/1999	58.63	0.00	3,585.43		
		12/9/1999	58.92	0.00	3,585.14		
		3/9/2000	59.19	0.00	3,584.87		
		6/8/2000	59.56	0.00	3,584.50		
		9/13/2000	60.16	0.00	3,583.90		
		12/7/2000	61.15	0.00	3,582.91		
		3/8/2001	61.43	0.00	3,582.63		
		6/21/01	61.48	0.00	3,582.58	(10)	
		9/10/01	61.53	0.00	3,582.53		
		12/6/2001	well dry during this and subsequent monitoring events				

- ⁽¹⁾ - Top of casing elevations and groundwater elevations of all monitor wells were relative to an arbitrary datum of 100.00 feet prior to March 1997 and have been converted to Mean Sea Level (MSL).
- ⁽²⁾ - For wells having measurable thickness of free product, the groundwater elevation was calculated as follows:
Groundwater Elevation = (TOC elevation)-(depth to groundwater)+[(free product thickness)x(SG of free product)]
Note: The specific gravity (SG) of the free product is 0.82.
- ⁽³⁾ - Not measured.
- ⁽⁴⁾ - Monitor well MW-2 could not be located after January 1994.
- ⁽⁵⁾ - Well plugged and abandoned July 2, 1999.
- ⁽⁶⁾ - Monitor well MW-11 could not be located after September 12, 1997.
- ⁽⁷⁾ - TOC elevations for MW-11A and MW-12 estimated relative to TOC elevation for MW-10.
- ⁽⁸⁾ - TOC elevations for MW-12D and OW-4 estimated relative to TOC elevation for MW-12.
- ⁽⁹⁾ - TOC elevation for MW-13 estimated relative to TOC elevation for MW-7.
- ⁽¹⁰⁾ - Well dry (measured depth to water is below base of screen); true groundwater elevation is less than listed groundwater elevation.

Table 3
January 9, 2003 Field Screening Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Cumulative Gallons Removed	pH	Temperature (°C)	Conductivity (umhos/cm)	Redox (mV)	Dissolved Oxygen (meter) (mg/L)	Dissolved Oxygen (Hach kit) (mg/L)	Ferrous Iron (mg/L)
MW-5	2.0	7.19	18.50	1066	-158.1	6.11	3.75	0.0
MW-10	0.5*	7.09	18.94	4715	-172.8	6.49	NM	NM
MW-11A	1.1	6.68	18.87	9992	-165.1	4.24	4.0	0.5
MW-12D	1.25	6.85	18.91	1079	-159.9	1.54	0.0	0.75
MW-14	1.5*	7.11	17.93	1706	-154.6	7.42	NM	NM
MW-15	2.75	6.99	18.55	1539	-151.0	6.65	NM	NM

Monitor wells MW-1, MW-8, and MW-9 not sampled.

Monitor well MW-2 not operative after January 1994; P&A'd 7/1/99.

Monitor well MW-6 P&A'd 7/1/99.

Monitor well MW-11 not operative after September 1997; P&A'd 7/1/99.

Monitor wells MW-12 and OW-4 were dry.

NM = Not Measured

* Well was purged dry using bailing techniques.

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G	
			micrograms per liter, ug/L				milligrams per liter, mg/L		
MW-1	8/10/92	Regular	5550.0	12090.0	2160.0	7370.0	NA	NA	
	2/9/93	Regular	2100.0	6500.0	1300.0	7400.0	NA	NA	
	8/19/93	Regular	3200.0	7300.0	1200.0	3700.0	NA	NA	
	1/27/94	Regular	1930.0	4580.0	672.0	2390.0	NA	NA	
	5/3/95	Regular	NSP	NSP	NSP	NSP	NA	NSP	
	8/1/95	Regular	Regular	390.0	1300.0	230.0	800.0	NA	5.7
	11/15/95	Regular	Regular	880.0	1800.0	300.0	970.0	NA	6.8
	2/23/96	Regular	Regular	1500.0	3700.0	620.0	2200.0	NA	21
	5/31/96	Regular	Regular	1100.0	1700.0	380.0	990.0	NA	7.5
	8/23/96	Regular	Regular	1800.0	3300.0	570.0	2100.0	NA	17
	12/2/96	Regular	Regular	5600.0	9600.0	2100.0	9600.0	100	64
	3/12/97	Regular	Regular	5500.0	9700.0	2600.0	8200.0	22	62
	6/12/97	Regular	Regular	5300.0	34000.0	7500.0	27000.0	180	160
	9/12/97	Regular	Regular	1800.0	4400.0	1000.0	3000.0	23	21
	12/10/97	Regular	Regular	7600.0	12000.0	2800.0	8200.0	11	71
	3/24/98	Regular	Regular	4800.0	7200.0	1200.0	2400.0	4.2	38
	6/23/98	Regular	Regular	53.0	680.0	580.0	1400.0	1.4	9.2
	9/30/1998	Regular	Regular	3.2	90.0	280.0	970.0	2.5	3.6
	12/10/1998	Regular	Regular	< 1.0	1.5	17.0	110.0	1.4	0.31
	3/10/1999	Regular	Regular	< 1.0	< 1.0	8.2	110.0	0.62	0.85
	3/10/1999	Duplicate	Duplicate	< 1.0	< 1.0	7.9	110.0	0.66	0.84
	6/10/1999	Regular	Regular	< 1.0	1.1	< 1.0	28.0	0.53	0.55
	6/10/1999	Duplicate	Duplicate	< 1.0	1.8	< 1.0	41.0	0.69	0.76
	9/14/1999	Regular	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	-	-	NS	NS	NS	NS	NS	NS
	3/9/2000	Regular	Regular	< 1	< 1	< 1	9.1	14	1.3
	6/8/2000	-	-	NS	NS	NS	NS	NS	NS
	9/13/2000	-	-	NS	NS	NS	NS	NS	NS
	12/7/2000	-	-	NS	NS	NS	NS	NS	NS
	3/8/2001	Regular	Regular	2.0	< 1	< 1	< 1	0.49	0.58
	6/21/2001	-	-	NS	NS	NS	NS	NS	NS
	9/10/2001	-	-	NS	NS	NS	NS	NS	NS
	12/6/2001	-	-	NS	NS	NS	NS	NS	NS
3/12/2002	Regular	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
6/18/2002	-	-	NS	NS	NS	NS	NS	NS	
9/16/2002	-	-	NS	NS	NS	NS	NS	NS	
1/9/2003	-	-	NS	NS	NS	NS	NS	NS	
MW-2 ¹	8/10/92	Regular	14.9	< 4	< 4	< 4	NA	NA	
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA	
	8/19/93	Regular	100.0	12.0	3.0	13.0	NA	NA	
	1/27/94	Regular	< 1	1.2	2.0	2.5	NA	NA	
MW-3	8/10/92	Regular	304.9	2099.0	6760.0	1586.0	NA	NA	
	2/9/93	Regular	130.0	< 10	< 10	190.0	NA	NA	
	8/19/93	Regular	560.0	3100.0	630.0	1900.0	NA	NA	
	1/27/94	Regular	1070.0	5380.0	510.0	3120.0	NA	NA	
	5/4/95	Regular	770.0	3300.0	470.0	1800.0	NA	NA	
	8/1/95	Regular	490.0	2900.0	890.0	1600.0	NA	14	
	11/15/95	Regular	250.0	1000.0	180.0	440.0	NA	2.9	
	2/23/96	Regular	120.0	810.0	170.0	560.0	NA	4	
	5/31/96	Regular	670.0	3900.0	1200.0	2300.0	NA	15	
	8/23/96	Regular	330.0	2200.0	590.0	1500.0	NA	12	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-3	12/2/96	Regular	220.0	1800.0	670.0	1000.0	0.89	7.4
	3/12/97	Regular	370.0	2000.0	960.0	1400.0	1.8	11
	6/12/97	Regular	860.0	4800.0	1700.0	2600.0	1.9	20
	9/11/97	Regular	770.0	3000.0	1600.0	1900.0	1.6	16
	12/10/97	Regular	240.0	740.0	500.0	450.0	0.59	5.3
	3/24/98	Regular	140.0	630.0	360.0	310.0	0.56	3.9
	6/23/98	Regular	100.0	720.0	350.0	490.0	0.40	4.9
	9/30/1998	Regular	42.0	470.0	450.0	530.0	1.0	3.8
	12/10/1998	Regular	13.0	220.0	160.0	290.0	1.3	0.43
	3/10/1999	Regular	3.2	7.4	42.0	32.0	0.2	0.44
	6/10/1999	Regular	1.7	3.1	<1.0	36.0	<0.20	0.18
	9/14/1999	Regular	<1.0	<1.0	<1.0	<2.0	<0.20	<0.10
	12/9/1999	Regular	<1	<1	<1	<1	<0.2	<0.1
	3/9/2000	Regular	<1	<1	<1	<1	0.32	<0.1
	6/8/2000	Regular	<1	<1	<1	<1	<0.22	<0.1
	9/13/2000	Regular	<1	<1	<1	<1	<0.2	<0.1
	12/7/2000	Regular	<1	<1	<1	<1	<0.25	<0.1
	3/8/2001	Regular	<1	<1	<1	<1	0.42	<0.1
	6/21/2001	Regular	<1	<1	<1	<1	<0.22	<0.1
	9/10/2001	Regular	<1	<1	<1	<1	<0.2	<0.1
	12/6/2001	Regular	<1	<1	<1	<1	<0.2	<0.1
	3/12/2002	Regular	<1	<1	<1	<1	<0.2	<0.1
	6/18/2002	Regular	<1	<1	<1	<1	<0.2	<0.1
9/16/2002	-	-	NS	NS	NS	NS	NS	NS
1/9/2003	-	-	NS	NS	NS	NS	NS	NS
MW-4	8/10/92	Regular	2594.0	10360.0	2160.0	6740.0	NA	NA
	2/9/93	Regular	5200.0	15000.0	2200.0	10000.0	NA	NA
	8/19/93	Regular	3000.0	12000.0	<2000	7000.0	NA	NA
	1/27/94	Regular	NSP	NSP	NSP	NSP	NA	NSP
	5/3/95	Regular	NSP	NSP	NSP	NSP	NA	NSP
	8/1/95	Regular	5700.0	17000.0	3500.0	13000.0	NA	120
	11/15/95	Regular	490.0	1600.0	310.0	1100.0	NA	5.2
	2/23/96	Regular	360.0	2800.0	560.0	2500.0	NA	18
	5/31/96	Regular	84.0	830.0	280.0	1100.0	NA	6.2
	8/23/96	Regular	110.0	1400.0	430.0	1800.0	NA	9.8
	12/2/96	Regular	190.0	2000.0	1800.0	7200.0	56	43
	3/12/97	Regular	220.0	1500.0	1500.0	4400.0	27	27
	6/12/97	Regular	47.0	270.0	360.0	950.0	2.5	6.2
	9/12/97	Regular	92.0	840.0	670.0	2100.0	15	7.6
	12/10/97	Regular	230.0	750.0	970.0	2300.0	3.7	16
	3/24/98	Regular	150.0	510.0	270.0	620.0	1.2	5.6
	6/23/98	Regular	160.0	890.0	590.0	1600.0	0.69	10
	9/30/1998	Regular	80.0	180.0	370.0	840.0	2.0	3.9
	12/10/1998	Regular	28.0	70.0	210.0	960.0	9.3	4.3
	12/10/1998	Duplicate	26.0	62.0	180.0	830.0	3.9	4.3
	3/10/1999	Regular	8.0	20.0	250.0	1400.0	13.0	13
	6/10/1999	Regular	<1.0	<1.0	12.0	12.0	0.44	0.63
	9/14/1999	Regular	<1.0	<1.0	3.3	13.1	0.35	0.17
12/9/1999	Regular	<1	2.5	2.3	20.1	2	0.53	
3/10/2000	Regular	<1	<1	<1	3.6	2.6	0.15	
6/8/2000	Regular	<1	<1	<1	<1	0.44	0.23	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-4	9/13/2000	Regular	< 1	< 1	< 1	< 1	0.61	< 0.1
	12/7/2000	Regular	< 1	< 1	1.3	< 1	0.53	0.16
	3/8/2001	Regular	< 1	< 1	< 1	< 1	0.43	0.16
	6/21/2001	Regular	< 1	< 1	< 1	< 1	< 0.25	< 0.1
	9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/6/2001	Regular	< 1	< 1	< 1	< 1	0.6	< 1
	3/12/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/16/2002	-	NS	NS	NS	NS	NS	NS
	1/9/2003	-	NS	NS	NS	NS	NS	NS
MW-5	8/10/92	Regular	< 4	< 4	< 4	< 4	NA	NA
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/10/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	1/27/94	Regular	8.7	29.9	4.0	11.3	NA	NA
	5/3/95	Regular	3.7	5.3	0.9	4.6	NA	NA
	8/1/95	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	11/15/95	Regular	< 0.3	1.2	< 0.3	1.5	NA	NA
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	5/31/96	Regular	31.0	86.0	10.0	20.0	NA	NA
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	12/10/97	Regular	< 5	< 5	< 5	< 5	< 0.2	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	12/10/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.55	< 0.1
	6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/13/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/7/2000	Regular	< 1	< 1	< 1	< 1	< 0.25	< 0.1
	3/8/2001	Regular	< 1	< 1	< 1	< 1	0.56	< 0.1
	6/21/2001	Regular	< 1	< 1	< 1	< 1	0.26	< 0.1
	9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/6/2001	Regular	< 1	< 1	< 1	< 1	0.49	< 0.1
3/12/2002	Regular	< 1	< 1	< 1	< 1	< 0.24	< 0.1	
6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
9/16/2002	Regular	< 0.074	< 0.11	< 0.068	< 0.082	0.3 J	< 0.05	
1/9/2003	Regular	< 1	< 1	< 1	< 1	< 1.0	< 0.1	
MW-6 ¹	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	7000.0	19000.0	3100.0	7200.0	NA	NA
	8/19/93	Regular	8100.0	19000.0	3500.0	6400.0	NA	NA
	1/27/94	Regular	7960.0	20200.0	3830.0	6150.0	NA	NA
	5/4/95	Regular	11000.0	17000.0	2900.0	6000.0	NA	NA

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-6	8/1/95	Regular	8300.0	12000.0	2500.0	5100.0	NA	60
	11/15/95	Regular	8900.0	17000.0	2900.0	5500.0	NA	57
	2/23/96	Regular	8100.0	10000.0	2300.0	4000.0	NA	58
	5/31/96	Regular	83.0	150.0	15.0	51.0	NA	0.57
	5/31/96	Duplicate	87.0	160.0	13.0	47.0	NA	0.52
	8/23/96	Regular	31.0	28.0	9.4	7.9	NA	0.46
	12/2/96	Regular	< 1	< 1	< 1	1.7	5.6	< 0.1
	3/12/97	Regular	12.0	< 5	6.8	18.0	12	< 0.5
	6/12/97	Regular	1900.0	1400.0	410.0	310.0	7.8	7.4
	9/11/97	Regular	11.0	1.3	3.4	< 1	1	< 0.1
	12/10/97	Regular	3.0	4.2	1.2	3.9	1.7	0.14
	3/23/98	Regular	3.6	< 1	4.0	< 1	< 0.2	< 0.1
	6/23/98	Regular	170.0	4.1	15.0	7.2	1.2	0.51
	9/30/1998	Regular	1000.0	420.0	140.0	270.0	4.0	3.3
	12/10/1998	Regular	7.6	6.6	1.7	5.8	2.0	< 0.1
3/10/1999	Regular	2500.0	930.0	590.0	1400.0	11.0	13	
MW-7	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	< 2	3.0	< 2	< 2	NA	NA
	1/27/94	Regular	1.1	< 1	< 1	< 1	NA	NA
	5/3/95	Regular	52.0	3.4	0.7	2.8	NA	NA
	8/1/95	Regular	22.0	2.2	0.9	2.8	NA	< 0.1
	11/15/95	Regular	8.4	0.8	< 0.3	0.9	NA	< 0.1
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	2/23/96	Duplicate	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	5/31/96	Regular	29.0	83.0	10.0	21.0	NA	0.25
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/11/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	12/10/97	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	12/10/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	4.7	< 0.1
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 5	< 5	< 5	< 5	1.8	< 0.5
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.66	< 0.1
6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.21	< 0.1	
9/13/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
12/7/2000	Regular	< 1	< 1	< 1	< 1	< 0.29	< 0.1	
3/8/2001	Regular	< 1	< 1	< 1	< 1	1.2	< 0.1	
6/21/2001	Regular	3.1	< 1	< 1	< 1	< 0.22	< 0.1	
9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.33	< 0.1	
12/6/2001	Regular	< 1	< 1	< 1	< 1	1.3	< 0.1	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-7	3/12/2002	Regular	< 1	< 1	< 1	< 1	NA	< 0.1
	6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/16/2002	-	NS	NS	NS	NS	NS	NS
	1/9/2003	-	NS	NS	NS	NS	NS	NS
MW-8	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	< 2	< 2	< 2	< 2	NA	NA
	1/27/94	Regular	< 1	< 1	< 1	< 1	NA	NA
	5/3/95	Regular	3.0	4.9	0.8	3.7	NA	NA
	8/1/95	Regular	3.1	1.2	0.5	1.6	NA	< 0.001
	8/1/95	Duplicate	3.6	1.5	0.5	1.5	NA	< 0.1
	11/15/95	Regular	< 0.3	0.5	< 0.3	< 0.6	NA	< 0.1
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	5/31/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	1.8	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/11/97	Regular	< 1	< 1	< 1	< 1	0.1	< 0.1
	12/10/97	Regular	< 1	< 1	< 1	< 1	0.3	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	12/10/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	-	NS	NS	NS	NS	NS	NS
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.55	< 0.1
	6/8/2000	-	NS	NS	NS	NS	NS	NS
	9/13/2000	-	NS	NS	NS	NS	NS	NS
	12/7/2000	-	NS	NS	NS	NS	NS	NS
	3/8/2001	Regular	< 1	< 1	< 1	< 1	1.6	< 0.1
	6/21/2001	-	NS	NS	NS	NS	NS	NS
9/10/2001	-	NS	NS	NS	NS	NS	NS	
12/6/2001	-	NS	NS	NS	NS	NS	NS	
3/12/2002	Regular	< 1	< 1	< 1	< 1	0.38	< 0.1	
6/18/2002	-	NS	NS	NS	NS	NS	NS	
9/16/2002	-	NS	NS	NS	NS	NS	NS	
1/9/2003	-	NS	NS	NS	NS	NS	NS	
MW-9	4/22/93	Regular	570.0	380.0	< 50	870.0	NA	NA
	7/15/93	Regular	121.0	7.3	3.0	458.0	NA	NA
	8/19/93	Regular	390.0	290.0	40.0	250.0	NA	NA
	1/27/94	Regular	327.0	357.0	51.1	293.0	NA	NA
	5/3/95	Regular	380.0	110.0	19.0	120.0	NA	NA
	8/1/95	Regular	660.0	410.0	91.0	310.0	NA	6.2
	11/15/95	Regular	240.0	24.0	11.0	140.0	NA	1.5
	11/15/95	Duplicate	170.0	18.0	10.0	120.0	NA	1.9
	2/23/96	Regular	170.0	18.0	2.3	160.0	NA	4.3
	5/31/96	Regular	120.0	16.0	3.0	200.0	NA	NA
8/23/96	Regular	82.0	13.0	6.0	270.0	NA	4	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-9	8/23/96	Duplicate	76.0	14.0	4.8	250.0	NA	4.4
	12/2/96	Regular	61.0	< 25	< 25	210.0	2.6	2.8
	12/2/96	Duplicate	86.0	13.0	2.4	270.0	3.7	2.9
	3/12/97	Regular	30.0	48.0	420.0	880.0	8.2	19
	6/12/97	Regular	4.7	2.1	11.0	97.0	2.6	2.2
	6/12/97	Duplicate	< 5	< 5	6.6	69.0	5.2	1.9
	9/12/97	Regular	2.1	2.3	2.1	120.0	1.2	1.9
	12/10/97	Regular	4.9	9.0	6.8	62.0	0.86	0.92
	3/24/98	Regular	< 1	< 1	< 1	26.0	0.9	1
	6/23/98	Regular	2.4	22.0	10.0	36.0	< 0.2	0.25
	9/30/1998	Regular	1.1	5.5	21.0	59.0	0.27	0.27
	12/10/1998	Regular	< 1.0	1.9	17.0	79.0	5.1	0.25
	3/10/1999	Regular	< 1.0	< 1.0	5.7	68.0	< 0.2	0.22
	6/10/1999	Regular	< 1.0	1.8	1.8	71.0	< 0.20	0.43
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	-	NS	NS	NS	NS	NS	NS
	3/9/2000	Regular	< 1	< 1	< 1	64.0	0.66	1.3
	6/8/2000	-	NS	NS	NS	NS	NS	NS
	9/13/2000	-	NS	NS	NS	NS	NS	NS
	12/7/2000	-	NS	NS	NS	NS	NS	NS
	3/8/2001	Regular	< 1	< 1	< 1	< 1	1.4	< 0.1
	6/21/2001	-	NS	NS	NS	NS	NS	NS
	9/10/2001	-	NS	NS	NS	NS	NS	NS
	12/6/2001	-	NS	NS	NS	NS	NS	NS
	3/12/2002	Regular	1	< 1	< 1	< 1	0.37	< 0.1
	6/18/2002	-	NS	NS	NS	NS	NS	NS
	9/16/2002	-	NS	NS	NS	NS	NS	NS
	1/9/2003	-	NS	NS	NS	NS	NS	NS
MW-10	8/19/93	Regular	190.0	460.0	< 200	240.0	NA	NA
	1/27/94	Regular	13.4	4.0	5.5	33.6	NA	NA
	5/4/95	Regular	980.0	15.0	11.0	84.0	NA	NA
	8/1/95	Regular	1300.0	32.0	32.0	100.0	NA	3.6
	11/15/95	Regular	1000.0	24.0	15.0	36.0	NA	1.7
	2/23/96	Regular	810.0	23.0	27.0	44.0	NA	2.4
	5/31/96	Regular	700.0	24.0	34.0	28.0	NA	2
	8/23/96	Regular	290.0	3.4	6.4	13.0	NA	1.4
	12/2/96	Regular	280.0	1.3	17.0	8.0	0.94	0.97
	3/12/97	Regular	110.0	< 5	17.0	< 5	0.61	0.57
	6/12/97	Regular	150.0	12.0	30.0	< 5	0.68	< 0.5
	9/12/97	Regular	87.0	2.3	26.0	2.7	0.76	0.33
	9/12/97	Duplicate	87.0	2.4	26.0	2.8	0.79	0.33
	12/10/97	Regular	41.0	9.8	12.0	7.7	1.1	0.28
	12/10/97	Duplicate	36.0	8.5	10.0	6.7	1.2	0.24
	3/23/98	Regular	36.0	< 5	5.9	< 5	1.6	< 0.5
	3/23/98	Duplicate	36.0	< 1	5.3	1.3	1.7	0.18
	6/23/98	Regular	37.0	< 5	< 5	< 5	2.1	< 0.5
	9/30/1998	Regular	84.0	3.2	30.0	2.2	1.4	0.36
	12/10/1998	Regular	29.0	1.0	7.0	1.0	0.86	0.18
	3/9/1999	Regular	28.0	< 5.0	5.8	< 5.0	0.92	< 0.5
6/10/1999	Regular	17.0	< 1.0	< 1.0	< 1.0	0.30	0.16	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G		
			micrograms per liter, ug/L				milligrams per liter, mg/L			
MW-10	9/14/1999	Regular	10.0	< 1.0	< 1.0	< 2.0	<0.20	<0.10		
	12/9/1999	Regular	23.0	< 1	< 1	1.2	0.44	0.16		
	3/10/2000	Regular	300.0	4.3	6.6	43.2	1.2	0.85		
	6/8/2000	Regular	78.0	1.7	7.2	9.0	0.67	0.74		
	9/13/2000	Regular	23.0	1.5	1.1	2.9	1.6	0.41		
	12/7/2000	Regular	7.2	< 1	< 1	< 1	1.5	0.15		
	3/8/2001	Regular	3.4	1.1	< 1	< 1	3.4	0.2		
	6/22/2001	Regular	< 1	< 1	< 1	< 1	1.2	<0.1		
	9/10/01 and 9/18/01	Regular	2	< 1	< 1	< 1	2.3	<0.1		
	12/6/2001	Regular	No Valid Data							
	3/12/2002	Regular	< 1	< 1	< 1	< 1	3.2	< 0.1		
	6/18/2002	Regular	< 1	< 1	< 1	< 1	1.2	< 0.1		
	9/16/2002	Regular	< 0.074	< 0.11	0.1	<0.082	3 J	< 0.05		
1/9/2003	Regular	< 1	< 1	< 1	< 1	< 1.0	< 0.1			
MW-11 ¹	8/19/93	Regular	< 2	< 2	< 2	< 2	NA	NA		
	1/27/94	Regular	< 1	< 1	< 1	< 1	NA	NA		
	5/4/95	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA		
	8/1/95	Regular	44.0	29.0	5.5	13.0	NA	0.2		
	11/15/95	Regular	190.0	2.8	6.2	11.0	NA	0.4		
	2/23/96	Regular	49.0	1.2	0.5	4.0	NA	0.25		
	5/31/96	Regular	300.0	83.0	12.0	28.0	NA	0.8		
	8/23/96	Regular	100.0	1.2	0.3	4.7	NA	0.26		
	12/2/96	Regular	970.0	< 5	6.0	8.1	2	1.3		
	3/12/97	Regular	130.0	< 5	13.0	5.8	0.42	< 0.5		
	3/12/97	Duplicate	100.0	< 5	10.0	5.1	0.43	< 0.5		
	6/12/97	Regular	150.0	23.0	19.0	< 5	1.1	0.55		
9/12/97	Regular	220.0	15.0	27.0	13.0	1	0.46			
MW-11A	3/24/98	Regular	24.0	5.0	< 5	< 5	0.28	0.14		
	6/23/98	Regular	9.9	< 5	< 5	< 5	< 0.2	< 0.5		
	9/30/1998	Regular	9.3	3.7	2.2	7.0	<0.20	0.1		
	12/10/1998	Regular	1.7	<1.0	<1.0	<1.0	<0.20	<0.1		
	3/10/1999	Regular	<5	< 5	< 5	< 5	0.3	<0.5		
	6/10/1999	Regular	<1.0	< 1.0	< 1.0	< 1.0	<0.20	<0.10		
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	<0.20	<0.10		
	12/9/1999	Regular	< 5	< 5	< 5	< 5	< 0.2	< 0.1		
	3/9/2000	Regular	1.2	< 1	< 1	< 1	0.43	< 0.1		
	6/8/2000	Regular	3.6	< 1	< 1	< 1	0.37	< 0.1		
	9/13/2000	Regular	1.4	< 1	< 1	< 1	0.36	< 0.1		
	12/7/00	Regular	26	< 1	< 1	3.3	0.3	0.12		
	3/8/01	Regular	12	< 5	< 5	< 5	2.2	< 0.5		
	6/22/2001	Regular	1.5	< 1	< 1	< 1	1	< 0.1		
	9/10/2001	Regular	7.9	< 1	< 1	< 1	1.1	< 0.1		
	12/6/2001	Regular	<1	< 1	< 1	< 1	1	< 0.1		
	3/12/2002	Regular	1.8	< 1	< 1	1	1.6	< 0.1		
	6/18/2002	Regular	2.9	< 0.1	1.3	< 1	0.91	< 0.1		
	9/16/2002	Regular	9	< 0.11	41	< 0.082	1 J	0.2		
1/9/2003	Regular	12	< 1	< 1	1.2	< 1.0	0.4			

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G	
			micrograms per liter, ug/L				milligrams per liter, mg/L		
MW-12	3/24/98	Regular	100.0	11.0	6.0	8.0	0.29	0.41	
	6/23/98	Regular	88.0	< 5	< 5	< 5	< 0.2	< 0.5	
	6/23/98	Duplicate	89.0	< 5	< 5	< 5	0.31	< 0.5	
	9/30/1998	Regular	260.0	3.0	1.2	7.9	< 0.20	0.62	
	12/10/1998	Regular	160.0	< 1.0	< 1.0	1.2	0.21	0.36	
	3/10/1999	Regular	160.0	1.1	< 1.0	2.9	0.38	0.45	
	6/10/1999	Regular	49.0	1.4	< 1.0	< 1.0	0.22	0.13	
	9/14/1999	Regular	75.0	< 1.0	< 1.0	< 2.0	< 0.20	0.23	
	12/9/1999	Regular	64.0	< 1	< 1	< 1	< 0.2	0.21	
	3/10/2000	Regular	93.0	< 1	< 1	< 1	< 0.2	0.21	
	3/10/2000	Duplicate	99.0	< 1	< 1	< 1	0.22	0.22	
	6/8/2000	Regular	62.0	< 1	< 1	< 1	< 0.2	< 0.1	
	9/13/2000	Regular	34.0	< 1	< 1	< 1	0.23	< 0.1	
	12/7/2000	Regular	27	< 1	2.9	1.9	< 0.25	< 0.1	
	3/8/2001	Regular	14	< 1	< 1	< 1	2.1	0.1	
	6/22/2001	Regular	12	< 1	< 1	< 1	0.51	0.11	
	9/10/2001	Well Dry (Not Sampled) During This and Subsequent Monitoring Events							
MW-12D	7/2/1999	Regular	< 5	< 5	< 5	< 5	< 0.20	< 0.10	
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10	
	12/9/1999	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.24	< 0.1	
	6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
	9/13/2000	-	NS	NS	NS	NS	NS	NS	
	12/7/2000	-	NS	NS	NS	NS	NS	NS	
	3/8/2001	-	NS	NS	NS	NS	NS	NS	
	6/22/2001	-	NS	NS	NS	NS	NS	NS	
	9/18/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
	12/6/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
	3/12/2002	Regular	< 1	< 1	< 1	< 1	0.44	< 0.1	
	6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
9/16/2002	Regular	< 0.074	< 0.11	< 0.068	< 0.082	0.2 J	< 0.05		
1/9/2003	Regular	< 1	< 1	< 1	< 1	< 1.0	< 0.1		
MW-13	7/2/1999	Regular	1500.0	23.0	750.0	58.0	2.2	5.1	
	9/14/1999	Regular	860.0	16.0	450.0	34.4	2.1	3.1	
	12/9/1999	Regular	430.0	16.0	410.0	40.9	0.46	3.2	
	3/10/2000	Regular	88.0	2.8	200.0	1.3	1.9	0.99	
	6/8/2000	Regular	6.0	< 1	63.0	3.3	1.1	0.91	
	9/13/2000	Regular	< 1.0	< 1.0	3.4	< 1.0	0.44	0.12	
	12/7/2000	Regular	< 1	< 1	< 1	< 1	0.43	< 0.1	
	3/8/2001	Regular	< 1	< 1	1.2	< 1	2	< 0.1	
	6/22/2001	Regular	< 1	< 1	< 1	< 1	0.31	< 0.1	
	9/10/2001	Regular	< 1	< 1	< 1	< 1	0.3	< 0.1	
	12/6/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
	3/12/2002	Regular	< 1	< 1	< 1	< 1	0.84	< 0.1	
	6/18/2002	Regular	< 1	< 1	< 1	< 1	0.3	< 0.1	
	9/16/2002	-	NS	NS	NS	NS	NS	NS	
	1/9/2003	-	NS	NS	NS	NS	NS	NS	
MW-14	1/14/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
	9/16/2002	Regular	NA	NA	NA	NA	NA	NA	
	1/9/2003	Regular	NA	NA	NA	NA	NA	NA	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-15	1/14/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/16/2002	Regular	NA	NA	NA	NA	NA	NA
	1/9/2003	Regular	NA	NA	NA	NA	NA	NA
OW-4	6/10/1999	Regular	<1.0	<1.0	<1.0	4.4	< 0.2	< 0.10
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.2	< 0.1
	3/9/2000	Regular	< 1.0	< 1.0	< 1.0	< 1.0	0.25	< 0.1
	6/8/2000	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.21	< 0.1
	9/13/2000	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.2	< 0.1
	12/7/2000							

Well Dry (Not Sampled) During This and Subsequent Monitoring Events

¹ Well plugged and abandoned 7/1/99

NA = Not Analyzed

NS = Not Sampled

NS-D = Not Sampled because well was dry

NSP = Not Sampled due to Phase-Separated Hydrocarbons

Table 5
 Cumulative Results⁽¹⁾ for Chloride⁽²⁾ Analyses
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Sample Date	Monitor Wells ⁽³⁾																
	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-11A	MW-12	MW-12D	MW-13	MW-14	MW-15	OW-4
8/1/95	160	150	310	130	380	310	350	110	2200	3400	NP	NP	NP	NP	NP	NP	NS
8/23/96	130	140	100	99	210	250	360	140	2000	2900	NP	NP	NP	NP	NP	NP	NS
3/23-24/98	212	206	126	151	183	223	364	164	2390	NS	940	1200	NP	NP	NP	NP	NS
3/9-10/99	163	156	142	155	411	238	274	123	1160	NS	834	314	NP	NP	NP	NP	NS
6/10-7/2/99	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	195	496	NP	NP	266
3/9-10/00	258	196	196	196	NP	224	241	131	474	NP	1290	327	117	276	NP	NP	258
1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	368	219	NS
3/8-9/01	NA	165	172	152	NP	224	250	127	879	NP	1720	586	NS	276	327	NA	NS-D
6/21/2001	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NS	NA	222	222	NS-D
9/10/2001	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NS-D	NA	NA	245	228	NS-D
9/18/2001	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NS-D	78.8	NA	NA	NA	NS-D
12/6/2001	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NS-D	NA	NA	276	215	NS-D
3/11-12/02	177	172	183	127	NP	188	241	110	861	NP	1230	NS-D	75.8	207	284	224	NS-D
6/18/2002	NS	NA	NA	NA	NP	NA	NS	NS	NA	NP	NA	NS-D	NA	145	258	233	NS-D
9/16/2002	NS	NS	NS	121	NP	NS	NS	NS	1030	NP	1550	NS-D	86	NS	293	246	NS-D
1/9/2003	NS	NS	NS	123	NP	NS	NS	NS	525	NP	3150	NS-D	94.6	NS	179	228	NS-D

⁽¹⁾ - in mg/L.

⁽²⁾ - NMWQCC standard for chloride is 250 mg/L.

⁽³⁾ - MW-2 not operative after May 3, 1995; P&A'd 7/1/99.

MW-6 P&A'd 7/1/99.

MW-11 P&A'd 7/1/99.

MW-11A installed February 1998.

MW-12 installed February 1998.

MW-12D installed June 1999.

MW-13 installed June 1999.

MW-14 installed January 2001.

MW-15 installed January 2001.

NP = not present at time of sampling event.

NS = not sampled during applicable sampling event.

NA = not analyzed for chloride during applicable sampling event.

NS-D = not sampled because well was dry during applicable sampling event.

Table 6
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells MW-5, MW-10, MW-11A, MW-12, and MW-12D
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-5	3/23/1998	3.87	190	< 0.0012
	3/9/1999	< 0.1	195	< 0.0012
	6/10/1999	4.73	209	< 0.0012
	9/14/1999	4.3	210	< 0.0012
	12/9/1999	4.2	210	< 0.0012
	3/9/2000	5.3	260	< 0.0012
	6/8/2000	4.7	240	< 0.0012
	9/13/2000	3.93	200	< 0.0012
	12/7/2000	3.27	160	< 0.0012
	3/8/2001	3.24	180	< 0.0012
	6/21/2001	2.74	150	0.0017
	9/10/2001	NA ⁽²⁾	130	< 0.0012
	12/6/2001	2.38	120	< 0.0012
	3/12/2002	2.98	120	< 0.0012
	6/18/2002	2.56	110	0.002
	9/16/2002	2.4	105	0.002
1/9/2003	2.1	97	0.004	
MW-10	3/23/1998	0.07	320	0.91
	6/23/1998	< 0.1	325	0.55
	9/30/1998	< 0.1	204	0.81
	12/10/1998	< 0.1	180	0.091
	3/9/1999	< 0.1	142	0.035
			223 ⁽³⁾	
	9/14/1999	< 0.10	160	0.0049
	12/9/1999	0.49	170	0.0039
	3/10/2000	0.1	160	0.0056
	6/8/2000	< 0.1	150	0.031
	9/13/2000	< 0.1	160	0.031
	12/7/2000	< 0.1	190	0.17
	3/8/2001	< 0.1	270	< 0.0012
	6/22/2001	< 0.1	270	0.044
	9/10/2001	NA	NA	NA
	3/12/2002	< 0.1	230	NA
	6/18/2002	< 0.1	240	0.007
9/16/2002	< 0.03	318	0.006	
1/9/2003	< 0.1	280	0.0024	

Table 6
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells MW-5, MW-10, MW-11A, MW-12, and MW-12D
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-11A	3/23/1998	< 0.05	190	0.14
	6/23/1998	< 0.1	225	0.11
	9/30/1998	0.4	196	0.043
	12/10/1998	0.7	188	0.033
	3/10/1999	< 0.1	164	0.094
		< 0.1 ⁽⁴⁾	227 ⁽³⁾	
	6/10/1999	< 0.1	181	0.0036
	9/13/1999	0.22	250	< 0.0012
	12/9/1999	< 0.1	290	0.0079
	3/9/2000	0.11	270	0.037
	6/8/2000	< 0.1	240	0.0069
	9/13/2000	< 0.1	320	< 0.0012
	12/7/2000	< 0.1	260	0.0096
	3/8/2001	< 0.1	330	0.0028
	6/22/2001	< 0.1	180	0.0074
	9/10/2001	NA	280	< 0.0012
	12/6/2001	< 0.1	240	0.0041
	3/12/2002	< 0.1	350	0.0044
	6/18/2002	< 0.1	560	0.0028
	9/16/2002	0.3	383	< 0.0012
1/9/2003	< 0.5	290	0.0063	
MW-12	3/23/1998	< 0.05	240	< 0.0012
	6/23/1998	< 0.1	240	< 0.0012
	9/30/1998	< 0.1	168	< 0.0012
	12/10/1998	< 0.1	202	< 0.0012
	3/10/1999	< 0.1	137	< 0.0012
		< 0.1 ⁽⁴⁾	193 ⁽³⁾	
	6/10/1999	< 0.1	217	< 0.0012
	9/14/1999	< 0.10	230	< 0.0012
	12/9/1999	< 0.1	180	< 0.0012
	3/10/2000	< 0.1	210	< 0.0012
	6/8/2000	< 0.1	220	< 0.0012
	9/13/2000	< 0.1	240	< 0.0012
	12/7/2000	< 0.1	260	< 0.0012
	3/8/2001	< 0.1	300	< 0.0012

Table 6
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells MW-5, MW-10, MW-11A, MW-12, and MW-12D
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-12	6/22/2001	< 0.1	360	0.0021
	9/10/2001	Well Dry (Not Sampled) During This and Subsequent Monitoring Events		
MW-12D	9/18/2001	NA	190	< 0.0012
	12/6/2001	< 0.1	200	< 0.0012
	3/12/2002	< 0.1	200	< 0.0012
	6/18/2002	< 0.1	180	0.0012
	9/16/2002	0.06	172	< 0.0012
	1/9/2003	< 0.1	150	0.005

(1) - By EPA Method 300, except as noted

(2) - NA indicates not analyzed

(3) - By EPA Method 375.4

(4) - By EPA Method 353.3

(5) - NS-D indicates not sampled (well dry)

mg/L = milligrams per liter

Appendices



APPENDICES



APPENDIX A

Groundwater Sampling Forms

WELL ID: MW-5

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 018 Date: 1/9/03 Time: 1358
 Client: BJ Services Personnel: S. Dalton, A. Marti
 Project Location: Hobbs, NM Weather: warm, windy from N, clear

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 64.50 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: Measured
 Depth to Static Water: 61.75 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 2.75 feet Well Volume: 0.44 gal Screened Interval (from to): 45-60 ^{ft}
Note: 2-inch well = 0.16 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 2" Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s): _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: Plastic
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: by hand gal/min

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
1410	1/2	7.17	18.56	1074	-161.2	5.58	—	—	—
1414	1	7.16	18.94	1061	-159.8	5.50	—	—	—
1418	1 1/2	7.20	18.49	1062	-158.9	5.60	—	—	—
1420	2	7.19	18.50	1066	-158.1	6.11	—	—	—

4. SAMPLING DATA

Method(s): Bailer, Size: 2" Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: Plastic
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: not recorded Field Filtered? Yes No
 Sample ID: MW-5 Sample Time: 1421 # of Containers: 10
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: 0.0 mg/L
 DO: 3.75 mg/L
 Nitrate: — mg/L
 Sulfate: — mg/L
 Alkalinity: — mg/L

5. COMMENTS

Purge samples were measured approx. each 1/2 gallon based on size of collection vessel used during bailing.
 3 well volumes were purged prior to sampling.
Note: Include comments such as well condition, odor, presence of NAPP, or other items not on the field data sheet.

Sarah Dalton
 Signature

WELL ID: MW-10

1. PROJECT INFORMATION

Project Number: 2832 Task Number: 018 Date: 01-09-03 Time: 1147
 Client: BJ Services Personnel: A. Monti, S. Dalton
 Project Location: Hobbs, NM Weather: Sunny, N wind, 63F

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 63.51 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: Historical
 Depth to Static Water: 61.07 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 2.44 feet Well Volume: 0.39 gal Screened Interval (from GS): _____
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 2" Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s):
 Materials: Pump/Bailer Stainless PVC Teflon® Other: Plastic
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: by hand gal/min
 1. YSI 600/610D
 2. Hach Test Kit
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
1150	0.5	7.09	18.94	4715	-172.8	6.49	—	—	gray color w/ odor
	Purged dry after bailing 0.5 gal. Wait for recharge to sample.								

4. SAMPLING DATA

Method(s): Bailer, Size: 2" Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: Plastic
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: not recorded Field Filtered? Yes No
 Sample ID: MW-10 Sample Time: 1144 # of Containers: 8
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses
 Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

Purge samples were measured approx. each 1/2 gallon per size of collection vessel used during bailing. Geochemical analyses were not performed per lack of water in well. Well was purged dry after bailing 0.5 gal. Sampled to dry. Only 8 containers were filled for analysis per lack of water.
Note: Include comments such as well condition, odor, presence of NAPL or other items not on the field data sheet.

Larah Dalton
 Signature

WELL ID: MW-11A

1. PROJECT INFORMATION

Project Number: 12432 Task Number: 018 Date: 1-9-03 Time: 1201
 Client: BJ Services Personnel: SDutton, Amarti
 Project Location: Hebbs NM Weather: Sunny, N wind, 63°F

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 63.82 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: Historical
 Depth to Static Water: 61.67 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 2.15 feet Well Volume: 0.34 gal Screened Interval (from GS): 50-65
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 2" Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s)
 Materials: Pump/Bailer Stainless PVC Teflon® Other: Plastic
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: by hand gal/min

1. YSI 6001610D
2. Hach Test Kit
3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
1208	0.5	6.79	18.83	9265	-167.8	5.12	—	—	—
1213	1.1	6.68	18.87	9992	-165.1	4.24	—	—	—
/									

4. SAMPLING DATA

Method(s): Bailer, Size: 2" Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: Plastic
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: not recorded Field Filtered? Yes No
 Sample ID: MW-11A Sample Time: 1214 # of Containers: 10
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: 1.0 mg/L
 DO: 4.0 mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS Well was sampled after 3 well volumes were purged by bailing. Purge samples were collected approx. each 0.5 gal. based on the size of the collection vessel used during bailing.

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Sarah Dutton
Signature

WELL ID: MW-12D

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 018 Date: 01-09-03 Time: 1030
 Client: BJ Services Personnel: Amorin, S Dalton
 Project Location: Hobbs, NM Weather: Sunny, Normal, 58°F

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 87.58 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: Historical
 Depth to Static Water: 61.86 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 25.72 feet Well Volume: 4.12 gal Screened Interval (from GS): _____
 Note: 2-inch well = 167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailor, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s)
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: 0.083 gal/min
 1. YSI 600/610D
 2. Hach Test Kit
 3. Fultz Pump

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other: DTW (ft)	Comments
1054	—							62.04	—
1057	0.25	6.98	18.70	1103	-145.1	3.61	—	62.22	gray color
1100	0.50	6.85	18.13	1098	-151.5	1.83	—	62.22	—
1103	0.75	6.84	18.45	1077	-155.5	1.38	—	62.15	—
1106	1.0	6.85	18.63	1075	-157.4	1.37	—	62.13	—
1109	1.25	6.85	18.91	1074	-159.9	1.54	—	62.11	—

4. SAMPLING DATA

Method(s): Bailor, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: 62.11 ft Field Filtered? Yes No
 Sample ID: MW-12D Sample Time: 1109 # of Containers: 10
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: 0.75 mg/L
 DO: 0 mg/L
 Nitrate: — mg/L
 Sulfate: — mg/L
 Alkalinity: — mg/L

5. COMMENTS

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Sarah Dalton
Signature

WELL ID: MW-14

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 018 Date: 1-9-03 Time: 1241
 Client: BJ Services Personnel: S Dalton, Amott
 Project Location: Hebbs, NM Weather: Sunny, 65F, Wind

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 69.37 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: Historical
 Depth to Static Water: 62.59 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 6.78 feet Well Volume: 1.08 gal Screened Interval (from GS): 54.9-64.5
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 2" Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s)
 Materials: Pump/Bailer Stainless PVC Teflon® Other: Plastic 1. YSI 600/610D
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: Nylon 2. _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: by hand gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
1249	1/2	7.18	18.21	1735	-157	7.25	—	—	clear
1254	1	7.08	18.21	1770	-156.4	7.09	—	—	—
1302	1 1/2	7.11	17.93	1706	-154.6	7.42	—	—	—
Purged dry at 1 1/2 gallons. Wait for recharge to sample.									

4. SAMPLING DATA

Method(s): Bailer, Size: 2" Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: Plastic
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: not recorded Field Filtered? Yes No
 Sample ID: MW-14 Sample Time: 1513 # of Containers: 1
 Duplicate Sample Collected? Yes No ID: —

Geochemical Analyses

Ferrous Iron: — mg/L
 DO: — mg/L
 Nitrate: — mg/L
 Sulfate: — mg/L
 Alkalinity: — mg/L

5. COMMENTS

Purge samples were collected approx. each 0.5 gallon based on size of collection vessel used during bailing. Well was purged dry after bailing 1.5 gal. wait for recharge to collect sample.

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Lanah Dalton
 Signature

WELL ID: MW-15

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 018 Date: 1-9-03 Time: 1315
 Client: BJ Services Personnel: S. Dalton, AMOATI
 Project Location: Hobbs, NM Weather: sunny, windy, 65°F

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 67.01 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: Historical
 Depth to Static Water: 61.59 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 5.42 feet Well Volume: 0.87 gal Screened Interval (from GS): 52-67
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 2" Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: Plastic Equipment Model(s)
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. YSI 6001610D
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____
 Was well purged dry? Yes No Pumping Rate: by hand gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
1320	0.5	7.01	18.58	1540	-157.2	6.91	—	—	—
1326	1.25	7.07	18.59	1542	-154.9	6.75	—	—	—
1331	1.75	6.95	18.55	1535	-154.7	6.84	—	—	—
1335	2.25	6.98	18.50	1540	-153.0	6.78	—	—	—
1342	2.75	6.99	18.55	1539	-151.0	6.65	—	—	—

4. SAMPLING DATA

Method(s): Bailer, Size: 2" Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: Plastic
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: not recorded Field Filtered? Yes No
 Sample ID: MW-15 Sample Time: 1342 # of Containers: 1
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

Purge samples were measured approx. each 0.5 gallon based on size of collection vessel used during bailing.
 Three well volumes were purged prior to sampling.
Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Sarah Dalton
 Signature

B



APPENDIX B

Laboratory Analytical Report



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:
03010287

Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax:	Project Name: BJ Hobbs/12832-018 Site: Hobbs,NM Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 2/24/03
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This Report Contains A Total Of 21 Pages

Excluding This Page

And

Chain Of Custody

2/24/03

Date



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:
Brown & Caldwell

Certificate of Analysis Number:
03010287

Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax:	Project Name: BJ Hobbs/12832-018 Site: Hobbs,NM Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 2/24/03
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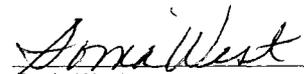
Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.


Sonia West
Senior Project Manager

2/24/03

Date



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

03010287

Report To: Brown & Caldwell
 Rick Rexroad
 1415 Louisiana
 Suite 2509
 Houston
 TX
 77002-
 ph: (713) 759-0999

fax: (713) 308-3886

Project Name: BJ Hobbs/12832-018

Site: Hobbs,NM

Site Address:

PO Number:

State: New Mexico

State Cert. No.:

Date Reported: 2/24/03

Fax To:

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
W-5	03010287-01	Water	1/9/03 2:21:00 PM	1/10/03 9:30:00 AM	163702	<input type="checkbox"/>
W-10	03010287-02	Water	1/9/03 2:44:00 PM	1/10/03 9:30:00 AM	163702	<input type="checkbox"/>
MW-11A	03010287-03	Water	1/9/03 12:14:00 PM	1/10/03 9:30:00 AM	163703	<input type="checkbox"/>
W-12D	03010287-04	Water	1/9/03 11:09:00 AM	1/10/03 9:30:00 AM	163703	<input type="checkbox"/>
W-14	03010287-05	Water	1/9/03 3:13:00 PM	1/10/03 9:30:00 AM	163703	<input type="checkbox"/>
MW-15	03010287-06	Water	1/9/03 1:42:00 PM	1/10/03 9:30:00 AM	163703	<input type="checkbox"/>
Trip Blank	03010287-07	Water	1/9/03	1/10/03 9:30:00 AM	163703	<input type="checkbox"/>

Arnie West
 Arnie West
 Senior Project Manager

2/24/03

Date

Joel Grice
 Laboratory Director

Ted Yen
 Quality Assurance Officer



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-5 Collected: 01/09/2003 14:21 SPL Sample ID: 03010287-01

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY (AS CaCO3), TOTAL			MCL	E310.1	Units: mg/L		
Alkalinity, Total (As CaCO3)	222	2	1		01/21/03 12:00	RA	1472820
CHLORIDE, TOTAL			MCL	E325.3	Units: mg/L		
Chloride	123	2	2		01/16/03 11:00	RA	1471693
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: ug/mL		
Diesel Range Organics	ND	1.0	1		01/15/03 15:03	AR	1464982
Surr: n-Pentacosane	68.4 %	18-120	1		01/15/03 15:03	AR	1464982

Prep Method	Prep Date	Prep Initials
SW3510C	01/12/2003 18:23	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		01/16/03 18:09	DL	1466429
Surr: 1,4-Difluorobenzene	101 %	74-121	1		01/16/03 18:09	DL	1466429
Surr: 4-Bromofluorobenzene	68.3 %	55-150	1		01/16/03 18:09	DL	1466429

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		01/20/03 13:30	ER	1470095
Ethylene	ND	0.0032	1		01/20/03 13:30	ER	1470095
Methane	0.004	0.0012	1		01/20/03 13:30	ER	1470095

ION CHROMATOGRAPHY			MCL	E300.0	Units: mg/L		
Nitrogen,Nitrate (As N)	2.1	0.1	1		01/10/03 15:34	CV	1469063
Sulfate	97	4	20		01/18/03 22:14	CV	1468700

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		01/16/03 18:09	DL	1466380
Ethylbenzene	ND	1	1		01/16/03 18:09	DL	1466380
Toluene	ND	1	1		01/16/03 18:09	DL	1466380
Xylenes,Total	ND	1	1		01/16/03 18:09	DL	1466380
Surr: 4-Bromofluorobenzene	94.5 %	56-158	1		01/16/03 18:09	DL	1466380
Surr: 1,4-Difluorobenzene	98.2 %	46-160	1		01/16/03 18:09	DL	1466380

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-10

Collected: 01/09/2003 14:44 SPL Sample ID: 03010287-02

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY (AS CaCO3), TOTAL				MCL E310.1	Units: mg/L		
Alkalinity, Total (As CaCO3)	408	2	1		01/21/03 12:00	RA	1472821
CHLORIDE, TOTAL				MCL E325.3	Units: mg/L		
Chloride	525	10	10		01/16/03 11:00	RA	1471694
DIESEL RANGE ORGANICS				MCL SW8015B	Units: ug/mL		
Diesel Range Organics	ND	1.0	1		01/15/03 15:41	AR	1464983
Surr: n-Pentacosane	69.2 %	18-120	1		01/15/03 15:41	AR	1464983

Prep Method	Prep Date	Prep Initials
SW3510C	01/12/2003 18:23	KL

GASOLINE RANGE ORGANICS				MCL SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		01/16/03 18:35	DL	1466430
Surr: 1,4-Difluorobenzene	107 %	74-121	1		01/16/03 18:35	DL	1466430
Surr: 4-Bromofluorobenzene	94.3 %	55-150	1		01/16/03 18:35	DL	1466430

HEADSPACE GAS ANALYSIS				MCL RSK147	Units: mg/L		
Ethane	ND	0.0025	1		01/20/03 13:41	ER	1470096
Ethylene	ND	0.0032	1		01/20/03 13:41	ER	1470096
Methane	0.0024	0.0012	1		01/20/03 13:41	ER	1470096

ION CHROMATOGRAPHY				MCL E300.0	Units: mg/L		
Nitrogen, Nitrate (As N)	ND	0.1	1		01/10/03 16:11	CV	1469066
Sulfate	280	10	50		01/18/03 22:52	CV	1468704

PURGEABLE AROMATICS				MCL SW8021B	Units: ug/L		
Benzene	ND	1	1		01/16/03 18:35	DL	1466381
Ethylbenzene	ND	1	1		01/16/03 18:35	DL	1466381
Toluene	ND	1	1		01/16/03 18:35	DL	1466381
Xylenes, Total	ND	1	1		01/16/03 18:35	DL	1466381
Surr: 4-Bromofluorobenzene	99.1 %	56-158	1		01/16/03 18:35	DL	1466381
Surr: 1,4-Difluorobenzene	102 %	46-160	1		01/16/03 18:35	DL	1466381

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-11A

Collected: 01/09/2003 12:14

SPL Sample ID: 03010287-03

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY (AS CaCO3), TOTAL			MCL	E310.1	Units: mg/L		
Alkalinity, Total (As CaCO3)	356	2	1		01/21/03 12:00	RA	1472822
CHLORIDE, TOTAL			MCL	E325.3	Units: mg/L		
Chloride	3150	50	50		01/16/03 11:00	RA	1471695
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: ug/mL		
Diesel Range Organics	ND	1.0	1		01/15/03 16:18	AR	1464984
Surr: n-Pentacosane	53.2	% 18-120	1		01/15/03 16:18	AR	1464984

Prep Method	Prep Date	Prep Initials
SW3510C	01/12/2003 18:23	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	0.4	0.1	1		01/16/03 19:02	DL	1466431
Surr: 1,4-Difluorobenzene	143	MI % 74-121	1	*	01/16/03 19:02	DL	1466431
Surr: 4-Bromofluorobenzene	100	% 55-150	1		01/16/03 19:02	DL	1466431

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		01/20/03 13:57	ER	1470097
Ethylene	ND	0.0032	1		01/20/03 13:57	ER	1470097
Methane	0.0063	0.0012	1		01/20/03 13:57	ER	1470097

ION CHROMATOGRAPHY			MCL	E300.0	Units: mg/L		
Nitrogen, Nitrate (As N)	ND	0.5	5		01/13/03 20:23	CV	1462785
Sulfate	290	10	50		01/18/03 23:05	CV	1468705

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	12	1	1		01/16/03 19:02	DL	1466382
Ethylbenzene	ND	1	1		01/16/03 19:02	DL	1466382
Toluene	ND	1	1		01/16/03 19:02	DL	1466382
Xylenes, Total	1.2	1	1		01/16/03 19:02	DL	1466382
Surr: 4-Bromofluorobenzene	100	% 56-158	1		01/16/03 19:02	DL	1466382
Surr: 1,4-Difluorobenzene	110	% 46-160	1		01/16/03 19:02	DL	1466382

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-12D

Collected: 01/09/2003 11:09

SPL Sample ID: 03010287-04

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY (AS CaCO3), TOTAL			MCL	E310.1	Units: mg/L		
Alkalinity, Total (As CaCO3)	225	2	1		01/21/03 12:00	RA	1472823
CHLORIDE, TOTAL			MCL	E325.3	Units: mg/L		
Chloride	94.6	1	1		01/16/03 11:00	RA	1471696
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: ug/mL		
Diesel Range Organics	ND	1.0	1		01/15/03 16:56	AR	1464985
Surr: n-Pentacosane	52.0	% 18-120	1		01/15/03 16:56	AR	1464985

Prep Method	Prep Date	Prep Initials
SW3510C	01/12/2003 18:23	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		01/16/03 19:29	DL	1466432
Surr: 1,4-Difluorobenzene	102	% 74-121	1		01/16/03 19:29	DL	1466432
Surr: 4-Bromofluorobenzene	74.7	% 55-150	1		01/16/03 19:29	DL	1466432

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		01/20/03 14:09	ER	1470098
Ethylene	ND	0.0032	1		01/20/03 14:09	ER	1470098
Methane	0.005	0.0012	1		01/20/03 14:09	ER	1470098

ION CHROMATOGRAPHY			MCL	E300.0	Units: mg/L		
Nitrogen, Nitrate (As N)	ND	0.1	1		01/10/03 16:37	CV	1469068
Sulfate	150	10	50		01/18/03 23:18	CV	1468706

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		01/16/03 19:29	DL	1466385
Ethylbenzene	ND	1	1		01/16/03 19:29	DL	1466385
Toluene	ND	1	1		01/16/03 19:29	DL	1466385
Xylenes, Total	ND	1	1		01/16/03 19:29	DL	1466385
Surr: 4-Bromofluorobenzene	98.6	% 56-158	1		01/16/03 19:29	DL	1466385
Surr: 1,4-Difluorobenzene	99.8	% 46-160	1		01/16/03 19:29	DL	1466385

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-14

Collected: 01/09/2003 15:13 SPL Sample ID: 03010287-05

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				MCL	E325.3	Units: mg/L	
Chloride	179	2	2		01/16/03 11:00	RA	1471697

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-15

Collected: 01/09/2003 13:42

SPL Sample ID: 03010287-06

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL			MCL	E325.3	Units: mg/L		
Chloride	228	5	5		01/16/03 11:00	RA	1471698

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution

MI - Matrix Interference



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8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID Trip Blank

Collected: 01/09/2003 0:00

SPL Sample ID: 03010287-07

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		01/17/03 17:49	DL	1469661
Ethylbenzene	ND	1	1		01/17/03 17:49	DL	1469661
Toluene	ND	1	1		01/17/03 17:49	DL	1469661
Xylenes,Total	ND	1	1		01/17/03 17:49	DL	1469661
Surr: 4-Bromofluorobenzene	96.6	% 56-158	1		01/17/03 17:49	DL	1469661
Surr: 1,4-Difluorobenzene	99.7	% 46-160	1		01/17/03 17:49	DL	1469661

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

Quality Control Documentation



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs/12832-018

Analysis: Diesel Range Organics
Method: SW8015B

WorkOrder: 03010287
Lab Batch ID: 24830

Method Blank

Samples in Analytical Batch:

RunID: HP_V_030115A-1464979 Units: ug/mL
Analysis Date: 01/15/2003 13:09 Analyst: AR
Preparation Date: 01/12/2003 18:23 Prep By: KL Method SW3510C

Lab Sample ID Client Sample ID
03010287-01B MW-5
03010287-02B MW-10
03010287-03B MW-11A
03010287-04B MW-12D

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Diesel Range Organics (ND, 1.0) and Surr: n-Pentacosane (73.4, 18-120).

Laboratory Control Sample (LCS)

RunID: HP_V_030115A-1464978 Units: ug/mL
Analysis Date: 01/15/2003 12:31 Analyst: AR
Preparation Date: 01/12/2003 18:23 Prep By: KL Method SW3510C

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row for Diesel Range Organics shows 2.5 spike, 1.76 result, 70% recovery, 21 lower limit, 175 upper limit.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 03010287-01
RunID: HP_V_030115A-1464986 Units: ug/mL
Analysis Date: 01/15/2003 17:34 Analyst: AR
Preparation Date: 01/12/2003 18:23 Prep By: KL Method SW3510C

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row for Diesel Range Organics shows ND sample result, 5 MS spike, 3.4 MS result, 67.3% MS recovery, 5 MSD spike, 3.81 MSD result, 75.5% MSD recovery, 11.6 RPD, 39 RPD limit, 13 low limit, 130 high limit.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
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HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs/12832-018

Analysis: Headspace Gas Analysis
Method: RSK147

WorkOrder: 03010287
Lab Batch ID: R75619

Method Blank

Samples in Analytical Batch:

RunID: VARC_030120B-1470094 Units: mg/L
Analysis Date: 01/20/2003 12:49 Analyst: ER

Lab Sample ID Client Sample ID
03010287-01E MW-5
03010287-02E MW-10
03010287-03E MW-11A
03010287-04E MW-12D

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Ethane, Ethylene, and Methane, all with ND results.

Sample Duplicate

Original Sample: 03010287-04
RunID: VARC_030120B-1470098 Units: mg/L
Analysis Date: 01/20/2003 14:09 Analyst: ER

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Rows include Butane, Ethane, Ethylene, Isobutane, Methane, Propane, and Propylene.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs/12832-018

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 03010287
Lab Batch ID: R75410

Method Blank

Samples in Analytical Batch:

RunID: HP_J_030116A-1465896 Units: ug/L
Analysis Date: 01/16/2003 14:18 Analyst: DL

Lab Sample ID Client Sample ID
03010287-01A MW-5
03010287-02A MW-10
03010287-03A MW-11A
03010287-04A MW-12D
03010287-07A Trip Blank

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Benzene, Ethylbenzene, Toluene, Xylenes, Total, and two surrogate compounds.

Laboratory Control Sample (LCS)

RunID: HP_J_030116A-1465895 Units: ug/L
Analysis Date: 01/16/2003 13:25 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Benzene, Ethylbenzene, Toluene, and Xylenes, Total.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 03010458-02
RunID: HP_J_030116A-1466396 Units: ug/L
Analysis Date: 01/16/2003 21:16 Analyst: DL

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Benzene, Ethylbenzene, Toluene, and Xylenes, Total.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs/12832-018

Analysis: Gasoline Range Organics
Method: SW8015B

WorkOrder: 03010287
Lab Batch ID: R75434

Method Blank

Samples in Analytical Batch:

RunID: HP_J_030116B-1466428 Units: mg/L
Analysis Date: 01/16/2003 14:18 Analyst: DL

Lab Sample ID Client Sample ID
03010287-01A MW-5
03010287-02A MW-10
03010287-03A MW-11A
03010287-04A MW-12D

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Gasoline Range Organics, Surr: 1,4-Difluorobenzene, and Surr: 4-Bromofluorobenzene.

Laboratory Control Sample (LCS)

RunID: HP_J_030116B-1467298 Units: mg/L
Analysis Date: 01/17/2003 13:49 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row for Gasoline Range Organics.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 03010458-03
RunID: HP_J_030116B-1466434 Units: mg/L
Analysis Date: 01/16/2003 22:09 Analyst: DL

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row for Gasoline Range Organics.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs/12832-018

Analysis: Ion Chromatography
Method: E300.0

WorkOrder: 03010287
Lab Batch ID: R75261

Method Blank

Samples in Analytical Batch:

RunID: IC1_030113A-1462776 Units: mg/L
Analysis Date: 01/13/2003 18:42 Analyst: CV

Lab Sample ID: 03010287-03C
Client Sample ID: MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Row: Nitrogen,Nitrate (As N), ND, 0.10

Laboratory Control Sample (LCS)

RunID: IC1_030113A-1462777 Units: mg/L
Analysis Date: 01/13/2003 18:54 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Nitrogen,Nitrate (As N), 10, 10, 100, 85, 115

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 03010287-03
RunID: IC1_030113A-1462786 Units: mg/L
Analysis Date: 01/13/2003 20:36 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Nitrogen,Nitrate (As N), ND, 50, 48.3, 96.7, 50, 45.7, 91.5, 5.54, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs/12832-018

Analysis: Ion Chromatography
Method: E300.0

WorkOrder: 03010287
Lab Batch ID: R75533B

Method Blank

Samples in Analytical Batch:

RunID: IC1_030118A-1468688 Units: mg/L
Analysis Date: 01/18/2003 20:21 Analyst: CV

Lab Sample ID Client Sample ID
03010287-01C MW-5
03010287-02C MW-10
03010287-03C MW-11A
03010287-04C MW-12D

Table with 3 columns: Analyte, Result, Rep Limit. Row: Sulfate, ND, 0.20

Laboratory Control Sample (LCS)

RunID: IC1_030118A-1468689 Units: mg/L
Analysis Date: 01/18/2003 20:33 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Sulfate, 10, 9.79, 98, 85, 115

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 03010287-01
RunID: IC1_030118A-1468701 Units: mg/L
Analysis Date: 01/18/2003 22:27 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Sulfate, 97.5, 200, 296, 99.1, 200, 293, 97.7, 1.48, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ Hobbs/12832-018

Analysis: Ion Chromatography
Method: E300.0

WorkOrder: 03010287
Lab Batch ID: R75564

Method Blank

Samples in Analytical Batch:

RunID: IC1_030110A-1469059 Units: mg/L
Analysis Date: 01/10/2003 14:43 Analyst: CV

Lab Sample ID Client Sample ID
03010287-01C MW-5
03010287-02C MW-10
03010287-04C MW-12D

Table with 3 columns: Analyte, Result, Rep Limit. Row: Nitrogen,Nitrate (As N), ND, 0.10

Laboratory Control Sample (LCS)

RunID: IC1_030110A-1469060 Units: mg/L
Analysis Date: 01/10/2003 14:56 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Nitrogen,Nitrate (As N), 10, 9.65, 96, 80, 120

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 03010287-01
RunID: IC1_030110A-1469064 Units: mg/L
Analysis Date: 01/10/2003 15:46 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Nitrogen,Nitrate (As N), 2.12, 10, 11.1, 89.3, 10, 10.6, 84.9, 5.07, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs/12832-018

Analysis: Chloride, Total
Method: E325.3

WorkOrder: 03010287
Lab Batch ID: R75695

Method Blank

Samples in Analytical Batch:

RunID: WET_030116W-1471688 Units: mg/L
Analysis Date: 01/16/2003 11:00 Analyst: RA

Table with 2 columns: Lab Sample ID, Client Sample ID. Rows include 03010287-01D to 03010287-06A.

Table with 3 columns: Analyte, Result, Rep Limit. Row for Chloride with Result ND and Rep Limit 1.0.

Laboratory Control Sample (LCS)

RunID: WET_030116W-1471702 Units: mg/L
Analysis Date: 01/16/2003 11:00 Analyst: RA

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row for Chloride with values 100, 98.07, 98, 90, 110.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 03010287-06
RunID: WET_030116W-1471699 Units: mg/L
Analysis Date: 01/16/2003 11:00 Analyst: RA

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row for Chloride with values 227.7, 250, 499.1, 108.6, 250, 499.1, 108.6, 0, 20, 85, 115.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs/12832-018

Analysis: Alkalinity (as CaCO3), Total
Method: E310.1

WorkOrder: 03010287
Lab Batch ID: R75775

Method Blank

Samples in Analytical Batch:

RunID: WET_030121J-1472817 Units: mg/L
Analysis Date: 01/21/2003 12:00 Analyst: RA

Lab Sample ID Client Sample ID
03010287-01C MW-5
03010287-02C MW-10
03010287-03C MW-11A
03010287-04C MW-12D

Table with 3 columns: Analyte, Result, Rep Limit. Row: Alkalinity, Total (As CaCO3) | ND | 2.0

Laboratory Control Sample (LCS)

RunID: WET_030121J-1472819 Units: mg/L
Analysis Date: 01/21/2003 12:00 Analyst: RA

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Alkalinity, Total (As CaCO3) | 98.9 | 97.44 | 99 | 90 | 110

Sample Duplicate

Original Sample: 03010287-04
RunID: WET_030121J-1472823 Units: mg/L
Analysis Date: 01/21/2003 12:00 Analyst: RA

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Row: Alkalinity, Total (As CaCO3) | 225 | 224.3 | 0 | 20

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

*Sample Receipt Checklist
And
Chain of Custody*



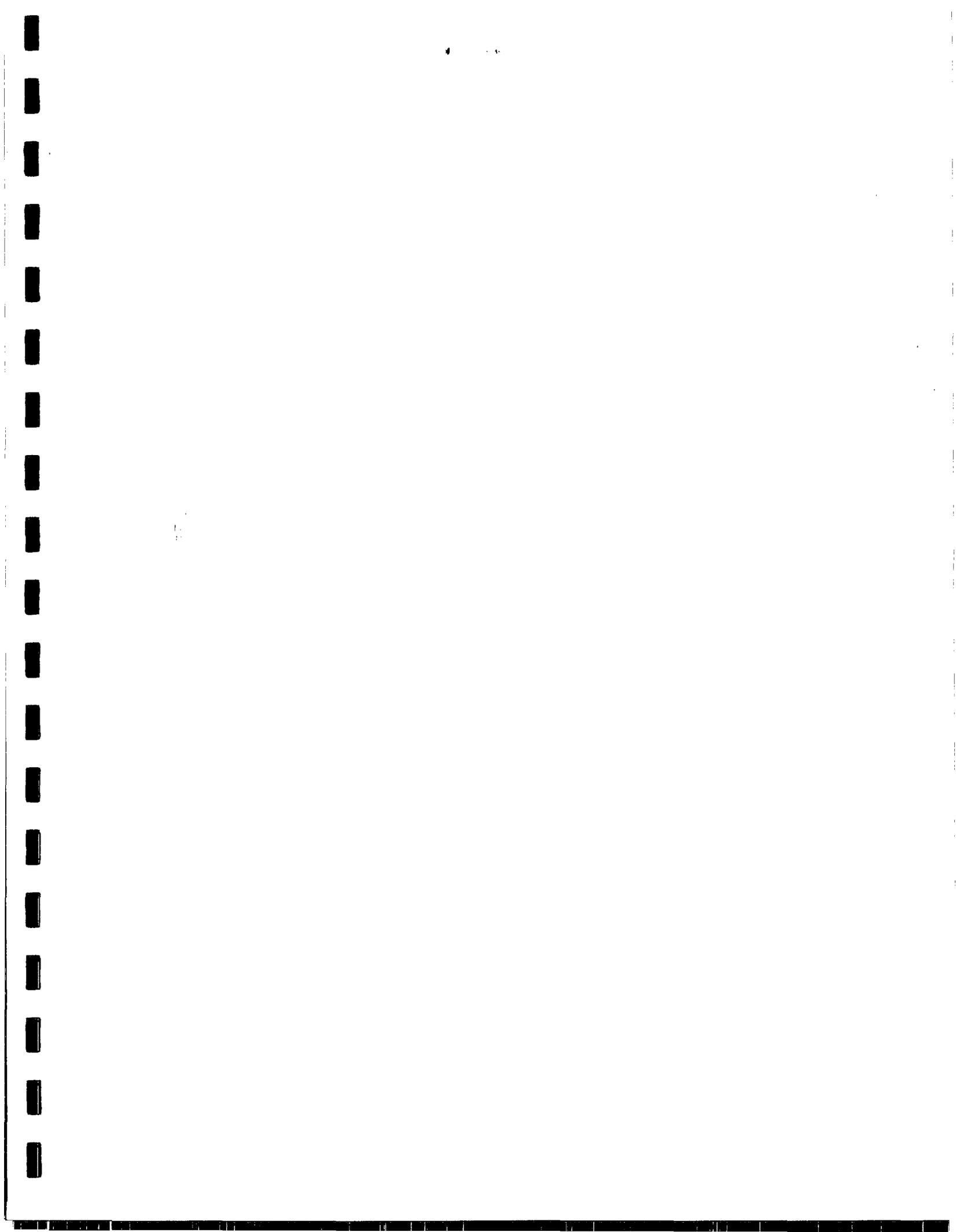
HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Sample Receipt Checklist

Workorder:	03010287	Received By:	NB
Date and Time Received:	1/10/03 9:30:00 AM	Carrier name:	FedEx
Temperature:	3	Chilled by:	Water Ice

- 1. Shipping container/cooler in good condition? Yes No Not Present
- 2. Custody seals intact on shipping container/cooler? Yes No Not Present
- 3. Custody seals intact on sample bottles? Yes No Not Present
- 4. Chain of custody present? Yes No
- 5. Chain of custody signed when relinquished and received? Yes No
- 6. Chain of custody agrees with sample labels? Yes No
- 7. Samples in proper container/bottle? Yes No
- 8. Sample containers intact? Yes No
- 9. Sufficient sample volume for indicated test? Yes No
- 10. All samples received within holding time? Yes No
- 11. Container/Temp Blank temperature in compliance? Yes No
- 12. Water - VOA vials have zero headspace? Yes No Not Applicable
- 13. Water - pH acceptable upon receipt? Yes No Not Applicable

SPL Representative:	<input type="text"/>	Contact Date & Time:	<input type="text"/>
Client Name Contacted:	<input type="text"/>		
Non Conformance Issues:	<input type="text"/>		
Client Instructions:	<input type="text"/>		





B R O W N A N D C A L D W E L L

**SEPTEMBER 2002 GROUNDWATER
SAMPLING REPORT
HOBBS, NEW MEXICO FACILITY**

BJ SERVICES COMPANY, U.S.A.

MAY 9, 2003

**SEPTEMBER 2002 GROUNDWATER SAMPLING REPORT
HOBBS, NEW MEXICO FACILITY
BJ SERVICES COMPANY, U.S.A.**

Prepared for

BJ Services Company, U.S.A.
11211 FM 2920
Tomball, Texas 77375

BC Project Number: 12832.017



Richard L. Rexroad, P.G.
Project Manager

May 9, 2003

Brown and Caldwell
1415 Louisiana, Suite 2500
Houston, Texas 77002 - (713) 759-0999

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DISTRIBUTION AND QA/QC REVIEWER'S SIGNATURE

FIGURES

- 1 Site Map
- 2 Groundwater Elevation Map for September 16, 2002
- 3 BTEX and TPH Distribution Map for September 16, 2002

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- 1 Site Chronology
- 2 Cumulative Groundwater Elevation Data
- 3 September 16, 2002 Field Screening Results for Groundwater Samples
- 4 Cumulative BTEX and TPH Analytical Results for Groundwater Samples
- 5 Cumulative Results for Chloride Analyses
- 6 Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells MW-5, MW-10, MW-11A, MW-12, and MW-12D

APPENDICES

- A Groundwater Sampling Forms
- B Laboratory Analytical Report



1.0 INTRODUCTION

Brown and Caldwell conducted a quarterly groundwater sampling event at the BJ Services Company, U.S.A. (BJ Services) facility located at 2708 West County Road in Hobbs, New Mexico in September 2002. This report presents a description of the groundwater sampling field activities, a summary and evaluation of the analytical results, and an evaluation of remedial technologies applied at the facility. A groundwater potentiometric surface map and a hydrocarbon distribution map are included.

A layout of the facility is shown in Figure 1. The facility formerly operated an on-site fueling system. Subsurface impact near the former diesel fueling system was detected by the New Mexico Oil Conservation Division (NMOCD) during an on-site inspection on February 7, 1991. The fueling system was taken out of operation in July 1995. The NMOCD has required a quarterly groundwater monitoring program to assess the concentration of hydrocarbon constituents in groundwater as a result of the diesel fuel release.

A biosparging system was activated in November 1995 and expanded in March/April 1997 and February/March 1998 to remediate soil and groundwater at the former fuel island area of the facility. The biosparging system was deactivated on November 1, 2000 after achieving cleanup goals for groundwater. The confirmation soil sampling program specified in the NMOCD-approved Remedial Action Plan (RAP) for the facility was conducted in July 2001. The results of the confirmation soil sampling program were presented to NMOCD in the report for the June 2001 groundwater sampling event. In accordance with the RAP for the facility, four additional groundwater sampling events were conducted following the confirmation soil sampling event. Hydrocarbon concentrations in groundwater samples from applicable monitor wells remained below the target concentrations specified in the RAP during each of these sampling events, so a request to decommission the biosparging system was submitted to NMOCD in the June 2002 Groundwater Sampling and Biosparging System Closure Report for the facility.

BJ Services removed three field waste tanks at the facility on March 6-7, 1997. The ongoing groundwater monitoring program was expanded to address both the former fuel island and the former field waste tanks areas of the facility, as directed by NMOCD in correspondence dated January 21, 1999.

A site chronology detailing the history of investigations into and remediation of soil and groundwater impacts in the former fueling system and the former field waste tanks areas of the facility is presented in Table 1.



2.0 FIELD ACTIVITIES AND RESULTS

Brown and Caldwell purged and sampled 6 monitor wells (MW-5, MW-10, MW-11A, MW-12D, MW-14, and MW-15) at the facility on September 16, 2002 to determine concentrations of dissolved-phase hydrocarbons and chlorides in groundwater and to evaluate general groundwater quality in the area of the facility. Monitor well locations are shown in Figure 1. The following subsections describe the field activities conducted by Brown and Caldwell during the September 2002 event and present the results of the associated groundwater analyses.

2.1 Groundwater Sampling Activities

Groundwater level measurements were obtained from all monitor wells at the facility on September 16, 2002, prior to purging and sampling the wells listed above. Groundwater levels were measured to the nearest 0.01 foot with an oil/water interface probe. Current and historic groundwater elevation data are presented in Table 2. The groundwater elevation data indicate that the groundwater flow direction is to the east/northeast, with an overall hydraulic gradient of approximately 0.007 foot/foot. A groundwater elevation map for September 16, 2002 is presented in Figure 2. The groundwater elevation data presented in Table 2 indicate that groundwater levels have continued to decline in monitor wells at the facility since late 1995.

In the March 2002 Groundwater Sampling Report for the facility, Brown and Caldwell recommended installation of a new monitor well, MW-16, to replace monitor well OW-4. Brown and Caldwell will proceed with this well installation activity upon approval by NMOCD and acquisition of access privileges from the off-site landowner.

Monitor wells MW-5, MW-10, MW-11A, MW-14 and MW-15 were purged and sampled with previously unused disposable bailers and clean, previously unused nylon string. A submersible pump was used to purge monitor well MW-12D until groundwater stabilization occurred, with stabilization defined as variation of less than 0.1° Celsius, less than 0.1 pH unit, less than 1% specific conductivity, and less than 15 millivolts (mV) Eh between consecutive measurements of groundwater

during the purging process. Three well volumes were purged from monitor wells MW-5, MW-11A, MW-14 and MW-15. Monitor well MW-10 was purged dry. The wells were sampled in general order of least impacted to most impacted (based on analytical results from the June 2002 and preceding sampling events) to further mitigate the potential for cross-contamination of wells.

Field parameter measurements for pH, conductivity, oxidation-reduction (redox) potential, dissolved oxygen, and temperatures were collected from wells containing an adequate volume of water during and upon completion of well purging. Ferrous iron and dissolved oxygen were measured in selected wells upon conclusion of purging activities. Field parameter readings were recorded on the groundwater sampling forms included in Appendix A. Field readings for the September 2002 sampling event are summarized in Table 3.

With the exception of monitor well MW-12D, groundwater samples were collected by pouring recovered water from a bailer. The groundwater sample from monitor well MW-12D was collected directly from the discharge line of the down-hole pump. Each sample was then transferred to laboratory-prepared, clean glass and/or plastic containers, sealed with Teflon[®]-lined lids, labeled, and placed on ice in an insulated cooler for delivery to Southern Petroleum Laboratory in Houston, Texas for analysis under standard chain-of-custody control.

Field measurement equipment was decontaminated prior to and after each usage. Decontamination procedures consisted of washing with fresh water and a non-phosphate detergent, then rinsing with deionized water. The submersible pump used to sample monitor well MW-12D was decontaminated by pumping clean tap water through the pump and tubing in a container at the surface. Purge water was discharged to an on-site water reclamation system for re-use by BJ Services.

2.2 Results of Groundwater Analyses

Groundwater samples from monitor wells MW-5, MW-10, MW-11A, MW-14 and MW-15 were analyzed for Method 325.3 chloride content. Groundwater samples from monitor wells MW-5,

MW-10, and MW-11A were also analyzed for gasoline- and diesel-range total petroleum hydrocarbons (TPH-G and TPH-D) by EPA Method 8015B and for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8021. Analyses of groundwater from selected wells for nitrate and sulfate (Method E300) and methane (Method RSK 147) were performed to evaluate the potential for natural attenuation of hydrocarbons at the facility. The laboratory analytical report and chain-of-custody documentation for the groundwater samples collected during the September 2002 sampling event are provided in Appendix B.

Current and cumulative analytical results for BTEX, TPH-D, and TPH-G are presented in Table 4. Figure 3 presents a hydrocarbon distribution map for the September 2002 sampling event. All BTEX concentrations are less than the applicable New Mexico Water Quality Control Commission (NMWQCC) standards.

Table 5 presents current and historic results for chloride analyses performed on groundwater samples collected at the facility. The chloride concentration in monitor wells MW-10 (1030 mg/L), MW-11A (1550 mg/L) and downgradient monitor well MW-14 (293 mg/L) exceed the NMWQCC chloride standard of 250 mg/L. The chloride concentration in monitor wells MW-5, MW-12D and MW-15 remained below 250 mg/L in September 2002.

The current and historic results for nitrate, sulfate, and dissolved methane analyses performed on groundwater samples from monitor wells MW-5, MW-10, MW-11A, MW-12, and MW-12D to assist in evaluation of natural attenuation processes at the facility are presented in Table 6.



3.0 EVALUATION OF REMEDIAL TECHNOLOGIES

The following subsections present evaluations of the remedial technologies applied at the former fueling system and former field waste tanks areas of the BJ Services facility at Hobbs, New Mexico.

3.1 Biosparging System at the Former Fueling System Area

Brown and Caldwell recommended installation of a biosparging system at the former fueling system area of the facility in the RAP submitted to the NMOCD in May 1994. The NMOCD approved the RAP on August 11, 1994. The biosparging system was installed in August 1995 and expanded in April 1997 and February 1998. Operation of the biosparging system resulted in substantial decreases in hydrocarbon concentrations in applicable former fueling system area monitor wells. In accordance with the RAP, confirmation soil sampling activities were conducted at the former fueling system area in July 2001 to verify the effectiveness of the biosparging system in remediating vadose zone soils in this area. The analytical results for these soil samples, as discussed in the report for the June 2001 groundwater sampling event, indicated that remediation goals for soil in this area had been achieved.

After completing the confirmation soil sampling activities, hydrocarbon concentrations in groundwater remained below target cleanup goals for four successive quarters. In accordance with the RAP for the facility, a request to decommission the biosparging system was submitted to NMOCD in the June 2002 Groundwater Sampling and Biosparging System Closure Report.

3.2 Natural Attenuation at the Former Field Waste Tanks Area

Natural attenuation is the primary remediation mechanism for the dissolved-phase hydrocarbon plume located in the area of the former field waste tanks (see Figure 1).

Plume behavior is the primary evidence of natural attenuation. Secondary evidence of natural attenuation can be obtained by the collection and evaluation of data relating to the concentrations of indigenous electron acceptors such as dissolved oxygen, nitrate, sulfate, and carbon dioxide. A plume is shrinking when the rate of hydrocarbon loading from a source area is less than the rate of natural degradation of hydrocarbons. Plume shrinkage in the absence of aggressive remediation is indicative of the occurrence of natural attenuation processes. Conversely, a plume is expanding if the rate of hydrocarbon loading from a source area is greater than the rate of natural degradation of hydrocarbons through natural attenuation processes.

The former field waste tanks in the eastern portion of the facility were removed in March 1997. Concentrations of total BTEX in monitor wells in the area of the former field waste tanks have been generally stable or declining subsequent to removal of the field waste tanks. Sporadic increases in total BTEX concentrations between quarterly sampling events have been observed in monitor wells in this area since March 1997, however. These increases may be attributed to sporadic loading rates from the vadose zone in excess of the natural attenuation rate of the area. The following subsections present primary and secondary evidence of natural attenuation of hydrocarbons in groundwater at the former field waste tanks area of the facility.

3.2.1 Primary Evidence

The benzene concentration in monitor well MW-10 has decreased from a maximum of 1.3 mg/L in August 1995 (prior to removal of the field waste tanks) to less than the NMWQCC standard of 0.01 mg/L in the seven applicable groundwater sampling events from December 2000 through September 2002. Concentrations of toluene, ethylbenzene, and xylenes in monitor well MW-10 have undergone similar decreases over this time period.

Benzene concentrations at the monitor well MW-11/11A location have decreased from a maximum of 0.970 mg/L in December 1996 (prior to removal of the field waste tanks) to less than the NMWQCC standard of 0.01 mg/L in the last six groundwater sampling events.

Concentrations of BTEX constituents at the monitor well MW-12/12D location have displayed decreases similar to those observed at the monitor well MW-11/11A location since September 1998.

3.2.2 Secondary Evidence

The following lines of geochemical evidence can also be used to suggest that intrinsic bioremediation (an important natural attenuation mechanism) of dissolved-phase hydrocarbons is occurring in the area of the former field waste tanks.

1. Dissolved oxygen may be utilized during intrinsic bioremediation. Dissolved oxygen concentrations should therefore be depressed in areas where intrinsic bioremediation is occurring.

Groundwater samples were collected primarily using bailers during the September 2002 sampling event due to low water levels in the wells. Dissolved oxygen concentrations in most wells at the facility were elevated in September 2002 relative to previous sampling events in which groundwater samples were collected using a downhole pump. Use of bailers in groundwater sampling causes groundwater samples to be oxygenated, precluding meaningful comparison of dissolved oxygen data from wells at impacted areas to corresponding data from wells in non-impacted areas.

Historic evidence submitted to the NMOCD in previous quarterly groundwater monitoring reports for the facility has indicated that dissolved oxygen concentrations have typically been depressed in hydrocarbon-impacted monitor wells relative to non-impacted wells at the facility (see the June 2001 Groundwater Sampling Report for BJ Services Hobbs, New Mexico Facility, for example).

2. Nitrate may be utilized as an electron acceptor during intrinsic bioremediation after dissolved oxygen is depleted. Therefore, nitrate concentrations may be depressed in areas where intrinsic bioremediation is occurring.

Nitrate was detected at a concentration of 2.4 mg/L in background monitor well MW-5 during the September 2002 sampling event. Although there was minimal to no hydrocarbon impact at former field waste tanks area wells MW-10, MW-11A, and MW-12D in September 2002, the maximum nitrate concentration detected in these wells was 0.3 mg/L. The decreased nitrate concentrations observed in September 2002 at former field waste tanks area wells MW-10, MW-11A, and MW-12D relative to the background nitrate concentration at the facility is likely due to residual effects of hydrocarbons.

3. When dissolved oxygen and nitrate are depleted, anaerobic microbes that utilize other electron acceptors become active. Ferrous iron is the reduction product of ferric iron, a common electron acceptor. Therefore, ferrous iron concentrations should increase in areas where intrinsic bioremediation is occurring.

Ferrous iron concentrations measured in former field waste tanks area monitor wells in September 2002 are inconclusive regarding use of ferric iron as an electron acceptor.

4. Microbes that utilize sulfate become active when dissolved oxygen, nitrate, and ferric iron are depleted. Sulfate concentrations should therefore decrease in areas where intrinsic bioremediation is occurring through use of sulfate as an electron acceptor.

September 2002 sulfate concentrations in former field waste tanks area monitor wells MW-10, MW-11A, and MW-12D ranged from 172 mg/L to 383 mg/L. The September 2002 sulfate concentration in background monitor well MW-5 is 105 mg/L. The fact that sulfate concentrations in former source area monitor wells are greater than the sulfate concentration in the background well suggests that sulfate is not being utilized as an electron acceptor in the former field waste tanks area.

5. Methane is a reaction product generated during utilization of carbon dioxide as an electron acceptor, and its concentration should therefore increase in areas where concentrations of electron acceptors such as dissolved oxygen, nitrate, and ferric iron have diminished.

Methane was detected in background monitor well MW-5 at a concentration of 0.002 mg/L during the September 2002 groundwater sampling event. Methane was detected in former field waste tanks area monitor well MW-10 at a concentration of 0.006 mg/L in September 2002, but was not detected in monitor wells MW-11A and MW-12D. The minimal differences in methane concentrations in these wells suggest that utilization of carbon dioxide as an electron acceptor is no longer occurring at the former field waste tanks area of the facility.

6. Redox potential is a measure of chemical energy in groundwater. The redox potential of groundwater from background well MW-5 was measured at 370.9 mV in September 2002. Respective redox potentials of -102.0 mV, -62.2 mV, and -114.0 mV were measured in former field waste tanks area monitor wells MW-10, MW-11A, and MW-12D in September 2002. The negative redox values in the former field waste tanks area monitor wells as compared to the positive redox value in the background well at the facility provides additional evidence that natural attenuation of hydrocarbons is occurring in the area of the former field waste tanks.
7. Alkalinity is expected to increase during natural attenuation processes, due to the leaching of carbonates from mineral substrates by microbially produced organic acids.

Laboratory method M2320B was used to measure bicarbonate alkalinity in September 2002.

The alkalinity bicarbonate of groundwater from background monitor well MW-5 was 249

mg/L. A comparable bicarbonate alkalinity of 262 mg/L was measured in the deep monitor well at the former field waste tanks area, MW-12D. Elevated bicarbonate alkalinities of 844 mg/L and 364 mg/L were measured the shallower former field waste tanks area monitor wells MW-10 and MW-11A, respectively. Based on the elevated bicarbonate alkalinity of groundwater in monitor wells MW-10 and MW-11A, it can be inferred that natural attenuation of hydrocarbons is occurring in the vicinity of these wells at the former field waste tanks area.

In conclusion, current nitrate data and historic dissolved oxygen data suggest that dissolved oxygen and nitrate act as electron acceptors during intrinsic bioremediation processes at former field waste tanks area of the facility. Current redox and alkalinity data provide further evidence that natural attenuation of hydrocarbons is occurring in this area.

It is recommended that monitoring for natural attenuation evaluation parameters continue in former field waste tank area monitor wells MW-10, MW-11A, and MW-12D and the background well, MW-5. Redox potential, dissolved oxygen content, and alkalinity are good indicators of the occurrence of aerobic bioremediation of hydrocarbons, so it is also recommended that field testing for these parameters be continued in all wells to be sampled during upcoming groundwater monitoring events.



4.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on information obtained during the September 2002 groundwater sampling event conducted at the BJ Services Hobbs, New Mexico facility.

4.1 Conclusions

- September 2002 benzene concentrations in former field waste tanks area monitor wells MW-10, MW-11A, and MW-12D are less than the NMWQCC standard of 0.01 mg/L for benzene. Natural attenuation processes appear to be occurring in the vicinity of the former field waste tanks removed in March 1997, based on generally decreasing hydrocarbon concentrations in local monitor wells over time and as substantiated by geochemical data.
- The chloride concentrations recorded in monitor wells MW-10, MW-11A and MW-14 during the September 2002 groundwater sampling event exceed the NMWQCC standard of 250 mg/L.

4.2 Recommendations

- Continue the quarterly monitoring program for former field waste tank area monitor wells MW-10, MW-11A, and MW-12D. Continue monitoring for natural attenuation parameters in these wells and the background monitor well MW-5, including field-testing for natural attenuation indicator parameters until compliance with NMWQCC standards is demonstrated.
- Upon NMOCD approval and acquisition of access rights, complete installation and sampling of an off-site well to define the downgradient extent of chloride impact to groundwater in the area of the facility.
- Upon NMOCD approval, decommission the biosparging system at the former fuel island area.

DISTRIBUTION

September 2002 Groundwater Sampling Report
BJ Services Company, U.S.A.
Hobbs, New Mexico

May 9, 2003

Final Distribution as follows:

1 copy to: State of New Mexico
Energy, Minerals, and Natural Resources Dept.
Oil Conservation Division
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505

Attention: Mr. Wayne Price

1 copy to: State of New Mexico
Oil Conservation Division, Hobbs District Office
1625 N. French Dr.
Post Office Box 1980
Hobbs, New Mexico 88240

Attention: Mr. Chris Williams

1 copy to: BJ Services Company, U.S.A.
11211 FM 2920
Tomball, Texas 77375

Attention: Ms. Jo Ann Cobb

1 copy to: BJ Services Company, U.S.A.
2708 West County Road
Hobbs, New Mexico 88240

Attention: John Adcock

1 copy to: Brown and Caldwell, Project File

QUALITY CONTROL REVIEWER

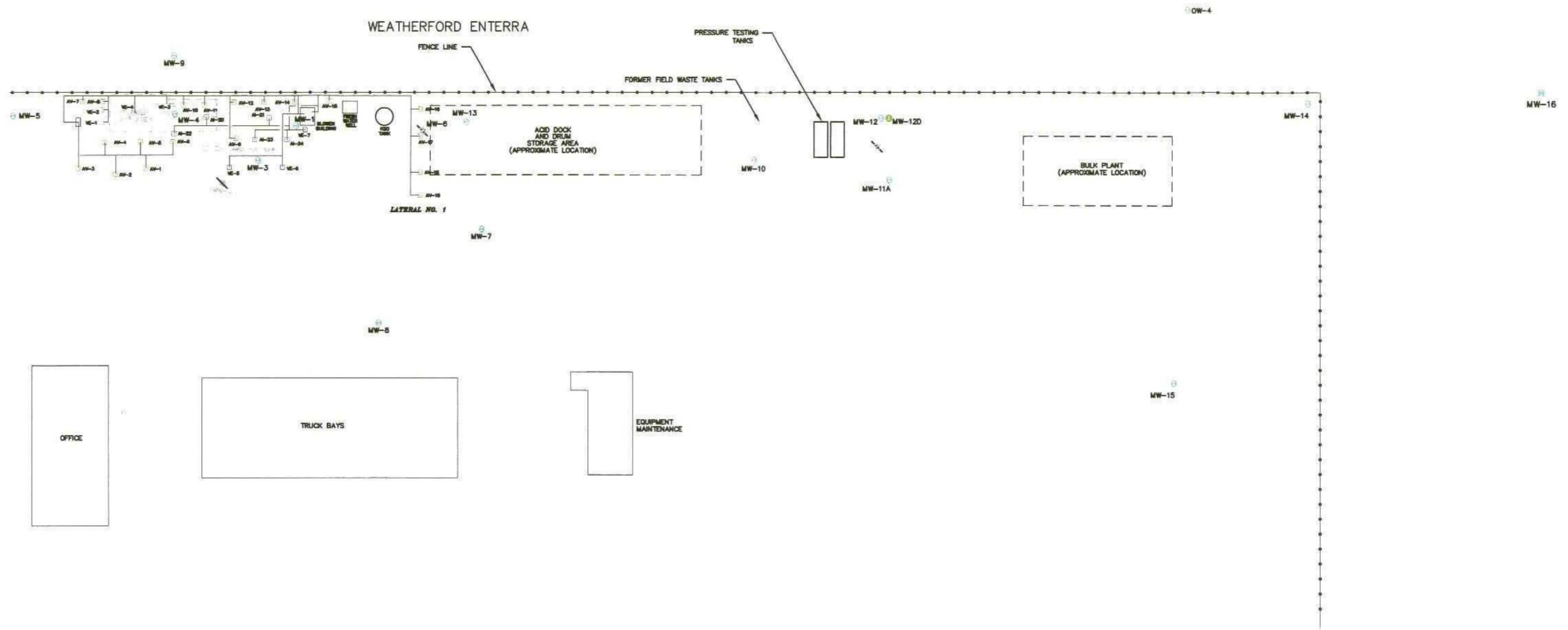

Lynn Wright
Principal Geologist

P:\Wp\BJSERV\12832\101r.doc

Figures



FIGURES

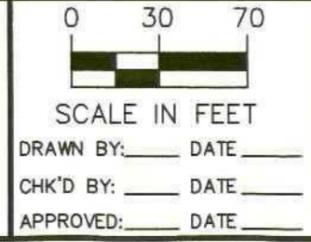


NOTE: DATUM FROM MONITOR WELL MW-12D NOT USED BECAUSE WELL IS SCREENED IN DEEPER PORTION OF THE AQUIFER THAN REMAINING WELLS.

BROWN AND CALDWELL
HOUSTON, TEXAS

SUBMITTED: _____ DATE: _____
PROJECT MANAGER

APPROVED: _____ DATE: _____
BROWN AND CALDWELL

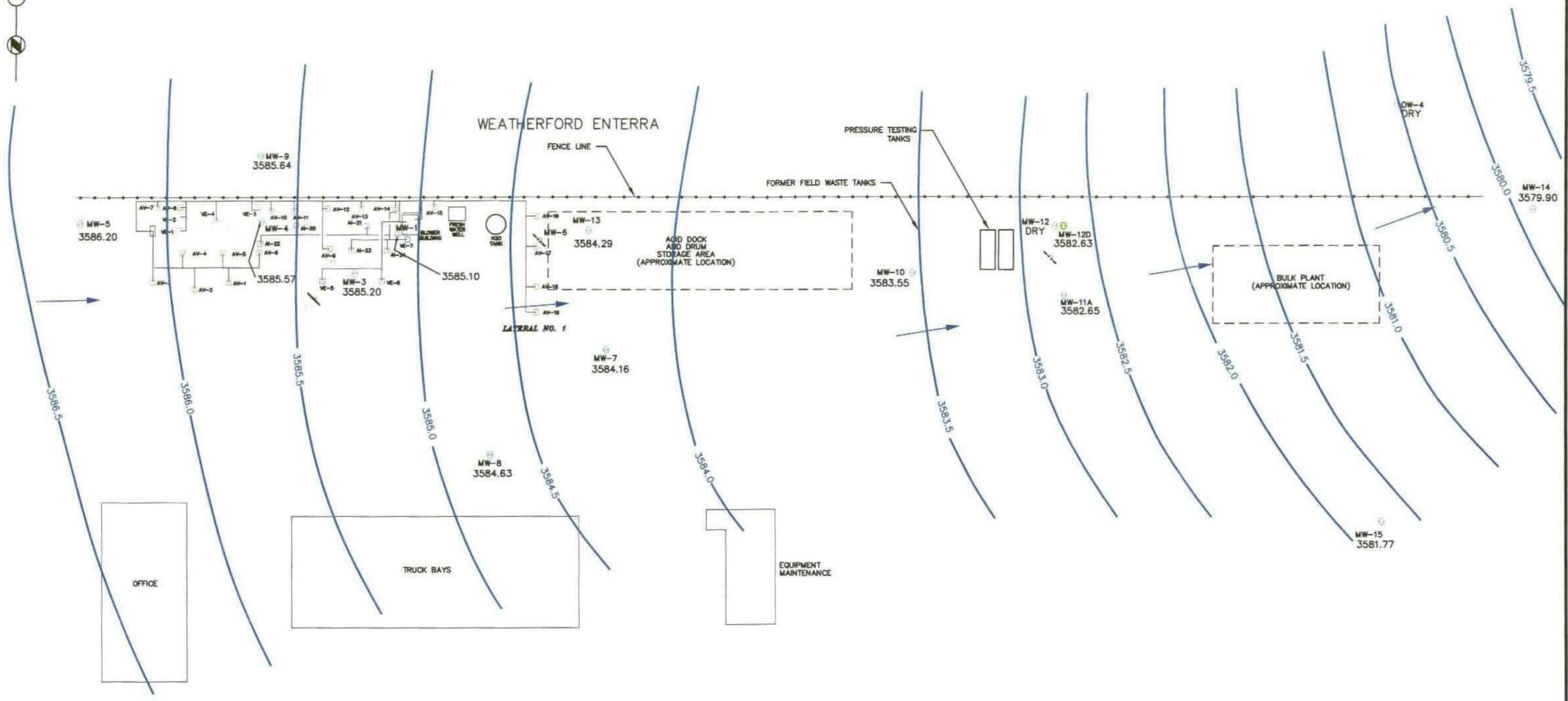


LEGEND	
	MW-3 EXISTING MONITOR WELL LOCATION
	BIOSPARGING SYSTEM
	MONITOR WELL (PLUGGED AND ABANDONED)
	MW-16 PROPOSED WELL LOCATION

TITLE	SITE MAP
CLIENT	BJ SERVICES COMPANY, U.S.A.
SITE	HOBBS, NEW MEXICO

DATE	4/6/01
PROJECT NUMBER	12832.017
FIGURE NUMBER	1

P:\Cad\JOBS\BjServices\12832\Site Map.dwg



BROWN AND CALDWELL
HOUSTON, TEXAS

SUBMITTED: _____ DATE: _____
PROJECT MANAGER

APPROVED: _____ DATE: _____
BROWN AND CALDWELL

0 30 60

SCALE: 1" = 60'

DRAWN BY: CLK DATE 6/01

CHK'D BY: _____ DATE _____

REV'D BY: CLK DATE 6/02

LEGEND

3585.17
MW-3
MONITOR WELL LOCATION WITH GROUNDWATER ELEVATION (feet AMSL)

BIOSPARGING SYSTEM

GROUNDWATER FLOW DIRECTION

MW-2
MONITOR WELL (PLUGGED AND ABANDONED)

TITLE	GROUNDWATER ELEVATION MAP FOR SEPTEMBER 16, 2002
CLIENT	BJ SERVICES COMPANY, U.S.A.
SITE	HOBBS, NEW MEXICO

DATE	6/26/02
PROJECT NUMBER	12832.017
FIGURE NUMBER	2

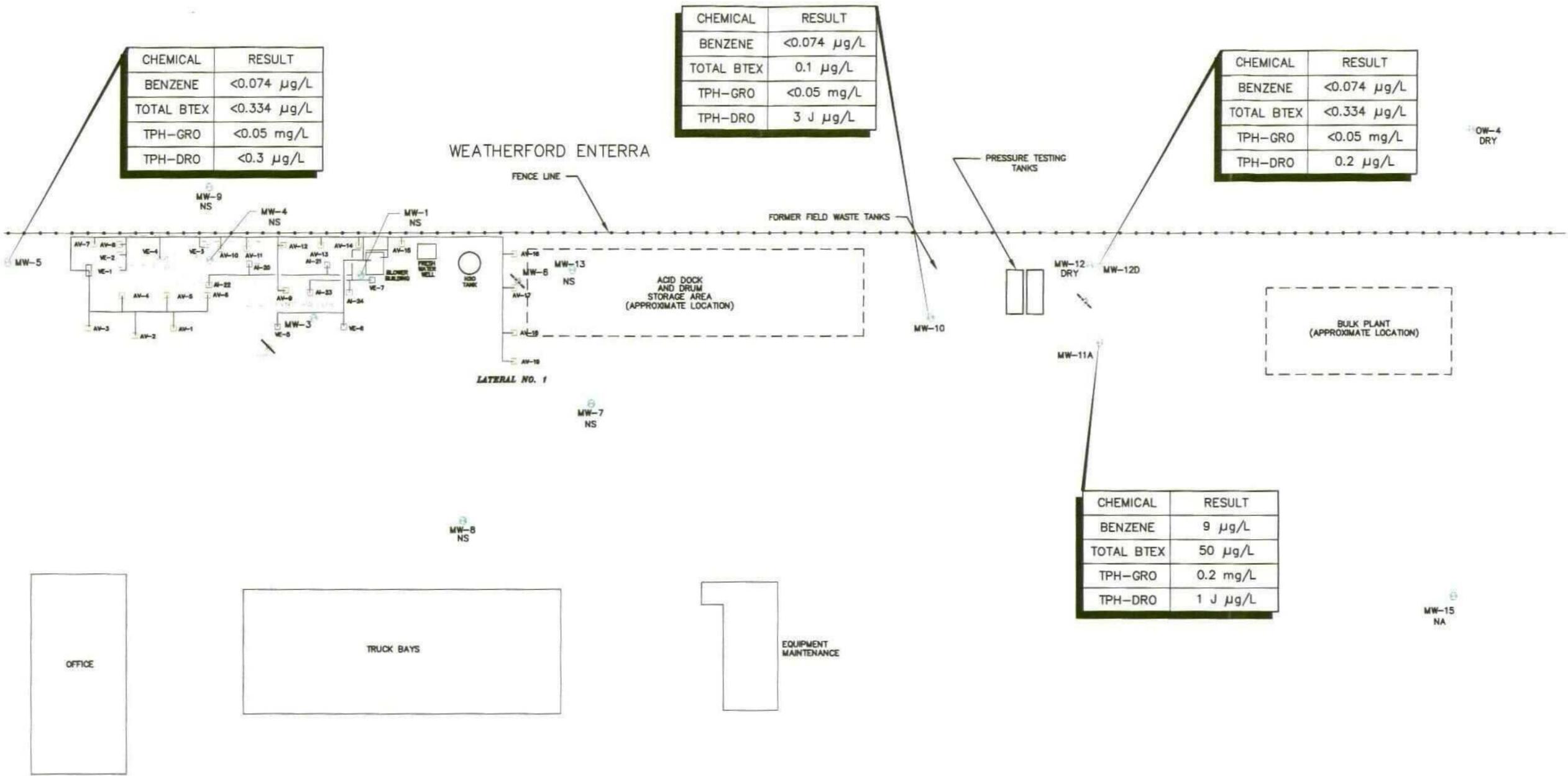
P:\Cad\JOBS\BJServices\12832\GWWE9-16-02.dwg

CHEMICAL	RESULT
BENZENE	<0.074 µg/L
TOTAL BTEX	<0.334 µg/L
TPH-GRO	<0.05 mg/L
TPH-DRO	<0.3 µg/L

CHEMICAL	RESULT
BENZENE	<0.074 µg/L
TOTAL BTEX	0.1 µg/L
TPH-GRO	<0.05 mg/L
TPH-DRO	3 J µg/L

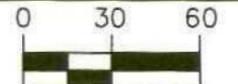
CHEMICAL	RESULT
BENZENE	<0.074 µg/L
TOTAL BTEX	<0.334 µg/L
TPH-GRO	<0.05 mg/L
TPH-DRO	0.2 µg/L

CHEMICAL	RESULT
BENZENE	9 µg/L
TOTAL BTEX	50 µg/L
TPH-GRO	0.2 mg/L
TPH-DRO	1 J µg/L



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BROWN AND CALDWELL
HOUSTON, TEXAS



SCALE: 1" = 60'
DRAWN BY: CLK DATE 6/01
CHK'D BY: _____ DATE _____
APPROVED: _____ DATE _____

- LEGEND**
- MW-3 EXISTING MONITOR WELL LOCATION
 - BIOSPARGING SYSTEM
 - MW-2 MONITOR WELL (PLUGGED AND ABANDONED)
 - NS WELL NOT SAMPLED
 - NA WELL NOT ANALYZED FOR BTEX/TPH

SUBMITTED: _____ DATE: _____
PROJECT MANAGER

APPROVED: _____ DATE: _____
BROWN AND CALDWELL

TITLE	BTEX AND TPH DISTRIBUTION MAP FOR SEPTEMBER 16, 2002	DATE	4/6/01	
CLIENT	BJ SERVICES COMPANY, U.S.A.		PROJECT NUMBER	12832.023
SITE	HOBBS, NEW MEXICO		FIGURE NUMBER	3

Tables



TABLES

Table 1
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
February 7, 1991	The New Mexico Oil Conservation Division (NMOCD) conducted an on-site inspection, including sampling of the on-site fresh water well.
August 6, 1991	The NMOCD requested submittal of an investigation work plan.
September 5, 1991	Roberts/Schornick and Associates, Inc. (RSA) submitted Technical Work Plan for soil and groundwater investigation to the NMOCD.
November 15, 1991	The NMOCD approved the Technical Work Plan submitted by RSA.
December 16, 1991	RSA sampled the fresh water well. The analytical results were submitted to the NMOCD.
February 21, 1992	Western sampled the fresh water well. The analytical results were submitted to the NMOCD.
July 29 - August 10, 1992	Brown and Caldwell conducted a soil and groundwater investigation according to the approved Technical Work Plan. The investigation included drilling and sampling nine soil borings, sampling six hand-augured soil borings, installation and sampling of five monitor wells, and sampling of the fresh water well.
October 12, 1992	Brown and Caldwell submitted a Soil and Groundwater Investigation Report to the NMOCD.
December 2, 1992	The NMOCD requested the installation and sampling of four additional monitor wells, including a monitor well on an adjacent property.
April 13, 1993	Brown and Caldwell conducted a vapor extraction pilot test on the existing monitor wells.
April 15, 1993	Brown and Caldwell installed off-site monitor well MW-9.
April 22, 1993	Brown and Caldwell sampled off-site monitor well MW-9.
May 27, 1993	Brown and Caldwell submitted a letter report documenting the installation and sampling of off-site monitor well MW-9 to the NMOCD.
June 2, 1993	Brown and Caldwell conducted a short-term aquifer test using the fresh water well at the facility.
June 8, 1993	USTank Management, Inc. conducted a non-volumetric tank system tightness test on the diesel and unleaded gasoline aboveground storage tanks at the facility.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
June 21, 1993	ENSR Consulting and Engineering (ENSR), the environmental consultant for the adjacent property owner on which off-site well MW-9 is located, submitted a request to sample monitor well MW-9.
July 15, 1993	ENSR split a groundwater sample collected from monitor well MW-9 with Brown and Caldwell.
July 30, 1993	USTank Management, Inc. submitted a tank tightness test report to Brown and Caldwell. The report indicated that both tanks and their associated piping passed.
August 16-19, 1993	Brown and Caldwell installed two additional downgradient monitor wells. Brown and Caldwell sampled each of the existing and newly installed monitor wells.
January 26, 1994	Brown and Caldwell performed a groundwater monitoring event; the existing monitor wells and the fresh water well were purged and sampled. The groundwater samples were analyzed for BTEX.
May 6, 1994	A Remedial Action Plan (RAP) was submitted to the NMOCD.
August 11, 1994	The RAP was approved by the NMOCD.
May 3, 1995	Brown and Caldwell conducted the May 1995 groundwater sampling event.
July 31, 1995	Brown and Caldwell conducted the July 1995 groundwater sampling event.
August 2-9, 1995	Installation of the biosparging system was initiated. Nineteen combined injection/extraction wells and three vacuum extraction wells were installed.
August 14-26, 1995	Remedial Construction Services, Inc. (RCS) constructed the initial design of the biosparging system.
September 19, 1995	Operation of the extraction portion of the biosparging system commenced.
November 13, 1995	Operation of the injection portion of the biosparging system commenced.
November 14, 1995	Brown and Caldwell conducted the November 1995 groundwater sampling event.
February 23, 1996	Brown and Caldwell conducted the February 1996 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
May 31, 1996	Brown and Caldwell conducted the May 1996 groundwater sampling event.
August 23, 1996	Brown and Caldwell conducted the August 1996 groundwater sampling event.
December 2, 1996	Brown and Caldwell conducted the December 1996 groundwater sampling event.
March 6-7, 1997	BJ Services removed three field waste tanks and associated hydrocarbon-impacted soil.
March 12, 1997	Brown and Caldwell conducted the March 1997 groundwater sampling event.
March 14, 1997	Vapor extraction well VE-4 was installed.
April 1997	Vapor extraction well VE-4 was connected to the vapor extraction system.
June 12, 1997	Brown and Caldwell conducted the June 1997 groundwater sampling event.
September 11-12, 1997	Brown and Caldwell conducted the September 1997 groundwater sampling event.
December 10, 1997	Brown and Caldwell conducted the December 1997 groundwater sampling event.
February 3-14, 1998	Air injection wells AI-20 through AI-24, vapor extraction wells VE-5 though VE-7, and monitor wells MW-11A and MW-12 were installed.
February 19, 1998	Operation of previously existing injection wells was suspended in preparation for start-up of new injection wells AI-20 through AI-24.
March 10, 1998	Operation of new air injection wells AI-20 through AI-24 and new vapor extraction wells VE-5 though VE-7 commenced.
March 23-24, 1998	Brown and Caldwell conducted the March 1998 groundwater sampling event.
March 24, 1998	Operation of previously existing injection wells and vapor extraction wells resumed.
June 23, 1998	Brown and Caldwell conducted the June 1998 groundwater sampling event.
September 30, 1998	Brown and Caldwell conducted the September 1998 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
December 9-10, 1998	Brown and Caldwell conducted the December 1998 groundwater sampling event.
January 21, 1999	The NMOCD requested submittal of a work plan by March 22, 1999 to perform additional groundwater delineation in the area of the former field waste tanks and the former AST/MW-6 area.
March 9-10, 1999	Brown and Caldwell conducted the March 1999 groundwater sampling event.
March 19, 1999	Brown and Caldwell submitted the work plan for groundwater delineation activities that was requested by the NMOCD.
May 19, 1999	The NMOCD approved the groundwater delineation work plan.
June 10, 1999	Brown and Caldwell performed sampling of existing monitor wells for the June /July 1999 groundwater sampling event.
July 2, 1999	Brown and Caldwell completed plugging and abandonment of monitor wells MW-2, MW-6, and MW-11; installed and developed monitor wells MW-12D and MW-13; and sampled monitor wells MW-12D and MW-13 to complete the June/July 1999 groundwater sampling event.
July 14, 1999	Brown and Caldwell redirected air discharge from the shallow injection well injection system to Lateral No. 1 and optimized air flow to injection wells AI-16 and AI-17 to apply increased remedial pressure to the eastern portion of the west plume.
September 13-14, 1999	Brown and Caldwell conducted the September 1999 groundwater sampling event.
December 9, 1999	Brown and Caldwell conducted the December 1999 groundwater sampling event.
March 9-10, 2000	Brown and Caldwell conducted the March 2000 groundwater sampling event and shut off air flow to biosparging system Lateral Nos. 4S, 5S, 6S, and 7S.
June 8, 2000	Brown and Caldwell conducted the June 2000 groundwater sampling event.
September 13, 2000	Brown and Caldwell conducted the September 2000 groundwater sampling event.
November 1, 2000	Brown and Caldwell deactivated the biosparging system.
December 7, 2000	Brown and Caldwell conducted the December 2000 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
January 2001	Brown and Caldwell installed and sampled monitor wells MW-14 and MW-15.
March 8-9, 2001	Brown and Caldwell conducted the March 2001 groundwater sampling event.
June 21-22, 2001	Brown and Caldwell conducted the June 2001 groundwater sampling event.
July 23, 2001	Brown and Caldwell collected soil samples from four soil borings installed at the former fueling system area of the facility to confirm the effectiveness of the biosparging system in remediating hydrocarbon impact to soil, as specified in the NMOCD-approved RAP.
September 10, 2001	Brown and Caldwell conducted the September 2001 groundwater sampling event.
December 6, 2001	Brown and Caldwell conducted the December 2001 groundwater sampling event.
February 26, 2002	Brown and Caldwell repaired the crushed well completion on monitor well MW-10.
February 28, 2002	NMOCD requested an evaluation of chloride content of groundwater at the facility.
March 11-12, 2002	Brown and Caldwell conducted the March 2002 groundwater sampling event. Groundwater samples from all water-producing wells at the facility were analyzed for chloride content.
May 21, 2002	Brown and Caldwell submitted the report for the March 2002 groundwater sampling event, including an evaluation of chloride content of groundwater at the facility and a recommendation for installation of a downgradient off-site well (MW-16) to replace off-site well OW-4, which has gone dry.
June 17-18, 2002	Brown and Caldwell conducted the June 2002 groundwater sampling event.
September 16, 2002	Brown and Caldwell conducted the September 2002 groundwater sampling event.
November 11, 2002	Brown and Caldwell submitted the June 2002 Groundwater Sampling Report and Biosparging System Closure Report.

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-1	3,647.53	8/10/1992	53.22	0.00	3,594.31	(1)
		2/9/1993	53.03	0.00	3,594.50	
		8/18/1993	53.10	0.00	3,594.43	
		1/26/1994	53.31	0.00	3,594.22	
		5/3/1995	54.64	0.20	3,593.05	(2)
		7/31/1995	54.14	0.00	3,593.39	
		11/14/1995	53.69	0.00	3,593.84	
		2/23/1996	54.32	0.00	3,593.21	
		5/31/1996	54.14	0.00	3,593.39	
		8/23/1996	56.17	0.00	3,591.36	
		12/2/1996	55.27	0.00	3,592.26	
		3/12/1997	55.70	0.27	3,592.05	
		6/12/1997	55.08	0.02	3,592.47	
		9/12/1997	55.64	0.51	3,592.31	
		12/10/1997	55.46	0.00	3,592.07	PSH Sheen
		3/24/1998	55.81	0.00	3,591.72	PSH Sheen
		6/23/1998	56.38	0.06	3,591.20	
		9/30/1998	56.82	0.00	3,590.71	PSH Sheen
		12/9/1998	57.05	0.00	3,590.48	
		3/10/1999	57.45	0.00	3,590.08	
		6/10/1999	58.02	0.00	3,589.51	
		7/2/1999	57.90	0.00	3,589.63	
		9/14/1999	58.14	0.00	3,589.39	
		12/9/1999	-	-	-	(3)
		3/9/2000	58.99	0.00	3,588.54	
		06/00	-	-	-	
		09/00	-	-	-	
		12/7/00	-	-	-	
		03/08/01	60.35	0.00	3587.18	
		6/21/01	60.99	0.00	3,586.54	
9/10/01	61.17	0.00	3,586.36			
12/6/2001	-	not measured	-			
03/11/02	62.11	0.00	3585.42			
6/17/02	62.53	0.00	3,585.00			
9/16/2002	62.43	0.00	3,585.10			
MW-2	3,644.84	8/10/1992	52.82	0.00	3,592.02	(1)
		2/9/1993	49.60	0.00	3,595.24	
		8/18/1993	49.71	0.00	3,595.13	
		1/26/1994	49.97	0.00	3,594.87	
		5/3/1995	-	-	-	(4),(5)
MW-3	3,645.00	8/10/1992	52.99	0.00	3,592.01	(1)
		2/9/1993	52.72	0.00	3,592.28	
		8/18/1993	52.82	0.00	3,592.18	
		1/26/1994	53.05	0.00	3,591.95	
		5/3/1995	54.31	0.00	3,590.69	
		7/31/1995	51.24	0.00	3,593.76	
		11/14/1995	51.10	0.00	3,593.90	
		2/23/1996	51.68	0.00	3,593.32	
		5/31/1996	51.45	0.00	3,593.55	
		8/23/1996	51.55	0.00	3,593.45	
		12/2/1996	52.23	0.00	3,592.77	
		3/12/1997	52.67	0.00	3,592.33	
		6/12/1997	52.68	0.00	3,592.32	
		9/11/1997	52.71	0.00	3,592.29	
		12/10/1997	52.89	0.00	3,592.11	
		3/23/1998	53.22	0.00	3,591.78	
		6/23/1998	53.66	0.00	3,591.34	
		9/30/1998	54.06	0.00	3,590.94	
		12/9/1998	54.36	0.00	3,590.64	
		3/10/1999	54.72	0.00	3,590.28	
		6/10/1999	55.17	0.00	3,589.83	
		7/2/1999	55.15	0.00	3,589.85	
		9/14/1999	55.42	0.00	3,589.58	
		12/9/1999	55.78	0.00	3,589.22	
		3/9/2000	56.23	0.00	3,588.77	
		6/8/2000	56.66	0.00	3,588.34	
		9/13/2000	56.77	0.00	3,588.23	
12/07/00	57.15	0.00	3,587.85			
03/08/01	57.69	0.00	3,587.31			
6/21/01	58.34	0.00	3,586.66			

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-3	3,645.00	9/10/01	58.54	0.00	3,586.46	
		12/6/2001	59.04	0.00	3,585.96	
		03/11/02	59.50	0.00	3,585.50	
		6/17/02	59.83	0.00	3,585.17	
		9/16/2002	59.80	0.00	3,585.20	
MW-4	3,645.28	8/10/1992	50.55	0.00	3,594.73	(1)
		2/9/1993	50.26	0.00	3,595.02	
		8/18/1993	50.38	0.00	3,594.90	
		1/26/1994	50.90	0.30	3,594.63	
		5/3/1995	51.51	0.45	3,594.14	
		7/31/1995	51.74	0.26	3,593.75	
		11/14/1995	51.03	0.00	3,594.25	
		2/23/1996	51.65	0.01	3,593.64	
		5/31/1996	51.48	0.00	3,593.80	
		8/23/1996	53.49	0.00	3,591.79	
		12/2/1996	52.32	0.00	3,592.96	
		3/12/1997	52.74	0.05	3,592.58	
		6/12/1997	53.08	0.44	3,592.56	
		9/12/1997	52.60	0.15	3,592.80	
		12/10/1997	52.89	0.00	3,592.39	PSH Sheen
		3/24/1998	53.20	0.25	3,592.29	
		6/23/1998	53.82	0.22	3,591.64	
		9/30/1998	53.96	0.00	3,591.32	200 ml PSH
		12/9/1998	54.27	0.00	3,591.01	
		3/10/1999	54.69	0.04	3,590.62	
		6/10/1999	55.07	0.00	3,590.21	
		7/2/1999	55.10	0.00	3,590.18	
		9/14/1999	55.33	0.00	3,589.95	
		12/9/1999	55.79	0.00	3,589.49	
		3/10/2000	56.12	0.00	3,589.16	
		6/8/2000	56.67	0.00	3,588.61	
		9/13/2000	56.65	0.00	3,588.63	
		12/07/00	57.05	0.00	3,588.23	
		03/08/01	57.72	0.00	3,587.56	
		6/21/01	58.18	0.00	3,587.10	
		9/10/01	58.54	0.00	3,586.74	
		12/6/2001	58.88	0.00	3,586.40	
		03/11/02	59.41	0.00	3,585.87	
6/17/02	59.67	0.00	3,585.61			
9/16/2002	59.71	0.00	3,585.57			
MW-5	3,647.72	8/10/1992	52.38	0.00	3,595.34	(1)
		2/9/1993	52.06	0.00	3,595.66	
		8/18/1993	52.16	0.00	3,595.56	
		1/26/1994	52.50	0.00	3,595.22	
		5/3/1995	53.57	0.00	3,594.15	
		7/31/1995	53.27	0.00	3,594.45	
		11/14/1995	52.83	0.00	3,594.89	
		2/23/1996	53.57	0.00	3,594.15	
		5/31/1996	53.16	0.00	3,594.56	
		8/23/1996	53.41	0.00	3,594.31	
		12/2/1996	53.98	0.00	3,593.74	
		3/12/1997	54.44	0.00	3,593.28	
		6/12/1997	54.48	0.00	3,593.24	
		9/12/1997	54.29	0.00	3,593.43	
		12/10/1997	54.66	0.00	3,593.06	
		3/23/1998	55.05	0.00	3,592.67	
		6/23/1998	55.44	0.00	3,592.28	
		9/30/1998	55.65	0.00	3,592.07	
		12/9/1998	56.00	0.00	3,591.72	
		3/9/1999	56.45	0.00	3,591.27	
		6/10/1999	56.91	0.00	3,590.81	
		7/2/1999	56.93	0.00	3,590.79	
		9/14/1999	57.12	0.00	3,590.60	
		12/9/1999	57.41	0.00	3,590.31	
		3/9/2000	57.92	0.00	3,589.80	
		6/8/2000	58.32	0.00	3,589.40	
		9/13/2000	58.36	0.00	3,589.36	
		12/07/00	58.71	0.00	3,589.01	
		03/08/01	59.36	0.00	3,588.36	
		6/21/01	59.94	0.00	3,587.78	

Table 2
 Cumulative Groundwater Elevation Data
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-5	3,647.72	9/10/01	59.85	0.00	3,587.87	
		12/6/2001	60.56	0.00	3,587.16	
		3/11/02	61.12	0.00	3,586.60	
		6/17/02	61.43	0.00	3,586.29	
		9/16/2002	61.52	0.00	3,586.20	
MW-6	3,644.74	2/9/1993	50.58	0.00	3,594.16	(1)
		8/18/1993	50.78	0.00	3,593.96	
		1/26/1994	51.00	0.00	3,593.74	
		5/3/1995	52.63	0.00	3,592.11	
		7/31/1995	51.90	0.00	3,592.84	
		11/14/1995	51.19	0.00	3,593.55	
		2/23/1996	52.10	0.00	3,592.64	
		5/31/1996	51.76	0.00	3,592.98	
		8/23/1996	51.63	0.00	3,593.11	
		12/2/1996	52.85	0.00	3,591.89	
		3/12/1997	53.55	0.00	3,591.19	
		6/12/1997	52.08	0.00	3,592.66	
		9/11/1997	53.72	0.00	3,591.02	
		12/10/1997	53.27	0.00	3,591.47	
		3/23/1998	53.56	0.00	3,591.18	
		6/23/1998	52.88	0.00	3,591.86	
		9/30/1998	54.89	0.00	3,589.85	
		12/9/1998	54.57	0.00	3,590.17	
		3/10/1999	55.10	0.00	3,589.64	
		7/2/1999				(5),(6)
MW-7	3,644.55	2/9/1993	50.53	0.00	3,594.02	(1)
		8/18/1993	50.74	0.00	3,593.81	
		1/26/1994	51.01	0.00	3,593.54	
		5/3/1995	52.25	0.00	3,592.30	
		7/31/1995	51.92	0.00	3,592.63	
		11/14/1995	51.48	0.00	3,593.07	
		2/23/1996	52.15	0.00	3,592.40	
		5/31/1996	51.78	0.00	3,592.77	
		8/23/1996	52.02	0.00	3,592.53	
		12/2/1996	52.52	0.00	3,592.03	
		3/12/1997	52.99	0.00	3,591.56	
		6/12/1997	53.08	0.00	3,591.47	
		9/11/1997	53.00	0.00	3,591.55	
		12/10/1997	53.28	0.00	3,591.27	
		3/23/1998	53.59	0.00	3,590.96	
		6/23/1998	54.20	0.00	3,590.35	
		9/30/1998	54.54	0.00	3,590.01	
		12/9/1998	54.74	0.00	3,589.81	
		3/9/1999	55.15	0.00	3,589.40	
		6/10/1999	55.66	0.00	3,588.89	
		7/2/1999	55.73	0.00	3,588.82	
		9/13/1999	55.94	0.00	3,588.61	
		12/9/1999	56.38	0.00	3,588.17	
		3/9/2000	56.74	0.00	3,587.81	
		6/8/2000	57.17	0.00	3,587.38	
		9/13/2000	57.40	0.00	3,587.15	
		12/07/00	57.77	0.00	3,586.78	
		03/08/01	58.29	0.00	3,586.26	
		6/21/01	58.91	0.00	3,585.64	
		9/10/01	59.25	0.00	3,585.30	
12/6/2001	59.75	0.00	3,584.80			
03/11/02	60.03	0.00	3,584.52			
6/17/02	60.39	0.00	3,584.16			
9/16/2002	60.39	0.00	3,584.16			
MW-8	3,644.87	2/9/1993	50.48	0.00	3,594.39	(1)
		8/18/1993	50.67	0.00	3,594.20	
		1/26/1994	50.96	0.00	3,593.91	
		5/3/1995	52.15	0.00	3,592.72	
		7/31/1995	51.77	0.00	3,593.10	
		11/14/1995	51.37	0.00	3,593.50	
		2/23/1996	52.17	0.00	3,592.70	
		5/31/1996	51.55	0.00	3,593.32	
		8/23/1996	51.92	0.00	3,592.95	
		12/2/1996	52.43	0.00	3,592.44	
		3/12/1997	52.93	0.00	3,591.94	

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-8	3,644.87	6/12/1997	53.96	0.00	3,590.91	(3)
		9/11/1997	52.73	0.00	3,592.14	
		12/10/1997	53.15	0.00	3,591.72	
		3/23/1998	53.51	0.00	3,591.36	
		6/23/1998	54.01	0.00	3,590.86	
		9/30/1998	54.35	0.00	3,590.52	
		12/9/1998	54.60	0.00	3,590.27	
		3/9/1999	55.00	0.00	3,589.87	
		6/10/1999	55.56	0.00	3,589.31	
		7/2/1999	55.57	0.00	3,589.30	
		9/13/1999	55.72	0.00	3,589.15	
		12/9/1999	-	-	-	
		3/9/2000	56.52	0.00	3,588.35	
		06/00	-	-	-	
		09/00	-	-	-	
		12/00	-	-	-	
		03/08/01	58.11	0.00	3,586.76	
		6/21/01	58.72	0.00	3,586.15	
		9/10/01	58.94	0.00	3,585.93	
		12/6/2001		not measured		
		03/11/02	59.94	0.00	3,584.93	
		6/17/02	60.22	0.00	3,584.65	
		9/16/2002	60.24	0.00	3,584.63	
MW-9	3,644.78	4/22/1993	49.73	0.00	3,595.05	(1)
		7/15/1993	49.65	0.00	3,595.13	
		8/18/1993	49.85	0.00	3,594.93	
		1/26/1994	50.02	0.00	3,594.76	
		5/3/1995	51.35	0.00	3,593.43	
		7/31/1995	50.97	0.00	3,593.81	
		11/14/1995	50.43	0.00	3,594.35	
		2/23/1996	51.12	0.00	3,593.66	
		5/31/1996	50.89	0.00	3,593.89	
		8/23/1996	50.98	0.00	3,593.80	
		12/2/1996	51.58	0.00	3,593.20	
		3/12/1997	52.21	0.05	3,592.61	
		6/12/1997	52.10	0.00	3,592.68	
		9/12/1997	51.95	0.00	3,592.83	
		12/10/1997	52.37	0.00	3,592.41	
		3/23/1998	52.68	0.00	3,592.10	
		6/23/1998	53.08	0.00	3,591.70	
		9/30/1998	53.39	0.01	3,591.40	
		12/9/1998	53.68	0.00	3,591.10	
		3/10/1999	54.15	0.00	3,590.63	
		6/10/1999	54.68	0.00	3,590.10	
		7/2/1999	54.71	0.00	3,590.07	
		9/13/1999	54.71	0.00	3,590.07	
12/9/1999	-	-	-			
3/9/2000	55.69	0.00	3,589.09			
06/00	-	-	-			
09/00	-	-	-			
12/00	-	-	-			
03/08/01	57.03	0.00	3,587.75			
6/21/01	57.91	0.00	3,586.87			
9/10/01	57.95	0.00	3,586.83			
12/6/2001		not measured				
03/11/02	58.96	0.00	3,585.82			
6/17/02	59.14	0.00	3,585.64			
9/16/2002		not measured				
MW-10	3,644.47	8/18/1993	51.54	0.00	3,592.93	(1)
		1/26/1994	51.90	0.00	3,592.57	
		5/3/1995	52.97	0.00	3,591.50	
		7/31/1995	52.87	0.00	3,591.60	
		11/14/1995	52.51	0.00	3,591.96	
		2/23/1996	53.05	0.00	3,591.42	
		5/31/1996	52.79	0.00	3,591.68	
		8/23/1996	53.03	0.00	3,591.44	
		12/2/1996	53.41	0.00	3,591.06	

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-10	3,644.47	3/12/1997	54.21	0.00	3,590.26	
		6/12/1997	53.99	0.00	3,590.48	
		9/12/1997	53.94	0.00	3,590.53	
		12/10/1997	54.12	0.00	3,590.35	
		3/23/1998	54.51	0.00	3,589.96	
		6/23/1998	55.12	0.00	3,589.35	
		9/30/1998	55.61	0.00	3,588.86	
		12/9/1998	55.80	0.00	3,588.67	
		3/9/1999	56.09	0.00	3,588.38	
		6/10/1999	56.60	0.00	3,587.87	
		7/2/1999	56.64	0.00	3,587.83	
		9/14/1999	56.91	0.00	3,587.56	
		12/9/1999	57.37	0.00	3,587.10	
		3/10/2000	57.71	0.00	3,586.76	
		6/8/2000	58.08	0.00	3,586.39	
		9/13/2000	58.44	0.00	3,586.03	
		12/07/00	58.89	0.00	3,585.66	
		03/09/01	59.31	0.00	3,585.24	
		6/21/01	59.89	0.00	3,584.66	
		9/10/01	61.34	0.00	3,583.21	
12/6/2001	60.65	0.00	3,583.90			
03/11/02	60.69	0.00	3,583.86			
6/17/02	60.98	0.00	3,583.57			
9/16/2002	61.00	0.00	3,583.55			
MW-11	3,643.78	8/18/1993	51.92	0.00	3,592.63	(1)
		1/26/1994	52.32	0.00	3,591.46	
		5/3/1995	53.38	0.00	3,590.40	
		7/31/1995	53.35	0.00	3,590.43	
		11/14/1995	52.96	0.00	3,590.82	
		2/23/1996	53.50	0.00	3,590.28	
		5/31/1996	53.25	0.00	3,590.53	
		8/23/1996	53.49	0.00	3,590.29	
		12/2/1996	53.79	0.00	3,589.99	
		3/12/1997	53.81	0.00	3,589.97	
		6/12/1997	53.96	0.00	3,589.82	
		9/12/1997	52.93	0.00	3,590.85	
		12/10/1997				(5),(6)
MW-11A	3,644.24	3/23/1998	54.79	0.00	3,589.45	(7)
		6/23/1998	55.43	0.00	3,588.81	
		9/30/1998	55.96	0.00	3,588.28	
		12/9/1998	56.13	0.00	3,588.11	
		3/10/1999	56.43	0.00	3,587.81	
		6/10/1999	56.94	0.00	3,587.30	
		7/2/1999	57.01	0.00	3,587.23	
		9/14/1999	57.36	0.00	3,586.88	
		12/9/1999	57.72	0.00	3,586.52	
		3/9/2000	58.01	0.00	3,586.23	
		6/8/2000	58.40	0.00	3,585.84	
		9/13/2000	58.84	0.00	3,585.40	
		12/07/00	59.29	0.00	3,584.95	
		03/08/01	59.72	0.00	3,584.52	
		6/21/01	60.28	0.00	3,583.96	
		9/10/01	60.69	0.00	3,583.55	
		12/6/2001	60.88	0.00	3,583.36	
03/11/02	61.42	0.00	3,582.82			
6/17/02	61.55	0.00	3,582.69			
9/16/2002	61.59	0.00	3,582.65			
MW-12	3,644.29	3/23/1998	54.72	0.00	3,589.57	(7)
		6/23/1998	55.48	0.00	3,588.81	
		9/30/1998	56.02	0.00	3,588.27	

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-12	3,644.29	12/9/1998	56.17	0.00	3,588.12	
		3/10/1999	56.45	0.00	3,587.84	
		6/10/1999	56.97	0.00	3,587.32	
		7/2/1999	56.99	0.00	3,587.30	
		9/14/1999	57.41	0.00	3,586.88	
		12/9/1999	57.76	0.00	3,586.53	
		3/10/2000	58.08	0.00	3,586.21	
		6/8/2000	58.42	0.00	3,585.87	
		9/13/2000	58.85	0.00	3,585.44	
		12/07/00	59.31	0.00	3,584.98	
		03/08/01	59.76	0.00	3,584.53	
		6/21/01	60.29	0.00	3,584.00	
		9/10/01	60.79	0.00	3,583.50	
		well dry during this and subsequent monitoring events				
MW-12D	3,644.38	7/2/1999	57.13	0.00	3,587.25	(8)
		9/14/1999	57.74	0.00	3,586.64	
		12/9/1999	57.86	0.00	3,586.52	
		3/9/2000	58.24	0.00	3,586.14	
		6/8/2000	58.56	0.00	3,585.82	
		09/00	-	-	-	
		12/00	-	-	-	
		03/08/01	-	-	-	
		6/21/01	-	-	-	
		9/10/01	-	-	-	
		12/6/2001	61.30	0.00	3,583.08	
		03/11/02	61.61	0.00	3,582.77	
		6/17/02	61.71	0.00	3,582.67	
9/16/2002	61.75	0.00	3,582.63			
MW-13	3,645.52	7/2/1999	56.60	0.00	3,588.92	(9)
		9/14/1999	56.92	0.00	3,588.60	
		12/9/1999	57.28	0.00	3,588.24	
		3/10/2000	57.68	0.00	3,587.84	
		6/8/2000	58.04	0.00	3,587.48	
		9/13/2000	58.29	0.00	3,587.23	
		12/07/00	58.68	0.00	3,586.84	
		03/08/01	59.19	0.00	3,586.33	
		6/21/01	59.80	0.00	3,585.72	
		9/10/01	60.03	0.00	3,585.49	
		12/6/2001	60.59	0.00	3,584.93	
		03/11/02	60.94	0.00	3,584.58	
		6/17/02	61.28	0.00	3,584.24	
9/16/2002	61.23	0.00	3,584.29			
MW-14	3,642.45	03/08/01	61.07	0.00	3,581.38	
		6/21/01	61.71	0.00	3,580.74	
		9/10/01	62.31	0.00	3,580.14	
		12/6/2001	62.80	0.00	3,579.65	
		03/11/02	62.70	0.00	3,579.75	
		6/17/02	62.65	0.00	3,579.80	
		9/16/2002	62.55	0.00	3,579.90	
MW-15	3,643.24	03/08/01	59.79	0.00	3,583.45	
		6/21/01	60.49	0.00	3,582.75	
		9/10/01	61.02	0.00	3,582.22	
		12/6/2001	61.47	0.00	3,581.77	
		03/11/02	61.65	0.00	3,581.59	
		6/17/02	61.68	0.00	3,581.56	
		9/16/2002	61.47	0.00	3,581.77	
OW-4	3,644.06	7/2/1999	58.18	0.00	3,585.88	(8)
		9/14/1999	58.63	0.00	3,585.43	
		12/9/1999	58.92	0.00	3,585.14	
		3/9/2000	59.19	0.00	3,584.87	

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
OW-4	3,644.06	6/8/2000	59.56	0.00	3,584.50	(10)
		9/13/2000	60.16	0.00	3,583.90	
		12/07/00	61.15	0.00	3,582.91	
		03/08/01	61.43	0.00	3,582.63	
		6/21/01	61.48	0.00	3,582.58	
		9/10/01	61.53	0.00	3,582.53	
		12/6/2001	well dry during this and subsequent monitoring events			

- (1) - Top of casing elevations and groundwater elevations of all monitor wells were relative to an arbitrary datum of 100.00 feet prior to March 1997 and have been converted to Mean Sea Level (MSL).
- (2) - For wells having measurable thickness of free product, the groundwater elevation was calculated as follows:
Groundwater Elevation = (TOC elevation)-(depth to groundwater)+[(free product thickness)x(SG of free product)]
Note: The specific gravity (SG) of the free product is 0.82.
- (3) - Not measured.
- (4) - Monitor well MW-2 could not be located after January 1994.
- (5) - Well plugged and abandoned July 2, 1999.
- (6) - Monitor well MW-11 could not be located after September 12, 1997.
- (7) - TOC elevations for MW-11A and MW-12 estimated relative to TOC elevation for MW-10.
- (8) - TOC elevations for MW-12D and OW-4 estimated relative to TOC elevation for MW-12.
- (9) - TOC elevation for MW-13 estimated relative to TOC elevation for MW-7.
- (10) - Well dry (measured depth to water is below base of screen), true groundwater elevation is less than listed groundwater elevation.

Table 3
September 16, 2002 Field Screening Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Cumulative Gallons Removed	pH	Temperature (°C)	Conductivity (umhos/cm)	Redox (mV)	Dissolved Oxygen (meter) (mg/L)	Dissolved Oxygen (Hach kit) (mg/L)	Ferrous Iron (mg/L)	Alkalinity (mg/L)
MW-5	1.5	8.35	19.29	1058	370.9	5.73	9.0	0.0	249
MW-10	0.5	8.17	21.09	2148	-102.0	3.70	NM	NM	844
MW-11A	1.5	8.34	20.62	5569	-62.2	3.26	8.25	0.0	364
MW-12D	1.25	8.93	19.32	1089	-114.0	0.23	0.0	7.25	262
MW-14	3.5	8.78	19.31	1879	141.1	6.23	NM	NM	NM
MW-15	3.0	8.78	18.97	1462	124.2	6.35	NM	NM	NM

Monitor wells MW-1, MW-8, and MW-9 not sampled.

Monitor well MW-2 not operative after January 1994; P&A'd 7/1/99.

Monitor well MW-6 P&A'd 7/1/99.

Monitor well MW-11 not operative after September 1997; P&A'd 7/1/99.

Monitor wells MW-12 and OW-4 were dry.

NM=Not Measured

Alkalinity reported as bicarbonate.

Lab measurement reported for alkalinity.

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-1	8/10/92	Regular	5550.0	12090.0	2160.0	7370.0	NA	NA
	2/9/93	Regular	2100.0	6500.0	1300.0	7400.0	NA	NA
	8/19/93	Regular	3200.0	7300.0	1200.0	3700.0	NA	NA
	1/27/94	Regular	1930.0	4580.0	672.0	2390.0	NA	NA
	5/3/95	Regular	NSP	NSP	NSP	NSP	NA	NSP
	8/1/95	Regular	390.0	1300.0	230.0	800.0	NA	5.7
	11/15/95	Regular	880.0	1800.0	300.0	970.0	NA	6.8
	2/23/96	Regular	1500.0	3700.0	620.0	2200.0	NA	21
	5/31/96	Regular	1100.0	1700.0	380.0	990.0	NA	7.5
	8/23/96	Regular	1800.0	3300.0	570.0	2100.0	NA	17
	12/2/96	Regular	5600.0	9600.0	2100.0	9600.0	100	64
	3/12/97	Regular	5500.0	9700.0	2600.0	8200.0	22	62
	6/12/97	Regular	5300.0	34000.0	7500.0	27000.0	180	160
	9/12/97	Regular	1800.0	4400.0	1000.0	3000.0	23	21
	12/10/97	Regular	7600.0	12000.0	2800.0	8200.0	11	71
	3/24/98	Regular	4800.0	7200.0	1200.0	2400.0	4.2	38
	6/23/98	Regular	53.0	680.0	580.0	1400.0	1.4	9.2
	9/30/1998	Regular	3.2	90.0	280.0	970.0	2.5	3.6
	12/10/1998	Regular	< 1.0	1.5	17.0	110.0	1.4	0.31
	3/10/1999	Regular	< 1.0	< 1.0	8.2	110.0	0.62	0.85
	3/10/1999	Duplicate	< 1.0	< 1.0	7.9	110.0	0.66	0.84
	6/10/1999	Regular	< 1.0	1.1	< 1.0	28.0	0.53	0.55
	6/10/1999	Duplicate	< 1.0	1.8	< 1.0	41.0	0.69	0.76
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	-	NS	NS	NS	NS	NS	NS
	3/9/2000	Regular	< 1	< 1	< 1	9.1	14	1.3
	6/8/2000	-	NS	NS	NS	NS	NS	NS
	9/13/2000	-	NS	NS	NS	NS	NS	NS
	12/7/2000	-	NS	NS	NS	NS	NS	NS
	3/8/2001	Regular	2.0	< 1	< 1	< 1	0.49	0.58
	6/21/2001	-	NS	NS	NS	NS	NS	NS
	9/10/2001	-	NS	NS	NS	NS	NS	NS
12/6/2001	-	NS	NS	NS	NS	NS	NS	
3/12/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
6/18/2002	-	NS	NS	NS	NS	NS	NS	
9/16/2002	-	NS	NS	NS	NS	NS	NS	
MW-2 ¹	8/10/92	Regular	14.9	< 4	< 4	< 4	NA	NA
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	100.0	12.0	3.0	13.0	NA	NA
	1/27/94	Regular	< 1	1.2	2.0	2.5	NA	NA
MW-3	8/10/92	Regular	304.9	2099.0	6760.0	1586.0	NA	NA
	2/9/93	Regular	130.0	< 10	< 10	190.0	NA	NA
	8/19/93	Regular	560.0	3100.0	630.0	1900.0	NA	NA
	1/27/94	Regular	1070.0	5380.0	510.0	3120.0	NA	NA
	5/4/95	Regular	770.0	3300.0	470.0	1800.0	NA	NA
	8/1/95	Regular	490.0	2900.0	890.0	1600.0	NA	14
	11/15/95	Regular	250.0	1000.0	180.0	440.0	NA	2.9
	2/23/96	Regular	120.0	810.0	170.0	560.0	NA	4
	5/31/96	Regular	670.0	3900.0	1200.0	2300.0	NA	15
	8/23/96	Regular	330.0	2200.0	590.0	1500.0	NA	12
	12/2/96	Regular	220.0	1800.0	670.0	1000.0	0.89	7.4
3/12/97	Regular	370.0	2000.0	960.0	1400.0	1.8	11	
MW-3	6/12/97	Regular	860.0	4800.0	1700.0	2600.0	1.9	20
	9/11/97	Regular	770.0	3000.0	1600.0	1900.0	1.6	16
	12/10/97	Regular	240.0	740.0	500.0	450.0	0.59	5.3
	3/24/98	Regular	140.0	630.0	360.0	310.0	0.56	3.9
	6/23/98	Regular	100.0	720.0	350.0	490.0	0.40	4.9
	9/30/1998	Regular	42.0	470.0	450.0	530.0	1.0	3.8
12/10/1998	Regular	13.0	220.0	160.0	290.0	1.3	0.43	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
	3/10/1999	Regular	3.2	7.4	42.0	32.0	0.2	0.44
	6/10/1999	Regular	1.7	3.1	<1.0	36.0	< 0.20	0.18
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.32	< 0.1
	6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.22	< 0.1
	9/13/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/7/2000	Regular	< 1	< 1	< 1	< 1	< 0.25	< 0.1
	3/8/2001	Regular	< 1	< 1	< 1	< 1	0.42	< 0.1
	6/21/2001	Regular	< 1	< 1	< 1	< 1	< 0.22	< 0.1
	9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/6/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/12/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/16/2002	-	NS	NS	NS	NS	NS	NS
MW-4	8/10/92	Regular	2594.0	10360.0	2160.0	6740.0	NA	NA
	2/9/93	Regular	5200.0	15000.0	2200.0	10000.0	NA	NA
	8/19/93	Regular	3000.0	12000.0	< 2000	7000.0	NA	NA
	1/27/94	Regular	NSP	NSP	NSP	NSP	NA	NSP
	5/3/95	Regular	NSP	NSP	NSP	NSP	NA	NSP
	8/1/95	Regular	5700.0	17000.0	3500.0	13000.0	NA	120
	11/15/95	Regular	490.0	1600.0	310.0	1100.0	NA	5.2
	2/23/96	Regular	360.0	2800.0	560.0	2500.0	NA	18
	5/31/96	Regular	84.0	830.0	280.0	1100.0	NA	6.2
	8/23/96	Regular	110.0	1400.0	430.0	1800.0	NA	9.8
	12/2/96	Regular	190.0	2000.0	1800.0	7200.0	56	43
	3/12/97	Regular	220.0	1500.0	1500.0	4400.0	27	27
	6/12/97	Regular	47.0	270.0	360.0	950.0	2.5	6.2
	9/12/97	Regular	92.0	840.0	670.0	2100.0	15	7.6
	12/10/97	Regular	230.0	750.0	970.0	2300.0	3.7	16
	3/24/98	Regular	150.0	510.0	270.0	620.0	1.2	5.6
	6/23/98	Regular	160.0	890.0	590.0	1600.0	0.69	10
	9/30/1998	Regular	80.0	180.0	370.0	840.0	2.0	3.9
	12/10/1998	Regular	28.0	70.0	210.0	960.0	9.3	4.3
	12/10/1998	Duplicate	26.0	62.0	180.0	830.0	3.9	4.3
	3/10/1999	Regular	8.0	20.0	250.0	1400.0	13.0	13
	6/10/1999	Regular	<1.0	<1.0	12.0	12.0	0.44	0.63
	9/14/1999	Regular	< 1.0	< 1.0	3.3	13.1	0.35	0.17
	12/9/1999	Regular	< 1	2.5	2.3	20.1	2	0.53
	3/10/2000	Regular	< 1	< 1	< 1	3.6	2.6	0.15
	6/8/2000	Regular	< 1	< 1	< 1	< 1	0.44	0.23
	9/13/2000	Regular	< 1	< 1	< 1	< 1	0.61	< 0.1
	12/7/2000	Regular	< 1	< 1	1.3	< 1	0.53	0.16
	3/8/2001	Regular	< 1	< 1	< 1	< 1	0.43	0.16
	6/21/2001	Regular	< 1	< 1	< 1	< 1	< 0.25	< 0.1
MW-4	9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/6/2001	Regular	< 1	< 1	< 1	< 1	0.6	< 1
	3/12/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/16/2002	-	NS	NS	NS	NS	NS	NS
MW-5	8/10/92	Regular	< 4	< 4	< 4	< 4	NA	NA
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/10/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	1/27/94	Regular	8.7	29.9	4.0	11.3	NA	NA
	5/3/95	Regular	3.7	5.3	0.9	4.6	NA	NA
	8/1/95	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	11/15/95	Regular	< 0.3	1.2	< 0.3	1.5	NA	NA
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	5/31/96	Regular	31.0	86.0	10.0	20.0	NA	NA

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	12/10/97	Regular	< 5	< 5	< 5	< 5	< 0.2	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	12/10/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.55	< 0.1
	6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/13/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/7/2000	Regular	< 1	< 1	< 1	< 1	< 0.25	< 0.1
	3/8/2001	Regular	< 1	< 1	< 1	< 1	0.56	< 0.1
	6/21/2001	Regular	< 1	< 1	< 1	< 1	0.26	< 0.1
	9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/6/2001	Regular	< 1	< 1	< 1	< 1	0.49	< 0.1
	3/12/2002	Regular	< 1	< 1	< 1	< 1	< 0.24	< 0.1
	6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/16/2002	Regular	< 0.074	< 0.11	< 0.068	< 0.082	0.3	< 0.05
MW-6 ¹	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	7000.0	19000.0	3100.0	7200.0	NA	NA
	8/19/93	Regular	8100.0	19000.0	3500.0	6400.0	NA	NA
	1/27/94	Regular	7960.0	20200.0	3830.0	6150.0	NA	NA
	5/4/95	Regular	11000.0	17000.0	2900.0	6000.0	NA	NA
	8/1/95	Regular	8300.0	12000.0	2500.0	5100.0	NA	60
	11/15/95	Regular	8900.0	17000.0	2900.0	5500.0	NA	57
	2/23/96	Regular	8100.0	10000.0	2300.0	4000.0	NA	58
	5/31/96	Regular	83.0	150.0	15.0	51.0	NA	0.57
	5/31/96	Duplicate	87.0	160.0	13.0	47.0	NA	0.52
	8/23/96	Regular	31.0	28.0	9.4	7.9	NA	0.46
	12/2/96	Regular	< 1	< 1	< 1	1.7	5.6	< 0.1
	3/12/97	Regular	12.0	< 5	6.8	18.0	12	< 0.5
	6/12/97	Regular	1900.0	1400.0	410.0	310.0	7.8	7.4
	9/11/97	Regular	11.0	1.3	3.4	< 1	1	< 0.1
MW-6	12/10/97	Regular	3.0	4.2	1.2	3.9	1.7	0.14
	3/23/98	Regular	3.6	< 1	4.0	< 1	< 0.2	< 0.1
	6/23/98	Regular	170.0	4.1	15.0	7.2	1.2	0.51
	9/30/1998	Regular	1000.0	420.0	140.0	270.0	4.0	3.3
	12/10/1998	Regular	7.6	6.6	1.7	5.8	2.0	< 0.1
	3/10/1999	Regular	2500.0	930.0	590.0	1400.0	11.0	13
MW-7	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	< 2	3.0	< 2	< 2	NA	NA
	1/27/94	Regular	1.1	< 1	< 1	< 1	NA	NA
	5/3/95	Regular	52.0	3.4	0.7	2.8	NA	NA
	8/1/95	Regular	22.0	2.2	0.9	2.8	NA	< 0.1
	11/15/95	Regular	8.4	0.8	< 0.3	0.9	NA	< 0.1
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	2/23/96	Duplicate	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	5/31/96	Regular	29.0	83.0	10.0	21.0	NA	0.25
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
	3/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/11/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	12/10/97	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	12/10/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	4.7	< 0.1
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 5	< 5	< 5	< 5	1.8	< 0.5
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.66	< 0.1
	6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.21	< 0.1
	9/13/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/7/2000	Regular	< 1	< 1	< 1	< 1	< 0.29	< 0.1
	3/8/2001	Regular	< 1	< 1	< 1	< 1	1.2	< 0.1
	6/21/2001	Regular	3.1	< 1	< 1	< 1	< 0.22	< 0.1
	9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.33	< 0.1
	12/6/2001	Regular	< 1	< 1	< 1	< 1	1.3	< 0.1
	3/12/2002	Regular	< 1	< 1	< 1	< 1	NA	< 0.1
	6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/16/2002	-	NS	NS	NS	NS	NS	NS
MW-8	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	< 2	< 2	< 2	< 2	NA	NA
	1/27/94	Regular	< 1	< 1	< 1	< 1	NA	NA
	5/3/95	Regular	3.0	4.9	0.8	3.7	NA	NA
	8/1/95	Regular	3.1	1.2	0.5	1.6	NA	< 0.001
	8/1/95	Duplicate	3.6	1.5	0.5	1.5	NA	< 0.1
	11/15/95	Regular	< 0.3	0.5	< 0.3	< 0.6	NA	< 0.1
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	5/31/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
MW-8	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	1.8	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/11/97	Regular	< 1	< 1	< 1	< 1	0.1	< 0.1
	12/10/97	Regular	< 1	< 1	< 1	< 1	0.3	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	12/10/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	-	NS	NS	NS	NS	NS	NS
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.55	< 0.1
	6/8/2000	-	NS	NS	NS	NS	NS	NS
	9/13/2000	-	NS	NS	NS	NS	NS	NS
	12/7/2000	-	NS	NS	NS	NS	NS	NS
	3/8/2001	Regular	< 1	< 1	< 1	< 1	1.6	< 0.1
	6/21/2001	-	NS	NS	NS	NS	NS	NS
	9/10/2001	-	NS	NS	NS	NS	NS	NS
	12/6/2001	-	NS	NS	NS	NS	NS	NS
	3/12/2002	Regular	< 1	< 1	< 1	< 1	0.38	< 0.1
	6/18/2002	-	NS	NS	NS	NS	NS	NS
	9/16/2002	-	NS	NS	NS	NS	NS	NS
MW-9	4/22/93	Regular	570.0	380.0	< 50	870.0	NA	NA

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
	7/15/93	Regular	121.0	7.3	3.0	458.0	NA	NA
	8/19/93	Regular	390.0	290.0	40.0	250.0	NA	NA
	1/27/94	Regular	327.0	357.0	51.1	293.0	NA	NA
	5/3/95	Regular	380.0	110.0	19.0	120.0	NA	NA
	8/1/95	Regular	660.0	410.0	91.0	310.0	NA	6.2
	11/15/95	Regular	240.0	24.0	11.0	140.0	NA	1.5
	11/15/95	Duplicate	170.0	18.0	10.0	120.0	NA	1.9
	2/23/96	Regular	170.0	18.0	2.3	160.0	NA	4.3
	5/31/96	Regular	120.0	16.0	3.0	200.0	NA	NA
	8/23/96	Regular	82.0	13.0	6.0	270.0	NA	4
	8/23/96	Duplicate	76.0	14.0	4.8	250.0	NA	4.4
	12/2/96	Regular	61.0	< 25	< 25	210.0	2.6	2.8
	12/2/96	Duplicate	86.0	13.0	2.4	270.0	3.7	2.9
	3/12/97	Regular	30.0	48.0	420.0	880.0	8.2	19
	6/12/97	Regular	4.7	2.1	11.0	97.0	2.6	2.2
	6/12/97	Duplicate	< 5	< 5	6.6	69.0	5.2	1.9
	9/12/97	Regular	2.1	2.3	2.1	120.0	1.2	1.9
	12/10/97	Regular	4.9	9.0	6.8	62.0	0.86	0.92
	3/24/98	Regular	< 1	< 1	< 1	26.0	0.9	1
	6/23/98	Regular	2.4	22.0	10.0	36.0	< 0.2	0.25
	9/30/1998	Regular	1.1	5.5	21.0	59.0	0.27	0.27
	12/10/1998	Regular	< 1.0	1.9	17.0	79.0	5.1	0.25
	3/10/1999	Regular	< 1.0	< 1.0	5.7	68.0	< 0.2	0.22
	6/10/1999	Regular	< 1.0	1.8	1.8	71.0	< 0.20	0.43
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	-	NS	NS	NS	NS	NS	NS
	3/9/2000	Regular	< 1	< 1	< 1	64.0	0.66	1.3
MW-9	6/8/2000	-	NS	NS	NS	NS	NS	NS
	9/13/2000	-	NS	NS	NS	NS	NS	NS
	12/7/2000	-	NS	NS	NS	NS	NS	NS
	3/8/2001	Regular	< 1	< 1	< 1	< 1	1.4	< 0.1
	6/21/2001	-	NS	NS	NS	NS	NS	NS
	9/10/2001	-	NS	NS	NS	NS	NS	NS
	12/6/2001	-	NS	NS	NS	NS	NS	NS
	3/12/2002	Regular	1	< 1	< 1	< 1	0.37	< 0.1
	6/18/2002	-	NS	NS	NS	NS	NS	NS
	9/16/2002	-	NS	NS	NS	NS	NS	NS
MW-10	8/19/93	Regular	190.0	460.0	< 200	240.0	NA	NA
	1/27/94	Regular	13.4	4.0	5.5	33.6	NA	NA
	5/4/95	Regular	980.0	15.0	11.0	84.0	NA	NA
	8/1/95	Regular	1300.0	32.0	32.0	100.0	NA	3.6
	11/15/95	Regular	1000.0	24.0	15.0	36.0	NA	1.7
	2/23/96	Regular	810.0	23.0	27.0	44.0	NA	2.4
	5/31/96	Regular	700.0	24.0	34.0	28.0	NA	2
	8/23/96	Regular	290.0	3.4	6.4	13.0	NA	1.4
	12/2/96	Regular	280.0	1.3	17.0	8.0	0.94	0.97
	3/12/97	Regular	110.0	< 5	17.0	< 5	0.61	0.57
	6/12/97	Regular	150.0	12.0	30.0	< 5	0.68	< 0.5
	9/12/97	Regular	87.0	2.3	26.0	2.7	0.76	0.33
	9/12/97	Duplicate	87.0	2.4	26.0	2.8	0.79	0.33
	12/10/97	Regular	41.0	9.8	12.0	7.7	1.1	0.28
	12/10/97	Duplicate	36.0	8.5	10.0	6.7	1.2	0.24
	3/23/98	Regular	36.0	< 5	5.9	< 5	1.6	< 0.5
	3/23/98	Duplicate	36.0	< 1	5.3	1.3	1.7	0.18
	6/23/98	Regular	37.0	< 5	< 5	< 5	2.1	< 0.5
	9/30/1998	Regular	84.0	3.2	30.0	2.2	1.4	0.36
	12/10/1998	Regular	29.0	1.0	7.0	1.0	0.86	0.18
	3/9/1999	Regular	28.0	< 5.0	5.8	< 5.0	0.92	< 0.5

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G		
			micrograms per liter, ug/L				milligrams per liter, mg/L			
	6/10/1999	Regular	17.0	<1.0	<1.0	<1.0	0.30	0.16		
	9/14/1999	Regular	10.0	<1.0	<1.0	<2.0	<0.20	<0.10		
	12/9/1999	Regular	23.0	<1	<1	1.2	0.44	0.16		
	3/10/2000	Regular	300.0	4.3	6.6	43.2	1.2	0.85		
	6/8/2000	Regular	78.0	1.7	7.2	9.0	0.67	0.74		
	9/13/2000	Regular	23.0	1.5	1.1	2.9	1.6	0.41		
	12/7/2000	Regular	7.2	<1	<1	<1	1.5	0.15		
	3/8/2001	Regular	3.4	1.1	<1	<1	3.4	0.2		
	6/22/2001	Regular	<1	<1	<1	<1	1.2	<0.1		
	9/10/01 and 9/18/01	Regular	2	<1	<1	<1	2.3	<0.1		
	12/6/2001	Regular	No Valid Data							
	3/12/2002	Regular	<1	<1	<1	<1	3.2	<0.1		
	6/18/2002	Regular	<1	<1	<1	<1	1.2	<0.1		
	9/16/2002	Regular	<0.074	<0.11	0.1	<0.082	3 J	<0.05		
MW-11 ¹	8/19/93	Regular	<2	<2	<2	<2	NA	NA		
	1/27/94	Regular	<1	<1	<1	<1	NA	NA		
	5/4/95	Regular	<0.3	<0.3	<0.3	<0.6	NA	NA		
	8/1/95	Regular	44.0	29.0	5.5	13.0	NA	0.2		
	11/15/95	Regular	190.0	2.8	6.2	11.0	NA	0.4		
	2/23/96	Regular	49.0	1.2	0.5	4.0	NA	0.25		
	5/31/96	Regular	300.0	83.0	12.0	28.0	NA	0.8		
	8/23/96	Regular	100.0	1.2	0.3	4.7	NA	0.26		
	12/2/96	Regular	970.0	<5	6.0	8.1	2	1.3		
	3/12/97	Regular	130.0	<5	13.0	5.8	0.42	<0.5		
	3/12/97	Duplicate	100.0	<5	10.0	5.1	0.43	<0.5		
	6/12/97	Regular	150.0	23.0	19.0	<5	1.1	0.55		
	9/12/97	Regular	220.0	15.0	27.0	13.0	1	0.46		
MW-11A	3/24/98	Regular	24.0	5.0	<5	<5	0.28	0.14		
	6/23/98	Regular	9.9	<5	<5	<5	<0.2	<0.5		
	9/30/1998	Regular	9.3	3.7	2.2	7.0	<0.20	0.1		
	12/10/1998	Regular	1.7	<1.0	<1.0	<1.0	<0.20	<0.1		
	3/10/1999	Regular	<5	<5	<5	<5	0.3	<0.5		
	6/10/1999	Regular	<1.0	<1.0	<1.0	<1.0	<0.20	<0.10		
	9/13/1999	Regular	<1.0	<1.0	<1.0	<2.0	<0.20	<0.10		
	12/9/1999	Regular	<5	<5	<5	<5	<0.2	<0.1		
	3/9/2000	Regular	1.2	<1	<1	<1	0.43	<0.1		
	6/8/2000	Regular	3.6	<1	<1	<1	0.37	<0.1		
	9/13/2000	Regular	1.4	<1	<1	<1	0.36	<0.1		
	12/7/00	Regular	26	<1	<1	3.3	0.3	0.12		
	3/8/01	Regular	12	<5	<5	<5	2.2	<0.5		
	6/22/2001	Regular	1.5	<1	<1	<1	1	<0.1		
	9/10/2001	Regular	7.9	<1	<1	<1	1.1	<0.1		
	12/6/2001	Regular	<1	<1	<1	<1	1	<0.1		
	3/12/2002	Regular	1.8	<1	<1	1	1.6	<0.1		
	6/18/2002	Regular	2.9	<0.1	1.3	<1	0.91	<0.1		
	9/16/2002	Regular	9.0	<0.11	41.0	<0.082	1 J	0.2		
MW-12	3/24/98	Regular	100.0	11.0	6.0	8.0	0.29	0.41		
	6/23/98	Regular	88.0	<5	<5	<5	<0.2	<0.5		
	6/23/98	Duplicate	89.0	<5	<5	<5	0.31	<0.5		
	9/30/1998	Regular	260.0	3.0	1.2	7.9	<0.20	0.62		
	12/10/1998	Regular	160.0	<1.0	<1.0	1.2	0.21	0.36		
	3/10/1999	Regular	160.0	1.1	<1.0	2.9	0.38	0.45		
	6/10/1999	Regular	49.0	1.4	<1.0	<1.0	0.22	0.13		
	9/14/1999	Regular	75.0	<1.0	<1.0	<2.0	<0.20	0.23		
	12/9/1999	Regular	64.0	<1	<1	<1	<0.2	0.21		
	3/10/2000	Regular	93.0	<1	<1	<1	<0.2	0.21		
	3/10/2000	Duplicate	99.0	<1	<1	<1	0.22	0.22		
	6/8/2000	Regular	62.0	<1	<1	<1	<0.2	<0.1		

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
	9/13/2000	Regular	34.0	< 1	< 1	< 1	0.23	< 0.1
	12/7/2000	Regular	27	< 1	2.9	1.9	<0.25	< 0.1
	3/8/2001	Regular	14	< 1	< 1	< 1	2.1	0.1
	6/22/2001	Regular	12	< 1	< 1	< 1	0.51	0.11
	9/10/2001		Well Dry (Not Sampled) During This and Subsequent Monitoring Events					
MW-12D	7/2/1999	Regular	< 5	< 5	< 5	< 5	<0.20	<0.10
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	<0.10
	12/9/1999	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.24	< 0.1
	6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/13/2000	-	NS	NS	NS	NS	NS	NS
	12/7/2000	-	NS	NS	NS	NS	NS	NS
	3/8/2001	-	NS	NS	NS	NS	NS	NS
	6/22/2001	-	NS	NS	NS	NS	NS	NS
	9/18/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/6/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/12/2002	Regular	< 1	< 1	< 1	< 1	0.44	< 0.1
	6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/16/2002	Regular	<0.074	<0.11	<0.068	<0.082	0.2	<0.05
MW-13	7/2/1999	Regular	1500.0	23.0	750.0	58.0	2.2	5.1
	9/14/1999	Regular	860.0	16.0	450.0	34.4	2.1	3.1
	12/9/1999	Regular	430.0	16.0	410.0	40.9	0.46	3.2
	3/10/2000	Regular	88.0	2.8	200.0	1.3	1.9	0.99
	6/8/2000	Regular	6.0	< 1	63.0	3.3	1.1	0.91
	9/13/2000	Regular	< 1.0	< 1.0	3.4	< 1.0	0.44	0.12
	12/7/2000	Regular	< 1	< 1	< 1	< 1	0.43	< 0.1
	3/8/2001	Regular	< 1	< 1	1.2	< 1	2	< 0.1
	6/22/2001	Regular	< 1	< 1	< 1	< 1	0.31	< 0.1
	9/10/2001	Regular	< 1	< 1	< 1	< 1	0.3	< 0.1
	12/6/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/12/2002	Regular	< 1	< 1	< 1	< 1	0.84	< 0.1
	6/18/2002	Regular	< 1	< 1	< 1	< 1	0.3	< 0.1
	9/16/2002	-	NS	NS	NS	NS	NS	NS
MW-14	1/14/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/16/2002	Regular	NA	NA	NA	NA	NA	NA
MW-15	1/14/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/16/2002	Regular	NA	NA	NA	NA	NA	NA
OW-4	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	4.4	< 0.2	< 0.10
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.2	< 0.1
	3/9/2000	Regular	< 1.0	< 1.0	< 1.0	< 1.0	0.25	< 0.1
	6/8/2000	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.21	< 0.1
	9/13/2000	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.2	< 0.1
	12/7/2000		Well Dry (Not Sampled) During This and Subsequent Monitoring Events					

¹ Well plugged and abandoned 7/1/99
 NA=Not Analyzed NS=Not Sampled NS-D=Not Sampled because well was dry
 NSP=Not Sampled due to Phase Separated Hydrocarbons

Table 5
 Cumulative Results⁽¹⁾ for Chloride⁽²⁾ Analyses
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Sample Date	Monitor Wells ⁽³⁾																
	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-11A	MW-12	MW-12D	MW-13	MW-14	MW-15	OW-4
8/1/95	160	150	310	130	380	310	350	110	2200	3400	NP ⁽⁴⁾	NP	NP	NP	NP	NP	NS ⁽⁵⁾
8/23/96	130	140	100	99	210	250	360	140	2000	2900	NP	NP	NP	NP	NP	NP	NS
3/23-24/98	212	206	126	151	183	223	364	164	2390	NS	940	1200	NP	NP	NP	NP	NS
3/9-10/99	163	156	142	155	411	238	274	123	1160	NS	834	314	NP	NP	NP	NP	NS
6/10-7/2/99	NA ⁽⁶⁾	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	195	496	NP	NP	266
3/9-10/00	258	196	196	196	NP	224	241	131	474	NP	1290	327	117	276	NP	NP	258
1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	368	219	NS
3/8-9/01	NA	165	172	152	NP	224	250	127	879	NP	1720	586	NS	276	327	NA	NS-D ⁽⁷⁾
6/21/2001	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NS	NA	222	222	NS-D
9/10/2001	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NS-D	NA	NA	245	228	NS-D
9/18/2001	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NS-D	78.8	NA	NA	NA	NS-D
12/6/2001	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NS-D	NA	NA	276	215	NS-D
3/11-12/02	177	172	183	127	NP	188	241	110	861	NP	1230	NS-D	75.8	207	284	224	NS-D
6/18/2002	NS	NA	NA	NA	NP	NA	NS	NS	NA	NP	NA	NS-D	NA	145	258	233	NS-D
9/16/2002	NS	NS	NS	121	NP	NS	NS	NS	1030	NP	1550	NS-D	86	NS	293	246	NS-D

(1) - in mg/L.

(2) - NMWQCC standard for chloride is 250 mg/L.

(3) - MW-2 not operative after May 3, 1995; P&A'd 7/1/99.
 MW-6 P&A'd 7/1/99.

MW-11 P&A'd 7/1/99.

MW-11A installed February 1998.

MW-12 installed February 1998.

MW-12D installed June 1999.

MW-13 installed June 1999.

MW-14 installed January 2001.

MW-15 installed January 2001.

(4) - NP indicates that well was not present at time of sampling event.

(5) - NS indicates that well was not sampled during applicable sampling event.

(6) - NA indicates that well was not analyzed for chloride during applicable sampling event.

(7) - NS-D indicates that well was dry (not sampled) during applicable sampling event.

Table 6
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells MW-5, MW-10, MW-11A, MW-12, and MW-12D
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-5	3/23/1998	3.87	190	< 0.0012
	3/9/1999	<0.1	195	< 0.0012
	6/10/1999	4.73	209	< 0.0012
	9/14/1999	4.3	210	< 0.0012
	12/9/1999	4.2	210	< 0.0012
	3/9/2000	5.3	260	< 0.0012
	6/8/2000	4.7	240	< 0.0012
	9/13/2000	3.93	200	< 0.0012
	12/7/2000	3.27	160	< 0.0012
	3/8/2001	3.24	180	< 0.0012
	6/21/2001	2.74	150	0.0017
	9/10/2001	NA ⁽²⁾	130	< 0.0012
	12/6/2001	2.38	120	< 0.0012
	3/12/2002	2.98	120	< 0.0012
	6/18/2002	2.56	110	0.002
9/16/2002	2.4	105	0.002	
MW-10	3/23/1998	0.07	320	0.91
	6/23/1998	< 0.1	325	0.55
	9/30/1998	< 0.1	204	0.81
	12/10/1998	< 0.1	180	0.091
	3/9/1999	< 0.1	142	0.035
			223 ⁽³⁾	
	9/14/1999	<0.10	160	0.0049
	12/9/1999	0.49	170	0.0039
	3/10/2000	0.1	160	0.0056
	6/8/2000	< 0.1	150	0.031
	9/13/2000	< 0.1	160	0.031
	12/7/2000	< 0.1	190	0.17
	3/8/2001	< 0.1	270	< 0.0012
	6/22/2001	< 0.1	270	0.044
	9/10/2001	NA	NA	NA
	3/12/2002	< 0.1	230	NA
6/18/2002	< 0.1	240	0.007	
9/16/2002	<0.03	318	0.006	

Table 6
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells MW-5, MW-10, MW-11A, MW-12, and MW-12D
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-11A	3/23/1998	< 0.05	190	0.14
	6/23/1998	< 0.1	225	0.11
	9/30/1998	0.4	196	0.043
	12/10/1998	0.7	188	0.033
	3/10/1999	< 0.1	164	0.094
		< 0.1 ⁽⁴⁾	227 ⁽³⁾	
	6/10/1999	< 0.1	181	0.0036
	9/13/1999	0.22	250	< 0.0012
	12/9/1999	< 0.1	290	0.0079
	3/9/2000	0.11	270	0.037
	6/8/2000	< 0.1	240	0.0069
	9/13/2000	< 0.1	320	< 0.0012
	12/7/2000	< 0.1	260	0.0096
	3/8/2001	< 0.1	330	0.0028
	6/22/2001	< 0.1	180	0.0074
	9/10/2001	NA	280	< 0.0012
	12/6/2001	< 0.1	240	0.0041
	3/12/2002	< 0.1	350	0.0044
	6/18/2002	< 0.1	560	0.0028
9/16/2002	0.3	383	< 0.0012	
MW-12	3/23/1998	< 0.05	240	< 0.0012
	6/23/1998	< 0.1	240	< 0.0012
	9/30/1998	< 0.1	168	< 0.0012
	12/10/1998	< 0.1	202	< 0.0012
	3/10/1999	< 0.1	137	< 0.0012
		< 0.1 ⁽⁴⁾	193 ⁽³⁾	
	6/10/1999	< 0.1	217	< 0.0012
	9/14/1999	< 0.10	230	< 0.0012
	12/9/1999	< 0.1	180	< 0.0012
	3/10/2000	< 0.1	210	< 0.0012
	6/8/2000	< 0.1	220	< 0.0012
	9/13/2000	< 0.1	240	< 0.0012
	12/7/2000	< 0.1	260	< 0.0012
	3/8/2001	< 0.1	300	< 0.0012

Table 6
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells MW-5, MW-10, MW-11A, MW-12, and MW-12D
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-12	6/22/2001	< 0.1	360	0.0021
	9/10/2001	Well Dry (Not Sampled) During This and Subsequent Monitoring Events		
MW-12D	9/18/2001	NA	190	< 0.0012
	12/6/2001	< 0.1	200	< 0.0012
	3/12/2002	< 0.1	200	< 0.0012
	6/18/2002	< 0.1	180	0.0012
	9/16/2002	0.06	172	<0.0012

⁽¹⁾ - By EPA Method 300, except as noted

⁽²⁾ - NA indicates not analyzed

⁽³⁾ - By EPA Method 375.4

⁽⁴⁾ - By EPA Method 353.3

⁽⁵⁾ - NS-D indicates not sampled (well dry)

mg/L = milligrams per liter

Appendices



APPENDICES

A



APPENDIX A

Groundwater Sampling Forms

WELL ID: MW-5

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 9/16/02 Time: 1515
 Client: BT services Personnel: Egbuluse/MORTH
 Project Location: Hobbs, NM Weather: 00s

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 91.52 feet 61.52 feet 61.52 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.52 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 2.98 feet Well Volume: 0.48 gal Screened Interval (from GS): _____
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s)
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. YSL-610
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____
 Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
1520	0.9	8.14	19.89	1082	350	5.63	—	—	clear
1525	1.5	8.35	19.29	1058	370.9	5.73	—	—	—

4. SAMPLING DATA

Method(s): Bailer, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing (Rope) Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-5 Sample Time: 1545 # of Containers: 10
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses
 Ferrous Iron: 0.0 mg/L
 DO: 9.0 mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

Well in good condition

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

A. MORTH
 Signature

WELL ID: MW-10

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 9/16/02 Time: 4:10
 Client: BT Services Personnel: Egbuluse, MWA
 Project Location: Hobbs, NM Weather: 80s

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 63.51 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.00 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 2.51 feet Well Volume: 0.40 gal Screened Interval (from GS): _____
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s):
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____ 1. YS1-610
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____ 2. _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
4:15	0.5	8.17	21.09	2198	-102.0	3.70	—	—	—
<i>well purged dry after removing 3-0.5 gallons</i>									

4. SAMPLING DATA

Method(s): Bailer, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-10 Sample Time: 7:30pm # of Containers: 8
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

of recharge well purged dry. Return to sample after 3 hours. well in good condition

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Amor
 Signature

WELL ID: MW-11A

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 9/16/02 Time: 5:03 pm
 Client: BT Services Personnel: MORTU/ Egbuluesi
 Project Location: Hobbs, NM Weather: BOS

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 63.82 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.59 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 2.23 feet Well Volume: 0.36 gal Screened Interval (from GS): _____
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s)
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. YSI-610
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____
 Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
5:10	1.0	8.34	20.62	5569	-62.2	3.26	—	—	—
1.5 gallons purged									
/									
/									
/									
/									
/									
/									

4. SAMPLING DATA

Method(s): Bailer, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-11A Sample Time: 5:15 # of Containers: 10
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: 0.0 mg/L
 DO: 8.25 mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

well in good condition

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Amor
 Signature

WELL ID: MW-12D

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 9/16/02 Time: 4:25 pm
 Client: BJ Services Personnel: Eghurtse/MOVI
 Project Location: Hobbs, NM Weather: 80s

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 87.58 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.75 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 25.83 feet Well Volume: 4.1 gal Screened Interval (from GS): _____
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: 0.083 gal/min
 Equipment Model(s):
 1. Yst-610
 2. _____
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other: <u>DTW*</u>	Comments
4:30	0.25	8.98	22.11	1126	-117.2	0.80	—	—	Black
4:33	0.50	8.95	19.93	1090	-117.2	0.37	—	—	—
4:36	0.75	8.92	19.42	1087	-109.8	0.24	—	—	cleaned up
4:39	1.0	8.92	19.39	1087	-110.8	0.24	—	—	—
4:42	1.25	8.93	19.32	1089	-114.0	0.23	—	—	—

4. SAMPLING DATA

Method(s): Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-12D Sample Time: 4:42 pm # of Containers: 10
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses
 Ferrous Iron: 0.0 mg/L ^{AM}
 DO: 7.25 mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

well in good condition.
 * DTW meter would not fit concurrently w/ submersible pump down.
Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Cumart
 Signature

WELL ID: MW-14

1. PROJECT INFORMATION

Project Number: 12.832 Task Number: 017 Date: 9/16/02 Time: 6:30pm
 Client: BJ services Personnel: MORTY Egboutse
 Project Location: Hobbs, NM Weather: 80s

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: NM feet (69.37) From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 62.55 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: 9160 AM - 82 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 6.82 feet Well Volume: 1.09 gal Screened Interval (from GS): _____
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s) _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. YSI-610
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____
 Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
7:00	1.0	8.84	19.26	1842	108.7	6.59	—	—	—
7:10	2.0	9.79	19.23	1884	129.3	6.31	—	—	—
7:20	3.5	8.78	19.31	1879	141.1	6.23	—	—	—
/									

4. SAMPLING DATA

Method(s): Bailer, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-14 Sample Time: 7:20pm # of Containers: 1
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

well in good condition

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

WELL ID: MW-15

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 9/16/02 Time: 5:40pm
 Client: BJ Services Personnel: MARTI/Eghuluese
 Project Location: Hobbs, NM Weather: 90's

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 67.01 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.97 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 5.54 feet Well Volume: 0.89 gal Screened Interval (from GS): _____
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 1.2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s):
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. YSI-610
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. —
 Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. —

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
6:04	1.0	9.02	19.30	1499	86.2	7.25	—	—	—
6:09	2.0	8.75	19.07	1513	106.8	6.69	—	—	—
6:14	3.0	8.78	18.97	1462	124.2	6.35	—	—	—
/									

4. SAMPLING DATA

Method(s): Bailer, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-15 Sample Time: 6:14pm # of Containers: 1
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

well in good condition

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Carmotta
Signature

B



APPENDIX B

Laboratory Analytical Report



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:
Brown & Caldwell

Certificate of Analysis Number:
02090533

Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	Project Name: BJ Hobbs 12832 Site: Hobbs, NM Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 10/9/02
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See TNRCC Laboratory Review Checklist for non conformance issues. These issues will be documented in the exceptions report of the checklist.

Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

Sonia West
Senior Project Manager

10/15/02

Date



LABORATORY DATA PACKAGE SIGNATURE PAGE

This Data Package consists of

- This signature page and the following Reportable Data:
- R1 Field Chain-of-Custody Documentation;
- R2 Sample Identification Cross-reference;
- R3 Test Reports (Analytical Data Sheets) for each environmental sample that includes:
 - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
 - b) dilution factors
 - c) preparation methods
 - d) cleanup methods, and
 - e) if required for the project, tentatively identified compounds (TICs).
- R4 Surrogate Recovery Data including:
 - a) Calculated %R, and
 - b) The Laboratory's QC limits.
- R5 Test Reports/Summary Forms for Blank Samples;
- R6 Laboratory Control Sample (LCS) Data including:
 - a) LCS spiking amounts,
 - b) Calculated %R for each analyte, and
 - c) The laboratory's LCS control limits
- R7 Test Reports for Matrix Spike/Matrix Spike Duplicates (MS/MSD) Including:
 - a) Samples associated with the MS/MSD clearly identified
 - b) MS/MSD spiking amounts,
 - c) Concentration of each MS/MSD analyte measured in the parent and spiked samples,
 - d) Calculated %Rs and Relative Percent Differences (RPDs), and
 - e) The laboratory's MS/MSD QC limits
- R8 Laboratory Analytical Duplicate (If Applicable) Recovery and Precision:
 - a) the amount of analyte measured in the duplicate,
 - b) the calculated RPD, and
 - c) the laboratory's QC limits for analytical duplicates.
- R9 List of Method Quantitation Limits (MQL's) for each analyte for each method and matrix;
- R10 Other problems or anomalies;
- The completed Laboratory Review Checklist, and
- An Exception Report for each item in the Laboratory Review Checklist noted with "No" or "Not Reviewed (NR)" or "Not Applicable (NA)".

Release Statement: "I am the laboratory manager, or his/her designee, and I am responsible for the release of this data package. This data package has been reviewed and is complete and technically compliant with the requirements of the methods used, except where noted in the attached exception reports. I affirm to the best of my knowledge that all problems/anomalies observed by this laboratory, (and if applicable, any and all laboratories subcontracted through this laboratory) that might affect the quality of the data, have been identified in the Laboratory Review Checklist, and that no information or data has been knowingly withheld that would affect the quality of the data."

Bernadette A. Fini
Name (printed)

Bernadette A. Fini
Signature

10/15/02
Date

Customer Service Manager
Official Title (Printed)

This laboratory is controlled by the person who by the signature below is releasing the data and is affirming that the laboratory data package meets the specifications in the above release statement.

Name (printed)

Signature

Date

Official Title (Printed)



TNRCC LABORATORY REVIEW CHECKLIST: REPORTABLE DATA

Laboratory Name:		SPL, Inc.	LRC Date:		10/15/02				
Project Name:		BJ Hobbs, NM # 12832	Laboratory Project Number:		02090533				
Reviewer Name:		Bernadette A. Fini	Prep Batch Number(s):		See enclosed QC report				
# ¹	Analysis ²	DESCRIPTION	YES	NO	NA ³	NR ⁴	ER # ⁵		
R1	OI	CHAIN-OF-CUSTODY (C-O-C):							
		1) Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		2) Were all departures from standard conditions described in an exception report?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
R2	OI	SAMPLE AND QUALITY CONTROL (QC) IDENTIFICATION:							
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		2) Are all laboratory ID numbers cross-referenced to the corresponding QC data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
R3	OI	TEST REPORTS:							
		1) Were samples prepared and analyzed within holding times?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		2) Other than those results <MQL, were all other raw values bracketed by calibration standards?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		3) Were calculations subject to independent checks by peer or supervisor?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		4) Were all analyte identifications subject to checks by peer supervisor?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		5) Were sample quantitation limits reported for all analytes not detected?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		6) Were results for soil and sediment reported on a dry weight basis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
		7) Were % moisture (or solids) reported for all soil and sediment samples?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
		8) If required for the project, were TIC's reported?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
R4	O	SURROGATE RECOVERY DATA:							
		1) Were surrogates added prior to extraction?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		2) Were surrogate percent recoveries in all samples within the laboratory QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
R5	OI	TEST REPORTS/SUMMARY FORMS FOR BLANK SAMPLES:							
		1) Were appropriate type(s) of blanks analyzed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		2) Were blanks analyzed at the appropriate frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		3) Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		4) Were blank concentrations <MQL?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
R6	OI	LABORATORY CONTROL SAMPLES (LCS's)							
		1) Were all COC's included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		2) Was each LCS taken through the entire analytical procedure, including preparation and, if applicable, cleanup procedures?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		3) Were LCS's analyzed at required frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		5) Does the detectability data document the laboratory's capability to detect the COC's at the MDL used to calculate the SQL's?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			533-01
		6) Was the LCSD RPD within QC limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			



TNRCC LABORATORY REVIEW CHECKLIST (continued): REPORTABLE DATA

Laboratory Name:		SPL, Inc.	LRC Date:		10/15/02		
Project Name:		BJ Hobbs, NM # 12832	Laboratory Project Number:		02090533		
Reviewer Name:		Bernadette A. Fini	Prep Batch Number(s):		See enclosed QC report		
#	Analysis ²	DESCRIPTION	YES	NO	NA ³	NR ⁴	ER # ⁵
R7	OI	MATRIX SPIKE (MS) and MATRIX SPIKE DUPLICATE (MSD) DATA:					
		1) Were all project/method specified analytes included in the MS and MSD?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		2) Were MS/MSD analyzed at the appropriate frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		3) Were MS (and MSD, if applicable) %Rs within the laboratory QC control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		4) Were MS/MSD RPDs within laboratory QC limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	533-02
R8	OI	ANALYTICAL DUPLICATE DATA:					
		1) Were appropriate analytical duplicates analyzed for each matrix?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		2) Were analytical duplicates analyzed at the appropriate frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		3) Were RPD's or relative standard deviations within the laboratory QC control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
R9	OI	METHOD QUANTITATION LIMITS (MQL'S)					
		1) Are the MQL's for each method analyte listed and included in the laboratory data package?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		2) Do the MQL's correspond to the concentration of the lowest non-zero calibration standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		3) Are unadjusted MQL's included in the laboratory data package?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
R10	OI	OTHER PROBLEMS/ANOMALIES:					
		1) Are all known problems/anomalies/special conditions noted in the LRC and ER?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		2) Were all necessary corrective actions performed successfully for the reported data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		3) If requested, is the justification for elevated SQL's documented?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Items identified by the letter "R" should be submitted to TNRCC in the Data Package. Items identified by the letter "S" should be retained and made available to the TNRCC upon request for a period of three years after the data are submitted.

² O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);

NA = Not applicable;

NR = Not Reviewed;

⁵ ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).



TNRCC LABORATORY REVIEW CHECKLIST (continued): SUPPORTING DATA

Laboratory Name:		SPL, Inc.	LRC Date:		10/15/02		
Project Name:		BJ Hobbs, NM # 12832	Laboratory Project Number:		02090533		
Reviewer Name:		Bernadette A. Fini	Prep Batch Number(s):		See enclosed QC report		
# ¹	Analysis ²	DESCRIPTION	YES	NO	NA ³	NR ⁴	ER # ⁵
S1	OI	INITIAL CALIBRATION (ICAL):					
		1) Were response factors (RFs) and/or relative response factors (RRFs) within the method-required QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		2) Were percent RSDs or correlation coefficient criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		3) Was the number of standards recommended in the method used for all analytes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		5) Are ICAL data available for all instruments used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		6) Has the initial calibration curve been verified using an appropriate second source standard?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S2	OI	INITIAL AND CONTINUING CALIBRATION VERIFICATION (ICV AND CCV):					
		1) Was the CCV analyzed at the method-required frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		2) Were percent differences for each analyte within the method-required QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		3) Was the ICAL curve verified for each analyte of interest?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S3	O	MASS SPECTRAL TUNING:					
		1) Was the appropriate compound for the method used for tuning?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		2) Were ion abundance data within the method-required QC limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S4	O	INTERNAL STANDARD (IS):					
		Were IS area counts and retention times within the method-required QC limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S5	OI	RAW DATA (NELAC Section 1 Appendix A Glossary, and Section 5.12):					
		1) Were the raw data (e.g., chromatograms, spectral data) reviewed by an analyst?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		2) Were all data associated with manual integrations flagged on raw data?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S6	O	DUAL COLUMN CONFIRMATION:					
		Did dual column confirmation results meet the method-required QC control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S7	O	TENTATIVELY IDENTIFIED COMPOUNDS (TIC's):					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S8	I	INTERFERENCE CHECK SAMPLE (ICS) RESULTS:					
		Were percent recoveries within method QC limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S9	I	SERIAL DILUTIONS, POST DIGESTION SPIKES, AND METHOD OF STANDARD ADDITIONS:					
		Were percent differences, recoveries, and linearity within the QC limits specified in the method?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S10	OI	PROFICIENCY TEST REPORTS:					
		Are proficiency testing or inter-laboratory comparison results on file?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S11	OI	METHOD DETECTION LIMIT (MDL) STUDIES:					
		1) Was an MDL study performed for each reported analyte?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		2) Is the MDL either adjusted or supported by the analysis of DCSs?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	533-03
S12	OI	STANDARDS DOCUMENTATION:					
		1) Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	



TNRCC LABORATORY REVIEW CHECKLIST (continued): SUPPORTING DATA

Laboratory Name:	SPL, Inc.	LRC Date:	10/15/02				
Project Name:	BJ Hobbs, NM # 12832	Laboratory Project Number:	02090533				
Reviewer Name:	Bernadette A. Fini	Prep Batch Number(s):	See enclosed QC report				
# ¹	Analysis ²	DESCRIPTION	YES	NO	NA ³	NR ⁴	ER # ⁵
S13	OI	COMPOUND/ANALYTE IDENTIFICATION PROCEDURES:					
		Are the procedures for compound/analyte identification documented?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S14	OI	DEMONSTRATION OF ANALYST COMPETENCY (DOC) :					
		1) Was DOC conducted consistent with NELAC 5C or ISO 4.2.2?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		2) Is documentation of the analyst's competency up-to-date of and on file?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S15	OI	VERIFICATION/VALIDATION DOCUMENTATION FOR METHODS					
		1) Are all the methods used to generate the data documented, verified, and validated, where applicable, (NELAC 5.10.2 or ISO/IEC 17025 Section 5.4.5)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
S16	OI	LABORATORY STANDARD OPERATING PROCEDURES(SOPS):					
		1) Are laboratory SOP's current and on file for each method performed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Items identified by the letter "R" should be submitted to TNRCC in the Data Package. Items identified by the letter "S" should be retained and made available

O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);

³ NA = Not applicable;

⁴ NR = Not Reviewed;

⁵ ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

02090533

Report To: Brown & Caldwell
 Rick Rexroad
 1415 Louisiana
 Suite 2509
 Houston
 TX
 77002-
 ph: (713) 759-0999 fax: (713) 308-3886

Project Name: BJ Hobbs 12832
Site: Hobbs, NM
Site Address:
PO Number:
State: New Mexico
State Cert. No.:
Date Reported: 10/9/2002

Fax To: Brown & Caldwell
 Rick Rexroad fax : (713) 308-3886

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
MW-5	02090533-01	Water	9/16/2002 3:45:00 PM	9/18/2002 8:00:00 AM	179997	<input type="checkbox"/>
MW-10	02090533-02	Water	9/16/2002 7:30:00 PM	9/18/2002 8:00:00 AM	179997	<input type="checkbox"/>
MW-11A	02090533-03	Water	9/16/2002 5:15:00 PM	9/18/2002 8:00:00 AM	179997	<input type="checkbox"/>
MW-12D	02090533-04	Water	9/16/2002 4:42:00 PM	9/18/2002 8:00:00 AM	179997	<input type="checkbox"/>
MW-14	02090533-05	Water	9/16/2002 7:20:00 PM	9/18/2002 8:00:00 AM	179997	<input type="checkbox"/>
MW-15	02090533-06	Water	9/16/2002 6:14:00 PM	9/18/2002 8:00:00 AM	179997	<input type="checkbox"/>

Jonathan West
 Jonathan West
 Senior Project Manager

10/9/2002
 Date

Joel Grice
 Laboratory Director
 Ted Yen
 Quality Assurance Officer



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-5

Collected: 09/16/2002 15:45

SPL Sample ID: 02090533-01

Site: Hobbs, NM

Analyses/Method	Result	QUAL	SQL	MDL	MQL	PQL	DF	Date Analyzed	Analyst
ALKALINITY, BICARBONATE					M2320 B		Units: mg/L		
Alkalinity, Bicarbonate	249		1	0.77	2	2	1	09/28/02 17:00	DG
ALKALINITY, CARBONATE					M2320 B		Units: mg/L		
Alkalinity, Carbonate	ND		1	0.77	2	2	1	09/28/02 17:00	DG
CHLORIDE, TOTAL					E325.3		Units: mg/L		
Chloride	121		2.5	0.66	1	5	5	09/26/02 16:30	CV
DIESEL RANGE ORGANICS					SW8015B		Units: ug/mL		
Diesel Range Organics	0.3		J 0.1		1		1	09/20/02 18:00	AR
Surr: n-Pentacosane	59.4				% 18-120		1	09/20/02 18:00	AR
<u>Prep Method</u>		<u>Prep Date</u>		<u>Prep Initials</u>					
SW3510C		09/20/2002 9:14		KL					
GASOLINE RANGE ORGANICS					SW8015B		Units: mg/L		
Gasoline Range Organics	ND		0.05	0.028	0.1	0.1	1	09/30/02 14:01	DL
Surr: 1,4-Difluorobenzene	96.7				% 74-121		1	09/30/02 14:01	DL
Surr: 4-Bromofluorobenzene	94.7				% 55-150		1	09/30/02 14:01	DL
HEADSPACE GAS ANALYSIS					RSK147		Units: mg/L		
Methane	0.002		0.0006	0.0012	0.0012	0.0012	1	09/26/02 14:27	ER
NITROGEN, NITRATE (AS N)					E300		Units: mg/L		
Nitrogen, Nitrate (As N)	2.4		0.05	0.03	0.1	0.1	1	09/18/02 13:00	SN
PURGEABLE AROMATICS					SW8021B		Units: ug/L		
Benzene	ND		0.074	0.074	1	1	1	09/30/02 14:01	DL
Ethylbenzene	ND		0.068	0.068	1	1	1	09/30/02 14:01	DL
Toluene	ND		0.11	0.106	1	1	1	09/30/02 14:01	DL
Xylenes, Total	ND		0.082	0.082	1	1	1	09/30/02 14:01	DL
Surr: 4-Bromofluorobenzene	97.9				% 56-158		1	09/30/02 14:01	DL
Surr: 1,4-Difluorobenzene	97.5				% 46-160		1	09/30/02 14:01	DL
SULFATE					E300		Units: mg/L		
Sulfate	105		1	0.04	0.2	2	10	09/30/02 15:22	CV

Qualifiers: ND/U - Not Detected above Sample Quantitation Limit >PCL - Result exceeds Protective Concentration Limit
 B - Analyte detected in associated Method Blank above MDL D - Surrogate Recovery not reportable due to dilution
 * - Surrogate Recovery Outside QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and MQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-10

Collected: 09/16/2002 19:30 SPL Sample ID: 02090533-02

Site: Hobbs, NM

Analyses/Method	Result	QUAL	SQL	MDL	MQL	PQL	DF	Date Analyzed	Analyst
ALKALINITY, BICARBONATE					M2320 B		Units: mg/L		
Alkalinity, Bicarbonate	844		0.77	0.77	2	2	1	09/28/02 17:00	DG
ALKALINITY, CARBONATE					M2320 B		Units: mg/L		
Alkalinity, Carbonate	ND		0.77	0.77	2	2	1	09/28/02 17:00	DG
CHLORIDE, TOTAL					E325.3		Units: mg/L		
Chloride	1030		16	0.66	1	25	25	09/26/02 16:30	CV
DIESEL RANGE ORGANICS					SW8015B		Units: ug/mL		
Diesel Range Organics	3 J		J 0.5		1		5	09/20/02 18:40	AR
Surr: n-Pentacosane	60.2				% 18-120		5	09/20/02 18:40	AR
<u>Prep Method</u>	<u>Prep Date</u>	<u>Prep Initials</u>							
SW3510C	09/20/2002 9:14	KL							
GASOLINE RANGE ORGANICS					SW8015B		Units: mg/L		
Gasoline Range Organics	ND		0.05	0.028	0.1	0.1	1	09/30/02 14:26	DL
Surr: 1,4-Difluorobenzene	101				% 74-121		1	09/30/02 14:26	DL
Surr: 4-Bromofluorobenzene	104				% 55-150		1	09/30/02 14:26	DL
HEADSPACE GAS ANALYSIS					RSK147		Units: mg/L		
Methane	0.006		0.0012	0.0012	0.0012	0.0012	1	09/26/02 14:41	ER
NITROGEN, NITRATE (AS N)					E300		Units: mg/L		
Nitrogen, Nitrate (As N)	ND		0.03	0.03	0.1	0.1	1	09/18/02 13:00	SN
PURGEABLE AROMATICS					SW8021B		Units: ug/L		
Benzene	ND		0.074	0.074	1	1	1	09/30/02 14:26	DL
Ethylbenzene	0.1		J 0.068	0.068	1	1	1	09/30/02 14:26	DL
Toluene	ND		0.11	0.106	1	1	1	09/30/02 14:26	DL
Xylenes, Total	ND		0.082	0.082	1	1	1	09/30/02 14:26	DL
Surr: 4-Bromofluorobenzene	99.8				% 56-158		1	09/30/02 14:26	DL
Surr: 1,4-Difluorobenzene	98.3				% 46-160		1	09/30/02 14:26	DL
SULFATE					E300		Units: mg/L		
Sulfate	318		5	0.04	0.2	10	50	09/30/02 15:22	CV

Qualifiers: ND/U - Not Detected above Sample Quantitation Limit >PCL - Result exceeds Protective Concentration Limit
 B - Analyte detected in associated Method Blank above MDL D - Surrogate Recovery not reportable due to dilution
 * - Surrogate Recovery Outside QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and MQL



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Client Sample ID MW-11A Collected: 09/16/2002 17:15 SPL Sample ID: 02090533-03

Site: Hobbs, NM

Analyses/Method	Result	QUAL	SQL	MDL	MQL	PQL	DF	Date Analyzed	Analyst
ALKALINITY, BICARBONATE					M2320 B		Units: mg/L		
Alkalinity, Bicarbonate	364		0.77	0.77	2	2	1	09/28/02 17:00	DG
ALKALINITY, CARBONATE					M2320 B		Units: mg/L		
Alkalinity, Carbonate	ND		0.77	0.77	2	2	1	09/28/02 17:00	DG
CHLORIDE, TOTAL					E325.3		Units: mg/L		
Chloride	1550		16	0.66	1	25	25	09/26/02 16:30	CV
DIESEL RANGE ORGANICS					SW8015B		Units: ug/mL		
Diesel Range Organics	1 J		J 0.5		1		5	09/20/02 19:19	AR
Surr: n-Pentacosane	61.6				% 18-120		5	09/20/02 19:19	AR
<u>Prep Method</u>	<u>Prep Date</u>	<u>Prep Initials</u>							
SW3510C	09/20/2002 9:14	KL							
GASOLINE RANGE ORGANICS					SW8015B		Units: mg/L		
Gasoline Range Organics	0.2		0.05	0.028	0.1	0.1	1	09/30/02 14:52	DL
Surr: 1,4-Difluorobenzene	101				% 74-121		1	09/30/02 14:52	DL
Surr: 4-Bromofluorobenzene	134				% 55-150		1	09/30/02 14:52	DL
HEADSPACE GAS ANALYSIS					RSK147		Units: mg/L		
Methane	ND		0.0012	0.0012	0.0012	0.0012	1	09/26/02 14:57	ER
NITROGEN, NITRATE (AS N)					E300		Units: mg/L		
Nitrogen, Nitrate (As N)	0.3		0.03	0.03	0.1	0.1	1	09/18/02 13:00	SN
PURGEABLE AROMATICS					SW8021B		Units: ug/L		
Benzene	9		0.074	0.074	1	1	1	09/30/02 14:52	DL
Ethylbenzene	41		0.068	0.068	1	1	1	09/30/02 14:52	DL
Toluene	ND		0.11	0.106	1	1	1	09/30/02 14:52	DL
Xylenes, Total	ND		0.082	0.082	1	1	1	09/30/02 14:52	DL
Surr: 4-Bromofluorobenzene	112				% 56-158		1	09/30/02 14:52	DL
Surr: 1,4-Difluorobenzene	103				% 46-160		1	09/30/02 14:52	DL
SULFATE					E300		Units: mg/L		
Sulfate	383		5	0.04	0.2	10	50	09/30/02 15:22	CV

Qualifiers: ND/U - Not Detected above Sample Quantitation Limit >PCL - Result exceeds Protective Concentration Limit
 B - Analyte detected in associated Method Blank above MDL D - Surrogate Recovery not reportable due to dilution
 * - Surrogate Recovery Outside QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and MQL



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Client Sample ID MW-12D Collected: 09/16/2002 16:42 SPL Sample ID: 02090533-04

Site: Hobbs, NM

Analyses/Method	Result	QUAL	SQL	MDL	MQL	PQL	DF	Date Analyzed	Analyst
ALKALINITY, BICARBONATE				M2320 B			Units: mg/L		
Alkalinity, Bicarbonate	262		0.77	0.77	2	2	1	09/28/02 17:00	DG
ALKALINITY, CARBONATE				M2320 B			Units: mg/L		
Alkalinity, Carbonate	ND		0.77	0.77	2	2	1	09/28/02 17:00	DG
CHLORIDE, TOTAL				E325.3			Units: mg/L		
Chloride	86		1.3	0.66	1	2	2	09/26/02 16:30	CV
DIESEL RANGE ORGANICS				SW8015B			Units: ug/mL		
Diesel Range Organics	0.2	J	0.1		1		1	09/20/02 19:58	AR
Surr: n-Pentacosane	41.0				% 18-120		1	09/20/02 19:58	AR
<u>Prep Method</u>	<u>Prep Date</u>	<u>Prep Initials</u>							
SW3510C	09/20/2002 9:14	KL							
GASOLINE RANGE ORGANICS				SW8015B			Units: mg/L		
Gasoline Range Organics	ND		0.05	0.028	0.1	0.1	1	09/30/02 15:17	DL
Surr: 1,4-Difluorobenzene	98.3				% 74-121		1	09/30/02 15:17	DL
Surr: 4-Bromofluorobenzene	95.7				% 55-150		1	09/30/02 15:17	DL
HEADSPACE GAS ANALYSIS				RSK147			Units: mg/L		
Methane	ND		0.0012	0.0012	0.0012	0.0012	1	09/26/02 15:25	ER
NITROGEN, NITRATE (AS N)				E300			Units: mg/L		
Nitrogen, Nitrate (As N)	0.06	J	0.03	0.03	0.1	0.1	1	09/18/02 13:00	SN
PURGEABLE AROMATICS				SW8021B			Units: ug/L		
Benzene	ND		0.074	0.074	1	1	1	09/30/02 15:17	DL
Ethylbenzene	ND		0.068	0.068	1	1	1	09/30/02 15:17	DL
Toluene	ND		0.11	0.106	1	1	1	09/30/02 15:17	DL
Xylenes, Total	ND		0.082	0.082	1	1	1	09/30/02 15:17	DL
Surr: 4-Bromofluorobenzene	97.3				% 56-158		1	09/30/02 15:17	DL
Surr: 1,4-Difluorobenzene	97.8				% 46-160		1	09/30/02 15:17	DL
SULFATE				E300			Units: mg/L		
Sulfate	172		2	0.04	0.2	4	20	09/30/02 15:22	CV

Qualifiers: ND/U - Not Detected above Sample Quantitation Limit >PCL - Result exceeds Protective Concentration Limit
 B - Analyte detected in associated Method Blank above MDL D - Surrogate Recovery not reportable due to dilution
 * - Surrogate Recovery Outside QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and MQL



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Client Sample ID MW-14 Collected: 09/16/2002 19:20 SPL Sample ID: 02090533-05

Site: Hobbs, NM

Analyses/Method	Result	QUAL	SQL	MDL	MQL	PQL	DF	Date Analyzed	Analyst
CHLORIDE, TOTAL					E325.3			Units: mg/L	
Chloride	293		3.3	0.66	1	5	5	09/26/02 16:30	CV

Qualifiers: ND/U - Not Detected above Sample Quantitation Limit >PCL - Result exceeds Protective Concentration Limit
B - Analyte detected in associated Method Blank above MDL D - Surrogate Recovery not reportable due to dilution
* - Surrogate Recovery Outside QC Limits MI - Matrix Interference
J - Estimated Value between MDL and MQL



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Client Sample ID MW-15 Collected: 09/16/2002 18:14 SPL Sample ID: 02090533-06

Site: Hobbs, NM

Analyses/Method	Result	QUAL	SQL	MDL	MQL	PQL	DF	Date Analyzed	Analyst
CHLORIDE, TOTAL					E325.3			Units: mg/L	
Chloride	246		3.3	0.66		1	5	09/26/02 16:30	CV

Qualifiers: ND/U - Not Detected above Sample Quantitation Limit >PCL - Result exceeds Protective Concentration Limit
B - Analyte detected in associated Method Blank above MDL D - Surrogate Recovery not reportable due to dilution
* - Surrogate Recovery Outside QC Limits MI - Matrix Interference
J - Estimated Value between MDL and MQL

Quality Control Documentation



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
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BJ Hobbs 12832

Analysis: Diesel Range Organics
Method: SW8015B

WorkOrder: 02090533
Lab Batch ID: 22579

Method Blank

Samples in Analytical Batch:

RunID: HP_V_020920C-1327781 Units: ug/mL
Analysis Date: 09/20/2002 18:40 Analyst: AR
Preparation Date: 09/20/2002 9:14 Prep By: KL Method SW3510C

Lab Sample ID Client Sample ID
02090533-01B MW-5
02090533-02B MW-10
02090533-03B MW-11A
02090533-04B MW-12D

Table with 4 columns: Analyte, Result, Qual, Rep Limit. Row 1: Diesel Range Organics, ND, , 1.0. Row 2: Surr: n-Pentacosane, 74.4, , 18-120.

Laboratory Control Sample (LCS)

RunID: HP_V_020920C-1327778 Units: ug/mL
Analysis Date: 09/20/2002 18:00 Analyst: AR
Preparation Date: 09/20/2002 9:14 Prep By: KL Method SW3510C

Table with 7 columns: Analyte, Spike Added, Result, Percent Recovery, Qual, Lower Limit, Upper Limit. Row 1: Diesel Range Organics, 2.5, 2.1, 84, , 21, 175.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02090558-02
RunID: HP_V_020920C-1327785 Units: ug/mL
Analysis Date: 09/20/2002 21:54 Analyst: AR
Preparation Date: 09/20/2002 9:14 Prep By: KL Method SW3510C

Table with 15 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS Qual, MS % Rcvry, MSD Spike Added, MSD Result, MSD % Rcvry, MSD Qual, RPD, RPD Qual, RPD Limit, Low Limit, High Limit. Row 1: Diesel Range Organics, ND, 5, 3.5, , 61, 5, 3.8, 68, , 11, 39, 13, 130.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
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Brown & Caldwell
BJ Hobbs 12832

Analysis: Headspace Gas Analysis
Method: RSK147

WorkOrder: 02090533
Lab Batch ID: R68587

Method Blank

Samples in Analytical Batch:

RunID: VARC_020926B-1332096 Units: mg/L
Analysis Date: 09/26/2002 13:29 Analyst: ER

Lab Sample ID	Client Sample ID
02090533-01C	MW-5
02090533-02C	MW-10
02090533-03C	MW-11A
02090533-04C	MW-12D

Analyte	Result	Qual	Rep Limit
Methane	ND		0.0012

Sample Duplicate

Original Sample: 02090539-03
RunID: VARC_020926B-1332104 Units: mg/L
Analysis Date: 09/26/2002 16:04 Analyst: ER

Analyte	Sample Result	DUP Result	DUP Result	RPD	RPD Limit
Butane	ND	ND		0	50
Ethane	0.003	0.0028		6	50
Ethylene	ND	ND		0	50
Isobutane	ND	ND		0	50
Methane	0.013	0.0122		3	50
Propane	ND	ND		0	50
Propylene	ND	ND		0	50

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
 B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
 J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 02090533
Lab Batch ID: R68774

Method Blank

Samples in Analytical Batch:

RunID: HP_U_020930A-1336179 Units: ug/L
Analysis Date: 09/30/2002 13:35 Analyst: DL

Lab Sample ID Client Sample ID
02090533-01A MW-5
02090533-02A MW-10
02090533-03A MW-11A
02090533-04A MW-12D

Table with 4 columns: Analyte, Result, Qual, Rep Limit. Rows include Benzene, Ethylbenzene, Toluene, Xylenes, Total, and Surr: 1,4-Difluorobenzene.

Laboratory Control Sample (LCS)

RunID: HP_U_020930A-1336178 Units: ug/L
Analysis Date: 09/30/2002 12:45 Analyst: DL

Table with 7 columns: Analyte, Spike Added, Result, Percent Recovery, Qual, Lower Limit, Upper Limit. Rows include Benzene, Ethylbenzene, Toluene, and Xylenes, Total.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02090533-03
RunID: HP_U_020930A-1336408 Units: ug/L
Analysis Date: 09/30/2002 16:08 Analyst: DL

Table with 15 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS Qual, MS % Rcvry, MSD Spike Added, MSD Result, MSD % Rcvry, MSD Qual, RPD, RPD Qual, RPD Limit, Low Limit, High Limit. Rows include Benzene, Ethylbenzene, Toluene, and Xylenes, Total.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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BJ Hobbs 12832

Analysis: Gasoline Range Organics
Method: SW8015B

WorkOrder: 02090533
Lab Batch ID: R68775

Method Blank

Samples in Analytical Batch:

RunID: HP_U_020930B-1336186 Units: mg/L
Analysis Date: 09/30/2002 13:35 Analyst: DL

Lab Sample ID Client Sample ID
02090533-01A MW-5
02090533-02A MW-10
02090533-03A MW-11A
02090533-04A MW-12D

Table with 4 columns: Analyte, Result, Qual, Rep Limit. Rows include Gasoline Range Organics, Surr: 1,4-Difluorobenzene, and Surr: 4-Bromofluorobenzene.

Laboratory Control Sample (LCS)

RunID: HP_U_020930B-1336185 Units: mg/L
Analysis Date: 09/30/2002 13:10 Analyst: DL

Table with 7 columns: Analyte, Spike Added, Result, Percent Recovery, Qual, Lower Limit, Upper Limit. Row for Gasoline Range Organics.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02090533-04
RunID: HP_U_020930B-1336511 Units: mg/L
Analysis Date: 09/30/2002 16:59 Analyst: DL

Table with 15 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS Qual, MS % Rcvry, MSD Spike Added, MSD Result, MSD % Rcvry, MSD Qual, RPD, RPD Qual, RPD Limit, Low Limit, High Limit. Row for Gasoline Range Organics.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Analysis: Nitrogen, Nitrate (As N)
Method: E300

WorkOrder: 02090533
Lab Batch ID: R68305

Method Blank

Samples in Analytical Batch:

RunID: WET_020918ZB-1326525 Units: mg/L
Analysis Date: 09/18/2002 11:45 Analyst: SN

Lab Sample ID Client Sample ID
02090533-01D MW-5
02090533-02D MW-10
02090533-03D MW-11A
02090533-04D MW-12D

Table with 4 columns: Analyte, Result, Qual, Rep Limit. Row: Nitrogen, Nitrate (As N), ND, 0.10

Laboratory Control Sample (LCS)

RunID: WET_020918ZB-1326526 Units: mg/L
Analysis Date: 09/18/2002 11:45 Analyst: SN

Table with 7 columns: Analyte, Spike Added, Result, Percent Recovery, Qual, Lower Limit, Upper Limit. Row: Nitrogen, Nitrate (As N), 10, 9.71, 97, 85, 115

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02090539-01
RunID: WET_020918ZB-1326528 Units: mg/L
Analysis Date: 09/18/2002 13:00 Analyst: SN

Table with 15 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS Qual, MS % Rcvry, MSD Spike Added, MSD Result, MSD % Rcvry, MSD Qual, RPD, RPD Qual, RPD Limit, Low Limit, High Limit. Row: Nitrogen, Nitrate (As N), ND, 10, 10.67, 106.7, 10, 10.72, 107.2, 0.5050, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ Hobbs 12832

Analysis: Chloride, Total
Method: E325.3

WorkOrder: 02090533
Lab Batch ID: R68665

Method Blank

Samples in Analytical Batch:

RunID: WET_020926L-1334114 Units: mg/L
Analysis Date: 09/26/2002 16:30 Analyst: CV

Lab Sample ID Client Sample ID
02090533-01D MW-5
02090533-02D MW-10
02090533-03D MW-11A
02090533-04D MW-12D
02090533-05D MW-14
02090533-06D MW-15

Table with 4 columns: Analyte, Result, Qual, Rep Limit. Row 1: Chloride, ND, , 1.0

Laboratory Control Sample (LCS)

RunID: WET_020926L-1334116 Units: mg/L
Analysis Date: 09/26/2002 16:30 Analyst: CV

Table with 7 columns: Analyte, Spike Added, Result, Percent Recovery, Qual, Lower Limit, Upper Limit. Row 1: Chloride, 99.1, 95.6, 96, , 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02090533-01
RunID: WET_020926L-1334118 Units: mg/L
Analysis Date: 09/26/2002 16:30 Analyst: CV

Table with 15 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS Qual, MS % Rcvry, MSD Spike Added, MSD Result, MSD % Rcvry, MSD Qual, RPD, RPD Qual, RPD Limit, Low Limit, High Limit. Row 1: Chloride, 120.6, 250, 370.4, , 99.93, 250, 370.4, 99.93, , 0, , 20, 85, 115

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ Hobbs 12832

Analysis: Alkalinity, Bicarbonate
Method: M2320 B

WorkOrder: 02090533
Lab Batch ID: R68693

Method Blank

Samples in Analytical Batch:

RunID: WET_020928A-1334553 Units: mg/L
Analysis Date: 09/28/2002 17:00 Analyst: DG

Lab Sample ID Client Sample ID
02090533-01D MW-5
02090533-02D MW-10
02090533-03D MW-11A
02090533-04D MW-12D

Table with 4 columns: Analyte, Result, Qual, Rep Limit. Row: Alkalinity, Bicarbonate, ND, 2.0

Laboratory Control Sample (LCS)

RunID: WET_020928A-1334555 Units: mg/L
Analysis Date: 09/28/2002 17:00 Analyst: DG

Table with 7 columns: Analyte, Spike Added, Result, Percent Recovery, Qual, Lower Limit, Upper Limit. Row: Alkalinity, Bicarbonate, 85.9, 87.1, 101, 90, 110

Sample Duplicate

Original Sample: 02090533-01
RunID: WET_020928A-1334556 Units: mg/L
Analysis Date: 09/28/2002 17:00 Analyst: DG

Table with 6 columns: Analyte, Sample Result, DUP Result, DUP Result, RPD, RPD Limit. Row: Alkalinity, Bicarbonate, 249, 250, 0, 20

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
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Brown & Caldwell
BJ Hobbs 12832

Analysis: Alkalinity, Carbonate
Method: M2320 B

WorkOrder: 02090533
Lab Batch ID: R68694

Method Blank

Samples in Analytical Batch:

RunID: WET_020928B-1334562 Units: mg/L
Analysis Date: 09/28/2002 17:00 Analyst: DG

Lab Sample ID Client Sample ID
02090533-01D MW-5
02090533-02D MW-10
02090533-03D MW-11A
02090533-04D MW-12D

Analyte	Result	Qual	Rep Limit
Alkalinity, Carbonate	ND		2.0

Laboratory Control Sample (LCS)

RunID: WET_020928B-1334564 Units: mg/L
Analysis Date: 09/28/2002 17:00 Analyst: DG

Analyte	Spike Added	Result	Percent Recovery	Qual	Lower Limit	Upper Limit
Alkalinity, Carbonate	85.9	87.1	101		90	110

Sample Duplicate

Original Sample: 02090533-01
RunID: WET_020928B-1334565 Units: mg/L
Analysis Date: 09/28/2002 17:00 Analyst: DG

Analyte	Sample Result	DUP Result	DUP Result	RPD	RPD Limit
Alkalinity, Carbonate	ND	ND		0	20

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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HOUSTON, TX 77054
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Brown & Caldwell
BJ Hobbs 12832

Analysis: Sulfate
Method: E300

WorkOrder: 02090533
Lab Batch ID: R68817

Method Blank

Samples in Analytical Batch:

RunID: WET_020930M-1337041 Units: mg/L
Analysis Date: 09/30/2002 15:22 Analyst: CV

Lab Sample ID Client Sample ID
02090533-01D MW-5
02090533-02D MW-10
02090533-03D MW-11A
02090533-04D MW-12D

Table with 4 columns: Analyte, Result, Qual, Rep Limit. Row 1: Sulfate, ND, , 0.20

Laboratory Control Sample (LCS)

RunID: WET_020930M-1337042 Units: mg/L
Analysis Date: 09/30/2002 15:22 Analyst: CV

Table with 8 columns: Analyte, Spike Added, Result, Percent Recovery, Qual, Lower Limit, Upper Limit. Row 1: Sulfate, 10, 9.09, 91, , 85, 115

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02090533-01
RunID: WET_020930M-1337044 Units: mg/L
Analysis Date: 09/30/2002 15:22 Analyst: CV

Table with 15 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS Qual, MS % Rcvry, MSD Spike Added, MSD Result, MSD % Rcvry, MSD Qual, RPD, RPD Qual, RPD Limit, Low Limit, High Limit. Row 1: Sulfate, 105.5, 100, 214.5, , 109.0, 100, 208.4, 102.9, , 5.746, , 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

*Sample Receipt Checklist
And
Chain of Custody*



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Sample Receipt Checklist

Workorder:	02090533	Received By:	RT
Date and Time Received:	9/18/2002 8:00:00 AM	Carrier name:	Client
Temperature:	5	Chilled by:	Water Ice

1. Shipping container/cooler in good condition? Yes No Not Present
2. Custody seals intact on shipping container/cooler? Yes No Not Present
3. Custody seals intact on sample bottles? Yes No Not Present
4. Chain of custody present? Yes No
5. Chain of custody signed when relinquished and received? Yes No
6. Chain of custody agrees with sample labels? Yes No
7. Samples in proper container/bottle? Yes No
8. Sample containers intact? Yes No
9. Sufficient sample volume for indicated test? Yes No
10. All samples received within holding time? Yes No
11. Container/Temp Blank temperature in compliance? Yes No
12. Water - VOA vials have zero headspace? Yes No Not Applicable
13. Water - pH acceptable upon receipt? Yes No Not Applicable

SPL Representative:

Contact Date & Time:

Client Name Contacted:

Non Conformance Issues:

Client Instructions:





B R O W N A N D C A L D W E L L

**SEPTEMBER 2001 GROUNDWATER
SAMPLING REPORT
HOBBS, NEW MEXICO FACILITY**

BJ SERVICES COMPANY, U.S.A.

JANUARY 7, 2002

**SEPTEMBER 2001 GROUNDWATER SAMPLING REPORT
HOBBS, NEW MEXICO FACILITY
BJ SERVICES COMPANY, U.S.A.**

Prepared for

BJ Services Company, U.S.A.
11211 FM 2920
Tomball, Texas 77375

BC Project Number: 12832.016



Richard L. Rexroad, P.G.
Project Manager

January 7, 2002

Brown and Caldwell
1415 Louisiana, Suite 2500
Houston, Texas 77002 - (713) 759-0999

"This report was prepared in accordance with the standards of the environmental consulting industry at the time it was prepared. It should not be relied upon by parties other than those for whom it was prepared, and then only to the extent of the scope of work which was authorized. This report does not guarantee that no additional environmental contamination beyond that described in this report exists at this site."

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DISTRIBUTION AND QA/QC REVIEWER'S SIGNATURE

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APPENDICES

- A Laboratory Analytical Reports for Groundwater Samples
- B Groundwater Sampling Forms



1.0 INTRODUCTION

Brown and Caldwell conducted a quarterly groundwater sampling event at the BJ Services Company, U.S.A. (BJ Services) facility located at 2708 West County Road in Hobbs, New Mexico in September 2001. This report presents a description of the groundwater sampling field activities, a summary and evaluation of the analytical results, and an evaluation of remedial technologies being applied at the facility. A groundwater potentiometric surface map and a hydrocarbons concentration map are included.

A layout of the facility is shown in Figure 1. The facility formerly operated an on-site fueling system. Subsurface impact near the former diesel fueling system was detected by the New Mexico Oil Conservation Division (NMOCD) during an on-site inspection on February 7, 1991. The fueling system was taken out of operation in July 1995. The NMOCD has required a quarterly groundwater monitoring program to assess the concentration of hydrocarbon constituents in groundwater as a result of the diesel fuel release.

A biosparging system was activated in November 1995 and expanded in March/April 1997 and February/March 1998 to remediate soil and groundwater at the former fuel island area of the facility. The biosparging system was deactivated on November 1, 2000 after achieving cleanup goals for groundwater. The confirmation soil sampling program specified in the NMOCD-approved Remedial Action Plan (RAP) for the facility was conducted in July 2001. The results of the confirmation soil sampling program were presented to NMOCD in the report for the June 2001 groundwater sampling event. The September 2001 sampling event is the first groundwater sampling event conducted since the completion of the confirmation soil boring program.

BJ Services removed three field waste tanks at the facility on March 6-7, 1997. The ongoing groundwater monitoring program was expanded to address both the former fuel island and the former field waste tanks areas of the facility, as directed by NMOCD in correspondence dated January 21, 1999.

A site chronology detailing the history of investigations into and remediation of soil and groundwater impacts in the former fueling system and the former field waste tanks areas of the facility is presented in Table 1.



2.0 FIELD ACTIVITIES AND RESULTS

Brown and Caldwell purged and sampled 10 monitor wells at the facility during the September 2001 groundwater sampling event to determine concentrations of dissolved-phase hydrocarbons in groundwater and to evaluate general groundwater quality in the area of the facility. Monitor well locations are shown in Figure 1. The following subsections describe the field activities conducted by Brown and Caldwell at the facility in September 2001 and present the results of the associated groundwater analyses.

2.1 Groundwater Sampling Activities

Groundwater level measurements were obtained from monitor wells prior to purging and sampling the wells. Groundwater levels were measured to the nearest 0.01 foot with an oil/water interface probe. Current and historic groundwater elevation data are presented in Table 2. The groundwater elevation data indicate that the groundwater flow direction is to the east/northeast, with a hydraulic gradient of approximately 0.008 foot/foot. A groundwater elevation map for September 10, 2001 is presented in Figure 2. The groundwater elevation data presented in Table 2 indicate that groundwater levels have declined in all monitor wells at the facility since late 1995. Monitor wells MW-12 and OW-4 did not contain sufficient water in September 2001 for collection of groundwater samples. Monitor well MW-12D is located adjacent to monitor well MW-12 and is screened in a deeper portion of the aquifer than is monitor well MW-12. Brown and Caldwell collected a groundwater sample from monitor well MW-12D in lieu of sampling monitor well MW-12.

All wells except monitor well MW-10 were purged and sampled using a bladder pump. Downhole tubing was decontaminated between each usage by pumping distilled water through the full length of the tubing to clean its interior and by rinsing its exterior with distilled water. Monitor well MW-10, which contained only a minimal quantity of water, was sampled with a disposable bailer. The wells were sampled in general order of least impacted to most impacted (based on analytical results

from the June 2001 sampling event) to further mitigate the potential for cross-contamination of wells.

Field parameter measurements for pH, conductivity, oxidation-reduction (redox) potential, dissolved oxygen, and temperature were collected from wells containing an adequate volume of water during and upon completion of well purging. Ferrous iron and alkalinity were measured in selected wells upon conclusion of purging activities to further assist in assessment of natural attenuation potential. Turbidity of groundwater was typically measured upon conclusion of purging activities. Field parameter readings were recorded on the groundwater sampling forms included in Appendix A. Field readings for the groundwater sampling event are summarized in Table 3.

Groundwater samples were collected directly from the discharge line of the bladder pump upon completion of purging operations or, in the case of monitor well MW-10, by pouring recovered water from a bailer. Each sample was transferred to laboratory-prepared, clean glass or plastic containers sealed with Teflon[®]-lined lids, labeled, and placed on ice in an insulated cooler for delivery to Southern Petroleum Laboratory in Houston, Texas for analysis. Completed chain-of-custody documentation was provided for all samples.

Field measurement equipment was decontaminated prior to and after each usage. Decontamination procedures consisted of washing with fresh water and a non-phosphate detergent, then rinsing with deionized water. Purge water was discharged to an on-site water reclamation system for re-use by BJ Services.

2.2 Results of Groundwater Analyses

Groundwater samples from monitor wells MW-14 and MW-15 were analyzed for chloride content using Method 325.3. Groundwater samples from the remaining wells sampled in September 2001 were analyzed for gasoline- and diesel-range total petroleum hydrocarbons (TPH-G and TPH-D) using EPA Method 8015B and for benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA

Method 8021. Selected wells were also sampled for natural attenuation evaluation parameters. The laboratory analytical reports and chain-of-custody documentation for the groundwater samples collected during the September 2001 sampling event are provided in Appendix B.

Current and cumulative analytical results for BTEX, TPH-D, and TPH-G are presented in Table 4. Figure 3 presents a hydrocarbons concentration map for the September 2001 sampling event. Benzene concentrations in excess of the laboratory detection limit were reported in only two of the eight groundwater samples submitted for BTEX analysis during this sampling event. Benzene concentrations were below the New Mexico Water Quality Control Commission (NMWQCC) standard of 0.01 milligrams per liter (mg/L) in all wells. Benzene has not been detected in former fuel island source area monitor wells MW-3, MW-4, or MW-13 since June 1999, March 1999, and June 2000, respectively. Adjustments to the biosparging system in July 1999 and March 2000 to increase air flow to the monitor well MW-13 area resulted in decreases in the concentration of benzene in monitor well MW-13 from 1.5 mg/L on July 2, 1999 to the present non-detectable concentration.

Table 5 presents current and historic results for chloride analyses performed on groundwater samples collected at the facility. The respective chloride concentrations of 245 mg/L and 228 mg/L in downgradient wells MW-14 and MW-15 in September 2001 are less than the NMWQCC standard of 250 mg/L for chloride. The chloride concentration in monitor well MW-15 has remained essentially constant from the time of its installation in January 2001 to the present. The chloride concentration in monitor well MW-14 has decreased from 368 mg/L to less than 250 mg/L during this time period.

Groundwater samples from selected wells were analyzed for sulfate by Method 300.0 and dissolved methane by Method RSK-SOP 147/175 to assist in evaluation of natural attenuation processes at the facility. In accordance with standard procedures for evaluating natural attenuation processes, sample aliquots designated for nitrate analysis by Method 300.0 were also collected from the selected wells on September 10, 2001. Method 300.0 specifies a maximum holding time of 48

hours between collection of samples and completion of nitrate analyses. Nitrate analyses of groundwater samples collected on September 10, 2001 could not be completed within 48 hours due to the national events of September 11, 2001, however. Nitrate analyses from monitor wells MW-5, MW-10, MW-11A, and MW-12D will be performed during upcoming groundwater sampling events. The current and historic results for nitrate, sulfate, and dissolved methane analyses performed on groundwater samples from monitor wells MW-5, MW-10, MW-11A, MW-12, and MW-12D are presented in Table 6.



3.0 EVALUATION OF REMEDIAL TECHNOLOGIES

The following subsections present evaluations of the remedial technologies applied at the former fueling system and former field waste tanks areas of the BJ Services facility at Hobbs, New Mexico.

3.1 Biosparging System at the Former Fueling System Area

Based on the results of previous investigations conducted by Brown and Caldwell and Roberts/Schornick and Associates, Inc., Brown and Caldwell recommended the installation of a biosparging system at the former fueling system area of the facility in the RAP submitted to the NMOCD in May 1994. The NMOCD approved the RAP on August 11, 1994. The biosparging system was installed in August 1995 and expanded in April 1997 and February 1998. Operation of the biosparging system resulted in substantial decreases in hydrocarbon concentrations in former fueling system area monitor wells MW-1, MW-3, MW-4, MW-9, and MW-13, as documented in the December 2000 groundwater sampling report for the facility.

Based on these favorable trends in hydrocarbon concentrations and in accordance with the recommendations presented in the report for the June 2000 groundwater sampling event, the biosparging system was deactivated on November 1, 2000. The September 2001 sampling event is the fourth sampling event completed since this shut down.

Benzene concentrations in former fueling system source area monitor wells MW-3, MW-4, MW-9, and MW-13 have remained at non-detectable levels since deactivation of the biosparging system. BTEX constituent concentrations in these wells and monitor well MW-1 have now remained below applicable NMWQCC standards for six consecutive quarters.

In accordance with the RAP, confirmation soil sampling activities were conducted at the former fueling system area in July 2001 to verify the effectiveness of the biosparging system in remediating vadose zone soils in this area. The analytical results for these soil samples, as

discussed in the report for the June 2001 groundwater sampling event, indicate that remediation goals for soil in this area have successfully been achieved. The September 2001 sampling event is the first groundwater sampling event conducted since the completion of the confirmation soil boring program. If, in accordance with the requirements specified in the NMOCD-approved RAP, analytical results for groundwater samples collected from monitor wells at the former fueling system source area do not exceed the groundwater remediation goals specified in the RAP during the 1-year followup quarterly monitoring period, then a biosparging system closure report will be submitted for the former fuel island portion of the facility.

3.2 Natural Attenuation at the Former Field Waste Tanks Area

Natural attenuation is the primary remediation mechanism for the dissolved-phase hydrocarbon plume located in the area of the former field waste tanks (see Figure 1).

Plume behavior is the primary evidence of natural attenuation. Secondary evidence of natural attenuation can be obtained by the collection and evaluation of data relating to the concentrations of indigenous electron acceptors such as dissolved oxygen, nitrate, sulfate, and carbon dioxide. A plume is shrinking when the rate of hydrocarbon loading from a source area is less than the rate of natural degradation of hydrocarbons. Plume shrinkage in the absence of aggressive remediation is indicative of the occurrence of natural attenuation processes. Conversely, a plume is expanding if the rate of hydrocarbon loading from a source area is greater than the rate of natural degradation of hydrocarbons through natural attenuation processes.

The former field waste tanks in the eastern portion of the facility were removed in March 1997. Concentrations of total BTEX in monitor wells in the area of the former field waste tanks have been generally stable or declining subsequent to removal of the field waste tanks. Sporadic increases in total BTEX concentrations between quarterly sampling events have been observed in monitor wells in this area since March 1997, however. These increases may be attributed to sporadic loading rates from the vadose zone in excess of the natural attenuation rate of the area. The following

subsections present primary and secondary evidence of natural attenuation of hydrocarbons in groundwater at the former field waste tanks area of the facility.

3.2.1 Primary Evidence

The benzene concentration in monitor well MW-10 has decreased from a maximum of 1.3 mg/L in August 1995 (prior to removal of the field waste tanks) to less than the NMWQCC standard of 0.01 mg/L in each of the last four groundwater sampling events. Concentrations of toluene, ethylbenzene, and xylenes in monitor well MW-10 have undergone similar decreases over this time period.

Benzene concentrations at the monitor well MW-11 and MW-11A location have decreased from a maximum of 0.970 mg/L in December 1996 (prior to removal of the field waste tanks) to less than the NMWQCC standard of 0.01 mg/L in the last two groundwater sampling events. There has been only one detection of toluene, ethylbenzene, or xylenes in monitor well MW-11A groundwater since September 1998.

Concentrations of BTEX constituents at the monitor well MW-12 location have displayed decreases similar to those observed at the monitor well MW-11 and MW-11A location since September 1998.

3.2.2 Secondary Evidence

The following lines of geochemical evidence can be used to suggest that intrinsic bioremediation (an important natural attenuation mechanism) of dissolved-phase hydrocarbons is occurring in the area of the former field waste tanks.

1. Dissolved oxygen may be utilized during intrinsic bioremediation. Dissolved oxygen concentrations should therefore be depressed in areas where intrinsic bioremediation is occurring.

There appear to be no consistent differences in dissolved oxygen concentrations in groundwater at the former field waste tanks area as compared to groundwater from non-hydrocarbon impacted wells at the facility. The lack of a discernible decrease in dissolved oxygen concentrations in groundwater at the former field waste tanks area in September 2001 is probably due to the very low to non-detectable concentrations of hydrocarbon constituents measured in monitor wells MW-10, MW-11A, and MW-12D during this sampling event.

Historic evidence submitted to the NMOCD in previous quarterly groundwater monitoring reports for the facility has indicated that dissolved oxygen concentrations have typically been depressed in hydrocarbon-impacted monitor wells relative to non-impacted wells at the facility (see the June 2001 Groundwater Sampling Report for BJ Services Hobbs, New Mexico Facility, for example). Continued use of dissolved oxygen as an electron acceptor during intrinsic bioremediation of residual hydrocarbons at the former field waste tanks area is likely to occur, but currently observed hydrocarbon concentrations are apparently too low to cause an observable decreases in dissolved oxygen concentrations in this area.

2. Nitrate may be utilized as an electron acceptor during intrinsic bioremediation after dissolved oxygen is depleted. Therefore, nitrate concentrations may be depressed in areas where intrinsic bioremediation is occurring.

As discussed in Section 2.1, nitrate analyses could not be performed within the method-specified 48-hour holding time during the September 2001 sampling event. However, historic data from the facility suggest that nitrate is used as an electron acceptor during natural attenuation processes in the former field waste tanks area. For example, nitrate concentrations were measured at less than 0.1 mg/L in former field waste tanks area monitor wells MW-10, MW-11A, and MW-12 during the June 2001 sampling event. These concentrations were less than the background nitrate concentration of 2.74 mg/L measured in monitor well MW-5 (see Table 6). The historic non-detections of nitrate in monitor wells MW-10, MW-11A, and MW-12 provided evidence that nitrate has served as an electron acceptor during natural attenuation of hydrocarbons in the former field waste tanks area of the facility.

3. When dissolved oxygen and nitrate are depleted, anaerobic microbes that utilize other electron acceptors become active. Ferrous iron is the reduction product of ferric iron, a common electron acceptor. Therefore, ferrous iron concentrations should increase in areas where intrinsic bioremediation is occurring.

Ferrous iron was measured at a concentration of 5.0 mg/L in former field waste tanks area monitor well MW-11A in September 2001, as shown in Table 3. Ferrous iron was measured at a concentration of 0.5 mg/L in background monitor well MW-5 and at concentrations of 1.5 mg/L in non-hydrocarbon impacted monitor wells MW-4 and MW-14. The elevated ferrous iron concentration in monitor well MW-11A suggests that ferric

iron is being used as an electron acceptor during natural attenuation of hydrocarbons at the former field waste tanks area.

Ferrous iron was measured at a concentration of 2 mg/L in monitor well MW-13 in September 2001. This ferrous iron concentration is greater than the ferrous iron concentrations of 0.5 mg/L to 1.5 mg/L measured in background and other non-hydrocarbon impacted monitor wells at the facility. This ferrous iron concentration is less than the ferrous iron concentration of 5.0 mg/L measured in former field waste tanks area monitor well MW-11A. Thus, the September 2001 ferrous iron concentration of 2 mg/L in monitor well MW-13 is intermediate between the ferrous iron concentrations measured in other non-hydrocarbon impacted monitor wells at the facility and the ferrous iron concentration measured in former field waste tanks area monitor well MW-11A. The intermediate ferrous iron oxygen concentration measured in monitor well MW-13 further suggests that the groundwater geochemistry in the area of well MW-13 is in the process of returning to ambient conditions after the recent removal of hydrocarbons from groundwater in that area and the November 2000 deactivation of the biosparging system, as previously documented for both ferrous iron and dissolved oxygen in the June 2001 Groundwater Sampling Report for BJ Services Hobbs, New Mexico Facility.

4. Microbes that utilize sulfate become active when dissolved oxygen, nitrate, and ferric iron are depleted. Sulfate concentrations should therefore decrease in areas where intrinsic bioremediation is occurring through use of sulfate as an electron acceptor. The sulfate concentration in former field waste tanks area monitor well MW-11A is 280 mg/L. The sulfate concentration in background monitor well MW-5 is 130 mg/L. The fact that the sulfate concentration in the hydrocarbon-impacted well is greater than the sulfate concentration in the background well suggests that sulfate is not being utilized as an electron acceptor in the former field waste tanks area.
5. Methane is a reaction product generated during utilization of carbon dioxide as an electron acceptor, and its concentration should therefore increase in areas where concentrations of electron acceptors such as dissolved oxygen, nitrate, and ferric iron have diminished.

Methane was not detected in the background monitor well or the monitor wells at the former field waste tanks area during the September 2001 groundwater sampling event. The non-detections of methane in groundwater at the former field waste tanks area in September 2001 may be attributable to the very low to non-detectable concentrations of hydrocarbon constituents measured in monitor wells MW-10, MW-11A, and MW-12D during this sampling event.

Previous quarterly groundwater monitoring reports for the facility submitted to the NMOCD have cited elevated methane concentrations in former field waste tanks area monitor wells (see the June 2001 Groundwater Sampling Report for BJ Services Hobbs, New Mexico Facility, for example). The historically elevated methane concentrations in monitor wells at the former field waste tanks area suggest that utilization of carbon dioxide

as an electron acceptor, resulting in methanogenesis, has occurred during natural attenuation of hydrocarbons at the former field waste tanks area of the facility.

6. Redox potential is a measure of chemical energy in groundwater. The redox potential of groundwater from background well MW-5 was measured at 171 millivolts (mV) in September 2001. Redox values in non-hydrocarbon impacted wells MW-3, MW-4, MW-7, MW-14 and MW-15 ranged from 138.1 mV to 177.1 mV, as shown in Table 3. A redox potential of -117.1 mV was measured in former field waste tanks area monitor well MW-11A. The negative redox value in former field waste tank area monitor well MW-11A provides additional evidence that natural attenuation of hydrocarbons is occurring in the area of the former field waste tanks.

A redox potential of 97 mV was measured in monitor well MW-13 in September 2001. This value is intermediate between the redox values ranging from 138.1 mV to 177.5 mV measured in other non-hydrocarbon impacted wells (i.e., MW-3, MW-4, MW-5, MW-7, MW-14 and MW-15) and the negative redox potential measured in former field waste tanks area monitor well MW-11A, providing further evidence that the groundwater geochemistry in the area of monitor well MW-13 is currently returning to ambient conditions after the recent removal of hydrocarbons in groundwater in that area and the November 2000 deactivation of the biosparging system

7. Alkalinity is expected to increase during natural attenuation processes, due to the leaching of carbonates from mineral substrates by microbially produced organic acids. Alkalinity data collected from monitor wells at the facility in September 2001 are inconclusive, however.

In conclusion, historic dissolved oxygen, nitrate, and methane data suggest that dissolved oxygen, nitrate, and carbon dioxide have acted as electron acceptors during intrinsic bioremediation processes at former field waste tanks area of the facility. Ferric iron also appears to be serving as an electron acceptor during natural attenuation of hydrocarbons, as evidenced by the elevated ferrous iron concentration in monitor well MW-11A at the former field waste tanks area in September 2001. Current redox data provide further evidence that natural attenuation of hydrocarbons is occurring in this area.

It is recommended that monitoring for natural attenuation evaluation parameters continue in former field waste tanks area monitor wells MW-10, MW-11A, and MW-12D and the background well, MW-5. Redox potential, dissolved oxygen content, and alkalinity are good indicators of the occurrence of aerobic bioremediation of hydrocarbons, so it is also recommended that field testing

for these parameters be performed in all wells to be sampled during upcoming groundwater monitoring events.



4.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on information obtained during the September 2001 groundwater sampling event conducted at the BJ Services Hobbs, New Mexico facility.

4.1 Conclusions

- Dissolved benzene and BTEX concentrations in all monitor wells located near the former fueling system area are non-detectable. TPH was detected in only one well in this area. Benzene, BTEX, and TPH concentrations in these wells have remained below applicable standards for the past six quarterly groundwater sampling events. Operation of the biosparging system in the former fueling system source area has resulted in substantial reductions in hydrocarbon impacts and achievement of remediation goals for groundwater in this area.
- Benzene concentrations in former field waste tanks area monitor wells sampled in September 2001 are less than the New Mexico WQCC standard of 0.01 mg/L for benzene. Natural attenuation processes appear to be occurring in the vicinity of the former field waste tanks removed in March 1997, based on decreasing hydrocarbon concentrations in local monitor wells over time and as substantiated by geochemical data.
- Groundwater geochemistry in the vicinity of monitor well MW-13, which is located downgradient of the former fueling system source area and the biosparging system, appears to be returning to ambient conditions following removal of hydrocarbons and the November 2000 deactivation of the biosparging system.
- Chloride concentrations in monitor wells MW-14 and MW-15 are less than the NMQCC standard of 250 mg/L. Chloride concentrations in monitor well MW-14 have been less than 250 mg/L for two consecutive quarters. Chloride concentrations in monitor well MW-15 have remained essentially constant since installation of these wells in January 2001.

4.2 Recommendations

- Continue the quarterly monitoring program for former field waste tank area monitor wells MW-10, MW-11A, and MW-12D. Continue monitoring for natural attenuation parameters in these wells and the background monitor well MW-5, including field-testing for natural attenuation indicator parameters.

- Continue quarterly monitoring of wells pertaining to the former fueling system source area for the 1-year period commencing in September 2001.
- If analytical results for groundwater samples collected from monitor wells at the former fueling system source area do not exceed the groundwater remediation goals specified in the RAP during the 1-year quarterly monitoring period, then a biosparging system closure report will be submitted for the former fuel island portion of the facility.
- After submittal and approval of the biosparging system closure report by the NMOCD, decommission the biosparging system and P&A the injection wells, extraction wells, and applicable monitor wells.

DISTRIBUTION

September 2001 Groundwater Sampling Report
BJ Services Company, U.S.A.
Hobbs, New Mexico

January 7, 2002

Final Distribution as follows:

1 copy to: State of New Mexico
Energy, Minerals, and Natural Resources Dept.
Oil Conservation Division
2040 South Pacheco Street, State Land Office Building
Santa Fe, New Mexico 87505

Attention: Mr. Wayne Price

1 copy to: State of New Mexico
Oil Conservation Division, Hobbs District Office
1625 N. French Dr.
Post Office Box 1980
Hobbs, New Mexico 88240

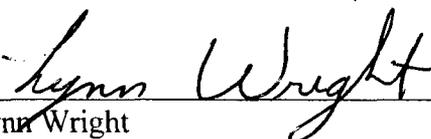
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11211 FM 2920
Tomball, Texas 77375

Attention: Ms. Jo Ann Cobb

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QUALITY CONTROL REVIEWER


Lynn Wright
Principal Geologist

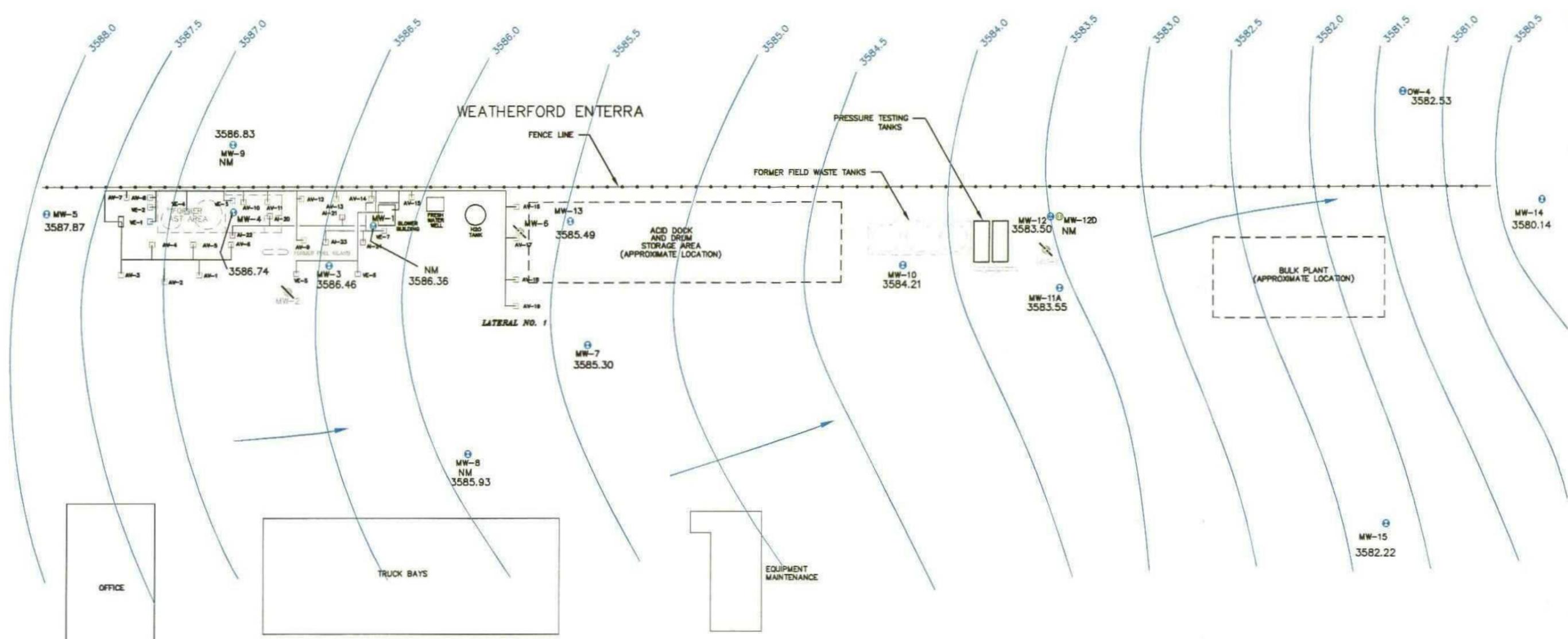
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Figures

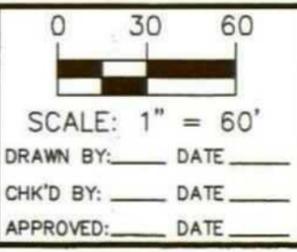


FIGURES



BROWN AND CALDWELL
HOUSTON, TEXAS

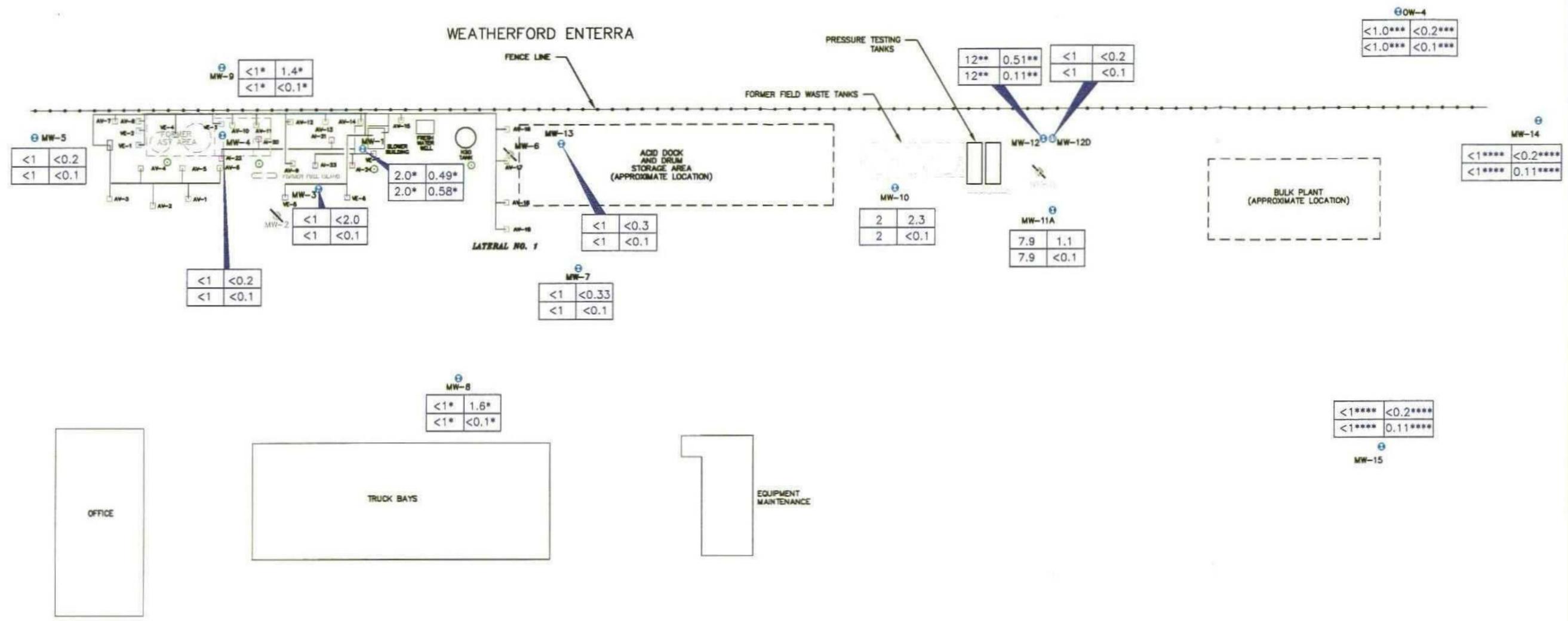
SUBMITTED: _____ DATE: _____
PROJECT MANAGER
APPROVED: _____ DATE: _____
BROWN AND CALDWELL



- LEGEND**
- 3586.46
MW-3
MONITOR WELL LOCATION WITH GROUNDWATER ELEVATION (feet AMSL)
 - BIOSPARGING SYSTEM
 - GROUNDWATER FLOW DIRECTION
 - MONITOR WELL (PLUGGED AND ABANDONED)

TITLE	GROUNDWATER ELEVATION MAP FOR SEPTEMBER 10, 2001
CLIENT	BJ SERVICES COMPANY, U.S.A.
SITE	HOBBS, NEW MEXICO

DATE	9/19/01
PROJECT NUMBER	12832.016
FIGURE NUMBER	2



P:\CAD\JOBS\12832\Hydro_Con9-10-01

BROWN AND CALDWELL
HOUSTON, TEXAS

0 30 60
SCALE: 1" = 60'
DRAWN BY: CLK DATE 6/01
CHK'D BY: DATE
REV'D BY: CLK DATE 10/01

LEGEND

MW-3 EXISTING MONITOR WELL LOCATION

MW-2 MONITOR WELL (PLUGGED AND ABANDONED)

BIOSPARGING SYSTEM

BENZENE (ug/L) <1 <0.2 - TPH-D (mg/L)

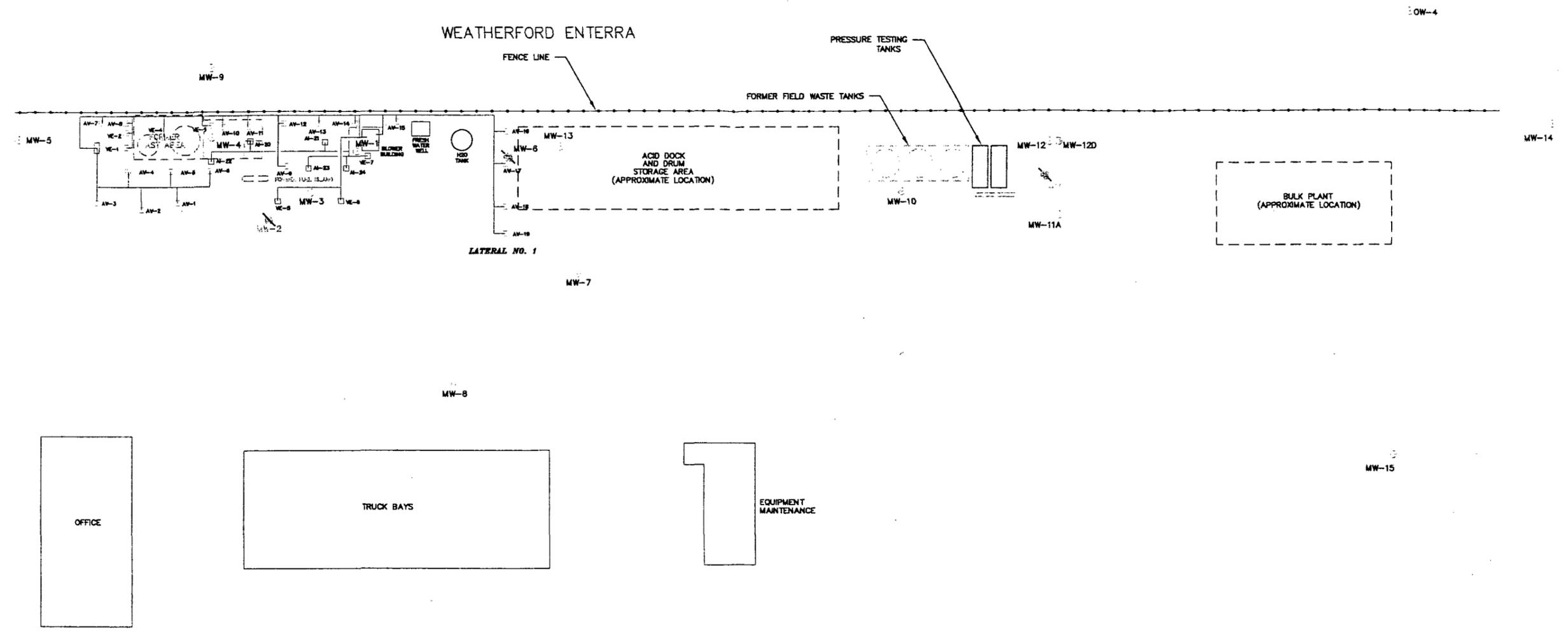
TOTAL BTX (ug/L) <1 <0.1 - TPH-G (mg/L)

* - INDICATES WELL NOT SAMPLED SEPTEMBER 2001; DATA PRESENTED ARE FROM 3/8/01
 ** - INDICATES WELL NOT SAMPLED SEPTEMBER 2001; DATA PRESENTED ARE FROM 8/22/01
 *** - INDICATES WELL NOT SAMPLED SEPTEMBER 2001; DATA PRESENTED ARE FROM 9/13/00
 **** - INDICATES WELL NOT SAMPLED SEPTEMBER 2001; DATA PRESENTED ARE FROM 1/14/01

TITLE	HYDROCARBONS CONCENTRATION MAP FOR SEPTEMBER 10, 2001	DATE	10/8/01
CLIENT	BJ SERVICES COMPANY, U.S.A.	PROJECT NUMBER	12832.016
SITE	HOBBS, NEW MEXICO	FIGURE NUMBER	3

SUBMITTED: _____ DATE: _____
PROJECT MANAGER

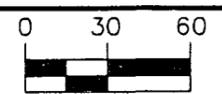
APPROVED: _____ DATE: _____
BROWN AND CALDWELL



P:\12832\PM\Locations.dwg 03-16-99 CLK

BROWN AND CALDWELL
HOUSTON, TEXAS

SUBMITTED: _____ DATE: _____
PROJECT MANAGER
APPROVED: _____ DATE: _____
BROWN AND CALDWELL



SCALE: 1" = 60'
DRAWN BY: _____ DATE: _____
CHK'D BY: _____ DATE: _____
APPROVED: _____ DATE: _____

LEGEND

- EXISTING MONITOR WELL LOCATION
- BIOSPARGING SYSTEM
- MONITOR WELL (PLUGGED AND ABANDONED)

TITLE	SITE MAP	DATE	8/15/01
CLIENT	BJ SERVICES COMPANY, U.S.A.	PROJECT NUMBER	12832.016
SITE	HOBBS, NEW MEXICO	FIGURE NUMBER	1

Tables



TABLES

Table 1
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
February 7, 1991	The New Mexico Oil Conservation Division (NMOCD) conducted an on-site inspection, including sampling of the on-site fresh water well.
August 6, 1991	The NMOCD requested submittal of an investigation work plan.
September 5, 1991	Roberts/Schornick and Associates, Inc. (RSA) submitted Technical Work Plan for soil and groundwater investigation to the NMOCD.
November 15, 1991	The NMOCD approved the Technical Work Plan submitted by RSA.
December 16, 1991	RSA sampled the fresh water well. The analytical results were submitted to the NMOCD.
February 21, 1992	Western sampled the fresh water well. The analytical results were submitted to the NMOCD.
July 29 - August 10, 1992	Brown and Caldwell conducted a soil and groundwater investigation according to the approved Technical Work Plan. The investigation included drilling and sampling nine soil borings, sampling six hand-augured soil borings, installation and sampling of five monitor wells, and sampling of the fresh water well.
October 12, 1992	Brown and Caldwell submitted a Soil and Groundwater Investigation Report to the NMOCD.
December 2, 1992	The NMOCD requested the installation and sampling of four additional monitor wells, including a monitor well on an adjacent property.
April 13, 1993	Brown and Caldwell conducted a vapor extraction pilot test on the existing monitor wells.
April 15, 1993	Brown and Caldwell installed off-site monitor well MW-9.
April 22, 1993	Brown and Caldwell sampled off-site monitor well MW-9.
May 27, 1993	Brown and Caldwell submitted a letter report documenting the installation and sampling of off-site monitor well MW-9 to the NMOCD.
June 2, 1993	Brown and Caldwell conducted a short-term aquifer test using the fresh water well at the facility.
June 8, 1993	USTank Management, Inc. conducted a non-volumetric tank system tightness test on the diesel and unleaded gasoline aboveground storage tanks at the facility.

Table 1 (Continued)
 Site Chronology
 BJ Services Company, U.S.A.
 Hobbs, New Mexico

Date	Activity
June 21, 1993	ENSR Consulting and Engineering (ENSR), the environmental consultant for the adjacent property owner on which off-site well MW-9 is located, submitted a request to sample monitor well MW-9.
July 15, 1993	ENSR split a groundwater sample collected from monitor well MW-9 with Brown and Caldwell.
July 30, 1993	USTank Management, Inc. submitted a tank tightness test report to Brown and Caldwell. The report indicated that both tanks and their associated piping passed.
August 16-19, 1993	Brown and Caldwell installed two additional downgradient monitor wells. Brown and Caldwell sampled each of the existing and newly installed monitor wells.
January 26, 1994	Brown and Caldwell performed a groundwater monitoring event; the existing monitor wells and the fresh water well were purged and sampled. The groundwater samples were analyzed for BTEX.
May 6, 1994	A Remedial Action Plan (RAP) submitted to the NMOCD.
August 11, 1994	The RAP was approved by the NMOCD.
May 3, 1995	Brown and Caldwell conducted the May 1995 groundwater sampling event.
July 31, 1995	Brown and Caldwell conducted the July 1995 groundwater sampling event.
August 2-9, 1995	Installation of the biosparging system was initiated. Nineteen combined injection/extraction wells and three vacuum extraction wells were installed.
August 14-26, 1995	Remedial Construction Services, Inc. (RCS) constructed the initial design of the biosparging system.
September 19, 1995	Operation of the extraction portion of the biosparging system commenced.
November 13, 1995	Operation of the injection portion of the biosparging system commenced.
November 14, 1995	Brown and Caldwell conducted the November 1995 groundwater sampling event.
February 23, 1996	Brown and Caldwell conducted the February 1996 groundwater sampling event.



Table 1 (Continued)
 Site Chronology
 BJ Services Company, U.S.A.
 Hobbs, New Mexico

Date	Activity
May 31, 1996	Brown and Caldwell conducted the May 1996 groundwater sampling event.
August 23, 1996	Brown and Caldwell conducted the August 1996 groundwater sampling event.
December 2, 1996	Brown and Caldwell conducted the December 1996 groundwater sampling event.
March 6-7, 1997	BJ Services removed three field waste tanks and associated hydrocarbon-impacted soil.
March 12, 1997	Brown and Caldwell conducted the March 1997 groundwater sampling event.
March 14, 1997	Vapor extraction well VE-4 was installed.
April 1997	Vapor extraction well VE-4 was connected to the vapor extraction system.
June 12, 1997	Brown and Caldwell conducted the June 1997 groundwater sampling event.
September 11-12, 1997	Brown and Caldwell conducted the September 1997 groundwater sampling event.
December 10, 1997	Brown and Caldwell conducted the December 1997 groundwater sampling event.
February 3-14, 1998	Air injection wells AI-20 through AI-24, vapor extraction wells VE-5 though VE-7, and monitor wells MW-11A and MW-12 were installed.
February 19, 1998	Operation of previously existing injection wells was suspended in preparation for start-up of new injection wells AI-20 through AI-24.
March 10, 1998	Operation of new air injection wells AI-20 through AI-24 and new vapor extraction wells VE-5 though VE-7 commenced.
March 23-24, 1998	Brown and Caldwell conducted the March 1998 groundwater sampling event.
March 24, 1998	Operation of previously existing injection wells and vapor extraction wells resumed.
June 23, 1998	Brown and Caldwell conducted the June 1998 groundwater sampling event.
September 30, 1998	Brown and Caldwell conducted the September 1998 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
December 9-10, 1998	Brown and Caldwell conducted the December 1998 groundwater sampling event.
January 21, 1999	The NMOCD requested submittal of a work plan by March 22, 1999 to perform additional groundwater delineation in the area of the former field waste tanks and the former AST/MW-6 area.
March 9-10, 1999	Brown and Caldwell conducted the March 1999 groundwater sampling event.
March 19, 1999	Brown and Caldwell submitted the work plan for groundwater delineation activities that was requested by the NMOCD.
May 19, 1999	The NMOCD approved the groundwater delineation work plan.
June 10, 1999	Brown and Caldwell performed sampling of existing monitor wells for the June /July 1999 groundwater sampling event.
July 2, 1999	Brown and Caldwell completed plugging and abandonment of monitor wells MW-2, MW-6, and MW-11; installed and developed monitor wells MW-12D and MW-13; and sampled monitor wells MW-12D and MW-13 to complete the June/July 1999 groundwater sampling event.
July 14, 1999	Brown and Caldwell redirected air discharge from the shallow injection well injection system to Lateral No. 1 and optimized air flow to injection wells AI-16 and AI-17 to apply increased remedial pressure to the eastern portion of the west plume.
September 13-14, 1999	Brown and Caldwell conducted the September 1999 groundwater sampling event.
December 9, 1999	Brown and Caldwell conducted the December 1999 groundwater sampling event.
March 9-10, 2000	Brown and Caldwell conducted the March 2000 groundwater sampling event and shut off air flow to biosparging system Lateral Nos. 4S, 5S, 6S, and 7S.
June 8, 2000	Brown and Caldwell conducted the June 2000 groundwater sampling event.
September 13, 2000	Brown and Caldwell conducted the September 2000 groundwater sampling event.
November 1, 2000	Brown and Caldwell deactivated the biosparging system.
December 7, 2000	Brown and Caldwell conducted the December 2000 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

January 2001	Brown and Caldwell installed and sampled monitor wells MW-14 and MW-15.
March 8-9, 2001	Brown and Caldwell conducted the March 2001 groundwater sampling event.
June 21-22, 2001	Brown and Caldwell conducted the June 2001 groundwater sampling event
July 23, 2001	Brown and Caldwell collected soil samples from four soil borings installed at the former fueling system area of the facility to confirm the effectiveness of the biosparging system in remediating hydrocarbon impact to soil, as specified in the NMOCD-approved RAP.
September 10, 2001	Brown and Caldwell conducted the September 2001 groundwater sampling event

Table 2
 Cumulative Groundwater Elevation Data
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-1	3,647.53	8/10/1992	53.22	0.00	3,594.31	(1)
		2/9/1993	53.03	0.00	3,594.50	
		8/18/1993	53.10	0.00	3,594.43	
		1/26/1994	53.31	0.00	3,594.22	
		5/3/1995	54.64	0.20	3,593.05	(2)
		7/31/1995	54.14	0.00	3,593.39	
		11/14/1995	53.69	0.00	3,593.84	
		2/23/1996	54.32	0.00	3,593.21	
		5/31/1996	54.14	0.00	3,593.39	
		8/23/1996	56.17	0.00	3,591.36	
		12/2/1996	55.27	0.00	3,592.26	
		3/12/1997	55.70	0.27	3,592.05	
		6/12/1997	55.08	0.02	3,592.47	
		9/12/1997	55.64	0.51	3,592.31	
		12/10/1997	55.46	0.00	3,592.07	PSH Sheen
		3/24/1998	55.81	0.00	3,591.72	PSH Sheen
		6/23/1998	56.38	0.06	3,591.20	
		9/30/1998	56.82	0.00	3,590.71	PSH Sheen
		12/9/1998	57.05	0.00	3,590.48	
		3/10/1999	57.45	0.00	3,590.08	
		6/10/1999	58.02	0.00	3,589.51	
		7/2/1999	57.90	0.00	3,589.63	
		9/14/1999	58.14	0.00	3,589.39	
12/9/1999	-	-	-			
3/9/2000	58.99	0.00	3,588.54	(3)		
6/8/2000	-	-	-			
9/13/2000	-	-	-			
12/7/2000	-	-	-			
3/8/2001	60.35	0.00	3,587.18			
6/21/01	60.99	0.00	3,586.54			
9/10/01	61.17	0.00	3,586.36			
MW-2	3,644.84	8/10/1992	52.82	0.00	3,592.02	(1)
		2/9/1993	49.60	0.00	3,595.24	
		8/18/1993	49.71	0.00	3,595.13	
		1/26/1994	49.97	0.00	3,594.87	
		5/3/1995	-	-	-	(4),(5)
MW-3	3,645.00	8/10/1992	52.99	0.00	3,592.01	(1)
		2/9/1993	52.72	0.00	3,592.28	
		8/18/1993	52.82	0.00	3,592.18	
		1/26/1994	53.05	0.00	3,591.95	
		5/3/1995	54.31	0.00	3,590.69	
		7/31/1995	51.24	0.00	3,593.76	
		11/14/1995	51.10	0.00	3,593.90	
		2/23/1996	51.68	0.00	3,593.32	
		5/31/1996	51.45	0.00	3,593.55	
		8/23/1996	51.55	0.00	3,593.45	
		12/2/1996	52.23	0.00	3,592.77	
		3/12/1997	52.67	0.00	3,592.33	
		6/12/1997	52.68	0.00	3,592.32	
		9/11/1997	52.71	0.00	3,592.29	
		12/10/1997	52.89	0.00	3,592.11	
3/23/1998	53.22	0.00	3,591.78			

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MW-3	3,645.00	6/23/1998	53.66	0.00	3,591.34	
		9/30/1998	54.06	0.00	3,590.94	
		12/9/1998	54.36	0.00	3,590.64	
		3/10/1999	54.72	0.00	3,590.28	
		6/10/1999	55.17	0.00	3,589.83	
		7/2/1999	55.15	0.00	3,589.85	
		9/14/1999	55.42	0.00	3,589.58	
		12/9/1999	55.78	0.00	3,589.22	
		3/9/2000	56.23	0.00	3,588.77	
		6/8/2000	56.66	0.00	3,588.34	
		9/13/2000	56.77	0.00	3,588.23	
		12/7/2000	57.15	0.00	3,587.85	
		3/8/2001	57.69	0.00	3,587.31	
		6/21/01	58.34	0.00	3,586.66	
9/10/01	58.54	0.00	3,586.46			
MW-4	3,645.28	8/10/1992	50.55	0.00	3,594.73	(1)
		2/9/1993	50.26	0.00	3,595.02	
		8/18/1993	50.38	0.00	3,594.90	
		1/26/1994	50.90	0.30	3,594.63	
		5/3/1995	51.51	0.45	3,594.14	
		7/31/1995	51.74	0.26	3,593.75	
		11/14/1995	51.03	0.00	3,594.25	
		2/23/1996	51.65	0.01	3,593.64	
		5/31/1996	51.48	0.00	3,593.80	
		8/23/1996	53.49	0.00	3,591.79	
		12/2/1996	52.32	0.00	3,592.96	
		3/12/1997	52.74	0.05	3,592.58	
		6/12/1997	53.08	0.44	3,592.56	
		9/12/1997	52.60	0.15	3,592.80	
		12/10/1997	52.89	0.00	3,592.39	PSH Sheen
		3/24/1998	53.20	0.25	3,592.29	
		6/23/1998	53.82	0.22	3,591.64	
		9/30/1998	53.96	0.00	3,591.32	200 ml PSH
		12/9/1998	54.27	0.00	3,591.01	
		3/10/1999	54.69	0.04	3,590.62	
		6/10/1999	55.07	0.00	3,590.21	
		7/2/1999	55.10	0.00	3,590.18	
		9/14/1999	55.33	0.00	3,589.95	
		12/9/1999	55.79	0.00	3,589.49	
3/10/2000	56.12	0.00	3,589.16			
6/8/2000	56.67	0.00	3,588.61			
9/13/2000	56.65	0.00	3,588.63			
12/7/2000	57.05	0.00	3,588.23			
3/8/2001	57.72	0.00	3,587.56			
6/21/01	58.18	0.00	3,587.10			
9/10/01	58.54	0.00	3,586.74			
MW-5	3,647.72	8/10/1992	52.38	0.00	3,595.34	(1)
		2/9/1993	52.06	0.00	3,595.66	
		8/18/1993	52.16	0.00	3,595.56	
		1/26/1994	52.50	0.00	3,595.22	
		5/3/1995	53.57	0.00	3,594.15	
		7/31/1995	53.27	0.00	3,594.45	

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Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-5	3,647.72	11/14/1995	52.83	0.00	3,594.89	
		2/23/1996	53.57	0.00	3,594.15	
		5/31/1996	53.16	0.00	3,594.56	
		8/23/1996	53.41	0.00	3,594.31	
		12/2/1996	53.98	0.00	3,593.74	
		3/12/1997	54.44	0.00	3,593.28	
		6/12/1997	54.48	0.00	3,593.24	
		9/12/1997	54.29	0.00	3,593.43	
		12/10/1997	54.66	0.00	3,593.06	
		3/23/1998	55.05	0.00	3,592.67	
		6/23/1998	55.44	0.00	3,592.28	
		9/30/1998	55.65	0.00	3,592.07	
		12/9/1998	56.00	0.00	3,591.72	
		3/9/1999	56.45	0.00	3,591.27	
		6/10/1999	56.91	0.00	3,590.81	
		7/2/1999	56.93	0.00	3,590.79	
		9/14/1999	57.12	0.00	3,590.60	
		12/9/1999	57.41	0.00	3,590.31	
		3/9/2000	57.92	0.00	3,589.80	
		6/8/2000	58.32	0.00	3,589.40	
		9/13/2000	58.36	0.00	3,589.36	
12/7/2000	58.71	0.00	3,589.01			
3/8/2001	59.36	0.00	3,588.36			
6/21/01	59.94	0.00	3,587.78			
9/10/01	59.85	0.00	3,587.87			
MW-6	3,644.74	2/9/1993	50.58	0.00	3,594.16	(1)
		8/18/1993	50.78	0.00	3,593.96	
		1/26/1994	51.00	0.00	3,593.74	
		5/3/1995	52.63	0.00	3,592.11	
		7/31/1995	51.90	0.00	3,592.84	
		11/14/1995	51.19	0.00	3,593.55	
		2/23/1996	52.10	0.00	3,592.64	
		5/31/1996	51.76	0.00	3,592.98	
		8/23/1996	51.63	0.00	3,593.11	
		12/2/1996	52.85	0.00	3,591.89	
		3/12/1997	53.55	0.00	3,591.19	
		6/12/1997	52.08	0.00	3,592.66	
		9/11/1997	53.72	0.00	3,591.02	
		12/10/1997	53.27	0.00	3,591.47	
		3/23/1998	53.56	0.00	3,591.18	
		6/23/1998	52.88	0.00	3,591.86	
		9/30/1998	54.89	0.00	3,589.85	
12/9/1998	54.57	0.00	3,590.17			
3/10/1999	55.10	0.00	3,589.64			
7/2/1999	-	-	-	(5),(6)		
MW-7	3,644.55	2/9/1993	50.53	0.00	3,594.02	(1)
		8/18/1993	50.74	0.00	3,593.81	
		1/26/1994	51.01	0.00	3,593.54	
		5/3/1995	52.25	0.00	3,592.30	
		7/31/1995	51.92	0.00	3,592.63	
		11/14/1995	51.48	0.00	3,593.07	
		2/23/1996	52.15	0.00	3,592.40	

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-7	3,644.55	5/31/1996	51.78	0.00	3,592.77	
		8/23/1996	52.02	0.00	3,592.53	
		12/2/1996	52.52	0.00	3,592.03	
		3/12/1997	52.99	0.00	3,591.56	
		6/12/1997	53.08	0.00	3,591.47	
		9/11/1997	53.00	0.00	3,591.55	
		12/10/1997	53.28	0.00	3,591.27	
		3/23/1998	53.59	0.00	3,590.96	
		6/23/1998	54.20	0.00	3,590.35	
		9/30/1998	54.54	0.00	3,590.01	
		12/9/1998	54.74	0.00	3,589.81	
		3/9/1999	55.15	0.00	3,589.40	
		6/10/1999	55.66	0.00	3,588.89	
		7/2/1999	55.73	0.00	3,588.82	
		9/13/1999	55.94	0.00	3,588.61	
		12/9/1999	56.38	0.00	3,588.17	
		3/9/2000	56.74	0.00	3,587.81	
		6/8/2000	57.17	0.00	3,587.38	
		9/13/2000	57.40	0.00	3,587.15	
		12/7/2000	57.77	0.00	3,586.78	
3/8/2001	58.29	0.00	3,586.26			
6/21/01	58.91	0.00	3,585.64			
9/10/01	59.25	0.00	3,585.30			
MW-8	3,644.87	2/9/1993	50.48	0.00	3,594.39	(1)
		8/18/1993	50.67	0.00	3,594.20	
		1/26/1994	50.96	0.00	3,593.91	
		5/3/1995	52.15	0.00	3,592.72	
		7/31/1995	51.77	0.00	3,593.10	
		11/14/1995	51.37	0.00	3,593.50	
		2/23/1996	52.17	0.00	3,592.70	
		5/31/1996	51.55	0.00	3,593.32	
		8/23/1996	51.92	0.00	3,592.95	
		12/2/1996	52.43	0.00	3,592.44	
		3/12/1997	52.93	0.00	3,591.94	
		6/12/1997	53.96	0.00	3,590.91	
		9/11/1997	52.73	0.00	3,592.14	
		12/10/1997	53.15	0.00	3,591.72	
		3/23/1998	53.51	0.00	3,591.36	
		6/23/1998	54.01	0.00	3,590.86	
		9/30/1998	54.35	0.00	3,590.52	
		12/9/1998	54.60	0.00	3,590.27	
		3/9/1999	55.00	0.00	3,589.87	
		6/10/1999	55.56	0.00	3,589.31	
		7/2/1999	55.57	0.00	3,589.30	
		9/13/1999	55.72	0.00	3,589.15	
		12/9/1999	-	-	-	(3)
3/9/2000	56.52	0.00	3,588.35			
6/8/2000	-	-	-			
9/13/2000	-	-	-			
12/7/2000	-	-	-			
3/8/2001	58.11	0.00	3,586.76			
6/21/01	58.72	0.00	3,586.15			

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 Hobbs, New Mexico Facility
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Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-8	3,644.37	9/10/01	58.94	0.00	3,585.93	
MW-9	3,644.78	4/22/1993	49.73	0.00	3,595.05	(1)
		7/15/1993	49.65	0.00	3,595.13	
		8/18/1993	49.85	0.00	3,594.93	
		1/26/1994	50.02	0.00	3,594.76	
		5/3/1995	51.35	0.00	3,593.43	
		7/31/1995	50.97	0.00	3,593.81	
		11/14/1995	50.43	0.00	3,594.35	
		2/23/1996	51.12	0.00	3,593.66	
		5/31/1996	50.89	0.00	3,593.89	
		8/23/1996	50.98	0.00	3,593.80	
		12/2/1996	51.58	0.00	3,593.20	
		3/12/1997	52.21	0.05	3,592.61	
		6/12/1997	52.10	0.00	3,592.68	PSH Sheen
		9/12/1997	51.95	0.00	3,592.83	PSH Sheen
		12/10/1997	52.37	0.00	3,592.41	PSH Sheen
		3/23/1998	52.68	0.00	3,592.10	PSH Sheen
		6/23/1998	53.08	0.00	3,591.70	PSH Sheen
		9/30/1998	53.39	0.01	3,591.40	PSH Sheen
		12/9/1998	53.68	0.00	3,591.10	
		3/10/1999	54.15	0.00	3,590.63	
		6/10/1999	54.68	0.00	3,590.10	
		7/2/1999	54.71	0.00	3,590.07	
		9/13/1999	54.71	0.00	3,590.07	
		12/9/1999	-	-	-	(3)
		3/9/2000	55.69	0.00	3,589.09	
		6/8/2000	-	-	-	
		9/13/2000	-	-	-	
		12/7/2000	-	-	-	
		3/8/2001	57.03	0.00	3,587.75	
		6/21/01	57.91	0.00	3,586.87	
		9/10/01	57.95	0.00	3,586.83	
MW-10	3,644.47	8/18/1993	51.54	0.00	3,592.93	(1)
		1/26/1994	51.90	0.00	3,592.57	
		5/3/1995	52.97	0.00	3,591.50	
		7/31/1995	52.87	0.00	3,591.60	
		11/14/1995	52.51	0.00	3,591.96	
		2/23/1996	53.05	0.00	3,591.42	
		5/31/1996	52.79	0.00	3,591.68	
		8/23/1996	53.03	0.00	3,591.44	
		12/2/1996	53.41	0.00	3,591.06	
		3/12/1997	54.21	0.00	3,590.26	
		6/12/1997	53.99	0.00	3,590.48	
		9/12/1997	53.94	0.00	3,590.53	
		12/10/1997	54.12	0.00	3,590.35	
		3/23/1998	54.51	0.00	3,589.96	
		6/23/1998	55.12	0.00	3,589.35	
		9/30/1998	55.61	0.00	3,588.86	
		12/9/1998	55.80	0.00	3,588.67	

Table 2
 Cumulative Groundwater Elevation Data
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-10	3,644.47	3/9/1999	56.09	0.00	3,588.38	
		6/10/1999	56.60	0.00	3,587.87	
		7/2/1999	56.64	0.00	3,587.83	
		9/14/1999	56.91	0.00	3,587.56	
		12/9/1999	57.37	0.00	3,587.10	
		3/10/2000	57.71	0.00	3,586.76	
		6/8/2000	58.08	0.00	3,586.39	
		9/13/2000	58.44	0.00	3,586.03	
		12/7/2000	58.89	0.00	3,585.66	
		3/9/2001	59.31	0.00	3,585.24	
		6/21/01	59.89	0.00	3,584.66	
9/10/01	61.34	0.00	3,583.21			
MW-11	3,643.78	8/18/1993	51.92	0.00	3,591.86	(1)
		1/26/1994	52.32	0.00	3,591.46	
		5/3/1995	53.38	0.00	3,590.40	
		7/31/1995	53.35	0.00	3,590.43	
		11/14/1995	52.96	0.00	3,590.82	
		2/23/1996	53.50	0.00	3,590.28	
		5/31/1996	53.25	0.00	3,590.53	
		8/23/1996	53.49	0.00	3,590.29	
		12/2/1996	53.79	0.00	3,589.99	
		3/12/1997	53.81	0.00	3,589.97	
		6/12/1997	53.96	0.00	3,589.82	
		9/12/1997	52.93	0.00	3,590.85	
		12/10/1997	-	-	-	(5),(6)
MW-11A	3,644.24	3/23/1998	54.79	0.00	3,589.45	(7)
		6/23/1998	55.43	0.00	3,588.81	
		9/30/1998	55.96	0.00	3,588.28	
		12/9/1998	56.13	0.00	3,588.11	
		3/10/1999	56.43	0.00	3,587.81	
		6/10/1999	56.94	0.00	3,587.30	
		7/2/1999	57.01	0.00	3,587.23	
		9/14/1999	57.36	0.00	3,586.88	
		12/9/1999	57.72	0.00	3,586.52	
		3/9/2000	58.01	0.00	3,586.23	
		6/8/2000	58.40	0.00	3,585.84	
		9/13/2000	58.84	0.00	3,585.40	
		12/7/2000	59.29	0.00	3,584.95	
		3/8/2001	59.72	0.00	3,584.52	
		6/21/01	60.28	0.00	3,583.96	
9/10/01	60.69	0.00	3,583.55			
MW-12	3,644.29	3/23/1998	54.72	0.00	3,589.57	(7)
		6/23/1998	55.48	0.00	3,588.81	
		9/30/1998	56.02	0.00	3,588.27	
		12/9/1998	56.17	0.00	3,588.12	

Table 2
 Cumulative Groundwater Elevation Data
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-12	3,644.29	3/10/1999	56.45	0.00	3,587.84	
		6/10/1999	56.97	0.00	3,587.32	
		7/2/1999	56.99	0.00	3,587.30	
		9/14/1999	57.41	0.00	3,586.88	
		12/9/1999	57.76	0.00	3,586.53	
		3/10/2000	58.08	0.00	3,586.21	
		6/8/2000	58.42	0.00	3,585.87	
		9/13/2000	58.85	0.00	3,585.44	
		12/7/2000	59.31	0.00	3,584.98	
		3/8/2001	59.76	0.00	3,584.53	
		6/21/01	60.29	0.00	3,584.00	
9/10/01	60.79	0.00	3,583.50			
MW-12D	3,644.38	7/2/1999	57.13	0.00	3,587.25	(8)
		9/14/1999	57.74	0.00	3,586.64	
		12/9/1999	57.86	0.00	3,586.52	
		3/9/2000	58.24	0.00	3,586.14	
		6/8/2000	58.56	0.00	3,585.82	
		9/13/2000	-	-	-	
		12/7/2000	-	-	-	
		3/8/2001	-	-	-	
		6/21/01	-	-	-	
9/10/01	-	-	-			
MW-13	3,645.52	7/2/1999	56.60	0.00	3,588.92	(9)
		9/14/1999	56.92	0.00	3,588.60	
		12/9/1999	57.28	0.00	3,588.24	
		3/10/2000	57.68	0.00	3,587.84	
		6/8/2000	58.04	0.00	3,587.48	
		9/13/2000	58.29	0.00	3,587.23	
		12/7/2000	58.68	0.00	3,586.84	
		3/8/2001	59.19	0.00	3,586.33	
		6/21/01	59.80	0.00	3,585.72	
9/10/01	60.03	0.00	3,585.49			
MW-14	3,642.45	3/8/2001	61.07	0.00	3,581.38	
		6/21/01	61.71	0.00	3,580.74	
		9/10/01	62.31	0.00	3,580.14	
MW-15	3,643.24	3/8/2001	59.79	0.00	3,583.45	
		6/21/01	60.49	0.00	3,582.75	
		9/10/01	61.02	0.00	3,582.22	
OW-4	3,644.06	7/2/1999	58.18	0.00	3,585.88	(8)
		9/14/1999	58.63	0.00	3,585.43	
		12/9/1999	58.92	0.00	3,585.14	
		3/9/2000	59.19	0.00	3,584.87	
		6/8/2000	59.56	0.00	3,584.50	
		9/13/2000	60.16	0.00	3,583.90	
		12/07/00	61.15	0.00	3,582.91	

Table 2
 Cumulative Groundwater Elevation Data
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
OW-4	3,644.06	3/8/2001	61.43	0.00	3,582.63	(10)
		6/21/01	61.48	0.00	3,582.58	
		9/10/01	61.53	0.00	3,582.53	

⁽¹⁾ - Top of casing elevations and groundwater elevations of all monitor wells were relative to an arbitrary datum of 100.00 feet prior to March 1997 and have been converted to Mean Sea Level (MSL).

⁽²⁾ - For wells having measurable thickness of free product, the groundwater elevation was calculated as follows:
 Groundwater Elevation = (TOC elevation)-(depth to groundwater)+[(free product thickness)x(SG of free product)]
 Note: The specific gravity (SG) of the free product is 0.82.

⁽³⁾ - Not measured.

⁽⁴⁾ - Monitor well MW-2 could not be located after January 1994.

⁽⁵⁾ - Well plugged and abandoned July 2, 1999.

⁽⁶⁾ - Monitor well MW-11 could not be located after September 12, 1997.

⁽⁷⁾ - TOC elevations for MW-11A and MW-12 estimated relative to TOC elevation for MW-10.

⁽⁸⁾ - TOC elevations for MW-12D and OW-4 estimated relative to TOC elevation for MW-12.

⁽⁹⁾ - TOC elevation for MW-13 estimated relative to TOC elevation for MW-7.

Table 4
 Cumulative BTEX and TPH Analytical Results for Groundwater Samples
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-1	8/10/92	Regular	5550.0	12090.0	2160.0	7370.0	NA	NA
	2/9/93	Regular	2100.0	6500.0	1300.0	7400.0	NA	NA
	8/19/93	Regular	3200.0	7300.0	1200.0	3700.0	NA	NA
	1/27/94	Regular	1930.0	4580.0	672.0	2390.0	NA	NA
	5/3/95	Regular	NSP	NSP	NSP	NSP	NA	NSP
	8/1/95	Regular	390.0	1300.0	230.0	800.0	NA	5.7
	11/15/95	Regular	880.0	1800.0	300.0	970.0	NA	6.8
	2/23/96	Regular	1500.0	3700.0	620.0	2200.0	NA	21
	5/31/96	Regular	1100.0	1700.0	380.0	990.0	NA	7.5
	8/23/96	Regular	1800.0	3300.0	570.0	2100.0	NA	17
	12/2/96	Regular	5600.0	9600.0	2100.0	9600.0	100	64
	3/12/97	Regular	5500.0	9700.0	2600.0	8200.0	22	62
	6/12/97	Regular	5300.0	34000.0	7500.0	27000.0	180	160
	9/12/97	Regular	1800.0	4400.0	1000.0	3000.0	23	21
	12/10/97	Regular	7600.0	12000.0	2800.0	8200.0	11	71
	3/24/98	Regular	4800.0	7200.0	1200.0	2400.0	4.2	38
	6/23/98	Regular	53.0	680.0	580.0	1400.0	1.4	9.2
	9/30/1998	Regular	3.2	90.0	280.0	970.0	2.5	3.6
	12/10/1998	Regular	<1.0	1.5	17.0	110.0	1.4	0.31
	3/10/1999	Regular	<1.0	<1.0	8.2	110.0	0.62	0.85
	3/10/1999	Duplicate	<1.0	<1.0	7.9	110.0	0.66	0.84
	6/10/1999	Regular	<1.0	1.1	<1.0	28.0	0.53	0.55
	6/10/1999	Duplicate	<1.0	1.8	<1.0	41.0	0.69	0.76
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	<0.20	<0.10
	12/9/1999	-	NS	NS	NS	NS	NS	NS
	3/9/2000	Regular	< 1	< 1	< 1	9.1	14	1.3
6/8/2000	-	NS	NS	NS	NS	NS	NS	
9/13/2000	-	NS	NS	NS	NS	NS	NS	
12/7/2000	-	NS	NS	NS	NS	NS	NS	
3/8/2001	Regular	2.0	<1	<1	<1	0.49	0.58	
6/21/2001	-	NS	NS	NS	NS	NS	NS	
9/10/2001	-	NS	NS	NS	NS	NS	NS	
MW-2 ¹	8/10/92	Regular	14.9	< 4	< 4	< 4	NA	NA
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	100.0	12.0	3.0	13.0	NA	NA
	1/27/94	Regular	< 1	1.2	2.0	2.5	NA	NA
MW-3	8/10/92	Regular	304.9	2099.0	6760.0	1586.0	NA	NA
	2/9/93	Regular	130.0	< 10	< 10	190.0	NA	NA
	8/19/93	Regular	560.0	3100.0	630.0	1900.0	NA	NA
	1/27/94	Regular	1070.0	5380.0	510.0	3120.0	NA	NA
	5/4/95	Regular	770.0	3300.0	470.0	1800.0	NA	NA
	8/1/95	Regular	490.0	2900.0	890.0	1600.0	NA	14
	11/15/95	Regular	250.0	1000.0	180.0	440.0	NA	2.9
	2/23/96	Regular	120.0	810.0	170.0	560.0	NA	4
	5/31/96	Regular	670.0	3900.0	1200.0	2200.0	NA	15
	8/23/96	Regular	330.0	2200.0	590.0	1500.0	NA	12
	12/2/96	Regular	220.0	1800.0	670.0	1000.0	0.39	7.4
	3/12/97	Regular	370.0	2000.0	960.0	1400.0	1.8	11
	6/12/97	Regular	860.0	4800.0	1700.0	2600.0	1.9	20
	9/11/97	Regular	770.0	3000.0	1600.0	1900.0	1.6	16

Table 4
 Cumulative BTEX and TPH Analytical Results for Groundwater Samples
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-3	12/10/97	Regular	240.0	740.0	500.0	450.0	0.59	5.3
	3/24/98	Regular	140.0	630.0	360.0	310.0	0.56	3.9
	6/23/98	Regular	100.0	720.0	350.0	490.0	0.40	4.9
	9/30/1998	Regular	42.0	470.0	450.0	530.0	1.9	3.8
	12/10/1998	Regular	13.0	220.0	160.0	290.0	1.3	0.43
	3/10/1999	Regular	3.2	7.4	42.0	32.0	0.2	0.44
	6/10/1999	Regular	1.7	3.1	<1.0	36.0	<0.20	0.18
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	<0.20	<0.10
	12/9/1999	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.32	< 0.1
	6/8/2000	Regular	< 1	< 1	< 1	< 1	<0.22	< 0.1
	9/13/2000	Regular	< 1	< 1	< 1	< 1	<0.2	< 0.1
	12/7/2000	Regular	< 1	< 1	< 1	< 1	<0.25	< 0.1
	3/8/2001	Regular	< 1	< 1	< 1	< 1	0.42	< 0.1
	6/21/2001	Regular	< 1	< 1	< 1	< 1	<0.22	< 0.1
	9/10/2001	Regular	< 1	< 1	< 1	< 1	<0.2	< 0.1
MW-4	8/10/92	Regular	2594.0	10360.0	2160.0	6740.0	NA	NA
	2/9/93	Regular	5200.0	15000.0	2200.0	10000.0	NA	NA
	8/19/93	Regular	3000.0	12000.0	< 2000	7000.0	NA	NA
	1/27/94	Regular	NSP	NSP	NSP	NSP	NA	NSP
	5/3/95	Regular	NSP	NSP	NSP	NSP	NA	NSP
	8/1/95	Regular	5700.0	17000.0	3500.0	13000.0	NA	120
	11/15/95	Regular	490.0	1600.0	310.0	1100.0	NA	5.2
	2/23/96	Regular	360.0	2800.0	560.0	2500.0	NA	18
	5/31/96	Regular	84.0	830.0	280.0	1100.0	NA	6.2
	8/23/96	Regular	110.0	1400.0	430.0	1800.0	NA	9.8
	12/2/96	Regular	190.0	2000.0	1800.0	7200.0	56	43
	3/12/97	Regular	220.0	1500.0	1500.0	4400.0	27	27
	6/12/97	Regular	47.0	270.0	360.0	950.0	2.5	6.2
	9/12/97	Regular	92.0	840.0	670.0	2100.0	15	7.6
	12/10/97	Regular	230.0	750.0	970.0	2300.0	3.7	16
	3/24/98	Regular	150.0	510.0	270.0	620.0	1.2	5.6
	6/23/98	Regular	160.0	890.0	590.0	1600.0	0.69	10
	9/30/1998	Regular	80.0	180.0	370.0	840.0	2.0	3.9
	12/10/1998	Regular	28.0	70.0	210.0	960.0	9.3	4.3
	12/10/1998	Duplicate	26.0	62.0	180.0	830.0	3.9	4.3
	3/10/1999	Regular	8.0	20.0	250.0	1400.0	13.0	13
	6/10/1999	Regular	<1.0	<1.0	12.0	12.0	0.44	0.63
	9/14/1999	Regular	< 1.0	< 1.0	3.3	13.1	0.35	0.17
	12/9/1999	Regular	< 1	2.5	2.3	20.1	2	0.53
3/10/2000	Regular	< 1	< 1	< 1	3.6	2.6	0.15	
6/8/2000	Regular	< 1	< 1	< 1	< 1	0.44	0.23	
9/13/2000	Regular	< 1	< 1	< 1	< 1	0.61	< 0.1	
12/7/2000	Regular	< 1	< 1	1.3	< 1	0.53	0.16	
3/8/2001	Regular	< 1	< 1	< 1	< 1	0.43	0.16	
6/21/2001	Regular	< 1	< 1	< 1	< 1	<0.25	< 0.1	
9/10/2001	Regular	< 1	< 1	< 1	< 1	<0.2	< 0.1	
MW-5	8/10/92	Regular	< 4	< 4	< 4	< 4	NA	NA
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/10/93	Regular	< 2	< 2	< 2	< 6	NA	NA

Table 4
 Cumulative BTEX and TPH Analytical Results for Groundwater Samples
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-5	1/27/94	Regular	8.7	29.9	4.0	11.3	NA	NA
	5/3/95	Regular	3.7	5.3	0.9	4.6	NA	NA
	8/1/95	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	11/15/95	Regular	< 0.3	1.2	< 0.3	1.5	NA	NA
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	5/31/96	Regular	31.0	86.0	10.0	20.0	NA	NA
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	12/10/97	Regular	< 5	< 5	< 5	< 5	< 0.2	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	12/10/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.55	< 0.1
	6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/13/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/7/2000	Regular	< 1	< 1	< 1	< 1	< 0.25	< 0.1
3/8/2001	Regular	< 1	< 1	< 1	< 1	0.56	< 0.1	
6/21/2001	Regular	< 1	< 1	< 1	< 1	0.26	< 0.1	
9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
MW-6 ¹	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	7000.0	19000.0	3100.0	7200.0	NA	NA
	8/19/93	Regular	8100.0	19000.0	3500.0	6400.0	NA	NA
	1/27/94	Regular	7960.0	20200.0	3830.0	6150.0	NA	NA
	5/4/95	Regular	11000.0	17000.0	2900.0	6000.0	NA	NA
	8/1/95	Regular	8300.0	12000.0	2500.0	5100.0	NA	60
	11/15/95	Regular	8900.0	17000.0	2900.0	5500.0	NA	57
	2/23/96	Regular	8100.0	10000.0	2300.0	4000.0	NA	58
	5/31/96	Regular	83.0	150.0	15.0	51.0	NA	0.57
	5/31/96	Duplicate	87.0	160.0	13.0	47.0	NA	0.52
	8/23/96	Regular	31.0	28.0	9.4	7.9	NA	0.46
	12/2/96	Regular	< 1	< 1	< 1	1.7	5.6	< 0.1
	3/12/97	Regular	12.0	< 5	6.8	18.0	12	< 0.5
	6/12/97	Regular	1900.0	1400.0	410.0	310.0	7.8	7.4
	9/11/97	Regular	11.0	1.3	3.4	< 1	1	< 0.1
	12/10/97	Regular	3.0	4.2	1.2	3.9	1.7	0.14
	3/23/98	Regular	3.6	< 1	4.0	< 1	< 0.2	< 0.1
6/23/98	Regular	170.0	4.1	15.0	7.2	1.2	0.51	
9/30/1998	Regular	1000.0	420.0	140.0	270.0	4.0	3.3	
12/10/1998	Regular	7.6	6.6	1.7	5.8	2.0	< 0.1	
3/10/1999	Regular	2500.0	930.0	590.0	1400.0	11.0	13	
MW-7	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA

Table 4
 Cumulative BTEX and TPH Analytical Results for Groundwater Samples
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-7	8/19/93	Regular	< 2	3.0	< 2	< 2	NA	NA
	1/27/94	Regular	1.1	< 1	< 1	< 1	NA	NA
	5/3/95	Regular	52.0	3.4	0.7	2.8	NA	NA
	8/1/95	Regular	22.0	2.2	0.9	2.8	NA	< 0.1
	11/15/95	Regular	8.4	0.8	< 0.3	0.9	NA	< 0.1
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	2/23/96	Duplicate	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	5/31/96	Regular	29.0	83.0	10.0	21.0	NA	0.25
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/11/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	12/10/97	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/1998	Regular	< 1.0	< 1.0		< 1.0	< 0.20	< 0.1
	12/10/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	4.7	< 0.1
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 5	< 5	< 5	< 5	1.8	< 0.5
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.66	< 0.1
	6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.21	< 0.1
	9/13/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/7/2000	Regular	< 1	< 1	< 1	< 1	< 0.29	< 0.1
	3/8/2001	Regular	< 1	< 1	< 1	< 1	1.2	< 0.1
	6/21/2001	Regular	3.1	< 1	< 1	< 1	< 0.22	< 0.1
	9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.33	< 0.1
MW-8	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	< 2	< 2	< 2	< 2	NA	NA
	1/27/94	Regular	< 1	< 1	< 1	< 1	NA	NA
	5/3/95	Regular	3.0	4.9	0.8	3.7	NA	NA
	8/1/95	Regular	3.1	1.2	0.5	1.6	NA	< 0.001
	8/1/95	Duplicate	3.6	1.5	0.5	1.5	NA	< 0.1
	11/15/95	Regular	< 0.3	0.5	< 0.3	< 0.6	NA	< 0.1
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	5/31/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	1.8	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/11/97	Regular	< 1	< 1	< 1	< 1	0.1	< 0.1
	12/10/97	Regular	< 1	< 1	< 1	< 1	0.3	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	12/10/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
3/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-8	6/10/1999	Regular	<1.0	<1.0	<1.0	<1.0	<0.20	<0.1
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	<0.20	<0.10
	12/9/1999	-	NS	NS	NS	NS	NS	NS
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.55	<0.1
	6/8/2000	-	NS	NS	NS	NS	NS	NS
	9/13/2000	-	NS	NS	NS	NS	NS	NS
	12/7/2000	-	NS	NS	NS	NS	NS	NS
	3/8/2001	Regular	< 1	< 1	< 1	< 1	1.6	<0.1
	6/21/2001	-	NS	NS	NS	NS	NS	NS
	9/10/2001	-	NS	NS	NS	NS	NS	NS
MW-9	4/22/93	Regular	570.0	380.0	< 50	870.0	NA	NA
	7/15/93	Regular	121.0	7.3	3.0	458.0	NA	NA
	8/19/93	Regular	390.0	290.0	40.0	250.0	NA	NA
	1/27/94	Regular	327.0	357.0	51.1	293.0	NA	NA
	5/3/95	Regular	380.0	110.0	19.0	120.0	NA	NA
	8/1/95	Regular	660.0	410.0	91.0	310.0	NA	6.2
	11/15/95	Regular	240.0	24.0	11.0	140.0	NA	1.5
	11/15/95	Duplicate	170.0	18.0	10.0	120.0	NA	1.9
	2/23/96	Regular	170.0	18.0	2.3	160.0	NA	4.3
	5/31/96	Regular	120.0	16.0	3.0	200.0	NA	NA
	8/23/96	Regular	82.0	13.0	6.0	270.0	NA	4
	8/23/96	Duplicate	76.0	14.0	4.8	250.0	NA	4.4
	12/2/96	Regular	61.0	< 25	< 25	210.0	2.6	2.8
	12/2/96	Duplicate	86.0	13.0	2.4	270.0	3.7	2.9
	3/12/97	Regular	30.0	48.0	420.0	880.0	8.2	19
	6/12/97	Regular	4.7	2.1	11.0	97.0	2.6	2.2
	6/12/97	Duplicate	< 5	< 5	6.6	69.0	5.2	1.9
	9/12/97	Regular	2.1	2.3	2.1	120.0	1.2	1.9
	12/10/97	Regular	4.9	9.0	6.8	62.0	0.86	0.92
	3/24/98	Regular	< 1	< 1	< 1	26.0	0.9	1
	6/23/98	Regular	2.4	22.0	10.0	36.0	< 0.2	0.25
	9/30/1998	Regular	1.1	5.5	21.0	59.0	0.27	0.27
	12/10/1998	Regular	< 1.0	1.9	17.0	79.0	5.1	0.25
	3/10/1999	Regular	<1.0	<1.0	5.7	68.0	<0.2	0.22
	6/10/1999	Regular	<1.0	1.8	1.8	71.0	<0.20	0.43
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	<0.20	<0.10
	12/9/1999	-	NS	NS	NS	NS	NS	NS
	3/9/2000	Regular	< 1	< 1	< 1	64.0	0.66	1.3
6/8/2000	-	NS	NS	NS	NS	NS	NS	
9/13/2000	-	NS	NS	NS	NS	NS	NS	
12/7/2000	-	NS	NS	NS	NS	NS	NS	
3/8/2001	Regular	< 1	< 1	< 1	< 1	1.4	<0.1	
6/21/2001	-	NS	NS	NS	NS	NS	NS	
9/10/2001	-	NS	NS	NS	NS	NS	NS	
MW-10	8/19/93	Regular	190.0	460.0	< 200	240.0	NA	NA
	1/27/94	Regular	13.4	4.0	5.5	33.6	NA	NA
	5/4/95	Regular	980.0	15.0	11.0	84.0	NA	NA
	8/1/95	Regular	1300.0	32.0	32.0	100.0	NA	3.6
	11/15/95	Regular	1000.0	24.0	15.0	36.0	NA	1.7
	2/23/96	Regular	810.0	23.0	27.0	44.0	NA	2.4

Table 4
 Cumulative BTEX and TPH Analytical Results for Groundwater Samples
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-10	5/31/96	Regular	700.0	24.0	34.0	28.0	NA	2
	8/23/96	Regular	290.0	3.4	6.4	13.0	NA	1.4
	12/2/96	Regular	280.0	1.3	17.0	8.0	0.94	0.97
	3/12/97	Regular	110.0	< 5	17.0	< 5	0.61	0.57
	6/12/97	Regular	150.0	12.0	30.0	< 5	0.68	< 0.5
	9/12/97	Regular	87.0	2.3	26.0	2.7	0.76	0.33
	9/12/97	Duplicate	87.0	2.4	26.0	2.8	0.79	0.33
	12/10/97	Regular	41.0	9.8	12.0	7.7	1.1	0.28
	12/10/97	Duplicate	36.0	8.5	10.0	6.7	1.2	0.24
	3/23/98	Regular	36.0	< 5	5.9	< 5	1.6	< 0.5
	3/23/98	Duplicate	36.0	< 1	5.3	1.3	1.7	0.18
	6/23/98	Regular	37.0	< 5	< 5	< 5	2.1	< 0.5
	9/30/1998	Regular	84.0	3.2	30.0	2.2	1.4	0.36
	12/10/1998	Regular	29.0	1.0	7.0	1.0	0.86	0.18
	3/9/1999	Regular	28.0	< 5.0	5.8	< 5.0	0.92	< 0.5
	6/10/1999	Regular	17.0	< 1.0	< 1.0	< 1.0	0.30	0.16
	9/14/1999	Regular	10.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	23.0	< 1	< 1	1.2	0.44	0.16
	3/10/2000	Regular	300.0	4.3	6.6	43.2	1.2	0.85
	6/8/2000	Regular	78.0	1.7	7.2	9.0	0.67	0.74
	9/13/2000	Regular	23.0	1.5	1.1	2.9	1.6	0.41
	12/7/2000	Regular	7.2	< 1	< 1	< 1	1.5	0.15
	3/8/2001	Regular	3.4	1.1	< 1	< 1	3.4	0.2
6/22/2001	Regular	< 1	< 1	< 1	< 1	1.2	< 0.1	
9/10/01 and 9/18/01	Regular	2	< 1	< 1	< 1	2.3	< 0.1	
MW-11 ¹	8/19/93	Regular	< 2	< 2	< 2	< 2	NA	NA
	1/27/94	Regular	< 1	< 1	< 1	< 1	NA	NA
	5/4/95	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	8/1/95	Regular	44.0	29.0	5.5	13.0	NA	0.2
	11/15/95	Regular	190.0	2.8	6.2	11.0	NA	0.4
	2/23/96	Regular	49.0	1.2	0.5	4.0	NA	0.25
	5/31/96	Regular	300.0	83.0	12.0	28.0	NA	0.8
	8/23/96	Regular	100.0	1.2	0.3	4.7	NA	0.26
	12/2/96	Regular	970.0	< 5	6.0	8.1	2	1.3
	3/12/97	Regular	130.0	< 5	13.0	5.8	0.42	< 0.5
	3/12/97	Duplicate	100.0	< 5	10.0	5.1	0.43	< 0.5
	6/12/97	Regular	150.0	23.0	19.0	< 5	1.1	0.55
	9/12/97	Regular	220.0	15.0	27.0	13.0	1	0.46
MW-11A	3/24/98	Regular	24.0	5.0	< 5	< 5	0.28	0.14
	6/23/98	Regular	9.9	< 5	< 5	< 5	< 0.2	< 0.5
	9/30/1998	Regular	9.3	3.7	2.2	7.0	< 0.20	0.1
	12/10/1998	Regular	1.7	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/10/1999	Regular	< 5	< 5	< 5	< 5	0.3	< 0.5
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.10
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 5	< 5	< 5	< 5	< 0.2	< 0.1
	3/9/2000	Regular	1.2	< 1	< 1	< 1	0.43	< 0.1
	6/8/2000	Regular	3.6	< 1	< 1	< 1	0.37	< 0.1
9/13/2000	Regular	1.4	< 1	< 1	< 1	0.36	< 0.1	

Table 4
 Cumulative BTEX and TPH Analytical Results for Groundwater Samples
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
	12/7/00	Regular	26	<1	<1	3.3	0.3	0.12
MW-11A	3/8/01	Regular	12	<5	<5	<5	2.2	<0.5
	6/22/2001	Regular	1.5	<1	<1	<1	1	<0.1
	9/10/2001	Regular	7.9	<1	<1	<1	1.1	<0.1
MW-12	3/24/98	Regular	100.0	11.0	6.0	8.0	0.29	0.41
	6/23/98	Regular	88.0	<5	<5	<5	<0.2	<0.5
	6/23/98	Duplicate	89.0	<5	<5	<5	0.31	<0.5
	9/30/1998	Regular	260.0	3.0	1.2	7.9	<0.20	0.62
	12/10/1998	Regular	160.0	<1.0	<1.0	1.2	0.21	0.36
	3/10/1999	Regular	160.0	1.1	<1.0	2.9	0.38	0.45
	6/10/1999	Regular	49.0	1.4	<1.0	<1.0	0.22	0.13
	9/14/1999	Regular	75.0	<1.0	<1.0	<2.0	<0.20	0.23
	12/9/1999	Regular	64.0	<1	<1	<1	<0.2	0.21
	3/10/2000	Regular	93.0	<1	<1	<1	<0.2	0.21
	3/10/2000	Duplicate	99.0	<1	<1	<1	0.22	0.22
	6/8/2000	Regular	62.0	<1	<1	<1	<0.2	<0.1
	9/13/2000	Regular	34.0	<1	<1	<1	0.23	<0.1
	12/7/2000	Regular	27	<1	2.9	1.9	<0.25	<0.1
	3/8/2001	Regular	14	<1	<1	<1	2.1	0.1
	6/22/2001	Regular	12	<1	<1	<1	0.51	0.11
9/10/2001	Regular	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D	
MW-12D	7/2/1999	Regular	<5	<5	<5	<5	<0.20	<0.10
	9/14/1999	Regular	<1.0	<1.0	<1.0	<2.0	<0.20	<0.10
	12/9/1999	Regular	<1	<1	<1	<1	<0.2	<0.1
	3/9/2000	Regular	<1	<1	<1	<1	0.24	<0.1
	6/8/2000	Regular	<1	<1	<1	<1	<0.2	<0.1
	9/13/2000	-	NS	NS	NS	NS	NS	NS
	12/7/2000	-	NS	NS	NS	NS	NS	NS
	3/8/2001	-	NS	NS	NS	NS	NS	NS
	6/22/2001	-	NS	NS	NS	NS	NS	NS
9/18/2001	Regular	<1	<1	<1	<1	<0.2	<0.1	
MW-13	7/2/1999	Regular	1500.0	23.0	750.0	58.0	2.2	5.1
	9/14/1999	Regular	860.0	16.0	450.0	34.4	2.1	3.1
	12/9/1999	Regular	430.0	16.0	410.0	40.9	0.46	3.2
	3/10/2000	Regular	88.0	2.8	200.0	1.3	1.9	0.99
	6/8/2000	Regular	6.0	<1	63.0	3.3	1.1	0.91
	9/13/2000	Regular	<1.0	<1.0	3.4	<1.0	0.44	0.12
	12/7/2000	Regular	<1	<1	<1	<1	0.43	<0.1
	3/8/2001	Regular	<1	<1	1.2	<1	2	<0.1
	6/22/2001	Regular	<1	<1	<1	<1	0.31	<0.1
9/10/2001	Regular	<1	<1	<1	<1	0.3	<0.1	
MW-14	1/14/2001	Regular	<1	<1	<1	<1	<0.2	<0.1
	6/21/2001	-	NS	NS	NS	NS	NS	NS
	9/10/2001	-	NS	NS	NS	NS	NS	NS
MW-15	1/14/2001	Regular	<1	<1	<1	<1	<0.2	<0.1
	6/21/2001	-	NS	NS	NS	NS	NS	NS
	9/10/2001	-	NS	NS	NS	NS	NS	NS
OW-4	6/10/1999	Regular	<1.0	<1.0	<1.0	4.4	<0.2	<0.10
	9/14/1999	Regular	<1.0	<1.0	<1.0	<2.0	<0.20	<0.10
	12/9/1999	Regular	<1.0	<1.0	<1.0	<1.0	<0.2	<0.1

Table 4
 Cumulative BTEX and TPH Analytical Results for Groundwater Samples
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L					
	3/9/2000	Regular	<1.0	<1.0	<1.0	<1.0	0.25	<0.1
OW-4	6/8/2000	Regular	<1.0	<1.0	<1.0	<1.0	<0.21	<0.1
	9/13/2000	Regular	<1.0	<1.0	<1.0	<1.0	<0.2	<0.1
	12/7/2000	-	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D
	3/8/2001	-	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D
	6/21/2001	-	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D
	9/10/2001	-	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D

¹ Well plugged and abandoned 7/1/99

NA=Not Analyzed NS=Not Sampled NS-D=Not Sampled because well was Dry NS-P=Not Sampled due to Phase-separated hydrocarbons in well

Table 5
Cumulative Results⁽¹⁾ for Chloride⁽²⁾ Analyses
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Sample Date	Monitor Wells ⁽³⁾																
	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-11A	MW-12	MW-12D	MW-13	MW-14	MW-15	OW-4
8/1/95	160	150	310	130	380	310	350	110	2200	3400	NA ⁽⁴⁾	NA	NA	NA	NA	NA	NA
8/23/96	130	140	100	99	210	250	360	140	2000	2900	NA	NA	NA	NA	NA	NA	NA
3/23-24/98	212	206	126	151	183	223	364	164	2390	NA	940	1200	NA	NA	NA	NA	NA
3/9-10/99	163	156	142	155	411	238	274	123	1160	NA	834	314	NA	NA	NA	NA	NA
6/10-7/2/99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	195	496	NA	NA	266
3/9-10/00	258	196	196	196	NA	224	241	131	474	NA	1290	327	117	276	NA	NA	258
1/14/2001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	368	219	NA
3/8-9/01	NA	165	172	152	NA	224	250	127	879	NA	1720	586	NA	276	327	NA	NA
6/21/2001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	222	222	NA
9/10/2001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	245	228	NA
9/18/2001	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	78.8	NA	NA	NA	NA

⁽¹⁾ - in mg/L.

⁽²⁾ - NMWQCC standard for chloride is 250 mg/L.

⁽³⁾ - MW-2 not operative after May 3, 1995; P&A'd 7/1/99.

MW-6 P&A'd 7/1/99.

MW-11 P&A'd 7/1/99.

MW-11 A installed February 1998.

MW-12 installed February 1998.

MW-12D installed June 1999.

MW-13 installed June 1999.

MW-14 installed January 2001.

MW-15 installed January 2001.

⁽⁴⁾ - NA indicates not analyzed.

Table 6
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for
Monitor Wells MW-5, MW-10, MW-11A, and MW-12
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-5	3/23/1998	3.87	190	<0.0012
	3/9/1999	<0.1	195	<0.0012
	6/10/1999	4.73	209	<0.0012
	9/14/1999	4.3	210	<0.0012
	12/9/1999	4.2	210	<0.0012
	3/9/2000	5.3	260	<0.0012
	6/8/2000	4.7	240	<0.0012
	9/13/2000	3.93	200	<0.0012
	12/7/2000	3.27	160	<0.0012
	3/8/2001	3.24	180	<0.0012
	6/21/2001	2.74	150	0.0017
9/10/2001	NA ⁽²⁾	130	<0.0012	
MW-10	3/23/1998	0.07	320	0.91
	6/23/1998	<0.1	325	0.55
	9/30/1998	<0.1	204	0.81
	12/10/1998	<0.1	180	0.091
	3/9/1999	<0.1	142	0.035
			223 ⁽³⁾	
	9/14/1999	<0.10	160	0.0049
	12/9/1999	0.49	170	0.0039
	3/10/2000	0.1	160	0.0056
	6/8/2000	<0.1	150	0.031
	9/13/2000	<0.1	160	0.031
	12/7/2000	<0.1	190	0.17
	3/8/2001	<0.1	270	<0.0012
6/22/2001	<0.1	270	0.044	
9/10/2001	NA	NA	NA	
MW-11A	3/23/1998	<0.05	190	0.14
	6/23/1998	<0.1	225	0.11
	9/30/1998	0.4	196	0.043
	12/10/1998	0.7	188	0.033
	3/10/1999	<0.1	164	0.094
<0.1 ⁽⁴⁾			227 ⁽³⁾	

Table 6
 Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for
 Monitor Wells MW-5, MW-10, MW-11A, and MW-12
 Hobbs, New Mexico
 BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-11A	6/10/1999	<0.1	181	0.0036
	9/13/1999	0.22	250	<0.0012
	12/9/1999	<0.1	290	0.0079
	3/9/2000	0.11	270	0.037
	6/8/2000	<0.1	240	0.0069
	9/13/2000	<0.1	320	<0.0012
	12/7/2000	<0.1	260	0.0096
	3/8/2001	<0.1	330	0.0028
	6/22/2001	<0.1	180	0.0074
	9/10/2001	NA	280	<0.0012
MW-12	3/23/1998	<0.05	240	<0.0012
	6/23/1998	<0.1	240	<0.0012
	9/30/1998	<0.1	168	<0.0012
	12/10/1998	<0.1	202	<0.0012
	3/10/1999	<0.1	137	<0.0012
		<0.1 ⁽⁴⁾	193 ⁽³⁾	
	6/10/1999	<0.1	217	<0.0012
	9/14/1999	<0.10	230	<0.0012
	12/9/1999	<0.1	180	<0.0012
	3/10/2000	<0.1	210	<0.0012
	6/8/2000	<0.1	220	<0.0012
	9/13/2000	<0.1	240	<0.0012
	12/7/2000	<0.1	260	<0.0012
	3/8/2001	<0.1	300	<0.0012
6/22/2001	<0.1	360	0.0021	
9/10/2001	NA	NA	NA	
MW-12D	9/18/2001	NA	190	<0.0012

⁽¹⁾ - Analysis by EPA Method 300, except as noted

⁽²⁾ - NA = not analyzed

⁽³⁾ - Analysis by EPA Method 375.4

⁽⁴⁾ - Analysis by EPA Method 353.3

mg/L = milligrams per liter

Appendices



APPENDICES

A



APPENDIX A

Groundwater Sampling Forms



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-3

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 016 Date: 9-10-01 Time: 13:30
 Client: BJSVCs Personnel: Dean Green
 Project Location: Hobbs Weather: Sunny, hot

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 62 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 58.54 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: _____ feet Well Volume: _____ gal Screened Interval (from GS): _____
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: 0.1 gal/min
 Equipment Model(s):
 1. RED MP15
 2. YSE-610D
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
13:45	0.1	7.33	23.41	1066	177.1	3.8			clear
13:50	0.5	7.30	23.40	1104	166.3	1.14	51		
13:55	1.0	7.28	23.38	1117	163.7	0.8			
14:00	1.5	7.26	23.31	1138	161.4	0.77	26		clear

4. SAMPLING DATA

Method(s): Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: _____ Field Filtered? Yes No
 Sample ID: MW-3 Sample Time: 14:00 # of Containers: 5
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: - mg/L
 DO: 1.0 mg/L
 Nitrate: - mg/L
 Sulfate: - mg/L
 Alkalinity: 770 mg/L

5. COMMENTS

well in good condition

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-4

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 016 Date: 10-9-01 Time: 14:00
 Client: BJSVC Personnel: DEAN CIPRI
 Project Location: Hobbs Weather: Sunny, hot

2. WELL DATA

Casing Diameter: 2 inches Type: PVC
 Screen Diameter: 2 inches Type: PVC
 Total Depth of Well: 61.0 feet From: Top of Well Casing (TOC)
 Depth to Static Water: 58.38 feet From: Top of Well Casing (TOC)
 Depth to Product: feet From: Top of Well Casing (TOC)
 Length of Water Column: feet Well Volume: gal Screened Interval (from GS):
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bladder Pump
 Materials: Pump/Bailer: Field Cleaned
 Materials: Rope/Tubing: Polyethylene
 Was well purged dry? No Pumping Rate: 0.1 gal/min

Equipment Model(s):
 1. QED-mp15
 2. YSI-6100

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
14:20	0.1	7.14	21.24	1344	154.1	1.7			Clear
14:25	0.5	7.11	21.09	1372	157.7	1.15			
14:30	1.0	7.09	21.07	1383	161.3	0.85	26		

4. SAMPLING DATA

Method(s): Bladder Pump
 Materials: Pump/Bailer: Field Cleaned
 Materials: Tubing/Rope: Polyethylene
 Depth to Water at Time of Sampling: 58.91 Field Filtered? No
 Sample ID: MW-4 Sample Time: 14:30 # of Containers: 5
 Duplicate Sample Collected? No

Geochemical Analyses:
 Ferrous Iron: 1.5 mg/L
 DO: 1.0 mg/L
 Nitrate: mg/L
 Sulfate: mg/L
 Alkalinity: 770 mg/L

5. COMMENTS well in good condition, cap & lock in place

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Signature



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-5

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 016 Date: 9-10-01 Time: 11:00
 Client: BJSVCs Personnel: DEAN, GIBSON
 Project Location: Hobbs Weather: SUNNY, HOT

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 64.5 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 59.85 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: _____ feet Well Volume: _____ gal Screened Interval (from GS): _____
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____ Equipment Model(s)
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. 9ED-MPIIS
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____ 2. YI-610D
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: 0.1 gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
<u>11:15</u>	<u>0.1</u>	<u>6.44</u>	<u>21.43</u>	<u>1340</u>	<u>141</u>	<u>3.20</u>			<u>clear</u>
<u>11:20</u>	<u>0.5</u>	<u>6.09</u>	<u>21.20</u>	<u>1310</u>	<u>157</u>	<u>1.14</u>	<u>28</u>		
<u>11:25</u>	<u>1.0</u>	<u>6.07</u>	<u>21.15</u>	<u>1300</u>	<u>163</u>	<u>0.84</u>			
<u>11:30</u>	<u>1.5</u>	<u>6.06</u>	<u>21.11</u>	<u>1280</u>	<u>171</u>	<u>0.81</u>	<u>23.4</u>		<u>clear</u>

4. SAMPLING DATA

Method(s): Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: 60.03 Field Filtered? Yes No
 Sample ID: MW5 Sample Time: 11:30 # of Containers: 9
 Duplicate Sample Collected? Yes No ID: _____

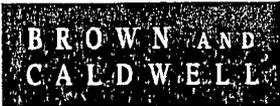
Geochemical Analyses
 Ferrous Iron: 0.5 mg/L
 DO: 1.0 mg/L
 Nitrate: — mg/L
 Sulfate: — mg/L
 Alkalinity: 770 mg/L

5. COMMENTS

well in good condition, cap & lock replaced.

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Signature: _____



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-7

1. PROJECT INFORMATION

Project Number: 12834 Task Number: 216 Date: 9-10-01 Time: 11:45
 Client: BS SVCS Personnel: DEAN CREN
 Project Location: Hobbs Weather: SUNNY, HOT

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 61.5 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 59.25 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: _____ feet Well Volume: _____ gal Screened Interval (from GS): _____
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.567 gal/ft

3. PURGE DATA

Purge Method: Bailor, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s): _____
 Materials: Pump/Bailor Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: 0.1 gal/min

Equipment Model(s):
 1. QED-mp 15
 2. YSI 610D
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
12:00	0.1	6.35	26.50	1144	168.1	3.12	-		clear
12:05	0.5	6.33	25.70	1340	171.3	1.50	38		
12:10	1.0	6.31	25.68	1410	175.1	1.12	-		
12:15	1.5	6.31	25.65	1420	177.1	1.08	42		clear

4. SAMPLING DATA

Method(s): Bailor, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailor Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: 62.8 Field Filtered? Yes No
 Sample ID: MW-7 Sample Time: 12:15 # of Containers: 5
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: 0 mg/L
 DO: 1.0 mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: 770 mg/L

5. COMMENTS well in good condition. cap & lock in place.

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Signature: _____



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-10

1. PROJECT INFORMATION

Project Number: 12532 Task Number: 016 Date: 5-13-01 Time: 16:15
 Client: BJSVCS Personnel: DEAN GREEN
 Project Location: 42665 Weather: Sunny, mild

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 62 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.34 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: - feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: _____ feet Well Volume: _____ gal Screened Interval (from GS): _____
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s): _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. _____
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____
 Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments

4. SAMPLING DATA

Method(s): Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: _____ Field Filtered? Yes No
 Sample ID: MW-10 Sample Time: 16:45 # of Containers: 1
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses
 Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS collected grab sample with bailer in suff. depth water for full set of samples. collected one liter bottle. well is heavily damaged casing & manway are broken from truck traffic
Note. include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Signature _____

GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-10

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 016 Date: 9/18/01 Time: 2024
 Client: BJ Services Personnel: L. Teague A. Mortl
 Project Location: Hobbs - MM Weather: Warm, Dry; No-sky data (dark)

2. WELL DATA

Casing Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Screen Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Total Depth of Well: <u>—</u> feet	From: <input type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Static Water: <u>57.80</u> feet	From: <input type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input checked="" type="checkbox"/> Other: <u>Damaged TOC</u>
Depth to Product: <u>—</u> feet	From: <input type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Length of Water Column: <u>—</u> feet	Well Volume: _____ gal Screened Interval (from GS): _____

Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailor, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s): _____

Materials: Pump/Bailor Stainless PVC Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. _____

Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____

Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Other:	Comments
—	—	—	—	—	—	—	—	—	—
									Grab Sample
									water dirty with insects and vegetation matter

4. SAMPLING DATA

Method(s): Bailor, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailor Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable

Depth to Water at Time of Sampling: _____ Field Filtered? Yes No

Sample ID: MW-10 Sample Time: 2/12 # of Containers: 6

Duplicate Sample Collected? Yes No ID: N/A

Geochemical Analyses

Ferrous Iron:	<u>/</u> mg/L
DO:	<u>/</u> mg/L
Nitrate:	<u>/</u> mg/L
Sulfate:	<u>/</u> mg/L
Alkalinity:	<u>/</u> mg/L

5. COMMENTS

TOC - Broken off; well cap will not seal well. Manway completely destroyed - needs replacing.
Slow Recharge

Note: include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

L. Teague
Signature



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: M6-11A

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 016 Date: 8/12/01 Time: 15:23
 Client: BJSVCS Personnel: DEAN, GARY
 Project Location: Hobbs Weather: Sunny, mild

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 63.3 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 60.69 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 2.61 feet Well Volume: 0.4 gal Screened Interval (from GS): _____
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s): _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: 0.1 gal/min
 1. YSE-610
 2. 250-T-915
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
15:35	0.1	7.14	23.71	4117	-77.1	2.81	612		cloudy
15:40	0.3	7.11	23.32	3944	-89.9	1.74	-		clear
15:45	1.0	7.10	23.24	3810	-117.1	1.52	39		↓

4. SAMPLING DATA

Method(s): Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: 61.14 Field Filtered? Yes No
 Sample ID: M6-11A Sample Time: 15:45 # of Containers: 9
 Duplicate Sample Collected? Yes No ID: Duplicates TS

Geochemical Analyses
 Ferrous Iron: 5.0 mg/L
 DO: 1.0 mg/L
 Nitrate: - mg/L
 Sulfate: - mg/L
 Alkalinity: 770 mg/L

5. COMMENTS

well in good condition, sample in place

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-12

1. PROJECT INFORMATION

Project Number: D532 Task Number: 216 Date: 9/10/01 Time: 15:55

Client: _____ Personnel: _____

Project Location: _____ Weather: _____

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____

Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____

Total Depth of Well: 61 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____

Depth to Static Water: 60.75 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____

Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____

Length of Water Column: _____ feet Well Volume: _____ gal Screened Interval (from GS): _____

Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s): _____

Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. _____

Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____

Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments

4. SAMPLING DATA

Method(s): Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Depth to Water at Time of Sampling: _____ Field Filtered? Yes No

Sample ID: _____ Sample Time: _____ # of Containers: _____

Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L

DO: _____ mg/L

Nitrate: _____ mg/L

Sulfate: _____ mg/L

Alkalinity: _____ mg/L

5. COMMENTS Well not sampled due to lack of water. Attempted to collect grab sample with bailer, notified office.

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Signature _____

GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-12D

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 016 Date: 9/18/01 Time: 2024
 Client: Bj Service Personnel: Teague; Muth
 Project Location: Hobbs Weather: Warm; Dark - No Sky Data

2. WELL DATA

Casing Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Screen Diameter: <u>2</u> inches	Type: <input type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Total Depth of Well: _____ feet	From: <input type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Static Water: <u>60.89</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Product: <u>N/A</u> feet	From: <input type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Length of Water Column: _____ feet	Well Volume: _____ gal
Screened Interval (from GS): _____	
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft	

3. PURGE DATA

Purge Method: Bailor, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s): _____

Materials: Pump/Bailor Stainless PVC Teflon® Other: Polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. _____

Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____

Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Other:	Comments
—	—	—	—	—	—	—	—	—	—
		Grab Sample							

4. SAMPLING DATA

Method(s): Bailor, Size: 1.5 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailor Stainless PVC Teflon® Other: Polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: Nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable

Depth to Water at Time of Sampling: _____ Field Filtered? Yes No

Sample ID: MW12D Sample Time: 2047 # of Containers: 9

Duplicate Sample Collected? Yes No ID: _____

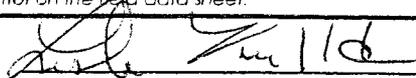
Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

Screw on cover is stripped & needs replacing.

Note: Include comments such as well condition, odor, presence of NAPL or other items not on the field data sheet.


Signature



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-13

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 016 Date: 10-9-01 Time: 14:45
 Client: BJSVC3 Personnel: DEAN, Green
 Project Location: Hobbs Weather: Sunny, hot

2. WELL DATA

Casing Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Screen Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Total Depth of Well: <u>65.2</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Static Water: <u>62.5</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Product: _____ feet	From: <input type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Length of Water Column: <u>5.17</u> feet	Well Volume: <u>2.9</u> gal

Screened interval (from GS): _____
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Was well purged dry? Yes No Pumping Rate: 0.1 gal/min

Equipment Model(s):
 1. YSI-610D
 2. RED-MP 15
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
<u>14:55</u>	<u>0.1</u>	<u>7.47</u>	<u>24.11</u>	<u>3711</u>	<u>147</u>	<u>3.88</u>	<u>46</u>		<u>cloudy</u>
<u>15:00</u>	<u>0.5</u>	<u>7.41</u>	<u>23.88</u>	<u>3408</u>	<u>138</u>	<u>2.11</u>	<u>-</u>		<u>cloudy</u>
<u>15:10</u>	<u>1.0</u>	<u>7.38</u>	<u>23.77</u>	<u>2710</u>	<u>114</u>	<u>1.46</u>	<u>210</u>		<u>clear</u>
<u>15:15</u>	<u>1.5</u>	<u>7.37</u>	<u>23.24</u>	<u>2418</u>	<u>97</u>	<u>2.75</u>	<u>60</u>		<u>b</u>

4. SAMPLING DATA

Method(s): Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Depth to Water at Time of Sampling: 60.74 Field Filtered? Yes No

Sample ID: MW-13 Sample Time: 15:15 # of Containers: 5

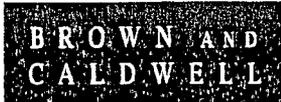
Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses
 Ferrous Iron: 2 mg/L
 DO: 1.0 mg/L
 Nitrate: - mg/L
 Sulfate: - mg/L
 Alkalinity: 220 mg/L

5. COMMENTS well in good condition, cap & lock in place

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Signature _____



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-14

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 016 Date: 9-10-01 Time: 12:25
 Client: BJSUC Personnel: DEAN Green
 Project Location: Hills Weather: Sunny, hot

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 69.2 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 62.71 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: _____ feet Well Volume: _____ gal Screened Interval (from GS): _____
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____ Equipment Model(s):
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. QED mp-15
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____ 2. YSE-610D
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: 0.1 gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
12:35	0.1	6.98	23.51	1211	147.3	1.77			clear
12:40	0.5	6.96	23.48	1417	140.3	1.14			
12:45	1.0	6.98	23.46	1428	138.1	0.85	27		clear

4. SAMPLING DATA

Method(s): Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: 62.77 Field Filtered? Yes No
 Sample ID: MW74 Sample Time: 12:45 # of Containers: 1
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: 1.5 mg/L
 DO: 1.0 mg/L
 Nitrate: - mg/L
 Sulfate: - mg/L
 Alkalinity: 270 mg/L

5. COMMENTS

well in good condition.

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-15

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 016 Date: 9-10-01 Time: 12:55
 Client: BSSVC Personnel: DEAN GREEN
 Project Location: 40665 Weather: Sunny, hot

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 67 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.02 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: _____ feet Well Volume: _____ gal Screened Interval (from GS): _____
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s):
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: 0.1 gal/min
 1. RED-LP15
 2. YSE-6100
 3.

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
13:05	0.1	6.91	20.91	1377	161.4	1.47			CL
13:10	0.5	6.90	21.11	1389	163.3	0.58	38		
13:15	1.0	6.89	21.13	1394	163.5	0.75	34		CL

4. SAMPLING DATA

Method(s): Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: 61.43 Field Filtered? Yes No
 Sample ID: MW-15 Sample Time: 13:15 # of Containers: 1
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: - mg/L
 DO: 1.5 mg/L
 Nitrate: - mg/L
 Sulfate: - mg/L
 Alkalinity: 770 mg/L

5. COMMENTS

well in good condition

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

B



APPENDIX B

Laboratory Analytical Reports for Groundwater Samples



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
(713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

01090631

<u>Report To:</u> Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	<u>Project Name:</u> BJ Hobbs <u>Site:</u> Hobbs, NM <u>Site Address:</u> <u>PO Number:</u> <u>State:</u> New Mexico <u>State Cert. No.:</u> <u>Date Reported:</u> 10/5/01
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This Report Contains A Total Of 13 Pages

Excluding This Page

And

Chain Of Custody

10/5/01

Date



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:
Brown & Caldwell

Certificate of Analysis Number:
01090631

<u>Report To:</u> Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	<u>Project Name:</u> BJ Hobbs <u>Site:</u> Hobbs, NM <u>Site Address:</u> <u>PO Number:</u> <u>State:</u> New Mexico <u>State Cert. No.:</u> <u>Date Reported:</u> 10/5/01
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Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.


Sonia West
Senior Project Manager

10/5/01

Date



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:
01090631

Report To: Brown & Caldwell
 Rick Rexroad
 1415 Louisiana
 Suite 2509
 Houston
 TX
 77002-
 ph: (713) 759-0999

fax: (713) 308-3886

Project Name: BJ Hobbs
Site: Hobbs, NM
Site Address:

PO Number:
State: New Mexico

State Cert. No.:

Date Reported: 10/5/01

Fax To: Brown & Caldwell
 Rick Rexroad fax : (713) 308-3886

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
MW-10	01090631-01	Water	9/18/01 9:12:00 PM	9/20/01 9:30:00 AM	103416	<input type="checkbox"/>
MW-12D	01090631-02	Water	9/18/01 8:47:00 PM	9/20/01 9:30:00 AM	103416	<input type="checkbox"/>

Sonia West
 Sonia West
 Senior Project Manager

10/5/01

Date

Joel Grice
 Laboratory Director
 Ted Yen
 Quality Assurance Officer



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-10 Collected: 9/18/01 9:12:00 SPL Sample ID: 01090631-01

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		09/24/01 22:23	DL	840474
Surr: 1,4-Difluorobenzene	99.3	% 74-121	1		09/24/01 22:23	DL	840474
Surr: 4-Bromofluorobenzene	107	% 55-150	1		09/24/01 22:23	DL	840474
PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	2	1	1		09/24/01 22:23	DL	840423
Ethylbenzene	ND	1	1		09/24/01 22:23	DL	840423
Toluene	ND	1	1		09/24/01 22:23	DL	840423
Xylenes, Total	ND	1	1		09/24/01 22:23	DL	840423
Total BTEX	2	1	1		09/24/01 22:23	DL	840423
Surr: 4-Bromofluorobenzene	110	% 48-156	1		09/24/01 22:23	DL	840423
Surr: 1,4-Difluorobenzene	104	% 72-137	1		09/24/01 22:23	DL	840423

Qualifiers: ND/U - Not Detected at the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-12D Collected: 9/18/01 8:47:00 SPL Sample ID: 01090631-02

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				MCL	E325.3	Units: mg/L	
Chloride	78.3	4	2		09/24/01 15:30	CV	839907

DIESEL RANGE ORGANICS				MCL	SW8015B	Units: mg/L	
Diesel Range Organics	ND	0.2	1		10/02/01 9:21	AM	848222
Surr: n-Pentacosane	68.4	% 18-120	1		10/02/01 9:21	AM	848222

Prep Method	Prep Date	Prep Initials
SW3510B	09/21/2001 7:45	KL

GASOLINE RANGE ORGANICS				MCL	SW8015B	Units: mg/L	
Gasoline Range Organics	ND	0.1	1		09/24/01 22:47	DL	840475
Surr: 1,4-Difluorobenzene	98.3	% 74-121	1		09/24/01 22:47	DL	840475
Surr: 4-Bromofluorobenzene	99.3	% 55-150	1		09/24/01 22:47	DL	840475

HEADSPACE GAS ANALYSIS				MCL	RSK147	Units: mg/L	
Ethane	ND	0.0025	1		10/05/01 10:57	ER	852704
Ethylene	ND	0.0032	1		10/05/01 10:57	ER	852704
Methane	ND	0.0012	1		10/05/01 10:57	ER	852704

PURGEABLE AROMATICS				MCL	SW8021B	Units: ug/L	
Benzene	ND	1	1		09/24/01 22:47	DL	840424
Ethylbenzene	ND	1	1		09/24/01 22:47	DL	840424
Toluene	ND	1	1		09/24/01 22:47	DL	840424
Xylenes, Total	ND	1	1		09/24/01 22:47	DL	840424
Total BTEX	ND	1	1		09/24/01 22:47	DL	840424
Surr: 4-Bromofluorobenzene	108	% 48-156	1		09/24/01 22:47	DL	840424
Surr: 1,4-Difluorobenzene	106	% 72-137	1		09/24/01 22:47	DL	840424

SULFATE				MCL	E300	Units: mg/L	
Sulfate	190	5	25		09/21/01 12:09	SN	847121

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL

Quality Control Documentation



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs

Analysis: Diesel Range Organics
Method: SW8015B

WorkOrder: 01090631
Lab Batch ID: 14972b

Method Blank

Samples in Analytical Batch:

RunID: HP_V_010927E-848220 Units: mg/L
Analysis Date: 09/27/2001 17:35 Analyst: AM
Preparation Date: 09/21/2001 7:45 Prep By: Method

Lab Sample ID: 01090631-02D
Client Sample ID: MW-12D

Table with 3 columns: Analyte, Result, Rep Limit. Rows: Diesel Range Organics (ND, 0.20), Surr: n-Pentacosane (90.8, 18-120)

Laboratory Control Sample (LCS)

RunID: HP_V_010927E-848221 Units: mg/L
Analysis Date: 09/27/2001 18:13 Analyst: AM
Preparation Date: 09/21/2001 7:45 Prep By: Method

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Diesel Range Organics (2.5, 2, 81, 21, 175)

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 01090673-03
RunID: HP_V_010927E-848224 Units: mg/L
Analysis Date: 09/30/2001 0:28 Analyst: AM
Preparation Date: 09/21/2001 7:45 Prep By: Method

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Diesel Range Organics (ND, 5, 4.1, 81.1, 5, 4.1, 81.3, 0.246, 39, 13, 130)

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell

BJ Hobbs

Analysis: Headspace Gas Analysis
Method: RSK147

WorkOrder: 01090631
Lab Batch ID: R44808

Method Blank

Samples in Analytical Batch:

RunID: VARC_011005A-852703 Units: mg/L
Analysis Date: 10/05/2001 10:33 Analyst: ER

Lab Sample ID: 01090631-02C
Client Sample ID: MW-12D

Analyte	Result	Rep Limit
Ethane	ND	0.0025
Ethylene	ND	0.0032
Methane	ND	0.0012

Sample Duplicate

Original Sample: 01090631-02
RunID: VARC_011005A-852704 Units: mg/L
Analysis Date: 10/05/2001 10:57 Analyst: ER

Analyte	Sample Result	DUP Result	RPD	RPD Limit
Butane	ND	ND	0	50
Ethane	ND	ND	0	50
Ethylene	ND	ND	0	50
Isobutane	ND	ND	0	50
Methane	ND	ND	0	50
Propane	ND	ND	0	50
Propylene	ND	ND	0	50

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 01090631
Lab Batch ID: R44004

Method Blank

Samples in Analytical Batch:

RunID: VARE_010924A-839392 Units: ug/L
Analysis Date: 09/24/2001 11:10 Analyst: DL

Lab Sample ID Client Sample ID
01090631-01A MW-10
01090631-02A MW-12D

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Benzene, Ethylbenzene, Toluene, Total BTEX, Xylenes, Total, and two surrogate compounds.

Laboratory Control Sample (LCS)

RunID: VARE_010924A-839391 Units: ug/L
Analysis Date: 09/24/2001 10:21 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Benzene, Ethylbenzene, Toluene, and Xylenes, Total.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 01090580-16
RunID: VARE_010924A-840416 Units: ug/L
Analysis Date: 09/24/2001 17:28 Analyst: DL

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Benzene, Ethylbenzene, Toluene, and Xylenes, Total.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell

BJ Hobbs

Analysis: Gasoline Range Organics
Method: SW8015B

WorkOrder: 01090631
Lab Batch ID: R44057

Method Blank

Samples in Analytical Batch:

RunID: VARE_010924D-840469 Units: mg/L
Analysis Date: 09/24/2001 11:10 Analyst: DL

Lab Sample ID Client Sample ID
01090631-01A MW-10
01090631-02A MW-12D

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Gasoline Range Organics, Surr: 1,4-Difluorobenzene, and Surr: 4-Bromofluorobenzene.

Laboratory Control Sample (LCS)

RunID: VARE_010924D-840468 Units: mg/L
Analysis Date: 09/24/2001 10:45 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row for Gasoline Range Organics.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 01090580-17
RunID: VARE_010924D-840471 Units: mg/L
Analysis Date: 09/24/2001 18:17 Analyst: DL

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row for Gasoline Range Organics.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell

BJ Hobbs

Analysis: Chloride, Total
Method: E325.3

WorkOrder: 01090631
Lab Batch ID: R44037

Method Blank

Samples in Analytical Batch:

RunID: WET_010924F-839904 Units: mg/L
Analysis Date: 09/24/2001 15:30 Analyst: CV

Lab Sample ID: 01090631-02B
Client Sample ID: MW-12D

Table with 3 columns: Analyte, Result, Rep Limit. Row: Chloride, ND, 2.0

Laboratory Control Sample (LCS)

RunID: WET_010924F-839906 Units: mg/L
Analysis Date: 09/24/2001 15:30 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Chloride, 76.2, 77.1, 101, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 01090631-02
RunID: WET_010924F-839908 Units: mg/L
Analysis Date: 09/24/2001 15:30 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Chloride, 79, 100, 179, 99.8, 100, 179, 99.8, 0, 20, 85, 115

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell

BJ Hobbs

Analysis: Sulfate
Method: E300

WorkOrder: 01090631
Lab Batch ID: R44443

Method Blank

Samples in Analytical Batch:

RunID: WET_010921W-847119 Units: mg/L
Analysis Date: 09/21/2001 12:09 Analyst: SN

Lab Sample ID: 01090631-02B
Client Sample ID: MW-12D

Analyte	Result	Rep Limit
Sulfate	NDI	0.20

Laboratory Control Sample (LCS)

RunID: WET_010921W-847120 Units: mg/L
Analysis Date: 09/21/2001 12:09 Analyst: SN

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Sulfate	10	10	102	90	110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 01090631-02
RunID: WET_010921W-847122 Units: mg/L
Analysis Date: 09/21/2001 12:09 Analyst: SN

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Sulfate	190	250	450	106	250	460	108	2.17	20	80	120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

*Sample Receipt Checklist
And
Chain of Custody*



HOUSTON LABORATORY
3880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Sample Receipt Checklist

Workorder:	01090631	Received By:	NB
Date and Time Received:	9/20/01 9:30:00 AM	Carrier name:	FedEx
Temperature:	3	Chilled by:	Water Ice

1. Shipping container/cooler in good condition? Yes No Not Present
2. Custody seals intact on shipping container/cooler? Yes No Not Present
3. Custody seals intact on sample bottles? Yes No Not Present
4. Chain of custody present? Yes No
5. Chain of custody signed when relinquished and received? Yes No
6. Chain of custody agrees with sample labels? Yes No
7. Samples in proper container/bottle? Yes No
8. Sample containers intact? Yes No
9. Sufficient sample volume for indicated test? Yes No
10. All samples received within holding time? Yes No
11. Container/Temp Blank temperature in compliance? Yes No
12. Water - VOA vials have zero headspace? Yes No Not Applicable
13. Water - pH acceptable upon receipt? Yes No Not Applicable

SPL Representative:

Contact Date & Time:

Client Name Contacted:

Non Conformance Issues:

Client Instructions:



SPL, Inc.

Analysis Request & Chain of Custody Record

SPL Workorder No: 010900431
103416
page 1 of 1

Client Name: BREW11 Caldwell
Address/Phone: 713-799-0999
Client Contact: Rick Rey Road
Project Name: BJ Hobbs
Project Location: Hobbs, NM
Invoice To: Rick Rey Road

matrix bottle size pres.
W=water S=soil SL=sludge O=other:
P=plastic A=amber glass G=glass V=vial
1=1 liter 4=4oz 40=vial 8=8oz 16=16oz
1=HCl 2=HNO3 3=H2SO4 O=other:

SAMPLE ID	DATE	TIME	comp	grab	matrix	bottle	size	pres.	Number of Containers	Requested Analysis
MW-1D	9/18/01	21:12			W	V	40	1	9	BTEX 8021 B
MW-12D	9/18/01	20:47			W	VAP	140	1	9	TPH-G
										SO4 300.0
										Methane ETHANE ETHANE 2
										CHLORIDES RISK SRF-147-105
										TPH-D-TPH 6.0015

Client/Consultant Remarks: _____ Laboratory remarks: _____

Requested TAT: 24hr 72hr 48hr Standard Other

Special Reporting Requirements: Standard QC Level 3 QC Level 4 QC

1. Relinquished by Sampler: *Mona Lisa* date: 9/19/01 time: 12:00
 3. Relinquished by: *Mona Lisa* date: 9/19/01 time: 12:00
 5. Relinquished by: *Mona Lisa* date: 9/20/01 time: 9:30

2. Received by: *Fd Ex*
 4. Received by: *Fd Ex*
 6. Received by Laboratory: *Mona Lisa*

Intact? Y N
 Temp: 30
 PM review (initial): *MW*

8880 Interchange Drive, Houston, TX 77054 (713) 660-0901
459-Hughes Drive, Traverse City, MI 49684 (616) 947-5777
500 Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
(713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

01090040

Report To:

Brown & Caldwell
Rick Rexroad
1415 Louisiana
Suite 2509
Houston
TX
77002-
ph: (713) 759-0999

fax: (713) 308-3886

Project Name:

BJ Service, Hobbs, NM

Site:

BJ-Hobbs

Site Address:

PO Number:

State:

New Mexico

State Cert. No.:

Date Reported:

10/1/01

This Report Contains A Total Of 23 Pages

Excluding This Page

And

Chain Of Custody

10/1/01

Date



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:
Brown & Caldwell

Certificate of Analysis Number:
01090040

Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	Project Name: BJ Service, Hobbs, NM Site: BJ-Hobbs Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 10/1/01
---	--

No sample containers were received for your sample ID's "OW-4 and MW-12" (SPL ID's: 01090040-09 and 01090040-07 respectively), to perform the requested analyses. Only one liter amber preserved with HCl was received for your sample ID "MW-10" (SPL ID: 01090040-05) for Diesel Range Organic (DRO) analysis. Also SPL did not receive sample containers to perform requested Nitrate, Sulfate, Ethane, Methane and Ethylene analyses on your sample ID "MW-13" (SPL ID: 01090040-08). Rick Rexroad was notified, via phone conversation, on September 12, 2001.

Your sample ID's "MW-5 and MW-11A" (SPL ID: 01090040-03 and 01090040-06 respectively) were analyzed for Fluoride by method 300.0 per historicals.

As per your request on September 13, 2001, the laboratory cancelled all analyses for Nitrate.

Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

Sonia West
Senior Project Manager

10/1/01

Date



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

01090040

Report To: Brown & Caldwell
 Rick Rexroad
 1415 Louisiana
 Suite 2509
 Houston
 TX
 77002-
 ph: (713) 759-0999

fax: (713) 308-3886

Project Name: BJ Service, Hobbs, NM

Site: BJ-Hobbs

Site Address:

PO Number:

State: New Mexico

State Cert. No.:

Date Reported: 10/1/01

Fax To:

Brown & Caldwell
 Rick Rexroad fax : (713) 308-3886

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
MW-3	01090040-01	Water	9/10/01 2:00:00 PM	9/11/01 9:00:00 AM	097670	<input type="checkbox"/>
MW-4	01090040-02	Water	9/10/01 2:30:00 PM	9/11/01 9:00:00 AM	097670	<input type="checkbox"/>
MW-5	01090040-03	Water	9/10/01 11:30:00 AM	9/11/01 9:00:00 AM	097670	<input type="checkbox"/>
MW-7	01090040-04	Water	9/10/01 12:15:00 PM	9/11/01 9:00:00 AM	097670	<input type="checkbox"/>
MW-10	01090040-05	Water		9/11/01 9:00:00 AM		<input checked="" type="checkbox"/>
MW-10	01090040-05	Water	9/10/01 4:45:00 PM	9/11/01 9:00:00 AM	097670	<input type="checkbox"/>
MW-10	01090040-05	Water	9/10/01 4:45:00 PM	9/11/01 9:00:00 AM	097670	<input checked="" type="checkbox"/>
MW-11A	01090040-06	Water	9/10/01 3:45:00 PM	9/11/01 9:00:00 AM	097670	<input type="checkbox"/>
MW-12	01090040-07	Water		9/11/01 9:00:00 AM		<input checked="" type="checkbox"/>
MW-13	01090040-08	Water	9/10/01 3:15:00 PM	9/11/01 9:00:00 AM	097670	<input type="checkbox"/>
OW-4	01090040-09	Water		9/11/01 9:00:00 AM		<input checked="" type="checkbox"/>
Duplicate	01090040-10	Water	9/10/01	9/11/01 9:00:00 AM	097670	<input type="checkbox"/>
Duplicate	01090040-10	Water	9/10/01	9/11/01 9:00:00 AM	097671	<input type="checkbox"/>
Trip Blank 9/4/01	01090040-11	Water	9/10/01	9/11/01 9:00:00 AM	097671	<input type="checkbox"/>
MW-14	01090040-12	Water	9/10/01	9/11/01 9:00:00 AM	097671	<input type="checkbox"/>
MW-15	01090040-13	Water	9/10/01	9/11/01 9:00:00 AM	097671	<input type="checkbox"/>

Sonia West
 Sonia West
 Senior Project Manager

10/1/01

Date

Joel Grice
 Laboratory Director
 Ted Yen
 Quality Assurance Officer



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID: MW-3 Collected: 9/10/01 2:00:00 SPL Sample ID: 01090040-01

Site: BJ-Hobbs

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.2	1		09/14/01 23:34 AM		832938
Surr: n-Pentacosane	87.6	% 18-120	1		09/14/01 23:34 AM		832938

Prep Method	Prep Date	Prep Initials
SW3510B	09/12/2001 11:51	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		09/14/01 15:53 DL		831091
Surr: 1,4-Difluorobenzene	96.7	% 74-121	1		09/14/01 15:53 DL		831091
Surr: 4-Bromofluorobenzene	106	% 55-150	1		09/14/01 15:53 DL		831091

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		09/14/01 15:53 DL		830982
Ethylbenzene	ND	1	1		09/14/01 15:53 DL		830982
Toluene	ND	1	1		09/14/01 15:53 DL		830982
Xylenes, Total	ND	1	1		09/14/01 15:53 DL		830982
Total BTEX	ND	1	1		09/14/01 15:53 DL		830982
Surr: 4-Bromofluorobenzene	106	% 48-156	1		09/14/01 15:53 DL		830982
Surr: 1,4-Difluorobenzene	110	% 72-137	1		09/14/01 15:53 DL		830982

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 3880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID: MW-4 Collected: 9/10/01 2:30:00 SPL Sample ID: 01090040-02

Site: BJ-Hobbs

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.2	1		09/15/01 0:13 AM		832939
Surr: n-Pentacosane	31.1	% 18-120	1		09/15/01 0:13 AM		832939

Prep Method	Prep Date	Prep Initials
SW3510B	09/12/2001 11:51	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		09/14/01 16:41 DL		831093
Surr: 1,4-Difluorobenzene	96.0	% 74-121	1		09/14/01 16:41 DL		831093
Surr: 4-Bromofluorobenzene	99.0	% 55-150	1		09/14/01 16:41 DL		831093

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		09/14/01 16:41 DL		830984
Ethylbenzene	ND	1	1		09/14/01 16:41 DL		830984
Toluene	ND	1	1		09/14/01 16:41 DL		830984
Xylenes, Total	ND	1	1		09/14/01 16:41 DL		830984
Total BTEX	ND	1	1		09/14/01 16:41 DL		830984
Surr: 4-Bromofluorobenzene	105	% 48-156	1		09/14/01 16:41 DL		830984
Surr: 1,4-Difluorobenzene	106	% 72-137	1		09/14/01 16:41 DL		830984

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID: MW-5 Collected: 9/10/01 11:30:00 SPL Sample ID: 01090040-03

Site: BJ-Hobbs

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.2	1		09/15/01 0:52 AM		832940
Surr: n-Pentacosane	50.4 %	18-120	1		09/15/01 0:52 AM		832940

Prep Method	Prep Date	Prep Initials
SW3510B	09/12/2001 11:51	KL

FLUORIDE-IC			MCL	E300	Units: mg/L		
Fluoride	1.5	0.1	1		09/11/01 14:45 SN		833673

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		09/14/01 16:17 DL		831092
Surr: 1,4-Difluorobenzene	99.0 %	74-121	1		09/14/01 16:17 DL		831092
Surr: 4-Bromofluorobenzene	107 %	55-150	1		09/14/01 16:17 DL		831092

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		09/26/01 16:20 ER		843070
Ethylene	ND	0.0032	1		09/26/01 16:20 ER		843070
Methane	ND	0.0012	1		09/26/01 16:20 ER		843070

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		09/14/01 16:17 DL		830983
Ethylbenzene	ND	1	1		09/14/01 16:17 DL		830983
Toluene	ND	1	1		09/14/01 16:17 DL		830983
Xylenes, Total	ND	1	1		09/14/01 16:17 DL		830983
Total BTEX	ND	1	1		09/14/01 16:17 DL		830983
Surr: 4-Bromofluorobenzene	105 %	48-156	1		09/14/01 16:17 DL		830983
Surr: 1,4-Difluorobenzene	107 %	72-137	1		09/14/01 16:17 DL		830983

SULFATE			MCL	E300	Units: mg/L		
Sulfate	130	4	20		09/12/01 12:33 SN		833722

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID: MW-7

Collected: 9/10/01 12:15:00 SPL Sample ID: 01090040-04

Site: BJ-Hobbs

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.33	1		09/15/01 1:31 AM		832941
Surr: n-Pentacosane	54.8	% 18-120	1		09/15/01 1:31 AM		832941

Prep Method	Prep Date	Prep Initials
SW3510B	09/12/2001 11:51	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		09/14/01 17:06 DL		831094
Surr: 1,4-Difluorobenzene	100	% 74-121	1		09/14/01 17:06 DL		831094
Surr: 4-Bromofluorobenzene	106	% 55-150	1		09/14/01 17:06 DL		831094

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		09/14/01 17:06 DL		830985
Ethylbenzene	ND	1	1		09/14/01 17:06 DL		830985
Toluene	ND	1	1		09/14/01 17:06 DL		830985
Xylenes, Total	ND	1	1		09/14/01 17:06 DL		830985
Total BTEX	ND	1	1		09/14/01 17:06 DL		830985
Surr: 4-Bromofluorobenzene	102	% 48-156	1		09/14/01 17:06 DL		830985
Surr: 1,4-Difluorobenzene	107	% 72-137	1		09/14/01 17:06 DL		830985

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID: MW-11A Collected: 9/10/01 3:45:00 SPL Sample ID: 01090040-06

Site: BJ-Hobbs

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	1.1	0.2	1		09/15/01 2:50 AM		832943
Surr: n-Pentacosane	39.6 %	18-120	1		09/15/01 2:50 AM		832943
<u>Prep Method</u>	<u>Prep Date</u>	<u>Prep Initials</u>					
SW3510B	09/12/2001 11:51	KL					
FLUORIDE-IC			MCL	E300	Units: mg/L		
Fluoride	4.6	0.1	1		09/11/01 14:45 SN		833676
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		09/14/01 17:30 DL		831095
Surr: 1,4-Difluorobenzene	99.3 %	74-121	1		09/14/01 17:30 DL		831095
Surr: 4-Bromofluorobenzene	110 %	55-150	1		09/14/01 17:30 DL		831095
HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		09/26/01 16:34 ER		843071
Ethylene	ND	0.0032	1		09/26/01 16:34 ER		843071
Methane	ND	0.0012	1		09/26/01 16:34 ER		843071
PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	7.9	1	1		09/14/01 17:30 DL		830986
Ethylbenzene	ND	1	1		09/14/01 17:30 DL		830986
Toluene	ND	1	1		09/14/01 17:30 DL		830986
Xylenes, Total	ND	1	1		09/14/01 17:30 DL		830986
Total BTEX	7.9	1	1		09/14/01 17:30 DL		830986
Surr: 4-Bromofluorobenzene	108 %	48-156	1		09/14/01 17:30 DL		830986
Surr: 1,4-Difluorobenzene	108 %	72-137	1		09/14/01 17:30 DL		830986
SULFATE			MCL	E300	Units: mg/L		
Sulfate	280	4	20		09/12/01 12:33 SN		833726

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID: MW-13 Collected: 9/10/01 3:15:00 SPL Sample ID: 01090040-08

Site: BJ-Hobbs

Analyses/Method	Result	Rep.Limit	Dif. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	0.3	0.2	1		09/15/01 3:29 AM		832944
Surr: n-Pentacosane	62.8 %	18-120	1		09/15/01 3:29 AM		832944

Prep Method	Prep Date	Prep Initials
SW3510B	09/12/2001 11:51	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		09/14/01 17:54 DL		831096
Surr: 1,4-Difluorobenzene	96.3 %	74-121	1		09/14/01 17:54 DL		831096
Surr: 4-Bromofluorobenzene	98.0 %	55-150	1		09/14/01 17:54 DL		831096

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		09/14/01 17:54 DL		830987
Ethylbenzene	ND	1	1		09/14/01 17:54 DL		830987
Toluene	ND	1	1		09/14/01 17:54 DL		830987
Xylenes, Total	ND	1	1		09/14/01 17:54 DL		830987
Total BTEX	ND	1	1		09/14/01 17:54 DL		830987
Surr: 4-Bromofluorobenzene	104 %	48-156	1		09/14/01 17:54 DL		830987
Surr: 1,4-Difluorobenzene	104 %	72-137	1		09/14/01 17:54 DL		830987

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: Duplicate Collected: 9/10/01 SPL Sample ID: 01090040-10

Site: BJ-Hobbs

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	0.57	0.2	1		09/15/01 4:08 AM		832945
Surr: n-Pentacosane	39.0 %	18-120	1		09/15/01 4:08 AM		832945

Prep Method	Prep Date	Prep Initials
SW3510B	09/12/2001 11:51	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	0.1	0.1	1		09/14/01 18:19 DL		831097
Surr: 1,4-Difluorobenzene	99.3 %	74-121	1		09/14/01 18:19 DL		831097
Surr: 4-Bromofluorobenzene	108 %	55-150	1		09/14/01 18:19 DL		831097

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	8	1	1		09/14/01 18:19 DL		830988
Ethylbenzene	ND	1	1		09/14/01 18:19 DL		830988
Toluene	ND	1	1		09/14/01 18:19 DL		830988
Xylenes, Total	ND	1	1		09/14/01 18:19 DL		830988
Total BTEX	8	1	1		09/14/01 18:19 DL		830988
Surr: 4-Bromofluorobenzene	108 %	48-156	1		09/14/01 18:19 DL		830988
Surr: 1,4-Difluorobenzene	107 %	72-137	1		09/14/01 18:19 DL		830988

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID: Trip Blank 9/4/01

Collected: 9/10/01

SPL Sample ID: 01090040-11

Site: BJ-Hobbs

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		09/14/01 15:28	DL	831090
Surr: 1,4-Difluorobenzene	97.3	% 74-121	1		09/14/01 15:28	DL	831090
Surr: 4-Bromofluorobenzene	97.3	% 55-150	1		09/14/01 15:28	DL	831090
PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		09/14/01 15:28	DL	830981
Ethylbenzene	ND	1	1		09/14/01 15:28	DL	830981
Toluene	ND	1	1		09/14/01 15:28	DL	830981
Xylenes, Total	ND	1	1		09/14/01 15:28	DL	830981
Total BTEX	ND	1	1		09/14/01 15:28	DL	830981
Surr: 4-Bromofluorobenzene	105	% 48-156	1		09/14/01 15:28	DL	830981
Surr: 1,4-Difluorobenzene	104	% 72-137	1		09/14/01 15:28	DL	830981

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
* - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
J - Estimated Value between MDL and PQL

Quality Control Documentation



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Service, Hobbs, NM

Analysis: Diesel Range Organics
Method: SW8015B

WorkOrder: 01090040
Lab Batch ID: 14783

Method Blank

Samples in Analytical Batch:

RunID: HP_V_010914E-832936 Units: mg/L
Analysis Date: 09/14/2001 22:15 Analyst: AM
Preparation Date: 09/12/2001 11:51 Prep By: KL Method SW3510B

Table with 2 columns: Lab Sample ID, Client Sample ID. Lists samples 01B through 10B with corresponding client IDs MW-3 to Duplicate.

Table with 3 columns: Analyte, Result, Rep Limit. Shows Diesel Range Organics (ND, 0.20) and Surr: n-Pentacosane (86.2, 18-120).

Laboratory Control Sample (LGS)

RunID: HP_V_010914E-832937 Units: mg/L
Analysis Date: 09/14/2001 22:54 Analyst: AM
Preparation Date: 09/12/2001 11:51 Prep By: KL Method SW3510B

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Shows Diesel Range Organics with 2.5 spike, 2 result, 78% recovery, and limits of 21 and 175.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 01090355-02
RunID: HP_V_010914E-832951 Units: mg/L
Analysis Date: 09/15/2001 10:40 Analyst: AM
Preparation Date: 09/12/2001 11:51 Prep By: KL Method SW3510B

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Shows Diesel Range Organics with 5 spike, 4 result, 78.4% recovery, 5 spike, 3.9 result, 77.6% recovery, and RPD of 1.00.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Service, Hobbs, NM

Analysis: Headspace Gas Analysis
Method: RSK147

WorkOrder: 01090040
Lab Batch ID: R44199

Method Blank

Samples in Analytical Batch:

RunID: VARC_010927A-843076 Units: mg/L
Analysis Date: 09/27/2001 8:28 Analyst: ER

Lab Sample ID Client Sample ID
01090040-03D MW-5
01090040-06D MW-11A

Analyte	Result	Rep Limit
Ethane	ND	0.0025
Ethylene	ND	0.0032
Methane	ND	0.0012

Sample Duplicate

Original Sample: 01090387-05
RunID: VARC_010927A-843067 Units: mg/L
Analysis Date: 09/26/2001 15:21 Analyst: ER

Analyte	Sample Result	DUP Result	RPD	RPD Limit
Butane	ND	ND	0	50
Ethane	ND	ND	0	50
Ethylene	ND	ND	0	50
Isobutane	ND	ND	0	50
Methane	0.0035	0.0029	19	50
Propane	ND	ND	0	50
Propylene	ND	ND	0	50

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Brown & Caldwell
 BJ Service, Hobbs, NM

Analysis: Purgeable Aromatics
 Method: SW8021B

WorkOrder: 01090040
 Lab Batch ID: R43550

Method Blank

Samples in Analytical Batch:

RunID: VARE_010914A-830978 Units: ug/L
 Analysis Date: 09/14/2001 13:02 Analyst: DL

Lab Sample ID	Client Sample ID
01090040-01A	MW-3
01090040-02A	MW-4
01090040-03A	MW-5
01090040-04A	MW-7
01090040-06A	MW-11A
01090040-08A	MW-13
01090040-10A	Duplicate
01090040-11A	Trip Blank 9/4/01

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Toluene	ND	1.0
Total BTEX	ND	1.0
Xylenes, Total	ND	1.0
Surr: 1,4-Difluorobenzene	105.0	72-137
Surr: 4-Bromofluorobenzene	107.6	48-156

Laboratory Control Sample (LCS)

RunID: VARE_010914A-830977 Units: ug/L
 Analysis Date: 09/14/2001 12:13 Analyst: DL

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	50	51	102	70	130
Ethylbenzene	50	53	107	70	130
Toluene	50	51	102	70	130
Total BTEX	300	318	106	70	130
Xylenes, Total	150	163	109	70	130

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 01090040-01
 RunID: VARE_010914A-830979 Units: ug/L
 Analysis Date: 09/14/2001 13:26 Analyst: DL

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Benzene	ND	20	19	94.9	20	20	98.5	3.70	21	32	164
Ethylbenzene	ND	20	19	94.8	20	20	98.8	4.15	19	52	142
Toluene	ND	20	19	90.9	20	19	94.7	4.14	20	38	159
Total BTEX	ND	120	115	95.8	120	118	98.3	2.58	20	32	164
Xylenes, Total	ND	60	58	96.7	60	59	98.3	1.71	18	53	144

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
 B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
 J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Service, Hobbs, NM

Analysis: Gasoline Range Organics
Method: SW8015B

WorkOrder: 01090040
Lab Batch ID: R43555

Method Blank

Samples in Analytical Batch:

RunID: VARE_010914B-831087 Units: mg/L
Analysis Date: 09/14/2001 13:02 Analyst: DL

Table with 2 columns: Lab Sample ID, Client Sample ID. Rows include 01090040-01A through 01090040-11A.

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Gasoline Range Organics, Surr: 1,4-Difluorobenzene, Surr: 4-Bromofluorobenzene.

Laboratory Control Sample (LCS)

RunID: VARE_010914B-831085 Units: mg/L
Analysis Date: 09/14/2001 12:37 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row for Gasoline Range Organics.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 01090040-03
RunID: VARE_010914B-831088 Units: mg/L
Analysis Date: 09/14/2001 14:15 Analyst: DL

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row for Gasoline Range Organics.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Service, Hobbs, NM

Analysis: Chloride, Total
Method: E325.3

WorkOrder: 01090040
Lab Batch ID: R43525

Method Blank

Samples in Analytical Batch:

RunID: WET_010914M-830258 Units: mg/L
Analysis Date: 09/14/2001 14:00 Analyst: CV

Lab Sample ID Client Sample ID
01090040-12A MW-14
01090040-13A MW-15

Table with 3 columns: Analyte, Result, Rep Limit. Row: Chloride, ND, 2.0

Laboratory Control Sample (LCS)

RunID: WET_010914M-830260 Units: mg/L
Analysis Date: 09/14/2001 14:00 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Chloride, 76.2, 77.1, 101, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 01090040-03
RunID: WET_010914M-830262 Units: mg/L
Analysis Date: 09/14/2001 14:00 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Chloride, 140, 250, 390, 99.8, 250, 385, 98.1, 1.77, 20, 85, 115

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Service, Hobbs, NM

Analysis: Fluoride-IC
Method: E300

WorkOrder: 01090040
Lab Batch ID: R43646

Method Blank

Samples in Analytical Batch:

RunID: WET_010911ZE-833671 Units: mg/L
Analysis Date: 09/11/2001 14:45 Analyst: SN

Lab Sample ID Client Sample ID
01090040-03C MW-5
01090040-06C MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Row: Fluoride, ND, 0.10

Laboratory Control Sample (LCS)

RunID: WET_010911ZE-833672 Units: mg/L
Analysis Date: 09/11/2001 14:45 Analyst: SN

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Fluoride, 10, 9.9, 99, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 01090040-03
RunID: WET_010911ZE-833674 Units: mg/L
Analysis Date: 09/11/2001 14:45 Analyst: SN

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Fluoride, 1.5, 10, 10, 84.8, 10, 10, 85.1, 0.330, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Service, Hobbs, NM

Analysis: Sulfate
Method: E300

WorkOrder: 01090040
Lab Batch ID: R43648

Method Blank

Samples in Analytical Batch:

RunID: WET_010912I-833719 Units: mg/L
Analysis Date: 09/12/2001 12:33 Analyst: SN

Lab Sample ID Client Sample ID
01090040-03C MW-5
01090040-06C MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Row: Sulfate, ND, 0.20

Laboratory Control Sample (LCS)

RunID: WET_010912I-833721 Units: mg/L
Analysis Date: 09/12/2001 12:33 Analyst: SN

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Sulfate, 10, 11, 107, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 01090040-03
RunID: WET_010912I-833723 Units: mg/L
Analysis Date: 09/12/2001 12:33 Analyst: SN

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Sulfate, 130, 200, 330, 101, 200, 330, 99.7, 1.04, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

*Sample Receipt Checklist
And
Chain of Custody*



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Sample Receipt Checklist

Workorder:	01090040	Received By:	RE
Date and Time Received:	9/11/01 9:00:00 AM	Carrier name:	FedEx
Temperature:	4	Chilled by:	Water Ice

1. Shipping container/cooler in good condition? Yes No Not Present
2. Custody seals intact on shipping container/cooler? Yes No Not Present
3. Custody seals intact on sample bottles? Yes No Not Present
4. Chain of custody present? Yes No
5. Chain of custody signed when relinquished and received? Yes No
6. Chain of custody agrees with sample labels? Yes No
1. Did not receive all samples for ID#OW-4 and ID#MW-12 and only received 1-amber liter preserved with HCL for ID#MW-10.
7. Samples in proper container/bottle? Yes No
8. Sample containers intact? Yes No
9. Sufficient sample volume for indicated test? Yes No
10. All samples received within holding time? Yes No
2. All samples for Nitrate analysis were received past the method required holding time.
11. Container/Temp Blank temperature in compliance? Yes No
12. Water - VOA vials have zero headspace? Yes No Not Applicable
13. Water - pH acceptable upon receipt? Yes No Not Applicable

SPL Representative: West, Sonia

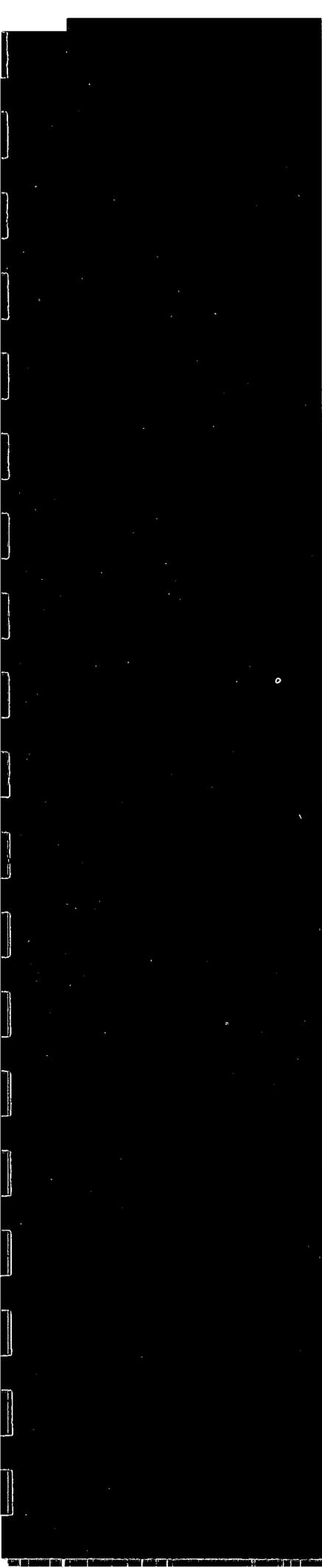
Contact Date & Time: 9/13/01 1:11:00 PM

Client Name Contacted: Rick Rexroad

Non Conformance Issues: 1. Login on hold until client is notified. Only received 1-cooler unable to track to see if client sent more than one cooler.

Client Instructions: 1. Per Rick OW-4 & MW-12 samples were not taken. He will check on sample MW-10. Client could only collect sample for DRO, need to proceed with the analysis. 2. Cancel all Nitrate analyses.





B R O W N A N D C A L D W E L L

**JUNE 2002 GROUNDWATER SAMPLING
REPORT AND BIOSPARGING SYSTEM
CLOSURE REPORT
HOBBS, NEW MEXICO FACILITY
BJ SERVICES COMPANY, U.S.A.**

NOVEMBER 11, 2002

**JUNE 2002 GROUNDWATER SAMPLING REPORT AND BIOSPARGING SYSTEM
CLOSURE REPORT
HOBBS, NEW MEXICO FACILITY
BJ SERVICES COMPANY, U.S.A.**

Prepared for

BJ Services Company, U.S.A.
11211 FM 2920
Tomball, Texas 77375

BC Project Number: 12832.017



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November 11, 2002

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1.0 INTRODUCTION

Brown and Caldwell conducted a quarterly groundwater sampling event at the BJ Services Company, U.S.A. (BJ Services) facility located at 2708 West County Road in Hobbs, New Mexico in June 2002. This report presents a description of the groundwater sampling field activities, a summary and evaluation of the analytical results, and an evaluation of remedial technologies being applied at the facility. A groundwater potentiometric surface map and a hydrocarbons concentration map are included.

A layout of the facility is shown in Figure 1. The facility formerly operated an on-site fueling system. Subsurface impact near the former diesel fueling system was detected by the New Mexico Oil Conservation Division (NMOCD) during an on-site inspection on February 7, 1991. The fueling system was taken out of operation in July 1995. The NMOCD has required a quarterly groundwater monitoring program to assess the concentration of hydrocarbon constituents in groundwater as a result of the diesel fuel release.

A biosparging system was activated in November 1995 and expanded in March/April 1997 and February/March 1998 to remediate soil and groundwater at the former fuel island area of the facility. The biosparging system was deactivated on November 1, 2000 after achieving cleanup goals for groundwater. The confirmation soil sampling program specified in the NMOCD-approved Remedial Action Plan (RAP) for the facility was conducted in July 2001. The results of the confirmation soil sampling program were presented to NMOCD in the report for the June 2001 groundwater sampling event. The June 2002 sampling event is the fourth groundwater sampling event conducted since the completion of the confirmation soil boring program.

BJ Services removed three field waste tanks at the facility on March 6-7, 1997. The ongoing groundwater monitoring program was expanded to address both the former fuel island and the former field waste tanks areas of the facility, as directed by NMOCD in correspondence dated January 21, 1999.

A site chronology detailing the history of investigations into and remediation of soil and groundwater impacts in the former fueling system and the former field waste tanks areas of the facility is presented in Table 1.

2.0 FIELD ACTIVITIES AND RESULTS

Brown and Caldwell purged and sampled 10 monitor wells (MW-3, MW-4, MW-5, MW-7, MW-10, MW-11A, MW-12D, MW-13, MW-14, and MW-15) at the facility on June 17-18, 2002 to determine concentrations of dissolved-phase hydrocarbons in groundwater and to evaluate general groundwater quality in the area of the facility. Monitor well locations are shown in Figure 1. The following subsections describe the field activities conducted by Brown and Caldwell during the June 2002 event, and present the results of the associated groundwater analyses.

2.1 Groundwater Sampling Activities

Groundwater level measurements were obtained from monitor wells on June 17, 2002, prior to purging and sampling the wells. Groundwater levels were measured to the nearest 0.01 foot with an oil/water interface probe. Current and historic groundwater elevation data are presented in Table 2. The groundwater elevation data indicate that the groundwater flow direction is to the east/northeast, with an overall hydraulic gradient of approximately 0.008 foot/foot. A groundwater elevation map for June 17, 2002 is presented in Figure 2. The groundwater elevation data presented in Table 2 indicate that groundwater levels have continued to decline in monitor wells at the facility since late 1995.

Monitor wells MW-12 and OW-4 were dry and could not be sampled. Monitor well MW-12D, which is located adjacent to monitor well MW-12 and screened in a deeper portion of the aquifer than monitor well MW-12, had sufficient water for collection of a complete sample. Accordingly, Brown and Caldwell collected a groundwater sample from monitor well MW-12D in lieu of sampling monitor well MW-12. In the March 2002 Groundwater Sampling Report for the facility, Brown and Caldwell recommended installation of a new monitor well, MW-16, to replace monitor well OW-4. Brown and Caldwell will proceed with this well installation activity upon approval by NMOCD and acquisition of access privileges from the off-site landowner.

All wells, with the exception of monitor well MW-12D, were purged and sampled with disposable bailers and clean, previously unused polyethylene string. Monitor well MW-12D was purged and sampled with a 2-inch submersible pump. Monitor wells MW-5, MW-7, MW-8, MW-10 and MW-14 were purged dry. Monitor well MW-8 did not recharge adequately after purging, and was not sampled. All wells that were sampled with the exception of MW-12D did not have enough water to sample on June 16, 2002. These wells were allowed to recharge and were sampled the next day. Monitor wells MW-12D and MW-15 were purged until groundwater stabilization occurred, with stabilization defined as variation of less than 0.1° Celsius, less than 0.1 pH units, less than 1% specific conductivity, and less than 15 millivolts (mV) Eh between consecutive measurements of groundwater during the purging process. The wells were sampled in general order of least impacted to most impacted (based on analytical results from the March 2002 and preceding sampling events) to further mitigate the potential for cross-contamination of wells.

Field parameter measurements for pH, conductivity, oxidation-reduction (redox) potential, dissolved oxygen, and temperature were collected from wells containing an adequate volume of water during and upon completion of well purging. Alkalinity was measured in selected wells upon conclusion of purging activities. Field parameter readings were recorded on the groundwater sampling forms included in Appendix A. Field readings for the June 2002 sampling event are summarized in Table 3.

Groundwater samples were collected by pouring recovered water from a bailer. Each sample was then transferred to laboratory-prepared, clean glass and/or plastic containers, sealed with Teflon®-lined lids, labeled, and placed on ice in an insulated cooler for delivery to Southern Petroleum Laboratory in Houston, Texas for analysis under standard chain-of-custody control.

Field measurement equipment was decontaminated prior to and after each usage. Decontamination procedures consisted of washing with fresh water and a non-phosphate detergent, then rinsing with deionized water. Purge water was discharged to an on-site water reclamation system for re-use by BJ Services.

2.2 Results of Groundwater Analyses

Groundwater samples from monitor wells MW-14 and MW-15 were analyzed for Method 325.3 chloride content. Groundwater samples from the remaining wells were analyzed for gasoline- and diesel-range total petroleum hydrocarbons (TPH-G and TPH-D) by EPA Method 8015B, and benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8021. Analyses of groundwater from selected wells for nitrate and sulfate (Method E300) and methane (Method RSK 147) were performed to evaluate the potential for natural attenuation of hydrocarbons at the facility. The laboratory analytical report and chain-of-custody documentation for the groundwater samples collected during the June 2002 sampling event are provided in Appendix B.

Current and cumulative analytical results for BTEX, TPH-D, and TPH-G are presented in Table 4. Figure 3 presents a hydrocarbons concentration map for the June 2002 sampling event. BTEX constituents were detected in only one of the eight applicable wells. Benzene and ethylbenzene were detected in monitor well MW-11A at respective concentrations of 0.0029 milligrams per liter (mg/L) and 0.0013 mg/L. All BTEX concentrations are less than the applicable New Mexico Water Quality Control Commission (NMWQCC) standards. Benzene has not been detected in former fuel island source area monitor wells MW-3 or MW-4 since June 1999 and March 1999, respectively. Adjustments to the biosparging system in July 1999 and March 2000 to increase air flow to the monitor well MW-13 area resulted in decreases in the concentration of benzene in monitor well MW-13 from 1.5 mg/L on July 2, 1999 to the present non-detectable concentration. Benzene has not been detected in monitor well MW-13 since June 2000.

Table 5 presents current and historic results for chloride analyses performed on groundwater samples collected at the facility. The June 2002 chloride concentration of 258 mg/L in downgradient monitor well MW-14 exceeds the NMWQCC chloride standard of 250 mg/L. The chloride concentration in monitor well MW-15 remained below 250 mg/L in June 2002.

The current and historic results for nitrate, sulfate, and dissolved methane analyses performed on groundwater samples from monitor wells MW-5, MW-10, MW-11A, MW-12, and MW-12D to assist in evaluation of natural attenuation processes at the facility are presented in Table 6.

3.0 EVALUATION OF REMEDIAL TECHNOLOGIES

The following subsections present evaluations of the remedial technologies applied at the former fueling system and former field waste tanks areas of the BJ Services facility at Hobbs, New Mexico.

3.1 Biosparging System at the Former Fueling System Area

Based on the results of previous investigations conducted by Brown and Caldwell and Roberts/Schornick and Associates, Inc., Brown and Caldwell recommended installation of a biosparging system at the former fueling system area of the facility in the RAP submitted to the NMOCD in May 1994. The NMOCD approved the RAP on August 11, 1994. The biosparging system was installed in August 1995 and expanded in April 1997 and February 1998. Operation of the biosparging system resulted in substantial decreases in hydrocarbon concentrations in former fueling system area monitor wells MW-1, MW-3, MW-4, MW-9, and MW-13, as documented in the December 2000 groundwater sampling report for the facility.

Based on the observed trends in hydrocarbon concentrations and in accordance with the recommendations presented in the report for the June 2000 groundwater sampling event, the biosparging system was deactivated on November 1, 2000. The June 2002 sampling event is the seventh sampling event completed since this shut down.

Benzene concentrations in former fueling system source area monitor wells MW-1, MW-3, MW-4, MW-9, and MW-13 have remained below applicable NMWQCC standards since deactivation of the biosparging system. Furthermore, BTEX constituent concentrations in these wells have now remained below applicable NMWQCC standards for the last nine consecutive quarters.

In accordance with the RAP, confirmation soil sampling activities were conducted at the former fueling system area in July 2001 to verify the effectiveness of the biosparging system in remediating vadose zone soils in this area. The analytical results for these soil samples, as

discussed in the report for the June 2001 groundwater sampling event, indicate that remediation goals for soil in this area have successfully been achieved. The June 2002 sampling event is the fourth of four groundwater sampling events conducted following the completion of the confirmation soil boring program, as specified in the NMOCD-approved RAP.

Analytical results for groundwater samples collected from the former fuel island monitor wells have not exceeded the groundwater remediation goals specified in the RAP during the 1-year quarterly monitoring period (i.e., September 2001, December 2001, March 2002, and June 2002) following completion of the confirmation soil boring program in July 2001. Therefore, in accordance with the requirements specified in the NMOCD-approved RAP, Brown and Caldwell recommends that BJ Services proceed with closure activities for the biosparging system, as described below in the biosparging system closure report. The remaining biosparging system closure activities will entail the following activities:

- Plug and abandon (P&A) monitor wells MW-1, MW-3, MW-4, MW-7, MW-8, MW-9 and MW-13;
- P&A air injection (AI) wells AI-20, AI-21, AI-22, AI-23, and AI-24;
- P&A vapor extraction (VE) wells VE-1, VE-2, VE-3, VE-4, VE-5, VE-6, and VE-7;
- P&A AI/VE wells AV-1, AV-2, AV-3, AV-4, AV-5, AV-6, AV-7, AV-8, AV-9, AV-10, AV-11, AV-12, AV-13, AV-14, AV-15, AV-16, AV-17, AV-18, and AV-19;
- Remove underground lines from the blower building to the AI, VE, and AI/VE wells listed above; and
- Remove the blowers from the blower building.

3.2 Natural Attenuation at the Former Field Waste Tanks Area

Natural attenuation is the primary remediation mechanism for the dissolved-phase hydrocarbon plume located in the area of the former field waste tanks (see Figure 1).

Plume behavior is the primary evidence of natural attenuation. Secondary evidence of natural attenuation can be obtained by the collection and evaluation of data relating to the concentrations of indigenous electron acceptors such as dissolved oxygen, nitrate, sulfate, and carbon dioxide. A plume is shrinking when the rate of hydrocarbon loading from a source area is less than the rate of natural degradation of hydrocarbons. Plume shrinkage in the absence of aggressive remediation is indicative of the occurrence of natural attenuation processes. Conversely, a plume is expanding if the rate of hydrocarbon loading from a source area is greater than the rate of natural degradation of hydrocarbons through natural attenuation processes.

The former field waste tanks in the eastern portion of the facility were removed in March 1997. Concentrations of total BTEX in monitor wells in the area of the former field waste tanks have been generally stable or declining subsequent to removal of the field waste tanks. Sporadic increases in total BTEX concentrations between quarterly sampling events have been observed in monitor wells in this area since March 1997, however. These increases may be attributed to sporadic loading rates from the vadose zone in excess of the natural attenuation rate of the area. The following subsections present primary and secondary evidence of natural attenuation of hydrocarbons in groundwater at the former field waste tanks area of the facility.

3.2.1 Primary Evidence

The benzene concentration in monitor well MW-10 has decreased from a maximum of 1.3 mg/L in August 1995 (prior to removal of the field waste tanks) to less than the NMWQCC standard of 0.01 mg/L in the six applicable groundwater sampling events from December 2000 through March 2002. Concentrations of toluene, ethylbenzene, and xylenes in monitor well MW-10 have undergone similar decreases over this time period. There were no detections of BTEX constituents in monitor well MW-10 in June 2002.

Benzene concentrations at the monitor well MW-11/11A location have decreased from a maximum of 0.970 mg/L in December 1996 (prior to removal of the field waste tanks) to less than the NMWQCC standard of 0.01 mg/L in the last five groundwater sampling events.

Concentrations of BTEX constituents at the monitor well MW-12/12D location have displayed decreases similar to those observed at the monitor well MW-11/11A location since September 1998.

3.2.2 Secondary Evidence

The following lines of geochemical evidence can also be used to suggest that intrinsic bioremediation (an important natural attenuation mechanism) of dissolved-phase hydrocarbons is occurring in the area of the former field waste tanks.

1. Dissolved oxygen may be utilized during intrinsic bioremediation. Dissolved oxygen concentrations should therefore be depressed in areas where intrinsic bioremediation is occurring.

Groundwater samples were collected using bailers during the June 2002 sampling event. Dissolved oxygen concentrations in most wells at the facility were elevated in June 2002 relative to previous sampling events in which groundwater samples were collected using a downhole pump. Use of bailers in groundwater sampling causes groundwater samples to be oxygenated, precluding meaningful comparison of dissolved oxygen data from wells at impacted areas to corresponding data from wells in non-impacted areas.

Historic evidence submitted to the NMOCD in previous quarterly groundwater monitoring reports for the facility has indicated that dissolved oxygen concentrations have typically been depressed in hydrocarbon-impacted monitor wells relative to non-impacted wells at the facility (see the June 2001 Groundwater Sampling Report for BJ Services Hobbs, New Mexico Facility, for example).

2. Nitrate may be utilized as an electron acceptor during intrinsic bioremediation after dissolved oxygen is depleted. Therefore, nitrate concentrations may be depressed in areas where intrinsic bioremediation is occurring.

Nitrate was detected at a concentration of 2.56 mg/L in background monitor well MW-5 during the June 2002 sampling event. Although there was minimal to no hydrocarbon

impact at former field waste tanks area wells MW-10, MW-11A, and MW-12D in June 2002, nitrate was not detected in any of these wells. The decreased nitrate concentrations observed in June 2002 at former field waste tanks area wells MW-10, MW-11A, and MW-12D relative to the background nitrate concentration at the facility is likely due to residual effects of hydrocarbons.

3. When dissolved oxygen and nitrate are depleted, anaerobic microbes that utilize other electron acceptors become active. Ferrous iron is the reduction product of ferric iron, a common electron acceptor. Therefore, ferrous iron concentrations should increase in areas where intrinsic bioremediation is occurring.

Ferrous iron concentrations were not measured in former field waste tanks area monitor wells in June 2002 due to insufficient yield from the wells.

4. Microbes that utilize sulfate become active when dissolved oxygen, nitrate, and ferric iron are depleted. Sulfate concentrations should therefore decrease in areas where intrinsic bioremediation is occurring through use of sulfate as an electron acceptor. June 2002 sulfate concentrations in former field waste tanks area monitor wells MW-10, MW-11A, and MW-12D ranged from 180 mg/L to 560 mg/L. The June 2002 sulfate concentration in background monitor well MW-5 is 110 mg/L. The fact that sulfate concentrations in former source area monitor wells are greater than the sulfate concentration in the background well suggests that sulfate is not being utilized as an electron acceptor in the former field waste tanks area.
5. Methane is a reaction product generated during utilization of carbon dioxide as an electron acceptor, and its concentration should therefore increase in areas where concentrations of electron acceptors such as dissolved oxygen, nitrate, and ferric iron have diminished.

Methane was detected in background monitor well MW-5 at a concentration of 0.002 mg/L during the June 2002 groundwater sampling event. Methane was detected in former field waste tanks area monitor wells MW-10 and MW-11A at respective concentrations of 0.007 mg/L and 0.0028 mg/L in June 2002. The elevated methane concentrations in monitor wells MW-10 and MW-11A at the former field waste tanks area suggests that utilization of carbon dioxide as an electron acceptor, resulting in methanogenesis, has occurred during natural attenuation of hydrocarbons in the vicinity of these wells at the former field waste tanks area of the facility.

Methane was detected at a concentration of 0.0012 mg/L in monitor well MW-12D in June 2002. This methane concentration is less than that of the background well (MW-5), suggesting that methanogenesis is not presently occurring in the deeper portion of the aquifer, downgradient of the former field waste tanks. BTEX constituents have never been detected in groundwater samples from monitor well MW-12D.

6. Redox potential is a measure of chemical energy in groundwater. The redox potential of groundwater from background well MW-5 was measured at 95.5 mV in June 2002. Respective redox potentials of -52.9 mV, -58.4 mV, and -54.5 mV were measured in former field waste tanks area monitor wells MW-10, MW-11A, and MW-12D in June 2002. The negative redox values in the former field waste tanks area monitor wells as compared to the positive redox value in the background well at the facility provides additional evidence that natural attenuation of hydrocarbons is occurring in the area of the former field waste tanks.
7. Alkalinity is expected to increase during natural attenuation processes, due to the leaching of carbonates from mineral substrates by microbially produced organic acids.

Alkalinity measurements collected in the field in June 2002 ranged from 110 mg/L to 165 mg/L in former field waste tanks area monitor wells MW-10 and MW-11A. Alkalinity was measured at 70 mg/L in background monitor well MW-5 in June 2002. Based on the elevated field-measured alkalinity of groundwater in monitor wells MW-10 and MW-11A, it can be inferred that natural attenuation of hydrocarbons is occurring in the area of monitor well MW-11A and MW-10 at the former field waste tanks area.

In conclusion, current and historic dissolved oxygen, nitrate, and methane data suggest that dissolved oxygen, nitrate, and carbon dioxide act as electron acceptors during intrinsic bioremediation processes at former field waste tanks area of the facility. Current redox and alkalinity data provide further evidence that natural attenuation of hydrocarbons is occurring in this area.

It is recommended that monitoring for natural attenuation evaluation parameters continue in former field waste tank area monitor wells MW-10, MW-11A, and MW-12D and the background well, MW-5. Redox potential, dissolved oxygen content, and alkalinity are good indicators of the occurrence of aerobic bioremediation of hydrocarbons, so it is also recommended that field testing for these parameters be continued in all wells to be sampled during upcoming groundwater monitoring events.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on information obtained during the June 2002 groundwater sampling event conducted at the BJ Services Hobbs, New Mexico facility.

4.1 Conclusions

- Dissolved benzene and BTEX concentrations in monitor wells located near and downgradient of the former fueling system area are less than applicable NMWQCC standards. There were no BTEX, TPH-G, or TPH-D detections in June 2002 in monitor wells MW-3, MW-4, and MW-7, which are located near the former fueling system area. BTEX and TPH-G were not detected in monitor well MW-13, which is located downgradient of the former fueling system. BTEX and TPH concentrations in these wells have remained below applicable standards for the ~~past nine quarterly~~ groundwater sampling events.
- The June 2002 sampling event is the fourth consecutive groundwater sampling event following completion of confirmation soil sampling activities at the former fuel island area in July 2001 in which BTEX and TPH concentrations in former fuel island area monitor wells have remained below the remediation standards specified in the NMOCD-approved RAP.
- June 2002 benzene concentrations in former field waste tanks area monitor wells MW-10, MW-11A, and MW-12D are less than the NMWQCC standard of 0.01 mg/L for benzene. There were no detections of hydrocarbon constituents in monitor well MW-12D during the June 2002 sampling event, and there were no TPH-G or BTEX detections in monitor well MW-10 during the current sampling event. Natural attenuation processes appear to be occurring in the vicinity of the former field waste tanks removed in March 1997, based on decreasing hydrocarbon concentrations in local monitor wells over time and as substantiated by geochemical data.
- The chloride concentration 258 mg/L recorded in monitor wells MW-14 during the June 2002 groundwater sampling event exceeds the NMWQCC standard of 250 mg/L. Chloride concentrations in this well have varied between 222 mg/L and 368 mg/L since its installation in January 2001.

4.2 Recommendations

- Continue the quarterly monitoring program for former field waste tank area monitor wells ~~MW-10, MW-11A, and MW-12D.~~ Continue monitoring for natural attenuation

parameters in these wells and the background monitor wells ~~MW-5~~ including field-testing for natural attenuation indicator parameters.

- Discontinue groundwater monitoring at monitor wells MW-3, MW-4, MW-7, MW-8, MW-9, and MW-13. Decommission the biosparging system at the former fuel island area as specified in Section 3.1 of this report.
- Upon NMOCD approval and acquisition of access rights, installation and sampling of an off-site well to define the downgradient extent of chloride impact to groundwater in the area of the facility is recommended.

DISTRIBUTION

June 2002 Groundwater Sampling Report and Biosparging System Closure Report
BJ Services Company, U.S.A.
Hobbs, New Mexico

November 11, 2002

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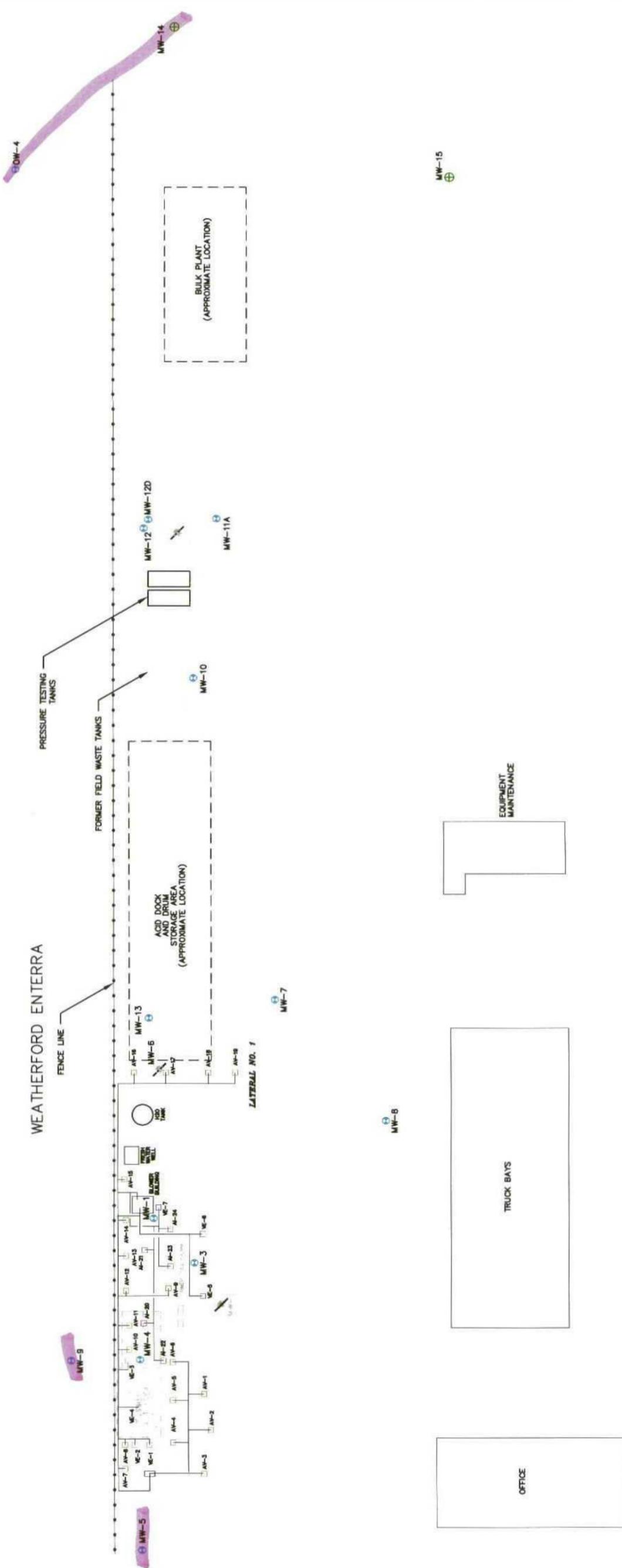
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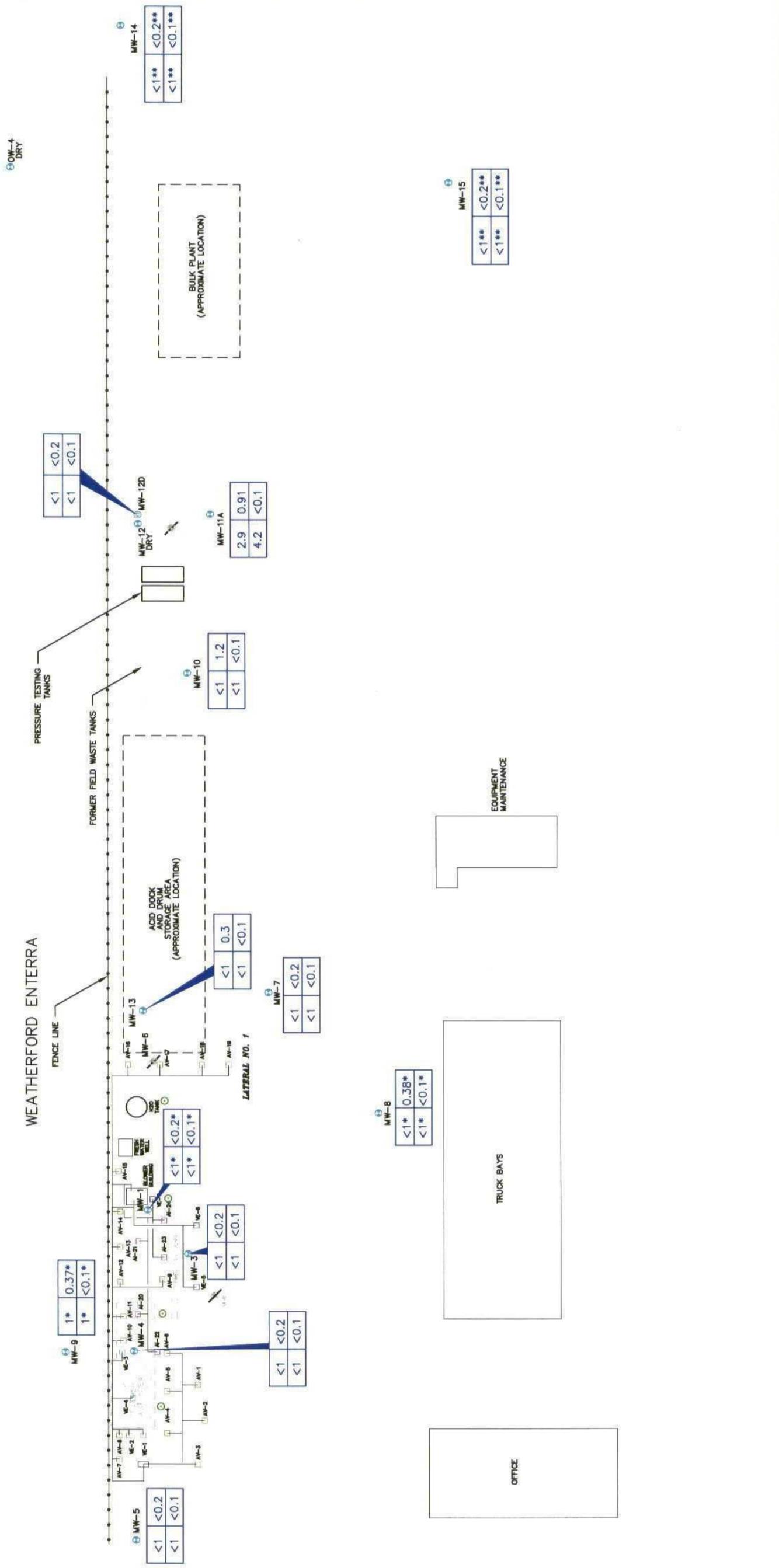
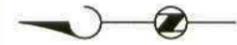

Lynn M. Wright, P.G.
Principal Geologist

RLR/uak

FIGURES



<p>BROWN AND CALDWELL HOUSTON, TEXAS</p> <p>SUBMITTED: _____ DATE: _____ APPROVED: _____ DATE: _____</p>		<p>LEGEND</p> <p> EXISTING MONITOR WELL LOCATION BIOSPARGING SYSTEM PROPOSED MONITOR WELL LOCATION MONITOR WELL (PLUGGED AND ABANDONED) </p>		<p>TITLE PROPOSED MONITOR WELL LOCATIONS</p> <p>CLIENT BJ SERVICES COMPANY, U.S.A.</p> <p>SITE HOBBS, NEW MEXICO</p>		<p>DATE 9/11/00</p> <p>PROJECT NUMBER 12832.022</p> <p>FIGURE NUMBER 1</p>	
<p>SCALE: 1" = 60'</p> <p>DRAWN BY: _____ DATE: _____ CHK'D BY: _____ DATE: _____ APPROVED: _____ DATE: _____</p>		<p>0 30 60</p>		<p>OFFICE</p> <p>TRUCK BAYS</p> <p>EQUIPMENT MAINTENANCE</p>		<p>NOV 07, 2002 - 12:56pm</p> <p>P:\Cdd\JOBS\BjServices\12832\PM\Locations2.dwg</p> <p>Kelly</p>	



BROWN AND CALDWELL HOUSTON, TEXAS SUBMITTED: _____ PROJECT MANAGER DATE: _____ APPROVED: _____ DATE: _____		LEGEND ⊕ MW-3 EXISTING MONITOR WELL LOCATION ⊖ MW-2 MONITOR WELL (PLUGGED AND ABANDONED) BIOSPARGING SYSTEM		TITLE: HYDROCARBONS CONCENTRATION MAP FOR JUNE 18, 2002	DATE: 7/8/02
SCALE: 1" = 60' DRAWN BY: CLK DATE 6/10/01 CHK'D BY: _____ DATE: _____ REV'D BY: CLK DATE 10/10/01		BENZENE (ug/L) <1 <0.2 - TPH-D (mg/L) TOTAL BTEX (ug/L) <1 <0.1 - TPH-G (mg/L)		CLIENT: BJ SERVICES COMPANY, U.S.A.	PROJECT NUMBER: 12832.016
OFFICE		TRUCK BAYS		SITE: HOBBS, NEW MEXICO	FIGURE NUMBER: 3

TABLES

Table 1
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
February 7, 1991	The New Mexico Oil Conservation Division (NMOCD) conducted an on-site inspection, including sampling of the on-site fresh water well.
August 6, 1991	The NMOCD requested submittal of an investigation work plan.
September 5, 1991	Roberts/Schornick and Associates, Inc. (RSA) submitted Technical Work Plan for soil and groundwater investigation to the NMOCD.
November 15, 1991	The NMOCD approved the Technical Work Plan submitted by RSA.
December 16, 1991	RSA sampled the fresh water well. The analytical results were submitted to the NMOCD.
February 21, 1992	Western sampled the fresh water well. The analytical results were submitted to the NMOCD.
July 29 - August 10, 1992	Brown and Caldwell conducted a soil and groundwater investigation according to the approved Technical Work Plan. The investigation included drilling and sampling nine soil borings, sampling six hand-augured soil borings, installation and sampling of five monitor wells, and sampling of the fresh water well.
October 12, 1992	Brown and Caldwell submitted a Soil and Groundwater Investigation Report to the NMOCD.
December 2, 1992	The NMOCD requested the installation and sampling of four additional monitor wells, including a monitor well on an adjacent property.
April 13, 1993	Brown and Caldwell conducted a vapor extraction pilot test on the existing monitor wells.
April 15, 1993	Brown and Caldwell installed off-site monitor well MW-9.
April 22, 1993	Brown and Caldwell sampled off-site monitor well MW-9.
May 27, 1993	Brown and Caldwell submitted a letter report documenting the installation and sampling of off-site monitor well MW-9 to the NMOCD.
June 2, 1993	Brown and Caldwell conducted a short-term aquifer test using the fresh water well at the facility.
June 8, 1993	USTank Management, Inc. conducted a non-volumetric tank system tightness test on the diesel and unleaded gasoline aboveground storage tanks at the facility.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
June 21, 1993	ENSR Consulting and Engineering (ENSR), the environmental consultant for the adjacent property owner on which off-site well MW-9 is located, submitted a request to sample monitor well MW-9.
July 15, 1993	ENSR split a groundwater sample collected from monitor well MW-9 with Brown and Caldwell.
July 30, 1993	USTank Management, Inc. submitted a tank tightness test report to Brown and Caldwell. The report indicated that both tanks and their associated piping passed.
August 16-19, 1993	Brown and Caldwell installed two additional downgradient monitor wells. Brown and Caldwell sampled each of the existing and newly installed monitor wells.
January 26, 1994	Brown and Caldwell performed a groundwater monitoring event; the existing monitor wells and the fresh water well were purged and sampled. The groundwater samples were analyzed for BTEX.
May 6, 1994	A Remedial Action Plan (RAP) was submitted to the NMOCD.
August 11, 1994	The RAP was approved by the NMOCD.
May 3, 1995	Brown and Caldwell conducted the May 1995 groundwater sampling event.
July 31, 1995	Brown and Caldwell conducted the July 1995 groundwater sampling event.
August 2-9, 1995	Installation of the biosparging system was initiated. Nineteen combined injection/extraction wells and three vacuum extraction wells were installed.
August 14-26, 1995	Remedial Construction Services, Inc. (RCS) constructed the initial design of the biosparging system.
September 19, 1995	Operation of the extraction portion of the biosparging system commenced.
November 13, 1995	Operation of the injection portion of the biosparging system commenced.
November 14, 1995	Brown and Caldwell conducted the November 1995 groundwater sampling event.
February 23, 1996	Brown and Caldwell conducted the February 1996 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
May 31, 1996	Brown and Caldwell conducted the May 1996 groundwater sampling event.
August 23, 1996	Brown and Caldwell conducted the August 1996 groundwater sampling event.
December 2, 1996	Brown and Caldwell conducted the December 1996 groundwater sampling event.
March 6-7, 1997	BJ Services removed three field waste tanks and associated hydrocarbon-impacted soil.
March 12, 1997	Brown and Caldwell conducted the March 1997 groundwater sampling event.
March 14, 1997	Vapor extraction well VE-4 was installed.
April 1997	Vapor extraction well VE-4 was connected to the vapor extraction system.
June 12, 1997	Brown and Caldwell conducted the June 1997 groundwater sampling event.
September 11-12, 1997	Brown and Caldwell conducted the September 1997 groundwater sampling event.
December 10, 1997	Brown and Caldwell conducted the December 1997 groundwater sampling event.
February 3-14, 1998	Air injection wells AI-20 through AI-24, vapor extraction wells VE-5 though VE-7, and monitor wells MW-11A and MW-12 were installed.
February 19, 1998	Operation of previously existing injection wells was suspended in preparation for start-up of new injection wells AI-20 through AI-24.
March 10, 1998	Operation of new air injection wells AI-20 through AI-24 and new vapor extraction wells VE-5 though VE-7 commenced.
March 23-24, 1998	Brown and Caldwell conducted the March 1998 groundwater sampling event.
March 24, 1998	Operation of previously existing injection wells and vapor extraction wells resumed.
June 23, 1998	Brown and Caldwell conducted the June 1998 groundwater sampling event.
September 30, 1998	Brown and Caldwell conducted the September 1998 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
December 9-10, 1998	Brown and Caldwell conducted the December 1998 groundwater sampling event.
January 21, 1999	The NMOCD requested submittal of a work plan by March 22, 1999 to perform additional groundwater delineation in the area of the former field waste tanks and the former AST/MW-6 area.
March 9-10, 1999	Brown and Caldwell conducted the March 1999 groundwater sampling event.
March 19, 1999	Brown and Caldwell submitted the work plan for groundwater delineation activities that was requested by the NMOCD.
May 19, 1999	The NMOCD approved the groundwater delineation work plan.
June 10, 1999	Brown and Caldwell performed sampling of existing monitor wells for the June /July 1999 groundwater sampling event.
July 2, 1999	Brown and Caldwell completed plugging and abandonment of monitor wells MW-2, MW-6, and MW-11; installed and developed monitor wells MW-12D and MW-13; and sampled monitor wells MW-12D and MW-13 to complete the June/July 1999 groundwater sampling event.
July 14, 1999	Brown and Caldwell redirected air discharge from the shallow injection well injection system to Lateral No. 1 and optimized air flow to injection wells AI-16 and AI-17 to apply increased remedial pressure to the eastern portion of the west plume.
September 13-14, 1999	Brown and Caldwell conducted the September 1999 groundwater sampling event.
December 9, 1999	Brown and Caldwell conducted the December 1999 groundwater sampling event.
March 9-10, 2000	Brown and Caldwell conducted the March 2000 groundwater sampling event and shut off air flow to biosparging system Lateral Nos. 4S, 5S, 6S, and 7S.
June 8, 2000	Brown and Caldwell conducted the June 2000 groundwater sampling event.
September 13, 2000	Brown and Caldwell conducted the September 2000 groundwater sampling event.
November 1, 2000	Brown and Caldwell deactivated the biosparging system.
December 7, 2000	Brown and Caldwell conducted the December 2000 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
January 2001	Brown and Caldwell installed and sampled monitor wells MW-14 and MW-15.
March 8-9, 2001	Brown and Caldwell conducted the March 2001 groundwater sampling event.
June 21-22, 2001	Brown and Caldwell conducted the June 2001 groundwater sampling event.
July 23, 2001	Brown and Caldwell collected soil samples from four soil borings installed at the former fueling system area of the facility to confirm the effectiveness of the biosparging system in remediating hydrocarbon impact to soil, as specified in the NMOCD-approved RAP.
September 10, 2001	Brown and Caldwell conducted the September 2001 groundwater sampling event.
December 6, 2001	Brown and Caldwell conducted the December 2001 groundwater sampling event.
February 26, 2002	Brown and Caldwell repaired the crushed well completion on monitor well MW-10.
February 28, 2002	NMOCD requested an evaluation of chloride content of groundwater at the facility.
March 11-12, 2002	Brown and Caldwell conducted the March 2002 groundwater sampling event. Groundwater samples from all water-producing wells at the facility were analyzed for chloride content.
May 21, 2002	Brown and Caldwell submitted the report for the March 2002 groundwater sampling event, including an evaluation of chloride content of groundwater at the facility and a recommendation for installation of a downgradient off-site well (MW-16) to replace off-site well OW-4, which has gone dry.
June 17-18, 2002	Brown and Caldwell conducted the June 2002 groundwater sampling event.

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-1	3,647.53	08/10/92	53.22	0.00	3,594.31	(1)
		02/09/93	53.03	0.00	3,594.50	
		08/18/93	53.10	0.00	3,594.43	
		01/26/94	53.31	0.00	3,594.22	
		05/03/95	54.64	0.20	3,593.05	(2)
		07/31/95	54.14	0.00	3,593.39	
		11/14/95	53.69	0.00	3,593.84	
		02/23/96	54.32	0.00	3,593.21	
		05/31/96	54.14	0.00	3,593.39	
		08/23/96	56.17	0.00	3,591.36	
		12/02/96	55.27	0.00	3,592.26	
		03/12/97	55.70	0.27	3,592.05	
		06/12/97	55.08	0.02	3,592.47	
		09/12/97	55.64	0.51	3,592.31	
		12/10/97	55.46	0.00	3,592.07	PSH Sheen
		03/24/98	55.81	0.00	3,591.72	PSH Sheen
		06/23/98	56.38	0.06	3,591.20	
		09/30/98	56.82	0.00	3,590.71	PSH Sheen
		12/09/98	57.05	0.00	3,590.48	
		03/10/99	57.45	0.00	3,590.08	
		06/10/99	58.02	0.00	3,589.51	
		07/02/99	57.90	0.00	3,589.63	
		09/14/99	58.14	0.00	3,589.39	
		12/09/99	-	-	-	
		03/09/00	58.99	0.00	3,588.54	(3)
		06/00	-	-	-	
		09/00	-	-	-	
12/7/00	-	-	-			
03/08/01	60.35	0.00	3587.18			
6/21/01	60.99	0.00	3,586.54			
9/10/01	61.17	0.00	3,586.36			
12/6/2001	-	not measured	-			
03/11/02	62.11	0.00	3585.42			
6/17/02	62.53	0.00	3,585.00			
MW-2	3,644.84	08/10/92	52.82	0.00	3,592.02	(1)
		02/09/93	49.60	0.00	3,595.24	
		08/18/93	49.71	0.00	3,595.13	
		01/26/94	49.97	0.00	3,594.87	
		05/03/95	-	-	-	(4),(5)
MW-3	3,645.00	08/10/92	52.99	0.00	3,592.01	(1)
		02/09/93	52.72	0.00	3,592.28	
		08/18/93	52.82	0.00	3,592.18	
		01/26/94	53.05	0.00	3,591.95	
		05/03/95	54.31	0.00	3,590.69	
		07/31/95	51.24	0.00	3,593.76	
		11/14/95	51.10	0.00	3,593.90	
		02/23/96	51.68	0.00	3,593.32	
		05/31/96	51.45	0.00	3,593.55	
		08/23/96	51.55	0.00	3,593.45	
		12/02/96	52.23	0.00	3,592.77	
		03/12/97	52.67	0.00	3,592.33	
		06/12/97	52.68	0.00	3,592.32	
		09/11/97	52.71	0.00	3,592.29	
		12/10/97	52.89	0.00	3,592.11	
		03/23/98	53.22	0.00	3,591.78	
		06/23/98	53.66	0.00	3,591.34	
		09/30/98	54.06	0.00	3,590.94	
		12/09/98	54.36	0.00	3,590.64	
03/10/99	54.72	0.00	3,590.28			
06/10/99	55.17	0.00	3,589.83			
07/02/99	55.15	0.00	3,589.85			

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments		
MW-3	3,645.00	09/14/99	55.42	0.00	3,589.58			
		12/09/99	55.78	0.00	3,589.22			
		03/09/00	56.23	0.00	3,588.77			
		06/08/00	56.66	0.00	3,588.34			
		09/13/00	56.77	0.00	3,588.23			
		12/07/00	57.15	0.00	3,587.85			
		03/08/01	57.69	0.00	3,587.31			
		6/21/01	58.34	0.00	3,586.66			
		9/10/01	58.54	0.00	3,586.46			
		12/6/2001	59.04	0.00	3,585.96			
		03/11/02	59.50	0.00	3,585.50			
		6/17/02	59.83	0.00	3,585.17			
		MW-4	3,645.28	08/10/92	50.55	0.00	3,594.73	(1)
				02/09/93	50.26	0.00	3,595.02	
08/18/93	50.38			0.00	3,594.90			
01/26/94	50.90			0.30	3,594.63			
05/03/95	51.51			0.45	3,594.14			
07/31/95	51.74			0.26	3,593.75			
11/14/95	51.03			0.00	3,594.25			
02/23/96	51.65			0.01	3,593.64			
05/31/96	51.48			0.00	3,593.80			
08/23/96	53.49			0.00	3,591.79			
12/02/96	52.32			0.00	3,592.96			
03/12/97	52.74			0.05	3,592.58			
06/12/97	53.08			0.44	3,592.56			
09/12/97	52.60			0.15	3,592.80			
12/10/97	52.89			0.00	3,592.39	PSH Sheen		
03/24/98	53.20			0.25	3,592.29			
06/23/98	53.82			0.22	3,591.64			
09/30/98	53.96			0.00	3,591.32	200 ml PSH		
12/09/98	54.27			0.00	3,591.01			
03/10/99	54.69			0.04	3,590.62			
06/10/99	55.07			0.00	3,590.21			
07/02/99	55.10			0.00	3,590.18			
09/14/99	55.33			0.00	3,589.95			
12/09/99	55.79			0.00	3,589.49			
03/10/00	56.12			0.00	3,589.16			
06/08/00	56.67			0.00	3,588.61			
09/13/00	56.65			0.00	3,588.63			
12/07/00	57.05			0.00	3,588.23			
03/08/01	57.72			0.00	3,587.56			
6/21/01	58.18			0.00	3,587.10			
9/10/01	58.54			0.00	3,586.74			
12/6/2001	58.88			0.00	3,586.40			
03/11/02	59.41			0.00	3,585.87			
6/17/02	59.67			0.00	3,585.61			
MW-5	3,647.72	08/10/92	52.38	0.00	3,595.34	(1)		
		02/09/93	52.06	0.00	3,595.66			
		08/18/93	52.16	0.00	3,595.56			
		01/26/94	52.50	0.00	3,595.22			
		05/03/95	53.57	0.00	3,594.15			
		07/31/95	53.27	0.00	3,594.45			
		11/14/95	52.83	0.00	3,594.89			
		02/23/96	53.57	0.00	3,594.15			
		05/31/96	53.16	0.00	3,594.56			
		08/23/96	53.41	0.00	3,594.31			
		12/02/96	53.98	0.00	3,593.74			
		03/12/97	54.44	0.00	3,593.28			
		06/12/97	54.48	0.00	3,593.24			
		09/12/97	54.29	0.00	3,593.43			
		12/10/97	54.66	0.00	3,593.06			
		03/23/98	55.05	0.00	3,592.67			
		06/23/98	55.44	0.00	3,592.28			
		09/30/98	55.65	0.00	3,592.07			
		12/09/98	56.00	0.00	3,591.72			
		03/09/99	56.45	0.00	3,591.27			

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-5	3,647.72	06/10/99	56.91	0.00	3,590.81	
		07/02/99	56.93	0.00	3,590.79	
		09/14/99	57.12	0.00	3,590.60	
		12/09/99	57.41	0.00	3,590.31	
		03/09/00	57.92	0.00	3,589.80	
		06/08/00	58.32	0.00	3,589.40	
		09/13/00	58.36	0.00	3,589.36	
		12/07/00	58.71	0.00	3,589.01	
		03/08/01	59.36	0.00	3,588.36	
		6/21/01	59.94	0.00	3,587.78	
		9/10/01	59.85	0.00	3,587.87	
		12/6/2001	60.56	0.00	3,587.16	
		3/11/02	61.12	0.00	3,586.60	
		6/17/02	61.43	0.00	3,586.29	
MW-6	3,644.74	02/09/93	50.58	0.00	3,594.16	(1)
		08/18/93	50.78	0.00	3,593.96	
		01/26/94	51.00	0.00	3,593.74	
		05/03/95	52.63	0.00	3,592.11	
		07/31/95	51.90	0.00	3,592.84	
		11/14/95	51.19	0.00	3,593.55	
		02/23/96	52.10	0.00	3,592.64	
		05/31/96	51.76	0.00	3,592.98	
		08/23/96	51.63	0.00	3,593.11	
		12/02/96	52.85	0.00	3,591.89	
		03/12/97	53.55	0.00	3,591.19	
		06/12/97	52.08	0.00	3,592.66	
		09/11/97	53.72	0.00	3,591.02	
		12/10/97	53.27	0.00	3,591.47	
		03/23/98	53.56	0.00	3,591.18	
		06/23/98	52.88	0.00	3,591.86	
		09/30/98	54.89	0.00	3,589.85	
		12/09/98	54.57	0.00	3,590.17	
		03/10/99	55.10	0.00	3,589.64	(5),(6)
07/02/99					(1)	
MW-7	3,644.55	02/09/93	50.53	0.00	3,594.02	(1)
		08/18/93	50.74	0.00	3,593.81	
		01/26/94	51.01	0.00	3,593.54	
		05/03/95	52.25	0.00	3,592.30	
		07/31/95	51.92	0.00	3,592.63	
		11/14/95	51.48	0.00	3,593.07	
		02/23/96	52.15	0.00	3,592.40	
		05/31/96	51.78	0.00	3,592.77	
		08/23/96	52.02	0.00	3,592.53	
		12/02/96	52.52	0.00	3,592.03	
		03/12/97	52.99	0.00	3,591.56	
		06/12/97	53.08	0.00	3,591.47	
		09/11/97	53.00	0.00	3,591.55	
		12/10/97	53.28	0.00	3,591.27	
		03/23/98	53.59	0.00	3,590.96	
		06/23/98	54.20	0.00	3,590.35	
		09/30/98	54.54	0.00	3,590.01	
		12/09/98	54.74	0.00	3,589.81	
		03/09/99	55.15	0.00	3,589.40	
		06/10/99	55.66	0.00	3,588.89	
		07/02/99	55.73	0.00	3,588.82	
		09/13/99	55.94	0.00	3,588.61	
		12/09/99	56.38	0.00	3,588.17	
		03/09/00	56.74	0.00	3,587.81	
		06/08/00	57.17	0.00	3,587.38	
		09/13/00	57.40	0.00	3,587.15	
		12/07/00	57.77	0.00	3,586.78	
		03/08/01	58.29	0.00	3,586.26	
		6/21/01	58.91	0.00	3,585.64	
9/10/01	59.25	0.00	3,585.30			
12/6/2001	59.75	0.00	3,584.80			
03/11/02	60.03	0.00	3,584.52			
6/17/02	60.39	0.00	3,584.16			

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments	
MW-8	3,644.87	02/09/93	50.48	0.00	3,594.39	(1)	
		08/18/93	50.67	0.00	3,594.20		
		01/26/94	50.96	0.00	3,593.91		
		05/03/95	52.15	0.00	3,592.72		
		07/31/95	51.77	0.00	3,593.10		
		11/14/95	51.37	0.00	3,593.50		
		02/23/96	52.17	0.00	3,592.70		
		05/31/96	51.55	0.00	3,593.32		
		08/23/96	51.92	0.00	3,592.95		
		12/02/96	52.43	0.00	3,592.44		
		03/12/97	52.93	0.00	3,591.94		
		06/12/97	53.96	0.00	3,590.91		
		09/11/97	52.73	0.00	3,592.14		
		12/10/97	53.15	0.00	3,591.72		
		03/23/98	53.51	0.00	3,591.36		
		06/23/98	54.01	0.00	3,590.86		
		09/30/98	54.35	0.00	3,590.52		
		12/09/98	54.60	0.00	3,590.27		
		03/09/99	55.00	0.00	3,589.87		
		06/10/99	55.56	0.00	3,589.31		
		07/02/99	55.57	0.00	3,589.30		
		09/13/99	55.72	0.00	3,589.15		
		12/09/99	-	-	-		
		03/09/00	56.52	0.00	3,588.35	(3)	
		06/00	-	-	-		
		09/00	-	-	-		
		12/00	-	-	-		
		03/08/01	58.11	0.00	3,586.76		
		6/21/01	58.72	0.00	3,586.15		
		9/10/01	58.94	0.00	3,585.93		
12/6/2001	-	not measured	-				
03/11/02	59.94	0.00	3,584.93				
6/17/02	60.22	0.00	3,584.65				
MW-9	3,644.78	04/22/93	49.73	0.00	3,595.05		(1)
		07/15/93	49.65	0.00	3,595.13		
		08/18/93	49.85	0.00	3,594.93		
		01/26/94	50.02	0.00	3,594.76		
		05/03/95	51.35	0.00	3,593.43		
		07/31/95	50.97	0.00	3,593.81		
		11/14/95	50.43	0.00	3,594.35		
		02/23/96	51.12	0.00	3,593.66		
		05/31/96	50.89	0.00	3,593.89		
		08/23/96	50.98	0.00	3,593.80		
		12/02/96	51.58	0.00	3,593.20		
		03/12/97	52.21	0.05	3,592.61		
		06/12/97	52.10	0.00	3,592.68		
		09/12/97	51.95	0.00	3,592.83		
		12/10/97	52.37	0.00	3,592.41		
		03/23/98	52.68	0.00	3,592.10		
		06/23/98	53.08	0.00	3,591.70		
		09/30/98	53.39	0.01	3,591.40		
		12/09/98	53.68	0.00	3,591.10		
		03/10/99	54.15	0.00	3,590.63		
		06/10/99	54.68	0.00	3,590.10		
		07/02/99	54.71	0.00	3,590.07		
		09/13/99	54.71	0.00	3,590.07		
		12/09/99	-	-	-		
		03/09/00	55.69	0.00	3,589.09	(3)	
		06/00	-	-	-		
		09/00	-	-	-		
12/00	-	-	-				
03/08/01	57.03	0.00	3,587.75				
6/21/01	57.91	0.00	3,586.87				
9/10/01	57.95	0.00	3,586.83				
12/6/2001	-	not measured	-				
03/11/02	58.96	0.00	3,585.82				
6/17/02	59.14	0.00	3,585.64				

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-10	3,644.47	08/18/93	51.54	0.00	3,592.93	(1)
		01/26/94	51.90	0.00	3,592.57	
		05/03/95	52.97	0.00	3,591.50	
		07/31/95	52.87	0.00	3,591.60	
		11/14/95	52.51	0.00	3,591.96	
		02/23/96	53.05	0.00	3,591.42	
		05/31/96	52.79	0.00	3,591.68	
		08/23/96	53.03	0.00	3,591.44	
		12/02/96	53.41	0.00	3,591.06	
		03/12/97	54.21	0.00	3,590.26	
		06/12/97	53.99	0.00	3,590.48	
		09/12/97	53.94	0.00	3,590.53	
		12/10/97	54.12	0.00	3,590.35	
		03/23/98	54.51	0.00	3,589.96	
		06/23/98	55.12	0.00	3,589.35	
		09/30/98	55.61	0.00	3,588.86	
		12/09/98	55.80	0.00	3,588.67	
		03/09/99	56.09	0.00	3,588.38	
		06/10/99	56.60	0.00	3,587.87	
		07/02/99	56.64	0.00	3,587.83	
		09/14/99	56.91	0.00	3,587.56	
		12/09/99	57.37	0.00	3,587.10	
		03/10/00	57.71	0.00	3,586.76	
		06/08/00	58.08	0.00	3,586.39	
		09/13/00	58.44	0.00	3,586.03	
		12/07/00	58.89	0.00	3,585.66	
03/09/01	59.31	0.00	3,585.24			
6/21/01	59.89	0.00	3,584.66			
9/10/01	61.34	0.00	3,583.21			
12/6/2001	60.65	0.00	3,583.90			
03/11/02	60.69	0.00	3,583.86			
6/17/02	60.98	0.00	3,583.57			
MW-11	3,643.78	08/18/93	51.92	0.00	3,592.63	(1)
		01/26/94	52.32	0.00	3,591.46	
		05/03/95	53.38	0.00	3,590.40	
		07/31/95	53.35	0.00	3,590.43	
		11/14/95	52.96	0.00	3,590.82	
		02/23/96	53.50	0.00	3,590.28	
		05/31/96	53.25	0.00	3,590.53	
		08/23/96	53.49	0.00	3,590.29	
		12/02/96	53.79	0.00	3,589.99	
		03/12/97	53.81	0.00	3,589.97	
		06/12/97	53.96	0.00	3,589.82	
		09/12/97	52.93	0.00	3,590.85	
MW-11A	3,644.24	03/23/98	54.79	0.00	3,589.45	(5),(6) (7)
		06/23/98	55.43	0.00	3,588.81	
		09/30/98	55.96	0.00	3,588.28	
		12/09/98	56.13	0.00	3,588.11	
		03/10/99	56.43	0.00	3,587.81	
		06/10/99	56.94	0.00	3,587.30	
		07/02/99	57.01	0.00	3,587.23	
		09/14/99	57.36	0.00	3,586.88	
		12/09/99	57.72	0.00	3,586.52	
		03/09/00	58.01	0.00	3,586.23	
		06/08/00	58.40	0.00	3,585.84	
		09/13/00	58.84	0.00	3,585.40	
		12/07/00	59.29	0.00	3,584.95	
		03/08/01	59.72	0.00	3,584.52	

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments	
MW-11A	3,644.24	6/21/01	60.28	0.00	3,583.96		
		9/10/01	60.69	0.00	3,583.55		
		12/6/2001	60.88	0.00	3,583.36		
		03/11/02	61.42	0.00	3,582.82		
		6/17/02	61.55	0.00	3,582.69		
MW-12	3,644.29	03/23/98	54.72	0.00	3,589.57	(7)	
		06/23/98	55.48	0.00	3,588.81		
		09/30/98	56.02	0.00	3,588.27		
		12/09/98	56.17	0.00	3,588.12		
		03/10/99	56.45	0.00	3,587.84		
		06/10/99	56.97	0.00	3,587.32		
		07/02/99	56.99	0.00	3,587.30		
		09/14/99	57.41	0.00	3,586.88		
		12/09/99	57.76	0.00	3,586.53		
		03/10/00	58.08	0.00	3,586.21		
		06/08/00	58.42	0.00	3,585.87		
		09/13/00	58.85	0.00	3,585.44		
		12/07/00	59.31	0.00	3,584.98		
		03/08/01	59.76	0.00	3,584.53		
		6/21/01	60.29	0.00	3,584.00		
		9/10/01	60.79	0.00	3,583.50		
		MW-12D	3,644.38	12/6/2001	well dry during this and subsequent monitoring events		
07/02/99	57.13			0.00	3,587.25		
09/14/99	57.74			0.00	3,586.64		
12/09/99	57.86			0.00	3,586.52		
03/09/00	58.24			0.00	3,586.14		
06/08/00	58.56			0.00	3,585.82		
09/00	-			-	-		
12/00	-			-	-		
03/08/01	-			-	-		
6/21/01	-			-	-		
9/10/01	-			-	-		
12/6/2001	61.30			0.00	3,583.08		
03/11/02	61.61			0.00	3,582.77		
6/17/02	61.71	0.00	3,582.67				
MW-13	3,645.52	07/02/99	56.60	0.00	3,588.92	(9)	
		09/14/99	56.92	0.00	3,588.60		
		12/09/99	57.28	0.00	3,588.24		
		03/10/00	57.68	0.00	3,587.84		
		06/08/00	58.04	0.00	3,587.48		
		09/13/00	58.29	0.00	3,587.23		
		12/07/00	58.68	0.00	3,586.84		
		03/08/01	59.19	0.00	3,586.33		
		6/21/01	59.80	0.00	3,585.72		
		9/10/01	60.03	0.00	3,585.49		
		12/6/2001	60.59	0.00	3,584.93		
MW-14	3,642.45	03/08/01	61.07	0.00	3,581.38		
		6/21/01	61.71	0.00	3,580.74		
		9/10/01	62.31	0.00	3,580.14		
		12/6/2001	62.80	0.00	3,579.65		
		03/11/02	62.70	0.00	3,579.75		
MW-15	3,643.24	6/17/02	62.65	0.00	3,579.80		
		03/08/01	59.79	0.00	3,583.45		
		6/21/01	60.49	0.00	3,582.75		
		9/10/01	61.02	0.00	3,582.22		
		12/6/2001	61.47	0.00	3,581.77		
		03/11/02	61.65	0.00	3,581.59		
		6/17/02	61.68	0.00	3,581.56		

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments		
OW-4	3,644.06	07/02/99	58.18	0.00	3,585.88	(8)		
		09/14/99	58.63	0.00	3,585.43			
		12/09/99	58.92	0.00	3,585.14			
		03/09/00	59.19	0.00	3,584.87			
		06/08/00	59.56	0.00	3,584.50			
		09/13/00	60.16	0.00	3,583.90			
		12/07/00	61.15	0.00	3,582.91			
		03/08/01	61.43	0.00	3,582.63		(10)	
		6/21/01	61.48	0.00	3,582.58			
		9/10/01	61.53	0.00	3,582.53			
		12/6/2001	well dry during this and subsequent monitoring events					

- ⁽¹⁾ - Top of casing elevations and groundwater elevations of all monitor wells were relative to an arbitrary datum of 100.00 feet prior to March 1997 and have been converted to Mean Sea Level (MSL).
- ⁽²⁾ - For wells having measurable thickness of free product, the groundwater elevation was calculated as follows:
Groundwater Elevation = (TOC elevation)-(depth to groundwater)+{(free product thickness)x(SG of free product)}
Note: The specific gravity (SG) of the free product is 0.82.
- ⁽³⁾ - Not measured.
- ⁽⁴⁾ - Monitor well MW-2 could not be located after January 1994.
- ⁽⁵⁾ - Well plugged and abandoned July 2, 1999.
- ⁽⁶⁾ - Monitor well MW-11 could not be located after September 12, 1997.
- ⁽⁷⁾ - TOC elevations for MW-11A and MW-12 estimated relative to TOC elevation for MW-10.
- ⁽⁸⁾ - TOC elevations for MW-12D and OW-4 estimated relative to TOC elevation for MW-12.
- ⁽⁹⁾ - TOC elevation for MW-13 estimated relative to TOC elevation for MW-7.
- ⁽¹⁰⁾ - Well dry (measured depth to water is below base of screen), true groundwater elevation is less than listed groundwater elevation.

Table 3
June 17-18, 2002 Field Screening Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Cumulative Gallons Removed	pH	Temperature (°C)	Conductivity (umhos/cm)	Redox (mV)	Dissolved Oxygen (meter) (mg/L)	Dissolved Oxygen (Hach kit) (mg/L)	Ferrous Iron (mg/L)	Alkalinity (mg/L)
MW-3	1.5	7.56	20.05	1267	84.5	7.53	NM	NM	NM
MW-4	2.0	7.51	20.70	1360	76.9	7.55	NM	NM	NM
MW-5	2	7.33	23.42	1093	95.5	7.56	NM	NM	70
MW-7	0.35	7.13	22.20	1408	138.5	5.54	NM	NM	NM
MW-10	1.0	6.86	21.01	4031	-52.9	1.64	NM	NM	165
MW-11A	1.0	6.84	20.73	6241	-58.40	2.53	NM	NM	110
MW-12D	4.6	7.17	20.09	1098	-54.5	0.52	NM	NM	NM
MW-13	2.5	7.32	19.83	1500	-1.6	2.96	NM	NM	NM
MW-14	1.5	7.81	19.55	1941	51.3	7.53	NM	NM	NM
MW-15	2.5	6.81	19.54	1428	132.9	6.19	NM	NM	NM

Monitor wells MW-1, MW-8, and MW-9 not sampled.

Monitor well MW-2 not operative after January 1994; P&A'd 7/1/99.

Monitor well MW-6 P&A'd 7/1/99.

Monitor well MW-11 not operative after September 1997; P&A'd 7/1/99.

Monitor wells MW-12 and OW-4 were dry.

NM=Not Measured

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-1	8/10/92	Regular	5550.0	12090.0	2160.0	7370.0	NA	NA
	2/9/93	Regular	2100.0	6500.0	1300.0	7400.0	NA	NA
	8/19/93	Regular	3200.0	7300.0	1200.0	3700.0	NA	NA
	1/27/94	Regular	1930.0	4580.0	672.0	2390.0	NA	NA
	5/3/95	Regular	NSP	NSP	NSP	NSP	NA	NSP
	8/1/95	Regular	390.0	1300.0	230.0	800.0	NA	5.7
	11/15/95	Regular	880.0	1800.0	300.0	970.0	NA	6.8
	2/23/96	Regular	1500.0	3700.0	620.0	2200.0	NA	21
	5/31/96	Regular	1100.0	1700.0	380.0	990.0	NA	7.5
	8/23/96	Regular	1800.0	3300.0	570.0	2100.0	NA	17
	12/2/96	Regular	5600.0	9600.0	2100.0	9600.0	100	64
	3/12/97	Regular	5500.0	9700.0	2600.0	8200.0	22	62
	6/12/97	Regular	5300.0	34000.0	7500.0	27000.0	180	160
	9/12/97	Regular	1800.0	4400.0	1000.0	3000.0	23	21
	12/10/97	Regular	7600.0	12000.0	2800.0	8200.0	11	71
	3/24/98	Regular	4800.0	7200.0	1200.0	2400.0	4.2	38
	6/23/98	Regular	53.0	680.0	580.0	1400.0	1.4	9.2
	9/30/1998	Regular	3.2	90.0	280.0	970.0	2.5	3.6
	12/10/1998	Regular	< 1.0	1.5	17.0	110.0	1.4	0.31
	3/10/1999	Regular	< 1.0	< 1.0	8.2	110.0	0.62	0.85
	3/10/1999	Duplicate	< 1.0	< 1.0	7.9	110.0	0.66	0.84
	6/10/1999	Regular	< 1.0	1.1	< 1.0	28.0	0.53	0.55
	6/10/1999	Duplicate	< 1.0	1.8	< 1.0	41.0	0.69	0.76
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	-	NS	NS	NS	NS	NS	NS
	3/9/2000	Regular	< 1	< 1	< 1	9.1	14	1.3
	6/8/2000	-	NS	NS	NS	NS	NS	NS
	9/13/2000	-	NS	NS	NS	NS	NS	NS
	12/7/2000	-	NS	NS	NS	NS	NS	NS
	3/8/2001	Regular	2.0	< 1	< 1	< 1	0.49	0.58
	6/21/2001	-	NS	NS	NS	NS	NS	NS
	9/10/2001	-	NS	NS	NS	NS	NS	NS
12/6/2001	-	NS	NS	NS	NS	NS	NS	
3/12/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
6/18/2002	-	NS	NS	NS	NS	NS	NS	
MW-2 ¹	8/10/92	Regular	14.9	< 4	< 4	< 4	NA	NA
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	100.0	12.0	3.0	13.0	NA	NA
	1/27/94	Regular	< 1	1.2	2.0	2.5	NA	NA
MW-3	8/10/92	Regular	304.9	2099.0	6760.0	1586.0	NA	NA
	2/9/93	Regular	130.0	< 10	< 10	190.0	NA	NA
	8/19/93	Regular	560.0	3100.0	630.0	1900.0	NA	NA
	1/27/94	Regular	1070.0	5380.0	510.0	3120.0	NA	NA
	5/4/95	Regular	770.0	3300.0	470.0	1800.0	NA	NA
	8/1/95	Regular	490.0	2900.0	890.0	1600.0	NA	14
	11/15/95	Regular	250.0	1000.0	180.0	440.0	NA	2.9
	2/23/96	Regular	120.0	810.0	170.0	560.0	NA	4
	5/31/96	Regular	670.0	3900.0	1200.0	2300.0	NA	15
	8/23/96	Regular	330.0	2200.0	590.0	1500.0	NA	12
	12/2/96	Regular	220.0	1800.0	670.0	1000.0	0.89	7.4
	3/12/97	Regular	370.0	2000.0	960.0	1400.0	1.8	11

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-3	6/12/97	Regular	860.0	4800.0	1700.0	2600.0	1.9	20
	9/11/97	Regular	770.0	3000.0	1600.0	1900.0	1.6	16
	12/10/97	Regular	240.0	740.0	500.0	450.0	0.59	5.3
	3/24/98	Regular	140.0	630.0	360.0	310.0	0.56	3.9
	6/23/98	Regular	100.0	720.0	350.0	490.0	0.40	4.9
	9/30/1998	Regular	42.0	470.0	450.0	530.0	1.0	3.8
	12/10/1998	Regular	13.0	220.0	160.0	290.0	1.3	0.43
	3/10/1999	Regular	3.2	7.4	42.0	32.0	0.2	0.44
	6/10/1999	Regular	1.7	3.1	<1.0	36.0	< 0.20	0.18
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.32	< 0.1
	6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.22	< 0.1
	9/13/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/7/2000	Regular	< 1	< 1	< 1	< 1	< 0.25	< 0.1
	3/8/2001	Regular	< 1	< 1	< 1	< 1	0.42	< 0.1
	6/21/2001	Regular	< 1	< 1	< 1	< 1	< 0.22	< 0.1
	9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/6/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/12/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
MW-4	8/10/92	Regular	2594.0	10360.0	2160.0	6740.0	NA	NA
	2/9/93	Regular	5200.0	15000.0	2200.0	10000.0	NA	NA
	8/19/93	Regular	3000.0	12000.0	< 2000	7000.0	NA	NA
	1/27/94	Regular	NSP	NSP	NSP	NSP	NA	NSP
	5/3/95	Regular	NSP	NSP	NSP	NSP	NA	NSP
	8/1/95	Regular	5700.0	17000.0	3500.0	13000.0	NA	120
	11/15/95	Regular	490.0	1600.0	310.0	1100.0	NA	5.2
	2/23/96	Regular	360.0	2800.0	560.0	2500.0	NA	18
	5/31/96	Regular	84.0	830.0	280.0	1100.0	NA	6.2
	8/23/96	Regular	110.0	1400.0	430.0	1800.0	NA	9.8
	12/2/96	Regular	190.0	2000.0	1800.0	7200.0	56	43
	3/12/97	Regular	220.0	1500.0	1500.0	4400.0	27	27
	6/12/97	Regular	47.0	270.0	360.0	950.0	2.5	6.2
	9/12/97	Regular	92.0	840.0	670.0	2100.0	15	7.6
	12/10/97	Regular	230.0	750.0	970.0	2300.0	3.7	16
	3/24/98	Regular	150.0	510.0	270.0	620.0	1.2	5.6
	6/23/98	Regular	160.0	890.0	590.0	1600.0	0.69	10
	9/30/1998	Regular	80.0	180.0	370.0	840.0	2.0	3.9
	12/10/1998	Regular	28.0	70.0	210.0	960.0	9.3	4.3
	12/10/1998	Duplicate	26.0	62.0	180.0	830.0	3.9	4.3
	3/10/1999	Regular	8.0	20.0	250.0	1400.0	13.0	13
	6/10/1999	Regular	<1.0	<1.0	12.0	12.0	0.44	0.63
	9/14/1999	Regular	< 1.0	< 1.0	3.3	13.1	0.35	0.17
	12/9/1999	Regular	< 1	2.5	2.3	20.1	2	0.53
	3/10/2000	Regular	< 1	< 1	< 1	3.6	2.6	0.15
	6/8/2000	Regular	< 1	< 1	< 1	< 1	0.44	0.23
9/13/2000	Regular	< 1	< 1	< 1	< 1	0.61	< 0.1	
12/7/2000	Regular	< 1	< 1	1.3	< 1	0.53	0.16	
3/8/2001	Regular	< 1	< 1	< 1	< 1	0.43	0.16	
6/21/2001	Regular	< 1	< 1	< 1	< 1	< 0.25	< 0.1	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-4	9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/6/2001	Regular	< 1	< 1	< 1	< 1	0.6	< 1
	3/12/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
MW-5	8/10/92	Regular	< 4	< 4	< 4	< 4	NA	NA
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/10/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	1/27/94	Regular	8.7	29.9	4.0	11.3	NA	NA
	5/3/95	Regular	3.7	5.3	0.9	4.6	NA	NA
	8/1/95	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	11/15/95	Regular	< 0.3	1.2	< 0.3	1.5	NA	NA
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	5/31/96	Regular	31.0	86.0	10.0	20.0	NA	NA
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	12/10/97	Regular	< 5	< 5	< 5	< 5	< 0.2	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	12/10/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.55	< 0.1
	6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/13/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/7/2000	Regular	< 1	< 1	< 1	< 1	< 0.25	< 0.1
	3/8/2001	Regular	< 1	< 1	< 1	< 1	0.56	< 0.1
6/21/2001	Regular	< 1	< 1	< 1	< 1	0.26	< 0.1	
9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
12/6/2001	Regular	< 1	< 1	< 1	< 1	0.49	< 0.1	
3/12/2002	Regular	< 1	< 1	< 1	< 1	< 0.24	< 0.1	
6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
MW-6 ¹	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	7000.0	19000.0	3100.0	7200.0	NA	NA
	8/19/93	Regular	8100.0	19000.0	3500.0	6400.0	NA	NA
	1/27/94	Regular	7960.0	20200.0	3830.0	6150.0	NA	NA
	5/4/95	Regular	11000.0	17000.0	2900.0	6000.0	NA	NA
	8/1/95	Regular	8300.0	12000.0	2500.0	5100.0	NA	60
	11/15/95	Regular	8900.0	17000.0	2900.0	5500.0	NA	57
	2/23/96	Regular	8100.0	10000.0	2300.0	4000.0	NA	58
	5/31/96	Regular	83.0	150.0	15.0	51.0	NA	0.57
	5/31/96	Duplicate	87.0	160.0	13.0	47.0	NA	0.52
	8/23/96	Regular	31.0	28.0	9.4	7.9	NA	0.46
	12/2/96	Regular	< 1	< 1	< 1	1.7	5.6	< 0.1
	3/12/97	Regular	12.0	< 5	6.8	18.0	12	< 0.5
	6/12/97	Regular	1900.0	1400.0	410.0	310.0	7.8	7.4
9/11/97	Regular	11.0	1.3	3.4	< 1	1	< 0.1	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-6	12/10/97	Regular	3.0	4.2	1.2	3.9	1.7	0.14
	3/23/98	Regular	3.6	< 1	4.0	< 1	< 0.2	< 0.1
	6/23/98	Regular	170.0	4.1	15.0	7.2	1.2	0.51
	9/30/1998	Regular	1000.0	420.0	140.0	270.0	4.0	3.3
	12/10/1998	Regular	7.6	6.6	1.7	5.8	2.0	< 0.1
	3/10/1999	Regular	2500.0	930.0	590.0	1400.0	11.0	13
MW-7	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	< 2	3.0	< 2	< 2	NA	NA
	1/27/94	Regular	1.1	< 1	< 1	< 1	NA	NA
	5/3/95	Regular	52.0	3.4	0.7	2.8	NA	NA
	8/1/95	Regular	22.0	2.2	0.9	2.8	NA	< 0.1
	11/15/95	Regular	8.4	0.8	< 0.3	0.9	NA	< 0.1
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	2/23/96	Duplicate	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	5/31/96	Regular	29.0	83.0	10.0	21.0	NA	0.25
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/11/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	12/10/97	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	12/10/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	4.7	< 0.1
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 5	< 5	< 5	< 5	1.8	< 0.5
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.66	< 0.1
	6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.21	< 0.1
	9/13/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
12/7/2000	Regular	< 1	< 1	< 1	< 1	< 0.29	< 0.1	
3/8/2001	Regular	< 1	< 1	< 1	< 1	1.2	< 0.1	
6/21/2001	Regular	3.1	< 1	< 1	< 1	< 0.22	< 0.1	
9/10/2001	Regular	< 1	< 1	< 1	< 1	< 0.33	< 0.1	
12/6/2001	Regular	< 1	< 1	< 1	< 1	1.3	< 0.1	
3/12/2002	Regular	< 1	< 1	< 1	< 1	NA	< 0.1	
6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1	
MW-8	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	< 2	< 2	< 2	< 2	NA	NA
	1/27/94	Regular	< 1	< 1	< 1	< 1	NA	NA
	5/3/95	Regular	3.0	4.9	0.8	3.7	NA	NA
	8/1/95	Regular	3.1	1.2	0.5	1.6	NA	< 0.001
	8/1/95	Duplicate	3.6	1.5	0.5	1.5	NA	< 0.1
	11/15/95	Regular	< 0.3	0.5	< 0.3	< 0.6	NA	< 0.1
	2/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	5/31/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1
	8/23/96	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	< 0.1

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-8	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	1.8	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/11/97	Regular	< 1	< 1	< 1	< 1	0.1	< 0.1
	12/10/97	Regular	< 1	< 1	< 1	< 1	0.3	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	12/10/1998	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	-	NS	NS	NS	NS	NS	NS
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.55	< 0.1
	6/8/2000	-	NS	NS	NS	NS	NS	NS
	9/13/2000	-	NS	NS	NS	NS	NS	NS
	12/7/2000	-	NS	NS	NS	NS	NS	NS
	3/8/2001	Regular	< 1	< 1	< 1	< 1	1.6	< 0.1
	6/21/2001	-	NS	NS	NS	NS	NS	NS
	9/10/2001	-	NS	NS	NS	NS	NS	NS
	12/6/2001	-	NS	NS	NS	NS	NS	NS
	3/12/2002	Regular	< 1	< 1	< 1	< 1	0.38	< 0.1
	6/18/2002	-	NS	NS	NS	NS	NS	NS
MW-9	4/22/93	Regular	570.0	380.0	< 50	870.0	NA	NA
	7/15/93	Regular	121.0	7.3	3.0	458.0	NA	NA
	8/19/93	Regular	390.0	290.0	40.0	250.0	NA	NA
	1/27/94	Regular	327.0	357.0	51.1	293.0	NA	NA
	5/3/95	Regular	380.0	110.0	19.0	120.0	NA	NA
	8/1/95	Regular	660.0	410.0	91.0	310.0	NA	6.2
	11/15/95	Regular	240.0	24.0	11.0	140.0	NA	1.5
	11/15/95	Duplicate	170.0	18.0	10.0	120.0	NA	1.9
	2/23/96	Regular	170.0	18.0	2.3	160.0	NA	4.3
	5/31/96	Regular	120.0	16.0	3.0	200.0	NA	NA
	8/23/96	Regular	82.0	13.0	6.0	270.0	NA	4
	8/23/96	Duplicate	76.0	14.0	4.8	250.0	NA	4.4
	12/2/96	Regular	61.0	< 25	< 25	210.0	2.6	2.8
	12/2/96	Duplicate	86.0	13.0	2.4	270.0	3.7	2.9
	3/12/97	Regular	30.0	48.0	420.0	880.0	8.2	19
	6/12/97	Regular	4.7	2.1	11.0	97.0	2.6	2.2
	6/12/97	Duplicate	< 5	< 5	6.6	69.0	5.2	1.9
	9/12/97	Regular	2.1	2.3	2.1	120.0	1.2	1.9
	12/10/97	Regular	4.9	9.0	6.8	62.0	0.86	0.92
	3/24/98	Regular	< 1	< 1	< 1	26.0	0.9	1
	6/23/98	Regular	2.4	22.0	10.0	36.0	< 0.2	0.25
	9/30/1998	Regular	1.1	5.5	21.0	59.0	0.27	0.27
	12/10/1998	Regular	< 1.0	1.9	17.0	79.0	5.1	0.25
	3/10/1999	Regular	< 1.0	< 1.0	5.7	68.0	< 0.2	0.22
	6/10/1999	Regular	< 1.0	1.8	1.8	71.0	< 0.20	0.43
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
12/9/1999	-	NS	NS	NS	NS	NS	NS	
3/9/2000	Regular	< 1	< 1	< 1	64.0	0.66	1.3	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G		
			micrograms per liter, ug/L				milligrams per liter, mg/L			
MW-9	6/8/2000	-	NS	NS	NS	NS	NS	NS		
	9/13/2000	-	NS	NS	NS	NS	NS	NS		
	12/7/2000	-	NS	NS	NS	NS	NS	NS		
	3/8/2001	Regular	< 1	< 1	< 1	< 1	1.4	< 0.1		
	6/21/2001	-	NS	NS	NS	NS	NS	NS		
	9/10/2001	-	NS	NS	NS	NS	NS	NS		
	12/6/2001	-	NS	NS	NS	NS	NS	NS		
	3/12/2002	Regular	1	< 1	< 1	< 1	0.37	< 0.1		
	6/18/2002	-	NS	NS	NS	NS	NS	NS		
MW-10	8/19/93	Regular	190.0	460.0	< 200	240.0	NA	NA		
	1/27/94	Regular	13.4	4.0	5.5	33.6	NA	NA		
	5/4/95	Regular	980.0	15.0	11.0	84.0	NA	NA		
	8/1/95	Regular	1300.0	32.0	32.0	100.0	NA	3.6		
	11/15/95	Regular	1000.0	24.0	15.0	36.0	NA	1.7		
	2/23/96	Regular	810.0	23.0	27.0	44.0	NA	2.4		
	5/31/96	Regular	700.0	24.0	34.0	28.0	NA	2		
	8/23/96	Regular	290.0	3.4	6.4	13.0	NA	1.4		
	12/2/96	Regular	280.0	1.3	17.0	8.0	0.94	0.97		
	3/12/97	Regular	110.0	< 5	17.0	< 5	0.61	0.57		
	6/12/97	Regular	150.0	12.0	30.0	< 5	0.68	< 0.5		
	9/12/97	Regular	87.0	2.3	26.0	2.7	0.76	0.33		
	9/12/97	Duplicate	87.0	2.4	26.0	2.8	0.79	0.33		
	12/10/97	Regular	41.0	9.8	12.0	7.7	1.1	0.28		
	12/10/97	Duplicate	36.0	8.5	10.0	6.7	1.2	0.24		
	3/23/98	Regular	36.0	< 5	5.9	< 5	1.6	< 0.5		
	3/23/98	Duplicate	36.0	< 1	5.3	1.3	1.7	0.18		
	6/23/98	Regular	37.0	< 5	< 5	< 5	2.1	< 0.5		
	9/30/1998	Regular	84.0	3.2	30.0	2.2	1.4	0.36		
	12/10/1998	Regular	29.0	1.0	7.0	1.0	0.86	0.18		
	3/9/1999	Regular	28.0	< 5.0	5.8	< 5.0	0.92	< 0.5		
	6/10/1999	Regular	17.0	< 1.0	< 1.0	< 1.0	0.30	0.16		
	9/14/1999	Regular	10.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10		
	12/9/1999	Regular	23.0	< 1	< 1	1.2	0.44	0.16		
	3/10/2000	Regular	300.0	4.3	6.6	43.2	1.2	0.85		
	6/8/2000	Regular	78.0	1.7	7.2	9.0	0.67	0.74		
	9/13/2000	Regular	23.0	1.5	1.1	2.9	1.6	0.41		
	12/7/2000	Regular	7.2	< 1	< 1	< 1	1.5	0.15		
	3/8/2001	Regular	3.4	1.1	< 1	< 1	3.4	0.2		
	6/22/2001	Regular	< 1	< 1	< 1	< 1	1.2	< 0.1		
	9/10/01 and 9/18/01	Regular	2	< 1	< 1	< 1	2.3	< 0.1		
	12/6/2001	Regular	No Valid Data							
	3/12/2002	Regular	< 1	< 1	< 1	< 1	3.2	< 0.1		
6/18/2002	Regular	< 1	< 1	< 1	< 1	1.2	< 0.1			

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-11 ¹	8/19/93	Regular	< 2	< 2	< 2	< 2	NA	NA
	1/27/94	Regular	< 1	< 1	< 1	< 1	NA	NA
	5/4/95	Regular	< 0.3	< 0.3	< 0.3	< 0.6	NA	NA
	8/1/95	Regular	44.0	29.0	5.5	13.0	NA	0.2
	11/15/95	Regular	190.0	2.8	6.2	11.0	NA	0.4
	2/23/96	Regular	49.0	1.2	0.5	4.0	NA	0.25
	5/31/96	Regular	300.0	83.0	12.0	28.0	NA	0.8
	8/23/96	Regular	100.0	1.2	0.3	4.7	NA	0.26
	12/2/96	Regular	970.0	< 5	6.0	8.1	2	1.3
	3/12/97	Regular	130.0	< 5	13.0	5.8	0.42	< 0.5
	3/12/97	Duplicate	100.0	< 5	10.0	5.1	0.43	< 0.5
	6/12/97	Regular	150.0	23.0	19.0	< 5	1.1	0.55
	9/12/97	Regular	220.0	15.0	27.0	13.0	1	0.46
MW-11A	3/24/98	Regular	24.0	5.0	< 5	< 5	0.28	0.14
	6/23/98	Regular	9.9	< 5	< 5	< 5	< 0.2	< 0.5
	9/30/1998	Regular	9.3	3.7	2.2	7.0	< 0.20	0.1
	12/10/1998	Regular	1.7	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/10/1999	Regular	< 5	< 5	< 5	< 5	0.3	< 0.5
	6/10/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.10
	9/13/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 5	< 5	< 5	< 5	< 0.2	< 0.1
	3/9/2000	Regular	1.2	< 1	< 1	< 1	0.43	< 0.1
	6/8/2000	Regular	3.6	< 1	< 1	< 1	0.37	< 0.1
	9/13/2000	Regular	1.4	< 1	< 1	< 1	0.36	< 0.1
	12/7/00	Regular	26	< 1	< 1	3.3	0.3	0.12
	3/8/01	Regular	12	< 5	< 5	< 5	2.2	< 0.5
	6/22/2001	Regular	1.5	< 1	< 1	< 1	1	< 0.1
	9/10/2001	Regular	7.9	< 1	< 1	< 1	1.1	< 0.1
	12/6/2001	Regular	< 1	< 1	< 1	< 1	1	< 0.1
	3/12/2002	Regular	1.8	< 1	< 1	1	1.6	< 0.1
	6/18/2002	Regular	2.9	< 1	1.3	< 1	0.91	< 0.1
MW-12	3/24/98	Regular	100.0	11.0	6.0	8.0	0.29	0.41
	6/23/98	Regular	88.0	< 5	< 5	< 5	< 0.2	< 0.5
	6/23/98	Duplicate	89.0	< 5	< 5	< 5	0.31	< 0.5
	9/30/1998	Regular	260.0	3.0	1.2	7.9	< 0.20	0.62
	12/10/1998	Regular	160.0	< 1.0	< 1.0	1.2	0.21	0.36
	3/10/1999	Regular	160.0	1.1	< 1.0	2.9	0.38	0.45
	6/10/1999	Regular	49.0	1.4	< 1.0	< 1.0	0.22	0.13
	9/14/1999	Regular	75.0	< 1.0	< 1.0	< 2.0	< 0.20	0.23
	12/9/1999	Regular	64.0	< 1	< 1	< 1	< 0.2	0.21
	3/10/2000	Regular	93.0	< 1	< 1	< 1	< 0.2	0.21
	3/10/2000	Duplicate	99.0	< 1	< 1	< 1	0.22	0.22
	6/8/2000	Regular	62.0	< 1	< 1	< 1	< 0.2	< 0.1
	9/13/2000	Regular	34.0	< 1	< 1	< 1	0.23	< 0.1
	12/7/2000	Regular	27	< 1	2.9	1.9	< 0.25	< 0.1
	3/8/2001	Regular	14	< 1	< 1	< 1	2.1	0.1
	6/22/2001	Regular	12	< 1	< 1	< 1	0.51	0.11
9/10/2001								

Well Dry (Not Sampled) During This and Subsequent Monitoring Events

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-12D	7/2/1999	Regular	< 5	< 5	< 5	< 5	<0.20	<0.10
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	<0.10
	12/9/1999	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/9/2000	Regular	< 1	< 1	< 1	< 1	0.24	< 0.1
	6/8/2000	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/13/2000	-	NS	NS	NS	NS	NS	NS
	12/7/2000	-	NS	NS	NS	NS	NS	NS
	3/8/2001	-	NS	NS	NS	NS	NS	NS
	6/22/2001	-	NS	NS	NS	NS	NS	NS
	9/18/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	12/6/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/12/2002	Regular	< 1	< 1	< 1	< 1	0.44	< 0.1
	6/18/2002	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	MW-13	7/2/1999	Regular	1500.0	23.0	750.0	58.0	2.2
9/14/1999		Regular	860.0	16.0	450.0	34.4	2.1	3.1
12/9/1999		Regular	430.0	16.0	410.0	40.9	0.46	3.2
3/10/2000		Regular	88.0	2.8	200.0	1.3	1.9	0.99
6/8/2000		Regular	6.0	< 1	63.0	3.3	1.1	0.91
9/13/2000		Regular	<1.0	<1.0	3.4	<1.0	0.44	0.12
12/7/2000		Regular	<1	<1	<1	<1	0.43	< 0.1
3/8/2001		Regular	<1	<1	1.2	<1	2	< 0.1
6/22/2001		Regular	< 1	< 1	< 1	< 1	0.31	< 0.1
9/10/2001		Regular	< 1	< 1	< 1	< 1	0.3	< 0.1
12/6/2001		Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
3/12/2002		Regular	< 1	< 1	< 1	< 1	0.84	< 0.1
6/18/2002		Regular	< 1	< 1	< 1	< 1	0.3	< 0.1
MW-14		1/14/2001	Regular	< 1	< 1	< 1	< 1	< 0.2
MW-15	1/14/2001	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
OW-4	6/10/1999	Regular	<1.0	<1.0	<1.0	4.4	< 0.2	< 0.10
	9/14/1999	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/1999	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.2	< 0.1
	3/9/2000	Regular	< 1.0	< 1.0	< 1.0	< 1.0	0.25	< 0.1
	6/8/2000	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.21	< 0.1
	9/13/2000	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.2	< 0.1

Well Dry (Not Sampled) During This and Subsequent Monitoring Events

¹ Well plugged and abandoned 7/1/99
 NA=Not Analyzed NS=Not Sampled NS-D=Not Sampled because well was dry
 NSP=Not Sampled due to Phase Separated Hydrocarbons

Table 5
Cumulative Results⁽¹⁾ for Chloride⁽²⁾ Analyses
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Sample Date	Monitor Wells ⁽³⁾																
	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-11A	MW-12	MW-12D	MW-13	MW-14	MW-15	OW-4
8/1/95	160	150	310	130	380	310	350	110	2200	3400	NP ⁽⁴⁾	NP	NP	NP	NP	NP	NS ⁽⁵⁾
8/23/96	130	140	100	99	210	250	360	140	2000	2900	NP	NP	NP	NP	NP	NP	NS
3/23-24/98	212	206	126	151	183	223	364	164	2390	NS	940	1200	NP	NP	NP	NP	NS
3/9-10/99	163	156	142	155	411	238	274	123	1160	NS	834	314	NP	NP	NP	NP	NS
6/10-7/2/99	NA ⁽⁶⁾	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	195	496	NP	NP	266
3/9-10/00	258	196	196	196	NP	224	241	131	474	NP	1290	327	117	276	NP	NP	258
1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	368	219	NS
3/8-9/01	NA	165	172	152	NP	224	250	127	879	NP	1720	586	NS	276	327	NA	NS-D ⁽⁷⁾
6/21/2001	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NS	NA	222	222	NS-D
9/10/2001	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NS-D	NA	NA	245	228	NS-D
9/18/2001	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NS-D	78.8	NA	NA	NA	NS-D
12/6/2001	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NS-D	NA	NA	276	215	NS-D
3/11-12/02	177	172	183	127	NP	188	241	110	861	NP	1230	NS-D	75.8	207	284	224	NS-D
6/18/2002	NS	NA	NA	NA	NP	NA	NS	NS	NA	NP	NA	NS-D	NA	145	258	233	NS-D

(1) - in mg/L.

(2) - NMWQCC standard for chloride is 250 mg/L.

(3) - MW-2 not operative after May 3, 1995; P&A'd 7/1/99.

MW-6 P&A'd 7/1/99.

MW-11 P&A'd 7/1/99.

MW-11A installed February 1998.

MW-12 installed February 1998.

MW-12D installed June 1999.

MW-13 installed June 1999.

MW-14 installed January 2001.

MW-15 installed January 2001.

(4) - NP indicates that well was not present at time of sampling event.

(5) - NS indicates that well was not sampled during applicable sampling event.

(6) - NA indicates that well was not analyzed for chloride during applicable sampling event.

(7) - NS-D indicates that well was dry (not sampled) during applicable sampling event.

Table 6
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells MW-5, MW-10, MW-11A, and MW-12
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-5	3/23/1998	3.87	190	< 0.0012
	3/9/1999	<0.1	195	< 0.0012
	6/10/1999	4.73	209	< 0.0012
	9/14/1999	4.3	210	< 0.0012
	12/9/1999	4.2	210	< 0.0012
	3/9/2000	5.3	260	< 0.0012
	6/8/2000	4.7	240	< 0.0012
	9/13/2000	3.93	200	< 0.0012
	12/7/2000	3.27	160	< 0.0012
	3/8/2001	3.24	180	< 0.0012
	6/21/2001	2.74	150	0.0017
	9/10/2001	NA ⁽²⁾	130	< 0.0012
	12/6/2001	2.38	120	< 0.0012
	3/12/2002	2.98	120	< 0.0012
6/18/2002	2.56	110	0.002	
MW-10	3/23/1998	0.07	320	0.91
	6/23/1998	< 0.1	325	0.55
	9/30/1998	< 0.1	204	0.81
	12/10/1998	< 0.1	180	0.091
	3/9/1999	< 0.1	142	0.035
			223 ⁽³⁾	
	9/14/1999	<0.10	160	0.0049
	12/9/1999	0.49	170	0.0039
	3/10/2000	0.1	160	0.0056
	6/8/2000	< 0.1	150	0.031
	9/13/2000	< 0.1	160	0.031
	12/7/2000	< 0.1	190	0.17
	3/8/2001	< 0.1	270	< 0.0012
	6/22/2001	< 0.1	270	0.044
9/10/2001	NA	NA	NA	
3/12/2002	< 0.1	230	NA	
6/18/2002	< 0.1	240	0.007	

Table 6
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells MW-5, MW-10, MW-11A, and MW-12
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-11A	3/23/1998	< 0.05	190	0.14
	6/23/1998	< 0.1	225	0.11
	9/30/1998	0.4	196	0.043
	12/10/1998	0.7	188	0.033
	3/10/1999	< 0.1	164	0.094
		< 0.1 ⁽⁴⁾	227 ⁽³⁾	
	6/10/1999	< 0.1	181	0.0036
	9/13/1999	0.22	250	< 0.0012
	12/9/1999	< 0.1	290	0.0079
	3/9/2000	0.11	270	0.037
	6/8/2000	< 0.1	240	0.0069
	9/13/2000	< 0.1	320	< 0.0012
	12/7/2000	< 0.1	260	0.0096
	3/8/2001	< 0.1	330	0.0028
	6/22/2001	< 0.1	180	0.0074
	9/10/2001	NA	280	< 0.0012
	12/6/2001	< 0.1	240	0.0041
	3/12/2002	< 0.1	350	0.0044
	6/18/2002	< 0.1	560	0.0028
MW-12	3/23/1998	< 0.05	240	< 0.0012
	6/23/1998	< 0.1	240	< 0.0012
	9/30/1998	< 0.1	168	< 0.0012
	12/10/1998	< 0.1	202	< 0.0012
	3/10/1999	< 0.1	137	< 0.0012
		< 0.1 ⁽⁴⁾	193 ⁽³⁾	
	6/10/1999	< 0.1	217	< 0.0012
	9/14/1999	< 0.10	230	< 0.0012
	12/9/1999	< 0.1	180	< 0.0012
	3/10/2000	< 0.1	210	< 0.0012
	6/8/2000	< 0.1	220	< 0.0012
	9/13/2000	< 0.1	240	< 0.0012
	12/7/2000	< 0.1	260	< 0.0012
	3/8/2001	< 0.1	300	< 0.0012

Table 6
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells MW-5, MW-10, MW-11A, and MW-12
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-12	6/22/2001	< 0.1	360	0.0021
	9/10/2001	Well Dry (Not Sampled) During This and Subsequent Monitoring Events		
MW-12D	9/18/2001	NA	190	< 0.0012
	12/6/2001	< 0.1	200	< 0.0012
	3/12/2002	< 0.1	200	< 0.0012
	6/18/2002	< 0.1	180	0.0012

⁽¹⁾ - By EPA Method 300, except as noted

⁽²⁾ - NA indicates not analyzed

⁽³⁾ - By EPA Method 375.4

⁽⁴⁾ - By EPA Method 353.3

⁽⁵⁾ - NS-D indicates not sampled (well dry)

mg/L = milligrams per liter

APPENDICES

APPENDIX A

Groundwater Sampling Forms

WELL ID: MW-3

1. PROJECT INFORMATION

Project Number: 12B32 Task Number: 017 Date: 6/17/02 Time: 5:30
 Client: BS Services Personnel: Mark Pausch
 Project Location: Hobbs, NM Weather: 80s Sunny

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 63.02 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 59.83 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: 3 AM feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 3.19 feet Well Volume: 0.51 gal Screened Interval (from GS): 45-60
 Pump intake depth: _____ (from GS) Note: 2-inch well = 0.16 gal/ft 4-inch well = 0.65 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: polyethylene Equipment Model(s)
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. YSI-610
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____
 Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Depth to Water (TOC)	Comments
5:49	1.53	7.56	20.09	1267	84.5	7.53	—	—	—
/									

4. SAMPLING DATA

Method(s): Bailer, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: _____ Field Filtered? Yes No
 Sample ID: MW-3 Sample Time: 12:08 6/18/02 # of Containers: 5
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

Well needs a pad. measurements not taken at 1-well volume intervals because YSI-needs more volume to take reading*
Note: include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

* in container. Not enough water to sample, return next day at 12:08, 6/18/02



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-4

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 6/17/02 Time: 5:50
 Client: BJ Services Personnel: Rausch, Murali
 Project Location: Hobbs, NM Weather: 80s Sunny

2. WELL DATA

Casing Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Screen Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Total Depth of Well: <u>62.82</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Static Water: <u>59.67</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Product: _____ feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Length of Water Column: <u>3.15</u> feet	Well Volume: <u>0.50</u> gal
Pump intake depth _____ (from GS)	Screened Interval (from GS): <u>45-60</u> <small>Note: 2-inch well = 0.16 gal/ft 4-inch well = 0.65 gal/ft</small>

3. PURGE DATA

Purge Method: Bailer, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Was well purged dry? Yes No Pumping Rate: _____ gal/min

Equipment Model(s)
 1. YSL-610
 2. _____
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Depth to Water (TOC)	Comments
6:00	1.0	7.42	—	1400	80.2	7.37	—	—	slightly turbid
6:22	2.0	7.51	20.70	1360	76.9	7.55	—	—	(brown)

4. SAMPLING DATA

Method(s): Bailer, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Depth to Water at Time of Sampling: _____ NM Field Filtered? Yes No

Sample ID: MW-4 Sample Time: 12:18 6/18 # of Containers: 5

Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

Well in good condition. Not enough H2O to sample. Return 6/18/02 @ 12:18pm! Readings taken at smallest readings that

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

WELL ID: MW-5

1. PROJECT INFORMATION

Project Number: 12B32 Task Number: 017 Date: 6/17/02 Time: 3:15
 Client: BS services Personnel: MATT RAUSCH
 Project Location: Hobbs, NM Weather: BOS hot clear

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 66.89 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.43 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 5.46 feet Well Volume: 0.87 gal Screened Interval (from GS): 45-60
 Pump intake depth — (from GS) Note: 2-inch well = 0.16 gal/ft 4-inch well = 0.65 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 1.5 in Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: polyethylene Equipment Model(s): YSI-610
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: _____ gal/min

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Depth to Water (TOC)	Comments
3:20	0.75	7.33	23.42	1093	95.5	7.56	—	—	—
2 gallons total									
(A diagonal line is drawn across the remaining empty rows of the table.)									

4. SAMPLING DATA

Method(s): Bailer, Size: 1.5 in Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: 47.8102 NM Field Filtered? Yes No
 Sample ID: MW-5 Sample Time: 9:36 6/18/02 # of Containers: 9
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: 70 mg/L

5. COMMENTS

well in good condition. Not enough H₂O to sample, wait for it to recharge and return the next day to sample 6/18/02 9:36 am. YSI
 Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

WELL ID: MW-7

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 6/17/02 Time: 4:03
 Client: BT Services Personnel: Raysch MW7
 Project Location: Hobbs, NM Weather: 80s Clear

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 63.18 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 60.39 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 2.79 feet Well Volume: 0.95 gal Screened Interval (from GS): 45-60
 Pump intake depth _____ (from GS) Note: 2-inch well = 0.16 gal/ft 4-inch well = 0.65 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: polyethylene Equipment Model(s)
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. YSI-60
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____
 Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Depth to Water (TOC)	Comments
4:05	0.35	7.13	22.20	14.08	1315	5.54	—	—	—

4. SAMPLING DATA

Method(s): Bailer, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: 10:20 AM NM Field Filtered? Yes No
 Sample ID: MW-7 Sample Time: 8:53 6/18 # of Containers: 4
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

not enough water in well to sample. Take the sample on the next day 6/18. Well in good condition. YSI readings taken at smallest interval possible given size of YSI probe and container.

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

WELL ID: MW-10

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 6/17/02 Time: 6:27
 Client: B5 Services Personnel: Rausch/Moffi
 Project Location: Hobbs, NM Weather: Obs sunny

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 63.51 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 60.98 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 3.53 feet Well Volume: 0.56 gal Screened Interval (from GS): _____
 Pump intake depth _____ (from GS) Note: 2-inch well = 0.16 gal/ft 4-inch well = 0.65 gal/ft

3. PURGE DATA

Purge Method: Bailor, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailor Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: _____ gal/min
 Equipment Model(s)
 1. YSI-610
 2. _____
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Depth to Water (TOC)	Comments
<u>6:35</u>	<u>1.0</u>	<u>6.86</u>	<u>21.01</u>	<u>9031</u>	<u>-52.9</u>	<u>1.64</u>	—	—	<u>has an odor of purple water</u>
*									

4. SAMPLING DATA

Method(s): Bailor, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailor Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-10 Sample Time: 9:15 6/18/02 of Containers: 8
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: 165 mg/L

5. COMMENTS

Field readings taken at shallowest interval possible given size of YSI probe & container. Well in good condition
*not enough water to sample. Return next day to sample
Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

WELL ID: MW-11A

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 6/17/02 Time: 6:40
 Client: RT Services Personnel: Ramsch/Morfi
 Project Location: Hobbs, NM Weather: 80s Sunny

2. WELL DATA

Casing Diameter: 3 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 63.82 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.55 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 2.27 feet Well Volume: 0.36 gal Screened Interval (from GS): ST-65
 Pump intake depth — (from GS) Note: 2-inch well = 0.16 gal/ft 4-inch well = 0.65 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: polyethylene Equipment Model(s): YSI-610
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: _____ gal/min

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Depth to Water (TOC)	Comments
<u>6:50</u>	<u>1.0</u>	<u>6.84</u>	<u>20.73</u>	<u>6291</u>	<u>-58.90</u>	<u>2.53</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>*</u>			<u>1.5 gallons removed total</u>						<u>has an odor</u>

4. SAMPLING DATA

Method(s): Bailer, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: — NM Field Filtered? Yes No
 Sample ID: MW-11A Sample Time: 12:35 # of Containers: 9
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: — mg/L
 DO: — mg/L
 Nitrate: — mg/L
 Sulfate: — mg/L
 Alkalinity: 110 mg/L

5. COMMENTS

Field readings taken at smallest interval possible given size of YSI probe & container
Well in good condition
* not enough water to sample. Return next day to sample.

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

(Signature)
 Signature

WELL ID: MW-12D

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 6/18/02 Time: 10:12
 Client: BJ Services Personnel: Rausch/Morgan
 Project Location: Hobbs, NM Weather: 70°F Windy Clear

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 87.58 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.61 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 25.97 feet Well Volume: 4.16 gal Screened Interval (from GS): 77.5-87.5
 Pump intake depth 82.5 (from GS) Note: 2-inch well = 0.16 gal/ft 4-inch well = 0.65 gal/ft

3. PURGE DATA

Purge Method: Bailor, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s)
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: 0.22 gal/min
 1. YSI-610
 2. Fultz Pump
 3. —

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Depth to Water (TOC)	Comments
10:43	0.6	7.80	21.07	1103	-62.1	0.60	—	62.22	Turbid
10:46	1.4	7.97	20.39	1101	-58.5	1.59	—	62.32	clearing up
10:49	2.0	7.40	20.14	1098	-46.8	1.14	—	62.41	clear
10:52	2.6	7.27	19.97	1096	-40.2	0.71	—	62.45	clear
10:55	3.4	7.19	19.91	1098	-48.6	0.56	—	62.16	clear
10:58	4.0	7.17	20.10	1099	-53.4	0.51	—	—	—
11:01	4.6	7.17	20.09	1098	-59.5	0.52	—	62.15	—

4. SAMPLING DATA

Method(s): Bailor, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: 62.15 Field Filtered? Yes No
 Sample ID: MW-12D Sample Time: 11:01 # of Containers: 9
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: — mg/L
 DO: — mg/L
 Nitrate: — mg/L
 Sulfate: — mg/L
 Alkalinity: 70 mg/L

5. COMMENTS

well in good condition

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

WELL ID: MW-13

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 6/17/02 Time: 4:28
 Client: BJ Services Personnel: Krusch/Morgan
 Project Location: Hobbs, NM Weather: windy/clear

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 66.38 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.28 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 5.10 feet Well Volume: 0.92 gal Screened Interval (from GS): G1-66
 Pump intake depth — (from GS) Note: 2-inch well = 0.16 gal/ft 4-inch well = 0.65 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s)
 Materials: Pump/Bailer Stainless PVC Teflon® Other: polyethylene 1. YSI-610
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____ 2. —
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: — gal/min 3. —

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Depth to Water (TOC)	Comments
4:36	1.0	7.45	20.97	1478	52.2	3.92	—	—	clear
4:46	2.25	7.32	19.83	1500	-1.6	2.96	—	—	black color
2.5 total taken									
(A large diagonal line is drawn across the remaining empty rows of the table.)									

4. SAMPLING DATA

Method(s): Bailer, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-13 Sample Time: 11:32 6/18/02 # of Containers: 5
 Duplicate Sample Collected? Yes No ID: —

Geochemical Analyses

Ferrous Iron: — mg/L
 DO: — mg/L
 Nitrate: — mg/L
 Sulfate: — mg/L
 Alkalinity: — mg/L

5. COMMENTS

well in good condition not enough water to sample. Return the next day to sample. Readings taken at smallest interval possible give size of YSI-probe and container
 Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

WELL ID: MW-14

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 6/17/02 Time: 7:50
 Client: BS Services Personnel: Rausch/Martl
 Project Location: Hobbs, NM Weather: 70's F, Windy

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 69.37 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 62.65 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 6.72 feet Well Volume: 1.08 gal Screened Interval (from GS): 54.5-69.5
 Pump intake depth — (from GS) Note: 2-inch well = 0.16 gal/ft 4-inch well = 0.65 gal/ft

3. PURGE DATA

Purge Method: Bailor, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s)
 Materials: Pump/Bailor Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. YST-610
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____
 Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Depth to Water (TOC)	Comments
7:57	1.0	7.81	19.55	1941	51.3	7.53	—	—	—
	dry @ 1.5 gallons								

4. SAMPLING DATA

Method(s): Bailor, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailor Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-14 Sample Time: 10:01 6/18/02 # of Containers: 1
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses
 Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

not enough water to sample -> return the next day to sample well in good condition. Field readings taken at smallest interval possible given sizes YST probe and container

Note: include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

WELL ID: MW-15

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 6/17/02 Time: 4:13 pm
 Client: BS Services Personnel: Rausch/Moore
 Project Location: Hobbs, NM Weather: Hot, 90's F

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 67.01 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.58 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 5.43 feet Well Volume: 0.87 gal Screened Interval (from GS): 52-67
 Pump intake depth _____ (from GS) Note: 2-inch well = 0.16 gal/ft 4-inch well = 0.65 gal/ft

3. PURGE DATA

Purge Method: Bailor, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailor Stainless PVC Teflon® Other: polyethylene Equipment Model(s) _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: _____ gal/min

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Depth to Water (TOC)	Comments
4:16	0.5	7.21	19.57	1402	71.8	6.94	—	—	
4:19	1.0	6.96	19.94	1365	106.2	6.94	—	—	
4:22	1.5	6.85	21.60	1414	120.2	6.66	—	—	
4:25	2.0	6.81	19.54	1420	122.9	6.14	—	—	
≈ 2.5 — Total purged volume									

4. SAMPLING DATA

Method(s): Bailor, Size: 1.5 inch Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailor Stainless PVC Teflon® Other: polyethylene
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: _____ Field Filtered? Yes No
 Sample ID: MW-15 Sample Time: 10:07 6/18/02 # of Containers: 1
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

well in good condition. Not enough water in well to sample. On 6/17, return next day to take sample. Well readings are taken at smallest interval possible given size of YSI probe and container
 Note: Include comments such as well condition, odor, presence of NAPL or other items not on the field data sheet.

APPENDIX B

Laboratory Analytical Report



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

02060636

<p>Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886</p>	<p>Project Name: BJ Hobbs 12832 Site: Hobbs, NM Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 7/3/02</p>
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This Report Contains A Total Of 26 Pages

Excluding This Page

And

Chain Of Custody

7/3/02

Date



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:
Brown & Caldwell

Certificate of Analysis Number:
02060636

Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	Project Name: BJ Hobbs 12832 Site: Hobbs, NM Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 7/3/02
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Three sets of trip blanks were received with the samples but was not written on the chain of custody (SPL ID's: 02060636-11, 02060636-12 and 02060636-13). Per Amanda Mortl via voicemail on June 20, 2002, SPL analyzed the trip blanks for VOC.

Additional sample was received for your sample ID "MW-13" (SPL ID: 02060636-08), however, no analyses were requested on the chain of custody. Per a revised chain of custody, received on June 20, 2002, via fax, SPL analyzed your sample for Chloride by method 325.3 as well as the analyses requested on the chain.

Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

Sonia West
Senior Project Manager

7/3/02

Date



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

02060636

Report To: Brown & Caldwell
 Rick Rexroad
 1415 Louisiana
 Suite 2509
 Houston
 TX
 77002-
 ph: (713) 759-0999

Project Name: BJ Hobbs 12832
Site: Hobbs, NM
Site Address:

PO Number:
State: New Mexico

State Cert. No.:
Date Reported: 7/3/02

Fax To: Brown & Caldwell
 Rick Rexroad fax : (713) 308-3886

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
MW-3	02060636-01	Water	6/18/02 12:08:00 PM	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>
MW-4	02060636-02	Water	6/18/02 12:18:00 PM	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>
MW-5	02060636-03	Water	6/18/02 9:36:00 AM	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>
MW-7	02060636-04	Water	6/18/02 8:53:00 AM	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>
MW-10	02060636-05	Water	6/18/02 9:15:00 AM	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>
MW-11A	02060636-06	Water	6/18/02 12:35:00 PM	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>
MW-12D	02060636-07	Water	6/18/02 11:01:00 AM	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>
MW-13	02060636-08	Water	6/18/02 11:32:00 AM	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>
MW-13	02060636-08	Water	6/18/02 11:32:00 AM	6/19/02 10:00:00 AM	174127	<input checked="" type="checkbox"/>
MW-14	02060636-09	Water	6/18/02 10:01:00 AM	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>
MW-15	02060636-10	Water	6/18/02 10:07:00 AM	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>
Trip Blank #1	02060636-11	Water	6/18/02	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>
Trip Blank #2	02060636-12	Water	6/18/02	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>
Trip Blank #3	02060636-13	Water	6/18/02	6/19/02 10:00:00 AM	174127	<input type="checkbox"/>

Sonia West
 Sonia West
 Senior Project Manager

7/3/02

Date

Joel Grice
 Laboratory Director

Ted Yen
 Quality Assurance Officer



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-3 Collected: 06/18/2002 12:08 SPL Sample ID: 02060636-01

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.2	1		06/25/02 10:08	AR	1195393
Surr: n-Pentacosane	45.8	% 18-120	1		06/25/02 10:08	AR	1195393

Prep Method	Prep Date	Prep Initials
SW3510B	06/20/2002 10:45	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		06/28/02 15:41	DL	1201408
Surr: 1,4-Difluorobenzene	89.3	% 74-121	1		06/28/02 15:41	DL	1201408
Surr: 4-Bromofluorobenzene	122	% 55-150	1		06/28/02 15:41	DL	1201408

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		06/28/02 15:41	DL	1201307
Ethylbenzene	ND	1	1		06/28/02 15:41	DL	1201307
Toluene	ND	1	1		06/28/02 15:41	DL	1201307
Xylenes, Total	ND	1	1		06/28/02 15:41	DL	1201307
Surr: 4-Bromofluorobenzene	90.2	% 48-156	1		06/28/02 15:41	DL	1201307
Surr: 1,4-Difluorobenzene	73.7	% 72-137	1		06/28/02 15:41	DL	1201307

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-4

Collected: 06/18/2002 12:18

SPL Sample ID: 02060636-02

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.2	1		06/25/02 10:46	AR	1195394
Surr: n-Pentacosane	38.2 %	18-120	1		06/25/02 10:46	AR	1195394

Prep Method	Prep Date	Prep Initials
SW3510B	06/20/2002 10:45	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		06/28/02 17:48	DL	1201409
Surr: 1,4-Difluorobenzene	93.7 %	74-121	1		06/28/02 17:48	DL	1201409
Surr: 4-Bromofluorobenzene	95.7 %	55-150	1		06/28/02 17:48	DL	1201409

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		06/28/02 17:48	DL	1201319
Ethylbenzene	ND	1	1		06/28/02 17:48	DL	1201319
Toluene	ND	1	1		06/28/02 17:48	DL	1201319
Xylenes, Total	ND	1	1		06/28/02 17:48	DL	1201319
Surr: 4-Bromofluorobenzene	96.4 %	48-156	1		06/28/02 17:48	DL	1201319
Surr: 1,4-Difluorobenzene	89.7 %	72-137	1		06/28/02 17:48	DL	1201319

Qualifiers: ND/U - Not Detected at the Reporting Limit
 B - Analyte detected in the associated Method Blank
 * - Surrogate Recovery Outside Advisable QC Limits
 J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)
 D - Surrogate Recovery Unreportable due to Dilution
 MI - Matrix Interference



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-5

Collected: 06/18/2002 9:36

SPL Sample ID: 02060636-03

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.2	1		06/25/02 11:25	AR	1195395
Surr: n-Pentacosane	41.6	% 18-120	1		06/25/02 11:25	AR	1195395

Prep Method	Prep Date	Prep Initials
SW3510B	06/20/2002 10:45	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		06/28/02 18:13	DL	1201410
Surr: 1,4-Difluorobenzene	102	% 74-121	1		06/28/02 18:13	DL	1201410
Surr: 4-Bromofluorobenzene	92.3	% 55-150	1		06/28/02 18:13	DL	1201410

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		06/28/02 13:26	ER	1200134
Ethylene	ND	0.0032	1		06/28/02 13:26	ER	1200134
Methane	0.002	0.0012	1		06/28/02 13:26	ER	1200134

NITROGEN, NITRATE (AS N)			MCL	E300	Units: mg/L		
Nitrogen, Nitrate (As N)	2.56	0.1	1		06/19/02 12:31	SN	1192614

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		06/28/02 18:13	DL	1201323
Ethylbenzene	ND	1	1		06/28/02 18:13	DL	1201323
Toluene	ND	1	1		06/28/02 18:13	DL	1201323
Xylenes, Total	ND	1	1		06/28/02 18:13	DL	1201323
Surr: 4-Bromofluorobenzene	85.6	% 48-156	1		06/28/02 18:13	DL	1201323
Surr: 1,4-Difluorobenzene	97.5	% 72-137	1		06/28/02 18:13	DL	1201323

SULFATE			MCL	E300	Units: mg/L		
Sulfate	110	4	20		06/27/02 16:13	ES	1200648

Qualifiers: ND/U - Not Detected at the Reporting Limit
 B - Analyte detected in the associated Method Blank
 * - Surrogate Recovery Outside Advisable QC Limits
 J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)
 D - Surrogate Recovery Unreportable due to Dilution
 MI - Matrix Interference



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Client Sample ID MW-7 Collected: 06/18/2002 8:53 SPL Sample ID: 02060636-04

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.2	1		06/25/02 12:03	AR	1195396
Surr: n-Pentacosane	56.4 %	18-120	1		06/25/02 12:03	AR	1195396

Prep Method	Prep Date	Prep Initials
SW3510B	06/20/2002 10:45	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		06/28/02 18:39	DL	1201411
Surr: 1,4-Difluorobenzene	92.0 %	74-121	1		06/28/02 18:39	DL	1201411
Surr: 4-Bromofluorobenzene	118 %	55-150	1		06/28/02 18:39	DL	1201411

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		06/28/02 18:39	DL	1201324
Ethylbenzene	ND	1	1		06/28/02 18:39	DL	1201324
Toluene	ND	1	1		06/28/02 18:39	DL	1201324
Xylenes, Total	ND	1	1		06/28/02 18:39	DL	1201324
Surr: 4-Bromofluorobenzene	82.4 %	48-156	1		06/28/02 18:39	DL	1201324
Surr: 1,4-Difluorobenzene	93.5 %	72-137	1		06/28/02 18:39	DL	1201324

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



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Client Sample ID MW-10 Collected: 06/18/2002 9:15 SPL Sample ID: 02060636-05

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	1.2	0.2	1		06/25/02 10:08	AR	1195387
Surr: n-Pentacosane	36.8	% 18-120	1		06/25/02 10:08	AR	1195387

Prep Method	Prep Date	Prep Initials
SW3510B	06/20/2002 10:45	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		06/28/02 19:04	DL	1201412
Surr: 1,4-Difluorobenzene	110	% 74-121	1		06/28/02 19:04	DL	1201412
Surr: 4-Bromofluorobenzene	124	% 55-150	1		06/28/02 19:04	DL	1201412

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		06/28/02 13:38	ER	1200135
Ethylene	ND	0.0032	1		06/28/02 13:38	ER	1200135
Methane	0.007	0.0012	1		06/28/02 13:38	ER	1200135

NITROGEN, NITRATE (AS N)			MCL	E300	Units: mg/L		
Nitrogen, Nitrate (As N)	ND	0.1	1		06/19/02 12:31	SN	1192617

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		06/28/02 19:04	DL	1201325
Ethylbenzene	ND	1	1		06/28/02 19:04	DL	1201325
Toluene	ND	1	1		06/28/02 19:04	DL	1201325
Xylenes, Total	ND	1	1		06/28/02 19:04	DL	1201325
Surr: 4-Bromofluorobenzene	105	% 48-156	1		06/28/02 19:04	DL	1201325
Surr: 1,4-Difluorobenzene	79.7	% 72-137	1		06/28/02 19:04	DL	1201325

SULFATE			MCL	E300	Units: mg/L		
Sulfate	240	5	25		06/27/02 16:13	ES	1200651

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



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Client Sample ID MW-11A Collected: 06/18/2002 12:35 SPL Sample ID: 02060636-06

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	0.91	0.2	1		06/25/02 10:46	AR	1195388
Surr: n-Pentacosane	41.4	% 18-120	1		06/25/02 10:46	AR	1195388

Prep Method	Prep Date	Prep Initials
SW3510B	06/20/2002 10:45	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		06/28/02 19:29	DL	1201413
Surr: 1,4-Difluorobenzene	97.3	% 74-121	1		06/28/02 19:29	DL	1201413
Surr: 4-Bromofluorobenzene	141	% 55-150	1		06/28/02 19:29	DL	1201413

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		06/28/02 13:49	ER	1200136
Ethylene	ND	0.0032	1		06/28/02 13:49	ER	1200136
Methane	0.0028	0.0012	1		06/28/02 13:49	ER	1200136

NITROGEN, NITRATE (AS N)			MCL	E300	Units: mg/L		
Nitrogen, Nitrate (As N)	ND	0.1	1		06/19/02 12:31	SN	1192618

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	2.9	1	1		06/28/02 19:29	DL	1201326
Ethylbenzene	1.3	1	1		06/28/02 19:29	DL	1201326
Toluene	ND	1	1		06/28/02 19:29	DL	1201326
Xylenes, Total	ND	1	1		06/28/02 19:29	DL	1201326
Surr: 4-Bromofluorobenzene	120	% 48-156	1		06/28/02 19:29	DL	1201326
Surr: 1,4-Difluorobenzene	89.2	% 72-137	1		06/28/02 19:29	DL	1201326

SULFATE			MCL	E300	Units: mg/L		
Sulfate	560	10	50		06/27/02 16:13	ES	1200652

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



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Client Sample ID MW-12D

Collected: 06/18/2002 11:01

SPL Sample ID: 02060636-07

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.2	1		06/25/02 12:03	AR	1195390
Surr: n-Pentacosane	26.0	% 18-120	1		06/25/02 12:03	AR	1195390

Prep Method	Prep Date	Prep Initials
SW3510B	06/20/2002 10:45	KL

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		06/28/02 19:55	DL	1201414
Surr: 1,4-Difluorobenzene	92.7	% 74-121	1		06/28/02 19:55	DL	1201414
Surr: 4-Bromofluorobenzene	111	% 55-150	1		06/28/02 19:55	DL	1201414

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		06/28/02 14:45	ER	1200139
Ethylene	0.004	0.0032	1		06/28/02 14:45	ER	1200139
Methane	0.0012	0.0012	1		06/28/02 14:45	ER	1200139

NITROGEN, NITRATE (AS N)			MCL	E300	Units: mg/L		
Nitrogen, Nitrate (As N)	ND	0.1	1		06/19/02 12:31	SN	1192619

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		06/28/02 19:55	DL	1201327
Ethylbenzene	ND	1	1		06/28/02 19:55	DL	1201327
Toluene	ND	1	1		06/28/02 19:55	DL	1201327
Xylenes, Total	ND	1	1		06/28/02 19:55	DL	1201327
Surr: 4-Bromofluorobenzene	80.5	% 48-156	1		06/28/02 19:55	DL	1201327
Surr: 1,4-Difluorobenzene	91.7	% 72-137	1		06/28/02 19:55	DL	1201327

SULFATE			MCL	E300	Units: mg/L		
Sulfate	180	2	10		06/27/02 16:13	ES	1200653

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



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Client Sample ID MW-13

Collected: 06/18/2002 11:32

SPL Sample ID: 02060636-08

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				MCL	E325.3	Units: mg/L	
Chloride	145	2	2		06/24/02 12:15	CV	1193520

DIESEL RANGE ORGANICS				MCL	SW8015B	Units: mg/L	
Diesel Range Organics	0.3	0.2		1		06/25/02 11:25	AR 1195389
Surr: n-Pentacosane	24.6	% 18-120		1		06/25/02 11:25	AR 1195389

Prep Method	Prep Date	Prep Initials
SW3510B	06/20/2002 10:45	KL

GASOLINE RANGE ORGANICS				MCL	SW8015B	Units: mg/L	
Gasoline Range Organics	ND	0.1		1		06/28/02 20:20	DL 1201415
Surr: 1,4-Difluorobenzene	89.7	% 74-121		1		06/28/02 20:20	DL 1201415
Surr: 4-Bromofluorobenzene	106	% 55-150		1		06/28/02 20:20	DL 1201415

PURGEABLE AROMATICS				MCL	SW8021B	Units: ug/L	
Benzene	ND	1		1		06/28/02 20:20	DL 1201328
Ethylbenzene	ND	1		1		06/28/02 20:20	DL 1201328
Toluene	ND	1		1		06/28/02 20:20	DL 1201328
Xylenes, Total	ND	1		1		06/28/02 20:20	DL 1201328
Surr: 4-Bromofluorobenzene	97.4	% 48-156		1		06/28/02 20:20	DL 1201328
Surr: 1,4-Difluorobenzene	82.5	% 72-137		1		06/28/02 20:20	DL 1201328

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



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Client Sample ID MW-14 Collected: 06/18/2002 10:01 SPL Sample ID: 02060636-09

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				MCL	E325.3	Units: mg/L	
Chloride	258	5	5		06/24/02 12:15	CV	1193521

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte detected in the associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference



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Client Sample ID MW-15

Collected: 06/18/2002 10:07

SPL Sample ID: 02060636-10

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				E325.3			
Chloride	233	5	5		06/24/02 12:15	CV	1193523

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution

MI - Matrix Interference



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Client Sample ID Trip Blank #1

Collected: 06/18/2002 0:00

SPL Sample ID: 02060636-11

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		06/28/02 20:45	DL	1201416
Surr: 1,4-Difluorobenzene	100	% 74-121	1		06/28/02 20:45	DL	1201416
Surr: 4-Bromofluorobenzene	114	% 55-150	1		06/28/02 20:45	DL	1201416
PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		06/28/02 20:45	DL	1201329
Ethylbenzene	ND	1	1		06/28/02 20:45	DL	1201329
Toluene	ND	1	1		06/28/02 20:45	DL	1201329
Xylenes,Total	ND	1	1		06/28/02 20:45	DL	1201329
Surr: 4-Bromofluorobenzene	96.2	% 48-156	1		06/28/02 20:45	DL	1201329
Surr: 1,4-Difluorobenzene	74.9	% 72-137	1		06/28/02 20:45	DL	1201329

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution

MI - Matrix Interference



HOUSTON LABORATORY
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Client Sample ID Trip Blank #2 Collected: 06/18/2002 0:00 SPL Sample ID: 02060636-12

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		06/28/02 21:11	DL	1201417
Surr: 1,4-Difluorobenzene	96.3	% 74-121	1		06/28/02 21:11	DL	1201417
Surr: 4-Bromofluorobenzene	118	% 55-150	1		06/28/02 21:11	DL	1201417
PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		06/28/02 21:11	DL	1201330
Ethylbenzene	ND	1	1		06/28/02 21:11	DL	1201330
Toluene	ND	1	1		06/28/02 21:11	DL	1201330
Xylenes, Total	ND	1	1		06/28/02 21:11	DL	1201330
Surr: 4-Bromofluorobenzene	75.2	% 48-156	1		06/28/02 21:11	DL	1201330
Surr: 1,4-Difluorobenzene	96.2	% 72-137	1		06/28/02 21:11	DL	1201330

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



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Client Sample ID Trip Blank #3

Collected: 06/18/2002 0:00

SPL Sample ID: 02060636-13

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		06/28/02 21:36	DL	1201418
Surr: 1,4-Difluorobenzene	96.0	% 74-121	1		06/28/02 21:36	DL	1201418
Surr: 4-Bromofluorobenzene	95.3	% 55-150	1		06/28/02 21:36	DL	1201418
PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		06/28/02 21:36	DL	1201331
Ethylbenzene	ND	1	1		06/28/02 21:36	DL	1201331
Toluene	ND	1	1		06/28/02 21:36	DL	1201331
Xylenes, Total	ND	1	1		06/28/02 21:36	DL	1201331
Surr: 4-Bromofluorobenzene	101	% 48-156	1		06/28/02 21:36	DL	1201331
Surr: 1,4-Difluorobenzene	81.6	% 72-137	1		06/28/02 21:36	DL	1201331

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution

MI - Matrix Interference

Quality Control Documentation



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Quality Control Report

Brown & Caldwell
 BJ Hobbs 12832

Analysis: Diesel Range Organics
 Method: SW8015B

WorkOrder: 02060636
 Lab Batch ID: 20751

Method Blank

Samples in Analytical Batch:

RunID: HP_V_020625C-1195392 Units: mg/L
 Analysis Date: 06/25/2002 13:58 Analyst: AR
 Preparation Date: 06/20/2002 10:45 Prep By: KL Method SW3510B

Lab Sample ID	Client Sample ID
02060636-01B	MW-3
02060636-02B	MW-4
02060636-03B	MW-5
02060636-04B	MW-7
02060636-05B	MW-10
02060636-06B	MW-11A
02060636-07B	MW-12D
02060636-08B	MW-13

Analyte	Result	Rep Limit
Diesel Range Organics	ND	0.20
Surr: n-Pentacosane	63.2	18-120

Laboratory Control Sample (LCS)

RunID: HP_V_020625C-1195391 Units: mg/L
 Analysis Date: 06/25/2002 13:20 Analyst: AR
 Preparation Date: 06/20/2002 10:45 Prep By: KL Method SW3510B

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Diesel Range Organics	2.5	1.7	70	21	175

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02060636-01
 RunID: HP_V_020625C-1195397 Units: mg/L
 Analysis Date: 06/25/2002 12:41 Analyst: AR
 Preparation Date: 06/20/2002 10:45 Prep By: KL Method SW3510B

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Diesel Range Organics	ND	5	2.8	54.2	5	4	78.2	36.3	39	13	130

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
 B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
 J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



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 (713) 660-0901

Quality Control Report

Brown & Caldwell
 BJ Hobbs 12832

Analysis: Headspace Gas Analysis
 Method: RSK147

WorkOrder: 02060636
 Lab Batch ID: R62368

Method Blank

Samples in Analytical Batch:

RunID: VARC_020628A-1200141 Units: mg/L
 Analysis Date: 06/28/2002 15:32 Analyst: ER

Lab Sample ID	Client Sample ID
02060636-03C	MW-5
02060636-05C	MW-10
02060636-06C	MW-11A
02060636-07C	MW-12D

Analyte	Result	Rep Limit
Ethane	ND	0.0025
Ethylene	ND	0.0032
Methane	ND	0.0012

Sample Duplicate

Original Sample: 02060636-07
 RunID: VARC_020628A-1200139 Units: mg/L
 Analysis Date: 06/28/2002 14:45 Analyst: ER

Analyte	Sample Result	DUP Result	RPD	RPD Limit
Butane	ND	ND	0	50
Ethane	ND	ND	0	50
Ethylene	0.004	0.0055	32	50
Isobutane	ND	ND	0	50
Methane	0.0012	0.0012	0	50
Propane	ND	ND	0	50
Propylene	ND	ND	0	50

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
 B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
 J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



HOUSTON LABORATORY
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Quality Control Report

Brown & Caldwell
BJ Hobbs 12832

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 02060636
Lab Batch ID: R62410

Method Blank

Samples in Analytical Batch:

RunID: VARD_020628B-1201290 Units: ug/L
Analysis Date: 06/28/2002 9:53 Analyst: DL

Lab Sample ID	Client Sample ID
02060636-01A	MW-3
02060636-02A	MW-4
02060636-03A	MW-5
02060636-04A	MW-7
02060636-05A	MW-10
02060636-06A	MW-11A
02060636-07A	MW-12D
02060636-08A	MW-13
02060636-11A	Trip Blank #1
02060636-12A	Trip Blank #2
02060636-13A	Trip Blank #3

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Toluene	ND	1.0
Xylenes, Total	ND	1.0
Surr: 1,4-Difluorobenzene	89.9	72-130
Surr: 4-Bromofluorobenzene	108.3	70-130

Laboratory Control Sample (LCS)

RunID: VARD_020628B-1201287 Units: ug/L
Analysis Date: 06/28/2002 3:35 Analyst: DL

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	50	50	100	70	130
Ethylbenzene	50	49	97	70	130
Toluene	50	47	94	70	130
Xylenes, Total	150	152	101	70	130

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02060628-01
RunID: VARD_020628B-1201288 Units: ug/L
Analysis Date: 06/28/2002 4:26 Analyst: DL

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Benzene	ND	20	22	108	20	22	108	0.0134	21	32	164
Ethylbenzene	ND	20	18	89.9	20	18	92.2	2.52	19	52	142
Toluene	ND	20	19	97.3	20	20	97.8	0.470	20	38	159
Xylenes, Total	1.2	60	63	103	60	65	106	3.18	18	53	144

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



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Quality Control Report

Brown & Caldwell
BJ Hobbs 12832

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 02060636
Lab Batch ID: R62410

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



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Quality Control Report

Brown & Caldwell

BJ Hobbs 12832

Analysis: Gasoline Range Organics
 Method: SW8015B

WorkOrder: 02060636
 Lab Batch ID: R62420

Method Blank

Samples in Analytical Batch:

RunID: VARD_020628C-1201406 Units: mg/L
 Analysis Date: 06/28/2002 9:53 Analyst: DL

Lab Sample ID	Client Sample ID
02060636-01A	MW-3
02060636-02A	MW-4
02060636-03A	MW-5
02060636-04A	MW-7
02060636-05A	MW-10
02060636-06A	MW-11A
02060636-07A	MW-12D
02060636-08A	MW-13
02060636-11A	Trip Blank #1
02060636-12A	Trip Blank #2
02060636-13A	Trip Blank #3

Analyte	Result	Rep Limit
Gasoline Range Organics	ND	0.10
Surr: 1,4-Difluorobenzene	87.0	74-121
Surr: 4-Bromofluorobenzene	126.3	55-150

Laboratory Control Sample (LCS)

RunID: VARD_020628C-1201403 Units: mg/L
 Analysis Date: 06/28/2002 4:01 Analyst: DL

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Gasoline Range Organics	1	0.81	81	70	130

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02060628-02
 RunID: VARD_020628C-1201404 Units: mg/L
 Analysis Date: 06/28/2002 9:02 Analyst: DL

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Gasoline Range Organics	ND	1.8	1.4	79.0	1.8	1.4	79.9	1.10	36	36	160

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
 B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
 J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



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Quality Control Report

Brown & Caldwell

BJ Hobbs 12832

Analysis: Nitrogen, Nitrate (As N)
 Method: E300

WorkOrder: 02060636
 Lab Batch ID: R61946

Method Blank

Samples in Analytical Batch:

RunID: WET_020619ZK-1192612 Units: mg/L
 Analysis Date: 06/19/2002 12:31 Analyst: SN

Lab Sample ID	Client Sample ID
02060636-03D	MW-5
02060636-05D	MW-10
02060636-06D	MW-11A
02060636-07D	MW-12D

Analyte	Result	Rep Limit
Nitrogen, Nitrate (As N)	ND	0.10

Laboratory Control Sample (LCS)

RunID: WET_020619ZK-1192613 Units: mg/L
 Analysis Date: 06/19/2002 12:31 Analyst: SN

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Nitrogen, Nitrate (As N)	10	9.92	99	90	110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02060636-03
 RunID: WET_020619ZK-1192615 Units: mg/L
 Analysis Date: 06/19/2002 12:31 Analyst: SN

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Nitrogen, Nitrate (As N)	2.6	10	13.7	111	10	13.5	110	1.40	20	76	124

Qualifiers: ND/U - Not Detected at the Reporting Limit
 B - Analyte detected in the associated Method Blank
 J - Estimated value between MDL and PQL
 MI - Matrix Interference
 D - Recovery Unreportable due to Dilution
 * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



HOUSTON LABORATORY
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Quality Control Report

Brown & Caldwell

BJ Hobbs 12832

Analysis: Chloride, Total
Method: E325.3

WorkOrder: 02060636
Lab Batch ID: R61982A

Method Blank

Samples in Analytical Batch:

RunID: WET_020624O-1193499 Units: mg/L
 Analysis Date: 06/24/2002 12:15 Analyst: CV

Lab Sample ID	Client Sample ID
02060636-08D	MW-13
02060636-09A	MW-14
02060636-10A	MW-15

Analyte	Result	Rep Limit
Chloride	ND	1.0

Laboratory Control Sample (LCS)

RunID: WET_020624O-1193501 Units: mg/L
 Analysis Date: 06/24/2002 12:15 Analyst: CV

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Chloride	143	141	99	90	110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02060552-11
 RunID: WET_020624O-1193516 Units: mg/L
 Analysis Date: 06/24/2002 12:15 Analyst: CV

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Chloride	37000	50000	86100	98.2	50000	86100	98.2	0	20	85	115

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
 B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
 J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



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Quality Control Report

Brown & Caldwell
 BJ Hobbs 12832

Analysis: Sulfate
Method: E300

WorkOrder: 02060636
Lab Batch ID: R62387

Method Blank

Samples in Analytical Batch:

RunID: WET_020627ZC-1200646 Units: mg/L
 Analysis Date: 06/27/2002 16:13 Analyst: ES

Lab Sample ID	Client Sample ID
02060636-03D	MW-5
02060636-05D	MW-10
02060636-06D	MW-11A
02060636-07D	MW-12D

Analyte	Result	Rep Limit
Sulfate	ND	0.20

Laboratory Control Sample (LCS)

RunID: WET_020627ZC-1200647 Units: mg/L
 Analysis Date: 06/27/2002 16:13 Analyst: ES

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Sulfate	10	9.5	95	90	110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02060636-03
 RunID: WET_020627ZC-1200649 Units: mg/L
 Analysis Date: 06/27/2002 16:13 Analyst: ES

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Sulfate	110	200	310	99.0	200	320	101	2.16	20	80	120

Qualifiers: ND/U - Not Detected at the Reporting Limit
 B - Analyte detected in the associated Method Blank
 J - Estimated value between MDL and PQL
 MI - Matrix Interference
 D - Recovery Unreportable due to Dilution
 * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

*Sample Receipt Checklist
And
Chain of Custody*



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Sample Receipt Checklist

Workorder:	02060636	Received By:	DS
Date and Time Received:	6/19/02 10:00:00 AM	Carrier name:	FedEx
Temperature:	4	Chilled by:	Water Ice

- 1. Shipping container/cooler in good condition? Yes No Not Present
- 2. Custody seals intact on shipping container/cooler? Yes No Not Present
- 3. Custody seals intact on sample bottles? Yes No Not Present
- 4. Chain of custody present? Yes No
- 5. Chain of custody signed when relinquished and received? Yes No
- 6. Chain of custody agrees with sample labels? Yes No
 1.Client sent three sets of Trip Banks but did not write them on COC. Also three unpreserved vials & one unpreserved plastic were received for ID:MW-13 (-08) but analysis was not marked on COC
- 7. Samples in proper container/bottle? Yes No
- 8. Sample containers intact? Yes No
- 9. Sufficient sample volume for indicated test? Yes No
- 10. All samples received within holding time? Yes No
- 11. Container/Temp Blank temperature in compliance? Yes No
- 12. Water - VOA vials have zero headspace? Yes No Not Applicable
- 13. Water - pH acceptable upon receipt? Yes No Not Applicable

SPL Representative:	<input type="text"/>	Contact Date & Time:	<input type="text"/>
Client Name Contacted:	<input type="text"/>		
Non Conformance Issues:	1.Trip Blank and extra containers for MW-13 were logged in for analysis per NW		
Client Instructions:	Amanda left a message to analyzed the trip blanks for voc's 6/19 1212am.		



SPL, Inc.

Analysis Request & Chain of Custody Record

SPL Worksheet No: 18-30-02

020600036

174127

page 1 of 1

Requested Analysis

Client Name: **Brown & Caldwell**
 Address/Phone: **1415 Louisiana # 2500**
 Client Contact: **HA Rick Reynolds**
 Project Name: **BT Hobbs**
 Project Number: **12R3Z**
 Project Location: **Hobbs, NM**
 Inmate To: **Rick Reynolds**

SAMPLE ID	DATE	TIME	comp	grab	matrix	bottle	size	pres.	Number of Containers	Requested Analysis
MW-3	6/18/02	12:08			W	VA	1	1	5	BTEX 8021
MW-4	6-18-02	12:18			W	VA	1	1	5	TPH D 8015
MW-5	6-18-02	9:36			W	VAP	1	1	9	TPH G 8015
MW-7	6/18/02	9:53			W	VAP	1	1	4	Methane Ethylene
MW-10	6/18/02	9:15			W	VAP	1	1	8	175/147
MW-11A	6/18/02	12:35			W	VAP	1	1	9	Nitrate/Sulfate
MW-12D	6/18/02	11:01			W	VAP	1	1	9	Chlorides
MW-13	6/18/02	11:32			W	VA	1	1	5	PH=2.0 B/19
MW-14	6/18/02	10:00			W	P	1	1	1	
MW-15	6/18/02	10:07			W	P	1	1	1	

PUSHY

Intact? **NO**
Temp: **NO**

Client/Consultant Remarks:
add chlorides to MW-13 analysis
MW 6-20-02

Laboratory remarks:

Special Detection Limits (specify):

Palgrave (initials): **MM**

Requested TAT

Standard QC: Level 3 QC Level 4 QC

1. Receiving by Sample: **DMW/CA/MWZ/A** date: **6/19/02** time: **2:30**

2. Received by: **DMW/CA/MWZ/A** date: **6/19/02** time: **10:00**

3. Releasing by: **DMW/CA/MWZ/A** date: **6/19/02** time: **10:00**

4. Received by: **DMW/CA/MWZ/A** date: **6/19/02** time: **10:00**

5. Requiring by: **DMW/CA/MWZ/A** date: **6/19/02** time: **10:00**

- 8880 Interchange Drive, Houston, TX 77054 (713) 660-0901
- 459-Hughes Drive, Traverse City, MI 49684 (616) 947-5777
- 500 Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775



SPL, Inc.

Analysis Request & Chain of Custody Record

SPL Workorder No:

02060036

174127

Requested Analysis

page 1 of 1

Client Name: **Brown & Caldwell**

Address/Phone: **1415 Louisiana #257D**

Client Contact: **FA Rick Reynolds**

Project Name: **BS HDDbs**

Project Number: **12832**

Project Location: **Hobbs, NM**

Invoice To: **Rick Reynolds**

SAMPLE ID

DATE

TIME

comp

grab

matrix bottle
W=water S=soil
SL=sludge O=other:

P=plastic A=amber glass
G=glass V=vial

1=1 liter 4=4oz 40=vial
8=8oz 16=16oz

1=HCl 2=HNO3
3=H2SO4 O=other:

Number of Containers

BTEX 8021

TPH D 8015

TPH G 8015

**Methan Ethane
Ethylene**

175/147

Nitrate/Sulfate

Chlorides

PK=20% B/19

SAMPLE ID	DATE	TIME	comp	grab	matrix	bottle	size	pres.	Number of Containers	Requested Analysis	Intact?	Temp:
MW-3	6/18/02	12:08			W	V	401	1	5	X		
MW-4	6-18-02	12:18			W	V	401	1	5	X		
MW-5	6/18/02	9:36			W	VAP	401	1	9	X		
MW-7	6/18/02	8:53			W	VAP	401	1	4	X		
MW-10	6/18/02	9:15			W	VAP	401	1	8	X		
MW-11A	6/18/02	12:35			W	VAP	401	1	9	X		
MW-12D	6/18/02	11:01			W	VAP	401	1	9	X		
MW-13	6/18/02	11:32			W	V	401	1	5	X		
MW-14	6/18/02	10:01			W	P	401	1	1	X		
MW-15	6/18/02	10:07			W	P	401	1	1	X		

PUSH

Requested TAT

- 24hr 72hr
- 48hr Standard
- Other

Special Reporting Requirements

Fax Results

Raw Data

Special Detection Limits (specify):

PM review (initial):

NW

Standard QC

1. Relinquished by Sample: **DMW/MSZ**

Level 3 QC

Level 4 QC

2. Received by: **6/18/02**

4. Received by: **DMW/MSZ**

3. Relinquished by:

date: **6/19/02**

time: **1000**

6. Received by Laboratory: **DMW/MSZ**

Intact? Y N

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500 Ambassador Caffery Parkway, Scott, LA 70563 (318) 237-4775

459-Hughes Drive, Traverse City, MI 49684 (616) 947-5777

1415 Louisiana, Suite 2500
Houston, TX 77002

Tel: (713) 759-0999
Fax: (713) 308-3886

May 21, 2002

Mr. Wayne Price
Environmental Bureau
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division,
2040 South Pacheco Street
Santa Fe, New Mexico 87006

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Oil Conservation Division

12832.017



Environmental Engineering & Consulting

**Subject: Transmittal of Report
March 2002 Quarterly Sampling Event
BJ Services Company U.S.A. – Hobbs Facility: GW-072
2708 West County Road
Hobbs, New Mexico**

References: (a) Letter from R. Rexroad (Brown and Caldwell) to W. Price (NMOCD) dated 2/26/02; Subject: Transmittal of Report, December 2001 Quarterly Sampling Event, BJ Services Company U.S.A. – Hobbs Facility: GW-072, 2708 West County Road, Hobbs, New Mexico

(b) Letter from W.Price (NMOCD) to J. Cobb (BJ Services) dated 2/28/02; Subject: BJ Hobbs Facility GW-072, Evaluation of Groundwater Chloride Content

Dear Mr. Price:

Enclosed please find the March 2002 Quarterly Sampling Event report for the BJ Services Company, U.S.A. (BJ Services) facility at Hobbs, New Mexico. As previously described in the Reference (a) correspondence, monitor wells MW-3, MW-4, MW-5, MW-11A, MW-12D, MW-13, and MW-14 were sampled during the December 2001 groundwater sampling event after removal of approximately 0.25 gallons of water, rather than being purged to stability, dryness, or removal of three well volumes of water from the well. As also noted in the Reference (a) correspondence, damage to monitor well MW-10 rendered the December 2001 chemical data from this well invalid. This correspondence presents an evaluation of the effects of the December 2001 non-standard purging procedures on chemical data from applicable wells, describes the February 2002 rehabilitation of monitor well MW-10, and responds to the New Mexico Oil Conservation Division (NMOCD) request for evaluation of groundwater chloride content at the subject facility.

Effects of December 2001 Purging Procedures

During the March 2002 quarterly sampling event, Brown and Caldwell collected groundwater samples from all water-producing wells at the subject facility after purging wells to stability, dryness, or removal of three well volumes of water. Specifically, monitor wells MW-3, MW-4, MW-5, MW-11A, and MW-14 were purged to dryness on March 11, 2002, and were sampled on March 12, 2002. Monitor wells MW-12D and MW-13 were purged until groundwater stabilization occurred, with stabilization defined

May 21, 2002
Mr. Wayne Price
Page 2

as variation of less than 0.1° Celsius, less than 0.1 pH units, less than 1% specific conductivity, and less than 15 millivolts Eh between consecutive measurements of groundwater during the purging process.

Comparison of analytical data from the December 2001 sampling event to current and historical constituent concentration data on a well-by-well basis (see Tables 4, 5, and 7 of the subject report, as applicable) indicates that the deviation from standard monitor well purging procedures that occurred for these wells in December 2001 appears to have had minimal to no effect on chemical analytical data, as described on a well-by-well basis below.

Groundwater samples from monitor wells MW-3, MW-4, MW-5, and MW-12D were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) and diesel- and gasoline-range total petroleum hydrocarbons (TPH-D and TPH-G) in December 2001. As indicated in Table 4 of the subject report, the non-standard December 2001 purging procedures may have resulted in slightly elevated TPH-D concentrations in the groundwater samples collected from monitor wells MW-4 and MW-5 in December 2001 as compared to corresponding June 2001, September 2001, and March 2002 data from these wells, but appear to have had no effect on other December 2001 hydrocarbon data from monitor wells MW-3, MW-4, MW-5, and MW-12D.

Benzene was not detected in monitor well MW-11A in December 2001, but was detected at respective concentrations of 1.5 milligrams per liter (mg/L), 7.9 mg/L, and 1.8 mg/L in June 2001, September 2001, and March 2002. The December 2001 non-detection of benzene in monitor well MW-11A may therefore be attributable to the non-standard purging procedure used for this well during that sampling event. Concentrations of toluene, ethylbenzene, xylenes, TPH-D, and TPH-G reported in monitor well MW-11A in December 2001 appear comparable to corresponding data from the June 2001, September 2001, and March 2002 sampling events, as indicated in Table 4 of the subject report.

TPH-D was not detected in monitor well MW-13 in December 2001, but was detected at respective concentrations of 0.31 mg/L, 0.3 mg/L, and 0.84 mg/L in June 2001, September 2001, and March 2002. As in the case of benzene in monitor well MW-11A, the December 2001 non-detection of TPH-D in monitor well MW-13 may be attributable to the non-standard purging procedure used for this well during that sampling event. BTEX and TPH-G concentrations reported in monitor well MW-13 in December 2001 appear comparable to corresponding data from the June 2001, September 2001, and March 2002 sampling events, as indicated in Table 4 of the subject report.

The chloride concentration of groundwater from monitor well MW-14 was measured in December 2001. The December 2001 chloride concentration of 276 mg/L appears to be consistent with chloride concentrations in the well ranging from 222 mg/L in June 2001 to 284 mg/L in March 2002, as indicated in Table 5 of the subject report.

May 21, 2002
Mr. Wayne Price
Page 3

Groundwater samples from monitor wells MW-5, MW-11A, and MW-12D in December 2001 were also submitted for nitrate, sulfate, and methane analyses. With the possible exception of a decreased nitrate concentration in monitor well MW-5 in December 2001, comparison of current and historic nitrate, sulfate, and methane data from monitor wells MW-5, MW-11A, and MW-12D to corresponding December 2001 data (see Table 7 of the subject report) indicates that the non-standard purging procedures used for these wells in December 2001 had no apparent affect on the December 2001 nitrate, sulfate, and methane data from these wells.

Rehabilitation of Monitor Well MW-10

As documented in the report for the December 2001 sampling event at the subject facility, the surface completion of monitor well MW-10 was damaged. Surficial soil materials had entered the well and accumulated to an approximate thickness of 1.6 feet in the bottom of the well. The accumulated sediment and low water level in the well resulted in production of a minimal quantity of extremely turbid groundwater from monitor well MW-10 during the December 2001 sampling event, and December 2001 chemical data from monitor well MW-10 were therefore considered invalid.

On February 26, 2002, Brown and Caldwell repaired the surface completion of monitor well MW-10 to ensure that it seals adequately to prevent introduction of surficial soil materials into the well and used compressed air to remove a substantial volume of accumulated sediment from the bottom of the well. The removal of accumulated sediment from the well resulted in increased groundwater production and decreased turbidity of groundwater produced from the well. March 2002 chemical data from monitor well MW-10 appear consistent with recent pre-December 2001 data from the well, as indicated in Tables 4, 5, 6, and 7 of the subject report.

Chloride Evaluation

In response to the request presented in the Reference (b) NMOCD correspondence, chloride content was measured in all wells that yielded an adequate volume of groundwater during the March 2002 sampling event. A chloride isoconcentration map for March 2002 is presented in the attached report.

Monitor wells MW-12 and OW-4 were previously reported to be dry. In the Reference (b) correspondence, NMOCD requested that these wells be re-established for sampling or replaced by new wells installed in these areas. Monitor well MW-12 has been replaced by monitor well MW-12D, which is located immediately adjacent to monitor well MW-12 and screened in a deeper portion of the aquifer. In the attached report, Brown and Caldwell recommends installation of a downgradient well (MW-16) located along the apparent axis of the zone of chloride impact to groundwater. Monitor well MW-16 will

May 21, 2002
Mr. Wayne Price
Page 4

serve as a replacement well for OW-4, and will be installed upon approval by NMOCD and attainment of right-of-access from the property owner.

If you have any questions regarding the information presented herein, please feel free to contact Mr. Lynn Wright of Brown and Caldwell (713) 759-0999 or Ms. Jo Ann Cobb of BJ Services at (281) 357-2572.

Sincerely,

BROWN AND CALDWELL

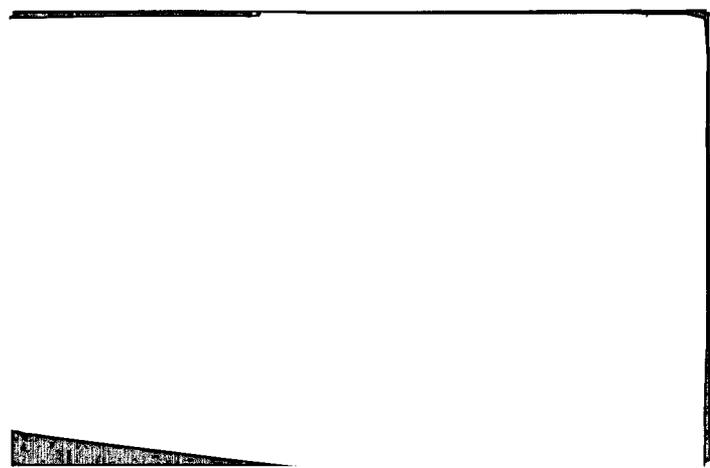
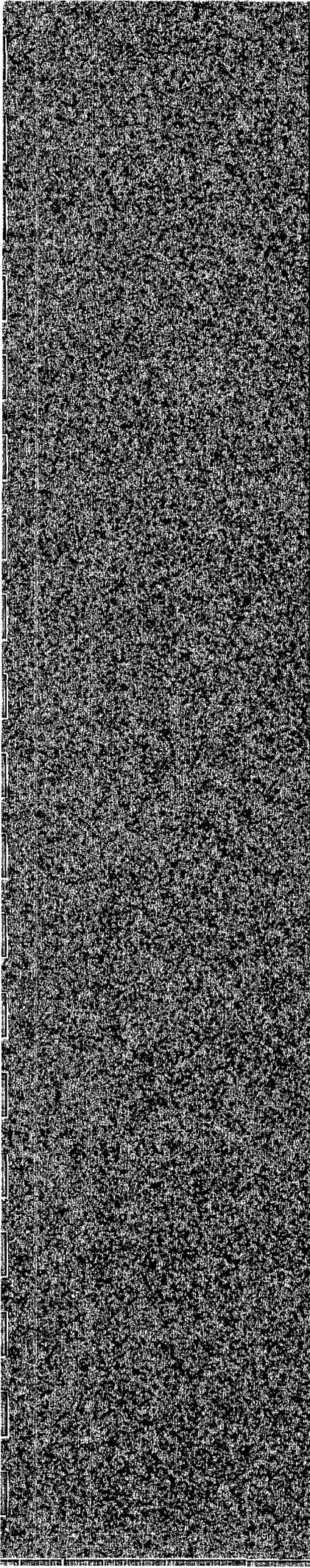


Richard L. Rexroad, P.G.
Project Manager

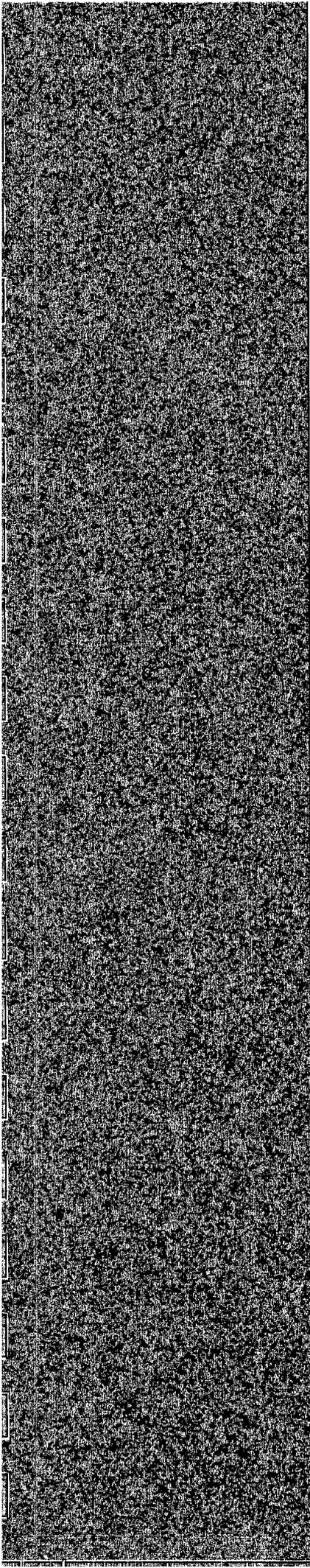
RLR:uak

Attachments (1)

cc: NMOCD – Hobbs, New Mexico Office
Jo Ann Cobb, BJ Services Company, U.S.A.
Brown and Caldwell Project File: 12832.02



B R O W N A N D C A L D W E L L



B R O W N A N D C A L D W E L L

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Environmental Bureau
Oil Conservation Division

**MARCH 2002 GROUNDWATER SAMPLING
REPORT
HOBBS, NEW MEXICO FACILITY
BJ SERVICES COMPANY, U.S.A.**

MAY 21, 2002

**MARCH 2002 GROUNDWATER SAMPLING REPORT
HOBBS, NEW MEXICO FACILITY
BJ SERVICES COMPANY, U.S.A.**

Prepared for

BJ Services Company, U.S.A.
11211 FM 2920
Tomball, Texas 77375

BC Project Number: 12832.017



Richard L. Rexroad, P.G.
Project Manager

May 21, 2002

Brown and Caldwell
1415 Louisiana, Suite 2500
Houston, Texas 77002 - (713) 759-0999

"This report was prepared in accordance with the standards of the environmental consulting industry at the time it was prepared. It should not be relied upon by parties other than those for whom it was prepared, and then only to the extent of the scope of work which was authorized. This report does not guarantee that no additional environmental contamination beyond that described in this report exists at this site."

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DISTRIBUTION AND QA/QC REVIEWER'S SIGNATURE

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- 7 Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells MW-5, MW-10, MW-11A, MW-12, and MW-12D

APPENDICES

- A Groundwater Sampling Forms
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1.0 INTRODUCTION

Brown and Caldwell conducted a quarterly groundwater sampling event at the BJ Services Company, U.S.A. (BJ Services) facility located at 2708 West County Road in Hobbs, New Mexico in March 2002. This report presents a description of the groundwater sampling field activities, a summary and evaluation of the analytical results, and an evaluation of remedial technologies being applied at the facility. A groundwater potentiometric surface map and a hydrocarbons concentration map are included.

A layout of the facility is shown in Figure 1. The facility formerly operated an on-site fueling system. Subsurface impact near the former diesel fueling system was detected by the New Mexico Oil Conservation Division (NMOCD) during an on-site inspection on February 7, 1991. The fueling system was taken out of operation in July 1995. The NMOCD has required a quarterly groundwater monitoring program to assess the concentration of hydrocarbon constituents in groundwater as a result of the diesel fuel release.

A biosparging system was activated in November 1995 and expanded in March/April 1997 and February/March 1998 to remediate soil and groundwater at the former fuel island area of the facility. The biosparging system was deactivated on November 1, 2000 after achieving cleanup goals for groundwater. The confirmation soil sampling program specified in the NMOCD-approved Remedial Action Plan (RAP) for the facility was conducted in July 2001. The results of the confirmation soil sampling program were presented to NMOCD in the report for the June 2001 groundwater sampling event. The March 2002 sampling event is the third groundwater sampling event conducted since the completion of the confirmation soil boring program.

BJ Services removed three field waste tanks at the facility on March 6-7, 1997. The ongoing groundwater monitoring program was expanded to address both the former fuel island and the former field waste tanks areas of the facility, as directed by NMOCD in correspondence dated January 21, 1999.

A site chronology detailing the history of investigations into and remediation of soil and groundwater impacts in the former fueling system and the former field waste tanks areas of the facility is presented in Table 1.



2.0 FIELD ACTIVITIES AND RESULTS

Brown and Caldwell purged and sampled 13 monitor wells (MW-1, MW-3, MW-4, MW-5, MW-7, MW-8, MW-9, MW-10, MW-11A, MW-12D, MW-13, MW-14 and MW-15) at the facility on March 11-12, 2002 to determine concentrations of dissolved-phase hydrocarbons in groundwater and to evaluate general groundwater quality in the area of the facility. Monitor well locations are shown in Figure 1. The following subsections describe the field activities conducted by Brown and Caldwell during the March 2002 event, and present the results of the associated groundwater analyses.

2.1 Groundwater Sampling Activities

Groundwater level measurements were obtained from monitor wells prior to purging and sampling the wells. Groundwater levels were measured to the nearest 0.01 foot with an oil/water interface probe. Current and historic groundwater elevation data are presented in Table 2. The groundwater elevation data indicate that the groundwater flow direction is to the east/northeast, with a hydraulic gradient of approximately 0.008 foot/foot. A groundwater elevation map for March 11, 2002 is presented in Figure 2. The groundwater elevation data presented in Table 2 indicate that groundwater levels have continued to decline in all monitor wells at the facility since late 1995.

Monitor wells MW-12 and OW-4 were dry and could not be sampled. Monitor well MW-12D, which is located adjacent to monitor well MW-12 and screened in a deeper portion of the aquifer than monitor well MW-12, had sufficient water for collection of a complete sample. Accordingly, Brown and Caldwell collected a groundwater sample from monitor well MW-12D in lieu of sampling monitor well MW-12.

Damage to monitor well MW-10 observed during the December 2001 sampling event precluded collection of a valid groundwater sample at that time, as noted in the report for the December 2001 sampling event at the facility. The well was repaired on February 26, 2002 and a partially complete sample was collected during the March 2002 sampling event, as discussed below.

Monitor wells MW-7, MW-8, MW-9, and MW-10 did not yield sufficient water during the March 2002 sampling event for collection of a complete suite of analytical parameters. Consequently, these wells were sampled selectively for various constituents. All of these wells were sampled for benzene, toluene, ethylbenzene, and xylenes (BTEX), chloride and other anions, gasoline-range total petroleum hydrocarbons (TPH-G), and carbonate and bicarbonate alkalinity. None of these wells were sampled for polynuclear aromatic hydrocarbons (PAHs), and analysis for diesel-range total petroleum hydrocarbons (TPH-D), metals, methane, and hardness was deleted from certain wells because:

1. The volume of groundwater required to complete these analyses could not be obtained from the wells over a 2-day time period; and
2. Previous data from the wells for these constituents indicate that these analyses were not critical in defining contaminant impact to groundwater at the facility.

Wells were purged and sampled with disposable bailers and clean, previously unused nylon string. Most of the wells were purged dry. Monitor wells MW-12D and MW-13 were purged until groundwater stabilization occurred, with stabilization defined as variation of less than 0.1° Celsius, less than 0.1 pH units, less than 1% specific conductivity, and less than 15 millivolts (mV) Eh between consecutive measurements of groundwater during the purging process. The wells were sampled in general order of least impacted to most impacted (based on analytical results from the December 2001 and preceding sampling events) to further mitigate the potential for cross-contamination of wells.

Field parameter measurements for pH, conductivity, oxidation-reduction (redox) potential, dissolved oxygen, and temperature were collected from wells containing an adequate volume of water during and upon completion of well purging. Ferrous iron and alkalinity were measured in selected wells upon conclusion of purging activities. Field parameter readings were recorded on the groundwater sampling forms included in Appendix A. Field readings for the March 2002 sampling event are summarized in Table 3.

Groundwater samples were collected by pouring recovered water from a bailer. Each sample was then transferred to laboratory-prepared, clean glass and/or plastic containers, sealed with Teflon[®]-lined lids, labeled, and placed on ice in an insulated cooler for delivery to Southern Petroleum Laboratory in Houston, Texas for analysis under standard chain-of-custody control.

Field measurement equipment was decontaminated prior to and after each usage. Decontamination procedures consisted of washing with fresh water and a non-phosphate detergent, then rinsing with deionized water. Purge water was discharged to an on-site water reclamation system for re-use by BJ Services.

2.2 Results of Groundwater Analyses

Groundwater samples from monitor wells MW-14 and MW-15 were analyzed for chloride content by Method 325.3. Assuming adequate groundwater yield, samples from the remaining wells were analyzed for chloride, TPH-G and TPH-D (EPA Method 8015B), BTEX (EPA Method 8021), PAHs (Method 8310), RCRA metals and calcium, magnesium, potassium, and sodium (Methods 6010B and 7470A), carbonate and bicarbonate alkalinity (Method M2320B), fluoride (Method E300), hardness (Method E130.2), nitrate and sulfate (Method E300), and methane (Method RSK 147). The laboratory analytical reports and chain-of-custody documentation for the groundwater samples collected during the March 2002 sampling event are provided in Appendix B.

Current and cumulative analytical results for BTEX, TPH-D, and TPH-G are presented in Table 4. Figure 3 presents a hydrocarbons concentration map for the March 2002 sampling event. BTEX constituents were detected in only two of 11 applicable wells. Benzene was detected in monitor wells MW-9 and MW-11A at respective concentrations of 0.001 milligrams per liter (mg/L) and 0.0018 mg/L. Xylenes were detected at a concentration of 0.001 mg/L in monitor well MW-11A. All benzene and xylenes concentrations are less than the New Mexico Water Quality Control Commission (NMWQCC) standards of 0.01 mg/L for benzene and 0.62 mg/L for xylenes.

Benzene has not been detected in former fuel island source area monitor wells MW-3 or MW-4 since June 1999 and March 1999, respectively. Adjustments to the biosparging system in July 1999 and March 2000 to increase air flow to the monitor well MW-13 area resulted in decreases in the concentration of benzene in monitor well MW-13 from 1.5 mg/L on July 2, 1999 to the present non-detectable concentration. Benzene has not been detected in monitor well MW-13 since June 2000.

Table 5 presents current and historic results for chloride analyses performed on groundwater samples collected at the facility. The March 2002 chloride concentration of 284 mg/L in downgradient monitor well MW-14 exceeds the NMWQCC chloride standard of 250 mg/L. The chloride concentration in monitor well MW-15 remained below 250 mg/L in March 2002. Figure 4 depicts the concentration of chloride in groundwater at the facility in March 2002.

Table 6 presents the remaining analytical results for annual sampling and analysis of applicable wells for NMWQCC constituents. The current and historic results for nitrate, sulfate, and dissolved methane analyses performed on groundwater samples from monitor wells MW-5, MW-10, MW-11A, MW-12, and MW-12D to assist in evaluation of natural attenuation processes at the facility are presented in Table 7.



3.0 EVALUATION OF REMEDIAL TECHNOLOGIES

The following subsections present evaluations of the remedial technologies applied at the former fueling system and former field waste tanks areas of the BJ Services facility at Hobbs, New Mexico.

3.1 Biosparging System at the Former Fueling System Area

Based on the results of previous investigations conducted by Brown and Caldwell and Roberts/Schornick and Associates, Inc., Brown and Caldwell recommended the installation of a biosparging system at the former fueling system area of the facility in the RAP submitted to the NMOCD in May 1994. The NMOCD approved the RAP on August 11, 1994. The biosparging system was installed in August 1995 and expanded in April 1997 and February 1998. Operation of the biosparging system resulted in substantial decreases in hydrocarbon concentrations in former fueling system area monitor wells MW-1, MW-3, MW-4, MW-9, and MW-13, as documented in the December 2000 groundwater sampling report for the facility.

Based on the observed trends in hydrocarbon concentrations and in accordance with the recommendations presented in the report for the June 2000 groundwater sampling event, the biosparging system was deactivated on November 1, 2000. The March 2002 sampling event is the sixth sampling event completed since this shut down.

Benzene concentrations in former fueling system source area monitor wells MW-1, MW-3, MW-4, MW-9, and MW-13 have remained below applicable NMWQCC standards since deactivation of the biosparging system. Furthermore, BTEX constituent concentrations in these wells have now remained below applicable NMWQCC standards for the last eight consecutive quarters.

In accordance with the RAP, confirmation soil sampling activities were conducted at the former fueling system area in July 2001 to verify the effectiveness of the biosparging system in remediating vadose zone soils in this area. The analytical results for these soil samples, as

discussed in the report for the June 2001 groundwater sampling event, indicate that remediation goals for soil in this area have successfully been achieved. The March 2002 sampling event is the third groundwater sampling event conducted since the completion of the confirmation soil boring program. Sampling of former fuel island source area wells that have sufficient groundwater and recharge for collection of valid groundwater samples will continue through June 2002. If, in accordance with the requirements specified in the NMOCD-approved RAP, analytical results for groundwater samples collected from these monitor wells do not exceed the groundwater remediation goals specified in the RAP during the 1-year followup quarterly monitoring period, then a biosparging system closure report will be submitted for the former fuel island portion of the facility.

3.2 Natural Attenuation at the Former Field Waste Tanks Area

Natural attenuation is the primary remediation mechanism for the dissolved-phase hydrocarbon plume located in the area of the former field waste tanks (see Figure 1).

Plume behavior is the primary evidence of natural attenuation. Secondary evidence of natural attenuation can be obtained by the collection and evaluation of data relating to the concentrations of indigenous electron acceptors such as dissolved oxygen, nitrate, sulfate, and carbon dioxide. A plume is shrinking when the rate of hydrocarbon loading from a source area is less than the rate of natural degradation of hydrocarbons. Plume shrinkage in the absence of aggressive remediation is indicative of the occurrence of natural attenuation processes. Conversely, a plume is expanding if the rate of hydrocarbon loading from a source area is greater than the rate of natural degradation of hydrocarbons through natural attenuation processes.

The former field waste tanks in the eastern portion of the facility were removed in March 1997. Concentrations of total BTEX in monitor wells in the area of the former field waste tanks have been generally stable or declining subsequent to removal of the field waste tanks. Sporadic increases in total BTEX concentrations between quarterly sampling events have been observed in monitor wells

in this area since March 1997, however. These increases may be attributed to sporadic loading rates from the vadose zone in excess of the natural attenuation rate of the area. The following subsections present primary and secondary evidence of natural attenuation of hydrocarbons in groundwater at the former field waste tanks area of the facility.

3.2.1 Primary Evidence

The benzene concentration in monitor well MW-10 has decreased from a maximum of 1.3 mg/L in August 1995 (prior to removal of the field waste tanks) to less than the NMWQCC standard of 0.01 mg/L in the five groundwater sampling events from December 2000 through March 2002. Concentrations of toluene, ethylbenzene, and xylenes in monitor well MW-10 have undergone similar decreases over this time period. There were no detections of BTEX constituents in monitor well MW-10 in March 2002.

Benzene concentrations at the monitor well MW-11/11A location have decreased from a maximum of 0.970 mg/L in December 1996 (prior to removal of the field waste tanks) to less than the NMWQCC standard of 0.01 mg/L in the last four groundwater sampling events.

Concentrations of BTEX constituents at the monitor well MW-12/12D location have displayed decreases similar to those observed at the monitor well MW-11/11A location since September 1998.

3.2.2 Secondary Evidence

The following lines of geochemical evidence can also be used to suggest that intrinsic bioremediation (an important natural attenuation mechanism) of dissolved-phase hydrocarbons is occurring in the area of the former field waste tanks.

1. Dissolved oxygen may be utilized during intrinsic bioremediation. Dissolved oxygen concentrations should therefore be depressed in areas where intrinsic bioremediation is occurring.

Groundwater samples were collected using bailers during the March 2002 sampling event. Dissolved oxygen concentrations in most wells at the facility were elevated in March 2002 relative to previous sampling events in which groundwater samples were collected using a downhole pump. Use of bailers in groundwater sampling causes groundwater samples to be oxygenated, precluding meaningful comparison of dissolved oxygen data from wells at impacted areas to corresponding data from wells in non-impacted areas.

Historic evidence submitted to the NMOCD in previous quarterly groundwater monitoring reports for the facility has indicated that dissolved oxygen concentrations have typically been depressed in hydrocarbon-impacted monitor wells relative to non-impacted wells at the facility (see the June 2001 Groundwater Sampling Report for BJ Services Hobbs, New Mexico Facility, for example).

2. Nitrate may be utilized as an electron acceptor during intrinsic bioremediation after dissolved oxygen is depleted. Therefore, nitrate concentrations may be depressed in areas where intrinsic bioremediation is occurring.

Nitrate was detected at a concentration of 2.98 mg/L in background monitor well MW-5 during the March 2002 sampling event. Although there was minimal to no hydrocarbon impact at former field waste tanks area wells MW-10, MW-11A, and MW-12D in March 2002, nitrate was not detected in any of these wells. The decreased nitrate concentrations observed in March 2002 at former field waste tanks area wells MW-10, MW-11A, and MW-12D relative to the background nitrate concentration at the facility is likely due to residual effects of hydrocarbons.

3. When dissolved oxygen and nitrate are depleted, anaerobic microbes that utilize other electron acceptors become active. Ferrous iron is the reduction product of ferric iron, a common electron acceptor. Therefore, ferrous iron concentrations should increase in areas where intrinsic bioremediation is occurring.

Ferrous iron was not detected in background monitor well MW-5 in March 2002. Ferrous iron was detected in monitor wells MW-11A and MW-12D at respective concentrations of 8.5 mg/L and 4.9 mg/L. The elevated ferrous iron concentrations in wells MW-11A and MW-12D suggest that intrinsic bioremediation of hydrocarbons is occurring at the former field waste tanks area.

Ferrous iron concentration was not measured in former field waste tanks area monitor well MW-10 groundwater in March 2002 due to insufficient yield from the well.

4. Microbes that utilize sulfate become active when dissolved oxygen, nitrate, and ferric iron are depleted. Sulfate concentrations should therefore decrease in areas where intrinsic bioremediation is occurring through use of sulfate as an electron acceptor. March 2002 sulfate concentrations in former field waste tanks area monitor wells MW-10, MW-11A and MW-12D ranged from 200 mg/L to 350 mg/L. The March 2002 sulfate concentration in background monitor well MW-5 is 120 mg/L. The fact that sulfate concentrations in former source area monitor wells are greater than the sulfate concentration in the background well suggests that sulfate is not being utilized as an electron acceptor in the former field waste tanks area.

5. Methane is a reaction product generated during utilization of carbon dioxide as an electron acceptor, and its concentration should therefore increase in areas where concentrations of electron acceptors such as dissolved oxygen, nitrate, and ferric iron have diminished.

Methane detected in former field waste tanks area monitor well MW-11A at a concentration of 0.0044 mg/L in March 2002, but was not detected in background monitor well MW-5. The elevated methane concentration in monitor well MW-11A at the former field waste tanks area suggests that utilization of carbon dioxide as an electron acceptor, resulting in methanogenesis, has occurred during natural attenuation of hydrocarbons in the vicinity of monitor well MW-11A at the former field waste tanks area of the facility.

Methane concentration was not measured in former field waste tanks area monitor well MW-10 groundwater in March 2002 due to insufficient yield from the well. Methane was not detected in monitor well MW-12D in March 2002.

6. Redox potential is a measure of chemical energy in groundwater. The redox potential of groundwater from background well MW-5 was measured at 47.5 mV in March 2002. Respective redox potentials of -102.8 mV, -64.2 mV, and -67.4 mV were measured in former field waste tanks area monitor wells MW-10, MW-11A, and MW-12D in March 2002. The negative redox values in the former field waste tanks area monitor wells as compared to the positive redox value in the background well at the facility provides additional evidence that natural attenuation of hydrocarbons is occurring in the area of the former field waste tanks.

7. Alkalinity is expected to increase during natural attenuation processes, due to the leaching of carbonates from mineral substrates by microbially produced organic acids.

Field alkalinity measurements in March 2002 ranged from 70 mg/L in background monitor well MW-5 to 140 mg/L in well MW-11A. Field alkalinity was not measured in former field waste tanks area monitor well MW-10 groundwater in March 2002 due to insufficient yield from the well. Based on the elevated field-measured alkalinity of groundwater in monitor well MW-11A, it can be inferred that natural attenuation of hydrocarbons is occurring in the area of monitor well MW-11A at the former field waste tanks area.

The March 2002 bicarbonate alkalinity data presented in Table 6 provide further substantiation of natural attenuation of hydrocarbons at the former field waste tanks area. Bicarbonate alkalinity was measured at 260 mg/L in background monitor well MW-5, at 784 mg/L in monitor well MW-10, and at 520 mg/L in monitor well MW-11A. The elevated bicarbonate alkalinity values in former field waste tanks area monitor wells MW-10 and MW-11A relative to background well MW-5 provide additional evidence of natural attenuation of hydrocarbons at the former field waste tanks area.

In conclusion, current and historic dissolved oxygen, nitrate, and methane data suggest that dissolved oxygen, nitrate, and carbon dioxide act as electron acceptors during intrinsic bioremediation processes at former field waste tanks area of the facility. Ferric iron also appears to be serving as an electron acceptor during natural attenuation of hydrocarbons, based on ferrous iron data from background wells and monitor wells at the former field waste tanks area. Current redox and alkalinity data provide further evidence that natural attenuation of hydrocarbons is occurring in this area.

It is recommended that monitoring for natural attenuation evaluation parameters continue in former field waste tank area monitor wells MW-10, MW-11A, and MW-12D and the background well, MW-5. Redox potential, dissolved oxygen content, and alkalinity are good indicators of the occurrence of aerobic bioremediation of hydrocarbons, so it is also recommended that field testing for these parameters be continued in all wells to be sampled during upcoming groundwater monitoring events.



4.0 CHLORIDE EVALUATION

In correspondence dated December 13, 2001, the NMOCD requested an evaluation of chloride content in groundwater at the facility. In February 2002, Brown and Caldwell used a BIOSCREEN model to predict the downgradient extent of chloride in groundwater at concentrations in excess of the NMWQCC standard of 250 mg/L for chloride. Based on input of available historic data from March 2000 through December 2001 for monitor wells MW-10, MW-11A, MW-12, MW-14, MW-15, and OW-4, the BIOSCREEN model predicted that the downgradient extent of chloride at concentrations in excess of 250 mg/L is located approximately 60 feet to 100 feet east of monitor well MW-14.

All wells capable of yielding a groundwater sample were sampled for chloride in the March 2002 sampling event. This complete set of contemporaneous chloride data, as presented in Table 5 and Figure 4, confirms the results of the February 2002 BIOSCREEN model. Based on this model, BJ Services and Brown and Caldwell propose installation of a new monitor well (MW-16) at the location indicated in Figure 4. Monitor well MW-16 would be installed with a 20-foot screen set at the top of the saturated zone within the uppermost aquifer present at the proposed location. Based on the previously documented continual decline in groundwater elevation in the uppermost aquifer at the facility, the 20-foot screen length is proposed in order to ensure long-term groundwater yield from monitor well MW-16.

Upon approval of the proposed monitor well MW-16 location by NMOCD and facilitation of access to the proposed well location from the property owner, monitor well MW-16 will be installed, developed, and sampled for chloride to investigate the downgradient extent of chloride impact to groundwater at concentration greater than 250 mg/L in the area of the facility.



5.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on information obtained during the March 2002 groundwater sampling event conducted at the BJ Services Hobbs, New Mexico facility.

5.1 Conclusions

- Dissolved benzene and BTEX concentrations in monitor wells located near and downgradient of the former fueling system area are less than applicable NMWQCC standards. There were no TPH-G detections in March 2002 in monitor wells MW-1, MW-3, and MW-4, which are located near the former fueling system area. BTEX and TPH concentrations in these wells have remained below applicable standards for the past eight quarterly groundwater sampling events.
- March 2002 benzene concentrations in former field waste tanks area monitor wells MW-10, MW-11A, and MW-12D are less than the NMWQCC standard of 0.01 mg/L for benzene. There were no detections of TPH-G or BTEX constituents in monitor wells MW-10 or MW-12D during the current sampling event. Natural attenuation processes appear to be occurring in the vicinity of the former field waste tanks removed in March 1997, based on decreasing hydrocarbon concentrations in local monitor wells over time and as substantiated by geochemical data.
- The chloride concentration 284 mg/L recorded in monitor wells MW-14 exceeds the NMWQCC standard of 250 mg/L. Chloride concentrations in this well have varied between 222 mg/L and 368 mg/L since its installation in January 2001.

5.2 Recommendations

- Continue the quarterly monitoring program for former field waste tank area monitor wells MW-11A, MW-12D, and (if feasible) MW-10. Continue monitoring for natural attenuation parameters in these wells and the background monitor well MW-5, including field-testing for natural attenuation indicator parameters.
- Perform a quarterly sampling event of monitor wells pertaining to the former fueling system source area in June 2002. If analytical results for groundwater samples do not exceed the groundwater remediation goals specified in the RAP, then the 1-year monitoring period following collection of confirmation soil samples in July 2001 (as specified in the RAP) will have been concluded, and a biosparging system closure report will be submitted for the former fuel island portion of the facility.

- After submittal and approval of the bioparging system closure report by the NMOCD, decommission the bioparging system and P&A the injection wells, extraction wells, and applicable monitor wells.
- Upon NMOCD approval and acquisition of access rights, installation and sampling of an off-site well to define the downgradient extent of chloride impact to groundwater in the area of the facility is recommended.

DISTRIBUTION

March 2002 Groundwater Sampling Report
BJ Services Company, U.S.A.
Hobbs, New Mexico

May 21, 2002

Final Distribution as follows:

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Oil Conservation Division
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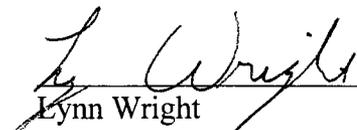
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Attention: Ms. Jo Ann Cobb

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QUALITY CONTROL REVIEWER



Lynn Wright
Principal Geologist

RLR/uak

Figures

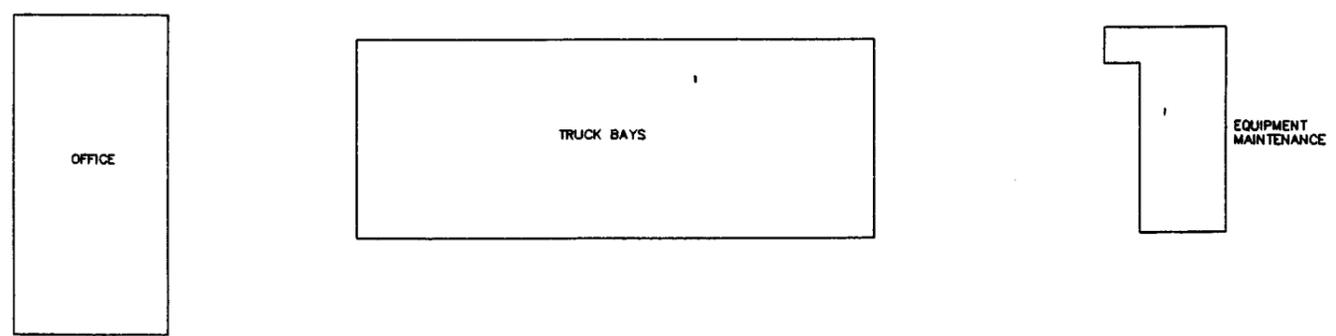
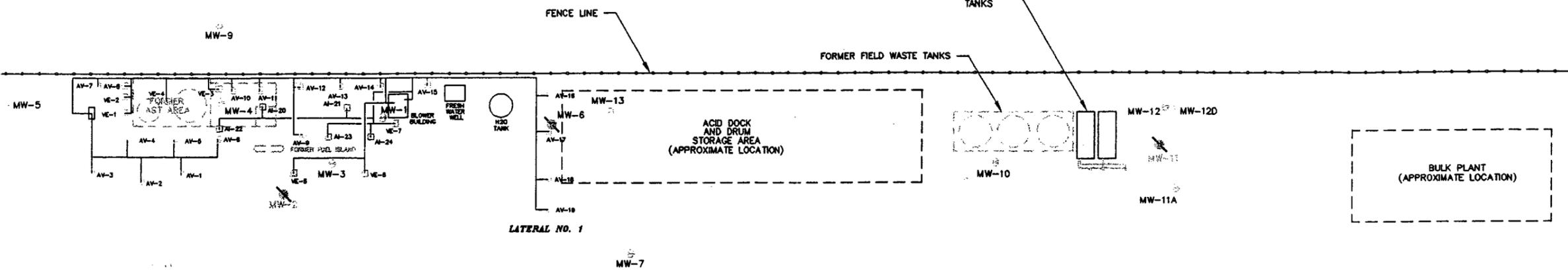


FIGURES



POW-4

WEATHERFORD ENTERRA



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HOUSTON, TEXAS

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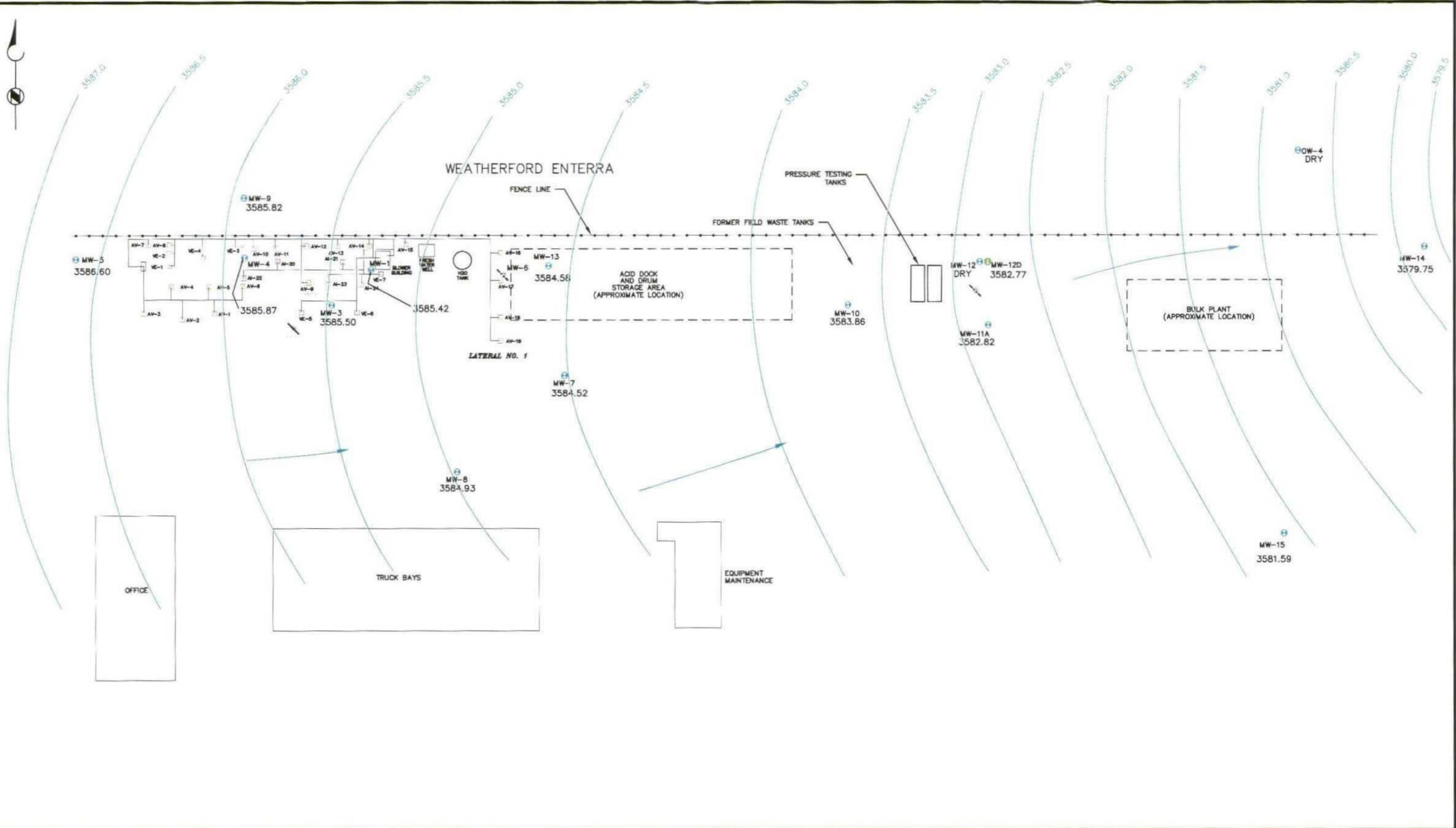


SCALE: 1" = 60'
DRAWN BY: _____ DATE: _____
CHK'D BY: _____ DATE: _____
APPROVED: _____ DATE: _____

LEGEND

- MW-3 EXISTING MONITOR WELL LOCATION
- BIOSPARGING SYSTEM
- MW-2 MONITOR WELL (PLUGGED AND ABANDONED)

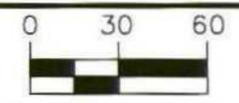
TITLE	SITE MAP	DATE	4/6/01
CLIENT	BJ SERVICES COMPANY, U.S.A.	PROJECT NUMBER	12832.016
SITE	HOBBS, NEW MEXICO	FIGURE NUMBER	1



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HOUSTON, TEXAS

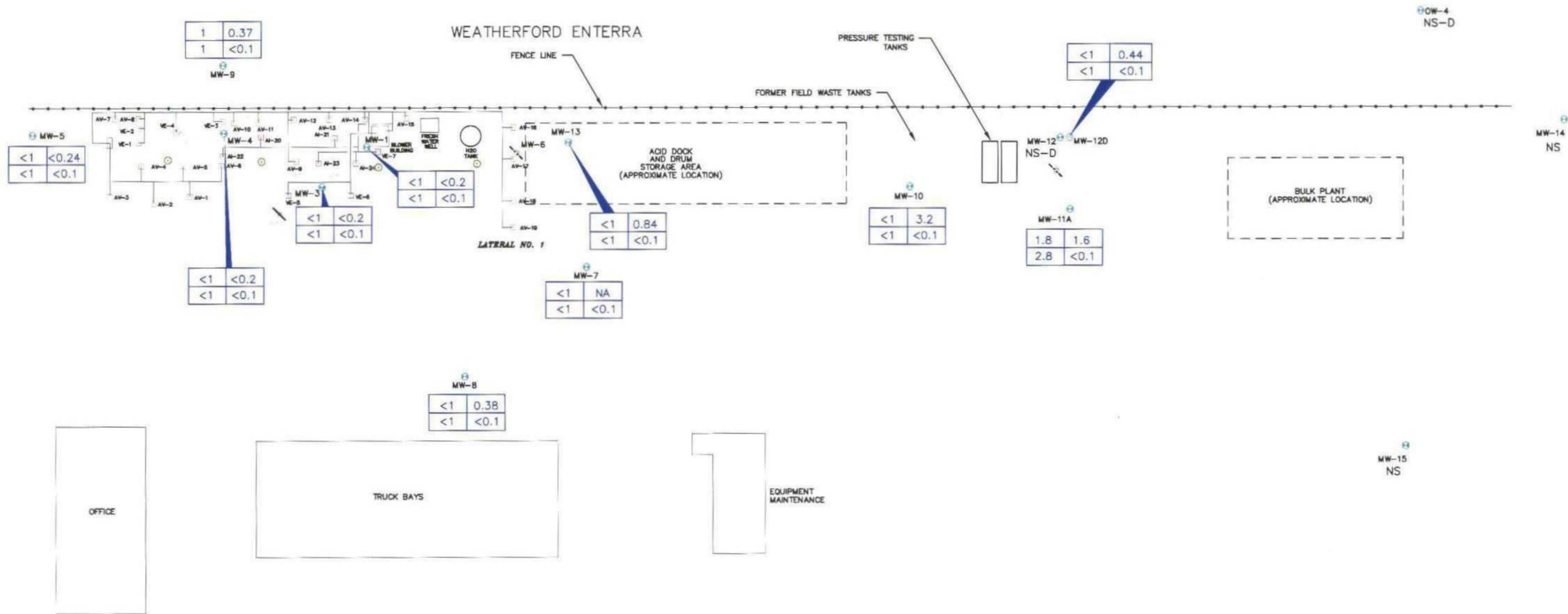
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SCALE IN FEET
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REV'D BY: CLK DATE 3/02

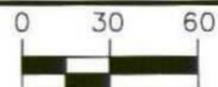
LEGEND	
3585.96 MW-3	MONITOR WELL LOCATION WITH GROUNDWATER ELEVATION (feet AMSL)
	BIOSPARGING SYSTEM
	GROUNDWATER FLOW DIRECTION
	MONITOR WELL (PLUGGED AND ABANDONED)
NM	NOT MEASURED

TITLE	GROUNDWATER ELEVATION MAP MARCH 11, 2002	DATE	3/20/02
CLIENT	BJ SERVICES COMPANY, U.S.A.	PROJECT NUMBER	12832.017
SITE	HOBBS, NEW MEXICO	FIGURE NUMBER	2



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SCALE IN FEET

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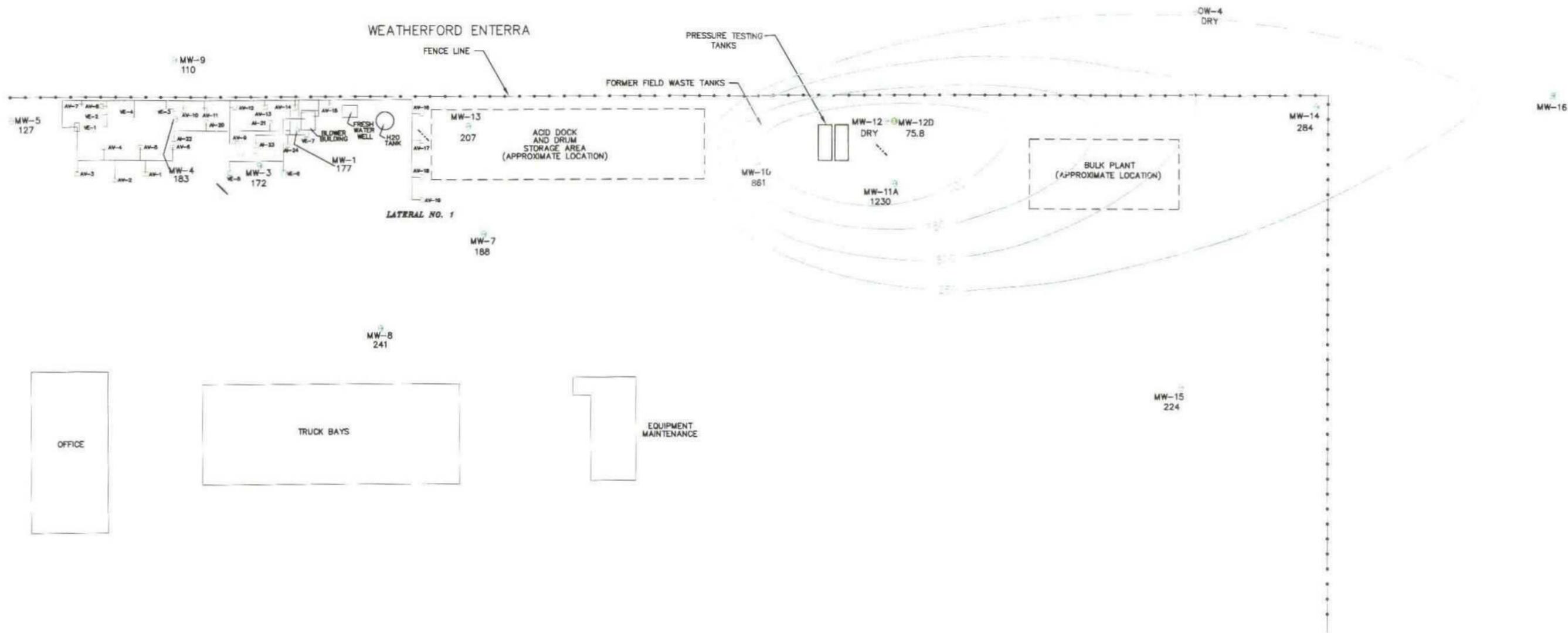
CHK'D BY: _____ DATE: _____

REV'D BY: _____ DATE: _____

LEGEND

- EXISTING MONITOR WELL LOCATION
- MONITOR WELL (PLUGGED AND ABANDONED)
- BIOSPARGING SYSTEM
- BENZENE (ug/L) <1 <0.2 - TPH-D (mg/L)
- TOTAL BTEX (ug/L) <1 <0.1 - TPH-G (mg/L)
- NS = NOT SAMPLED
- NA = NOT ANALYZED
- NS-D = NOT SAMPLED (DRY WELL)

TITLE	HYDROCARBONS DISTRIBUTION MAP FOR MARCH 12, 2002	DATE	3/20/02
CLIENT	BJ SERVICES COMPANY, U.S.A.	PROJECT NUMBER	12832.017
SITE	HOBBS, NEW MEXICO	FIGURE NUMBER	3



NOTE: DATUM FROM MONITOR WELL MW-12D NOT USED BECAUSE WELL IS SCREENED IN DEEPER PORTION OF THE AQUIFER THAN REMAINING WELLS.

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HOUSTON, TEXAS

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PROJECT MANAGER
APPROVED: _____ DATE: _____
BROWN AND CALDWELL



SCALE IN FEET
DRAWN BY: CLK DATE 1/02
CHK'D BY: _____ DATE _____
REV'D BY: CLK DATE 4/02

- LEGEND**
- 172
MW-3 MONITOR WELL LOCATION WITH CHLORIDE CONCENTRATION (mg/L)
 - BIOSPARGING SYSTEM
 - MONITOR WELL (PLUGGED AND ABANDONED)
 - PROPOSED WELL LOCATION

CONTOUR INTERVAL = 250 mg/L

TITLE GROUNDWATER CHLORIDE CONCENTRATION MAP
MARCH 12, 2002

CLIENT BJ SERVICES COMPANY, U.S.A.

SITE HOBBS, NEW MEXICO

DATE 4/3/02

PROJECT NUM 12832.01

FIGURE NUM 4



Tables



TABLES

Table 1
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
February 7, 1991	The New Mexico Oil Conservation Division (NMOCD) conducted an on-site inspection, including sampling of the on-site fresh water well.
August 6, 1991	The NMOCD requested submittal of an investigation work plan.
September 5, 1991	Roberts/Schornick and Associates, Inc. (RSA) submitted Technical Work Plan for soil and groundwater investigation to the NMOCD.
November 15, 1991	The NMOCD approved the Technical Work Plan submitted by RSA.
December 16, 1991	RSA sampled the fresh water well. The analytical results were submitted to the NMOCD.
February 21, 1992	Western sampled the fresh water well. The analytical results were submitted to the NMOCD.
July 29 - August 10, 1992	Brown and Caldwell conducted a soil and groundwater investigation according to the approved Technical Work Plan. The investigation included drilling and sampling nine soil borings, sampling six hand-augured soil borings, installation and sampling of five monitor wells, and sampling of the fresh water well.
October 12, 1992	Brown and Caldwell submitted a Soil and Groundwater Investigation Report to the NMOCD.
December 2, 1992	The NMOCD requested the installation and sampling of four additional monitor wells, including a monitor well on an adjacent property.
April 13, 1993	Brown and Caldwell conducted a vapor extraction pilot test on the existing monitor wells.
April 15, 1993	Brown and Caldwell installed off-site monitor well MW-9.
April 22, 1993	Brown and Caldwell sampled off-site monitor well MW-9.
May 27, 1993	Brown and Caldwell submitted a letter report documenting the installation and sampling of off-site monitor well MW-9 to the NMOCD.
June 2, 1993	Brown and Caldwell conducted a short-term aquifer test using the fresh water well at the facility.
June 8, 1993	USTank Management, Inc. conducted a non-volumetric tank system tightness test on the diesel and unleaded gasoline aboveground storage tanks at the facility.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
June 21, 1993	ENSR Consulting and Engineering (ENSR), the environmental consultant for the adjacent property owner on which off-site well MW-9 is located, submitted a request to sample monitor well MW-9.
July 15, 1993	ENSR split a groundwater sample collected from monitor well MW-9 with Brown and Caldwell.
July 30, 1993	USTank Management, Inc. submitted a tank tightness test report to Brown and Caldwell. The report indicated that both tanks and their associated piping passed.
August 16-19, 1993	Brown and Caldwell installed two additional downgradient monitor wells. Brown and Caldwell sampled each of the existing and newly installed monitor wells.
January 26, 1994	Brown and Caldwell performed a groundwater monitoring event; the existing monitor wells and the fresh water well were purged and sampled. The groundwater samples were analyzed for BTEX.
May 6, 1994	A Remedial Action Plan (RAP) was submitted to the NMOCD.
August 11, 1994	The RAP was approved by the NMOCD.
May 3, 1995	Brown and Caldwell conducted the May 1995 groundwater sampling event.
July 31, 1995	Brown and Caldwell conducted the July 1995 groundwater sampling event.
August 2-9, 1995	Installation of the biosparging system was initiated. Nineteen combined injection/extraction wells and three vacuum extraction wells were installed.
August 14-26, 1995	Remedial Construction Services, Inc. (RCS) constructed the initial design of the biosparging system.
September 19, 1995	Operation of the extraction portion of the biosparging system commenced.
November 13, 1995	Operation of the injection portion of the biosparging system commenced.
November 14, 1995	Brown and Caldwell conducted the November 1995 groundwater sampling event.
February 23, 1996	Brown and Caldwell conducted the February 1996 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
May 31, 1996	Brown and Caldwell conducted the May 1996 groundwater sampling event.
August 23, 1996	Brown and Caldwell conducted the August 1996 groundwater sampling event.
December 2, 1996	Brown and Caldwell conducted the December 1996 groundwater sampling event.
March 6-7, 1997	BJ Services removed three field waste tanks and associated hydrocarbon-impacted soil.
March 12, 1997	Brown and Caldwell conducted the March 1997 groundwater sampling event.
March 14, 1997	Vapor extraction well VE-4 was installed.
April 1997	Vapor extraction well VE-4 was connected to the vapor extraction system.
June 12, 1997	Brown and Caldwell conducted the June 1997 groundwater sampling event.
September 11-12, 1997	Brown and Caldwell conducted the September 1997 groundwater sampling event.
December 10, 1997	Brown and Caldwell conducted the December 1997 groundwater sampling event.
February 3-14, 1998	Air injection wells AI-20 through AI-24, vapor extraction wells VE-5 though VE-7, and monitor wells MW-11A and MW-12 were installed.
February 19, 1998	Operation of previously existing injection wells was suspended in preparation for start-up of new injection wells AI-20 through AI-24.
March 10, 1998	Operation of new air injection wells AI-20 through AI-24 and new vapor extraction wells VE-5 though VE-7 commenced.
March 23-24, 1998	Brown and Caldwell conducted the March 1998 groundwater sampling event.
March 24, 1998	Operation of previously existing injection wells and vapor extraction wells resumed.
June 23, 1998	Brown and Caldwell conducted the June 1998 groundwater sampling event.
September 30, 1998	Brown and Caldwell conducted the September 1998 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
December 9-10, 1998	Brown and Caldwell conducted the December 1998 groundwater sampling event.
January 21, 1999	The NMOCD requested submittal of a work plan by March 22, 1999 to perform additional groundwater delineation in the area of the former field waste tanks and the former AST/MW-6 area.
March 9-10, 1999	Brown and Caldwell conducted the March 1999 groundwater sampling event.
March 19, 1999	Brown and Caldwell submitted the work plan for groundwater delineation activities that was requested by the NMOCD.
May 19, 1999	The NMOCD approved the groundwater delineation work plan.
June 10, 1999	Brown and Caldwell performed sampling of existing monitor wells for the June /July 1999 groundwater sampling event.
July 2, 1999	Brown and Caldwell completed plugging and abandonment of monitor wells MW-2, MW-6, and MW-11; installed and developed monitor wells MW-12D and MW-13; and sampled monitor wells MW-12D and MW-13 to complete the June/July 1999 groundwater sampling event.
July 14, 1999	Brown and Caldwell redirected air discharge from the shallow injection well injection system to Lateral No. 1 and optimized air flow to injection wells AI-16 and AI-17 to apply increased remedial pressure to the eastern portion of the west plume.
September 13-14, 1999	Brown and Caldwell conducted the September 1999 groundwater sampling event.
December 9, 1999	Brown and Caldwell conducted the December 1999 groundwater sampling event.
March 9-10, 2000	Brown and Caldwell conducted the March 2000 groundwater sampling event and shut off air flow to biosparging system Lateral Nos. 4S, 5S, 6S, and 7S.
June 8, 2000	Brown and Caldwell conducted the June 2000 groundwater sampling event.
September 13, 2000	Brown and Caldwell conducted the September 2000 groundwater sampling event.
November 1, 2000	Brown and Caldwell deactivated the biosparging system.
December 7, 2000	Brown and Caldwell conducted the December 2000 groundwater sampling event.

Table 1 (Continued)
Site Chronology
BJ Services Company, U.S.A.
Hobbs, New Mexico

Date	Activity
January 2001	Brown and Caldwell installed and sampled monitor wells MW-14 and MW-15.
March 8-9, 2001	Brown and Caldwell conducted the March 2001 groundwater sampling event.
June 21-22, 2001	Brown and Caldwell conducted the June 2001 groundwater sampling event.
July 23, 2001	Brown and Caldwell collected soil samples from four soil borings installed at the former fueling system area of the facility to confirm the effectiveness of the biosparging system in remediating hydrocarbon impact to soil, as specified in the NMOCD-approved RAP.
September 10, 2001	Brown and Caldwell conducted the September 2001 groundwater sampling event.
December 6, 2001	Brown and Caldwell conducted the December 2001 groundwater sampling event.
February 26, 2002	Brown and Caldwell repaired the crushed well completion on monitor well MW-10.
March 11-12, 2002	Brown and Caldwell conducted the March 2002 groundwater sampling event.

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-1	3,647.53	08/10/92	53.22	0.00	3,594.31	(1)
		02/09/93	53.03	0.00	3,594.50	
		08/18/93	53.10	0.00	3,594.43	
		01/26/94	53.31	0.00	3,594.22	
		05/03/95	54.64	0.20	3,593.05	(2)
		07/31/95	54.14	0.00	3,593.39	
		11/14/95	53.69	0.00	3,593.84	
		02/23/96	54.32	0.00	3,593.21	
		05/31/96	54.14	0.00	3,593.39	
		08/23/96	56.17	0.00	3,591.36	
		12/02/96	55.27	0.00	3,592.26	
		03/12/97	55.70	0.27	3,592.05	
		06/12/97	55.08	0.02	3,592.47	
		09/12/97	55.64	0.51	3,592.31	
		12/10/97	55.46	0.00	3,592.07	PSH Sheen
		03/24/98	55.81	0.00	3,591.72	PSH Sheen
		06/23/98	56.38	0.06	3,591.20	
		09/30/98	56.82	0.00	3,590.71	PSH Sheen
		12/09/98	57.05	0.00	3,590.48	
		03/10/99	57.45	0.00	3,590.08	
		06/10/99	58.02	0.00	3,589.51	
		07/02/99	57.90	0.00	3,589.63	
		09/14/99	58.14	0.00	3,589.39	
		12/09/99	-	-	-	(3)
		03/09/00	58.99	0.00	3,588.54	
		06/00	-	-	-	
		09/00	-	-	-	
12/7/00	-	-	-			
03/08/01	60.35	0.00	3587.18			
6/21/01	60.99	0.00	3,586.54			
9/10/01	61.17	0.00	3,586.36			
12/6/01	not measured					
03/11/02	62.11	0.00	3585.42			
MW-2	3,644.84	08/10/92	52.82	0.00	3,592.02	(1)
		02/09/93	49.60	0.00	3,595.24	
		08/18/93	49.71	0.00	3,595.13	
		01/26/94	49.97	0.00	3,594.87	
		05/03/95	-	-	-	(4),(5)
MW-3	3,645.00	08/10/92	52.99	0.00	3,592.01	(1)
		02/09/93	52.72	0.00	3,592.28	
		08/18/93	52.82	0.00	3,592.18	
		01/26/94	53.05	0.00	3,591.95	
		05/03/95	54.31	0.00	3,590.69	
		07/31/95	51.24	0.00	3,593.76	
		11/14/95	51.10	0.00	3,593.90	
		02/23/96	51.68	0.00	3,593.32	
		05/31/96	51.45	0.00	3,593.55	
		08/23/96	51.55	0.00	3,593.45	
		12/02/96	52.23	0.00	3,592.77	
		03/12/97	52.67	0.00	3,592.33	
		06/12/97	52.68	0.00	3,592.32	
		09/11/97	52.71	0.00	3,592.29	
		12/10/97	52.89	0.00	3,592.11	
		03/23/98	53.22	0.00	3,591.78	
		06/23/98	53.66	0.00	3,591.34	
09/30/98	54.06	0.00	3,590.94			
12/09/98	54.36	0.00	3,590.64			
03/10/99	54.72	0.00	3,590.28			
06/10/99	55.17	0.00	3,589.83			
07/02/99	55.15	0.00	3,589.85			

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-3	3,645.00	09/14/99	55.42	0.00	3,589.58	
		12/09/99	55.78	0.00	3,589.22	
		03/09/00	56.23	0.00	3,588.77	
		06/08/00	56.66	0.00	3,588.34	
		09/13/00	56.77	0.00	3,588.23	
		12/07/00	57.15	0.00	3,587.85	
		03/08/01	57.69	0.00	3,587.31	
		6/21/01	58.34	0.00	3,586.66	
		9/10/01	58.54	0.00	3,586.46	
		12/6/01	59.04	0.00	3,585.96	
		03/11/02	59.50	0.00	3,585.50	
MW-4	3,645.28	08/10/92	50.55	0.00	3,594.73	(1)
		02/09/93	50.26	0.00	3,595.02	
		08/18/93	50.38	0.00	3,594.90	
		01/26/94	50.90	0.30	3,594.63	
		05/03/95	51.51	0.45	3,594.14	
		07/31/95	51.74	0.26	3,593.75	
		11/14/95	51.03	0.00	3,594.25	
		02/23/96	51.65	0.01	3,593.64	
		05/31/96	51.48	0.00	3,593.80	
		08/23/96	53.49	0.00	3,591.79	
		12/02/96	52.32	0.00	3,592.96	
		03/12/97	52.74	0.05	3,592.58	
		06/12/97	53.08	0.44	3,592.56	
		09/12/97	52.60	0.15	3,592.80	
		12/10/97	52.89	0.00	3,592.39	PSH Sheen
		03/24/98	53.20	0.25	3,592.29	
		06/23/98	53.82	0.22	3,591.64	
		09/30/98	53.96	0.00	3,591.32	200 ml PSH
		12/09/98	54.27	0.00	3,591.01	
		03/10/99	54.69	0.04	3,590.62	
		06/10/99	55.07	0.00	3,590.21	
		07/02/99	55.10	0.00	3,590.18	
		09/14/99	55.33	0.00	3,589.95	
		12/09/99	55.79	0.00	3,589.49	
		03/10/00	56.12	0.00	3,589.16	
		06/08/00	56.67	0.00	3,588.61	
		09/13/00	56.65	0.00	3,588.63	
		12/07/00	57.05	0.00	3,588.23	
03/08/01	57.72	0.00	3,587.56			
6/21/01	58.18	0.00	3,587.10			
9/10/01	58.54	0.00	3,586.74			
12/6/01	58.88	0.00	3,586.40			
03/11/02	59.41	0.00	3,585.87			
MW-5	3,647.72	08/10/92	52.38	0.00	3,595.34	(1)
		02/09/93	52.06	0.00	3,595.66	
		08/18/93	52.16	0.00	3,595.56	
		01/26/94	52.50	0.00	3,595.22	
		05/03/95	53.57	0.00	3,594.15	
		07/31/95	53.27	0.00	3,594.45	
		11/14/95	52.83	0.00	3,594.89	
		02/23/96	53.57	0.00	3,594.15	
		05/31/96	53.16	0.00	3,594.56	
		08/23/96	53.41	0.00	3,594.31	
		12/02/96	53.98	0.00	3,593.74	
		03/12/97	54.44	0.00	3,593.28	
		06/12/97	54.48	0.00	3,593.24	
		09/12/97	54.29	0.00	3,593.43	
		12/10/97	54.66	0.00	3,593.06	
		03/23/98	55.05	0.00	3,592.67	
		06/23/98	55.44	0.00	3,592.28	
		09/30/98	55.65	0.00	3,592.07	
		12/09/98	56.00	0.00	3,591.72	
		03/09/99	56.45	0.00	3,591.27	

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-5		06/10/99	56.91	0.00	3,590.81	
		07/02/99	56.93	0.00	3,590.79	
		09/14/99	57.12	0.00	3,590.60	
		12/09/99	57.41	0.00	3,590.31	
		03/09/00	57.92	0.00	3,589.80	
		06/08/00	58.32	0.00	3,589.40	
		09/13/00	58.36	0.00	3,589.36	
		12/07/00	58.71	0.00	3,589.01	
		03/08/01	59.36	0.00	3,588.36	
		6/21/01	59.94	0.00	3,587.78	
		9/10/01	59.85	0.00	3,587.87	
		12/6/01	60.56	0.00	3,587.16	
		3/11/02	61.12	0.00	3,586.60	
MW-6	3,644.74	02/09/93	50.58	0.00	3,594.16	(1)
		08/18/93	50.78	0.00	3,593.96	
		01/26/94	51.00	0.00	3,593.74	
		05/03/95	52.63	0.00	3,592.11	
		07/31/95	51.90	0.00	3,592.84	
		11/14/95	51.19	0.00	3,593.55	
		02/23/96	52.10	0.00	3,592.64	
		05/31/96	51.76	0.00	3,592.98	
		08/23/96	51.63	0.00	3,593.11	
		12/02/96	52.85	0.00	3,591.89	
		03/12/97	53.55	0.00	3,591.19	
		06/12/97	52.08	0.00	3,592.66	
		09/11/97	53.72	0.00	3,591.02	
		12/10/97	53.27	0.00	3,591.47	
		03/23/98	53.56	0.00	3,591.18	
		06/23/98	52.88	0.00	3,591.86	
		09/30/98	54.89	0.00	3,589.85	
		12/09/98	54.57	0.00	3,590.17	
		03/10/99	55.10	0.00	3,589.64	
		07/02/99				
MW-7	3,644.55	02/09/93	50.53	0.00	3,594.02	(1)
		08/18/93	50.74	0.00	3,593.81	
		01/26/94	51.01	0.00	3,593.54	
		05/03/95	52.25	0.00	3,592.30	
		07/31/95	51.92	0.00	3,592.63	
		11/14/95	51.48	0.00	3,593.07	
		02/23/96	52.15	0.00	3,592.40	
		05/31/96	51.78	0.00	3,592.77	
		08/23/96	52.02	0.00	3,592.53	
		12/02/96	52.52	0.00	3,592.03	
		03/12/97	52.99	0.00	3,591.56	
		06/12/97	53.08	0.00	3,591.47	
		09/11/97	53.00	0.00	3,591.55	
		12/10/97	53.28	0.00	3,591.27	
		03/23/98	53.59	0.00	3,590.96	
		06/23/98	54.20	0.00	3,590.35	
		09/30/98	54.54	0.00	3,590.01	
		12/09/98	54.74	0.00	3,589.81	
		03/09/99	55.15	0.00	3,589.40	
		06/10/99	55.66	0.00	3,588.89	
		07/02/99	55.73	0.00	3,588.82	
		09/13/99	55.94	0.00	3,588.61	
		12/09/99	56.38	0.00	3,588.17	
		03/09/00	56.74	0.00	3,587.81	
		06/08/00	57.17	0.00	3,587.38	
		09/13/00	57.40	0.00	3,587.15	
		12/07/00	57.77	0.00	3,586.78	
		03/08/01	58.29	0.00	3,586.26	
6/21/01	58.91	0.00	3,585.64			
9/10/01	59.25	0.00	3,585.30			
12/6/01	59.75	0.00	3,584.80			
03/11/02	60.03	0.00	3,584.52			

**Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.**

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments	
MW-8	3,644.87	02/09/93	50.48	0.00	3,594.39	(1)	
		08/18/93	50.67	0.00	3,594.20		
		01/26/94	50.96	0.00	3,593.91		
		05/03/95	52.15	0.00	3,592.72		
		07/31/95	51.77	0.00	3,593.10		
		11/14/95	51.37	0.00	3,593.50		
		02/23/96	52.17	0.00	3,592.70		
		05/31/96	51.55	0.00	3,593.32		
		08/23/96	51.92	0.00	3,592.95		
		12/02/96	52.43	0.00	3,592.44		
		03/12/97	52.93	0.00	3,591.94		
		06/12/97	53.96	0.00	3,590.91		
		09/11/97	52.73	0.00	3,592.14		
		12/10/97	53.15	0.00	3,591.72		
		03/23/98	53.51	0.00	3,591.36		
		06/23/98	54.01	0.00	3,590.86		
		09/30/98	54.35	0.00	3,590.52		
		12/09/98	54.60	0.00	3,590.27		
		03/09/99	55.00	0.00	3,589.87		
		06/10/99	55.56	0.00	3,589.31		
		07/02/99	55.57	0.00	3,589.30		
		09/13/99	55.72	0.00	3,589.15		
		12/09/99	-	-	-		(3)
		03/09/00	56.52	0.00	3,588.35		
		06/00	-	-	-		
		09/00	-	-	-		
		12/00	-	-	-		
03/08/01	58.11	0.00	3,586.76				
6/21/01	58.72	0.00	3,586.15				
9/10/01	58.94	0.00	3,585.93				
12/6/01	not measured						
03/11/02	59.94	0.00	3,584.93				
MW-9	3,644.78	04/22/93	49.73	0.00	3,595.05	(1)	
		07/15/93	49.65	0.00	3,595.13		
		08/18/93	49.85	0.00	3,594.93		
		01/26/94	50.02	0.00	3,594.76		
		05/03/95	51.35	0.00	3,593.43		
		07/31/95	50.97	0.00	3,593.81		
		11/14/95	50.43	0.00	3,594.35		
		02/23/96	51.12	0.00	3,593.66		
		05/31/96	50.89	0.00	3,593.89		
		08/23/96	50.98	0.00	3,593.80		
		12/02/96	51.58	0.00	3,593.20		
		03/12/97	52.21	0.05	3,592.61		
		06/12/97	52.10	0.00	3,592.68		
		09/12/97	51.95	0.00	3,592.83		
		12/10/97	52.37	0.00	3,592.41		
		03/23/98	52.68	0.00	3,592.10		
		06/23/98	53.08	0.00	3,591.70		
		09/30/98	53.39	0.01	3,591.40		
		12/09/98	53.68	0.00	3,591.10		
		03/10/99	54.15	0.00	3,590.63		
		06/10/99	54.68	0.00	3,590.10		
		07/02/99	54.71	0.00	3,590.07		
		09/13/99	54.71	0.00	3,590.07		
		12/09/99	-	-	-		(3)
		03/09/00	55.69	0.00	3,589.09		
		06/00	-	-	-		
		09/00	-	-	-		
12/00	-	-	-				
03/08/01	57.03	0.00	3,587.75				
6/21/01	57.91	0.00	3,586.87				
9/10/01	57.95	0.00	3,586.83				
12/6/01	not measured						
03/11/02	58.96	0.00	3,585.82				

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-10	3,644.47	08/18/93	51.54	0.00	3,592.93	(1)
		01/26/94	51.90	0.00	3,592.57	
		05/03/95	52.97	0.00	3,591.50	
		07/31/95	52.87	0.00	3,591.60	
		11/14/95	52.51	0.00	3,591.96	
		02/23/96	53.05	0.00	3,591.42	
		05/31/96	52.79	0.00	3,591.68	
		08/23/96	53.03	0.00	3,591.44	
		12/02/96	53.41	0.00	3,591.06	
		03/12/97	54.21	0.00	3,590.26	
		06/12/97	53.99	0.00	3,590.48	
		09/12/97	53.94	0.00	3,590.53	
		12/10/97	54.12	0.00	3,590.35	
		03/23/98	54.51	0.00	3,589.96	
		06/23/98	55.12	0.00	3,589.35	
		09/30/98	55.61	0.00	3,588.86	
		12/09/98	55.80	0.00	3,588.67	
		03/09/99	56.09	0.00	3,588.38	
		06/10/99	56.60	0.00	3,587.87	
		07/02/99	56.64	0.00	3,587.83	
		09/14/99	56.91	0.00	3,587.56	
		12/09/99	57.37	0.00	3,587.10	
		03/10/00	57.71	0.00	3,586.76	
06/08/00	58.08	0.00	3,586.39			
09/13/00	58.44	0.00	3,586.03			
12/07/00	58.89	0.00	3,585.66			
03/09/01	59.31	0.00	3,585.24			
6/21/01	59.89	0.00	3,584.66			
9/10/01	61.34	0.00	3,583.21			
12/6/01	60.65	0.00	3,583.90			
03/11/02	60.69	0.00	3,583.86			
MW-11	3,643.78	08/18/93	51.92	0.00	3,591.86	(1)
		01/26/94	52.32	0.00	3,591.46	
		05/03/95	53.38	0.00	3,590.40	
		07/31/95	53.35	0.00	3,590.43	
		11/14/95	52.96	0.00	3,590.82	
		02/23/96	53.50	0.00	3,590.28	
		05/31/96	53.25	0.00	3,590.53	
		08/23/96	53.49	0.00	3,590.29	
		12/02/96	53.79	0.00	3,589.99	
		03/12/97	53.81	0.00	3,589.97	
		06/12/97	53.96	0.00	3,589.82	
		09/12/97	52.93	0.00	3,590.85	
		12/10/97				
MW-11A	3,644.24	03/23/98	54.79	0.00	3,589.45	(7)
		06/23/98	55.43	0.00	3,588.81	
		09/30/98	55.96	0.00	3,588.28	
		12/09/98	56.13	0.00	3,588.11	
		03/10/99	56.43	0.00	3,587.81	
		06/10/99	56.94	0.00	3,587.30	
		07/02/99	57.01	0.00	3,587.23	
		09/14/99	57.36	0.00	3,586.88	
		12/09/99	57.72	0.00	3,586.52	
		03/09/00	58.01	0.00	3,586.23	
		06/08/00	58.40	0.00	3,585.84	
		09/13/00	58.84	0.00	3,585.40	
		12/07/00	59.29	0.00	3,584.95	
		03/08/01	59.72	0.00	3,584.52	
6/21/01	60.28	0.00	3,583.96			

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments
MW-11A	3,644.24	9/10/01	60.69	0.00	3,583.55	
		12/6/01	60.88	0.00	3,583.36	
		03/11/02	61.42	0.00	3,582.82	
MW-12	3,644.29	03/23/98	54.72	0.00	3,589.57	(7)
		06/23/98	55.48	0.00	3,588.81	
		09/30/98	56.02	0.00	3,588.27	
		12/09/98	56.17	0.00	3,588.12	
		03/10/99	56.45	0.00	3,587.84	
		06/10/99	56.97	0.00	3,587.32	
		07/02/99	56.99	0.00	3,587.30	
		09/14/99	57.41	0.00	3,586.88	
		12/09/99	57.76	0.00	3,586.53	
		03/10/00	58.08	0.00	3,586.21	
		06/08/00	58.42	0.00	3,585.87	
		09/13/00	58.85	0.00	3,585.44	
		12/07/00	59.31	0.00	3,584.98	
		03/08/01	59.76	0.00	3,584.53	
		6/21/01	60.29	0.00	3,584.00	
9/10/01	60.79	0.00	3,583.50			
			well dry			
			well dry			
MW-12D	3,644.38	07/02/99	57.13	0.00	3,587.25	(8)
		09/14/99	57.74	0.00	3,586.64	
		12/09/99	57.86	0.00	3,586.52	
		03/09/00	58.24	0.00	3,586.14	
		06/08/00	58.56	0.00	3,585.82	
		09/00	-	-	-	
		12/00	-	-	-	
		03/08/01	-	-	-	
		6/21/01	-	-	-	
		9/10/01	-	-	-	
		12/6/01	61.30	0.00	3,583.08	
		03/11/02	61.61	0.00	3,582.77	
MW-13	3,645.52	07/02/99	56.60	0.00	3,588.92	(9)
		09/14/99	56.92	0.00	3,588.60	
		12/09/99	57.28	0.00	3,588.24	
		03/10/00	57.68	0.00	3,587.84	
		06/08/00	58.04	0.00	3,587.48	
		09/13/00	58.29	0.00	3,587.23	
		12/07/00	58.68	0.00	3,586.84	
		03/08/01	59.19	0.00	3,586.33	
		6/21/01	59.80	0.00	3,585.72	
		9/10/01	60.03	0.00	3,585.49	
		12/6/01	60.59	0.00	3,584.93	
03/11/02	60.94	0.00	3,584.58			
MW-14	3,642.45	03/08/01	61.07	0.00	3,581.38	
		6/21/01	61.71	0.00	3,580.74	
		9/10/01	62.31	0.00	3,580.14	
		12/6/01	62.80	0.00	3,579.65	
		03/11/02	62.70	0.00	3,579.75	
MW-15	3,643.24	03/08/01	59.79	0.00	3,583.45	
		6/21/01	60.49	0.00	3,582.75	
		9/10/01	61.02	0.00	3,582.22	
		12/6/01	61.47	0.00	3,581.77	
		03/11/02	61.65	0.00	3,581.59	

Table 2
Cumulative Groundwater Elevation Data
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Top-of-Casing Elevation (MSL)	Date Measured	Depth to Groundwater (feet)	Free Product Thickness (feet)	Groundwater Elevation (MSL)	Comments	
OW-4	3,644.06	07/02/99	58.18	0.00	3,585.88	(8)	
		09/14/99	58.63	0.00	3,585.43		
		12/09/99	58.92	0.00	3,585.14		
		03/09/00	59.19	0.00	3,584.87		
		06/08/00	59.56	0.00	3,584.50		
		09/13/00	60.16	0.00	3,583.90		
		12/07/00	61.15	0.00	3,582.91		
		03/08/01	61.43	0.00	3,582.63		
		6/21/01	61.48	0.00	3,582.58	(10)	
		9/10/01	61.53	0.00	3,582.53		
		12/6/01	well dry				
		03/11/02	well dry				

- (1) - Top of casing elevations and groundwater elevations of all monitor wells were relative to an arbitrary datum of 100.00 feet prior to March 1997 and have been converted to Mean Sea Level (MSL).
- (2) - For wells having measurable thickness of free product, the groundwater elevation was calculated as follows:
 $\text{Groundwater Elevation} = (\text{TOC elevation}) - (\text{depth to groundwater}) + [(\text{free product thickness}) \times (\text{SG of free product})]$
 Note: The specific gravity (SG) of the free product is 0.82.
- (3) - Not measured.
- (4) - Monitor well MW-2 could not be located after January 1994.
- (5) - Well plugged and abandoned July 2, 1999.
- (6) - Monitor well MW-11 could not be located after September 12, 1997.
- (7) - TOC elevations for MW-11A and MW-12 estimated relative to TOC elevation for MW-10.
- (8) - TOC elevations for MW-12D and OW-4 estimated relative to TOC elevation for MW-12.
- (9) - TOC elevation for MW-13 estimated relative to TOC elevation for MW-7.
- (10) - Well dry (measured depth to water is below base of screen), true groundwater elevation is less than listed groundwater elevation.

Table 3
March 11-12, 2002 Field Screening Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Cumulative Gallons Removed	pH	Temperature (°C)	Conductivity (umhos/cm)	Redox (mV)	Dissolved Oxygen (meter) (mg/L)	Dissolved Oxygen (Hach kit) (mg/L)	Ferrous Iron (mg/L)	Alkalinity (mg/L)
MW-1	2	7.66	17.99	1354	1.1	5.44	NM	NM	NM
MW-3	2	7.78	17.91	1235	19.9	7.91	NM	NM	NM
MW-4	2	7.87	17.95	1310	35.7	8.27	NM	NM	NM
MW-5	1.0	8.18	18.71	1111.0	47.5	6.26	4	0	70
MW-7	0.25	8.04	18.55	1460	19.7	4.15	NM	NM	NM
MW-8	0.5	8.01	18.48	1506	11.5	5.79	NM	NM	NM
MW-9 ⁽¹⁾	0.25	NM	NM	NM	NM	NM	NM	NM	NM
MW-10	0.3	7.23	18.62	3988	-102.8	2.73	NM	NM	NM
MW-11A	1.0	7.39	18.01	5253	-64.2	4.82	0	8.5	140
MW-12D	12	7.77	17.59	1091	-67.4	3.56	0	4.9	80
MW-13	2.6	7.73	18.13	1504	-45.9	4.52	NM	NM	NM
MW-14	0.6	7.41	17.49	1815	54.0	6.40	NM	NM	NM
MW-15	2	7.74	18.04	1351	17.8	5.85	NM	NM	NM

⁽¹⁾ Well yielded insufficient groundwater for measurement of field screening data.

Monitor well MW-2 not operative after January 1994; P&A'd 7/1/99.

Monitor well MW-6 P&A'd 7/1/99.

Monitor well MW-11 not operative after September 1997; P&A'd 7/1/99.

Monitor wells MW-12 and OW-4 were dry.

NM=Not Measured

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-1	8/10/92	Regular	5550.0	12090.0	2160.0	7370.0	NA	NA
	2/9/93	Regular	2100.0	6500.0	1300.0	7400.0	NA	NA
	8/19/93	Regular	3200.0	7300.0	1200.0	3700.0	NA	NA
	1/27/94	Regular	1930.0	4580.0	672.0	2390.0	NA	NA
	5/3/95	Regular	NSP	NSP	NSP	NSP	NA	NSP
	8/1/95	Regular	390.0	1300.0	230.0	800.0	NA	5.7
	11/15/95	Regular	880.0	1800.0	300.0	970.0	NA	6.8
	2/23/96	Regular	1500.0	3700.0	620.0	2200.0	NA	21
	5/31/96	Regular	1100.0	1700.0	380.0	990.0	NA	7.5
	8/23/96	Regular	1800.0	3300.0	570.0	2100.0	NA	17
	12/2/96	Regular	5600.0	9600.0	2100.0	9600.0	100	64
	3/12/97	Regular	5500.0	9700.0	2600.0	8200.0	22	62
	6/12/97	Regular	5300.0	34000.0	7500.0	27000.0	180	160
	9/12/97	Regular	1800.0	4400.0	1000.0	3000.0	23	21
	12/10/97	Regular	7600.0	12000.0	2800.0	8200.0	11	71
	3/24/98	Regular	4800.0	7200.0	1200.0	2400.0	4.2	38
	6/23/98	Regular	53.0	680.0	580.0	1400.0	1.4	9.2
	9/30/98	Regular	3.2	90.0	280.0	970.0	2.5	3.6
	12/10/98	Regular	<1.0	1.5	17.0	110.0	1.4	0.31
	3/10/99	Regular	<1.0	<1.0	8.2	110.0	0.62	0.85
	3/10/99	Duplicate	<1.0	<1.0	7.9	110.0	0.66	0.84
	6/10/99	Regular	<1.0	1.1	<1.0	28.0	0.53	0.55
	6/10/99	Duplicate	<1.0	1.8	<1.0	41.0	0.69	0.76
	9/14/99	Regular	< 1.0	< 1.0	< 1.0	< 2.0	<0.20	<0.10
	12/9/99	-	NS	NS	NS	NS	NS	NS
	3/9/00	Regular	< 1	< 1	< 1	9.1	14	1.3
	6/8/00	-	NS	NS	NS	NS	NS	NS
	9/13/00	-	NS	NS	NS	NS	NS	NS
	12/7/00	-	NS	NS	NS	NS	NS	NS
	3/8/01	Regular	2.0	<1	<1	<1	0.49	0.58
	6/21/01	-	NS	NS	NS	NS	NS	NS
9/10/01	-	NS	NS	NS	NS	NS	NS	
12/6/01	-	NS	NS	NS	NS	NS	NS	
3/12/02	Regular	<1	<1	<1	<1	<0.2	<0.1	
MW-2 ¹	8/10/92	Regular	14.9	< 4	< 4	< 4	NA	NA
	2/9/93	Regular	< 2	< 2	< 2	< 6	NA	NA
	8/19/93	Regular	100.0	12.0	3.0	13.0	NA	NA
	1/27/94	Regular	< 1	1.2	2.0	2.5	NA	NA
MW-3	8/10/92	Regular	304.9	2099.0	6760.0	1586.0	NA	NA
	2/9/93	Regular	130.0	< 10	< 10	190.0	NA	NA
	8/19/93	Regular	560.0	3100.0	630.0	1900.0	NA	NA
	1/27/94	Regular	1070.0	5380.0	510.0	3120.0	NA	NA
	5/4/95	Regular	770.0	3300.0	470.0	1800.0	NA	NA
	8/1/95	Regular	490.0	2900.0	890.0	1600.0	NA	14
	11/15/95	Regular	250.0	1000.0	180.0	440.0	NA	2.9
	2/23/96	Regular	120.0	810.0	170.0	560.0	NA	4
	5/31/96	Regular	670.0	3900.0	1200.0	2300.0	NA	15
	8/23/96	Regular	330.0	2200.0	590.0	1500.0	NA	12
	12/2/96	Regular	220.0	1800.0	670.0	1000.0	0.89	7.4
3/12/97	Regular	370.0	2000.0	960.0	1400.0	1.8	11	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-3	6/12/97	Regular	860.0	4800.0	1700.0	2600.0	1.9	20
	9/11/97	Regular	770.0	3000.0	1600.0	1900.0	1.6	16
	12/10/97	Regular	240.0	740.0	500.0	450.0	0.59	5.3
	3/24/98	Regular	140.0	630.0	360.0	310.0	0.56	3.9
	6/23/98	Regular	100.0	720.0	350.0	490.0	0.40	4.9
	9/30/98	Regular	42.0	470.0	450.0	530.0	1.0	3.8
	12/10/98	Regular	13.0	220.0	160.0	290.0	1.3	0.43
	3/10/99	Regular	3.2	7.4	42.0	32.0	0.2	0.44
	6/10/99	Regular	1.7	3.1	<1.0	36.0	<0.20	0.18
	9/14/99	Regular	<1.0	<1.0	<1.0	<2.0	<0.20	<0.10
	12/9/99	Regular	<1	<1	<1	<1	<0.2	<0.1
	3/9/00	Regular	<1	<1	<1	<1	0.32	<0.1
	6/8/00	Regular	<1	<1	<1	<1	<0.22	<0.1
	9/13/00	Regular	<1	<1	<1	<1	<0.2	<0.1
	12/7/00	Regular	<1	<1	<1	<1	<0.25	<0.1
	3/8/01	Regular	<1	<1	<1	<1	0.42	<0.1
	6/21/01	Regular	<1	<1	<1	<1	<0.22	<0.1
	9/10/01	Regular	<1	<1	<1	<1	<0.2	<0.1
	12/6/01	Regular	<1	<1	<1	<1	<0.2	<0.1
	3/12/02	Regular	<1	<1	<1	<1	<0.2	<0.1
MW-4	8/10/92	Regular	2594.0	10360.0	2160.0	6740.0	NA	NA
	2/9/93	Regular	5200.0	15000.0	2200.0	10000.0	NA	NA
	8/19/93	Regular	3000.0	12000.0	<2000	7000.0	NA	NA
	1/27/94	Regular	NSP	NSP	NSP	NSP	NA	NSP
	5/3/95	Regular	NSP	NSP	NSP	NSP	NA	NSP
	8/1/95	Regular	5700.0	17000.0	3500.0	13000.0	NA	120
	11/15/95	Regular	490.0	1600.0	310.0	1100.0	NA	5.2
	2/23/96	Regular	360.0	2800.0	560.0	2500.0	NA	18
	5/31/96	Regular	84.0	830.0	280.0	1100.0	NA	6.2
	8/23/96	Regular	110.0	1400.0	430.0	1800.0	NA	9.8
	12/2/96	Regular	190.0	2000.0	1800.0	7200.0	56	43
	3/12/97	Regular	220.0	1500.0	1500.0	4400.0	27	27
	6/12/97	Regular	47.0	270.0	360.0	950.0	2.5	6.2
	9/12/97	Regular	92.0	840.0	670.0	2100.0	15	7.6
	12/10/97	Regular	230.0	750.0	970.0	2300.0	3.7	16
	3/24/98	Regular	150.0	510.0	270.0	620.0	1.2	5.6
	6/23/98	Regular	160.0	890.0	590.0	1600.0	0.69	10
	9/30/98	Regular	80.0	180.0	370.0	840.0	2.0	3.9
	12/10/98	Regular	28.0	70.0	210.0	960.0	9.3	4.3
	12/10/98	Duplicate	26.0	62.0	180.0	830.0	3.9	4.3
	3/10/99	Regular	8.0	20.0	250.0	1400.0	13.0	13
	6/10/99	Regular	<1.0	<1.0	12.0	12.0	0.44	0.63
	9/14/99	Regular	<1.0	<1.0	3.3	13.1	0.35	0.17
	12/9/99	Regular	<1	2.5	2.3	20.1	2	0.53
	3/10/00	Regular	<1	<1	<1	3.6	2.6	0.15
	6/8/00	Regular	<1	<1	<1	<1	0.44	0.23
	9/13/00	Regular	<1	<1	<1	<1	0.61	<0.1
12/7/00	Regular	<1	<1	1.3	<1	0.53	0.16	
3/8/01	Regular	<1	<1	<1	<1	0.43	0.16	
6/21/01	Regular	<1	<1	<1	<1	<0.25	<0.1	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-4	9/10/01	Regular	<1	<1	<1	<1	<0.2	<0.1
	12/6/01	Regular	<1	<1	<1	<1	0.6	<1
	3/12/02	Regular	<1	<1	<1	<1	<0.2	<0.1
MW-5	8/10/92	Regular	<4	<4	<4	<4	NA	NA
	2/9/93	Regular	<2	<2	<2	<6	NA	NA
	8/10/93	Regular	<2	<2	<2	<6	NA	NA
	1/27/94	Regular	8.7	29.9	4.0	11.3	NA	NA
	5/3/95	Regular	3.7	5.3	0.9	4.6	NA	NA
	8/1/95	Regular	<0.3	<0.3	<0.3	<0.6	NA	NA
	11/15/95	Regular	<0.3	1.2	<0.3	1.5	NA	NA
	2/23/96	Regular	<0.3	<0.3	<0.3	<0.6	NA	NA
	5/31/96	Regular	31.0	86.0	10.0	20.0	NA	NA
	8/23/96	Regular	<0.3	<0.3	<0.3	<0.6	NA	<0.1
	12/2/96	Regular	<1	<1	<1	<1	<0.1	<0.1
	3/12/97	Regular	<1	<1	<1	<1	<0.1	<0.1
	6/12/97	Regular	<1	<1	<1	<1	<0.1	<0.1
	9/12/97	Regular	<1	<1	<1	<1	<0.1	<0.1
	12/10/97	Regular	<5	<5	<5	<5	<0.2	<0.1
	3/23/98	Regular	<1	<1	<1	<1	<0.2	<0.1
	6/23/98	Regular	<1	<1	<1	<1	<0.2	<0.1
	9/30/98	Regular	<1.0	<1.0	<1.0	<1.0	<0.20	<0.1
	12/10/98	Regular	<1.0	<1.0	<1.0	<1.0	<0.20	<0.1
	3/9/99	Regular	<1.0	<1.0	<1.0	<1.0	<0.20	<0.1
	6/10/99	Regular	<1.0	<1.0	<1.0	<1.0	<0.20	<0.1
	9/14/99	Regular	<1.0	<1.0	<1.0	<2.0	<0.20	<0.10
	12/9/99	Regular	<1	<1	<1	<1	<0.2	<0.1
	3/9/00	Regular	<1	<1	<1	<1	0.55	<0.1
	6/8/00	Regular	<1	<1	<1	<1	<0.2	<0.1
	9/13/00	Regular	<1	<1	<1	<1	<0.2	<0.1
	12/7/00	Regular	<1	<1	<1	<1	<0.25	<0.1
	3/8/01	Regular	<1	<1	<1	<1	0.56	<0.1
6/21/01	Regular	<1	<1	<1	<1	0.26	<0.1	
9/10/01	Regular	<1	<1	<1	<1	<0.2	<0.1	
12/6/01	Regular	<1	<1	<1	<1	0.49	<0.1	
3/12/02	Regular	<1	<1	<1	<1	<0.24	<0.1	
MW-6 ¹	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	7000.0	19000.0	3100.0	7200.0	NA	NA
	8/19/93	Regular	8100.0	19000.0	3500.0	6400.0	NA	NA
	1/27/94	Regular	7960.0	20200.0	3830.0	6150.0	NA	NA
	5/4/95	Regular	11000.0	17000.0	2900.0	6000.0	NA	NA
	8/1/95	Regular	8300.0	12000.0	2500.0	5100.0	NA	60
	11/15/95	Regular	8900.0	17000.0	2900.0	5500.0	NA	57
	2/23/96	Regular	8100.0	10000.0	2300.0	4000.0	NA	58
	5/31/96	Regular	83.0	150.0	15.0	51.0	NA	0.57
	5/31/96	Duplicate	87.0	160.0	13.0	47.0	NA	0.52
	8/23/96	Regular	31.0	28.0	9.4	7.9	NA	0.46
	12/2/96	Regular	<1	<1	<1	1.7	5.6	<0.1
	3/12/97	Regular	12.0	<5	6.8	18.0	12	<0.5
	6/12/97	Regular	1900.0	1400.0	410.0	310.0	7.8	7.4
9/11/97	Regular	11.0	1.3	3.4	<1	1	<0.1	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-6	12/10/97	Regular	3.0	4.2	1.2	3.9	1.7	0.14
	3/23/98	Regular	3.6	<1	4.0	<1	<0.2	<0.1
	6/23/98	Regular	170.0	4.1	15.0	7.2	1.2	0.51
	9/30/98	Regular	1000.0	420.0	140.0	270.0	4.0	3.3
	12/10/98	Regular	7.6	6.6	1.7	5.8	2.0	<0.1
	3/10/99	Regular	2500.0	930.0	590.0	1400.0	11.0	13
MW-7	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	<2	<2	<2	<6	NA	NA
	8/19/93	Regular	<2	3.0	<2	<2	NA	NA
	1/27/94	Regular	1.1	<1	<1	<1	NA	NA
	5/3/95	Regular	52.0	3.4	0.7	2.8	NA	NA
	8/1/95	Regular	22.0	2.2	0.9	2.8	NA	<0.1
	11/15/95	Regular	8.4	0.8	<0.3	0.9	NA	<0.1
	2/23/96	Regular	<0.3	<0.3	<0.3	<0.6	NA	<0.1
	2/23/96	Duplicate	<0.3	<0.3	<0.3	<0.6	NA	<0.1
	5/31/96	Regular	29.0	83.0	10.0	21.0	NA	0.25
	8/23/96	Regular	<0.3	<0.3	<0.3	<0.6	NA	<0.1
	12/2/96	Regular	<1	<1	<1	<1	<0.1	<0.1
	3/12/97	Regular	<1	<1	<1	<1	<0.1	<0.1
	6/12/97	Regular	<1	<1	<1	<1	<0.1	<0.1
	9/11/97	Regular	<1	<1	<1	<1	<0.1	<0.1
	12/10/97	Regular	<1	<1	<1	<1	<0.2	<0.1
	3/23/98	Regular	<1	<1	<1	<1	<0.2	<0.1
	6/23/98	Regular	<1	<1	<1	<1	<0.2	<0.1
	9/30/98	Regular	<1.0	<1.0	<1.0	<1.0	<0.20	<0.1
	12/10/98	Regular	<1.0	<1.0	<1.0	<1.0	<0.20	<0.1
	3/9/99	Regular	<1.0	<1.0	<1.0	<1.0	4.7	<0.1
	6/10/99	Regular	<1.0	<1.0	<1.0	<1.0	<0.20	<0.1
	9/13/99	Regular	<1.0	<1.0	<1.0	<2.0	<0.20	<0.10
	12/9/99	Regular	<5	<5	<5	<5	1.8	<0.5
3/9/00	Regular	<1	<1	<1	<1	0.66	<0.1	
6/8/00	Regular	<1	<1	<1	<1	<0.21	<0.1	
9/13/00	Regular	<1	<1	<1	<1	<0.2	<0.1	
12/7/00	Regular	<1	<1	<1	<1	<0.29	<0.1	
3/8/01	Regular	<1	<1	<1	<1	1.2	<0.1	
6/21/01	Regular	3.1	<1	<1	<1	<0.22	<0.1	
9/10/01	Regular	<1	<1	<1	<1	<0.33	<0.1	
12/6/01	Regular	<1	<1	<1	<1	1.3	<0.1	
3/12/02	Regular	<1	<1	<1	<1	NA	<0.1	
MW-8	8/10/92	Regular	NS	NS	NS	NS	NA	NS
	2/9/93	Regular	<2	<2	<2	<6	NA	NA
	8/19/93	Regular	<2	<2	<2	<2	NA	NA
	1/27/94	Regular	<1	<1	<1	<1	NA	NA
	5/3/95	Regular	3.0	4.9	0.8	3.7	NA	NA
	8/1/95	Regular	3.1	1.2	0.5	1.6	NA	<0.001
	8/1/95	Duplicate	3.6	1.5	0.5	1.5	NA	<0.1
	11/15/95	Regular	<0.3	0.5	<0.3	<0.6	NA	<0.1
	2/23/96	Regular	<0.3	<0.3	<0.3	<0.6	NA	<0.1
	5/31/96	Regular	<0.3	<0.3	<0.3	<0.6	NA	<0.1
	8/23/96	Regular	<0.3	<0.3	<0.3	<0.6	NA	<0.1

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-8	12/2/96	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	3/12/97	Regular	< 1	< 1	< 1	1.8	< 0.1	< 0.1
	6/12/97	Regular	< 1	< 1	< 1	< 1	< 0.1	< 0.1
	9/11/97	Regular	< 1	< 1	< 1	< 1	0.1	< 0.1
	12/10/97	Regular	< 1	< 1	< 1	< 1	0.3	< 0.1
	3/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	6/23/98	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/30/98	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	12/10/98	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	3/9/99	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	6/10/99	Regular	< 1.0	< 1.0	< 1.0	< 1.0	< 0.20	< 0.1
	9/13/99	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10
	12/9/99	-	NS	NS	NS	NS	NS	NS
	3/9/00	Regular	< 1	< 1	< 1	< 1	0.55	< 0.1
	6/8/00	-	NS	NS	NS	NS	NS	NS
	9/13/00	-	NS	NS	NS	NS	NS	NS
	12/7/00	-	NS	NS	NS	NS	NS	NS
	3/8/01	Regular	< 1	< 1	< 1	< 1	1.6	< 0.1
	6/21/01	-	NS	NS	NS	NS	NS	NS
	9/10/01	-	NS	NS	NS	NS	NS	NS
	12/6/01	-	NS	NS	NS	NS	NS	NS
3/12/02	Regular	< 1	< 1	< 1	< 1	0.38	< 0.1	
MW-9	4/22/93	Regular	570.0	380.0	< 50	870.0	NA	NA
	7/15/93	Regular	121.0	7.3	3.0	458.0	NA	NA
	8/19/93	Regular	390.0	290.0	40.0	250.0	NA	NA
	1/27/94	Regular	327.0	357.0	51.1	293.0	NA	NA
	5/3/95	Regular	380.0	110.0	19.0	120.0	NA	NA
	8/1/95	Regular	660.0	410.0	91.0	310.0	NA	6.2
	11/15/95	Regular	240.0	24.0	11.0	140.0	NA	1.5
	11/15/95	Duplicate	170.0	18.0	10.0	120.0	NA	1.9
	2/23/96	Regular	170.0	18.0	2.3	160.0	NA	4.3
	5/31/96	Regular	120.0	16.0	3.0	200.0	NA	NA
	8/23/96	Regular	82.0	13.0	6.0	270.0	NA	4
	8/23/96	Duplicate	76.0	14.0	4.8	250.0	NA	4.4
	12/2/96	Regular	61.0	< 25	< 25	210.0	2.6	2.8
	12/2/96	Duplicate	86.0	13.0	2.4	270.0	3.7	2.9
	3/12/97	Regular	30.0	48.0	420.0	880.0	8.2	19
	6/12/97	Regular	4.7	2.1	11.0	97.0	2.6	2.2
	6/12/97	Duplicate	< 5	< 5	6.6	69.0	5.2	1.9
	9/12/97	Regular	2.1	2.3	2.1	120.0	1.2	1.9
	12/10/97	Regular	4.9	9.0	6.8	62.0	0.86	0.92
	3/24/98	Regular	< 1	< 1	< 1	26.0	0.9	1
	6/23/98	Regular	2.4	22.0	10.0	36.0	< 0.2	0.25
	9/30/98	Regular	1.1	5.5	21.0	59.0	0.27	0.27
	12/10/98	Regular	< 1.0	1.9	17.0	79.0	5.1	0.25
3/10/99	Regular	< 1.0	< 1.0	5.7	68.0	< 0.2	0.22	
6/10/99	Regular	< 1.0	1.8	1.8	71.0	< 0.20	0.43	
9/13/99	Regular	< 1.0	< 1.0	< 1.0	< 2.0	< 0.20	< 0.10	
12/9/99	-	NS	NS	NS	NS	NS	NS	
3/9/00	Regular	< 1	< 1	< 1	64.0	0.66	1.3	

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G	
			micrograms per liter, ug/L				milligrams per liter, mg/L		
MW-9	6/8/00	-	NS	NS	NS	NS	NS	NS	
	9/13/00	-	NS	NS	NS	NS	NS	NS	
	12/7/00	-	NS	NS	NS	NS	NS	NS	
	3/8/01	Regular	<1	<1	<1	<1	1.4	<0.1	
	6/21/01	-	NS	NS	NS	NS	NS	NS	
	9/10/01	-	NS	NS	NS	NS	NS	NS	
	12/6/01	-	NS	NS	NS	NS	NS	NS	
	3/12/02	Regular	1	<1	<1	<1	0.37	<0.1	
MW-10	8/19/93	Regular	190.0	460.0	<200	240.0	NA	NA	
	1/27/94	Regular	13.4	4.0	5.5	33.6	NA	NA	
	5/4/95	Regular	980.0	15.0	11.0	84.0	NA	NA	
	8/1/95	Regular	1300.0	32.0	32.0	100.0	NA	3.6	
	11/15/95	Regular	1000.0	24.0	15.0	36.0	NA	1.7	
	2/23/96	Regular	810.0	23.0	27.0	44.0	NA	2.4	
	5/31/96	Regular	700.0	24.0	34.0	28.0	NA	2	
	8/23/96	Regular	290.0	3.4	6.4	13.0	NA	1.4	
	12/2/96	Regular	280.0	1.3	17.0	8.0	0.94	0.97	
	3/12/97	Regular	110.0	<5	17.0	<5	0.61	0.57	
	6/12/97	Regular	150.0	12.0	30.0	<5	0.68	<0.5	
	9/12/97	Regular	87.0	2.3	26.0	2.7	0.76	0.33	
	9/12/97	Duplicate	87.0	2.4	26.0	2.8	0.79	0.33	
	12/10/97	Regular	41.0	9.8	12.0	7.7	1.1	0.28	
	12/10/97	Duplicate	36.0	8.5	10.0	6.7	1.2	0.24	
	3/23/98	Regular	36.0	<5	5.9	<5	1.6	<0.5	
	3/23/98	Duplicate	36.0	<1	5.3	1.3	1.7	0.18	
	6/23/98	Regular	37.0	<5	<5	<5	2.1	<0.5	
	9/30/98	Regular	84.0	3.2	30.0	2.2	1.4	0.36	
	12/10/98	Regular	29.0	1.0	7.0	1.0	0.86	0.18	
	3/9/99	Regular	28.0	<5.0	5.8	<5.0	0.92	<0.5	
	6/10/99	Regular	17.0	<1.0	<1.0	<1.0	0.30	0.16	
	9/14/99	Regular	10.0	<1.0	<1.0	<2.0	<0.20	<0.10	
	12/9/99	Regular	23.0	<1	<1	1.2	0.44	0.16	
	3/10/00	Regular	300.0	4.3	6.6	43.2	1.2	0.85	
	6/8/00	Regular	78.0	1.7	7.2	9.0	0.67	0.74	
	9/13/00	Regular	23.0	1.5	1.1	2.9	1.6	0.41	
	12/7/00	Regular	7.2	<1	<1	<1	1.5	0.15	
	3/8/01	Regular	3.4	1.1	<1	<1	3.4	0.2	
	6/22/01	Regular	<1	<1	<1	<1	1.2	<0.1	
	9/10/01 and 9/18/01	Regular	2	<1	<1	<1	2.3	<0.1	
	12/6/01	Regular	No Valid Data						
3/12/02	Regular	<1	<1	<1	<1	3.2	<0.1		

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-11 ¹	8/19/93	Regular	<2	<2	<2	<2	NA	NA
	1/27/94	Regular	<1	<1	<1	<1	NA	NA
	5/4/95	Regular	<0.3	<0.3	<0.3	<0.6	NA	NA
	8/1/95	Regular	44.0	29.0	5.5	13.0	NA	0.2
	11/15/95	Regular	190.0	2.8	6.2	11.0	NA	0.4
	2/23/96	Regular	49.0	1.2	0.5	4.0	NA	0.25
	5/31/96	Regular	300.0	83.0	12.0	28.0	NA	0.8
	8/23/96	Regular	100.0	1.2	0.3	4.7	NA	0.26
	12/2/96	Regular	970.0	<5	6.0	8.1	2	1.3
	3/12/97	Regular	130.0	<5	13.0	5.8	0.42	<0.5
	3/12/97	Duplicate	100.0	<5	10.0	5.1	0.43	<0.5
6/12/97	Regular	150.0	23.0	19.0	<5	1.1	0.55	
9/12/97	Regular	220.0	15.0	27.0	13.0	1	0.46	
MW-11A	3/24/98	Regular	24.0	5.0	<5	<5	0.28	0.14
	6/23/98	Regular	9.9	<5	<5	<5	<0.2	<0.5
	9/30/98	Regular	9.3	3.7	2.2	7.0	<0.20	0.1
	12/10/98	Regular	1.7	<1.0	<1.0	<1.0	<0.20	<0.1
	3/10/99	Regular	<5	<5	<5	<5	0.3	<0.5
	6/10/99	Regular	<1.0	<1.0	<1.0	<1.0	<0.20	<0.10
	9/13/99	Regular	<1.0	<1.0	<1.0	<2.0	<0.20	<0.10
	12/9/99	Regular	<5	<5	<5	<5	<0.2	<0.1
	3/9/00	Regular	1.2	<1	<1	<1	0.43	<0.1
	6/8/00	Regular	3.6	<1	<1	<1	0.37	<0.1
	9/13/00	Regular	1.4	<1	<1	<1	0.36	<0.1
	12/7/00	Regular	26	<1	<1	3.3	0.3	0.12
	3/8/01	Regular	12	<5	<5	<5	2.2	<0.5
	6/22/01	Regular	1.5	<1	<1	<1	1	<0.1
	9/10/01	Regular	7.9	<1	<1	<1	1.1	<0.1
12/6/01	Regular	<1	<1	<1	<1	1	<0.1	
3/12/02	Regular	1.8	<1	<1	1	1.6	<0.1	
MW-12	3/24/98	Regular	100.0	11.0	6.0	8.0	0.29	0.41
	6/23/98	Regular	88.0	<5	<5	<5	<0.2	<0.5
	6/23/98	Duplicate	89.0	<5	<5	<5	0.31	<0.5
	9/30/98	Regular	260.0	3.0	1.2	7.9	<0.20	0.62
	12/10/98	Regular	160.0	<1.0	<1.0	1.2	0.21	0.36
	3/10/99	Regular	160.0	1.1	<1.0	2.9	0.38	0.45
	6/10/99	Regular	49.0	1.4	<1.0	<1.0	0.22	0.13
	9/14/99	Regular	75.0	<1.0	<1.0	<2.0	<0.20	0.23
	12/9/99	Regular	64.0	<1	<1	<1	<0.2	0.21
	3/10/00	Regular	93.0	<1	<1	<1	<0.2	0.21
	3/10/00	Duplicate	99.0	<1	<1	<1	0.22	0.22
	6/8/00	Regular	62.0	<1	<1	<1	<0.2	<0.1
	9/13/00	Regular	34.0	<1	<1	<1	0.23	<0.1
	12/7/00	Regular	27	<1	2.9	1.9	<0.25	<0.1
	3/8/01	Regular	14	<1	<1	<1	2.1	0.1
	6/22/01	Regular	12	<1	<1	<1	0.51	0.11
	9/10/01	Regular	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D
	12/6/01	Regular	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D
	3/12/02	Regular	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D

Table 4
Cumulative BTEX and TPH Analytical Results for Groundwater Samples
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Monitor Well	Sample Date	Sample Type	Benzene	Toluene	Ethylbenzene	Xylenes	TPH-D	TPH-G
			micrograms per liter, ug/L				milligrams per liter, mg/L	
MW-12D	7/2/99	Regular	< 5	< 5	< 5	< 5	<0.20	<0.10
	9/14/99	Regular	< 1.0	< 1.0	< 1.0	< 2.0	<0.20	<0.10
	12/9/99	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	3/9/00	Regular	< 1	< 1	< 1	< 1	0.24	< 0.1
	6/8/00	Regular	< 1	< 1	< 1	< 1	< 0.2	< 0.1
	9/13/00	-	NS	NS	NS	NS	NS	NS
	12/7/00	-	NS	NS	NS	NS	NS	NS
	3/8/01	-	NS	NS	NS	NS	NS	NS
	6/22/01	-	NS	NS	NS	NS	NS	NS
	9/18/01	Regular	< 1	< 1	< 1	< 1	<0.2	<0.1
	12/6/01	Regular	< 1	< 1	< 1	< 1	<0.2	<0.1
	3/12/02	Regular	< 1	< 1	< 1	< 1	0.44	<0.1
MW-13	7/2/99	Regular	1500.0	23.0	750.0	58.0	2.2	5.1
	9/14/99	Regular	860.0	16.0	450.0	34.4	2.1	3.1
	12/9/99	Regular	430.0	16.0	410.0	40.9	0.46	3.2
	3/10/00	Regular	88.0	2.8	200.0	1.3	1.9	0.99
	6/8/00	Regular	6.0	< 1	63.0	3.3	1.1	0.91
	9/13/00	Regular	<1.0	<1.0	3.4	<1.0	0.44	0.12
	12/7/00	Regular	<1	<1	<1	<1	0.43	<0.1
	3/8/01	Regular	<1	<1	1.2	<1	2	<0.1
	6/22/01	Regular	<1	<1	<1	<1	0.31	<0.1
	9/10/01	Regular	<1	<1	<1	<1	0.3	<0.1
	12/6/01	Regular	<1	<1	<1	<1	<0.2	<0.1
	3/12/02	Regular	<1	<1	<1	<1	0.84	<0.1
MW-14	1/14/01	Regular	<1	<1	<1	<1	<0.2	<0.1
	6/21/01	-	NA	NA	NA	NA	NA	NA
	9/10/01	-	NA	NA	NA	NA	NA	NA
	12/6/01	-	NA	NA	NA	NA	NA	NA
MW-15	1/14/01	Regular	<1	<1	<1	<1	<0.2	<0.1
	6/21/01	-	NA	NA	NA	NA	NA	NA
	9/10/01	-	NA	NA	NA	NA	NA	NA
	12/6/01	-	NA	NA	NA	NA	NA	NA
OW-4	6/10/99	Regular	<1.0	<1.0	<1.0	4.4	<0.2	<0.10
	9/14/99	Regular	< 1.0	< 1.0	< 1.0	< 2.0	<0.20	<0.10
	12/9/99	Regular	<1.0	<1.0	<1.0	<1.0	<0.2	<0.1
	3/9/00	Regular	<1.0	<1.0	<1.0	<1.0	0.25	<0.1
	6/8/00	Regular	<1.0	<1.0	<1.0	<1.0	<0.21	<0.1
	9/13/00	Regular	<1.0	<1.0	<1.0	<1.0	<0.2	<0.1
	12/7/00	-	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D
	3/8/01	-	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D
	6/21/01	-	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D
	9/10/01	-	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D
	12/6/01	-	NS-D	NS-D	NS-D	NS-D	NS-D	NS-D

¹ Well plugged and abandoned 7/1/99

NA=Not Analyzed

NS=Not Sampled

NS-D=Not Sampled because well was dry

NSP=Not Sampled due to Phase Separated Hydrocarbons

Table 5
Cumulative Results⁽¹⁾ for Chloride⁽²⁾ Analyses
Hobbs, New Mexico Facility
BJ Services Company, U.S.A.

Sample Date	Monitor Wells ⁽³⁾																
	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-11A	MW-12	MW-12D	MW-13	MW-14	MW-15	OW-4
8/1/95	160	150	310	130	380	310	350	110	2200	3400	NP ⁽⁴⁾	NP	NP	NP	NP	NP	NS ⁽⁵⁾
8/23/96	130	140	100	99	210	250	360	140	2000	2900	NP	NP	NP	NP	NP	NP	NS
3/23-24/98	212	206	126	151	183	223	364	164	2390	NS	940	1200	NP	NP	NP	NP	NS
3/9-10/99	163	156	142	155	411	238	274	123	1160	NS	834	314	NP	NP	NP	NP	NS
6/10-7/2/99	NA ⁽⁶⁾	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	195	496	NP	NP	266
3/9-10/00	258	196	196	196	NP	224	241	131	474	NP	1290	327	117	276	NP	NP	258
1/14/01	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	368	219	NS
3/8-9/01	NA	165	172	152	NP	224	250	127	879	NP	1720	586	NS	276	327	NA	NS-D ⁽⁷⁾
6/21/01	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NS	NA	222	222	NS-D
9/10/01	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NS-D	NA	NA	245	228	NS-D
9/18/01	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NS-D	78.8	NA	NA	NA	NS-D
12/6/01	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NS-D	NA	NA	276	215	NS-D
3/11-12/02	177	172	183	127	NP	188	241	110	861	NP	1230	NS-D	75.8	207	284	224	NS-D

(1) - in mg/L.

(2) - NMWQCC standard for chloride is 250 mg/L.

(3) - MW-2 not operative after May 3, 1995; P&A'd 7/1/99.
 MW-6 P&A'd 7/1/99.
 MW-11 P&A'd 7/1/99.

MW-11A installed February 1998.

MW-12 installed February 1998.

MW-12D installed June 1999.

MW-13 installed June 1999.

MW-14 installed January 2001.

MW-15 installed January 2001.

(4) - NP indicates that well was not present at time of sampling event.

(5) - NS indicates that well was not sampled during applicable sampling event.

(6) - NA indicates that well was not analyzed for chloride during applicable sampling event.

(7) - NS-D indicates that well was dry (not sampled) during applicable sampling event.

Table 6
 Summary of Groundwater Quality Parameters and Detected PAHs, Metals, VOCs and SVOCs
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Analyte (units)	Sample Date	Monitor Wells ⁽¹⁾																
		MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-11A	MW-12	MW-12D	MW-13	MW-14	MW-15	OW-4
Bicarbonate, as CaCO ₃ (mg/L)	8/1/95	380	430	490	290	670	440	360	570	520	560	NP ^(h)	NP	NP	NP	NP	NP	NS ^(d)
	8/23/1996	310	310	210	270	120	400	280	390	520	430	NP	NP	NP	NP	NP	NP	NS
	3/23-24/98	286	214	175	247	180	309	260	306	557	NS	319	451	NP	NP	NP	NP	NS
	3/9-10/99	92	309	186	283	286	358	317	333	278	NS	335	386	NP	NP	NP	NP	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NS	NS	NS	200	520	NP	NP	NS
	3/9-10/00	89.1	248	160	253	NP	301	362	279	455	NP	703	402	244	240	NP	NP	1020
Carbonate, as CaCO ₃ (mg/L)	1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NS	NS	NS	NS	NS	374	250	NS
	3/8-9/01	90.9	242	232	222	NP	283	252	586	NP	646	475	NS	NS	131	NA ^(h)	NS	NS-D ^(h)
	3/11-12/02	230	230	210	260	NP	260	340	260	784	NP	520	NS-D	260	164	NS	NS	NS-D
	8/1/95	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	NP	NP	NP	NP	NP	NS
	8/23/96	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NP	NP	NP	NP	NP	NS
	3/23-24/98	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness-Total, as CaCO ₃ (mg/L)	3/9-10/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NS	NS	<1	<1	<1	<1	<1	<1
	6/10-7/2/99	<2	<2	<2	<2	NP	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	3/9-10/00	NS	NS	NS	NS	NP	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	3/8-9/01	<2	<2	<2	<2	NP	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	3/11-12/02	<2	<2	<2	<2	NP	<2	<2	<2	<2	<2	<2	NS-D	<2	<2	<2	<2	<2
Hydroxide (mg/L)	3/23-24/98	430	430	275	342	440	670	740	510	1450	NP	1000	1600	NP	NP	NP	NP	NS
	3/9-10/99	250	440	310	340	640	780	680	370	720	NS	1150	460	NP	NP	NP	NP	NS
	3/9-10/00	600	450	500	1200	NP	660	760	430	760	NP	880	700	260	540	NP	NP	3000
	3/8-9/01	310	470	610	440	NP	590	590	1000	1300	NP	1900	1300	NS	670	NA	NS	NS-D
	3/11-12/02	420	420	450	420	NP	ND ^(h)	ND	ND	1200	NP	1400	NS-D	330	750	NS	NS	NS-D
	8/1/95	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	NP	NP	NP	NP	NP	NS
Methane (mg/L)	8/23/96	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	3/23-24/98	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	0.039	<0.0012	0.91	NS	0.14	<0.0012	NP	NP	NP	NP	NS
	3/9-10/99	NS	NS	NS	<0.0012	NS	NS	NS	NS	0.035	NS	0.094	<0.0012	NP	NP	NP	NP	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NA	NA	0.0015	0.0017	NP	NP	<0.0012
	3/9-10/00	<0.0012	<0.0012	<0.0012	<0.0012	NP	<0.0012	0.13	<0.0012	0.0056	NP	0.037	<0.0012	<0.0012	<0.0012	NP	NP	<0.0012
	3/8-9/01	<0.0012	<0.0012	<0.0012	<0.0012	NP	<0.0012	<0.0012	<0.0012	<0.0012	NP	0.0028	<0.0012	NS	<0.0012	NA	NS	NS-D
Anions (mg/L)	3/11-12/02	0.007	<0.0012	0.0024	<0.0012	NP	ND	ND	ND	ND	NP	0.0044	NS-D	<0.0012	NS	NS	NS-D	
	3/23-24/98	0.9	1.2	1.2	0.6	1.1	0.8	0.9	1.3	6.1	NS	2.9	4.2	NP	NP	NP	NS	
	3/9-10/99	1.54	1.46	1.5	1.38	1.79	1.56	1.44	1.84	4.93	NS	3.08	3.13	NP	NP	NP	NS	
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	1.83	2.22	NP	NS	3.45
	3/9-10/00	1.7	1.1	1.1	1.1	NP	0.75	0.69	1.5	1	NP	<0.1	1.7	1.3	1.7	NP	NP	3.8
	1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nitrate (Nitrogen as N)	3/8-9/01	1.3	0.77	0.63	0.86	NP	0.69	0.66	0.92	1.2	NP	1.1	1.9	NS	1.6	NA	NS	NS-D
	3/11-12/02	1.2	1.4	1.2	1.4	NP	1.3	1.1	1.5	1.8	NP	2.1	NS-D	1.4	2.3	NS	NS	NS-D
	8/1/95	4.7	5.6	15	28	1.3	9.2	11	38	<0.1	5.5	NP	NP	NP	NP	NP	NP	NS
	8/23/96	11	7.6	7.6	12	<0.5	10	8.6	24	<5	11	NP	NP	NP	NP	NP	NP	NS

Table 6
 Summary of Groundwater Quality Parameters and Detected PAHs, Metals, VOCs and SVOCs
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Analyte (units)	Sample Date	Monitor Wells ⁽¹⁾																
		MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-11A	MW-12	MW-12D	MW-13	MW-14	MW-15	OW-4
Nitrate (Nitrogen as N)	3/23-24/98	1.78	3.07	2.59	3.87	0.69	3.92	1.84	4.27	0.07	NS	<0.05	<0.05	NP	NP	NP	NP	NS
	3/9-10/99	0.7	2.1	2.6	NA	<0.1	3.3	0.7	3.7	NA	NP	<0.1	<0.1	NP	NP	NP	NP	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	2.1	2.4	NP	NP	3.96
	3/9-10/00	0.33	2.9	3.7	5.3	NP	3.6	0.35	7.2	0.1	NP	0.11	<0.1	0.14	<0.1	NP	NP	3.6
	1/14/01-3/01	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	4.5	4.88	NS
	3/8-9/01	4.31	2.56	4.75	3.24	NP	2.82	0.664	7.9	<0.1	NP	<0.1	<0.1	NS	<0.1	NA	NS	NS-D
3/11-12/02	5.7	3.86	8.55	2.98	NP	3.23	0.607	6.34	<0.1	NP	<0.1	NS-D	<0.1	<0.1	NS	NS	NS-D	
Sulfate	8/1/95	150	150	210	230	6.7	180	160	150	130	230	NP	NP	NP	NP	NP	NP	NS
	8/23/96	130	150	150	140	85	80	160	180	120	130	NP	NP	NP	NP	NP	NP	NS
	3/23-24/98	130	180	160	190	230	310	250	230	320	NS	190	240	NP	NP	NP	NP	NS
	3/9-10/99	196	162	178	195	72	246	240	146	223	NP	227	193	NP	NP	NP	NP	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	249	334	NP	NP	192
	3/9-10/00	530	190	250	260	NP	280	260	170	160	NP	270	210	200	170	NP	NP	200
1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	180	130	NS	
3/8-9/01	210	170	180	180	NP	260	240	150	270	NP	330	300	NS	380	NA	NS	NS-D	
3/11-12/02	190	150	160	120	NP	240	250	130	230	NP	350	NS-D	200	380	NS	NS	NS-D	
Calcium	8/1/95	120	120	220	160	320	300	300	180	610	490	NP	NP	NP	NP	NP	NP	NS
	8/23/96	120	130	89	110	62	270	230	190	390	440	NP	NP	NP	NP	NP	NP	NS
	3/23-24/98	129	122	79	109	94	208	215	142	417	NS	259	388	NP	NP	NP	NP	NS
	3/9-10/99	80.2	129	90.8	116	141	233	197	122	214	NP	308	148	NP	NP	NP	NP	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	113	389	NP	NP	141
	3/9-10/00	155	119	147	387	NP	167	215	110	177	NP	229	180	78.1	122	NP	NP	882
	1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	150	NS	NS-D
	3/8-9/01	86.8	148	214	157	NP	172	183	381	331	NP	466	338	NS	198	NA	NS	NS-D
	3/11-12/02	112	121	130	143	NP	ND	ND	ND	303	NP	330	NS-D	120	225	NS	NS	NS-D
	8/1/95	34	36	58	27	72	42	49	43	130	130	NP	NP	NP	NP	NP	NP	NS
	8/23/96	120	32	21	18	28	40	48	44	84	120	NP	NP	NP	NP	NP	NP	NS
	3/23-24/98	36	30	18	20	42	47	52	36	130	NS	96	108	NP	NP	NP	NP	NS
3/9-10/99	19.7	31.5	20.4	21.6	62.2	54.4	47.7	28.5	43	NP	101	32.1	NP	NP	NP	NP	NS	
6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	16.6	83.9	NP	NP	44.3	
3/9-10/00	41.3	27.5	26.3	29.2	NP	44.3	39.1	26.2	61	NP	47.7	30.6	7.25	38.8	NP	NP	74.5	
1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	87.5	28.3	NS	
3/8-9/01	20.7	24.9	25.9	16.6	NP	41.1	37.4	28.2	95.1	NP	93.4	95.3	NS	52.3	NA	NS	NS-D	
3/11-12/02	27.3	20.7	20.7	13	NP	ND	ND	ND	ND	NP	103	NS-D	6.06	44.7	NS	NS	NS-D	
Potassium	8/1/95	2.4	2.6	3.5	4.2	3	3.4	5	4.1	35	46	NP	NP	NP	NP	NP	NP	NS
	8/23/96	2.4	3	2.2	3.1	2.4	3.7	3.9	2.6	41	53	NP	NP	NP	NP	NP	NP	NS
	3/23-24/98	<20	<20	<20	<20	<20	<20	<20	<20	20	NS	30	70	NP	NP	NP	NP	NS
	3/9-10/99	3	4	3	4	4	9	4	3	15	NP	21	101	NP	NP	NP	NP	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	66	6	NP	NP	3
	3/9-10/00	4.01	4.11	3.95	5.61	NP	6.98	4.53	4.08	18.3	NP	18.6	104	70.6	2.84	NP	NP	10.7
1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	3.59	NS	4.59	

Table 6
 Summary of Groundwater Quality Parameters and Detected PAHs, Metals, VOCs and SVOCs
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Analyte (units)	Sample Date	Monitor Wells ⁽¹⁾																
		MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-11A	MW-12	MW-12D	MW-13	MW-14	MW-15	OW-4
Potassium	3/8-9/01	<2	2.56	2.76	2.25	NP	5.15	2.94	3.84	19.5	NP	33.5	47.2	NS	2.26	NA	NS	NS-D
	3/11-12/02	2.82	4.05	2.79	3.55	NP	ND	ND	ND	ND	NP	41.5	NS-D	72	2.82	NS	NS	NS-D
	8/1/95	100	93	140	110	130	95	94	98	660	2000	NP	NP	NP	NP	NP	NP	NS
	8/23/96	100	110	88	120	120	96	100	83	960	2600	NP	NP	NP	NP	NP	NP	NS
	3/23-24/98	113	126	109	130	100	92	101	118	1090	NS	312	381	NP	NP	NP	NP	NS
	3/9-10/99	126	135	124	155	141	110	115	122	856	NP	225	180	NP	NP	NP	NP	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	121	165	NP	NP	103
	3/9-10/00	123	112	115	123	NP	95.1	95.4	99.1	181	NP	608	129	103	114	NP	NP	97.3
	1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	144	108	NS
	3/8-9/01	141	124	135	147	NP	121	118	119	410	NP	801	185	NS	142	NA	NS	NS-D
3/11-12/02	147	133	128	145	NP	ND	ND	ND	ND	NP	660	NS-D	79.4	127	NS	NS	NS-D	
Metals (mg/L)																		
Arsenic	8/1/95	0.0076	0.0043	<0.002	0.0059	0.028	0.0033	0.0034	0.0055	0.015	0.0086	NP	NP	NP	NP	NP	NP	NS
	8/23/96	0.0078	0.0066	0.0059	0.0067	0.018	0.0036	0.0033	0.0044	0.028	0.011	NP	NP	NP	NP	NP	NP	NS
	3/23-24/98	0.007	0.007	0.008	0.007	0.013	<0.005	<0.005	0.005	0.035	NS	0.019	0.013	NP	NP	NP	NP	NS
	3/9-10/99	0.013	0.009	0.012	0.005	0.02	0.006	0.005	0.007	0.026	NP	0.036	0.066	NP	NP	NP	NP	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	0.022	0.008	NP	NP	<0.005
	3/9-10/00	0.0178	0.00817	0.0178	0.0173	NP	0.00849	0.00953	0.00757	0.0474	NP	0.108	0.0948	0.0143	<0.005	NP	NP	0.034
	1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	0.00511	<0.005	NS
	3/8-9/01	0.0205	0.0094	0.0386	0.00974	NP	0.00694	NA	0.013	0.133	NP	0.08	0.0445	NS	0.00673	NA	NS	NS-D
	3/11-12/02	0.00939	0.00889	0.0101	0.0104	NP	ND	ND	ND	0.286	NP	0.086	NS-D	0.0471	0.012	NS	NS	NS-D
	8/1/95	0.069	0.38	0.34	0.049	1.1	0.069	0.075	0.089	0.37	0.2	NP	NP	NP	NP	NP	NP	NS
8/23/96	0.064	0.24	0.069	0.038	0.29	0.061	0.066	0.089	0.26	0.2	NP	NP	NP	NP	NP	NP	NS	
3/23-24/98	0.11	0.182	0.044	0.044	0.208	0.059	0.074	0.066	0.287	NS	0.163	0.157	NP	NP	NP	NP	NS	
3/9-10/99	0.058	0.059	0.045	0.054	0.555	0.076	0.052	0.043	0.17	NP	0.174	0.144	NP	NP	NP	NP	NS	
6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	0.155	0.333	NP	NP	0.062	
3/9-10/00	0.0917	0.108	0.0694	0.184	NP	0.046	0.236	0.0419	0.281	NP	0.872	0.245	0.0962	0.113	NP	NP	1.49	
1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	0.0833	0.073	NS	
3/8-9/01	0.044	0.119	0.0978	0.0055	NP	0.043	0.0512	0.111	0.23	NP	0.401	0.603	NS	0.171	NA	NS	NS-D	
3/11-12/02	0.06	0.0797	0.0805	0.0524	NP	ND	ND	ND	0.294	NP	0.348	NS-D	0.0865	0.109	NS	NS	NS-D	
Cadmium	8/1/95	<0.001	<0.001	0.0052	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NP	NP	NP	NP	NP	NP	NS
	8/23/96	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NP	NP	NP	NP	NP	NP	NS
	3/23-24/98	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NS	<0.005	<0.005	NP	NP	NP	NP	NS
	3/9-10/99	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NP	<0.005	<0.005	NP	NP	NP	NP	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	<0.005	<0.005	NP	NP	<0.005
	3/9-10/00	<0.005	<0.005	0.0178	<0.005	NP	<0.005	<0.005	<0.005	<0.005	NP	<0.005	<0.005	<0.005	<0.005	NP	NP	<0.005
	1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NS	<0.005	<0.005	NS-D
	3/8-9/01	<0.005	<0.005	0.0121	<0.005	NP	<0.005	<0.005	<0.005	<0.005	NP	<0.005	<0.005	<0.005	<0.005	NA	NS	NS-D
	3/11-12/02	<0.005	<0.005	<0.005	<0.005	NP	ND	ND	ND	<0.005	NP	<0.005	NS-D	<0.005	<0.005	NS	NS	NS-D
	8/1/95	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NP	NP	NP	NP	NP	NP	NS
8/23/96	<0.01	<0.01	<0.01	<0.01	0.049	<0.01	<0.01	<0.01	<0.01	<0.01	NP	NP	NP	NP	NP	NP	NS	
3/23-24/98	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NS	<0.01	<0.01	<0.01	<0.01	NP	NP	NS	

Table 6
 Summary of Groundwater Quality Parameters and Detected PAHs, Metals, VOCs and SVOCs
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Analyte (units)	Sample Date	Monitor Wells ⁽¹⁾														OW-4				
		MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-11A	MW-12	MW-12D	MW-13		MW-14	MW-15		
Chromium	3/9-10/99	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NP	NP	NP	NP	NS	
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NP	NP	NP	NP	NP	<0.01							
	3/9-10/00	<0.01	<0.01	<0.01	0.0248	NP	<0.01	<0.01	<0.01	0.031	NP	0.0342	0.0124	<0.01	NP	NP	NP	NP	NP	0.105
	1/14/2001	NS	NS	NS	NS	NP	NS	NP	NP	NP	NP	NS	NS							
	3/8-9/01	<0.01	<0.01	0.0104	0.0101	NP	<0.01	<0.01	0.013	0.0109	NP	0.0392	0.0469	0.0104	NP	NP	NP	NP	NS	NS-D
	3/11-12/02	<0.01	<0.01	<0.01	<0.01	NP	ND	ND	ND	0.0246	NP	0.023	NS-D	<0.01	NP	NP	NP	NP	NS	NS-D
	8/1/1995	<0.002	<0.002	0.0044	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.0025	NP	NS	NS						
	8/23/96	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	NP	NP	NP	NP	NS	NS
	3/23-24/98	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NP	NP	NP	NP	NS	NS
	3/9-10/99	<0.005	<0.005	<0.005	<0.005	0.013	<0.005	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	NP	NP	NP	NP	NS	NS
6/10-7/2/99	NS	NS	NS	NS	NP	NS	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005							
3/9-10/00	<0.005	<0.005	<0.005	0.00565	NP	<0.005	<0.005	<0.005	0.00661	NP	0.00595	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0355	
1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NP	NP	NP	NP	NS	NS-D	
3/8-9/01	<0.005	<0.005	0.00602	<0.005	NP	<0.005	<0.005	0.00597	0.0222	NP	0.0119	0.00627	<0.005	NP	NP	NP	NP	NS	NS-D	
3/11-12/02	<0.005	<0.005	<0.005	<0.005	NP	ND	ND	ND	0.0234	NP	<0.005	NS-D	<0.005	NP	NP	NP	NP	NS	NS-D	
Mercury	8/1/1995	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	8/23/96	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NP	NP	NP	NP	NS	NS
	3/23-24/98	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NP	NP	NP	NP	NS	NS
	3/9-10/99	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NP	NP	NP	NP	NS	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002						
	3/9-10/00	NS	NS	NS	NS	NP	NS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002						
	1/14/2001	NS	NS	NS	NS	NP	NS	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002						
	3/8-9/01	<0.0002	<0.0002	<0.0002	<0.0002	NP	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NP	NP	NP	NP	NS	NS-D
	3/11-12/02	<0.0002	<0.0002	<0.0002	0.000243	NP	ND	ND	ND	<0.0002	<0.0002	<0.0002	NS-D	<0.0002	NP	NP	NP	NP	NS	NS-D
	8/1/1995	<0.004	<0.004	<0.004	<0.004	<0.004	NS	NS	NS	NS	NS	NP	NS	NS						
8/23/96	<0.004	<0.004	<0.004	<0.004	<0.004	NS	NS	NS	NS	NS	NP	NS	NS							
3/23-24/98	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NP	NP	NP	NP	NS	NS	
3/9-10/99	0.005	0.006	<0.005	0.006	<0.005	NS	NS	NS	<0.005	<0.005	<0.005	<0.005	<0.005	NP	NP	NP	NP	NS	NS	
6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NP	NP	NP	NP	NS	NS	
3/9-10/00	<0.005	<0.005	<0.005	<0.005	NP	0.00926	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
1/14/2001	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	NS	NP	NP	NP	NP	NS	NS-D	
3/8-9/01	<0.005	0.00702	0.00598	0.00587	NP	0.00617	<0.005	0.0054	<0.005	<0.005	<0.005	<0.005	<0.005	NP	NP	NP	NP	NS	NS-D	
3/11-12/02	0.00549	0.00625	<0.005	0.00558	NP	ND	ND	ND	<0.005	<0.005	<0.005	NS-D	<0.005	NP	NP	NP	NP	NS	NS-D	
PAHs (µg/L)	8/1/1995	<50	<10	<500	<5	<30	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	8/23/96	<10	<10	<30	<5	<30	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	3/23-24/98	<10	<30	<30	<5	<30	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	3/9-10/99	<0.1	<0.1	<2.0	<0.1	<2.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	3/9-10/00	0.28	<0.1	<0.1	<0.1	NP	NS	NS	NS	NS	NP	NS	NS	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	1/14/2001	NS	NS	<0.12	<0.1	NP	NS	NS	NS	NS	NP	NS	NS	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
	3/8-9/01	<0.12	<0.13	<0.12	<0.1	NP	<0.13	<0.12	<0.12	<0.15	NP	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
	3/11-12/02	<0.1	<0.11	<0.1	<0.1	NP	ND	ND	ND	<0.15	NP	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	8/1/1995	<50	<10	<500	<5	<30	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
8/23/96	<10	<10	<30	<5	<30	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Acenaphthylene	8/1/1995	<50	<10	<500	<5	<30	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	8/23/96	<10	<10	<30	<5	<30	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	3/23-24/98	<10	<30	<30	<5	<30	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	3/9-10/99	<0.1	<0.1	<2.0	<0.1	<2.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NP	NS	NS	NS	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	3/9-10/00	0.28	<0.1	<0.1	<0.1	NP	NS	NS	NS	NS	NP	NS	NS	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	1/14/2001	NS	NS	<0.12	<0.1	NP	NS	NS	NS	NS	NP	NS	NS	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
	3/8-9/01	<0.12	<0.13	<0.12	<0.1	NP	<0.13	<0.12	<0.12	<0.15	NP	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
	3/11-12/02	<0.1	<0.11	<0.1	<0.1	NP	ND	ND	ND	<0.15	NP	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	8/1/1995	<50	<10	<500	<5	<30	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
8/23/96	<10	<10	<30	<5	<30	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	

Table 6
 Summary of Groundwater Quality Parameters and Detected PAHs, Metals, VOCs and SVOCs
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Analyte (units)	Sample Date	Monitor Wells ⁽¹⁾																	
		MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-11A	MW-12	MW-12D	MW-13	MW-14	MW-15	OW-4	
Isopropylbenzene	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NS
	3/8-9/01	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NA	NP	NP	NP	NS-D
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NS-D	NA	NA	NA	NP	NP	NP	NS-D
	3/23-24/98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NP	NP	NP	NP	NP	NP	NP	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	NS	< 5	190	NP	NP	NP	< 5
Naphthalene	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NA	NP	NP	NP	NS
	3/8-9/01	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NA	NP	NP	NP	NS
	3/8-9/01	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NA	NP	NP	NP	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NS-D	NA	NA	NA	NP	NP	NP	NS-D
	3/23-24/98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NP	NP	NP	NP	NP	NP	NP	NP	NS
n-Propylbenzene	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NP	NS	NS	< 5	68	NP	NP	NP	NP	< 5
	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NP	NS
	3/8-9/01	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NP	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NS-D	NA	NA	NA	NP	NP	NP	NS-D
	3/23-24/98	NS	NS	NS	NS	NP	NS	NS	NS	NP	NP	NP	NP	NP	NP	NP	NP	NP	NS
1,2,4-Trimethylbenzene	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NP	NS	NS	< 5	93	NP	NP	NP	NP	< 5
	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NP	NS
	3/8-9/01	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NP	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NS-D	NA	NA	NA	NP	NP	NP	NS-D
	3/23-24/98	NS	NS	NS	NS	NP	NS	NS	NS	NP	NP	NP	NP	NP	NP	NP	NP	NP	NS
1,3,5-Trimethylbenzene	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NP	NS	NS	< 5	93	NP	NP	NP	NP	< 5
	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NP	NS
	3/8-9/01	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NP	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NS-D	NA	NA	NA	NP	NP	NP	NS-D
	3/23-24/98	NS	NS	NS	NS	NP	NS	NS	NS	NP	NP	NP	NP	NP	NP	NP	NP	NP	NS
MTBE	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NP	NS	NS	< 5	25	NP	NP	NP	NP	< 10
	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NP	NS
	3/8-9/01	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NP	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NS-D	NA	NA	NA	NP	NP	NP	NS
	3/23-24/98	NS	NS	NS	NS	NP	NS	NS	NS	NP	NP	NP	NP	NP	NP	NP	NP	NP	NS
SVOCs (µg/L)	8/1/95	< 50	97	< 500	< 5	42	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	NS
	8/23/96	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NP	NS	NS	< 5	56	NP	NP	NP	NP	< 5
	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NP	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NS-D	NA	NA	NA	NP	NP	NP	NS-D
2,4-Dimethylphenol	8/1/95	280	62	1500	< 5	150	< 5	36	23	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	NS
	8/23/96	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NP	NS	NS	< 5	29	NP	NP	NP	NP	< 5
	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NP	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NS-D	NA	NA	NA	NP	NP	NP	NS-D
2-Methylnaphthalene	8/1/95	280	62	1500	< 5	150	< 5	36	23	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	NS
	8/23/96	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NP	NS	NS	< 5	29	NP	NP	NP	NP	< 5
	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NP	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NS-D	NA	NA	NA	NP	NP	NP	NS-D
2-Methylphenol	8/1/95	< 50	56	< 500	< 5	< 30	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	NS
	8/23/96	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NP	NS	NS	< 5	< 5	NP	NP	NP	NP	< 5
	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NP	NP	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NP	NA	NS-D	NA	NA	NA	NP	NP	NP	NS-D

Table 6
 Summary of Groundwater Quality Parameters and Detected PAHs, Metals, VOCs and SVOCs
 Hobbs, New Mexico Facility
 BJ Services Company, U.S.A.

Analyte (units)	Sample Date	Monitor Wells ⁽¹⁾																	
		MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-11A	MW-12	MW-12D	MW-13	MW-14	MW-15	OW-4	
2-Methylphenol	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NS	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NS	NS-D
4-Methylphenol	8/1/95	< 80	< 20	< 800	< 8	150	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8
	8/23/96	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NS	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NS	NS-D
Bis(2-ethylhexyl)-phthalate	8/1/95	750	< 20	10000	40	< 40	< 7	< 7	< 7	< 7	< 7	< 7	< 7	< 7	< 7	< 7	< 7	< 7	< 7
	8/23/96	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NS	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NS	NS-D
Phenol	8/1/95	< 50	< 10	< 500	< 5	< 30	< 5	< 5	< 5	8.2	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	8/23/96	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	6/10-7/2/99	NS	NS	NS	NS	NP	NS	NS	NS	NS	NP	NS	< 5	< 5	6	< 5	< 5	< 5	< 5
	3/9-10/00	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NS	NS
	3/11-12/02	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NA	NA	NA	NA	NP	NP	NS	NS-D

(1) - MW-2 not operative after May 3, 1995; MW-11 not operative after September 1997; MW-2, MW-6, and MW-11 P&A'd 7/1/99.

(2) - NP = Well not present at time of sampling event.

(3) - NS = Well not sampled.

(4) - NA = Not Analyzed.

(5) - NS-D = Well not sampled (dry well).

(6) - ND = No data - sample aliquot not collected due to insufficient well yield.

Table 7
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells
MW-5, MW-10, MW-11A, and MW-12
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-5	3/23/98	3.87	190	<0.0012
	3/9/99	<0.1	195	<0.0012
	6/10/99	4.73	209	<0.0012
	9/14/99	4.3	210	<0.0012
	12/9/99	4.2	210	<0.0012
	3/9/00	5.3	260	<0.0012
	6/8/00	4.7	240	<0.0012
	9/13/00	3.93	200	<0.0012
	12/7/00	3.27	160	<0.0012
	3/8/01	3.24	180	<0.0012
	6/21/01	2.74	150	0.0017
	9/10/01	NA ⁽²⁾	130	<0.0012
	12/6/01	2.38	120	<0.0012
	3/12/02	2.98	120	<0.0012
MW-10	3/23/98	0.07	320	0.91
	6/23/98	<0.1	325	0.55
	9/30/98	<0.1	204	0.81
	12/10/98	<0.1	180	0.091
	3/9/99	<0.1	142	0.035
			223 ⁽³⁾	
	9/14/99	<0.10	160	0.0049
	12/9/99	0.49	170	0.0039
	3/10/00	0.1	160	0.0056
	6/8/00	<0.1	150	0.031
	9/13/00	<0.1	160	0.031
	12/7/00	<0.1	190	0.17
	3/8/01	<0.1	270	<0.0012
	6/22/01	<0.1	270	0.044
9/10/01	NA	NA	NA	
3/12/02	<0.1	230	NA	

Table 7
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells
MW-5, MW-10, MW-11A, and MW-12
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate ⁽¹⁾ (mg/L)	Sulfate ⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-11A	3/23/98	<0.05	190	0.14
	6/23/98	<0.1	225	0.11
	9/30/98	0.4	196	0.043
	12/10/98	0.7	188	0.033
	3/10/99	<0.1	164	0.094
		<0.1 ⁽⁴⁾	227 ⁽³⁾	
	6/10/99	<0.1	181	0.0036
	9/13/99	0.22	250	<0.0012
	12/9/99	<0.1	290	0.0079
	3/9/00	0.11	270	0.037
	6/8/00	<0.1	240	0.0069
	9/13/00	<0.1	320	<0.0012
	12/7/00	<0.1	260	0.0096
	3/8/01	<0.1	330	0.0028
	6/22/01	<0.1	180	0.0074
	9/10/01	NA	280	<0.0012
	12/6/01	<0.1	240	0.0041
3/12/02	<0.1	350	0.0044	
MW-12	3/23/98	<0.05	240	<0.0012
	6/23/98	<0.1	240	<0.0012
	9/30/98	<0.1	168	<0.0012
	12/10/98	<0.1	202	<0.0012
	3/10/99	<0.1	137	<0.0012
		<0.1 ⁽⁴⁾	193 ⁽³⁾	
	6/10/99	<0.1	217	<0.0012
	9/14/99	<0.10	230	<0.0012
	12/9/99	<0.1	180	<0.0012
	3/10/00	<0.1	210	<0.0012
	6/8/00	<0.1	220	<0.0012
	9/13/00	<0.1	240	<0.0012
	12/7/00	<0.1	260	<0.0012
	3/8/01	<0.1	300	<0.0012
6/22/01	<0.1	360	0.0021	
MW-12	9/10/01	NS-D ⁽⁵⁾	NS-D	NS-D
	9/18/01	NA	190	<0.0012

Table 7
Current and Historical Nitrate, Sulfate, and Dissolved Methane Data for Monitor Wells
MW-5, MW-10, MW-11A, and MW-12
Hobbs, New Mexico
BJ Services Company, U.S.A.

Well	Date	Nitrate⁽¹⁾ (mg/L)	Sulfate⁽¹⁾ (mg/L)	Dissolved Methane (mg/L)
MW-12D	12/6/01	<0.1	200	<0.0012
	3/12/02	<0.1	200	<0.0012

⁽¹⁾ - By EPA Method 300, except as noted

⁽²⁾ - NA indicates not analyzed

⁽³⁾ - By EPA Method 375.4

⁽⁴⁾ - By EPA Method 353.3

⁽⁵⁾ - NS-D indicates not sampled (well dry)

mg/L = milligrams per liter

Appendices



APPENDICES

A



APPENDIX A
Groundwater Sampling Forms



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-1

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 17 Date: 3-11-02 Time: 18:52
 Client: BS Personnel: CG, AM
 Project Location: Hobbs Weather: WINDY / 70S

2. WELL DATA

Casing Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Screen Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Total Depth of Well: <u>64.39</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Static Water: <u>62.11</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Product: <u>-</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Length of Water Column: <u>2.28</u> feet	Well Volume: <u>1.14</u> gal
Screened Interval (from GS): <u>45-60</u> <small>Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft</small>	

3. PURGE DATA

Purge Method: Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer: Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Rope/Tubing: Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable

Was well purged dry? Yes No Pumping Rate: - gal/min

Equipment Model(s):
 1. YSI
 2. _____
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Other:	Comments
13:55	1	7.73	18.81	1505	61.6	4.56	-		BLACK COLOR
14:01	2	7.66	17.99	1354	1.1	5.44	-		

4. SAMPLING DATA

Method(s): Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer: Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Tubing/Rope: Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable

Depth to Water at Time of Sampling: - NM Field Filtered? Yes No

Sample ID: MW-1 Sample Time: 8:44 3:00 # of Containers: 11

Duplicate Sample Collected? Yes No ID: MW-1

Geochemical Analyses

Ferrous Iron:	_____	mg/L
DO:	_____	mg/L
Nitrate:	_____	mg/L
Sulfate:	_____	mg/L
Alkalinity:	_____	mg/L

5. COMMENTS

well in good condition, no tubing

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-3

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 3-11-02 Time: 14:12
 Client: BS Personnel: CB, AM
 Project Location: Holbb S Weather: WINDY

2. WELL DATA

Casing Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Screen Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Total Depth of Well: <u>63.02</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Static Water: <u>59.5</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Product: _____ feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Length of Water Column: <u>3.51</u> feet	Well Volume: <u>1.76</u> gal
Screened Interval (from GS): <u>45-60</u> <small>Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft</small>	

3. PURGE DATA

Purge Method: Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer Stainless PVC Teflon® Other: _____ Equipment Model(s):
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. YSI

Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____

Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Other:	Comments
1422	1	8.14	19.25	1261	-15.9	6.52	-		Clear
1430	2	7.78	17.91	1255	19.7	7.91	-		

4. SAMPLING DATA

Method(s): Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Tubing (Rope) Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable

Depth to Water at Time of Sampling: NM Field Filtered? Yes No

Sample ID: MW-3 Sample Time: 3:12 9:18 # of Containers: 12

Duplicate Sample Collected? Yes No ID: MW-3

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Signature: Cory

GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-4

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 3-11-02 Time: 14:34
 Client: BS Personnel: C.G., AM
 Project Location: HUBBS Weather: WINDY

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 62.82 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 59.41 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: - feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 3.41 feet Well Volume: 1.705 gal Screened Interval (from GS): 45-60
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s): _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. YSE
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable 2. _____
 Was well purged dry? Yes No Pumping Rate: _____ gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Other:	Comments
1445	1	8.16	17.74	1335	13.8	7.61	-		
1454	2	2.87	17.95	1310	35.7	8.27	-		

4. SAMPLING DATA

Method(s): Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-4 Sample Time: 3-11-02 9:40 # of Containers: 11
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses
 Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

WELL IN GOOD CONDITION

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Signature Coy



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-5

1. PROJECT INFORMATION

Project Number: 12B32 Task Number: 017 Date: 3/11/02 Time: 13:05
 Client: BT Services Personnel: CG, AM
 Project Location: Hobbs, NM Weather: windy

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 64.90 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 61.12 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 3.38 feet Well Volume: 0.54 gal Screened Interval (from GS): 45-60
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailor, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailor Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rops/Tubing Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: _____ gal/min
 Equipment Model(s)
 1. YSI-61D
 2. _____
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
13:10	1.0	8.18	18.71	1111.0	47.5	6.28			

4. SAMPLING DATA

Method(s): Bailor, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailor Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rops Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-5 Sample Time: 3-12-02 8:15 # of Containers: 11
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: 0 mg/L
 DO: 4 mg/L
 Nitrate: — mg/L
 Sulfate: — mg/L
 Alkalinity: 70 mg/L

5. COMMENTS

well in good condition

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Amanda Moll
Signature



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-7

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 3-11-02 Time: 15:14
 Client: BJ Services Personnel: CG, AM
 Project Location: Hobbs, NM Weather: windy

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 61.5 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 60.03 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 1.47 feet Well Volume: 0.24 gal Screened Interval (from GS): 49-60
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s):
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope Tubing Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: _____ gal/min
 1. XSI-610
 2. _____
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
15:29	0.25	8.04	18.55	1460	19.7	4.15			

4. SAMPLING DATA

Method(s): Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-7 Sample Time: 3:12:02 10:34 # of Containers: 4
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

Rubber Ring missing, eye bolt gone

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Amanda North
Signature



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-B

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 3-11-02 Time: 15:04
 Client: BJ Services Personnel: CG, AM
 Project Location: Holds Weather: Windy

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 62.2 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 59.94 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: - feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 2.26 feet Well Volume: 0.36 gal Screened Interval (from GS): 45-60
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailor, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailor Stainless PVC Teflon® Other: _____ Equipment Model(s)
 Dedicated Prepared Off-Site Field Cleaned Disposable 1. YSI-610
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: nylon 2. _____
 Dedicated Prepared Off-Site Field Cleaned Disposable 3. _____
 Was well purged dry? Yes No Pumping Rate: _____ gal/min

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
15:04	0.5	8.01	18.98	1506	11.5	5.79	—	—	—

4. SAMPLING DATA

Method(s): Bailor, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailor Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-B Sample Time: 3-12-02 10:19 # of Containers: 4
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

replaced well cap, needs rubber ring

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Amanda Mott
Signature



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-10

1. PROJECT INFORMATION

Project Number: 12332 Task Number: 017 Date: 3-11-02 Time: 16:07
 Client: BT Services Personnel: GG, AM
 Project Location: Hobbs, NM Weather: Windy

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 62.0 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 60.69 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: — feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 1.31 feet Well Volume: 0.21 gal Screened Interval (from GS): unspecified
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: _____ gal/min
 Equipment Model(s)
 1. X51-610
 2. _____
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other:	Comments
16:12	0.3	7.23	18.68	3988	-102.8	2.73			purple

4. SAMPLING DATA

Method(s): Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-10 Sample Time: 3:12:02 11:07 # of Containers: 4
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses
 Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS well in good condition

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Amanda Moritz
 Signature



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-11A

1. PROJECT INFORMATION

Project Number: 12892 Task Number: 017 Date: 3-11-02 Time: 7:12
 Client: BS Personnel: CH, AM
 Project Location: 11665 Weather: WINDY

2. WELL DATA

Casing Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Screen Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Total Depth of Well: <u>63.83</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Static Water: <u>61.42</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Product: <u>-</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Length of Water Column: <u>241</u> feet	Well Volume: <u>120</u> gal
Screened Interval (from GS): <u>50-65</u> <small>Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft</small>	

3. PURGE DATA

Purge Method: Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable

Was well purged dry? Yes No Pumping Rate: _____ gal/min

Equipment Model(s)
 1. YSE
 2. _____
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Other:	Comments
<u>7:28</u>	<u>0.75</u>	<u>7.45</u>	<u>16.97</u>	<u>4852</u>	<u>-41.0</u>	<u>6.27</u>			
<u>7:33</u>	<u>1.0</u>	<u>7.39</u>	<u>18.01</u>	<u>5253</u>	<u>-64.24.02</u>				

4. SAMPLING DATA

Method(s): Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable

Depth to Water at Time of Sampling: NM Field Filtered? Yes No

Sample ID: MW-11A Sample Time: 3:00 1148 # of Containers: 12

Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: 8.5 mg/L

DO: 0 mg/L

Nitrate: - mg/L

Sulfate: - mg/L

Alkalinity: 140 mg/L

5. COMMENTS

WELL IN GOOD CONDITION

Note: include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Cou
Signature

GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-12D

1. PROJECT INFORMATION

Project Number: 12852 Task Number: 007 Date: 3-11-02 Time: 1745
 Client: BS Personnel: CG, AM
 Project Location: Holtz Weather: Cold, WINDY

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 87.58 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 4.61 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: - feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 25.97 feet Well Volume: 13.0 gal Screened Interval (from GS): 77.5-87.5
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s):
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____ 1. EST
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: nylon 2. _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: - gal/min 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Other:	Comments
1753	1	8.24	17.86	1260	-48.5	3.27			
1756	2	7.87	17.57	1114	-46.1	4.57			
1802	4	7.72	17.66	1093	-53.4	2.90			
1809	6	7.79	17.73	1087	-61.0	3.20			
1815	8	7.92	17.47	1084	-49.6	4.45			
1821	9	7.89	17.71	1086	-51.3	3.38			
1824	11	7.79	17.61	1097	-68.8	3.66			
1828	12	7.77	17.57	1091	-67.4	3.54			

4. SAMPLING DATA

Method(s): Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-12D Sample Time: 12:27 3002 # of Containers: 14
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: 4.9 mg/L
 DO: 0 mg/L
 Nitrate: - mg/L
 Sulfate: - mg/L
 Alkalinity: 20 mg/L

5. COMMENTS

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: mw13

1. PROJECT INFORMATION

Project Number: 12732 Task Number: 017 Date: Monday 3-16-02 Time: 1534
 Client: BS Personnel: Cgt. AJM
 Project Location: Hobbs Weather: windy

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
 Total Depth of Well: 66.85 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Static Water: 60.94 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Depth to Product: - feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
 Length of Water Column: 5.46 feet Well Volume: 2.7 gal Screened Interval (from GS): 51-66
 Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____ Equipment Model(s): _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Was well purged dry? Yes No Pumping Rate: - gal/min

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Other:	Comments
1544	0.5	7.77	17.85	1479	-54.7	3.76	-		
1550	1.2	7.71	18.15	1492	-33.5	3.82	-		
1556	2.6	7.73	18.13	1504	-45.9	4.52	-		

4. SAMPLING DATA

Method(s): Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
 Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
 Depth to Water at Time of Sampling: NM Field Filtered? Yes No
 Sample ID: MW-13 Sample Time: 1041 3-10 # of Containers: 11
 Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

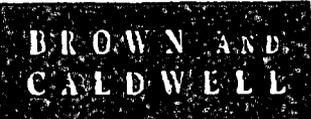
Ferrous Iron: - mg/L
 DO: - mg/L
 Nitrate: - mg/L
 Sulfate: - mg/L
 Alkalinity: - mg/L

5. COMMENTS

NO BATS

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Signature:



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-14

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017
Client: BJ Services
Project Location: Hobbs, NM

Date: 3/11/02 Time: 16:59
Personnel: CG, AM
Weather: windy

2. WELL DATA

Casing Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
Screen Diameter: 2 inches Type: PVC Stainless Galv. Steel Teflon® Other: _____
Total Depth of Well: 69.20 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
Depth to Static Water: 62.70 feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
Depth to Product: _____ feet From: Top of Well Casing (TOC) Top of Protective Casing Other: _____
Length of Water Column: 6.50 feet Well Volume: 1.07 gal Screened Interval (from GS): 53-68
Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft

3. PURGE DATA

Purge Method: Bailor, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____
Materials: Pump/Bailor Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
Was well purged dry? Yes No Pumping Rate: _____ gal/min
Equipment Model(s)
1. YSI-610
2. _____
3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	ORP	Dissolved Oxygen	Turbidity	Other.	Comments
<u>17:04</u>	<u>0.6</u>	<u>7.91</u>	<u>17.49</u>	<u>1815</u>	<u>54.0</u>	<u>6.90</u>	—	—	—

4. SAMPLING DATA

Method(s): Bailor, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____
Materials: Pump/Bailor Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable
Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable
Depth to Water at Time of Sampling: NM Field Filtered? Yes No
Sample ID: MW-14 Sample Time: 3/12/02 11:24 # of Containers: 1
Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
DO: _____ mg/L
Nitrate: _____ mg/L
Sulfate: _____ mg/L
Alkalinity: _____ mg/L

5. COMMENTS

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Amanda Mordahl
Signature



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: MW-15

1. PROJECT INFORMATION

Project Number: 12832 Task Number: 017 Date: 3-1-02 Time: 1624
 Client: BS Personnel: CG, AM
 Project Location: 160665 Weather: WINDY

2. WELL DATA

Casing Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Screen Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Total Depth of Well: <u>67.0</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Static Water: <u>61.65</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Product: <u>-</u> feet	From: <input type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Length of Water Column: <u>5.35</u> feet	Well Volume: <u>2.68</u> gal
Screened Interval (from GS): <u>52-67</u> <small>Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft</small>	

3. PURGE DATA

Purge Method: Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer: Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Rope/Tubing: Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable

Was well purged dry? Yes No Pumping Rate: CG gal/min

Equipment Model(s):
 1. IST
 2. _____
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Other:	Comments
<u>1638</u>	<u>0.75</u>	<u>7.51</u>	<u>17.55</u>	<u>143</u>	<u>-23.1</u>	<u>6.22</u>			
<u>1643</u>	<u>2</u>	<u>7.74</u>	<u>18.04</u>	<u>135</u>	<u>17.8</u>	<u>5.85</u>			

4. SAMPLING DATA

Method(s): Bailer, Size: 2 Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer: Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Tubing (Rope): Polyethylene Polypropylene Teflon® Other: nylon
 Dedicated Prepared Off-Site Field Cleaned Disposable

Depth to Water at Time of Sampling: NM Field Filtered? Yes No

Sample ID: MW-15 Sample Time: 3:12:02 118 # of Containers: 1

Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: - mg/L
 DO: - mg/L
 Nitrate: - mg/L
 Sulfate: - mg/L
 Alkalinity: - mg/L

5. COMMENTS

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

CG
Signature



GROUNDWATER SAMPLING FIELD DATA SHEET

WELL ID: 624

1. PROJECT INFORMATION

Project Number: 12852 Task Number: _____ Date: 3-18-02 ^{AM 4/12/02} Time: 1:00 PM
 Client: BS Personnel: GA, AM
 Project Location: Woods Weather: WINDY

2. WELL DATA

Casing Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Screen Diameter: <u>2</u> inches	Type: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> Stainless <input type="checkbox"/> Galv. Steel <input type="checkbox"/> Teflon® <input type="checkbox"/> Other: _____
Total Depth of Well: <u>61.80</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Static Water: <u>DK</u> feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Depth to Product: _____ feet	From: <input checked="" type="checkbox"/> Top of Well Casing (TOC) <input type="checkbox"/> Top of Protective Casing <input type="checkbox"/> Other: _____
Length of Water Column: _____ feet	Well Volume: _____ gal
Screened Interval (from GS): <u>unsaturated</u> <small>Note: 2-inch well = 0.167 gal/ft 4-inch well = 0.667 gal/ft</small>	

3. PURGE DATA

Purge Method: Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Centrifugal Pump Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Rope/Tubing Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Was well purged dry? Yes No Pumping Rate: _____ gal/min

Equipment Model(s)
 1. YSL 610 AM 4/10/02
 2. _____
 3. _____

Time	Cum. Gallons Removed	pH	Temp	Spec. Cond.	Eh	Dissolved Oxygen	Turbidity	Other:	Comments
	<u>DK</u>								

4. SAMPLING DATA

Method(s): Bailer, Size: _____ Bladder Pump 2" Submersible Pump 4" Submersible Pump
 Peristaltic Pump Inertial Lift Pump Other: _____

Materials: Pump/Bailer Stainless PVC Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Materials: Tubing/Rope Polyethylene Polypropylene Teflon® Other: _____
 Dedicated Prepared Off-Site Field Cleaned Disposable

Depth to Water at Time of Sampling: _____ Field Filtered? Yes No

Sample ID: _____ Sample Time: _____ # of Containers: _____

Duplicate Sample Collected? Yes No ID: _____

Geochemical Analyses

Ferrous Iron: _____ mg/L
 DO: _____ mg/L
 Nitrate: _____ mg/L
 Sulfate: _____ mg/L
 Alkalinity: _____ mg/L

5. COMMENTS

Note: Include comments such as well condition, odor, presence of NAPL, or other items not on the field data sheet.

Signature: [Signature]

B



APPENDIX B

Laboratory Analytical Reports



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
(713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:
02030430

Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	Project Name: BJ Hobbs 12832-07 Site: Hobbs, NM Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 3/25/02
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This Report Contains A Total Of 33 Pages

Excluding This Page

And

Chain Of Custody

3/25/02

Date



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:
Brown & Caldwell

Certificate of Analysis Number:

02030430

Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	Project Name: BJ Hobbs 12832-07 Site: Hobbs, NM Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 3/25/02
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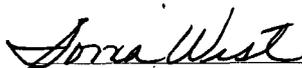
Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.


Sonia West
Senior Project Manager

3/25/02

Date



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

02030430

Report To: Brown & Caldwell
 Rick Rexroad
 1415 Louisiana
 Suite 2509
 Houston
 TX
 77002-
 ph: (713) 759-0999

Project Name: BJ Hobbs 12832-07
Site: Hobbs, NM
Site Address:

PO Number:
State: New Mexico

State Cert. No.:
Date Reported: 3/25/02

Fax To: Brown & Caldwell
 Rick Rexroad fax : (713) 308-3886

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
MW-1	02030430-01	Water	3/12/02 8:44:00 AM	3/13/02 10:00:00 AM	169963	<input type="checkbox"/>
MW-3	02030430-02	Water	3/12/02 9:18:00 AM	3/13/02 10:00:00 AM	169963	<input type="checkbox"/>
MW-4	02030430-03	Water	3/12/02 9:40:00 AM	3/13/02 10:00:00 AM	169963	<input type="checkbox"/>
Trip Blank 3/12/02	02030430-04	Water	3/12/02	3/13/02 10:00:00 AM	169963	<input type="checkbox"/>

Sonia West
 Sonia West
 Senior Project Manager

3/25/02

Date

Joel Grice
 Laboratory Director
 Ted Yen
 Quality Assurance Officer



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-1

Collected: 03/12/2002 8:44

SPL Sample ID: 02030430-01

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY, BICARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Bicarbonate	230	2	1		03/15/02 15:30	SN	1070464
ALKALINITY, CARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Carbonate	ND	2	1		03/15/02 15:30	SN	1070522
CHLORIDE, TOTAL			MCL	E325.3	Units: mg/L		
Chloride	177	5	5		03/18/02 14:30	CV	1064797
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.2	1		03/19/02 7:00	AR	1068842
Surr: n-Pentacosane	92.6	% 18-120	1		03/19/02 7:00	AR	1068842

Prep Method	Prep Date	Prep Initials
SW3510B	03/14/2002 12:11	KL

FLUORIDE-IC			MCL	E300	Units: mg/L		
Fluoride	1.2	0.1	1		03/13/02 11:55	ES	1067979
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		03/15/02 5:08	DL	1062097
Surr: 1,4-Difluorobenzene	101	% 74-121	1		03/15/02 5:08	DL	1062097
Surr: 4-Bromofluorobenzene	96.0	% 55-150	1		03/15/02 5:08	DL	1062097

HARDNESS, TOTAL (TITRIMETRIC, EDTA)			MCL	E130.2	Units: mg/L		
Hardness (As CaCO3)	420	25	5		03/19/02 11:45	CV	1068413

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		03/22/02 11:04	ER	1070786
Ethylene	ND	0.0032	1		03/22/02 11:04	ER	1070786
Methane	0.007	0.0012	1		03/22/02 11:04	ER	1070786

MERCURY, TOTAL			MCL	SW7470A	Units: mg/L		
Mercury	ND	0.0002	1		03/15/02 12:50	R_T	1063735

Prep Method	Prep Date	Prep Initials
SW7470A	03/15/2002 9:30	R_T

METALS BY METHOD 6010B, TOTAL			MCL	SW6010B	Units: mg/L		
Arsenic	0.00939	0.005	1		03/15/02 2:12	JS	1062857
Lead	ND	0.005	1		03/15/02 2:12	JS	1062857
Selenium	0.00549	0.005	1		03/15/02 2:12	JS	1062857
Barium	0.06	0.005	1		03/19/02 4:04	NS	1068539
Cadmium	ND	0.005	1		03/19/02 4:04	NS	1068539
Calcium	112	0.1	1		03/21/02 2:12	NS	1069154
Chromium	ND	0.01	1		03/19/02 4:04	NS	1068539

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-1

Collected: 03/12/2002 8:44

SPL Sample ID: 02030430-01

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
Magnesium	27.3	0.1	1		03/19/02 4:04	NS	1068539
Potassium	2.82	2	1		03/19/02 4:04	NS	1068539
Silver	ND	0.01	1		03/19/02 4:04	NS	1068539
Sodium	147	0.5	1		03/19/02 4:04	NS	1068539

Prep Method	Prep Date	Prep Initials
SW3010A	03/14/2002 7:30	MW

NITROGEN, NITRATE (AS N)			MCL	E300	Units: mg/L		
Nitrogen, Nitrate (As N)	5.7	0.1	1		03/13/02 11:55	ES	1064693

POLYNUCLEAR AROMATIC HYDROCARBONS			MCL	SW8310	Units: ug/L		
Acenaphthene	ND	0.1	1		03/18/02 19:21	YN	1065582
Acenaphthylene	ND	0.1	1		03/18/02 19:21	YN	1065582
Anthracene	ND	0.1	1		03/18/02 19:21	YN	1065582
Benz(a)anthracene	ND	0.1	1		03/18/02 19:21	YN	1065582
Benzo(a)pyrene	ND	0.1	1		03/18/02 19:21	YN	1065582
Benzo(b)fluoranthene	ND	0.1	1		03/18/02 19:21	YN	1065582
Benzo(g,h,i)perylene	ND	0.1	1		03/18/02 19:21	YN	1065582
Benzo(k)fluoranthene	ND	0.1	1		03/18/02 19:21	YN	1065582
Chrysene	ND	0.1	1		03/18/02 19:21	YN	1065582
Dibenzo(a,h)anthracene	ND	0.1	1		03/18/02 19:21	YN	1065582
Fluoranthene	ND	0.1	1		03/18/02 19:21	YN	1065582
Fluorene	ND	0.1	1		03/18/02 19:21	YN	1065582
Indeno(1,2,3-cd)pyrene	ND	0.1	1		03/18/02 19:21	YN	1065582
Naphthalene	ND	0.1	1		03/18/02 19:21	YN	1065582
Phenanthrene	ND	0.1	1		03/18/02 19:21	YN	1065582
Pyrene	ND	0.1	1		03/18/02 19:21	YN	1065582
Surr: 1-Fluoronaphthalene	52.7	% 15-96	1		03/18/02 19:21	YN	1065582
Surr: Phenanthrene-d10	55.5	% 33-108	1		03/18/02 19:21	YN	1065582

Prep Method	Prep Date	Prep Initials
SW3510B	03/15/2002 15:01	DB

PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		03/15/02 5:08	DL	1062039
Ethylbenzene	ND	1	1		03/15/02 5:08	DL	1062039
Toluene	ND	1	1		03/15/02 5:08	DL	1062039
Xylenes, Total	ND	1	1		03/15/02 5:08	DL	1062039
Surr: 4-Bromofluorobenzene	103	% 48-156	1		03/15/02 5:08	DL	1062039
Surr: 1,4-Difluorobenzene	102	% 72-137	1		03/15/02 5:08	DL	1062039

SULFATE			MCL	E300	Units: mg/L		
Sulfate	190	4	20		03/14/02 11:34	ES	1068042

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
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HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-3

Collected: 03/12/2002 9:18

SPL Sample ID: 02030430-02

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY, BICARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Bicarbonate	230	2	1		03/15/02 15:30	SN	1070465
ALKALINITY, CARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Carbonate	ND	2	1		03/15/02 15:30	SN	1070523
CHLORIDE, TOTAL			MCL	E325.3	Units: mg/L		
Chloride	172	2	2		03/18/02 14:30	CV	1064800
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.2	1		03/19/02 7:37	AR	1068843
Surr: n-Pentacosane	98.2	% 18-120	1		03/19/02 7:37	AR	1068843

Prep Method	Prep Date	Prep Initials
SW3510B	03/14/2002 12:11	KL

FLUORIDE-IC			MCL	E300	Units: mg/L		
Fluoride	1.4	0.1	1		03/13/02 11:55	ES	1067980
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		03/15/02 4:43	DL	1062093
Surr: 1,4-Difluorobenzene	101	% 74-121	1		03/15/02 4:43	DL	1062093
Surr: 4-Bromofluorobenzene	96.0	% 55-150	1		03/15/02 4:43	DL	1062093

HARDNESS, TOTAL (TITRIMETRIC, EDTA)			MCL	E130.2	Units: mg/L		
Hardness (As CaCO3)	420	25	5		03/19/02 11:45	CV	1068414

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		03/22/02 11:15	ER	1070788
Ethylene	ND	0.0032	1		03/22/02 11:15	ER	1070788
Methane	ND	0.0012	1		03/22/02 11:15	ER	1070788

MERCURY, TOTAL			MCL	SW7470A	Units: mg/L		
Mercury	ND	0.0002	1		03/15/02 12:50	R_T	1063736

Prep Method	Prep Date	Prep Initials
SW7470A	03/15/2002 9:30	R_T

METALS BY METHOD 6010B, TOTAL			MCL	SW6010B	Units: mg/L		
Arsenic	0.00889	0.005	1		03/15/02 2:19	JS	1062858
Lead	ND	0.005	1		03/15/02 2:19	JS	1062858
Selenium	0.00625	0.005	1		03/15/02 2:19	JS	1062858
Barium	0.0797	0.005	1		03/19/02 4:10	NS	1068540
Cadmium	ND	0.005	1		03/19/02 4:10	NS	1068540
Calcium	121	0.1	1		03/21/02 2:18	NS	1069155
Chromium	ND	0.01	1		03/19/02 4:10	NS	1068540

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
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 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-3

Collected: 03/12/2002 9:18

SPL Sample ID: 02030430-02

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
Magnesium	20.7	0.1	1		03/19/02 4:10	NS	1068540
Potassium	4.05	2	1		03/19/02 4:10	NS	1068540
Silver	ND	0.01	1		03/19/02 4:10	NS	1068540
Sodium	133	0.5	1		03/19/02 4:10	NS	1068540

Prep Method	Prep Date	Prep Initials
SW3010A	03/14/2002 7:30	MW

NITROGEN, NITRATE (AS N)	MCL	E300	Units: mg/L
Nitrogen, Nitrate (As N)	3.86	0.1	1 03/13/02 11:55 ES 1064694

POLYNUCLEAR AROMATIC HYDROCARBONS	MCL	SW8310	Units: ug/L
Acenaphthene	ND	0.11	1 03/18/02 19:59 YN 1065583
Acenaphthylene	ND	0.11	1 03/18/02 19:59 YN 1065583
Anthracene	ND	0.11	1 03/18/02 19:59 YN 1065583
Benz(a)anthracene	ND	0.11	1 03/18/02 19:59 YN 1065583
Benzo(a)pyrene	ND	0.11	1 03/18/02 19:59 YN 1065583
Benzo(b)fluoranthene	ND	0.11	1 03/18/02 19:59 YN 1065583
Benzo(g,h,i)perylene	ND	0.11	1 03/18/02 19:59 YN 1065583
Benzo(k)fluoranthene	ND	0.11	1 03/18/02 19:59 YN 1065583
Chrysene	ND	0.11	1 03/18/02 19:59 YN 1065583
Dibenzo(a,h)anthracene	ND	0.11	1 03/18/02 19:59 YN 1065583
Fluoranthene	ND	0.11	1 03/18/02 19:59 YN 1065583
Fluorene	ND	0.11	1 03/18/02 19:59 YN 1065583
Indeno(1,2,3-cd)pyrene	ND	0.11	1 03/18/02 19:59 YN 1065583
Naphthalene	ND	0.11	1 03/18/02 19:59 YN 1065583
Phenanthrene	ND	0.11	1 03/18/02 19:59 YN 1065583
Pyrene	ND	0.11	1 03/18/02 19:59 YN 1065583
Surr: 1-Fluoronaphthalene	66.5	% 15-96	1 03/18/02 19:59 YN 1065583
Surr: Phenanthrene-d10	67.1	% 33-108	1 03/18/02 19:59 YN 1065583

Prep Method	Prep Date	Prep Initials
SW3510B	03/15/2002 15:01	DB

PURGEABLE AROMATICS	MCL	SW8021B	Units: ug/L
Benzene	ND	1	1 03/15/02 4:43 DL 1062038
Ethylbenzene	ND	1	1 03/15/02 4:43 DL 1062038
Toluene	ND	1	1 03/15/02 4:43 DL 1062038
Xylenes, Total	ND	1	1 03/15/02 4:43 DL 1062038
Surr: 4-Bromofluorobenzene	102	% 48-156	1 03/15/02 4:43 DL 1062038
Surr: 1,4-Difluorobenzene	100	% 72-137	1 03/15/02 4:43 DL 1062038

SULFATE	MCL	E300	Units: mg/L
Sulfate	150	2	10 03/14/02 11:34 ES 1068045

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
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 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-4 Collected: 03/12/2002 9:40 SPL Sample ID: 02030430-03

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY, BICARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Bicarbonate	210	2	1		03/15/02 15:30	SN	1070466
ALKALINITY, CARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Carbonate	ND	2	1		03/15/02 15:30	SN	1070524
CHLORIDE, TOTAL			MCL	E325.3	Units: mg/L		
Chloride	183	2	2		03/18/02 14:30	CV	1064801
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.2	1		03/19/02 8:13	AR	1068844
Surr: n-Pentacosane	93.8 %	18-120	1		03/19/02 8:13	AR	1068844

Prep Method	Prep Date	Prep Initials
SW3510B	03/14/2002 12:11	KL

FLUORIDE-IC			MCL	E300	Units: mg/L		
Fluoride	1.2	0.1	1		03/13/02 11:55	ES	1067986

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		03/15/02 4:17	DL	1062090
Surr: 1,4-Difluorobenzene	102 %	74-121	1		03/15/02 4:17	DL	1062090
Surr: 4-Bromofluorobenzene	96.3 %	55-150	1		03/15/02 4:17	DL	1062090

HARDNESS, TOTAL (TITRIMETRIC, EDTA)			MCL	E130.2	Units: mg/L		
Hardness (As CaCO3)	450	25	5		03/19/02 11:45	CV	1068418

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		03/22/02 11:25	ER	1070983
Ethylene	ND	0.0032	1		03/22/02 11:25	ER	1070983
Methane	0.0024	0.0012	1		03/22/02 11:25	ER	1070983

MERCURY, TOTAL			MCL	SW7470A	Units: mg/L		
Mercury	ND	0.0002	1		03/15/02 12:50	R_T	1063737

Prep Method	Prep Date	Prep Initials
SW7470A	03/15/2002 9:30	R_T

METALS BY METHOD 6010B, TOTAL			MCL	SW6010B	Units: mg/L		
Arsenic	0.0101	0.005	1		03/15/02 2:44	JS	1062862
Lead	ND	0.005	1		03/15/02 2:44	JS	1062862
Selenium	ND	0.005	1		03/15/02 2:44	JS	1062862
Barium	0.0805	0.005	1		03/19/02 4:17	NS	1068541
Cadmium	ND	0.005	1		03/19/02 4:17	NS	1068541
Calcium	130	0.1	1		03/21/02 2:25	NS	1069156
Chromium	ND	0.01	1		03/19/02 4:17	NS	1068541

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
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 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-4

Collected: 03/12/2002 9:40

SPL Sample ID: 02030430-03

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
Magnesium	20.7	0.1	1		03/19/02 4:17	NS	1068541
Potassium	2.79	2	1		03/19/02 4:17	NS	1068541
Silver	ND	0.01	1		03/19/02 4:17	NS	1068541
Sodium	128	0.5	1		03/19/02 4:17	NS	1068541

Prep Method	Prep Date	Prep Initials
SW3010A	03/14/2002 7:30	MW

NITROGEN, NITRATE (AS N)		MCL	E300	Units: mg/L	
Nitrogen, Nitrate (As N)	8.55	0.1	1	03/13/02 11:55	ES 1064697

POLYNUCLEAR AROMATIC HYDROCARBONS		MCL	SW8310	Units: ug/L	
Acenaphthene	ND	0.1	1	03/18/02 16:49	YN 1065581
Acenaphthylene	ND	0.1	1	03/18/02 16:49	YN 1065581
Anthracene	ND	0.1	1	03/18/02 16:49	YN 1065581
Benz(a)anthracene	ND	0.1	1	03/18/02 16:49	YN 1065581
Benzo(a)pyrene	ND	0.1	1	03/18/02 16:49	YN 1065581
Benzo(b)fluoranthene	ND	0.1	1	03/18/02 16:49	YN 1065581
Benzo(g,h,i)perylene	ND	0.1	1	03/18/02 16:49	YN 1065581
Benzo(k)fluoranthene	ND	0.1	1	03/18/02 16:49	YN 1065581
Chrysene	ND	0.1	1	03/18/02 16:49	YN 1065581
Dibenzo(a,h)anthracene	ND	0.1	1	03/18/02 16:49	YN 1065581
Fluoranthene	ND	0.1	1	03/18/02 16:49	YN 1065581
Fluorene	ND	0.1	1	03/18/02 16:49	YN 1065581
Indeno(1,2,3-cd)pyrene	ND	0.1	1	03/18/02 16:49	YN 1065581
Naphthalene	ND	0.1	1	03/18/02 16:49	YN 1065581
Phenanthrene	ND	0.1	1	03/18/02 16:49	YN 1065581
Pyrene	ND	0.1	1	03/18/02 16:49	YN 1065581
Surr: 1-Fluoronaphthalene	56.2	% 15-96	1	03/18/02 16:49	YN 1065581
Surr: Phenanthrene-d10	58.3	% 33-108	1	03/18/02 16:49	YN 1065581

Prep Method	Prep Date	Prep Initials
SW3510B	03/15/2002 15:01	DB

PURGEABLE AROMATICS		MCL	SW8021B	Units: ug/L	
Benzene	ND	1	1	03/15/02 4:17	DL 1062037
Ethylbenzene	ND	1	1	03/15/02 4:17	DL 1062037
Toluene	ND	1	1	03/15/02 4:17	DL 1062037
Xylenes, Total	ND	1	1	03/15/02 4:17	DL 1062037
Surr: 4-Bromofluorobenzene	103	% 48-156	1	03/15/02 4:17	DL 1062037
Surr: 1,4-Difluorobenzene	101	% 72-137	1	03/15/02 4:17	DL 1062037

SULFATE		MCL	E300	Units: mg/L	
Sulfate	160	2	10	03/14/02 11:34	ES 1068046

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



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Client Sample ID Trip Blank 3/12/02 Collected: 03/12/2002 0:00 SPL Sample ID: 02030430-04

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		03/15/02 1:20	DL	1062073
Surr: 1,4-Difluorobenzene	96.7	% 74-121	1		03/15/02 1:20	DL	1062073
Surr: 4-Bromofluorobenzene	95.0	% 55-150	1		03/15/02 1:20	DL	1062073
PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		03/15/02 1:20	DL	1062030
Ethylbenzene	ND	1	1		03/15/02 1:20	DL	1062030
Toluene	ND	1	1		03/15/02 1:20	DL	1062030
Xylenes, Total	ND	1	1		03/15/02 1:20	DL	1062030
Surr: 4-Bromofluorobenzene	101	% 48-156	1		03/15/02 1:20	DL	1062030
Surr: 1,4-Difluorobenzene	102	% 72-137	1		03/15/02 1:20	DL	1062030

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
* - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
J - Estimated Value between MDL and PQL

Quality Control Documentation



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
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Brown & Caldwell
BJ Hobbs 12832-07

Analysis: Diesel Range Organics
Method: SW8015B

WorkOrder: 02030430
Lab Batch ID: 18664

Method Blank

Samples in Analytical Batch:

RunID: HP_T_020318B-1068833 Units: mg/L
Analysis Date: 03/18/2002 20:02 Analyst: AR
Preparation Date: 03/14/2002 12:11 Prep By: KL Method SW3510B

Lab Sample ID Client Sample ID
02030430-01B MW-1
02030430-02B MW-3
02030430-03B MW-4

Table with 3 columns: Analyte, Result, Rep Limit. Rows: Diesel Range Organics (ND, 0.20), Surr: n-Pentacosane (70.2, 18-120)

Laboratory Control Sample (LCS)

RunID: HP_T_020318B-1068834 Units: mg/L
Analysis Date: 03/18/2002 20:38 Analyst: AR
Preparation Date: 03/14/2002 12:11 Prep By: KL Method SW3510B

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Diesel Range Organics (2.5, 1.7, 66, 21, 175)

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030441-02
RunID: HP_T_020318B-1068836 Units: mg/L
Analysis Date: 03/18/2002 22:28 Analyst: AR
Preparation Date: 03/14/2002 12:11 Prep By: Method

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Diesel Range Organics (0.078, 5, 3.4, 66.2, 5, 3.4, 66.0, 0.248, 39, 13, 130)

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
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Analysis: Headspace Gas Analysis
Method: RSK147

WorkOrder: 02030430
Lab Batch ID: R55822

Method Blank

Samples in Analytical Batch:

RunID: VARC_020322A-1070780 Units: mg/L
Analysis Date: 03/22/2002 9:34 Analyst: ER

Lab Sample ID Client Sample ID
02030430-01G MW-1
02030430-02G MW-3
02030430-03G MW-4

Table with 3 columns: Analyte, Result, Rep Limit. Rows: Ethane (ND, 0.0025), Ethylene (ND, 0.0032), Methane (ND, 0.0012)

Sample Duplicate

Original Sample: 02030428-03
RunID: VARC_020322A-1070784 Units: mg/L
Analysis Date: 03/22/2002 10:52 Analyst: ER

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Rows: Butane, Ethane, Ethylene, Isobutane, Methane, Propane, Propylene

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
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Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 02030430
Lab Batch ID: R55390

Method Blank

Samples in Analytical Batch:

RunID: HP_U_020314A-1062017 Units: ug/L
Analysis Date: 03/14/2002 17:18 Analyst: DL

Lab Sample ID Client Sample ID
02030430-01A MW-1
02030430-02A MW-3
02030430-03A MW-4
02030430-04A Trip Blank 3/12/02

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Benzene, Ethylbenzene, Toluene, Xylenes, Total, and Surr: 1,4-Difluorobenzene.

Laboratory Control Sample (LCS)

RunID: HP_U_020314A-1062016 Units: ug/L
Analysis Date: 03/14/2002 16:27 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Benzene, Ethylbenzene, Toluene, Xylenes, Total.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: HP_U_020314A-1062018 Units: ug/L
Analysis Date: 03/14/2002 17:43 Analyst: DL

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Benzene, Ethylbenzene, Toluene, Xylenes, Total.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
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Analysis: Gasoline Range Organics
Method: SW8015B

WorkOrder: 02030430
Lab Batch ID: R55392

Method Blank

Samples in Analytical Batch:

RunID: HP_U_020314B-1062062 Units: mg/L
Analysis Date: 03/14/2002 17:18 Analyst: DL

Lab Sample ID Client Sample ID
02030430-01A MW-1
02030430-02A MW-3
02030430-03A MW-4
02030430-04A Trip Blank 3/12/02

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Gasoline Range Organics, Surr: 1,4-Difluorobenzene, and Surr: 4-Bromofluorobenzene.

Laboratory Control Sample (LCS)

RunID: HP_U_020314B-1062061 Units: mg/L
Analysis Date: 03/14/2002 16:52 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row for Gasoline Range Organics.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-02
RunID: HP_U_020314B-1062063 Units: mg/L
Analysis Date: 03/14/2002 18:33 Analyst: DL

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row for Gasoline Range Organics.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Analysis: Polynuclear Aromatic Hydrocarbons
Method: SW8310

WorkOrder: 02030430
Lab Batch ID: 18700

Method Blank

Samples in Analytical Batch:

RunID: 2_020318A-1065578 Units: ug/L
Analysis Date: 03/18/2002 13:38 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Lab Sample ID Client Sample ID
02030430-01C MW-1
02030430-02C MW-3
02030430-03C MW-4

Table with 3 columns: Analyte, Result, Rep Limit. Lists various polynuclear aromatic hydrocarbons and their results (mostly ND) and reporting limits.

Laboratory Control Sample (LCS)

RunID: 2_020318A-1065579 Units: ug/L
Analysis Date: 03/18/2002 14:16 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Shows recovery data for various analytes.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell

BJ Hobbs 12832-07

Analysis: Polynuclear Aromatic Hydrocarbons
Method: SW8310

WorkOrder: 02030430
Lab Batch ID: 18700

Laboratory Control Sample (LCS)

RunID: 2_020318A-1065579 Units: ug/L
Analysis Date: 03/18/2002 14:16 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Naphthalene, Phenanthrene, and Pyrene.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030427-01
RunID: 2_020318A-1065586 Units: ug/L
Analysis Date: 03/18/2002 21:53 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Large table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Lists various polynuclear aromatic hydrocarbons and their recovery data.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
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Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030430
Lab Batch ID: 18657

Method Blank

Samples in Analytical Batch:

RunID: TJA_020318F-1068520 Units: mg/L
Analysis Date: 03/19/2002 1:59 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Lab Sample ID Client Sample ID
02030430-01D MW-1
02030430-02D MW-3
02030430-03D MW-4

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Barium, Cadmium, Chromium, Magnesium, Potassium, Silver, Sodium.

Laboratory Control Sample (LCS)

RunID: TJA_020318F-1068521 Units: mg/L
Analysis Date: 03/19/2002 2:05 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Barium, Cadmium, Chromium, Magnesium, Potassium, Silver, Sodium.

Post Digestion Spike (PDS) / Post Digestion Spike Duplicate (PDSD)

Sample Spiked: 02030442-05
RunID: TJA_020318F-1068526 Units: mg/L
Analysis Date: 03/19/2002 2:36 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: Method

Table with 12 columns: Analyte, Sample Result, PDS Spike Added, PDS Result, PDS % Recovery, PDSD Spike Added, PDSD Result, PDSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Magnesium, Potassium, Sodium.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030430
Lab Batch ID: 18657

Sample Spiked: 02030442-05
RunID: TJA_020318F-1068523 Units: mg/L
Analysis Date: 03/19/2002 2:17 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Barium, Cadmium, Chromium, Magnesium, Potassium, Silver, and Sodium.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030430
Lab Batch ID: 18657-T

Method Blank

Samples in Analytical Batch:

RunID: TJAT_020314B-1062837 Units: mg/L
Analysis Date: 03/14/2002 23:57 Analyst: JS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Lab Sample ID Client Sample ID
02030430-01D MW-1
02030430-02D MW-3
02030430-03D MW-4

Table with 3 columns: Analyte, Result, Rep Limit. Rows: Arsenic, Lead, Selenium.

Laboratory Control Sample (LCS)

RunID: TJAT_020314B-1062838 Units: mg/L
Analysis Date: 03/15/2002 0:03 Analyst: JS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows: Arsenic, Lead, Selenium.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030442-05
RunID: TJAT_020314B-1062840 Units: mg/L
Analysis Date: 03/15/2002 0:17 Analyst: JS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows: Arsenic, Lead, Selenium.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



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Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030430
Lab Batch ID: 18657A

Method Blank

Samples in Analytical Batch:

RunID: TJA_020320D-1069137 Units: mg/L
Analysis Date: 03/21/2002 0:15 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A
Lab Sample ID: 02030430-01D Client Sample ID: MW-1
02030430-02D Client Sample ID: MW-3
02030430-03D Client Sample ID: MW-4

Table with 3 columns: Analyte, Result, Rep Limit. Rows: Calcium (ND, 0.1), Sodium (ND, 0.5)

Laboratory Control Sample (LCS)

RunID: TJA_020320D-1069138 Units: mg/L
Analysis Date: 03/21/2002 0:21 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows: Calcium, Sodium

Post Digestion Spike (PDS) / Post Digestion Spike Duplicate (PDSD)

Sample Spiked: 02030442-05
RunID: TJA_020320D-1069143 Units: mg/L
Analysis Date: 03/21/2002 0:52 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: Method

Table with 12 columns: Analyte, Sample Result, PDS Spike Added, PDS Result, PDS % Recovery, PDSD Spike Added, PDSD Result, PDSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows: Calcium, Sodium

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030442-05
RunID: TJA_020320D-1069140 Units: mg/L
Analysis Date: 03/21/2002 0:34 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows: Calcium, Sodium

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030430
Lab Batch ID: 18657A

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030442-05
RunID: TJA_020320D-1069140 Units: mg/L
Analysis Date: 03/21/2002 0:34 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Calcium	140	1	137	-757 *	1	139	-539 *	33.6 *	20	75	125
Sodium	130	1	118	-722 *	1	119	-703 *	2.62	20	75	125

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Analysis: Mercury, Total
Method: SW7470A

WorkOrder: 02030430
Lab Batch ID: 18720

Method Blank

Samples in Analytical Batch:

RunID: HGL_020315B-1063715 Units: mg/L
Analysis Date: 03/15/2002 12:50 Analyst: R_T
Preparation Date: 03/15/2002 9:30 Prep By: R_T Method SW7470A

Table with 2 columns: Lab Sample ID, Client Sample ID. Rows include 02030430-01D (MW-1), 02030430-02D (MW-3), 02030430-03D (MW-4).

Table with 3 columns: Analyte, Result, Rep Limit. Row: Mercury, ND, 0.0002

Laboratory Control Sample (LCS)

RunID: HGL_020315B-1063717 Units: mg/L
Analysis Date: 03/15/2002 12:50 Analyst: R_T
Preparation Date: 03/15/2002 9:30 Prep By: R_T Method SW7470A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Mercury, 0.002, 0.00212, 106, 80, 120

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030325-01
RunID: HGL_020315B-1063719 Units: mg/L
Analysis Date: 03/15/2002 12:50 Analyst: R_T
Preparation Date: 03/15/2002 9:30 Prep By: R_T Method SW7470A

Table with 11 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Mercury, ND, 0.002, 0.00202, 101, 0.002, 0.0022, 110, 8.53, 20, 75, 125

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Analysis: Nitrogen, Nitrate (As N)
Method: E300

WorkOrder: 02030430
Lab Batch ID: R55540

Method Blank

Samples in Analytical Batch:

RunID: WET_020313S-1064679 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Lab Sample ID: 02030430-01F
Client Sample ID: MW-1

Table with 3 columns: Analyte, Result, Rep Limit. Row: Nitrogen, Nitrate (As N), ND, 0.10

Laboratory Control Sample (LCS)

RunID: WET_020313S-1064680 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Nitrogen, Nitrate (As N), 10, 9.46, 95, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020313S-1064682 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Nitrogen, Nitrate (As N), 3.0, 10, 12.6, 95.9, 10, 12.6, 95.7, 0.271, 20, 76, 124

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ Hobbs 12832-07

Analysis: Nitrogen, Nitrate (As N)
Method: E300

WorkOrder: 02030430
Lab Batch ID: R55540A

Method Blank

Samples in Analytical Batch:

RunID: WET_020313S-1064679 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Lab Sample ID Client Sample ID
02030430-02F MW-3
02030430-03F MW-4

Table with 3 columns: Analyte, Result, Rep Limit. Row: Nitrogen, Nitrate (As N), ND, 0.10

Laboratory Control Sample (LCS)

RunID: WET_020313S-1064680 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Nitrogen, Nitrate (As N), 10, 9.46, 95, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030430-02
RunID: WET_020313S-1064695 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Nitrogen, Nitrate (As N), 3.9, 10, 13.5, 96.7, 10, 13.4, 95.4, 1.36, 20, 76, 124

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-07

Analysis: Chloride, Total
Method: E325.3

WorkOrder: 02030430
Lab Batch ID: R55542A

Method Blank

Samples in Analytical Batch:

RunID: WET_020318L-1064782 Units: mg/L
Analysis Date: 03/18/2002 14:30 Analyst: CV

Lab Sample ID Client Sample ID
02030430-01E MW-1
02030430-02E MW-3
02030430-03E MW-4

Table with 3 columns: Analyte, Result, Rep Limit. Row: Chloride, ND, 1.0

Laboratory Control Sample (LCS)

RunID: WET_020318L-1064784 Units: mg/L
Analysis Date: 03/18/2002 14:30 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Chloride, 143, 141, 99, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030430-01
RunID: WET_020318L-1064798 Units: mg/L
Analysis Date: 03/18/2002 14:30 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Chloride, 180, 250, 426, 99.9, 250, 431, 102, 1.71, 20, 85, 115

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-07

Analysis: Fluoride-IC
Method: E300

WorkOrder: 02030430
Lab Batch ID: R55674

Method Blank

Samples in Analytical Batch:

RunID: WET_020313T-1067964 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Lab Sample ID: 02030430-01F
Client Sample ID: MW-1

Table with 3 columns: Analyte, Result, Rep Limit. Row: Fluoride, ND, 0.10

Laboratory Control Sample (LCS)

RunID: WET_020313T-1067965 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Fluoride, 10, 9.8, 98, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020313T-1067967 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 11 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Fluoride, 1.4, 10, 9.8, 84.1, 10, 9.7, 82.4, 1.97, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-07

Analysis: Fluoride-IC
Method: E300

WorkOrder: 02030430
Lab Batch ID: R55674A

Method Blank

Samples in Analytical Batch:

RunID: WET_020313T-1067964 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Lab Sample ID Client Sample ID
02030430-02F MW-3
02030430-03F MW-4

Table with 3 columns: Analyte, Result, Rep Limit. Row: Fluoride, ND, 0.10

Laboratory Control Sample (LCS)

RunID: WET_020313T-1067965 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Fluoride, 10, 9.8, 98, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030430-02
RunID: WET_020313T-1067981 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Fluoride, 1.4, 10, 9.5, 81.0, 10, 9.4, 80.1, 1.18, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-07

Analysis: Sulfate
Method: E300

WorkOrder: 02030430
Lab Batch ID: R55679A

Method Blank

Samples in Analytical Batch:

RunID: WET_020314S-1068028 Units: mg/L
Analysis Date: 03/14/2002 11:34 Analyst: ES

Lab Sample ID Client Sample ID
02030430-01F MW-1
02030430-02F MW-3
02030430-03F MW-4

Table with 3 columns: Analyte, Result, Rep Limit. Row: Sulfate, ND, 0.20

Laboratory Control Sample (LCS)

RunID: WET_020314S-1068029 Units: mg/L
Analysis Date: 03/14/2002 11:34 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Sulfate, 10, 9.9, 99, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030430-01
RunID: WET_020314S-1068043 Units: mg/L
Analysis Date: 03/14/2002 11:34 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Sulfate, 190, 200, 390, 99.2, 200, 390, 99.5, 0.262, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-07

Analysis: Hardness, Total (Titrimetric, EDTA)
Method: E130.2

WorkOrder: 02030430
Lab Batch ID: R55701

Method Blank

Samples in Analytical Batch:

RunID: WET_020319U-1068403 Units: mg/L
Analysis Date: 03/19/2002 11:45 Analyst: CV

Lab Sample ID Client Sample ID
02030430-01D MW-1
02030430-02D MW-3
02030430-03D MW-4

Table with 3 columns: Analyte, Result, Rep Limit. Row: Hardness (As CaCO3), ND, 5.0

Laboratory Control Sample (LCS)

RunID: WET_020319U-1068405 Units: mg/L
Analysis Date: 03/19/2002 11:45 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Hardness (As CaCO3), 202, 200, 101, 94, 108

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020319U-1068407 Units: mg/L
Analysis Date: 03/19/2002 11:45 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Hardness (As CaCO3), 420, 500, 920, 100, 500, 920, 100, 0, 20, 81, 111

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-07

Analysis: Alkalinity, Bicarbonate
Method: M2320 B

WorkOrder: 02030430
Lab Batch ID: R55803A

Method Blank

Samples in Analytical Batch:

RunID: WET_020315S-1070451 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 2 columns: Lab Sample ID, Client Sample ID. Rows include 02030430-01E (MW-1), 02030430-02E (MW-3), 02030430-03E (MW-4).

Table with 3 columns: Analyte, Result, Rep Limit. Row: Alkalinity, Bicarbonate, ND, 2.0

Laboratory Control Sample (LCS)

RunID: WET_020315S-1070453 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Alkalinity, Bicarbonate, 80.3, 80, 100, 90, 110

Sample Duplicate

Original Sample: 02030430-03
RunID: WET_020315S-1070466 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Row: Alkalinity, Bicarbonate, 210, 210, 0, 20

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-07

Analysis: Alkalinity, Carbonate
Method: M2320 B

WorkOrder: 02030430
Lab Batch ID: R55804A

Method Blank

Samples in Analytical Batch:

RunID: WET_020315T-1070509 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Lab Sample ID Client Sample ID
02030430-01E MW-1
02030430-02E MW-3
02030430-03E MW-4

Table with 3 columns: Analyte, Result, Rep Limit. Row: Alkalinity, Carbonate, ND, 2.0

Laboratory Control Sample (LCS)

RunID: WET_020315T-1070511 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Alkalinity, Carbonate, 80.3, 80, 100, 90, 110

Sample Duplicate

Original Sample: 02030430-03
RunID: WET_020315T-1070524 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Row: Alkalinity, Carbonate, ND, ND, 0, 20

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

*Sample Receipt Checklist
And
Chain of Custody*



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Sample Receipt Checklist

Workorder:	02030430	Received By:	DS
Date and Time Received:	3/13/02 10:00:00 AM	Carrier name:	FedEx
Temperature:	4	Chilled by:	Water Ice

- 1. Shipping container/cooler in good condition? Yes No Not Present
- 2. Custody seals intact on shipping container/cooler? Yes No Not Present
- 3. Custody seals intact on sample bottles? Yes No Not Present
- 4. Chain of custody present? Yes No
- 5. Chain of custody signed when relinquished and received? Yes No
- 6. Chain of custody agrees with sample labels? Yes No
- 7. Samples in proper container/bottle? Yes No
- 8. Sample containers intact? Yes No
- 9. Sufficient sample volume for indicated test? Yes No
- 10. All samples received within holding time? Yes No
- 11. Container/Temp Blank temperature in compliance? Yes No
- 12. Water - VOA vials have zero headspace? Yes No Not Applicable
- 13. Water - pH acceptable upon receipt? Yes No Not Applicable

SPL Representative:	<input type="text"/>	Contact Date & Time:	<input type="text"/>
Client Name Contacted:	<input type="text"/>		
Non Conformance Issues:	<input type="text"/>		
Client Instructions:	<input type="text"/>		



SPL, Inc.

Analysis Request & Chain of Custody Record

SPL Workorder No:

169963

02030430

page 1 of 1

Requested Analysis

Client Name: Brown & Caldwell

Address/Phone: 1415 Louisiana St 713-759-0779

Client Contact: Rick Rexroad

Project Name: BS Hobbs

Project Number: 12832-017

Project Location: Hobbs, NM

Invoice To: Rick Rexroad

matrix bottle size pres. Number of Containers

W=water S=soil SL=sludge O=other: P=plastic A=amber glass G=glass V=vial 1=1 liter 4=4oz 40=vial 8=8oz 16=16oz 1=HCl 2=HNO3 3=H2SO4 O=other:

Requested Analysis

- BTEX 80218, TPH 8015
- TPH D, TPH G 8015
- PAHs 8310
- RCA metals 30546012 7000, Ca, Mg, K, Na 6010
- Chloride 325-3
- Nitrate Sulfate Fluoride 300-D
- Carb/bicarb 4500-CO2-D
- Total Calcds Hardness 130.1
- methane/ethylene/Ethane RSK 507

SAMPLE ID	DATE	TIME	comp	grab	matrix	bottle	size	pres.	Number of Containers	Requested Analysis											
										BTEX	TPH	TPH D	TPH G	PAHs	RCA metals	Chloride	Nitrate Sulfate Fluoride	Carb/bicarb	Total Calcds	methane/ethylene/Ethane	
MW-1	3/12/02	8:44			W	PAV	401	1,2	11	X	X	X	X	X	X	X	X	X	X	X	X
MW-3	3/12/02	9:18			W	PAV	40,1	1,2	12	X	X	X	X	X	X	X	X	X	X	X	X
MW-4	3/12/02	9:40			W	PAV	70,1	1,2	11	X	X	X	X	X	X	X	X	X	X	X	X
RUSH																					

Top Blank-1 3/12/02

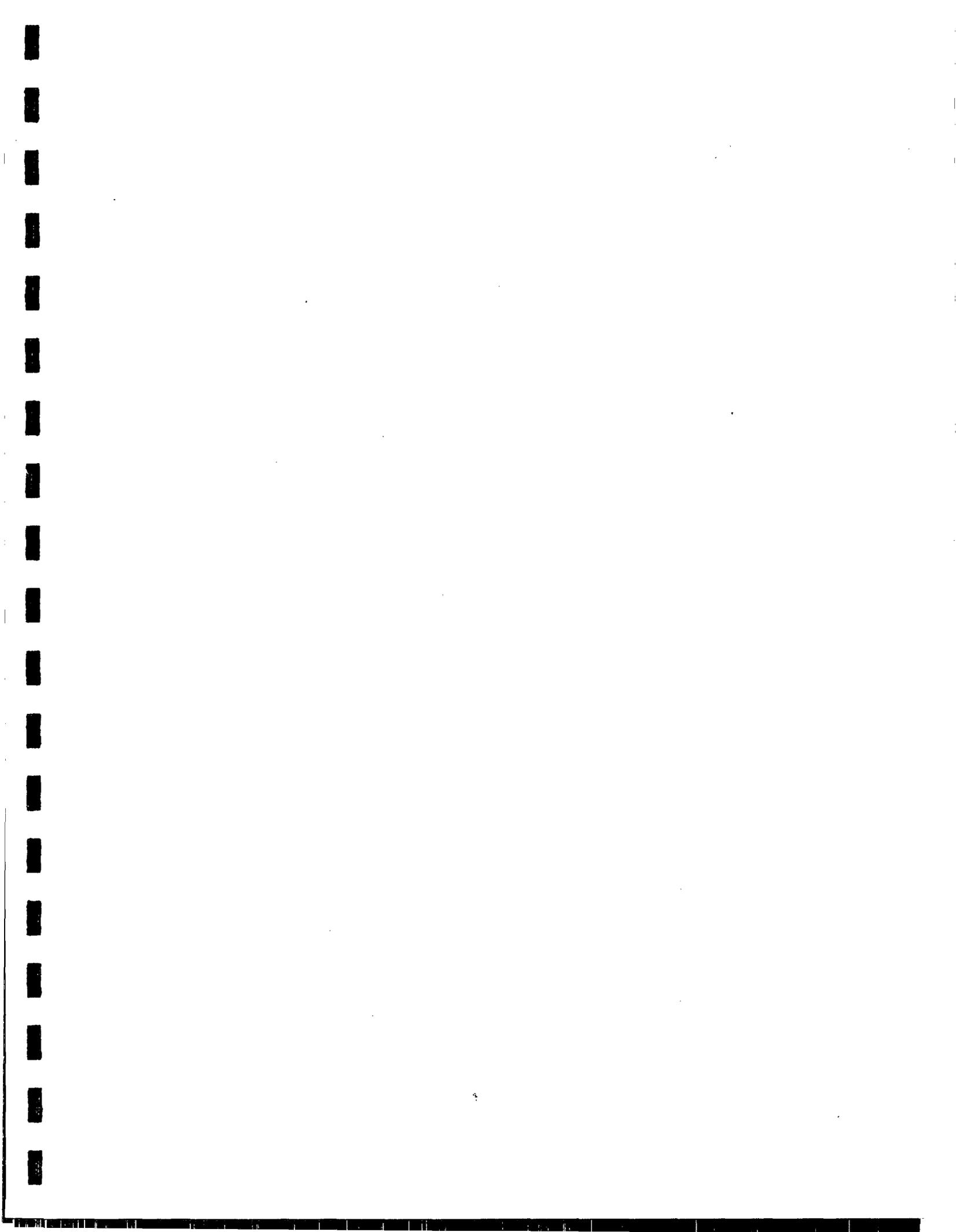
Client/Consultant Remarks: Laboratory remarks:

Requested TAT: 24hr, 72hr, 48hr, Standard, Other

Special Reporting Requirements: Standard QC, Level 3 QC, Level 4 QC, Raw Data, Special Detection Limits (specify):

8880 Interchange Drive, Houston, TX 77054 (713) 660-0901 500 Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775







HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
(713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

02030425

Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	Project Name: BJ Hobbs 12832-017 Site: Hobbs,NM Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 3/25/02
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This Report Contains A Total Of 29 Pages

Excluding This Page

And

Chain Of Custody

3/25/02

Date



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:
Brown & Caldwell

Certificate of Analysis Number:

02030425

Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	Project Name: BJ Hobbs 12832-017 Site: Hobbs, NM Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 3/25/02
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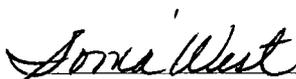
Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.


Sonia West
Senior Project Manager

3/25/02

Date



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

02030425

Report To: Brown & Caldwell
 Rick Rexroad
 1415 Louisiana
 Suite 2509
 Houston
 TX
 77002-
 ph: (713) 759-0999

fax: (713) 308-3886

Project Name: BJ Hobbs 12832-017

Site: Hobbs,NM

Site Address:

PO Number:

State: New Mexico

State Cert. No.:

Date Reported: 3/25/02

Fax To:

Brown & Caldwell
 Rick Rexroad fax : (713) 308-3886

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
MW-5	02030425-01	Water	3/12/02 8:15:00 AM	3/13/02 10:00:00 AM	169961	<input type="checkbox"/>
MW-7	02030425-02	Water	3/12/02 10:34:00 AM	3/13/02 10:00:00 AM	169961	<input type="checkbox"/>
MW-8	02030425-03	Water	3/12/02 10:19:00 AM	3/13/02 10:00:00 AM	169961	<input type="checkbox"/>
Trip Blank-2	02030425-04	Water	3/12/02	3/13/02 10:00:00 AM	169961	<input type="checkbox"/>

Sonia West
 Sonia West
 Senior Project Manager

3/25/02

Date

Joel Grice
 Laboratory Director

Ted Yen
 Quality Assurance Officer



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-5 Collected: 03/12/2002 8:15 SPL Sample ID: 02030425-01

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY, BICARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Bicarbonate	260	2	1		03/15/02 15:30	SN	1070454
ALKALINITY, CARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Carbonate	ND	2	1		03/15/02 15:30	SN	1070512
CHLORIDE, TOTAL			MCL	E325.3	Units: mg/L		
Chloride	127	2	2		03/14/02 11:00	CV	1061396
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	ND	0.24	1		03/19/02 4:34	AR	1068838
Surr: n-Pentacosane	80.5	% 18-120	1		03/19/02 4:34	AR	1068838

Prep Method	Prep Date	Prep Initials
SW3510B	03/14/2002 12:11	KL

FLUORIDE-IC			MCL	E300	Units: mg/L		
Fluoride	1.4	0.1	1		03/13/02 11:55	ES	1067966
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		03/14/02 22:22	DL	1062071
Surr: 1,4-Difluorobenzene	101	% 74-121	1		03/14/02 22:22	DL	1062071
Surr: 4-Bromofluorobenzene	96.3	% 55-150	1		03/14/02 22:22	DL	1062071

HARDNESS, TOTAL (TITRIMETRIC, EDTA)			MCL	E130.2	Units: mg/L		
Hardness (As CaCO3)	420	50	10		03/19/02 11:45	CV	1068406

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		03/22/02 10:12	ER	1070781
Ethylene	ND	0.0032	1		03/22/02 10:12	ER	1070781
Methane	ND	0.0012	1		03/22/02 10:12	ER	1070781

MERCURY, TOTAL			MCL	SW7470A	Units: mg/L		
Mercury	0.000243	0.0002	1		03/15/02 12:50	R_T	1063730

Prep Method	Prep Date	Prep Initials
SW7470A	03/15/2002 9:30	R_T

METALS BY METHOD 6010B, TOTAL			MCL	SW6010B	Units: mg/L		
Arsenic	0.0104	0.005	1		03/15/02 1:41	JS	1062852
Lead	ND	0.005	1		03/15/02 1:41	JS	1062852
Selenium	0.00558	0.005	1		03/15/02 1:41	JS	1062852
Barium	0.0524	0.005	1		03/19/02 3:33	NS	1068534
Cadmium	ND	0.005	1		03/19/02 3:33	NS	1068534
Calcium	143	0.1	1		03/21/02 1:06	NS	1069145
Chromium	ND	0.01	1		03/19/02 3:33	NS	1068534

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-5

Collected: 03/12/2002 8:15

SPL Sample ID: 02030425-01

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
Magnesium	13	0.1	1		03/19/02 3:33	NS	1068534
Potassium	3.55	2	1		03/19/02 3:33	NS	1068534
Silver	ND	0.01	1		03/19/02 3:33	NS	1068534
Sodium	145	0.5	1		03/19/02 3:33	NS	1068534

Prep Method	Prep Date	Prep Initials
SW3010A	03/14/2002 7:30	MW

NITROGEN, NITRATE (AS N)	MCL	E300	Units: mg/L
Nitrogen, Nitrate (As N)	2.98	0.1	1 03/13/02 11:55 ES 1064681

POLYNUCLEAR AROMATIC HYDROCARBONS	MCL	SW8310	Units: ug/L
Acenaphthene	ND	0.1	1 03/18/02 20:37 YN 1065584
Acenaphthylene	ND	0.1	1 03/18/02 20:37 YN 1065584
Anthracene	ND	0.1	1 03/18/02 20:37 YN 1065584
Benz(a)anthracene	ND	0.1	1 03/18/02 20:37 YN 1065584
Benzo(a)pyrene	ND	0.1	1 03/18/02 20:37 YN 1065584
Benzo(b)fluoranthene	ND	0.1	1 03/18/02 20:37 YN 1065584
Benzo(g,h,i)perylene	ND	0.1	1 03/18/02 20:37 YN 1065584
Benzo(k)fluoranthene	ND	0.1	1 03/18/02 20:37 YN 1065584
Chrysene	ND	0.1	1 03/18/02 20:37 YN 1065584
Dibenzo(a,h)anthracene	ND	0.1	1 03/18/02 20:37 YN 1065584
Fluoranthene	ND	0.1	1 03/18/02 20:37 YN 1065584
Fluorene	ND	0.1	1 03/18/02 20:37 YN 1065584
Indeno(1,2,3-cd)pyrene	ND	0.1	1 03/18/02 20:37 YN 1065584
Naphthalene	ND	0.1	1 03/18/02 20:37 YN 1065584
Phenanthrene	ND	0.1	1 03/18/02 20:37 YN 1065584
Pyrene	ND	0.1	1 03/18/02 20:37 YN 1065584
Surr: 1-Fluoronaphthalene	73.3 %	15-96	1 03/18/02 20:37 YN 1065584
Surr: Phenanthrene-d10	73.8 %	33-108	1 03/18/02 20:37 YN 1065584

Prep Method	Prep Date	Prep Initials
SW3510B	03/15/2002 15:01	DB

PURGEABLE AROMATICS	MCL	SW8021B	Units: ug/L
Benzene	ND	1	1 03/14/02 22:22 DL 1062026
Ethylbenzene	ND	1	1 03/14/02 22:22 DL 1062026
Toluene	ND	1	1 03/14/02 22:22 DL 1062026
Xylenes, Total	ND	1	1 03/14/02 22:22 DL 1062026
Surr: 4-Bromofluorobenzene	103 %	48-156	1 03/14/02 22:22 DL 1062026
Surr: 1,4-Difluorobenzene	99.6 %	72-137	1 03/14/02 22:22 DL 1062026

SULFATE	MCL	E300	Units: mg/L
Sulfate	120	4	20 03/14/02 11:34 ES 1068030

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-7 Collected: 03/12/2002 10:34 SPL Sample ID: 02030425-02

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY, BICARBONATE							
Alkalinity, Bicarbonate	260	2	1	M2320 B	03/15/02 15:30	SN	1070456
ALKALINITY, CARBONATE							
Alkalinity, Carbonate	ND	2	1	M2320 B	03/15/02 15:30	SN	1070514
CHLORIDE, TOTAL							
Chloride	188	2	2	E325.3	03/14/02 11:00	CV	1061398
FLUORIDE-IC							
Fluoride	1.3	0.1	1	E300	03/13/02 11:55	ES	1067970
GASOLINE RANGE ORGANICS							
Gasoline Range Organics	ND	0.1	1	SW8015B	03/14/02 21:57	DL	1062070
Surr: 1,4-Difluorobenzene	101	% 74-121	1		03/14/02 21:57	DL	1062070
Surr: 4-Bromofluorobenzene	96.0	% 55-150	1		03/14/02 21:57	DL	1062070
NITROGEN, NITRATE (AS N)							
Nitrogen, Nitrate (As N)	3.23	0.1	1	E300	03/13/02 11:55	ES	1064684
PURGEABLE AROMATICS							
Benzene	ND	1	1	SW8021B	03/14/02 21:57	DL	1062025
Ethylbenzene	ND	1	1		03/14/02 21:57	DL	1062025
Toluene	ND	1	1		03/14/02 21:57	DL	1062025
Xylenes, Total	ND	1	1		03/14/02 21:57	DL	1062025
Surr: 4-Bromofluorobenzene	102	% 48-156	1		03/14/02 21:57	DL	1062025
Surr: 1,4-Difluorobenzene	101	% 72-137	1		03/14/02 21:57	DL	1062025
SULFATE							
Sulfate	240	4	20	E300	03/14/02 11:34	ES	1068033

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
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Client Sample ID MW-8 Collected: 03/12/2002 10:19 SPL Sample ID: 02030425-03

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #						
ALKALINITY, BICARBONATE													
Alkalinity, Bicarbonate	340	2	1	M2320 B	03/15/02 15:30	SN	1070457						
ALKALINITY, CARBONATE													
Alkalinity, Carbonate	ND	2	1	M2320 B	03/15/02 15:30	SN	1070515						
CHLORIDE, TOTAL													
Chloride	241	5	5	E325.3	03/14/02 11:00	CV	1061403						
DIESEL RANGE ORGANICS													
Diesel Range Organics	0.38	0.25	1	SW8015B	03/19/02 5:10	AR	1068839						
Surr: n-Pentacosane	102	% 18-120	1		03/19/02 5:10	AR	1068839						
<table border="1"> <thead> <tr> <th>Prep Method</th> <th>Prep Date</th> <th>Prep Initials</th> </tr> </thead> <tbody> <tr> <td>SW3510B</td> <td>03/14/2002 12:11</td> <td>KL</td> </tr> </tbody> </table>								Prep Method	Prep Date	Prep Initials	SW3510B	03/14/2002 12:11	KL
Prep Method	Prep Date	Prep Initials											
SW3510B	03/14/2002 12:11	KL											
FLUORIDE-IC													
Fluoride	1.1	0.1	1	E300	03/13/02 11:55	ES	1067971						
GASOLINE RANGE ORGANICS													
Gasoline Range Organics	ND	0.1	1	SW8015B	03/14/02 21:31	DL	1062069						
Surr: 1,4-Difluorobenzene	101	% 74-121	1		03/14/02 21:31	DL	1062069						
Surr: 4-Bromofluorobenzene	96.3	% 55-150	1		03/14/02 21:31	DL	1062069						
NITROGEN, NITRATE (AS N)													
Nitrogen, Nitrate (As N)	0.607	0.1	1	E300	03/13/02 11:55	ES	1064685						
PURGEABLE AROMATICS													
Benzene	ND	1	1	SW8021B	03/14/02 21:31	DL	1062024						
Ethylbenzene	ND	1	1		03/14/02 21:31	DL	1062024						
Toluene	ND	1	1		03/14/02 21:31	DL	1062024						
Xylenes, Total	ND	1	1		03/14/02 21:31	DL	1062024						
Surr: 4-Bromofluorobenzene	102	% 48-156	1		03/14/02 21:31	DL	1062024						
Surr: 1,4-Difluorobenzene	99.1	% 72-137	1		03/14/02 21:31	DL	1062024						
SULFATE													
Sulfate	250	4	20	E300	03/14/02 11:34	ES	1068034						

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID Trip Blank-2 Collected: 03/12/2002 0:00 SPL Sample ID: 02030425-04

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		03/14/02 21:06	DL	1062068
Surr: 1,4-Difluorobenzene	101	% 74-121	1		03/14/02 21:06	DL	1062068
Surr: 4-Bromofluorobenzene	95.7	% 55-150	1		03/14/02 21:06	DL	1062068
PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		03/14/02 21:06	DL	1062023
Ethylbenzene	ND	1	1		03/14/02 21:06	DL	1062023
Toluene	ND	1	1		03/14/02 21:06	DL	1062023
Xylenes,Total	ND	1	1		03/14/02 21:06	DL	1062023
Surr: 4-Bromofluorobenzene	102	% 48-156	1		03/14/02 21:06	DL	1062023
Surr: 1,4-Difluorobenzene	98.0	% 72-137	1		03/14/02 21:06	DL	1062023

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
* - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
J - Estimated Value between MDL and PQL

Quality Control Documentation



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Diesel Range Organics
Method: SW8015B

WorkOrder: 02030425
Lab Batch ID: 18664

Method Blank

Samples in Analytical Batch:

RunID: HP_T_020318B-1068833 Units: mg/L
Analysis Date: 03/18/2002 20:02 Analyst: AR
Preparation Date: 03/14/2002 12:11 Prep By: KL Method SW3510B

Table with 3 columns: Analyte, Result, Rep Limit. Rows: Diesel Range Organics, Surr: n-Pentacosane.

Laboratory Control Sample (LCS)

RunID: HP_T_020318B-1068834 Units: mg/L
Analysis Date: 03/18/2002 20:38 Analyst: AR
Preparation Date: 03/14/2002 12:11 Prep By: KL Method SW3510B

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Diesel Range Organics.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030441-02
RunID: HP_T_020318B-1068836 Units: mg/L
Analysis Date: 03/18/2002 22:28 Analyst: AR
Preparation Date: 03/14/2002 12:11 Prep By: Method

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Diesel Range Organics.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
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Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Headspace Gas Analysis
Method: RSK147

WorkOrder: 02030425
Lab Batch ID: R55822

Method Blank

Samples in Analytical Batch:

RunID: VARC_020322A-1070780 Units: mg/L
Analysis Date: 03/22/2002 9:34 Analyst: ER

Lab Sample ID: 02030425-01G
Client Sample ID: MW-5

Table with 3 columns: Analyte, Result, Rep Limit. Rows: Ethane (ND, 0.0025), Ethylene (ND, 0.0032), Methane (ND, 0.0012)

Sample Duplicate

Original Sample: 02030428-03
RunID: VARC_020322A-1070784 Units: mg/L
Analysis Date: 03/22/2002 10:52 Analyst: ER

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Rows: Butane, Ethane, Ethylene, Isobutane, Methane, Propane, Propylene

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 02030425
Lab Batch ID: R55390

Method Blank

Samples in Analytical Batch:

RunID: HP_U_020314A-1062017 Units: ug/L
Analysis Date: 03/14/2002 17:18 Analyst: DL

Lab Sample ID Client Sample ID
02030425-01A MW-5
02030425-02A MW-7
02030425-03A MW-8
02030425-04A Trip Blank-2

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Benzene, Ethylbenzene, Toluene, Xylenes, Total, and Surr: 1,4-Difluorobenzene.

Laboratory Control Sample (LCS)

RunID: HP_U_020314A-1062016 Units: ug/L
Analysis Date: 03/14/2002 16:27 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Benzene, Ethylbenzene, Toluene, Xylenes, Total.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: HP_U_020314A-1062018 Units: ug/L
Analysis Date: 03/14/2002 17:43 Analyst: DL

Table with 13 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Benzene, Ethylbenzene, Toluene, Xylenes, Total.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
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(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Gasoline Range Organics
Method: SW8015B

WorkOrder: 02030425
Lab Batch ID: R55392

Method Blank

Samples in Analytical Batch:

RunID: HP_U_020314B-1062062 Units: mg/L
Analysis Date: 03/14/2002 17:18 Analyst: DL

Lab Sample ID Client Sample ID
02030425-01A MW-5
02030425-02A MW-7
02030425-03A MW-8
02030425-04A Trip Blank-2

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Gasoline Range Organics, Surr: 1,4-Difluorobenzene, and Surr: 4-Bromofluorobenzene.

Laboratory Control Sample (LCS)

RunID: HP_U_020314B-1062061 Units: mg/L
Analysis Date: 03/14/2002 16:52 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row for Gasoline Range Organics.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-02
RunID: HP_U_020314B-1062063 Units: mg/L
Analysis Date: 03/14/2002 18:33 Analyst: DL

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row for Gasoline Range Organics.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Polynuclear Aromatic Hydrocarbons
Method: SW8310

WorkOrder: 02030425
Lab Batch ID: 18700

Method Blank

Samples in Analytical Batch:

RunID: 2_020318A-1065578 Units: ug/L
Analysis Date: 03/18/2002 13:38 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Lab Sample ID: 02030425-01C
Client Sample ID: MW-5

Table with 3 columns: Analyte, Result, Rep Limit. Lists various polynuclear aromatic hydrocarbons and their results (mostly ND) and reporting limits.

Laboratory Control Sample (LCS)

RunID: 2_020318A-1065579 Units: ug/L
Analysis Date: 03/18/2002 14:16 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Shows recovery data for various analytes.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Polynuclear Aromatic Hydrocarbons
Method: SW8310

WorkOrder: 02030425
Lab Batch ID: 18700

Laboratory Control Sample (LCS)

RunID: 2_020318A-1065579 Units: ug/L
Analysis Date: 03/18/2002 14:16 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Naphthalene, Phenanthrene, and Pyrene.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030427-01
RunID: 2_020318A-1065586 Units: ug/L
Analysis Date: 03/18/2002 21:53 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Large table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Lists various polynuclear aromatic hydrocarbons and their results.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell

BJ Hobbs 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030425
Lab Batch ID: 18657

Method Blank

Samples in Analytical Batch:

RunID: TJA_020318F-1068520 Units: mg/L
Analysis Date: 03/19/2002 1:59 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Lab Sample ID: 02030425-01D
Client Sample ID: MW-5

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Barium, Cadmium, Chromium, Magnesium, Potassium, Silver, Sodium.

Laboratory Control Sample (LCS)

RunID: TJA_020318F-1068521 Units: mg/L
Analysis Date: 03/19/2002 2:05 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Barium, Cadmium, Chromium, Magnesium, Potassium, Silver, Sodium.

Post Digestion Spike (PDS) / Post Digestion Spike Duplicate (PDSD)

Sample Spiked: 02030442-05
RunID: TJA_020318F-1068526 Units: mg/L
Analysis Date: 03/19/2002 2:36 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: Method

Table with 12 columns: Analyte, Sample Result, PDS Spike Added, PDS Result, PDS % Recovery, PDSD Spike Added, PDSD Result, PDSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Magnesium, Potassium, Sodium.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell

BJ Hobbs 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030425
Lab Batch ID: 18657

Sample Spiked: 02030442-05
RunID: TJA_020318F-1068523 Units: mg/L
Analysis Date: 03/19/2002 2:17 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Barium, Cadmium, Chromium, Magnesium, Potassium, Silver, and Sodium.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030425
Lab Batch ID: 18657-T

Method Blank

Samples in Analytical Batch:

RunID: TJAT_020314B-1062837 Units: mg/L
Analysis Date: 03/14/2002 23:57 Analyst: JS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Lab Sample ID: 02030425-01D
Client Sample ID: MW-5

Table with 3 columns: Analyte, Result, Rep Limit. Rows for Arsenic, Lead, Selenium.

Laboratory Control Sample (LCS)

RunID: TJAT_020314B-1062838 Units: mg/L
Analysis Date: 03/15/2002 0:03 Analyst: JS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows for Arsenic, Lead, Selenium.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030442-05
RunID: TJAT_020314B-1062840 Units: mg/L
Analysis Date: 03/15/2002 0:17 Analyst: JS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows for Arsenic, Lead, Selenium.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030425
Lab Batch ID: 18657A

Method Blank

Samples in Analytical Batch:

RunID: TJA_020320D-1069137 Units: mg/L
Analysis Date: 03/21/2002 0:15 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Lab Sample ID: 02030425-01D
Client Sample ID: MW-5

Table with 3 columns: Analyte, Result, Rep Limit. Rows for Calcium and Sodium.

Laboratory Control Sample (LCS)

RunID: TJA_020320D-1069138 Units: mg/L
Analysis Date: 03/21/2002 0:21 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows for Calcium and Sodium.

Post Digestion Spike (PDS) / Post Digestion Spike Duplicate (PDSD)

Sample Spiked: 02030442-05
RunID: TJA_020320D-1069143 Units: mg/L
Analysis Date: 03/21/2002 0:52 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: Method

Table with 12 columns: Analyte, Sample Result, PDS Spike Added, PDS Result, PDS % Recovery, PDSD Spike Added, PDSD Result, PDSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows for Calcium and Sodium.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030442-05
RunID: TJA_020320D-1069140 Units: mg/L
Analysis Date: 03/21/2002 0:34 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows for Calcium and Sodium.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030425
Lab Batch ID: 18657A

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030442-05
RunID: TJA_020320D-1069140 Units: mg/L
Analysis Date: 03/21/2002 0:34 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Calcium and Sodium.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Mercury, Total
Method: SW7470A

WorkOrder: 02030425
Lab Batch ID: 18720

Method Blank

Samples in Analytical Batch:

RunID: HGL_020315B-1063715 Units: mg/L
Analysis Date: 03/15/2002 12:50 Analyst: R_T
Preparation Date: 03/15/2002 9:30 Prep By: R_T Method SW7470A

Lab Sample ID: 02030425-01D
Client Sample ID: MW-5

Table with 3 columns: Analyte, Result, Rep Limit. Row: Mercury, ND, 0.0002

Laboratory Control Sample (LCS)

RunID: HGL_020315B-1063717 Units: mg/L
Analysis Date: 03/15/2002 12:50 Analyst: R_T
Preparation Date: 03/15/2002 9:30 Prep By: R_T Method SW7470A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Mercury, 0.002, 0.00212, 106, 80, 120

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030325-01
RunID: HGL_020315B-1063719 Units: mg/L
Analysis Date: 03/15/2002 12:50 Analyst: R_T
Preparation Date: 03/15/2002 9:30 Prep By: R_T Method SW7470A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Mercury, ND, 0.002, 0.00202, 101, 0.002, 0.0022, 110, 8.53, 20, 75, 125

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

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Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Chloride, Total
Method: E325.3

WorkOrder: 02030425
Lab Batch ID: R55362

Method Blank

Samples in Analytical Batch:

RunID: WET_020314A-1061384 Units: mg/L
Analysis Date: 03/14/2002 11:00 Analyst: CV

Lab Sample ID Client Sample ID
02030425-01E MW-5
02030425-02E MW-7
02030425-03E MW-8

Table with 3 columns: Analyte, Result, Rep Limit. Row: Chloride, ND, 1.0

Laboratory Control Sample (LCS)

RunID: WET_020314A-1061386 Units: mg/L
Analysis Date: 03/14/2002 11:00 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Chloride, 143, 140, 98, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030254-01
RunID: WET_020314A-1061388 Units: mg/L
Analysis Date: 03/14/2002 11:00 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Chloride, 6.9, 50, 56, 98.2, 50, 56.9, 99.9, 1.74, 20, 85, 115

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Nitrogen, Nitrate (As N)
Method: E300

WorkOrder: 02030425
Lab Batch ID: R55540

Method Blank

Samples in Analytical Batch:

RunID: WET_020313S-1064679 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Lab Sample ID Client Sample ID
02030425-01E MW-5
02030425-02E MW-7
02030425-03E MW-8

Table with 3 columns: Analyte, Result, Rep Limit. Row: Nitrogen, Nitrate (As N), ND, 0.10

Laboratory Control Sample (LCS)

RunID: WET_020313S-1064680 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Nitrogen, Nitrate (As N), 10, 9.46, 95, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020313S-1064682 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Nitrogen, Nitrate (As N), 3.0, 10, 12.6, 95.9, 10, 12.6, 95.7, 0.271, 20, 76, 124

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
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HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Fluoride-IC
Method: E300

WorkOrder: 02030425
Lab Batch ID: R55674

Method Blank

Samples in Analytical Batch:

RunID: WET_020313T-1067964 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Lab Sample ID Client Sample ID
02030425-01E MW-5
02030425-02E MW-7
02030425-03E MW-8

Table with 3 columns: Analyte, Result, Rep Limit. Row: Fluoride, ND, 0.10

Laboratory Control Sample (LCS)

RunID: WET_020313T-1067965 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Fluoride, 10, 9.8, 98, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020313T-1067967 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Fluoride, 1.4, 10, 9.8, 84.1, 10, 9.7, 82.4, 1.97, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Sulfate
Method: E300

WorkOrder: 02030425
Lab Batch ID: R55679

Method Blank

Samples in Analytical Batch:

RunID: WET_020314S-1068028 Units: mg/L
Analysis Date: 03/14/2002 11:34 Analyst: ES

Lab Sample ID Client Sample ID
02030425-01E MW-5
02030425-02E MW-7
02030425-03E MW-8

Table with 3 columns: Analyte, Result, Rep Limit. Row: Sulfate, ND, 0.20

Laboratory Control Sample (LCS)

RunID: WET_020314S-1068029 Units: mg/L
Analysis Date: 03/14/2002 11:34 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Sulfate, 10, 9.9, 99, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020314S-1068031 Units: mg/L
Analysis Date: 03/14/2002 11:34 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Sulfate, 120, 200, 310, 94.9, 200, 310, 94.1, 0.809, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Hardness, Total (Titrimetric, EDTA)
Method: E130.2

WorkOrder: 02030425
Lab Batch ID: R55701

Method Blank

Samples in Analytical Batch:

RunID: WET_020319U-1068403 Units: mg/L
Analysis Date: 03/19/2002 11:45 Analyst: CV

Lab Sample ID: 02030425-01D
Client Sample ID: MW-5

Table with 3 columns: Analyte, Result, Rep Limit. Row: Hardness (As CaCO3), ND, 5.0

Laboratory Control Sample (LCS)

RunID: WET_020319U-1068405 Units: mg/L
Analysis Date: 03/19/2002 11:45 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Hardness (As CaCO3), 202, 200, 101, 94, 108

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020319U-1068407 Units: mg/L
Analysis Date: 03/19/2002 11:45 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Hardness (As CaCO3), 420, 500, 920, 100, 500, 920, 100, 0, 20, 81, 111

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Alkalinity, Bicarbonate
Method: M2320 B

WorkOrder: 02030425
Lab Batch ID: R55803

Method Blank

Samples in Analytical Batch:

RunID: WET_020315S-1070451 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Lab Sample ID Client Sample ID
02030425-01F MW-5
02030425-02E MW-7
02030425-03E MW-8

Table with 3 columns: Analyte, Result, Rep Limit. Row: Alkalinity, Bicarbonate, ND, 2.0

Laboratory Control Sample (LCS)

RunID: WET_020315S-1070453 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Alkalinity, Bicarbonate, 80.3, 80, 100, 90, 110

Sample Duplicate

Original Sample: 02030425-01
RunID: WET_020315S-1070454 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Row: Alkalinity, Bicarbonate, 260, 260, 0, 20

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs 12832-017

Analysis: Alkalinity, Carbonate
Method: M2320 B

WorkOrder: 02030425
Lab Batch ID: R55804

Method Blank

Samples in Analytical Batch:

RunID: WET_020315T-1070509 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Lab Sample ID Client Sample ID
02030425-01F MW-5
02030425-02E MW-7
02030425-03E MW-8

Table with 3 columns: Analyte, Result, Rep Limit. Row: Alkalinity, Carbonate, ND, 2.0

Laboratory Control Sample (LCS)

RunID: WET_020315T-1070511 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Alkalinity, Carbonate, 80.3, 80, 100, 90, 110

Sample Duplicate

Original Sample: 02030425-01
RunID: WET_020315T-1070512 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Row: Alkalinity, Carbonate, ND, ND, 0, 20

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

*Sample Receipt Checklist
And
Chain of Custody*



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Sample Receipt Checklist

Workorder:	02030425	Received By:	RE
Date and Time Received:	3/13/02 10:00:00 AM	Carrier name:	FedEx
Temperature:	4	Chilled by:	Water Ice

- 1. Shipping container/cooler in good condition? Yes No Not Present
- 2. Custody seals intact on shipping container/cooler? Yes No Not Present
- 3. Custody seals intact on sample bottles? Yes No Not Present
- 4. Chain of custody present? Yes No
- 5. Chain of custody signed when relinquished and received? Yes No
- 6. Chain of custody agrees with sample labels? Yes No
- 7. Samples in proper container/bottle? Yes No
- 8. Sample containers intact? Yes No
- 9. Sufficient sample volume for indicated test? Yes No
- 10. All samples received within holding time? Yes No
- 11. Container/Temp Blank temperature in compliance? Yes No
- 12. Water - VOA vials have zero headspace? Yes No Not Applicable
- 13. Water - pH acceptable upon receipt? Yes No Not Applicable

SPL Representative:	<input type="text"/>	Contact Date & Time:	<input type="text"/>
Client Name Contacted:	<input type="text"/>		
Non Conformance Issues:	<input type="text"/>		
Client Instructions:	<input type="text"/>		



SPL, Inc.

Analysis Request & Chain of Custody Record

SPL Workorder No:

02030425

169961

page 1 of 1

Requested Analysis

Client Name: Brown & Caldwell 713-759-0999

Address/Phone: 1915 Louisiana St Houston 77002

Client Contact: Rick Re Kroad

Project Name: BJ Hobbs

Project Number: 12832-017

Project Location: Hobbs, NM

Invoice To: Rick Re Kroad

SAMPLE ID

DATE

TIME

comp

grab

matrix bottle
W=water S=soil
SL=sludge O=other:

P=plastic A=amber glass
G=glass V=vial

size
1=1 liter 4=4oz 40=vial
8=8oz 16=16oz

pres.
1=HCl 2=HNO3
3=H2SO4 O=other:

Number of Containers

BTEX 0021 B
TPH G 8015

TPH-D, TPH G
8015

PAH 8310

RCA metals 300/600
700, Ca Mg K Na

chloride 6010
325.3

Nitrate Sulfate
Fluoride 300-D

Bicarb/Carb
4500-102-D

Tot. CaCO3 Hardness
130.1

Methane Ethylene
Ethane RSK 50P

MW-5	3/12/02	8:15	X	W	PAV	140	4	X	X	X	X	X	X	X	X	X	X	X	X
MW-7	3/12/02	10:34	X	W	VP	140	4	X	X	X	X	X	X	X	X	X	X	X	X
MW-8	3/12/02	10:19	X	W	VPA	140	5	X	X	X	X	X	X	X	X	X	X	X	X
Top Blank-2	3/12/02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

RUSH

Client/Consultant Remarks: + test on blank first, if not enough water

Laboratory remarks:

Intact? Y N
Temp: 4c

Requested TAT

24hr 72hr
 48hr Standard
 Other

Special Reporting Requirements

Standard QC Level 3 QC Level 4 QC

1. Relinquished by Sampler: Amanda MPH
 3. Relinquished by:
 5. Relinquished by:
 2. Received by:
 4. Received by:
 6. Received by Laboratory:
 PM review (initial):

8880 Interchange Drive, Houston, TX 77054 (713) 660-0901
 4501 Highway Drive, Traverso, City, MI 49684 (616) 947-5777

500 Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775

175/147







HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
(713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

02030428

Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	Project Name: BJ Hobbs- 12832-017 Site: Hobbs, NM Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 4/3/02
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This Report Contains A Total Of 30 Pages

Excluding This Page

And

Chain Of Custody

4/3/02

Date



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:
Brown & Caldwell

Certificate of Analysis Number:
02030428

Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	Project Name: BJ Hobbs- 12832-017 Site: Hobbs, NM Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 4/3/02
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Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

Sonia West
Senior Project Manager

4/3/02

Date



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:
02030428

Report To: Brown & Caldwell
 Rick Rexroad
 1415 Louisiana
 Suite 2509
 Houston
 TX
 77002-
 ph: (713) 759-0999

fax: (713) 308-3886

Project Name: BJ Hobbs- 12832-017

Site: Hobbs, NM

Site Address:

PO Number:

State: New Mexico

State Cert. No.:

Date Reported: 4/3/02

Fax To:

Brown & Caldwell
 Rick Rexroad fax : (713) 308-3886

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
MW-9	02030428-01	Water	3/12/02 1:45:00 PM	3/13/02 10:00:00 AM	169962	<input type="checkbox"/>
MW-10	02030428-02	Water	3/12/02 11:07:00 AM	3/13/02 10:00:00 AM	169962	<input type="checkbox"/>
MW-11A	02030428-03	Water	3/12/02 11:48:00 AM	3/13/02 10:00:00 AM	169962	<input type="checkbox"/>
Trip Blank-3	02030428-04	Water	3/12/02	3/13/02 10:00:00 AM	169962	<input type="checkbox"/>

Sonia West
 Sonia West
 Senior Project Manager

4/3/02

Date

Joel Grice
 Laboratory Director

Ted Yen
 Quality Assurance Officer



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-9 Collected: 03/12/2002 13:45 SPL Sample ID: 02030428-01

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #						
ALKALINITY, BICARBONATE													
Alkalinity, Bicarbonate	260	2	1	MCL	03/15/02 15:30	M2320 B SN	1070460						
ALKALINITY, CARBONATE													
Alkalinity, Carbonate	ND	2	1	MCL	03/15/02 15:30	M2320 B SN	1070518						
CHLORIDE, TOTAL													
Chloride	110	2	2	MCL	03/18/02 14:30	E325.3 CV	1064793						
DIESEL RANGE ORGANICS													
Diesel Range Organics	0.37	0.26	1	MCL	03/18/02 13:20	SW8015B AM	1068848						
Surr: n-Pentacosane	86.6	% 18-120	1	MCL	03/18/02 13:20	SW8015B AM	1068848						
<table border="1"> <tr> <td>Prep Method</td> <td>Prep Date</td> <td>Prep Initials</td> </tr> <tr> <td>SW3510B</td> <td>03/14/2002 12:18</td> <td>KL</td> </tr> </table>								Prep Method	Prep Date	Prep Initials	SW3510B	03/14/2002 12:18	KL
Prep Method	Prep Date	Prep Initials											
SW3510B	03/14/2002 12:18	KL											
FLUORIDE-IC													
Fluoride	1.5	0.1	1	MCL	03/13/02 11:55	E300 ES	1067976						
GASOLINE RANGE ORGANICS													
Gasoline Range Organics	ND	0.1	1	MCL	03/15/02 3:01	SW8015B DL	1062080						
Surr: 1,4-Difluorobenzene	102	% 74-121	1	MCL	03/15/02 3:01	SW8015B DL	1062080						
Surr: 4-Bromofluorobenzene	100	% 55-150	1	MCL	03/15/02 3:01	SW8015B DL	1062080						
NITROGEN, NITRATE (AS N)													
Nitrogen, Nitrate (As N)	6.34	0.1	1	MCL	03/13/02 11:55	E300 ES	1064690						
PURGEABLE AROMATICS													
Benzene	1	1	1	MCL	03/15/02 3:01	SW8021B DL	1062034						
Ethylbenzene	ND	1	1	MCL	03/15/02 3:01	SW8021B DL	1062034						
Toluene	ND	1	1	MCL	03/15/02 3:01	SW8021B DL	1062034						
Xylenes, Total	ND	1	1	MCL	03/15/02 3:01	SW8021B DL	1062034						
Surr: 4-Bromofluorobenzene	104	% 48-156	1	MCL	03/15/02 3:01	SW8021B DL	1062034						
Surr: 1,4-Difluorobenzene	99.3	% 72-137	1	MCL	03/15/02 3:01	SW8021B DL	1062034						
SULFATE													
Sulfate	130	2	10	MCL	03/14/02 11:34	E300 ES	1068039						

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-10 Collected: 03/12/2002 11:07 SPL Sample ID: 02030428-02

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY, BICARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Bicarbonate	784	2	1		03/15/02 15:30	SN	1070461
ALKALINITY, CARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Carbonate	ND	2	1		03/15/02 15:30	SN	1070519
CHLORIDE, TOTAL			MCL	E325.3	Units: mg/L		
Chloride	861	10	10		03/18/02 14:30	CV	1064795
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	3.2	1	5		03/18/02 13:57	AM	1068849
Surr: n-Pentacosane	144 MI	% 18-120	5 *		03/18/02 13:57	AM	1068849

Prep Method	Prep Date	Prep Initials
SW3510B	03/14/2002 12:18	KL

FLUORIDE-IC			MCL	E300	Units: mg/L		
Fluoride	1.8	0.1	1		03/13/02 11:55	ES	1067977

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		03/15/02 2:36	DL	1062077
Surr: 1,4-Difluorobenzene	103	% 74-121	1		03/15/02 2:36	DL	1062077
Surr: 4-Bromofluorobenzene	96.7	% 55-150	1		03/15/02 2:36	DL	1062077

HARDNESS, TOTAL (TITRIMETRIC, EDTA)			MCL	E130.2	Units: mg/L		
Hardness (As CaCO3)	1200	120	25		03/19/02 11:45	CV	1068411

MERCURY, TOTAL			MCL	SW7470A	Units: mg/L		
Mercury	ND	0.0002	1		03/15/02 12:50	R_T	1063733

Prep Method	Prep Date	Prep Initials
SW7470A	03/15/2002 9:30	R_T

METALS BY METHOD 6010B, TOTAL			MCL	SW6010B	Units: mg/L		
Arsenic	0.286	0.005	1		03/15/02 2:00	JS	1062855
Lead	0.0234	0.005	1		03/15/02 2:00	JS	1062855
Selenium	ND	0.005	1		03/15/02 2:00	JS	1062855
Barium	0.294	0.005	1		03/19/02 3:52	NS	1068537
Cadmium	ND	0.005	1		03/19/02 3:52	NS	1068537
Calcium	303	0.1	1		03/21/02 1:44	NS	1069150
Chromium	0.0246	0.01	1		03/19/02 3:52	NS	1068537
Magnesium	97.6	0.1	1		03/19/02 3:52	NS	1068537
Potassium	18.8	2	1		03/19/02 3:52	NS	1068537
Silver	ND	0.01	1		03/19/02 3:52	NS	1068537
Sodium	584	1	2		03/21/02 1:52	NS	1069151

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



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Client Sample ID MW-10 Collected: 03/12/2002 11:07 SPL Sample ID: 02030428-02

Site: Hobbs, NM

Analyses/Method Result Rep.Limit Dil. Factor QUAL Date Analyzed Analyst Seq. #

Prep Method	Prep Date	Prep Initials
SW3010A	03/14/2002 7:30	MW

NITROGEN, NITRATE (AS N) MCL E300 Units: mg/L
 Nitrogen, Nitrate (As N) ND 0.1 1 03/13/02 11:55 ES 1064691

PURGEABLE AROMATICS MCL SW8021B Units: ug/L

Benzene	ND	1	1	03/15/02 2:36	DL	1062033
Ethylbenzene	ND	1	1	03/15/02 2:36	DL	1062033
Toluene	ND	1	1	03/15/02 2:36	DL	1062033
Xylenes, Total	ND	1	1	03/15/02 2:36	DL	1062033
Surr: 4-Bromofluorobenzene	104	% 48-156	1	03/15/02 2:36	DL	1062033
Surr: 1,4-Difluorobenzene	99.4	% 72-137	1	03/15/02 2:36	DL	1062033

SULFATE MCL E300 Units: mg/L
 Sulfate 230 4 20 03/14/02 11:34 ES 1068040

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



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Client Sample ID MW-11A Collected: 03/12/2002 11:48 SPL Sample ID: 02030428-03

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY, BICARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Bicarbonate	520	2	1		03/15/02 15:30	SN	1070462
ALKALINITY, CARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Carbonate	ND	2	1		03/15/02 15:30	SN	1070520
CHLORIDE, TOTAL			MCL	E325.3	Units: mg/L		
Chloride	1230	25	25		03/18/02 14:30	CV	1064796
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	1.6	1	5		03/18/02 14:33	AM	1068850
Surr: n-Pentacosane	127 MI	% 18-120	5	*	03/18/02 14:33	AM	1068850

Prep Method	Prep Date	Prep Initials
SW3510B	03/14/2002 12:18	KL

FLUORIDE-IC			MCL	E300	Units: mg/L		
Fluoride	2.1	0.1	1		03/13/02 11:55	ES	1067978

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		03/15/02 2:10	DL	1062075
Surr: 1,4-Difluorobenzene	100	% 74-121	1		03/15/02 2:10	DL	1062075
Surr: 4-Bromofluorobenzene	93.3	% 55-150	1		03/15/02 2:10	DL	1062075

HARDNESS, TOTAL (TITRIMETRIC, EDTA)			MCL	E130.2	Units: mg/L		
Hardness (As CaCO3)	1400	120	25		03/19/02 11:45	CV	1068412

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		03/22/02 10:52	ER	1070784
Ethylene	ND	0.0032	1		03/22/02 10:52	ER	1070784
Methane	0.0044	0.0012	1		03/22/02 10:52	ER	1070784

MERCURY, TOTAL			MCL	SW7470A	Units: mg/L		
Mercury	ND	0.0002	1		03/15/02 12:50	R_T	1063734

Prep Method	Prep Date	Prep Initials
SW7470A	03/15/2002 9:30	R_T

METALS BY METHOD 6010B, TOTAL			MCL	SW6010B	Units: mg/L		
Arsenic	0.086	0.005	1		03/15/02 2:06	JS	1062856
Lead	ND	0.005	1		03/15/02 2:06	JS	1062856
Selenium	ND	0.005	1		03/15/02 2:06	JS	1062856
Barium	0.348	0.005	1		03/19/02 3:58	NS	1068538
Cadmium	ND	0.005	1		03/19/02 3:58	NS	1068538
Calcium	330	0.1	1		03/21/02 1:58	NS	1069152
Chromium	0.023	0.01	1		03/19/02 3:58	NS	1068538

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
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 (713) 660-0901

Client Sample ID MW-11A

Collected: 03/12/2002 11:48

SPL Sample ID: 02030428-03

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
Magnesium	103	0.1	1		03/19/02 3:58	NS	1068538
Potassium	41.5	2	1		03/19/02 3:58	NS	1068538
Silver	ND	0.01	1		03/19/02 3:58	NS	1068538
Sodium	660	1	2		03/21/02 2:06	NS	1069153

Prep Method	Prep Date	Prep Initials
SW3010A	03/14/2002 7:30	MW

NITROGEN, NITRATE (AS N)		MCL	E300	Units: mg/L	
Nitrogen, Nitrate (As N)	ND	0.1	1	03/13/02 11:55	ES 1064692

POLYNUCLEAR AROMATIC HYDROCARBONS		MCL	SW8310	Units: ug/L	
Acenaphthene	ND	0.1	1	03/18/02 23:09	YN 1065590
Acenaphthylene	1.1	0.1	1	03/18/02 23:09	YN 1065590
Anthracene	ND	0.1	1	03/18/02 23:09	YN 1065590
Benz(a)anthracene	ND	0.1	1	03/18/02 23:09	YN 1065590
Benzo(a)pyrene	ND	0.1	1	03/18/02 23:09	YN 1065590
Benzo(b)fluoranthene	ND	0.1	1	03/18/02 23:09	YN 1065590
Benzo(g,h,i)perylene	ND	0.1	1	03/18/02 23:09	YN 1065590
Benzo(k)fluoranthene	ND	0.1	1	03/18/02 23:09	YN 1065590
Chrysene	ND	0.1	1	03/18/02 23:09	YN 1065590
Dibenzo(a,h)anthracene	ND	0.1	1	03/18/02 23:09	YN 1065590
Fluoranthene	ND	0.1	1	03/18/02 23:09	YN 1065590
Fluorene	0.1	0.1	1	03/18/02 23:09	YN 1065590
Indeno(1,2,3-cd)pyrene	ND	0.1	1	03/18/02 23:09	YN 1065590
Naphthalene	0.14	0.1	1	03/18/02 23:09	YN 1065590
Phenanthrene	ND	0.1	1	03/18/02 23:09	YN 1065590
Pyrene	ND	0.1	1	03/18/02 23:09	YN 1065590
Surr: 1-Fluoronaphthalene	80.7	% 15-96	1	03/18/02 23:09	YN 1065590
Surr: Phenanthrene-d10	64.4	% 33-108	1	03/18/02 23:09	YN 1065590

Prep Method	Prep Date	Prep Initials
SW3510B	03/15/2002 15:01	DB

PURGEABLE AROMATICS		MCL	SW8021B	Units: ug/L	
Benzene	1.8	1	1	03/15/02 2:10	DL 1062032
Ethylbenzene	ND	1	1	03/15/02 2:10	DL 1062032
Toluene	ND	1	1	03/15/02 2:10	DL 1062032
Xylenes, Total	1	1	1	03/15/02 2:10	DL 1062032
Surr: 4-Bromofluorobenzene	106	% 48-156	1	03/15/02 2:10	DL 1062032
Surr: 1,4-Difluorobenzene	101	% 72-137	1	03/15/02 2:10	DL 1062032

SULFATE		MCL	E300	Units: mg/L	
Sulfate	350	4	20	03/14/02 11:34	ES 1068041

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID Trip Blank-3 Collected: 03/12/2002 0:00 SPL Sample ID: 02030428-04

Site: Hobbs, NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		03/15/02 1:45	DL	1062074
Surr: 1,4-Difluorobenzene	101	% 74-121	1		03/15/02 1:45	DL	1062074
Surr: 4-Bromofluorobenzene	95.7	% 55-150	1		03/15/02 1:45	DL	1062074
PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		03/15/02 1:45	DL	1062031
Ethylbenzene	ND	1	1		03/15/02 1:45	DL	1062031
Toluene	ND	1	1		03/15/02 1:45	DL	1062031
Xylenes, Total	ND	1	1		03/15/02 1:45	DL	1062031
Surr: 4-Bromofluorobenzene	102	% 48-156	1		03/15/02 1:45	DL	1062031
Surr: 1,4-Difluorobenzene	98.9	% 72-137	1		03/15/02 1:45	DL	1062031

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
* - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
J - Estimated Value between MDL and PQL

Quality Control Documentation



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Diesel Range Organics
Method: SW8015B

WorkOrder: 02030428
Lab Batch ID: 18665

Method Blank

Samples in Analytical Batch:

RunID: HP_B_020318C-1068846 Units: mg/L
Analysis Date: 03/18/2002 12:07 Analyst: AM
Preparation Date: 03/14/2002 12:18 Prep By: KL Method SW3510B
Lab Sample ID: 02030428-01B Client Sample ID: MW-9
02030428-02B MW-10
02030428-03B MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Rows: Diesel Range Organics (ND, 0.20), Surr: n-Pentacosane (73.2, 18-120)

Laboratory Control Sample (LCS)

RunID: HP_B_020318C-1068847 Units: mg/L
Analysis Date: 03/18/2002 12:44 Analyst: AM
Preparation Date: 03/14/2002 12:18 Prep By: KL Method SW3510B

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Diesel Range Organics (2.5, 2.1, 84, 21, 175)

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030428-03
RunID: HP_B_020318C-1068851 Units: mg/L
Analysis Date: 03/18/2002 15:10 Analyst: AM
Preparation Date: 03/14/2002 12:18 Prep By: KL Method SW3510B

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Diesel Range Organics (ND, 5, 5.2, 71.4, 5, 5.2, 71.9, 0.684, 39, 13, 130)

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
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Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Headspace Gas Analysis
Method: RSK147

WorkOrder: 02030428
Lab Batch ID: R55822

Method Blank

Samples in Analytical Batch:

RunID: VARC_020322A-1070780 Units: mg/L
Analysis Date: 03/22/2002 9:34 Analyst: ER

Lab Sample ID: 02030428-03H
Client Sample ID: MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Ethane, Ethylene, and Methane, all with ND results.

Sample Duplicate

Original Sample: 02030428-03
RunID: VARC_020322A-1070784 Units: mg/L
Analysis Date: 03/22/2002 10:52 Analyst: ER

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Rows include Butane, Ethane, Ethylene, Isobutane, Methane, Propane, and Propylene.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 02030428
Lab Batch ID: R55390

Method Blank

Samples in Analytical Batch:

RunID: HP_U_020314A-1062017 Units: ug/L
Analysis Date: 03/14/2002 17:18 Analyst: DL

Lab Sample ID Client Sample ID
02030428-01A MW-9
02030428-02A MW-10
02030428-03A MW-11A
02030428-04A Trip Blank-3

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Benzene, Ethylbenzene, Toluene, Xylenes, Total, and two Surr. entries.

Laboratory Control Sample (LCS)

RunID: HP_U_020314A-1062016 Units: ug/L
Analysis Date: 03/14/2002 16:27 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Benzene, Ethylbenzene, Toluene, and Xylenes, Total.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: HP_U_020314A-1062018 Units: ug/L
Analysis Date: 03/14/2002 17:43 Analyst: DL

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Benzene, Ethylbenzene, Toluene, and Xylenes, Total.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Gasoline Range Organics
Method: SW8015B

WorkOrder: 02030428
Lab Batch ID: R55392

Method Blank

Samples in Analytical Batch:

RunID: HP_U_020314B-1062062 Units: mg/L
Analysis Date: 03/14/2002 17:18 Analyst: DL

Lab Sample ID Client Sample ID
02030428-01A MW-9
02030428-02A MW-10
02030428-03A MW-11A
02030428-04A Trip Blank-3

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Gasoline Range Organics, Surr: 1,4-Difluorobenzene, and Surr: 4-Bromofluorobenzene.

Laboratory Control Sample (LCS)

RunID: HP_U_020314B-1062061 Units: mg/L
Analysis Date: 03/14/2002 16:52 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row for Gasoline Range Organics.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-02
RunID: HP_U_020314B-1062063 Units: mg/L
Analysis Date: 03/14/2002 18:33 Analyst: DL

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row for Gasoline Range Organics.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
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Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Polynuclear Aromatic Hydrocarbons
Method: SW8310

WorkOrder: 02030428
Lab Batch ID: 18700

Method Blank

Samples in Analytical Batch:

RunID: 2_020318A-1065578 Units: ug/L
Analysis Date: 03/18/2002 13:38 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Lab Sample ID 02030428-03D
Client Sample ID MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Lists various polynuclear aromatic hydrocarbons and their results (mostly ND) and reporting limits.

Laboratory Control Sample (LCS)

RunID: 2_020318A-1065579 Units: ug/L
Analysis Date: 03/18/2002 14:16 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Table with 7 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Shows recovery data for various analytes.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell

BJ Hobbs- 12832-017

Analysis: Polynuclear Aromatic Hydrocarbons
Method: SW8310

WorkOrder: 02030428
Lab Batch ID: 18700

Laboratory Control Sample (LCS)

RunID: 2_020318A-1065579 Units: ug/L
Analysis Date: 03/18/2002 14:16 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Naphthalene, Phenanthrene, and Pyrene.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030427-01
RunID: 2_020318A-1065586 Units: ug/L
Analysis Date: 03/18/2002 21:53 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Large table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Lists various polynuclear aromatic hydrocarbons.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030428
Lab Batch ID: 18657

Method Blank

Samples in Analytical Batch:

RunID: TJA_020318F-1068520 Units: mg/L
Analysis Date: 03/19/2002 1:59 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A
Lab Sample ID: 02030428-02E Client Sample ID: MW-10
02030428-03E Client Sample ID: MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Barium, Cadmium, Chromium, Magnesium, Potassium, Silver.

Laboratory Control Sample (LCS)

RunID: TJA_020318F-1068521 Units: mg/L
Analysis Date: 03/19/2002 2:05 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Barium, Cadmium, Chromium, Magnesium, Potassium, Silver.

Post Digestion Spike (PDS) / Post Digestion Spike Duplicate (PDSD)

Sample Spiked: 02030442-05
RunID: TJA_020318F-1068526 Units: mg/L
Analysis Date: 03/19/2002 2:36 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: Method

Table with 12 columns: Analyte, Sample Result, PDS Spike Added, PDS Result, PDS % Recovery, PDSD Spike Added, PDSD Result, PDSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Magnesium, Potassium.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030428
Lab Batch ID: 18657

Sample Spiked: 02030442-05
RunID: TJA_020318F-1068523 Units: mg/L
Analysis Date: 03/19/2002 2:17 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Barium, Cadmium, Chromium, Magnesium, Potassium, and Silver.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030428
Lab Batch ID: 18657-T

Method Blank

Samples in Analytical Batch:

RunID: TJAT_020314B-1062837 Units: mg/L
Analysis Date: 03/14/2002 23:57 Analyst: JS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Lab Sample ID Client Sample ID
02030428-02E MW-10
02030428-03E MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Rows for Arsenic, Lead, Selenium.

Laboratory Control Sample (LCS)

RunID: TJAT_020314B-1062838 Units: mg/L
Analysis Date: 03/15/2002 0:03 Analyst: JS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows for Arsenic, Lead, Selenium.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030442-05
RunID: TJAT_020314B-1062840 Units: mg/L
Analysis Date: 03/15/2002 0:17 Analyst: JS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows for Arsenic, Lead, Selenium.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030428
Lab Batch ID: 18657A

Method Blank

Samples in Analytical Batch:

RunID: TJA_020320D-1069137 Units: mg/L
Analysis Date: 03/21/2002 0:15 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 3 columns: Analyte, Result, Rep Limit. Rows for Calcium and Sodium.

Laboratory Control Sample (LCS)

RunID: TJA_020320D-1069138 Units: mg/L
Analysis Date: 03/21/2002 0:21 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows for Calcium and Sodium.

Post Digestion Spike (PDS) / Post Digestion Spike Duplicate (PDSD)

Sample Spiked: 02030442-05
RunID: TJA_020320D-1069143 Units: mg/L
Analysis Date: 03/21/2002 0:52 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: Method

Table with 12 columns: Analyte, Sample Result, PDS Spike Added, PDS Result, PDS % Recovery, PDSD Spike Added, PDSD Result, PDSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows for Calcium and Sodium.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030442-05
RunID: TJA_020320D-1069140 Units: mg/L
Analysis Date: 03/21/2002 0:34 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows for Calcium and Sodium.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030428
Lab Batch ID: 18657A

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030442-05
RunID: TJA_020320D-1069140 Units: mg/L
Analysis Date: 03/21/2002 0:34 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Calcium and Sodium.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
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HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Mercury, Total
Method: SW7470A

WorkOrder: 02030428
Lab Batch ID: 18720

Method Blank

Samples in Analytical Batch:

RunID: HGL_020315B-1063715 Units: mg/L
Analysis Date: 03/15/2002 12:50 Analyst: R_T
Preparation Date: 03/15/2002 9:30 Prep By: R_T Method SW7470A
Lab Sample ID: 02030428-02E Client Sample ID: MW-10
02030428-03E Client Sample ID: MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Row: Mercury, ND, 0.0002

Laboratory Control Sample (LCS)

RunID: HGL_020315B-1063717 Units: mg/L
Analysis Date: 03/15/2002 12:50 Analyst: R_T
Preparation Date: 03/15/2002 9:30 Prep By: R_T Method SW7470A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Mercury, 0.002, 0.00212, 106, 80, 120

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030325-01
RunID: HGL_020315B-1063719 Units: mg/L
Analysis Date: 03/15/2002 12:50 Analyst: R_T
Preparation Date: 03/15/2002 9:30 Prep By: R_T Method SW7470A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Mercury, ND, 0.002, 0.00202, 101, 0.002, 0.0022, 110, 8.53, 20, 75, 125

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
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HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Nitrogen, Nitrate (As N)
Method: E300

WorkOrder: 02030428
Lab Batch ID: R55540

Method Blank

Samples in Analytical Batch:

RunID: WET_020313S-1064679 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Lab Sample ID Client Sample ID
02030428-01F MW-9
02030428-02F MW-10
02030428-03F MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Row: Nitrogen, Nitrate (As N), ND, 0.10

Laboratory Control Sample (LCS)

RunID: WET_020313S-1064680 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Nitrogen, Nitrate (As N), 10, 9.46, 95, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020313S-1064682 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Nitrogen, Nitrate (As N), 3.0, 10, 12.6, 95.9, 10, 12.6, 95.7, 0.271, 20, 76, 124

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
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HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Chloride, Total
Method: E325.3

WorkOrder: 02030428
Lab Batch ID: R55542

Method Blank

Samples in Analytical Batch:

RunID: WET_020318L-1064782 Units: mg/L
Analysis Date: 03/18/2002 14:30 Analyst: CV

Lab Sample ID Client Sample ID
02030428-01F MW-9
02030428-02F MW-10
02030428-03F MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Row: Chloride, ND, 1.0

Laboratory Control Sample (LCS)

RunID: WET_020318L-1064784 Units: mg/L
Analysis Date: 03/18/2002 14:30 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Chloride, 143, 141, 99, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030583-03
RunID: WET_020318L-1064788 Units: mg/L
Analysis Date: 03/18/2002 14:30 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Chloride, 690, 1250, 1940, 99.9, 1250, 1940, 99.9, 0, 20, 85, 115

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Fluoride-IC
Method: E300

WorkOrder: 02030428
Lab Batch ID: R55674

Method Blank

Samples in Analytical Batch:

RunID: WET_020313T-1067964 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Lab Sample ID Client Sample ID
02030428-01F MW-9
02030428-02F MW-10
02030428-03F MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Row: Fluoride, ND, 0.10

Laboratory Control Sample (LCS)

RunID: WET_020313T-1067965 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Fluoride, 10, 9.8, 98, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020313T-1067967 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Fluoride, 1.4, 10, 9.8, 84.1, 10, 9.7, 82.4, 1.97, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
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HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Sulfate
Method: E300

WorkOrder: 02030428
Lab Batch ID: R55679

Method Blank

Samples in Analytical Batch:

RunID: WET_020314S-1068028 Units: mg/L
Analysis Date: 03/14/2002 11:34 Analyst: ES

Lab Sample ID Client Sample ID
02030428-01F MW-9
02030428-02F MW-10
02030428-03F MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Row: Sulfate, ND, 0.20

Laboratory Control Sample (LCS)

RunID: WET_020314S-1068029 Units: mg/L
Analysis Date: 03/14/2002 11:34 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Sulfate, 10, 9.9, 99, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020314S-1068031 Units: mg/L
Analysis Date: 03/14/2002 11:34 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Sulfate, 120, 200, 310, 94.9, 200, 310, 94.1, 0.809, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Hardness, Total (Titrimetric, EDTA)
Method: E130.2

WorkOrder: 02030428
Lab Batch ID: R55701

Method Blank

Samples in Analytical Batch:

RunID: WET_020319U-1068403 Units: mg/L
Analysis Date: 03/19/2002 11:45 Analyst: CV

Lab Sample ID Client Sample ID
02030428-02E MW-10
02030428-03E MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Row: Hardness (As CaCO3), ND, 5.0

Laboratory Control Sample (LCS)

RunID: WET_020319U-1068405 Units: mg/L
Analysis Date: 03/19/2002 11:45 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Hardness (As CaCO3), 202, 200, 101, 94, 108

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020319U-1068407 Units: mg/L
Analysis Date: 03/19/2002 11:45 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Hardness (As CaCO3), 420, 500, 920, 100, 500, 920, 100, 0, 20, 81, 111

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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HOUSTON, TX 77054
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Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Alkalinity, Bicarbonate
Method: M2320 B

WorkOrder: 02030428
Lab Batch ID: R55803

Method Blank

Samples in Analytical Batch:

RunID: WET_020315S-1070451 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Lab Sample ID Client Sample ID
02030428-01F MW-9
02030428-02F MW-10
02030428-03G MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Row: Alkalinity, Bicarbonate, ND, 2.0

Laboratory Control Sample (LCS)

RunID: WET_020315S-1070453 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Alkalinity, Bicarbonate, 80.3, 80, 100, 90, 110

Sample Duplicate

Original Sample: 02030425-01
RunID: WET_020315S-1070454 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Row: Alkalinity, Bicarbonate, 260, 260, 0, 20

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ Hobbs- 12832-017

Analysis: Alkalinity, Carbonate
Method: M2320 B

WorkOrder: 02030428
Lab Batch ID: R55804

Method Blank

Samples in Analytical Batch:

RunID: WET_020315T-1070509 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Lab Sample ID Client Sample ID
02030428-01F MW-9
02030428-02F MW-10
02030428-03G MW-11A

Table with 3 columns: Analyte, Result, Rep Limit. Row: Alkalinity, Carbonate, ND, 2.0

Laboratory Control Sample (LCS)

RunID: WET_020315T-1070511 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Alkalinity, Carbonate, 80.3, 80, 100, 90, 110

Sample Duplicate

Original Sample: 02030425-01
RunID: WET_020315T-1070512 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Row: Alkalinity, Carbonate, ND, ND, 0, 20

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

*Sample Receipt Checklist
And
Chain of Custody*



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Sample Receipt Checklist

Workorder:	02030428	Received By:	RE
Date and Time Received:	3/13/02 10:00:00 AM	Carrier name:	FedEx
Temperature:	4	Chilled by:	Water Ice

- 1. Shipping container/cooler in good condition? Yes No Not Present
- 2. Custody seals intact on shipping container/cooler? Yes No Not Present
- 3. Custody seals intact on sample bottles? Yes No Not Present
- 4. Chain of custody present? Yes No
- 5. Chain of custody signed when relinquished and received? Yes No
- 6. Chain of custody agrees with sample labels? Yes No
- 7. Samples in proper container/bottle? Yes No
- 8. Sample containers intact? Yes No
- 9. Sufficient sample volume for indicated test? Yes No
- 10. All samples received within holding time? Yes No
- 11. Container/Temp Blank temperature in compliance? Yes No
- 12. Water - VOA vials have zero headspace? Yes No Not Applicable
- 13. Water - pH acceptable upon receipt? Yes No Not Applicable

SPL Representative:

Contact Date & Time:

Client Name Contacted:

Non Conformance Issues:

Client Instructions:



SPL, Inc.

Analysis Request & Chain of Custody Record

SPL Workorder No:

02030428

169962

page 1 of 1

Requested Analysis

Client Name: Brown & Caldwell 713 757 0999

Address/Phone: 1415 Louisiana St Houston 77002

Client Contact: Rick Renroad

Project Name: BS Hobbs

Project Number: 12832-017

Project Location: Hobbs, NM

Invoice To: Rick Renroad

SAMPLE ID

matrix bottle size pres.

W=water S=soil SL=sludge O=other: P=plastic A=amber glass G=glass V=vial

1=1 liter 4=4oz 40=vial 8=8oz 16=16oz

1=HCl 2=HNO3 3=H2SO4 O=other:

Number of Containers

BTX 60215 TPH 6 8015

TPH D TPH G 0015

PAH 8310

RCA metals 3000 7000 Ca, Mg, Na, K, GAO

chloride 325.3

phosphate sulfate 300 chloride fluoride

Bicarb Carb 4500-002-D

Pop. CaCO3 hardness 130.1

Methane Ethylene Ethane RSKSOP

175/147

DATE	TIME	comp	grab
MW-9	3/12/02	11:07	13:45
MW-1D	3/12/02	11:07	
MW-11A	3/12/02	11:48	
Trip Blank-3	3/12/02	3/12/02	

RUSH

Client/Consultant Remarks: + Analyze for chlorides first, if not enough water for all tests test for metals first, if not enough water

Requested TAT

- 24hr
- 72hr
- 48hr
- Standard
- Other

Special Reporting Requirements

Standard QC

1. Relinquished by Sampler: Amanda Moran

3. Relinquished by:

5. Relinquished by:

Fax Results

Level 3 QC

Raw Data

Level 4 QC

Special Detection Limits (specify):

2. Received by:

4. Received by:

6. Received by Laboratory:

Intact? Y N Temp: 42

PM review (initial):

8880 Interchange Drive, Houston, TX 77054 (713) 660-0901

500 Ambassador Caffery Parkway, Scott, LA 70583 (318) 237-4775

4590 Highway Drive, Fort Worth, TX 76104 (817) 943-5577







HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
(713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

02030427

<u>Report To:</u> Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	<u>Project Name:</u> BJ-Hobbs 12832-017 <u>Site:</u> Hobbs,NM <u>Site Address:</u> <u>PO Number:</u> <u>State:</u> New Mexico <u>State Cert. No.:</u> <u>Date Reported:</u> 3/25/02
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This Report Contains A Total Of 31 Pages

Excluding This Page

And

Chain Of Custody

3/25/02

Date



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:
Brown & Caldwell

Certificate of Analysis Number:
02030427

Report To: Brown & Caldwell Rick Rexroad 1415 Louisiana Suite 2509 Houston TX 77002- ph: (713) 759-0999 fax: (713) 308-3886	Project Name: BJ-Hobbs 12832-017 Site: Hobbs,NM Site Address: PO Number: State: New Mexico State Cert. No.: Date Reported: 3/25/02
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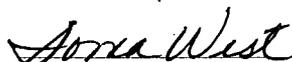
Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

This report shall not be reproduced except in full, without the written approval of the laboratory. The reported results are only representative of the samples submitted for testing.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.


Sonia West
Senior Project Manager

3/25/02

Date



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Brown & Caldwell

Certificate of Analysis Number:

02030427

Report To: Brown & Caldwell
 Rick Rexroad
 1415 Louisiana
 Suite 2509
 Houston
 TX
 77002-
 ph: (713) 759-0999 fax: (713) 308-3886

Project Name: BJ-Hobbs 12832-017
Site: Hobbs,NM
Site Address:
PO Number:
State: New Mexico
State Cert. No.:
Date Reported: 3/25/02

Fax To: Brown & Caldwell
 Rick Rexroad fax : (713) 308-3886

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
MW-12D	02030427-01	Water	3/12/02 12:27:00 PM	3/13/02 10:00:00 AM	169934	<input type="checkbox"/>
MW-13	02030427-02	Water	3/12/02 10:41:00 AM	3/13/02 10:00:00 AM	169934	<input type="checkbox"/>
MW-14	02030427-03	Water	3/12/02 11:24:00 AM	3/13/02 10:00:00 AM	169934	<input type="checkbox"/>
MW-15	02030427-04	Water	3/12/02 11:18:00 AM	3/13/02 10:00:00 AM	169934	<input type="checkbox"/>
Trip Blank-4 3/12/02	02030427-05	Water	3/12/02	3/13/02 10:00:00 AM	169934	<input type="checkbox"/>

Sonia West
 Sonia West
 Senior Project Manager

3/25/02

Date

Joel Grice
 Laboratory Director

Ted Yen
 Quality Assurance Officer



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-12D Collected: 03/12/2002 12:27 SPL Sample ID: 02030427-01

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY, BICARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Bicarbonate	260	2	1		03/15/02 15:30	SN	1070458
ALKALINITY, CARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Carbonate	ND	2	1		03/15/02 15:30	SN	1070516
CHLORIDE, TOTAL			MCL	E325.3	Units: mg/L		
Chloride	75.8	1	1		03/14/02 11:00	CV	1061406
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	0.44	0.2	1		03/19/02 5:47	AR	1068840
Surr: n-Pentacosane	76.0	% 18-120	1		03/19/02 5:47	AR	1068840

Prep Method	Prep Date	Prep Initials
SW3510B	03/14/2002 12:11	KL

FLUORIDE-IC			MCL	E300	Units: mg/L		
Fluoride	1.4	0.1	1		03/13/02 11:55	ES	1067972
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		03/15/02 3:27	DL	1062084
Surr: 1,4-Difluorobenzene	102	% 74-121	1		03/15/02 3:27	DL	1062084
Surr: 4-Bromofluorobenzene	96.0	% 55-150	1		03/15/02 3:27	DL	1062084
HARDNESS, TOTAL (TITRIMETRIC, EDTA)			MCL	E130.2	Units: mg/L		
Hardness (As CaCO3)	330	25	5		03/19/02 11:45	CV	1068409
HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		03/22/02 10:27	ER	1070782
Ethylene	ND	0.0032	1		03/22/02 10:27	ER	1070782
Methane	ND	0.0012	1		03/22/02 10:27	ER	1070782
MERCURY, TOTAL			MCL	SW7470A	Units: mg/L		
Mercury	ND	0.0002	1		03/15/02 12:50	R_T	1063731

Prep Method	Prep Date	Prep Initials
SW7470A	03/15/2002 9:30	R_T

METALS BY METHOD 6010B, TOTAL			MCL	SW6010B	Units: mg/L		
Arsenic	0.0471	0.005	1		03/15/02 1:48	JS	1062853
Lead	ND	0.005	1		03/15/02 1:48	JS	1062853
Selenium	ND	0.005	1		03/15/02 1:48	JS	1062853
Barium	0.0865	0.005	1		03/19/02 3:39	NS	1068535
Cadmium	ND	0.005	1		03/19/02 3:39	NS	1068535
Calcium	120	0.1	1		03/21/02 1:12	NS	1069146
Chromium	ND	0.01	1		03/19/02 3:39	NS	1068535

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
 B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
 * - Surrogate Recovery Outside Advisable QC Limits MI - Matrix Interference
 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-12D

Collected: 03/12/2002 12:27

SPL Sample ID: 02030427-01

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
Magnesium	6.06	0.1	1		03/19/02 3:39	NS	1068535
Potassium	72	2	1		03/19/02 3:39	NS	1068535
Silver	ND	0.01	1		03/19/02 3:39	NS	1068535
Sodium	79.4	0.5	1		03/19/02 3:39	NS	1068535

Prep Method	Prep Date	Prep Initials
SW3010A	03/14/2002 7:30	MW

NITROGEN, NITRATE (AS N)	MCL	E300	Units: mg/L
Nitrogen, Nitrate (As N)	ND	0.1	1 03/13/02 11:55 ES 1064686

POLYNUCLEAR AROMATIC HYDROCARBONS	MCL	SW8310	Units: ug/L
Acenaphthene	ND	0.1	1 03/18/02 21:15 YN 1065585
Acenaphthylene	ND	0.1	1 03/18/02 21:15 YN 1065585
Anthracene	ND	0.1	1 03/18/02 21:15 YN 1065585
Benz(a)anthracene	ND	0.1	1 03/18/02 21:15 YN 1065585
Benzo(a)pyrene	ND	0.1	1 03/18/02 21:15 YN 1065585
Benzo(b)fluoranthene	ND	0.1	1 03/18/02 21:15 YN 1065585
Benzo(g,h,i)perylene	ND	0.1	1 03/18/02 21:15 YN 1065585
Benzo(k)fluoranthene	ND	0.1	1 03/18/02 21:15 YN 1065585
Chrysene	ND	0.1	1 03/18/02 21:15 YN 1065585
Dibenzo(a,h)anthracene	ND	0.1	1 03/18/02 21:15 YN 1065585
Fluoranthene	ND	0.1	1 03/18/02 21:15 YN 1065585
Fluorene	ND	0.1	1 03/18/02 21:15 YN 1065585
Indeno(1,2,3-cd)pyrene	ND	0.1	1 03/18/02 21:15 YN 1065585
Naphthalene	ND	0.1	1 03/18/02 21:15 YN 1065585
Phenanthrene	ND	0.1	1 03/18/02 21:15 YN 1065585
Pyrene	ND	0.1	1 03/18/02 21:15 YN 1065585
Surr: 1-Fluoronaphthalene	57.9 %	15-96	1 03/18/02 21:15 YN 1065585
Surr: Phenanthrene-d10	62.7 %	33-108	1 03/18/02 21:15 YN 1065585

Prep Method	Prep Date	Prep Initials
SW3510B	03/15/2002 15:01	DB

PURGEABLE AROMATICS	MCL	SW8021B	Units: ug/L
Benzene	ND	1	1 03/15/02 3:27 DL 1062035
Ethylbenzene	ND	1	1 03/15/02 3:27 DL 1062035
Toluene	ND	1	1 03/15/02 3:27 DL 1062035
Xylenes, Total	ND	1	1 03/15/02 3:27 DL 1062035
Surr: 4-Bromofluorobenzene	103 %	48-156	1 03/15/02 3:27 DL 1062035
Surr: 1,4-Difluorobenzene	100 %	72-137	1 03/15/02 3:27 DL 1062035

SULFATE	MCL	E300	Units: mg/L
Sulfate	200	4	20 03/14/02 11:34 ES 1068035

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
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 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-13 Collected: 03/12/2002 10:41 SPL Sample ID: 02030427-02

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
ALKALINITY, BICARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Bicarbonate	164	2	1		03/15/02 15:30	SN	1070459
ALKALINITY, CARBONATE			MCL	M2320 B	Units: mg/L		
Alkalinity, Carbonate	ND	2	1		03/15/02 15:30	SN	1070517
CHLORIDE, TOTAL			MCL	E325.3	Units: mg/L		
Chloride	207	5	5		03/14/02 11:00	CV	1061409
DIESEL RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Diesel Range Organics	0.84	0.2	1		03/19/02 6:24	AR	1068841
Surr: n-Pentacosane	86.8	% 18-120	1		03/19/02 6:24	AR	1068841

Prep Method	Prep Date	Prep Initials
SW3510B	03/14/2002 12:11	KL

FLUORIDE-IC			MCL	E300	Units: mg/L		
Fluoride	2.3	0.1	1		03/13/02 11:55	ES	1067973

GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		03/15/02 3:52	DL	1062087
Surr: 1,4-Difluorobenzene	102	% 74-121	1		03/15/02 3:52	DL	1062087
Surr: 4-Bromofluorobenzene	96.7	% 55-150	1		03/15/02 3:52	DL	1062087

HARDNESS, TOTAL (TITRIMETRIC, EDTA)			MCL	E130.2	Units: mg/L		
Hardness (As CaCO3)	750	50	10		03/19/02 11:45	CV	1068410

HEADSPACE GAS ANALYSIS			MCL	RSK147	Units: mg/L		
Ethane	ND	0.0025	1		03/22/02 10:37	ER	1070783
Ethylene	ND	0.0032	1		03/22/02 10:37	ER	1070783
Methane	ND	0.0012	1		03/22/02 10:37	ER	1070783

MERCURY, TOTAL			MCL	SW7470A	Units: mg/L		
Mercury	ND	0.0002	1		03/15/02 12:50	R_T	1063732

Prep Method	Prep Date	Prep Initials
SW7470A	03/15/2002 9:30	R_T

METALS BY METHOD 6010B, TOTAL			MCL	SW6010B	Units: mg/L		
Arsenic	0.012	0.005	1		03/15/02 1:54	JS	1062854
Lead	ND	0.005	1		03/15/02 1:54	JS	1062854
Selenium	ND	0.005	1		03/15/02 1:54	JS	1062854
Barium	0.109	0.005	1		03/19/02 3:45	NS	1068536
Cadmium	ND	0.005	1		03/19/02 3:45	NS	1068536
Calcium	225	0.1	1		03/21/02 1:38	NS	1069149
Chromium	0.0114	0.01	1		03/19/02 3:45	NS	1068536

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
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HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TX 77054
 (713) 660-0901

Client Sample ID MW-13

Collected: 03/12/2002 10:41

SPL Sample ID: 02030427-02

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
Magnesium	44.7	0.1	1		03/19/02 3:45	NS	1068536
Potassium	2.82	2	1		03/19/02 3:45	NS	1068536
Silver	ND	0.01	1		03/19/02 3:45	NS	1068536
Sodium	127	0.5	1		03/19/02 3:45	NS	1068536

Prep Method	Prep Date	Prep Initials
SW3010A	03/14/2002 7:30	MW

NITROGEN, NITRATE (AS N)		MCL	E300	Units: mg/L		
Nitrogen, Nitrate (As N)	ND	0.1	1	03/13/02 11:55	ES	1064687

POLYNUCLEAR AROMATIC HYDROCARBONS		MCL	SW8310	Units: ug/L		
Acenaphthene	ND	0.1	1	03/18/02 16:11	YN	1065580
Acenaphthylene	ND	0.1	1	03/18/02 16:11	YN	1065580
Anthracene	ND	0.1	1	03/18/02 16:11	YN	1065580
Benz(a)anthracene	ND	0.1	1	03/18/02 16:11	YN	1065580
Benzo(a)pyrene	ND	0.1	1	03/18/02 16:11	YN	1065580
Benzo(b)fluoranthene	ND	0.1	1	03/18/02 16:11	YN	1065580
Benzo(g,h,i)perylene	ND	0.1	1	03/18/02 16:11	YN	1065580
Benzo(k)fluoranthene	ND	0.1	1	03/18/02 16:11	YN	1065580
Chrysene	ND	0.1	1	03/18/02 16:11	YN	1065580
Dibenzo(a,h)anthracene	ND	0.1	1	03/18/02 16:11	YN	1065580
Fluoranthene	ND	0.1	1	03/18/02 16:11	YN	1065580
Fluorene	ND	0.1	1	03/18/02 16:11	YN	1065580
Indeno(1,2,3-cd)pyrene	ND	0.1	1	03/18/02 16:11	YN	1065580
Naphthalene	ND	0.1	1	03/18/02 16:11	YN	1065580
Phenanthrene	ND	0.1	1	03/18/02 16:11	YN	1065580
Pyrene	ND	0.1	1	03/18/02 16:11	YN	1065580
Surr: 1-Fluoronaphthalene	54.5	% 15-96	1	03/18/02 16:11	YN	1065580
Surr: Phenanthrene-d10	57.6	% 33-108	1	03/18/02 16:11	YN	1065580

Prep Method	Prep Date	Prep Initials
SW3510B	03/15/2002 15:01	DB

PURGEABLE AROMATICS		MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1	03/15/02 3:52	DL	1062036
Ethylbenzene	ND	1	1	03/15/02 3:52	DL	1062036
Toluene	ND	1	1	03/15/02 3:52	DL	1062036
Xylenes,Total	ND	1	1	03/15/02 3:52	DL	1062036
Surr: 4-Bromofluorobenzene	102	% 48-156	1	03/15/02 3:52	DL	1062036
Surr: 1,4-Difluorobenzene	100	% 72-137	1	03/15/02 3:52	DL	1062036

SULFATE		MCL	E300	Units: mg/L		
Sulfate	380	4	20	03/14/02 11:34	ES	1068036

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
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 J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-14 Collected: 03/12/2002 11:24 SPL Sample ID: 02030427-03

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				MCL	E325.3	Units: mg/L	
Chloride	284	5		5	03/14/02 11:00	CV	1061413

Qualifiers: ND/U - Not Detected at the Reporting Limit >MCL - Result Over Maximum Contamination Limit(MCL)
B - Analyte detected in the associated Method Blank D - Surrogate Recovery Unreportable due to Dilution
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J - Estimated Value between MDL and PQL



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID Trip Blank-4 3/12/02

Collected: 03/12/2002 0:00

SPL Sample ID: 02030427-05

Site: Hobbs,NM

Analyses/Method	Result	Rep.Limit	Dil. Factor	QUAL	Date Analyzed	Analyst	Seq. #
GASOLINE RANGE ORGANICS			MCL	SW8015B	Units: mg/L		
Gasoline Range Organics	ND	0.1	1		03/14/02 20:40	DL	1062067
Surr: 1,4-Difluorobenzene	101	% 74-121	1		03/14/02 20:40	DL	1062067
Surr: 4-Bromofluorobenzene	95.0	% 55-150	1		03/14/02 20:40	DL	1062067
PURGEABLE AROMATICS			MCL	SW8021B	Units: ug/L		
Benzene	ND	1	1		03/14/02 20:40	DL	1062022
Ethylbenzene	ND	1	1		03/14/02 20:40	DL	1062022
Toluene	ND	1	1		03/14/02 20:40	DL	1062022
Xylenes,Total	ND	1	1		03/14/02 20:40	DL	1062022
Surr: 4-Bromofluorobenzene	101	% 48-156	1		03/14/02 20:40	DL	1062022
Surr: 1,4-Difluorobenzene	99.7	% 72-137	1		03/14/02 20:40	DL	1062022

Qualifiers:

ND/U - Not Detected at the Reporting Limit

B - Analyte detected in the associated Method Blank

* - Surrogate Recovery Outside Advisable QC Limits

J - Estimated Value between MDL and PQL

>MCL - Result Over Maximum Contamination Limit(MCL)

D - Surrogate Recovery Unreportable due to Dilution

MI - Matrix Interference

Quality Control Documentation



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Diesel Range Organics
Method: SW8015B

WorkOrder: 02030427
Lab Batch ID: 18664

Method Blank

Samples in Analytical Batch:

RunID: HP_T_020318B-1068833 Units: mg/L
Analysis Date: 03/18/2002 20:02 Analyst: AR
Preparation Date: 03/14/2002 12:11 Prep By: KL Method SW3510B
Lab Sample ID: 02030427-01B Client Sample ID: MW-12D
02030427-02B Client Sample ID: MW-13

Table with 3 columns: Analyte, Result, Rep Limit. Rows: Diesel Range Organics (ND, 0.20), Surr: n-Pentacosane (70.2, 18-120)

Laboratory Control Sample (LCS)

RunID: HP_T_020318B-1068834 Units: mg/L
Analysis Date: 03/18/2002 20:38 Analyst: AR
Preparation Date: 03/14/2002 12:11 Prep By: KL Method SW3510B

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Diesel Range Organics (2.5, 1.7, 66, 21, 175)

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030441-02
RunID: HP_T_020318B-1068836 Units: mg/L
Analysis Date: 03/18/2002 22:28 Analyst: AR
Preparation Date: 03/14/2002 12:11 Prep By: Method

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Diesel Range Organics (0.078, 5, 3.4, 66.2, 5, 3.4, 66.0, 0.248, 39, 13, 130)

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Headspace Gas Analysis
Method: RSK147

WorkOrder: 02030427
Lab Batch ID: R55822

Method Blank

Samples in Analytical Batch:

RunID: VARC_020322A-1070780 Units: mg/L
Analysis Date: 03/22/2002 9:34 Analyst: ER

Lab Sample ID Client Sample ID
02030427-01E MW-12D
02030427-02E MW-13

Table with 3 columns: Analyte, Result, Rep Limit. Rows: Ethane (ND, 0.0025), Ethylene (ND, 0.0032), Methane (ND, 0.0012)

Sample Duplicate

Original Sample: 02030428-03
RunID: VARC_020322A-1070784 Units: mg/L
Analysis Date: 03/22/2002 10:52 Analyst: ER

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Rows: Butane, Ethane, Ethylene, Isobutane, Methane, Propane, Propylene

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 02030427
Lab Batch ID: R55390

Method Blank

Samples in Analytical Batch:

RunID: HP_U_020314A-1062017 Units: ug/L
Analysis Date: 03/14/2002 17:18 Analyst: DL

Lab Sample ID Client Sample ID
02030427-01A MW-12D
02030427-02A MW-13
02030427-05A Trip Blank-4 3/12/02

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Benzene, Ethylbenzene, Toluene, Xylenes, Total, and Surr: 1,4-Difluorobenzene.

Laboratory Control Sample (LCS)

RunID: HP_U_020314A-1062016 Units: ug/L
Analysis Date: 03/14/2002 16:27 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Benzene, Ethylbenzene, Toluene, and Xylenes, Total.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: HP_U_020314A-1062018 Units: ug/L
Analysis Date: 03/14/2002 17:43 Analyst: DL

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Benzene, Ethylbenzene, Toluene, and Xylenes, Total.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Gasoline Range Organics
Method: SW8015B

WorkOrder: 02030427
Lab Batch ID: R55392

Method Blank

Samples in Analytical Batch:

RunID: HP_U_020314B-1062062 Units: mg/L
Analysis Date: 03/14/2002 17:18 Analyst: DL

Lab Sample ID Client Sample ID
02030427-01A MW-12D
02030427-02A MW-13
02030427-05A Trip Blank-4 3/12/02

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Gasoline Range Organics, Surr: 1,4-Difluorobenzene, and Surr: 4-Bromofluorobenzene.

Laboratory Control Sample (LCS)

RunID: HP_U_020314B-1062061 Units: mg/L
Analysis Date: 03/14/2002 16:52 Analyst: DL

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row for Gasoline Range Organics.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-02
RunID: HP_U_020314B-1062063 Units: mg/L
Analysis Date: 03/14/2002 18:33 Analyst: DL

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row for Gasoline Range Organics.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Polynuclear Aromatic Hydrocarbons
Method: SW8310

WorkOrder: 02030427
Lab Batch ID: 18700

Method Blank

Samples in Analytical Batch:

RunID: 2_020318A-1065578 Units: ug/L
Analysis Date: 03/18/2002 13:38 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Lab Sample ID Client Sample ID
02030427-01C MW-12D
02030427-02C MW-13

Table with 3 columns: Analyte, Result, Rep Limit. Lists various polynuclear aromatic hydrocarbons and their results (mostly ND) and reporting limits.

Laboratory Control Sample (LCS)

RunID: 2_020318A-1065579 Units: ug/L
Analysis Date: 03/18/2002 14:16 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Shows recovery data for various PAHs.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Polynuclear Aromatic Hydrocarbons
Method: SW8310

WorkOrder: 02030427
Lab Batch ID: 18700

Laboratory Control Sample (LCS)

RunID: 2_020318A-1065579 Units: ug/L
Analysis Date: 03/18/2002 14:16 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Naphthalene, Phenanthrene, and Pyrene.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030427-01
RunID: 2_020318A-1065586 Units: ug/L
Analysis Date: 03/18/2002 21:53 Analyst: YN
Preparation Date: 03/15/2002 15:01 Prep By: DB Method SW3510B

Large table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Lists various polynuclear aromatic hydrocarbons and their recovery data.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell

BJ-Hobbs 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030427
Lab Batch ID: 18657

Method Blank

Samples in Analytical Batch:

RunID: TJA_020318F-1068520 Units: mg/L
Analysis Date: 03/19/2002 1:59 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Lab Sample ID Client Sample ID
02030427-01D MW-12D
02030427-02D MW-13

Table with 3 columns: Analyte, Result, Rep Limit. Rows include Barium, Cadmium, Chromium, Magnesium, Potassium, Silver, Sodium.

Laboratory Control Sample (LCS)

RunID: TJA_020318F-1068521 Units: mg/L
Analysis Date: 03/19/2002 2:05 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows include Barium, Cadmium, Chromium, Magnesium, Potassium, Silver, Sodium.

Post Digestion Spike (PDS) / Post Digestion Spike Duplicate (PDSD)

Sample Spiked: 02030442-05
RunID: TJA_020318F-1068526 Units: mg/L
Analysis Date: 03/19/2002 2:36 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: Method

Table with 12 columns: Analyte, Sample Result, PDS Spike Added, PDS Result, PDS % Recovery, PDSD Spike Added, PDSD Result, PDSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Magnesium, Potassium, Sodium.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030427
Lab Batch ID: 18657

Sample Spiked: 02030442-05
RunID: TJA_020318F-1068523 Units: mg/L
Analysis Date: 03/19/2002 2:17 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows include Barium, Cadmium, Chromium, Magnesium, Potassium, Silver, and Sodium.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030427
Lab Batch ID: 18657-T

Method Blank

Samples in Analytical Batch:

RunID: TJAT_020314B-1062837 Units: mg/L
Analysis Date: 03/14/2002 23:57 Analyst: JS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Lab Sample ID Client Sample ID
02030427-01D MW-12D
02030427-02D MW-13

Table with 4 columns: Analyte, Result, Rep Limit. Rows for Arsenic, Lead, Selenium.

Laboratory Control Sample (LCS)

RunID: TJAT_020314B-1062838 Units: mg/L
Analysis Date: 03/15/2002 0:03 Analyst: JS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 7 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows for Arsenic, Lead, Selenium.

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030442-05
RunID: TJAT_020314B-1062840 Units: mg/L
Analysis Date: 03/15/2002 0:17 Analyst: JS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows for Arsenic, Lead, Selenium.

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



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Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030427
Lab Batch ID: 18657A

Method Blank

Samples in Analytical Batch:

RunID: TJA_020320D-1069137 Units: mg/L
Analysis Date: 03/21/2002 0:15 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Lab Sample ID Client Sample ID
02030427-01D MW-12D
02030427-02D MW-13

Table with 3 columns: Analyte, Result, Rep Limit. Rows: Calcium (ND, 0.1), Sodium (ND, 0.5)

Laboratory Control Sample (LCS)

RunID: TJA_020320D-1069138 Units: mg/L
Analysis Date: 03/21/2002 0:21 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Rows: Calcium, Sodium

Post Digestion Spike (PDS) / Post Digestion Spike Duplicate (PDSD)

Sample Spiked: 02030442-05
RunID: TJA_020320D-1069143 Units: mg/L
Analysis Date: 03/21/2002 0:52 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: Method

Table with 12 columns: Analyte, Sample Result, PDS Spike Added, PDS Result, PDS % Recovery, PDSD Spike Added, PDSD Result, PDSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows: Calcium, Sodium

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030442-05
RunID: TJA_020320D-1069140 Units: mg/L
Analysis Date: 03/21/2002 0:34 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Rows: Calcium, Sodium

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



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Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Metals by Method 6010B, Total
Method: SW6010B

WorkOrder: 02030427
Lab Batch ID: 18657A

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030442-05
RunID: TJA_020320D-1069140 Units: mg/L
Analysis Date: 03/21/2002 0:34 Analyst: NS
Preparation Date: 03/14/2002 7:30 Prep By: MW Method SW3010A

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Calcium	140	1	137	-757 *	1	139	-539 *	33.6 *	20	75	125
Sodium	130	1	118	-722 *	1	119	-703 *	2.62	20	75	125

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
 B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
 J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Mercury, Total
Method: SW7470A

WorkOrder: 02030427
Lab Batch ID: 18720

Method Blank

Samples in Analytical Batch:

RunID: HGL_020315B-1063715 Units: mg/L
Analysis Date: 03/15/2002 12:50 Analyst: R_T
Preparation Date: 03/15/2002 9:30 Prep By: R_T Method SW7470A
Lab Sample ID: 02030427-01D Client Sample ID: MW-12D
02030427-02D Client Sample ID: MW-13

Table with 3 columns: Analyte, Result, Rep Limit. Row: Mercury, ND, 0.0002

Laboratory Control Sample (LCS)

RunID: HGL_020315B-1063717 Units: mg/L
Analysis Date: 03/15/2002 12:50 Analyst: R_T
Preparation Date: 03/15/2002 9:30 Prep By: R_T Method SW7470A

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Mercury, 0.002, 0.00212, 106, 80, 120

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030325-01
RunID: HGL_020315B-1063719 Units: mg/L
Analysis Date: 03/15/2002 12:50 Analyst: R_T
Preparation Date: 03/15/2002 9:30 Prep By: R_T Method SW7470A

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Mercury, ND, 0.002, 0.00202, 101, 0.002, 0.0022, 110, 8.53, 20, 75, 125

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



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Brown & Caldwell
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Analysis: Chloride, Total
Method: E325.3

WorkOrder: 02030427
Lab Batch ID: R55362

Method Blank

Samples in Analytical Batch:

RunID: WET_020314A-1061384 Units: mg/L
Analysis Date: 03/14/2002 11:00 Analyst: CV

Lab Sample ID Client Sample ID
02030427-01G MW-12D
02030427-02G MW-13
02030427-03A MW-14
02030427-04A MW-15

Table with 3 columns: Analyte, Result, Rep Limit. Row: Chloride, ND, 1.0

Laboratory Control Sample (LCS)

RunID: WET_020314A-1061386 Units: mg/L
Analysis Date: 03/14/2002 11:00 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Chloride, 143, 140, 98, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030254-01
RunID: WET_020314A-1061388 Units: mg/L
Analysis Date: 03/14/2002 11:00 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Chloride, 6.9, 50, 56, 98.2, 50, 56.9, 99.9, 1.74, 20, 85, 115

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Analysis: Nitrogen, Nitrate (As N)
Method: E300

WorkOrder: 02030427
Lab Batch ID: R55540

Method Blank

Samples in Analytical Batch:

RunID: WET_020313S-1064679 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Lab Sample ID Client Sample ID
02030427-01F MW-12D
02030427-02F MW-13

Table with 3 columns: Analyte, Result, Rep Limit. Row: Nitrogen, Nitrate (As N), ND, 0.10

Laboratory Control Sample (LCS)

RunID: WET_020313S-1064680 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Nitrogen, Nitrate (As N), 10, 9.46, 95, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020313S-1064682 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Nitrogen, Nitrate (As N), 3.0, 10, 12.6, 95.9, 10, 12.6, 95.7, 0.271, 20, 76, 124

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Fluoride-IC
Method: E300

WorkOrder: 02030427
Lab Batch ID: R55674

Method Blank

Samples in Analytical Batch:

RunID: WET_020313T-1067964 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Lab Sample ID Client Sample ID
02030427-01F MW-12D
02030427-02F MW-13

Table with 3 columns: Analyte, Result, Rep Limit. Row: Fluoride, ND, 0.10

Laboratory Control Sample (LCS)

RunID: WET_020313T-1067965 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Fluoride, 10, 9.8, 98, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020313T-1067967 Units: mg/L
Analysis Date: 03/13/2002 11:55 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Fluoride, 1.4, 10, 9.8, 84.1, 10, 9.7, 82.4, 1.97, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Sulfate
Method: E300

WorkOrder: 02030427
Lab Batch ID: R55679

Method Blank

Samples in Analytical Batch:

RunID: WET_020314S-1068028 Units: mg/L
Analysis Date: 03/14/2002 11:34 Analyst: ES

Lab Sample ID Client Sample ID
02030427-01F MW-12D
02030427-02F MW-13

Table with 3 columns: Analyte, Result, Rep Limit. Row: Sulfate, ND, 0.20

Laboratory Control Sample (LCS)

RunID: WET_020314S-1068029 Units: mg/L
Analysis Date: 03/14/2002 11:34 Analyst: ES

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Sulfate, 10, 9.9, 99, 90, 110

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020314S-1068031 Units: mg/L
Analysis Date: 03/14/2002 11:34 Analyst: ES

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Sulfate, 120, 200, 310, 94.9, 200, 310, 94.1, 0.809, 20, 80, 120

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



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Brown & Caldwell
BJ-Hobbs 12832-017

Analysis: Hardness, Total (Titrimetric, EDTA)
Method: E130.2

WorkOrder: 02030427
Lab Batch ID: R55701

Method Blank

Samples in Analytical Batch:

RunID: WET_020319U-1068403 Units: mg/L
Analysis Date: 03/19/2002 11:45 Analyst: CV

Lab Sample ID Client Sample ID
02030427-01D MW-12D
02030427-02D MW-13

Table with 3 columns: Analyte, Result, Rep Limit. Row: Hardness (As CaCO3), ND, 5.0

Laboratory Control Sample (LCS)

RunID: WET_020319U-1068405 Units: mg/L
Analysis Date: 03/19/2002 11:45 Analyst: CV

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Hardness (As CaCO3), 202, 200, 101, 94, 108

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 02030425-01
RunID: WET_020319U-1068407 Units: mg/L
Analysis Date: 03/19/2002 11:45 Analyst: CV

Table with 12 columns: Analyte, Sample Result, MS Spike Added, MS Result, MS % Recovery, MSD Spike Added, MSD Result, MSD % Recovery, RPD, RPD Limit, Low Limit, High Limit. Row: Hardness (As CaCO3), 420, 500, 920, 100, 500, 920, 100, 0, 20, 81, 111

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

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BJ-Hobbs 12832-017

Analysis: Alkalinity, Bicarbonate
Method: M2320 B

WorkOrder: 02030427
Lab Batch ID: R55803

Method Blank

Samples in Analytical Batch:

RunID: WET_020315S-1070451 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Lab Sample ID Client Sample ID
02030427-01G MW-12D
02030427-02G MW-13

Table with 3 columns: Analyte, Result, Rep Limit. Row: Alkalinity, Bicarbonate, ND, 2.0

Laboratory Control Sample (LCS)

RunID: WET_020315S-1070453 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Alkalinity, Bicarbonate, 80.3, 80, 100, 90, 110

Sample Duplicate

Original Sample: 02030425-01
RunID: WET_020315S-1070454 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Row: Alkalinity, Bicarbonate, 260, 260, 0, 20

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.



Quality Control Report

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Brown & Caldwell

BJ-Hobbs 12832-017

Analysis: Alkalinity, Carbonate
Method: M2320 B

WorkOrder: 02030427
Lab Batch ID: R55804

Method Blank

Samples in Analytical Batch:

RunID: WET_020315T-1070509 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Lab Sample ID Client Sample ID
02030427-01G MW-12D
02030427-02G MW-13

Table with 3 columns: Analyte, Result, Rep Limit. Row: Alkalinity, Carbonate, ND, 2.0

Laboratory Control Sample (LCS)

RunID: WET_020315T-1070511 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 6 columns: Analyte, Spike Added, Result, Percent Recovery, Lower Limit, Upper Limit. Row: Alkalinity, Carbonate, 80.3, 80, 100, 90, 110

Sample Duplicate

Original Sample: 02030425-01
RunID: WET_020315T-1070512 Units: mg/L
Analysis Date: 03/15/2002 15:30 Analyst: SN

Table with 5 columns: Analyte, Sample Result, DUP Result, RPD, RPD Limit. Row: Alkalinity, Carbonate, ND, ND, 0, 20

Qualifiers: ND/U - Not Detected at the Reporting Limit MI - Matrix Interference
B - Analyte detected in the associated Method Blank D - Recovery Unreportable due to Dilution
J - Estimated value between MDL and PQL * - Recovery Outside Advisable QC Limits

The percent recoveries for QC samples are correct as reported. Due to significant figures and rounding, the reported RPD may differ from the displayed RPD values but is correct as reported.

*Sample Receipt Checklist
And
Chain of Custody*



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Sample Receipt Checklist

Workorder:	02030427	Received By:	DS
Date and Time Received:	3/13/02 10:00:00 AM	Carrier name:	FedEx
Temperature:	3	Chilled by:	Water Ice

- 1. Shipping container/cooler in good condition? Yes No Not Present
- 2. Custody seals intact on shipping container/cooler? Yes No Not Present
- 3. Custody seals intact on sample bottles? Yes No Not Present
- 4. Chain of custody present? Yes No
- 5. Chain of custody signed when relinquished and received? Yes No
- 6. Chain of custody agrees with sample labels? Yes No
- 7. Samples in proper container/bottle? Yes No
- 8. Sample containers intact? Yes No
- 9. Sufficient sample volume for indicated test? Yes No
- 10. All samples received within holding time? Yes No
- 11. Container/Temp Blank temperature in compliance? Yes No
- 12. Water - VOA vials have zero headspace? Yes No Not Applicable
- 13. Water - pH acceptable upon receipt? Yes No Not Applicable

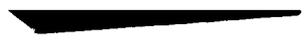
SPL Representative:

Contact Date & Time:

Client Name Contacted:

Non Conformance Issues:

Client Instructions:



1 2 3 4



