ARCADIS

Infrastructure, buildings, environment, communications

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Mr. Robert Patterson
Key Energy Services
2625 W. Marland
Hobbs, New Mexico 88241

ENVIRONMENT

Subject:
Findings and Recommendations from a Soil and Groundwater Investigation of the Saltwater Facility
Key Energy Services, Hobbs, New Mexico Facility
Lea County, New Mexico

Date:
May 20, 2003

Contact:
Brady Kolb

Phone:
(432) 687-5400

Email:
bkolb@arcadis-us.com

Our ref:
G:/Aproject/Key Energy Services/MT095.01 Hobbs/reports/Key Energy Hobbs Saltwater Facility Report

Dear Mr. Patterson:

On March 25-28, 2003, ARCADIS G&M, Inc. (ARCADIS) performed an investigation into the potential impacts to soil and groundwater associated with the Key Energy Services saltwater facility located at 1502 West Broadway Place, Hobbs, New Mexico (Figure 1). A total of three soil borings (one of which was converted into a monitor well) were advanced using air rotary drilling.

FIELD METHODS

Three soil borings (figure 2) were drilled in the vicinity of the old truck loading dock at the saltwater facility. Either direct-push or a short (1 foot in length) coring device was used to collect soil samples for analysis. The sampling device was thoroughly cleaned between each sample using laboratory-grade detergent and water. Soil samples were caught at intervals of 0.5 feet, 2 feet and 5 feet, and at 5-foot intervals thereafter to total depth. Upon completion, SB-1 and SB-2 were plugged to the surface with hydrated bentonite chips.

The samples were split between a laboratory-provided 8-ounce glass jar and plastic zip-lock bags. The headspace in the zip-lock bags was analyzed using a photo-ionization detector (PID) previously calibrated using 100 parts per million (ppm) isobutane. A scintillator was used to screen for the potential of naturally occurring radioactive material (NORM).

The two borings, SB-1 and SB-2, were both drilled to a total depth of 35 feet. The third soil boring (MW-1) was drilled to the top of the Triassic-age contact (196 feet). However, the 5-foot sample intervals were terminated at the groundwater contact (approximately 55 feet). MW-1 was completed at a depth of 196 feet below ground surface. The well was screened from 196 to 46 feet with 4-inch schedule 40 PVC, 0.020-inch mill slots. The gravel pack, consisting of 8/16 Brady sand, was filled into

the annulus to a depth of 43 feet. A three-foot hydrated bentonite plug was placed above the gravel pack. The well was then grouted to surface with Portland cement containing 2-5% bentonite to create a watertight seal. MW-1 was then developed using a bailer and 4-inch pump. Approximately 85 barrels of water were removed from MW-1. The monitor well was pumped until the pH, conductivity and field chloride readings stabilized to within 10% percent of the previous reading. A groundwater sample was then collected from the well.

Two soil samples from each borehole were submitted to the laboratory for analysis. One sample was taken from the sample with the highest headspace reading; the other sample was taken from the base of the boring. Samples were collected according to standard procedures in containers supplied by the laboratory. They were placed on ice immediately upon collection and kept on ice until they were turned over to laboratory personnel.

PID readings, scintillator readings and soil descriptions are summarized on the boring logs in Appendix A. Using appropriate chain-of-custody protocol, the soil samples were hand-delivered by ARCADIS personnel to Environmental Lab of Texas I, LTD (Environmental Lab).

The soil samples were analyzed for total petroleum hydrocarbons (TPH) by method 8015M and for benzene, toluene, ethylbenzene and xylenes (BTEX) by method 8021B/5030. The samples were also examined for the eight RCRA metals (arsenic, barium, cadmium, chromium, lead, selenium, silver, mercury) and for chloride.

The groundwater sample collected from MW-1 was submitted to Environmental Lab, for analysis of BTEX 8021B, polynuclear aromatic hydrocarbons (PAHs) major cations (calcium, magnesium, potassium, and sodium), RCRA metals, major anions (bicarbonate alkalinity, carbonate alkalinity, chloride, hydroxide alkalinity, and sulfate) and total dissolved solids (TDS).

FIELD AND ANALYTICAL RESULTS FOR SOIL

No PID readings higher than 10 ppm were observed in any of the three soil borings. Field readings for NORM did not exceed two times measured background levels.

Analytical results were examined for completeness and procedural errors, and none were observed. The complete laboratory analytical report is included in Appendix B.

No BTEX was detected in any of the samples analyzed. TPH was found in the diesel range organics [DRO] (>C12-C35) in SB-1 (2') at a level of 114 mg/kg. The TPH reading is most likely attributed to the possibility that an existing oil-topped pad was

located at the site prior to the caliche topping used to construct the present day site. TPH and BTEX analytical results are summarized in Table A.

Chlorides were detected in elevated concentrations in the three soil borings. However the elevated detections appear to be limited to the very shallow soil at the site (upper 2 feet). SB-1(2') contained 9750 mg/kg chloride, but at the base of the boring, SB-1(35') the chloride concentration was only 266 mg/kg. Similarly, in SB-2 (6") the chloride detection was 27,300, but in SB-2(35') the chloride concentration was 70.9 mg/kg. The two intervals submitted for analysis from MW-1 were the six inch and 55 foot sample. The results for chloride in MW-1 are 8,330 mg/kg and <20.0 mg/kg, respectively. The 55-foot sample represents the top of the saturated unit. In addition to the chloride analyses, the soil samples were submitted for analysis of RCRA 8 metals. No metals analysis exceeded the New Mexico Environment Department screening levels for industrial/occupational sites. Chloride and RCRA 8 metals analytical results are summarized in Table B.

FIELD AND ANALYTICAL RESULTS FOR GROUNDWATER

Neither BTEX nor PAHs, were detected in the groundwater sample from MW-1. Chloride was detected at 665 mg/L. This result is higher than the WQCC drinking water standard of 250 mg/L. Also, TDS was detected at 1600 mg/L. Small amounts of the metals arsenic, barium and selenium were detected in the groundwater at concentrations of 0.012 mg/L, 0.123 mg/L and 0.011 mg/L, respectively. Groundwater sample results are summarized in Table C. The presence of dissolved arsenic, barium, and selenium can most likely be attributed to those metals occurring naturally in the soils. According to the United States Geologic Survey (USGS) report "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States", background concentrations of arsenic, barium and selenium can occur at approximately 4.1 ppm, greater than 300 ppm, and approximately 0.3 ppm, respectively.

CONCLUSIONS

There were four types of potential soil impact addressed by this investigation. These potential impacts were NORM, hydrocarbon, metals and chloride. A groundwater investigation was conducted at this site. Field and laboratory analysis indicated the following:

1. No NORM impact was found at this site.
2. Hydrocarbon impact was addressed by the PID readings and the laboratory analysis of soil samples.
   2a. Laboratory analysis indicates that there is no BTEX impact.
   2b. The only TPH impact encountered was DRO (>C12-C35), and only one sample exceeded the 100-ppm regulatory limit. This sample was taken

in SB-1 (2'). The DRO was 114 ppm, and the sample below SB-1 (35') had no detectable hydrocarbon impact.

3. Laboratory analysis of the soil samples for RCRA metals indicated that there was no selenium or silver detected in any of the samples.
   3a. Barium was encountered, but it is felt that this was a natural occurrence.
   3b. Small amounts of arsenic, cadmium, chromium, lead and mercury were encountered in the soils, and they are most likely naturally occurring. According to the USGS report "Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States".
4. Moderately high concentrations of chlorides were encountered in each of the soil borings, and these appear to decrease with depth.
   4a. The highest chloride concentrations appear to be associated with the shallow borings (SB-1 & SB-2) around the cement pad.
   4b. The chlorides were in the 8,330 milligrams per kilogram (mg/Kg) to 27,300 mg/Kg (equivalent to ppm) range.
5. A downgradient monitor well was installed southeast of the pit.
   5a. No BTEX was detected in the groundwater.
   5b. No PAHs were detected in the groundwater.
   5c. Small amounts of arsenic, barium and selenium were detected in the groundwater. The detections of these analytes is most likely attributed to natural occurrence.
   5d. The chloride concentration of 665 mg/L exceeds the WQCC drinking water standard of 250mg/L. Due to lack of information on background groundwater analytical, it cannot be determined whether the elevated chloride and TDS are a result of the saltwater pit or natural occurrence.

RECOMMENDATIONS

ARCADIS proposes the following recommendations for consideration:

1. An additional monitor well should be drilled on the upgradient (northwest) side of the pit. This monitor well will aid in determining the background level of the chloride noted in the downgradient well (MW-1).
2. A shallow soil sample in another area removed from the pad should be taken and analyzed for RCRA total metals and chlorides to be used as a background control sample.
3. Excavation of the shallow impacted soil associated with the cement pad is recommended. The impacted soil should be removed and replaced.
4. It is required that the soils at the base of an excavation be sampled to comply with NMOCD regulations.

ARCADIS appreciates the opportunity to investigate this property for Key Energy Services. If you should have any questions regarding this report of activities at the site, please do not hesitate to contact us at (432) 687-5400.

Very truly yours,

ARCADIS G&M, Inc.

Brady Kolb
Geologist/Scientist

Steven P. Tischer
Remediation Department Manager

copies: Mr. Gene Butler
Key Energy Services
6 Desta Drive #5900
Midland, TX 79705

TABLES

ARCADIS

Key Energy Services
Hobbs, New Mexico
Saltwater Loading Facility

Samples collected March 25, 2003

Table A

Organic Compounds(Soil)
in mg/Kg (ppm)

Soil Borings	TPH		BTEX				
	GRO, C6-C12	DRO, >C12-C35	Benzene	Ethylbenzene	Toluene	p/m-Xylene	o-Xylene
SB-1 (2')	<10.0	114	<0.025	<0.025	<0.025	<0.025	<0.025
SB-1 (35')	<10.0	<10.0	<0.025	<0.025	<0.025	<0.025	<0.025
SB-2 (6")	<10.0	<10.0	<0.025	<0.025	<0.025	<0.025	<0.025
SB-2 (35')	<10.0	<10.0	<0.025	<0.025	<0.025	<0.025	<0.025
MW-1 (2')	<10.0	110	<0.025	<0.025	<0.025	<0.025	<0.025
MW-1(55')	<10.0	<10.0	<0.025	<0.025	<0.025	<0.025	<0.025

Key Energy Services
Hobbs, New Mexico
Saltwater Loading Facility

ARCADIS

Samples collected March 25, 2003

Table B

Eight RCRA Metals and Chloride (Soil)
in mg/Kg (ppm)

Soil Borings	Chloride	Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver	Mercury
SB-1 (2')	9570	3.68	542	0.06	2.39	2.18	<0.20	<0.10	0.0315
SB-1 (35')	266	1.42	122	<0.050	1.95	<0.550	<0.20	<0.10	<0.0250
SB-2 (6")	27300	5.75	478	<0.050	1.41	<0.550	<0.20	<0.10	<0.0250
SB-2 (35')	70.9	1.17	34.8	<0.050	2.7	<0.550	<0.20	<0.10	<0.0250
MW-1 (6")	8330	5.45	368	<0.050	2.07	<0.550	<0.20	<0.10	<0.0250
MW-1 (55')	<20.0	0.526	30.8	<0.050	2.91	0.744	<0.20	<0.10	<0.0250

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Key Energy Services
Hobbs, New Mexico
Saltwater Loading Facility

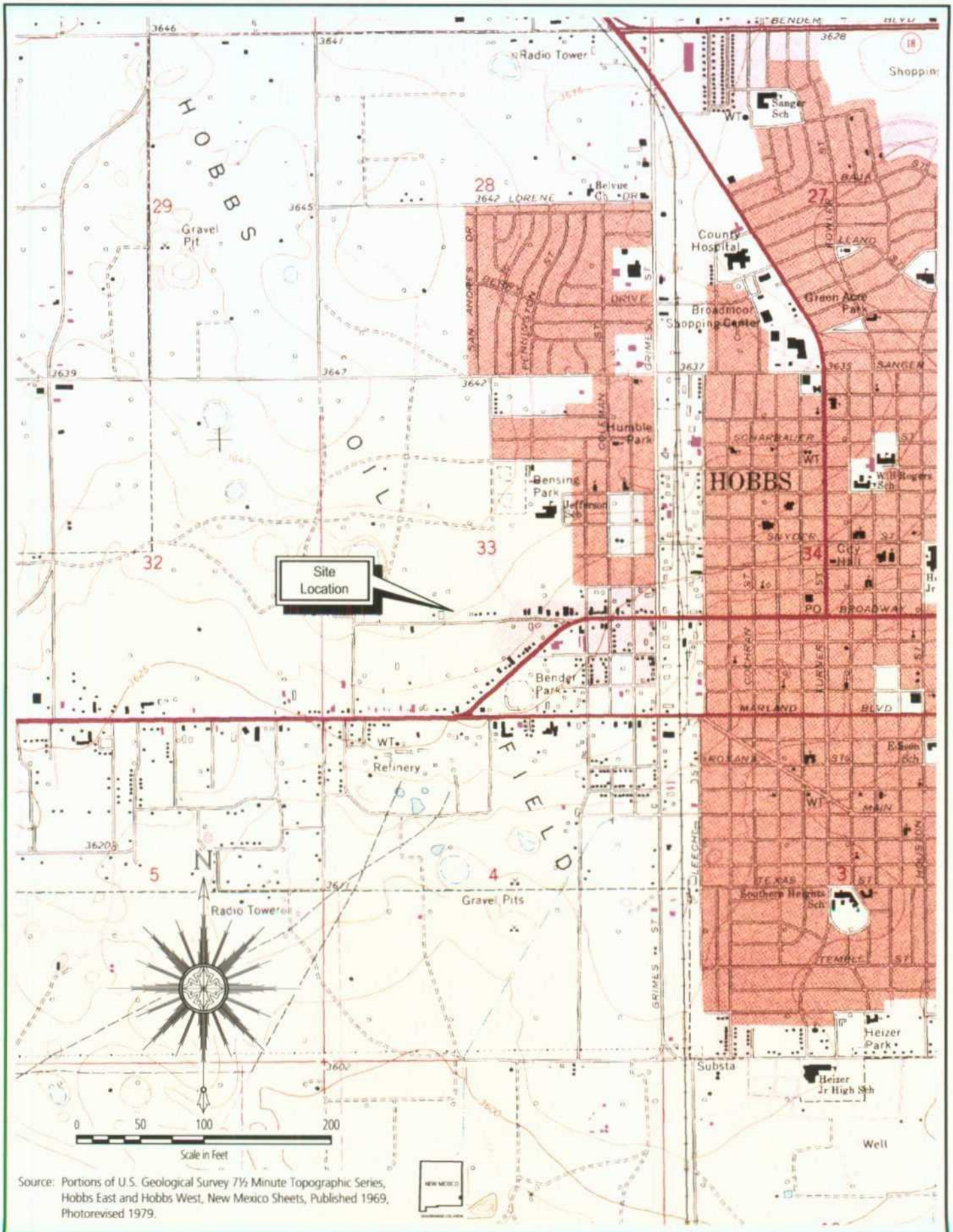
Samples Collected March 25, 2003

Table C

MW-1 Groundwater Analytical Results
in mg/L (ppm)

Analyte	Result
Volatile Organics	
Benzene	<0.001
Toluene	<0.001
Ethylbenzene	<0.001
m,p-Xylene	<0.001
o-Xylene	<0.001
PAHs	
Naphthalene	<0.005
Acenaphthylene	<0.005
Acenaphthene	<0.005
Flourene	<0.005
Phenanthrene	<0.005
Anthracene	<0.005
Fluoranthene	<0.005
Pyrene	<0.005
Benzo(a)anthracene	<0.005
Chrysene	<0.005
Benzo(a)fluoranthene	<0.005
Benzo(k)fluoranthene	<0.005
Benzo(a)pyrene	<0.005
Ideno(1,2,3-cd)Pyrene	<0.005
Dibenzo(a,h)Anthracene	<0.005
Benzo(g,h,I)Perylene	<0.005
Inorganics	
Calcium	129
Magnesium	24.2
Potassium	7.93
Sodium	337
Arsenic	0.012
Barium	0.123
Cadmium	<0.001
Chromium	<0.002
Lead	<0.011
Selenium	0.011
Silver	<0.002
Mercury	<0.00050
Bicarbonate	290
Carbonate	<0.10
Chloride	665
Alkalinity	<0.10
Sulfate	137
Total Dissolved Solids	1600

FIGURES



Source: Portions of U.S. Geological Survey 7½ Minute Topographic Series, Hobbs East and Hobbs West, New Mexico Sheets, Published 1969, Photorevised 1979.

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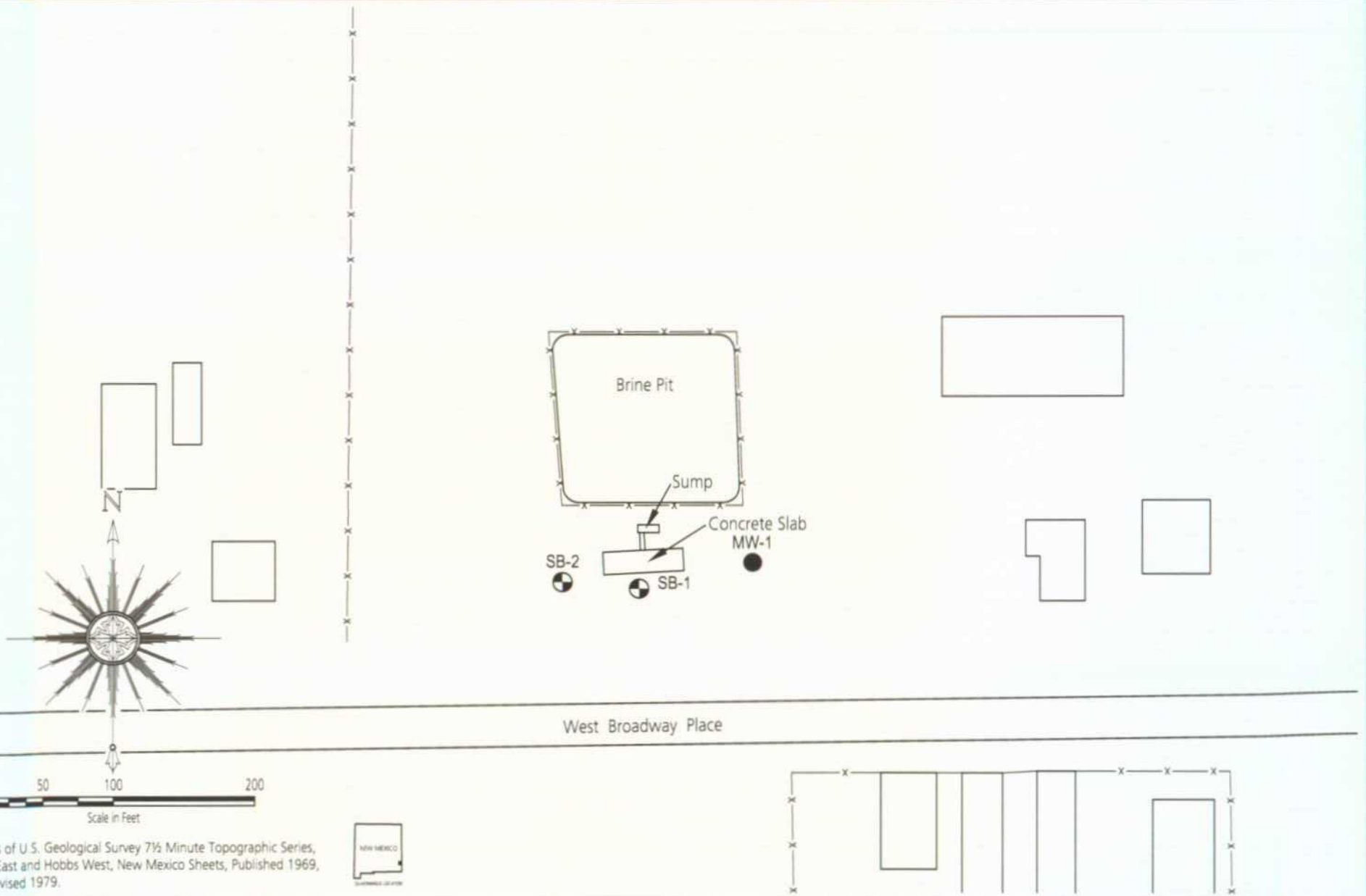
Drawing Date	File Name	File Location	Task Manager	Project Director	Area Manager
8 May 2003	MT795101.dwg	\AutoCAD\DWG\Key Energy Services\MT000795.001	B. Kolb	S. Tischer	A. Schmidt

Key Energy Services, Inc.
Hobbs Saltwater Facility

Site Location Map

City of Hobbs, Lea County, New Mexico

Technical Review	Unique Number
S. Tischer	31-014-00497
Project Number	**Figure**
MT000795.0001	1



Source: Portions of U.S. Geological Survey 7½ Minute Topographic Series, Hobbs East and Hobbs West, New Mexico Sheets, Published 1969, Photorevised 1979.

ARCADIS
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Midland, TX 79701-3383
Tel: 432 687 5400 Fax: 432 687 5401

Drawing Date	File Name	File Location	Task Manager	Project Director	Area Manager
8 May 2003	MT795102.dwg	:AutoCAD:DWG:Key Energy Services:MT000795.001	B. Kolb	S. Tischer	A. Schmidt

Key Energy Services, Inc.
Hobbs Saltwater Facility

Site Plan

City Of Hobbs, Lea County, New Mexico

Technical Review	Unique Number
S. Tischer	31-014-00498

Project Number	Figure
MT000795.0001	2

APPENDIX A

Appendix A

Boring and Well Logs

BORING LOG

BORING NO. SB-1

ARCADIS
1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687-5400 Fax: 432 687-5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
UNIQUE NUMBER: 31-014-00493 FILE NAME: SB-1.dat

DRILLING CO: Scarborough Drilling
DRILLING METHOD: Air
DRILLER: S. Scarborough
LOGGER: B. Kolb
DATE BEGUN: 3/25/03 DATE COMPLETED: 3/25/03

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM READINGS ur/hr	LITHOLOGY	DESCRIPTION
0		Core				0.3	4.0		CALICHE: 7.5 YR 8/1 white, 20% fine-grained to very fine-grained SAND, well rounded, poorly sorted, dry.
		Core							
		Shovel							
		Core				0.3	4.5		
		Shovel							
-5		Core				0.1	4.0		
		Shovel							
-10		Core				0.1	5.0		
		Shovel							
-15		Core				0.1	5.0		
		Shovel							CALICHE: 7.5 YR 8/1 white, 30% to 35% fine-grained to very fine-grained SAND, well rounded, very hard at -28.0' to -29.0', dry.
-20		Core				0.0	4.5		
		Shovel							
-25		Core				0.1	5.0		
		Shovel							
-30		Core				0.0	5.0		
		Shovel							
-35		Core				0.1	4.5		

BORING LOG

BORING NO. SB-1

ARCADIS
1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687-5400 Fax: 432 687-5401

PROJECT NUMBER:	MT000795.0001	DRILLING CO:	Scarborough Drilling
CLIENT NAME:	Key Energy Services, Inc.	DRILLING METHOD:	Air
PROJECT NAME:	Hobbs Saltwater Facility	DRILLER:	S. Scarborough
SITE LOCATION:	Lea County, New Mexico	LOGGER:	B. Kolb
UNIQUE NUMBER:	31-014-00493 FILE NAME: SB-1.dat	DATE BEGUN:	3/25/03 DATE COMPLETED: 3/25/03

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM READINGS ur/hr	LITHOLOGY	DESCRIPTION
0		Core				0.3	4.0		CALICHE: 7.5 YR 8/1 white, 20% fine-grained to very fine-grained SAND, well rounded, poorly sorted, dry.
		Core							
		Shovel							
		Core				0.3	4.5		
		Shovel							
-5		Core				0.1	4.0		
		Shovel							
-10		Core				0.1	5.0		
		Shovel							
-15		Core				0.1	5.0		
		Shovel							CALICHE: 7.5 YR 8/1 white, 30% to 35% fine-grained to very fine-grained SAND, well rounded, very hard at -28.0' to -29.0', dry.
-20		Core				0.0	4.5		
		Shovel							
-25		Core				0.1	5.0		
		Shovel							
-30		Core				0.0	5.0		
		Shovel							
-35		Core				0.1	4.5		

BORING LOG

BORING NO. SB-1

ARCADIS
1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687-5400 Fax: 432 687-5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
UNIQUE NUMBER: 31-014-00493 FILE NAME: SB-1.dat

DRILLING CO: Scarborough Drilling
DRILLING METHOD: Air
DRILLER: S. Scarborough
LOGGER: B. Kolb
DATE BEGUN: 3/25/03 DATE COMPLETED: 3/25/03

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM READINGS ur/hr	LITHOLOGY	DESCRIPTION
0		Core				0.3	4.0		CALICHE: 7.5 YR 8/1 white, 20% fine-grained to very fine-grained SAND, well rounded, poorly sorted, dry.
		Core							
		Shovel							
		Core				0.3	4.5		
		Shovel							
-5		Core				0.1	4.0		
		Shovel							
-10		Core				0.1	5.0		
		Shovel							
-15		Core				0.1	5.0		
		Shovel							CALICHE: 7.5 YR 8/1 white, 30% to 35% fine-grained to very fine-grained SAND, well rounded, very hard at -28.0' to -29.0', dry.
-20		Core				0.0	4.5		
		Shovel							
-25		Core				0.1	5.0		
		Shovel							
-30		Core				0.0	5.0		
		Shovel							
-35		Core				0.1	4.5		

BORING LOG

BORING NO. SB-1

ARCADIS
1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687-5400 Fax: 432 687-5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
UNIQUE NUMBER: 31-014-00493 FILE NAME: SB-1.dat

DRILLING CO: Scarborough Drilling
DRILLING METHOD: Air
DRILLER: S. Scarborough
LOGGER: B. Kolb
DATE BEGUN: 3/25/03 DATE COMPLETED: 3/25/03

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM READINGS ur/hr	LITHOLOGY	DESCRIPTION
0		Core				0.3	4.0		CALICHE: 7.5 YR 8/1 white, 20% fine-grained to very fine-grained SAND, well rounded, poorly sorted, dry.
		Core							
		Shovel							
		Core				0.3	4.5		
		Shovel							
-5		Core				0.1	4.0		
		Shovel							
-10		Core				0.1	5.0		
		Shovel							
-15		Core				0.1	5.0		
		Shovel							CALICHE: 7.5 YR 8/1 white, 30% to 35% fine-grained to very fine-grained SAND, well rounded, very hard at -28.0' to -29.0', dry.
-20		Core				0.0	4.5		
		Shovel							
-25		Core				0.1	5.0		
		Shovel							
-30		Core				0.0	5.0		
		Shovel							
-35		Core				0.1	4.5		

ARCADIS

BORING LOG

BORING NO. SB-1

1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687-5400 Fax: 432 687-5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
UNIQUE NUMBER: 31-014-00493 FILE NAME: SB-1.dat

DRILLING CO: Scarborough Drilling
DRILLING METHOD: Air
DRILLER: S. Scarborough
LOGGER: B. Kolb
DATE BEGUN: 3/25/03 DATE COMPLETED: 3/25/03

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM READINGS ur/hr	LITHOLOGY	DESCRIPTION
0		Core				0.3	4.0		CALICHE: 7.5 YR 8/1 white, 20% fine-grained to very fine-grained SAND, well rounded, poorly sorted, dry.
		Core							
		Shovel							
		Core				0.3	4.5		
		Shovel							
-5		Core				0.1	4.0		
		Shovel							
-10		Core				0.1	5.0		
		Shovel							
-15		Core				0.1	5.0		
		Shovel							CALICHE: 7.5 YR 8/1 white, 30% to 35% fine-grained to very fine-grained SAND, well rounded, very hard at -28.0' to -29.0', dry.
-20		Core				0.0	4.5		
		Shovel							
-25		Core				0.1	5.0		
		Shovel							
-30		Core				0.0	5.0		
		Shovel							
-35		Core				0.1	4.5		

BORING LOG

BORING NO. SB-2

ARCADIS
1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687-5400 Fax: 432 687-5401

PROJECT NUMBER:	MT000795.0001	DRILLING CO:	Scarborough Drilling
CLIENT NAME:	Key Energy Services, Inc.	DRILLING METHOD:	Air
PROJECT NAME:	Hobbs Saltwater Facility	DRILLER:	S. Scarborough
SITE LOCATION:	Lea County, New Mexico	LOGGER:	B. Kolb
UNIQUE NUMBER:	31-014-00494 FILE NAME: SB-2.dat	DATE BEGUN:	3/25/03 DATE COMPLETED: 3/25/03

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM READINGS ur/hr	LITHOLOGY	DESCRIPTION
0		Shovel							
		Core				0.3	8.0		CALICHE: 7.5 YR 8/1 white, 20% fine-grained to very fine-grained SAND, well rounded, poorly sorted, very hard at -28.0' ot -29.0'.
		Shovel							
		Core				0.1	5.0		
		Shovel							
-5		Core				0.1	5.0		
		Shovel							
-10		Core				0.1	4.0		
		Shovel							
-15		Core				0.0	5.0		
		Shovel							
-20		Core				0.1	5.0		
		Shovel							
-25		Core				0.1	6.0		
		Shovel							
-30		Core				0.1	5.0		CALICHE: 5 YR 8/1 white, 30% fine-grained to very fine-grained SAND, well rounded, poorly sorted, hard.
		Shovel							
-35		Core				0.0	5.0		

BORING LOG

BORING NO. SB-2

ARCADIS
1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687-5400 Fax: 432 687-5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
UNIQUE NUMBER: 31-014-00494 FILE NAME: SB-2.dat

DRILLING CO: Scarborough Drilling
DRILLING METHOD: Air
DRILLER: S. Scarborough
LOGGER: B. Kolb
DATE BEGUN: 3/25/03 DATE COMPLETED: 3/25/03

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM READINGS ur/hr	LITHOLOGY	DESCRIPTION
0		Shovel							
		Core				0.3	8.0		CALICHE: 7.5 YR 8/1 white, 20% fine-grained to very fine-grained SAND, well rounded, poorly sorted, very hard at -28.0' ot -29.0'.
		Shovel							
		Core				0.1	5.0		
		Shovel							
-5		Core				0.1	5.0		
		Shovel							
-10		Core				0.1	4.0		
		Shovel							
-15		Core				0.0	5.0		
		Shovel							
-20		Core				0.1	5.0		
		Shovel							
-25		Core				0.1	6.0		
		Shovel							
-30		Core				0.1	5.0		CALICHE: 5 YR 8/1 white, 30% fine-grained to very fine-grained SAND, well rounded, poorly sorted, hard.
		Shovel							
-35		Core				0.0	5.0		

BORING LOG

BORING NO. SB-2

ARCADIS
1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687-5400 Fax: 432 687-5401

PROJECT NUMBER:	MT000795.0001	DRILLING CO:	Scarborough Drilling
CLIENT NAME:	Key Energy Services, Inc.	DRILLING METHOD:	Air
PROJECT NAME:	Hobbs Saltwater Facility	DRILLER:	S. Scarborough
SITE LOCATION:	Lea County, New Mexico	LOGGER:	B. Kolb
UNIQUE NUMBER:	31-014-00494 FILE NAME: SB-2.dat	DATE BEGUN:	3/25/03 DATE COMPLETED: 3/25/03

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM READINGS ur/hr	LITHOLOGY	DESCRIPTION
0		Shovel							
		Core				0.3	8.0		CALICHE: 7.5 YR 8/1 white, 20% fine-grained to very fine-grained SAND, well rounded, poorly sorted, very hard at -28.0' ot -29.0'.
		Shovel							
		Core				0.1	5.0		
		Shovel							
-5		Core				0.1	5.0		
		Shovel							
-10		Core				0.1	4.0		
		Shovel							
-15		Core				0.0	5.0		
		Shovel							
-20		Core				0.1	5.0		
		Shovel							
-25		Core				0.1	6.0		
		Shovel							
-30		Core				0.1	5.0		CALICHE: 5 YR 8/1 white, 30% fine-grained to very fine-grained SAND, well rounded, poorly sorted, hard.
		Shovel							
-35		Core				0.0	5.0		

BORING LOG

BORING NO. SB-2

ARCADIS

1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687-5400 Fax: 432 687-5401

PROJECT NUMBER:	MT000795.0001	DRILLING CO:	Scarborough Drilling
CLIENT NAME:	Key Energy Services, Inc.	DRILLING METHOD:	Air
PROJECT NAME:	Hobbs Saltwater Facility	DRILLER:	S. Scarborough
SITE LOCATION:	Lea County, New Mexico	LOGGER:	B. Kolb
UNIQUE NUMBER:	31-014-00494 FILE NAME: SB-2.dat	DATE BEGUN:	3/25/03 DATE COMPLETED: 3/25/03

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM READINGS ur/hr	LITHOLOGY	DESCRIPTION
0		Shovel							
		Core				0.3	8.0		CALICHE: 7.5 YR 8/1 white, 20% fine-grained to very fine-grained SAND, well rounded, poorly sorted, very hard at -28.0' ot -29.0'.
		Shovel							
		Core				0.1	5.0		
		Shovel							
-5		Core				0.1	5.0		
		Shovel							
-10		Core				0.1	4.0		
		Shovel							
-15		Core				0.0	5.0		
		Shovel							
-20		Core				0.1	5.0		
		Shovel							
-25		Core				0.1	6.0		
		Shovel							
-30		Core				0.1	5.0		CALICHE: 5 YR 8/1 white, 30% fine-grained to very fine-grained SAND, well rounded, poorly sorted, hard.
		Shovel							
-35		Core				0.0	5.0		

BORING LOG

BORING NO. SB-2

ARCADIS
1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687-5400 Fax: 432 687-5401

PROJECT NUMBER:	MT000795.0001	DRILLING CO:	Scarborough Drilling
CLIENT NAME:	Key Energy Services, Inc.	DRILLING METHOD:	Air
PROJECT NAME:	Hobbs Saltwater Facility	DRILLER:	S. Scarborough
SITE LOCATION:	Lea County, New Mexico	LOGGER:	B. Kolb
UNIQUE NUMBER:	31-014-00494 FILE NAME: SB-2.dat	DATE BEGUN:	3/25/03 DATE COMPLETED: 3/25/03

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM READINGS ur/hr	LITHOLOGY	DESCRIPTION
0		Shovel							
		Core				0.3	8.0		CALICHE: 7.5 YR 8/1 white, 20% fine-grained to very fine-grained SAND, well rounded, poorly sorted, very hard at -28.0' ot -29.0'.
		Shovel							
		Core				0.1	5.0		
		Shovel							
-5		Core				0.1	5.0		
		Shovel							
-10		Core				0.1	4.0		
		Shovel							
-15		Core				0.0	5.0		
		Shovel							
-20		Core				0.1	5.0		
		Shovel							
-25		Core				0.1	6.0		
		Shovel							
-30		Core				0.1	5.0		CALICHE: 5 YR 8/1 white, 30% fine-grained to very fine-grained SAND, well rounded, poorly sorted, hard.
		Shovel							
-35		Core				0.0	5.0		

WELL LOG

WELL NO. MW-1

ARCADIS 1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
LOGGER: B. Kolb ELEVATION (T.O.C.): 3,636.08'
FILE NAME: MW-1.dat UNIQUE NUMBER: 31-014-00495

STATIC WATER LEVEL: -62.80' MEAS. PT.: T.O.C. DATE: —
HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
SCREEN PACK:	8/16 Sand	-196.0' to -43.0'
CASING TYPE:	4" Diameter Sch. 40 PVC Blank	-46.0' to Surface
	—	—
	—	—
WELL SCREEN:	4" Diameter Sch. 40 PVC, 0.020" slots	-196.0' to -46.0'
PLUG BACK:	8/16 Sand	-200.0' to -196.0'

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
0		Core				0.3	5.0		CALICHE 7.5 YR 8/1 white, 20% SAND, medium-grained to very fine-grained, subrounded to well rounded, hard.	
		Core								
		Shovel				0.1	4.0			
-5		Core				0.1	4.5			
		Shovel								
-10		Core				0.0	6.0			
		Shovel								
-15		Core				0.1	5.0			
		Shovel								
-20		Core				0.0	4.0			
		Shovel								
-25		Core				0.1	6.0			
		Shovel								
-30		Core				0.1	4.0			
		Shovel								
-35		Core				0.1	6.0			
		Shovel								
-40		Core				0.0	6.0			
		Shovel				0.1	4.0			
-45		Core								
		Shovel								
-50		Core				0.1	6.0			

WELL LOG

WELL NO. MW-1

ARCADIS 1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
LOGGER: B. Kolb ELEVATION (T.O.C.): 3,636.08'
FILE NAME: MW-1.dat UNIQUE NUMBER: 31-014-00495

STATIC WATER LEVEL: -62.80' MEAS. PT.: T.O.C. DATE: —
HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
SCREEN PACK:	8/16 Sand	-196.0' to -43.0'
CASING TYPE:	4" Diameter Sch. 40 PVC Blank	-46.0' to Surface
	—	—
	—	—
WELL SCREEN:	4" Diameter Sch. 40 PVC, 0.020" slots	-196.0' to -46.0'
PLUG BACK:	8/16 Sand	-200.0' to -196.0'

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
-55		Shovel								
		Core				0.1	5.0		SAND 10 R 6/8 light red, fine-grained to very fine-grained, trace GRAVEL, subrounded, poorly sorted, semi-consolidated.	
-60		Shovel							SAND 10 R 6/8 light red, fine-grained to very fine-grained, 20% GRAVEL, 10% CLAY, subrounded, poorly sorted, SAND, GRAVEL up to 10 mm, semi-consolidated.	
		Shovel								
-65										
		Shovel								
-70										
		Shovel								
-75										
		Shovel								
-80										
		Shovel								
-85										
		Shovel								
-90										
		Shovel								
-95										
		Shovel								
-100										
		Shovel								
-105										

WELL LOG

ARCADIS

1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

WELL NO. MW-1

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
LOGGER: B. Kolb ELEVATION (T.O.C.): 3,636.08'
FILE NAME: MW-1.dat UNIQUE NUMBER: 31-014-00495

STATIC WATER LEVEL: -62.80' MEAS. PT.: T.O.C. DATE: —
HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
SCREEN PACK:	8/16 Sand	-196.0' to -43.0'
CASING TYPE:	4" Diameter Sch. 40 PVC Blank	-46.0' to Surface
	—	—
	—	—
WELL SCREEN:	4" Diameter Sch. 40 PVC, 0.020" slots	-196.0' to -46.0'
PLUG BACK:	8/16 Sand	-200.0' to -196.0'

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
110		Shovel								
		Shovel								
115										
		Shovel								
120										
		Shovel								
125										
		Shovel								
130										
		Shovel								
135									SAND 5 YR 6/4 light reddish brown, fine-grained to very fine-grained, 10% CLAY, 10% GRAVEL, some LIMESTONE fragments.	
		Shovel								
140										
		Shovel								
145										
		Shovel							LIMESTONE 10 YR 8/1 white, SAND, interbeds, very hard.	
150										
		Shovel								
155									SAND 5 YR 6/8 reddish yellow, coarse-grained to fine-grained, 30% GRAVEL, SAND, subrounded, poorly sorted GRAVEL <10 mm, rounded, occasional black CHERT SAND grain, GRAVEL size increases with depth to >15 mm.	
		Shovel								

WELL LOG

WELL NO. MW-1

ARCADIS 1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
LOGGER: B. Kolb ELEVATION (T.O.C.): 3,636.08'
FILE NAME: MW-1.dat UNIQUE NUMBER: 31-014-00495

STATIC WATER LEVEL: -62.80' MEAS. PT.: T.O.C. DATE: —
HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
SCREEN PACK:	8/16 Sand	-196.0' to -43.0'
CASING TYPE:	4" Diameter Sch. 40 PVC Blank	-46.0' to Surface
	—	—
	—	—
WELL SCREEN:	4" Diameter Sch. 40 PVC, 0.020" slots	-196.0' to -46.0'
PLUG BACK:	8/16 Sand	-200.0' to -196.0'

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
160		Shovel								
165		Shovel								
170		Shovel								
175		Shovel								
180		Shovel								
185		Shovel								
190		Shovel							SAND 5 YR 6/8 reddish yellow, coarse-grained to fine-grained, 25% CLAY, 20% GRAVEL, loose.	
195		Shovel							CLAY 10 R 5/6 red, very sticky, trace very fine-grained SAND.	
200										

WELL LOG

WELL NO. MW-1

ARCADIS 1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
LOGGER: B. Kolb ELEVATION (T.O.C.): 3,636.08'
FILE NAME: MW-1.dat UNIQUE NUMBER: 31-014-00495

STATIC WATER LEVEL: -62.80' MEAS. PT.: T.O.C. DATE: —
HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
SCREEN PACK:	8/16 Sand	-196.0' to -43.0'
CASING TYPE:	4" Diameter Sch. 40 PVC Blank	-46.0' to Surface
	—	—
	—	—
WELL SCREEN:	4" Diameter Sch. 40 PVC, 0.020" slots	-196.0' to -46.0'
PLUG BACK:	8/16 Sand	-200.0' to -196.0'

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
0		Core				0.3	5.0		CALICHE 7.5 YR 8/1 white, 20% SAND, medium-grained to very fine-grained, subrounded to well rounded, hard.	
		Core								
		Shovel								
		Core				0.1	4.0			
-5		Shovel								
		Core				0.1	4.5			
		Shovel								
-10		Core				0.0	6.0			
		Shovel								
-15		Core				0.1	5.0			
		Shovel								
-20		Core				0.0	4.0			
		Shovel								
-25		Core				0.1	6.0			
		Shovel								
-30		Core				0.1	4.0			
		Shovel								
-35		Core				0.1	6.0			
		Shovel								
-40		Core				0.0	6.0			
		Shovel				0.1	4.0			
-45		Core								
		Shovel								
-50		Core				0.1	6.0			

WELL LOG

WELL NO. MW-1

ARCADIS 1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
LOGGER: B. Kolb ELEVATION (T.O.C.): 3,636.08'
FILE NAME: MW-1.dat UNIQUE NUMBER: 31-014-00495

STATIC WATER LEVEL: -62.80' MEAS. PT.: T.O.C. DATE: —
HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
SCREEN PACK:	8/16 Sand	-196.0' to -43.0'
CASING TYPE:	4" Diameter Sch. 40 PVC Blank	-46.0' to Surface
	—	—
	—	—
WELL SCREEN:	4" Diameter Sch. 40 PVC, 0.020" slots	-196.0' to -46.0'
PLUG BACK:	8/16 Sand	-200.0' to -196.0'

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
-55		Shovel								
		Core				0.1	5.0		SAND 10 R 6/8 light red, fine-grained to very fine-grained, trace GRAVEL, subrounded, poorly sorted, semi-consolidated.	
-60		Shovel							SAND 10 R 6/8 light red, fine-grained to very fine-grained, 20% GRAVEL, 10% CLAY, subrounded, poorly sorted, SAND, GRAVEL up to 10 mm, semi-consolidated.	
		Shovel								
-65		Shovel								
-70		Shovel								
-75		Shovel								
-80		Shovel								
-85		Shovel								
-90		Shovel								
-95		Shovel								
-100		Shovel								
-105										

WELL LOG

ARCADIS

1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

WELL NO. MW-1

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
LOGGER: B. Kolb ELEVATION (T.O.C.): 3,636.08'
FILE NAME: MW-1.dat UNIQUE NUMBER: 31-014-00495

STATIC WATER LEVEL: -62.80' MEAS. PT.: T.O.C. DATE: —
HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
SCREEN PACK:	8/16 Sand	-196.0' to -43.0'
CASING TYPE:	4" Diameter Sch. 40 PVC Blank	-46.0' to Surface
	—	—
	—	—
WELL SCREEN:	4" Diameter Sch. 40 PVC, 0.020" slots	-196.0' to -46.0'
PLUG BACK:	8/16 Sand	-200.0' to -196.0'

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
110		Shovel								
		Shovel								
115										
		Shovel								
120										
		Shovel								
125										
		Shovel								
130										
		Shovel								
135									SAND 5 YR 6/4 light reddish brown, fine-grained to very fine-grained, 10% CLAY, 10% GRAVEL, some LIMESTONE fragments.	
		Shovel								
140										
		Shovel								
145										
		Shovel							LIMESTONE 10 YR 8/1 white, SAND, interbeds, very hard.	
150										
		Shovel								
155									SAND 5 YR 6/8 reddish yellow, coarse-grained to fine-grained, 30% GRAVEL, SAND, subrounded, poorly sorted GRAVEL <10 mm, rounded, occasional black CHERT SAND grain, GRAVEL size increases with depth to >15 mm.	
		Shovel								

WELL LOG

ARCADIS

1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

WELL NO. MW-1

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
LOGGER: B. Kolb ELEVATION (T.O.C.): 3,636.08'
FILE NAME: MW-1.dat UNIQUE NUMBER: 31-014-00495

STATIC WATER LEVEL: -62.80' MEAS. PT.: T.O.C. DATE: —
HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
SCREEN PACK:	8/16 Sand	-196.0' to -43.0'
CASING TYPE:	4" Diameter Sch. 40 PVC Blank	-46.0' to Surface
	—	—
	—	—
WELL SCREEN:	4" Diameter Sch. 40 PVC, 0.020" slots	-196.0' to -46.0'
PLUG BACK:	8/16 Sand	-200.0' to -196.0'

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
160										
165		Shovel								
170		Shovel								
175		Shovel								
180		Shovel								
185		Shovel								
190		Shovel							SAND 5 YR 6/8 reddish yellow, coarse-grained to fine-grained, 25% CLAY, 20% GRAVEL, loose.	
195		Shovel							CLAY 10 R 5/6 red, very sticky, trace very fine-grained SAND.	
200										

WELL LOG

WELL NO. MW-1

ARCADIS 1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
LOGGER: B. Kolb ELEVATION (T.O.C.): 3,636.08'
FILE NAME: MW-1.dat UNIQUE NUMBER: 31-014-00495

STATIC WATER LEVEL: -62.80' MEAS. PT.: T.O.C. DATE: —
HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
SCREEN PACK:	8/16 Sand	-196.0' to -43.0'
CASING TYPE:	4" Diameter Sch. 40 PVC Blank	-46.0' to Surface
	—	—
	—	—
WELL SCREEN:	4" Diameter Sch. 40 PVC, 0.020" slots	-196.0' to -46.0'
PLUG BACK:	8/16 Sand	-200.0' to -196.0'

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
0		Core				0.3	5.0		CALICHE 7.5 YR 8/1 white, 20% SAND, medium-grained to very fine-grained, subrounded to well rounded, hard.	
		Core								
		Shovel				0.1	4.0			
-5		Core								
		Shovel				0.1	4.5			
-10		Core				0.0	6.0			
		Shovel								
-15		Core				0.1	5.0			
		Shovel								
-20		Core				0.0	4.0			
		Shovel								
-25		Core				0.1	6.0			
		Shovel								
-30		Core				0.1	4.0			
		Shovel								
-35		Core				0.1	6.0			
		Shovel								
-40		Core				0.0	6.0			
		Shovel				0.1	4.0			
-45		Core								
		Shovel								
-50		Core				0.1	6.0			

WELL LOG

WELL NO. MW-1

ARCADIS 1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
LOGGER: B. Kolb ELEVATION (T.O.C.): 3,636.08'
FILE NAME: MW-1.dat UNIQUE NUMBER: 31-014-00495

STATIC WATER LEVEL: -62.80' MEAS. PT.: T.O.C. DATE: —
HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
SCREEN PACK:	8/16 Sand	-196.0' to -43.0'
CASING TYPE:	4" Diameter Sch. 40 PVC Blank	-46.0' to Surface
	—	—
	—	—
WELL SCREEN:	4" Diameter Sch. 40 PVC, 0.020" slots	-196.0' to -46.0'
PLUG BACK:	8/16 Sand	-200.0' to -196.0'

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
-55		Shovel								
		Core				0.1	5.0		SAND 10 R 6/8 light red, fine-grained to very fine-grained, trace GRAVEL, subrounded, poorly sorted, semi-consolidated.	
-60		Shovel							SAND 10 R 6/8 light red, fine-grained to very fine-grained, 20% GRAVEL, 10% CLAY, subrounded, poorly sorted, SAND, GRAVEL up to 10 mm, semi-consolidated.	
-65		Shovel								
-70		Shovel								
-75		Shovel								
-80		Shovel								
-85		Shovel								
-90		Shovel								
-95		Shovel								
-100		Shovel								
-105		Shovel								

WELL LOG

WELL NO. MW-1

ARCADIS 1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
LOGGER: B. Kolb ELEVATION (T.O.C.): 3,636.08'
FILE NAME: MW-1.dat UNIQUE NUMBER: 31-014-00495

STATIC WATER LEVEL: -62.80' MEAS. PT.: T.O.C. DATE: —
HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
SCREEN PACK:	8/16 Sand	-196.0' to -43.0'
CASING TYPE:	4" Diameter Sch. 40 PVC Blank	-46.0' to Surface
	—	—
	—	—
WELL SCREEN:	4" Diameter Sch. 40 PVC, 0.020" slots	-196.0' to -46.0'
PLUG BACK:	8/16 Sand	-200.0' to -196.0'

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
110		Shovel								
		Shovel								
115										
		Shovel								
120										
		Shovel								
125										
		Shovel								
130										
		Shovel								
135									SAND 5 YR 6/4 light reddish brown, fine-grained to very fine-grained, 10% CLAY, 10% GRAVEL, some LIMESTONE fragments.	
		Shovel								
140										
		Shovel								
145										
		Shovel							LIMESTONE 10 YR 8/1 white, SAND, interbeds, very hard.	
150										
		Shovel								
155									SAND 5 YR 6/8 reddish yellow, coarse-grained to fine-grained, 30% GRAVEL, SAND, subrounded, poorly sorted GRAVEL <10 mm, rounded, occasional black CHERT SAND grain, GRAVEL size increases with depth to >15 mm.	
		Shovel								

WELL LOG

WELL NO. MW-1

ARCADIS 1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
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HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
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	—	—
	—	—
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DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
160		Shovel								
165		Shovel								
170		Shovel								
175		Shovel								
180		Shovel								
185		Shovel								
190		Shovel							SAND 5 YR 6/8 reddish yellow, coarse-grained to fine-grained, 25% CLAY, 20% GRAVEL, loose.	
195		Shovel							CLAY 10 R 5/6 red, very sticky, trace very fine-grained SAND.	
200										

WELL LOG

WELL NO. MW-1

ARCADIS 1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
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STATIC WATER LEVEL: -62.80' MEAS. PT.: T.O.C. DATE: —
HOLE SIZE(S): 8" TOTAL DEPTH: -200.0'
SURFACE COMPLETION: Flush Completion 4' x 4' x 6" Concrete Slab

	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
SEAL TYPE:	Bentonite	-43.0' to -40.0'
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	—	—
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DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
0		Core							CALICHE 7.5 YR 8/1 white, 20% SAND, medium-grained to very fine-grained, subrounded to well rounded, hard.	
		Core				0.3	5.0			
		Shovel								
		Core				0.1	4.0			
		Shovel								
-5		Core				0.1	4.5			
		Shovel								
-10		Core				0.0	6.0			
		Shovel								
-15		Core				0.1	5.0			
		Shovel								
-20		Core				0.0	4.0			
		Shovel								
-25		Core				0.1	6.0			
		Shovel								
-30		Core				0.1	4.0			
		Shovel								
-35		Core				0.1	6.0			
		Shovel								
-40		Core				0.0	6.0			
		Shovel				0.1	4.0			
-45		Core								
		Shovel								
-50		Core				0.1	6.0			

WELL LOG

WELL NO. MW-1

ARCADIS 1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

PROJECT NUMBER: MT000795.0001
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PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
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		Core				0.1	5.0		SAND 10 R 6/8 light red, fine-grained to very fine-grained, trace GRAVEL, subrounded, poorly sorted, semi-consolidated.	
-60		Shovel							SAND 10 R 6/8 light red, fine-grained to very fine-grained, 20% GRAVEL, 10% CLAY, subrounded, poorly sorted, SAND, GRAVEL up to 10 mm, semi-consolidated.	
		Shovel								
-65		Shovel								
-70		Shovel								
-75		Shovel								
-80		Shovel								
-85		Shovel								
-90		Shovel								
-95		Shovel								
-100		Shovel								
-105										

WELL LOG

ARCADIS

1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

WELL NO. MW-1

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
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SEAL TYPE:	Bentonite	-43.0' to -40.0'
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	—	—
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DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
110		Shovel								
		Shovel								
115										
		Shovel								
120										
		Shovel								
125										
		Shovel								
130										
		Shovel								
135									SAND 5 YR 6/4 light reddish brown, fine-grained to very fine-grained, 10% CLAY, 10% GRAVEL, some LIMESTONE fragments.	
		Shovel								
140										
		Shovel								
145										
		Shovel							LIMESTONE 10 YR 8/1 white, SAND, interbeds, very hard.	
150										
		Shovel								
155									SAND 5 YR 6/8 reddish yellow, coarse-grained to fine-grained, 30% GRAVEL, SAND, subrounded, poorly sorted GRAVEL <10 mm, rounded, occasional black CHERT SAND grain, GRAVEL size increases with depth to >15 mm.	
		Shovel								

WELL LOG

ARCADIS

1004 N. Big Spring St. Suite 300, Midland, TX 79701-3383 Tel: 432 687 5400 Fax: 432 687 5401

WELL NO. MW-1

PROJECT NUMBER: MT000795.0001
CLIENT NAME: Key Energy Services, Inc.
PROJECT NAME: Hobbs Saltwater Facility
SITE LOCATION: Lea County, New Mexico
—
DRILLING CO: Scarborough Drilling
DRILLING METHOD: Rotary/Air/Mud
SAMPLE METHOD: Various
DATE BEGUN: 3/28/03 DATE COMPLETED: 3/28/03
DRILLER: S. Scarborough ELEVATION (SURF.): 3,636.3'
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	TYPES	DEPTHS
GROUT TYPE:	Portland Cement	-40.0' to Surface
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	—	—
	—	—
WELL SCREEN:	4" Diameter Sch. 40 PVC, 0.020" slots	-196.0' to -46.0'
PLUG BACK:	8/16 Sand	-200.0' to -196.0'

DEPTH	SAMPLED	SAMPLING METHOD	ANALYZED	MOISTURE	RECOVERY	OVM READING	NORM RDNG ur/hr	LITHOLOGY	DESCRIPTION	WELL INSTALLATION
160		Shovel								
165		Shovel								
170		Shovel								
175		Shovel								
180		Shovel								
185		Shovel								
190		Shovel							SAND 5 YR 6/8 reddish yellow, coarse-grained to fine-grained, 25% CLAY, 20% GRAVEL, loose.	
195		Shovel							CLAY 10 R 5/6 red, very sticky, trace very fine-grained SAND.	
200										

APPENDIX B

ARCADIS

Appendix B

Analytical Report

ANALYTICAL REPORT

Prepared for:

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Project: MT000795.0001

PO#:

Order#: G0306109

Report Date: 04/08/2003

Certificates
US EPA Laboratory Code TX00158

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET

MIDLAND, TX 79701
687-5401

Order#: G0306109
Project: MT000795.000 1
Project Name: MT000795.0001
Location: Key Hobbs

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

			Date / Time	Date / Time		
0306109-01	MW-1	WATER	3/27/03 17:50	3/28/03 11:04	See COC	See COC

Lab Testing: **Rejected:** No **Temp:** 1.5 C

8021B/5030 BTEX
8270C PAHs by GC/MS
Anions
Cations
METALS RCRA 7 Dissolved
Mercury, Dissolved
Total Dissolved Solids (TDS)

0306109-02	MW-1 (55')	SOIL	3/25/03 16:58	3/28/03 11:04	See COC	See COC

Lab Testing: **Rejected:** No **Temp:** 1.5 C

8015M
8021B/5030 BTEX
METALS RCRA 7 Total
Chloride
Mercury, Total

0306109-03	MW-1 (6")	SOIL	3/25/03 15:02	3/28/03 11:04	See COC	See COC

Lab Testing: **Rejected:** No **Temp:** 1.5 C

8015M
8021B/5030 BTEX
METALS RCRA 7 Total
Chloride
Mercury, Total

0306109-04	SB-1 (35')	SOIL	3/25/03 14:06	3/28/03 11:04	See COC	See COC

Lab Testing: **Rejected:** No **Temp:** 1.5 C

8015M
8021B/5030 BTEX
METALS RCRA 7 Total
Chloride
Mercury, Total

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET

MIDLAND, TX 79701
687-5401

Order#: G0306109
Project: MT000795.000 1
Project Name: MT000795.0001
Location: Key Hobbs

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

			Date / Time	Date / Time		
0306109-05	SB-1 (2')	SOIL	3/25/03 13:05	3/28/03 11:04	See COC	See COC
	Lab Testing:	**Rejected:** No		**Temp:** 1.5 C		
	8015M 8021B/5030 BTEX METALS RCRA 7 Total Chloride Mercury, Total					
0306109-06	SB-2 (6")	SOIL	3/25/03 9:49	3/28/03 11:04	See COC	See COC
	Lab Testing:	**Rejected:** No		**Temp:** 1.5 C		
	8015M 8021B/5030 BTEX METALS RCRA 7 Total Chloride Mercury, Total					
0306109-07	SB-2 (35')	SOIL	3/25/03 11:10	3/28/03 11:04	See COC	See COC
	Lab Testing:	**Rejected:** No		**Temp:** 1.5 C		
	8015M 8021B/5030 BTEX METALS RCRA 7 Total Chloride Mercury, Total					
0306109-08	Trip Blank	WATER		3/28/03 11:04	See COC	See COC
	Lab Testing:	**Rejected:** No		**Temp:** 1.5 C		
	8021B/5030 BTEX					

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-01
Sample ID: MW-1

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0005153-02		4/4/03 16:51	1	1	CK	8021B

Parameter	Result mg/L	RL
Benzene	<0.001	0.001
Toluene	<0.001	0.001
Ethylbenzene	<0.001	0.001
p/m-Xylene	<0.001	0.001
o-Xylene	<0.001	0.001

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	95%	80	120
Bromofluorobenzene	82%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-01
Sample ID: MW-1

8270C PAHs by GC/MS

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0005119-02		3/31/03 23:30	1	1	CK	8270C

Parameter	Result µg/L	RL
Naphthalene	<5	5.00
Acenaphthylene	<5	5.00
Acenaphthene	<5	5.00
Fluorene	<5	5.00
Phenanthrene	<5	5.00
Anthracene	<5	5.00
Fluoranthene	<5	5.00
Pyrene	<5	5.00
Benzo(a)anthracene	<5	5.00
Chrysene	<5	5.00
Benzo(b)fluoranthene	<5	5.00
Benzo(k)fluoranthene	<5	5.00
Benzo(a)pyrene	<5	5.00
Indeno(1,2,3-cd)Pyrene	<5	5.00
Dibenzo(a,h)Anthracene	<5	5.00
Benzo(g,h,i)Perylene	<5	5.00

Surrogates	% Recovered	QC Limits (%)	
Nitrobenzene-d5	37%	35	114
2-Fluorobiphenyl	47%	43	116
p-Terphenyl-d14	33%	33	141

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

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ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
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Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-02
Sample ID: MW-1 (55')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		4/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	98%	70	130
1-Chlorooctadecane	99%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0005116-02		4/1/03 15:07	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Toluene	<0.025	0.025
Ethylbenzene	<0.025	0.025
p/m-Xylene	<0.025	0.025
o-Xylene	<0.025	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	82%	80	120
Bromofluorobenzene	111%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-03
Sample ID: MW-1 (6")

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		4/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	102%	70	130
1-Chlorooctadecane	99%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0005116-02		4/1/03 15:27	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Toluene	<0.025	0.025
Ethylbenzene	<0.025	0.025
p/m-Xylene	<0.025	0.025
o-Xylene	<0.025	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	81%	80	120
Bromofluorobenzene	111%	80	120

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ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-04
Sample ID: SB-1 (35')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		4/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	103%	70	130
1-Chlorooctadecane	100%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0005116-02		4/1/03 16:02	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Toluene	<0.025	0.025
Ethylbenzene	<0.025	0.025
p/m-Xylene	<0.025	0.025
o-Xylene	<0.025	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	90%	80	120
Bromofluorobenzene	109%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-05
Sample ID: SB-1 (2')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		4/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	114	10.0
TOTAL, C6-C35	114	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	107%	70	130
1-Chlorooctadecane	107%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0005116-02		4/1/03 16:22	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Toluene	<0.025	0.025
Ethylbenzene	<0.025	0.025
p/m-Xylene	<0.025	0.025
o-Xylene	<0.025	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	81%	80	120
Bromofluorobenzene	115%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-06
Sample ID: SB-2 (6")

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		4/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	115%	70	130
1-Chlorooctadecane	113%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0005116-02		4/1/03 16:42	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Toluene	<0.025	0.025
Ethylbenzene	<0.025	0.025
p/m-Xylene	<0.025	0.025
o-Xylene	<0.025	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	91%	80	120
Bromofluorobenzene	119%	80	120

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ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-07
Sample ID: SB-2 (35')

8015M

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
		4/1/03	1	1	WL	8015M

Parameter	Result mg/kg	RL
GRO, C6-C12	<10.0	10.0
DRO, >C12-C35	<10.0	10.0
TOTAL, C6-C35	<10.0	10.0

Surrogates	% Recovered	QC Limits (%)	
1-Chlorooctane	104%	70	130
1-Chlorooctadecane	100%	70	130

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0005116-02		4/1/03 17:02	1	25	CK	8021B

Parameter	Result mg/kg	RL
Benzene	<0.025	0.025
Toluene	<0.025	0.025
Ethylbenzene	<0.025	0.025
p/m-Xylene	<0.025	0.025
o-Xylene	<0.025	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	90%	80	120
Bromofluorobenzene	120%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-08
Sample ID: Trip Blank

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0005153-02		4/4/03 17:12	1	1	CK	8021B

Parameter	Result mg/L	RL
Benzene	<0.001	0.001
Toluene	<0.001	0.001
Ethylbenzene	<0.001	0.001
p/m-Xylene	<0.001	0.001
o-Xylene	<0.001	0.001

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	91%	80	120
Bromofluorobenzene	83%	80	120

Approval: Raland K Tuttle 4-08-03
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-01
Sample ID: MW-1

Cations

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Calcium	129	mg/L	100	1.00	6010B	03/29/2003	3/29/03	SM
Magnesium	24.2	mg/L	10	0.010	6010B	03/29/2003	3/29/03	SM
Potassium	7.93	mg/L	10	0.500	6010B	03/29/2003	3/29/03	SM
Sodium	337	mg/L	100	1.00	6010B	03/29/2003	3/29/03	SM

METALS RCRA 7 Dissolved

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Arsenic	0.012	mg/L	1	0.008	6010B		3/31/03	SM
Barium	0.123	mg/L	1	0.001	6010B		3/31/03	SM
Cadmium	<0.001	mg/L	1	0.001	6010B		3/31/03	SM
Chromium	<0.002	mg/L	1	0.002	6010B		3/31/03	SM
Lead	<0.011	mg/L	1	0.011	6010B		3/31/03	SM
Selenium	0.011	mg/L	1	0.004	6010B		3/31/03	SM
Silver	<0.002	mg/L	1	0.002	6010B		3/31/03	SM

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Mercury, Dissolved	< 0.00050	mg/L	1	0.00050	7470	04/01/2003	4/1/03	SM

Lab ID: 0306109-02
Sample ID: MW-1 (55')

METALS RCRA 7 Total

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Arsenic	0.526	mg/kg	50	0.40	3050/6010B	04/01/2003	4/3/03	SM
Barium	30.8	mg/kg	50	0.050	3050/6010B	04/01/2003	4/3/03	SM
Cadmium	< 0.050	mg/kg	50	0.050	3050/6010B	04/01/2003	4/3/03	SM
Chromium	2.91	mg/kg	50	0.10	3050/6010B	04/01/2003	4/3/03	SM
Lead	0.744	mg/kg	50	0.550	3050/6010B	04/01/2003	4/3/03	SM
Selenium	< 0.20	mg/kg	50	0.20	3050/6010B	04/01/2003	4/3/03	SM
Silver	< 0.10	mg/kg	50	0.10	3050/6010B	04/01/2003	4/3/03	SM

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Mercury, Total	< 0.0250	mg/kg	50	0.0250	7471	04/01/2003	4/2/03	SM

N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-03
Sample ID: MW-1 (6")

METALS RCRA 7 Total

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Arsenic	5.45	mg/kg	50	0.40	3050/6010B	04/01/2003	4/3/03	SM
Barium	368	mg/kg	50	0.050	3050/6010B	04/01/2003	4/3/03	SM
Cadmium	< 0.050	mg/kg	50	0.050	3050/6010B	04/01/2003	4/3/03	SM
Chromium	2.07	mg/kg	50	0.10	3050/6010B	04/01/2003	4/3/03	SM
Lead	< 0.550	mg/kg	50	0.550	3050/6010B	04/01/2003	4/3/03	SM
Selenium	< 0.20	mg/kg	50	0.20	3050/6010B	04/01/2003	4/3/03	SM
Silver	< 0.10	mg/kg	50	0.10	3050/6010B	04/01/2003	4/3/03	SM

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Mercury, Total	< 0.0250	mg/kg	50	0.0250	7471	04/01/2003	4/2/03	SM

Lab ID: 0306109-04
Sample ID: SB-1 (35')

METALS RCRA 7 Total

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Arsenic	1.42	mg/kg	50	0.40	3050/6010B	04/01/2003	4/3/03	SM
Barium	122	mg/kg	50	0.050	3050/6010B	04/01/2003	4/3/03	SM
Cadmium	< 0.050	mg/kg	50	0.050	3050/6010B	04/01/2003	4/3/03	SM
Chromium	1.95	mg/kg	50	0.10	3050/6010B	04/01/2003	4/3/03	SM
Lead	< 0.550	mg/kg	50	0.550	3050/6010B	04/01/2003	4/3/03	SM
Selenium	< 0.20	mg/kg	50	0.20	3050/6010B	04/01/2003	4/3/03	SM
Silver	< 0.10	mg/kg	50	0.10	3050/6010B	04/01/2003	4/3/03	SM

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Mercury, Total	< 0.0250	mg/kg	50	0.0250	7471	04/01/2003	4/2/03	SM

Lab ID: 0306109-05
Sample ID: SB-1 (2')

METALS RCRA 7 Total

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Arsenic	3.68	mg/kg	50	0.40	3050/6010B	04/01/2003	4/3/03	SM
Barium	542	mg/kg	50	0.050	3050/6010B	04/01/2003	4/3/03	SM
Cadmium	0.060	mg/kg	50	0.050	3050/6010B	04/01/2003	4/3/03	SM
Chromium	2.39	mg/kg	50	0.10	3050/6010B	04/01/2003	4/3/03	SM
Lead	2.18	mg/kg	50	0.550	3050/6010B	04/01/2003	4/3/03	SM
Selenium	< 0.20	mg/kg	50	0.20	3050/6010B	04/01/2003	4/3/03	SM
Silver	< 0.10	mg/kg	50	0.10	3050/6010B	04/01/2003	4/3/03	SM

N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-05
Sample ID: SB-1 (2')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Mercury, Total	0.0315	mg/kg	50	0.0250	7471	04/01/2003	4/2/03	SM

Lab ID: 0306109-06
Sample ID: SB-2 (6")

METALS RCRA 7 Total

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Arsenic	5.75	mg/kg	50	0.40	3050/6010B	04/01/2003	4/3/03	SM
Barium	478	mg/kg	50	0.050	3050/6010B	04/01/2003	4/3/03	SM
Cadmium	< 0.050	mg/kg	50	0.050	3050/6010B	04/01/2003	4/3/03	SM
Chromium	1.41	mg/kg	50	0.10	3050/6010B	04/01/2003	4/3/03	SM
Lead	< 0.550	mg/kg	50	0.550	3050/6010B	04/01/2003	4/3/03	SM
Selenium	< 0.20	mg/kg	50	0.20	3050/6010B	04/01/2003	4/3/03	SM
Silver	< 0.10	mg/kg	50	0.10	3050/6010B	04/01/2003	4/3/03	SM

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Mercury, Total	< 0.0250	mg/kg	50	0.0250	7471	04/01/2003	4/2/03	SM

Lab ID: 0306109-07
Sample ID: SB-2 (35')

METALS RCRA 7 Total

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Arsenic	1.17	mg/kg	50	0.40	3050/6010B	04/01/2003	4/3/03	SM
Barium	34.8	mg/kg	50	0.050	3050/6010B	04/01/2003	4/3/03	SM
Cadmium	< 0.050	mg/kg	50	0.050	3050/6010B	04/01/2003	4/3/03	SM
Chromium	2.70	mg/kg	50	0.10	3050/6010B	04/01/2003	4/3/03	SM
Lead	< 0.550	mg/kg	50	0.550	3050/6010B	04/01/2003	4/3/03	SM
Selenium	< 0.20	mg/kg	50	0.20	3050/6010B	04/01/2003	4/3/03	SM
Silver	< 0.10	mg/kg	50	0.10	3050/6010B	04/01/2003	4/3/03	SM

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Prepared	Date Analyzed	Analyst
Mercury, Total	< 0.0250	mg/kg	50	0.0250	7471	04/01/2003	4/2/03	SM

N/A = Not Applicable RL = Reporting Limit

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#:	**G0306109**
Project:	**MT000795.0001**
Project Name:	**MT000795.0001**
Location:	**Key Hobbs**

Approval: Raland K Tuttle 4-08-03
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

N/A = Not Applicable **RL = Reporting Limit**

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-01
Sample ID: MW-1

Anions

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Bicarbonate Alkalinity	290	mg/L	1	2.00	310.1	3/28/03	CK
Carbonate Alkalinity	<0.10	mg/L	1	0.10	310.1	3/28/03	CK
Chloride	665	mg/L	1	5.00	9253	3/31/03	CK
Hydroxide Alkalinity	<0.10	mg/L	1	0.10	310.1	3/28/03	CK
SULFATE, 375.4	137	mg/L	2.5	1.25	375.4	4/1/03	SB

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Total Dissolved Solids (TDS)	1600	mg/L	1	5.0	160.1	3/31/03	TAL

Lab ID: 0306109-02
Sample ID: MW-1 (55')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	<20.0	mg/kg	1	20	9253	3/31/03	CK

Lab ID: 0306109-03
Sample ID: MW-1 (6")

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	8330	mg/kg	1	20	9253	3/31/03	CK

Lab ID: 0306109-04
Sample ID: SB-1 (35')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	266	mg/kg	1	20	9253	3/31/03	CK

Lab ID: 0306109-05
Sample ID: SB-1 (2')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	9570	mg/kg	1	20	9253	3/31/03	CK

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MR. STEVE TISCHER
ARCADIS GERAGHTY & MILLER, INC.
1004 N. BIG SPRING STREET
MIDLAND, TX 79701

Order#: G0306109
Project: MT000795.0001
Project Name: MT000795.0001
Location: Key Hobbs

Lab ID: 0306109-06
Sample ID: SB-2 (6")

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	27300	mg/kg	1	20	9253	3/31/03	CK

Lab ID: 0306109-07
Sample ID: SB-2 (35')

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride	70.9	mg/kg	1	20	9253	3/31/03	CK

Approval: Raland K Tuttle 4-08-03
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

8015M

Order#: G0306109

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0005102-02			<10.0		
MS SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0306116-01	0	952	898	94.3%	
MSD SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0306116-01	0	952	923	97.%	2.7%
SRM SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
TOTAL, C6-C35-mg/kg	0005102-05		1000	907	90.7%	

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QUALITY CONTROL REPORT

8021B/5030 BTEX

Order#: G0306109

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-mg/kg	0005116-02			<0.025		
Benzene-mg/L	0005153-02			<0.001		
Toluene-mg/kg	0005116-02			<0.025		
Toluene-mg/L	0005153-02			<0.001		
Ethylbenzene-mg/kg	0005116-02			<0.025		
Ethylbenzene-mg/L	0005153-02			<0.001		
p/m-Xylene-mg/kg	0005116-02			<0.025		
p/m-Xylene-mg/L	0005153-02			<0.001		
o-Xylene-mg/kg	0005116-02			<0.025		
o-Xylene-mg/L	0005153-02			<0.001		
CONTROL WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Benzene-mg/L	0005153-03		0.1	0.110	110.%	
Toluene-mg/L	0005153-03		0.1	0.112	112.%	
Ethylbenzene-mg/L	0005153-03		0.1	0.111	111.%	
p/m-Xylene-mg/L	0005153-03		0.2	0.230	115.%	
o-Xylene-mg/L	0005153-03		0.1	0.109	109.%	
CONTROL DUP WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
[illegible]zene-mg/L	0005153-04		0.1	0.115	115.%	4.4%
Toluene-mg/L	0005153-04		0.1	0.114	114.%	1.8%
Ethylbenzene-mg/L	0005153-04		0.1	0.113	113.%	1.8%
p/m-Xylene-mg/L	0005153-04		0.2	0.225	112.5%	2.2%
o-Xylene-mg/L	0005153-04		0.1	0.111	111.%	1.8%
MS SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Benzene-mg/kg	0306119-01	0	0.1	0.089	89.%	
Toluene-mg/kg	0306119-01	0	0.1	0.092	92.%	
Ethylbenzene-mg/kg	0306119-01	0	0.1	0.100	100.%	
p/m-Xylene-mg/kg	0306119-01	0	0.2	0.209	104.5%	
o-Xylene-mg/kg	0306119-01	0	0.1	0.107	107.%	
MSD SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Benzene-mg/kg	0306119-01	0	0.1	0.086	86.%	3.4%
Toluene-mg/kg	0306119-01	0	0.1	0.089	89.%	3.3%
Ethylbenzene-mg/kg	0306119-01	0	0.1	0.097	97.%	3.%
p/m-Xylene-mg/kg	0306119-01	0	0.2	0.204	102.%	2.4%
o-Xylene-mg/kg	0306119-01	0	0.1	0.103	103.%	3.8%
SRM SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
[illegible]nzene-mg/kg	0005116-05		0.1	0.085	85.%	

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SRM SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Benzene-mg/L	0005153-05		0.1	0.108	108.%	
Toluene-mg/kg	0005116-05		0.1	0.089	89.%	
Toluene-mg/L	0005153-05		0.1	0.111	111.%	
Ethylbenzene-mg/kg	0005116-05		0.1	0.095	95.%	
Ethylbenzene-mg/L	0005153-05		0.1	0.109	109.%	
p/m-Xylene-mg/kg	0005116-05		0.2	0.199	99.5%	
p/m-Xylene-mg/L	0005153-05		0.2	0.224	112.%	
o-Xylene-mg/kg	0005116-05		0.1	0.099	99.%	
o-Xylene-mg/L	0005153-05		0.1	0.102	102.%	

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8270C PAHs by GC/MS

Order#: G0306109

BLANK WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Naphthalene-µg/L	0005119-02			<5		
Acenaphthylene-µg/L	0005119-02			<5		
Acenaphthene-µg/L	0005119-02			<5		
Fluorene-µg/L	0005119-02			<5		
Phenanthrene-µg/L	0005119-02			<5		
Anthracene-µg/L	0005119-02			<5		
Fluoranthene-µg/L	0005119-02			<5		
Pyrene-µg/L	0005119-02			<5		
Benzo(a)anthracene-µg/L	0005119-02			<5		
Chrysene-µg/L	0005119-02			<5		
Benzo(b)fluoranthene-µg/L	0005119-02			<5		
Benzo(k)fluoranthene-µg/L	0005119-02			<5		
Benzo(a)pyrene-µg/L	0005119-02			<5		
Indeno(1,2,3-cd)Pyrene-µg/L	0005119-02			<5		
Dibenzo(a,h)Anthracene-µg/L	0005119-02			<5		
Benzo(g,h,i)Perylene-µg/L	0005119-02			<5		
CONTROL WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Acenaphthene-µg/L	0005119-03		100	56.3	56.3%	
Pyrene-µg/L	0005119-03		100	37.3	37.3%	
CONTROL DUP WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Acenaphthene-µg/L	0005119-04		100	59	59.%	4.7%
Pyrene-µg/L	0005119-04		100	35	35.%	6.4%
SRM WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Acenaphthene-µg/L	0005119-05		50	45.4	90.8%	
Fluoranthene-µg/L	0005119-05		50	60.8	121.6%	
Benzo(a)pyrene-µg/L	0005119-05		50	42.7	85.4%	

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QUALITY CONTROL REPORT

Anions

Order#: G0306109

BLANK WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Bicarbonate Alkalinity-mg/L	0005092-01			<2.00		
Carbonate Alkalinity-mg/L	0005092-01			<0.10		
Chloride-mg/L	0005096-01			<5.00		
Hydroxide Alkalinity-mg/L	0005092-01			<0.10		
SULFATE, 375.4-mg/L	0005108-01			<0.50		
DUPLICATE WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Bicarbonate Alkalinity-mg/L	0306109-01	290		291		0.3%
Carbonate Alkalinity-mg/L	0306109-01	0		<0.10		0.%
Hydroxide Alkalinity-mg/L	0306109-01	0		<0.10		0.%
SULFATE, 375.4-mg/L	0306109-01	137		143		4.3%
MS WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/L	0306109-01	665	500	1140	95.%	
MSD WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/L	0306109-01	665	500	1140	95.%	0.%
SRM WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
rbonate Alkalinity-mg/L	0005092-04		0.05	0.0518	103.6%	
Carbonate Alkalinity-mg/L	0005092-04		0.05	0.0518	103.6%	
Chloride-mg/L	0005096-04		5000	4960	99.2%	
Hydroxide Alkalinity-mg/L	0005092-04		0.05	0.0518	103.6%	
SULFATE, 375.4-mg/L	0005108-04		50	52.1	104.2%	

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QUALITY CONTROL REPORT

Cations

Order#: G0306109

BLANK WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Calcium-mg/L	0005090-02			<0.010		
Magnesium-mg/L	0005090-02			<0.001		
Potassium-mg/L	0005090-02			<0.050		
Sodium-mg/L	0005090-02			<0.010		
CONTROL WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Calcium-mg/L	0005090-03		2	2.02	101.%	
Magnesium-mg/L	0005090-03		2	2.10	105.%	
Potassium-mg/L	0005090-03		2	1.84	92.%	
Sodium-mg/L	0005090-03		2	1.81	90.5%	
CONTROL DUP WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Calcium-mg/L	0005090-04		2	1.99	99.5%	1.5%
Magnesium-mg/L	0005090-04		2	2.12	106.%	0.9%
Potassium-mg/L	0005090-04		2	1.76	88.%	4.4%
Sodium-mg/L	0005090-04		2	1.82	91.%	0.6%
SRM WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Calcium-mg/L	0005090-05		2	1.99	99.5%	
Magnesium-mg/L	0005090-05		2	2.12	106.%	
Potassium-mg/L	0005090-05		2	1.76	88.%	
Sodium-mg/L	0005090-05		2	1.82	91.%	

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QUALITY CONTROL REPORT

METALS RCRA 7 Dissolved

Order#: G0306109

BLANK WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Arsenic-mg/L	0005094-02			<0.008		
Barium-mg/L	0005094-02			<0.001		
Cadmium-mg/L	0005094-02			<0.001		
Chromium-mg/L	0005094-02			<0.002		
Lead-mg/L	0005094-02			<0.011		
Selenium-mg/L	0005094-02			<0.004		
Silver-mg/L	0005094-02			<0.002		
CONTROL WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Arsenic-mg/L	0005094-03		0.8	0.797	99.6%	
Barium-mg/L	0005094-03		0.2	0.211	105.5%	
Cadmium-mg/L	0005094-03		0.2	0.204	102.%	
Chromium-mg/L	0005094-03		0.2	0.209	104.5%	
Lead-mg/L	0005094-03		1.1	1.17	106.4%	
Selenium-mg/L	0005094-03		0.4	0.404	101.%	
Silver-mg/L	0005094-03		0.1	0.102	102.%	
CONTROL DUP WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Arsenic-mg/L	0005094-04		0.8	0.801	100.1%	0.5%
...um-mg/L	0005094-04		0.2	0.212	106.%	0.5%
Cadmium-mg/L	0005094-04		0.2	0.202	101.%	1.%
Chromium-mg/L	0005094-04		0.2	0.212	106.%	1.4%
Lead-mg/L	0005094-04		1.1	1.17	106.4%	0.%
Selenium-mg/L	0005094-04		0.4	0.402	100.5%	0.5%
Silver-mg/L	0005094-04		0.1	0.098	98.%	4.%
SRM WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Arsenic-mg/L	0005094-05		1	0.988	98.8%	
Barium-mg/L	0005094-05		1	0.991	99.1%	
Cadmium-mg/L	0005094-05		1	0.998	99.8%	
Chromium-mg/L	0005094-05		1	1.00	100.%	
Lead-mg/L	0005094-05		1	0.985	98.5%	
Selenium-mg/L	0005094-05		1	0.987	98.7%	
Silver-mg/L	0005094-05		0.5	0.497	99.4%	

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

METALS RCRA 7 Total

Order#: G0306109

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Arsenic-mg/kg	0005130-02			< 0.40		
Barium-mg/kg	0005130-02			< 0.050		
Cadmium-mg/kg	0005130-02			< 0.050		
Chromium-mg/kg	0005130-02			< 0.10		
Lead-mg/kg	0005130-02			< 0.55		
Selenium-mg/kg	0005130-02			< 0.20		
Silver-mg/kg	0005130-02			< 0.10		
CONTROL SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Arsenic-mg/kg	0005130-03		40	40.6	101.5%	
Barium-mg/kg	0005130-03		10	10.2	102.%	
Cadmium-mg/kg	0005130-03		10	9.93	99.3%	
Chromium-mg/kg	0005130-03		10	10.4	104.%	
Lead-mg/kg	0005130-03		55	57.0	103.6%	
Selenium-mg/kg	0005130-03		20	20.6	103.%	
Silver-mg/kg	0005130-03		5	5.27	105.4%	
CONTROL DUP SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Arsenic-mg/kg	0005130-04		40	41.3	103.3%	1.7%
ium-mg/kg	0005130-04		10	10.1	101.%	1.%
Cadmium-mg/kg	0005130-04		10	9.90	99.%	0.3%
Chromium-mg/kg	0005130-04		10	10.4	104.%	0.%
Lead-mg/kg	0005130-04		55	56.4	102.5%	1.1%
Selenium-mg/kg	0005130-04		20	21.5	107.5%	4.3%
Silver-mg/kg	0005130-04		5	5.38	107.6%	2.1%
SRM SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Arsenic-mg/kg	0005130-05		1	1.02	102.%	
Barium-mg/kg	0005130-05		1	1.01	101.%	
Cadmium-mg/kg	0005130-05		1	1.00	100.%	
Chromium-mg/kg	0005130-05		1	1.04	104.%	
Lead-mg/kg	0005130-05		1	0.996	99.6%	
Selenium-mg/kg	0005130-05		1	0.982	98.2%	
Silver-mg/kg	0005130-05		0.5	0.516	103.2%	

ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

Test Parameters

Order#: G0306109

BLANK SOIL	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/kg	0005095-01			<20.0		
Mercury, Dissolved-mg/L	0005110-01			< 0.00050		
Mercury, Total-mg/kg	0005127-01			< 0.025		
Total Dissolved Solids (TDS)-mg/L	0005098-01			<5.0		
CONTROL WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Mercury, Dissolved-mg/L	0005110-02		0.001	0.00096	96.%	
CONTROL DUP WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Mercury, Dissolved-mg/L	0005110-03		0.001	0.00097	97.%	1.%
DUPLICATE WATER	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Total Dissolved Solids (TDS)-mg/L	0306109-01	1600		1600		0.%
MS SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/kg	0306109-02	0	500	532	106.4%	
Mercury, Total-mg/kg	0306109-02	0	0.05	0.0480	96.%	
MSD SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/kg	0306109-02	0	500	517	103.4%	2.9%
Mercury, Total-mg/kg	0306109-02	0.048	0.05	0.0450	90.%	6.5%
SRM SOIL	**LAB-ID #**	**Sample Concentr.**	**Spike Concentr.**	**QC Test Result**	**Pct (%) Recovery**	**RPD**
Chloride-mg/kg	0005095-04		5000	4960	99.2%	
Mercury, Dissolved-mg/L	0005110-04		0.001	0.00099	99.%	
Mercury, Total-mg/kg	0005127-04		0.001	0.00098	98.%	

ARCADIS GERAGHTY & MILLER

Laboratory Task Order No./P.O. No. ______

CHAIN-OF-CUSTODY RECORD

Page ___ of ___

Project Number/Name MT000745.0001
Project Location Key Hobbs
Laboratory Environmental Lab of Texas
Project Manager Steve Tischer
Sampler(s)/Affiliation BK/Midland

0306109

	Sample ID/Location	Matrix	Date/~~Time~~ Sampled	Time ~~Lab ID~~	BTEX	Method 8021 ~~PAHs~~ $Na_2S_2O_3$	method 6020 RCRA 8 metals HNO_3 *	6010 method TDS, major cations major Anions	No-Pres BTEX, TPH (8015), chloride RCRA 8 metals		Remarks	Total
01	MW-1	L	3/27/03	1750	2	1	1	1	—		1 Amber Liter, 1 plastic Liter, 1 250 ml plastic, 2 40 mL glass	5
02	~~[illegible]~~ BK MW-1 (55')	S	3/25/03	1658	—	—	—	—	1		8 oz jar	1
03	MW-1 (6")	S	3/25/03	1502	—	—	—	—	2		4 oz jars	2
04	SB-1 (35')	S	3/25/03	1406	—	—	—	—	2		4 oz jars	2
05	SB-1 (2')	S	3/25/03	1305	—	—	—	—	1		4 oz jar	1
06	SB-2 (6")	S	3/25/03	0949	—	—	—	—	2		4 oz jars	2
07	SB-2 (35')	S	3/25/03	1110	—	—	—	—	2		4 oz jars	2
08	Trip Blank	L	—	—	1	—	—	—	—		40 ml glass	1

Sample Matrix: L = Liquid; S = Solid; A = Air

Total No. of Bottles/Containers 16

Relinquished by: Brady [illegible] Kolb	Organization: ARCADIS	Date 3/28/03	Time 1104	Seal Intact? Yes No N/A
Received by: Jeanne McMurrey	Organization: Env. Lab of Tx	Date 3/28/03	Time 1104	
Relinquished by:	Organization:	Date / /	Time	Seal Intact? Yes No N/A
Received by:	Organization:	Date / /	Time	

Special Instructions/Remarks: * Field Filtered

Rec. 1.5°C

Delivery Method: ☒ In Person ☐ Common Carrier ______ (SPECIFY) ☐ Lab Courier ☐ Other ______ (SPECIFY)

AG 05-0597