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REPORTS

DATE:

10/2001 - MW'S

PHASE I

1 October 2001
AMEC Project No. 1-517-000035

MONITORING WELL INSTALLATION AND GROUND WATER SAMPLING

ELDRIDGE RANCH
LEA COUNTY, NEW MEXICO

Submitted To:

New Mexico Energy, Minerals,
and Natural Resources Department
Oil Conservation Division
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505

Submitted By:

AMEC Earth & Environmental, Inc.
8519 Jefferson, N.E.
Albuquerque, New Mexico 87113

1 October 2001
AMEC Job No. 1-517-000035

Energy, Minerals and Natural Resources Department
New Mexico Oil Conservation Division
1220 St Francis Drive
Santa Fe, New Mexico 87505

Attention: Mr. Bill Olson

RE: MONITORING WELL INSTALLATION AND SAMPLING
ELDRIDGE RANCH
LEA COUNTY, NEW MEXICO

Enclosed is AMEC Earth and Environmental's, (AMEC) report for the for the above referenced site. This report includes results from a field exploratory drilling program, sampling of subsurface soils and ground water, and chemical analysis of samples.

We appreciate the opportunity to provide environmental services to the Oil Conservation Division for this project. If you have any questions regarding this report, please give me a call at 821-1801.

Respectfully submitted,

AMEC Earth & Environmental, Inc.

Bob Wilcox, P.G.
Senior Project Manager

Reviewed by:

Fred T. Schelby, P.E.
Engineering Manager

BW:rrg

Attachment

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8519 Jefferson, N.E.
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New Mexico Oil Conservation Division
Monitoring Well Installation and Sampling
Eldridge Ranch
Lea County, New Mexico
AMEC Project No. 1-517-000035
1 October 2001

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Lea County, New Mexico
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1 October 2001

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1.0 EXECUTIVE SUMMARY

This report addresses AMEC Earth and Environmental's (AMEC) monitor well installation and ground water sampling performed at the request of the New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division (OCD) at the Eldridge Ranch located near the township of Monument in Lea County, New Mexico. The purpose of this study was to evaluate the horizontal extent of petroleum hydrocarbon concentrations in ground water in the vicinity of the Eldridge residence after BTEX (benzene, toluene, ethylbenzene and xylenes) components were detected in the Eldridge's irrigation and domestic well waters.

A number of crude oil wells and refined petroleum pipelines are located near the Eldridge property. The configuration of the monitor wells were determined by OCD and AMEC personnel to assist in evaluating the source of hydrocarbon concentrations. During the field investigation, an AMEC geologist supervised the drilling of seven (7) soil borings and installation of seven (7) monitor wells. The monitor wells (MW-1, MW-2, MW-3, MW-4, MW-5, MW-6 and MW-7) were installed north of the Eldridge residence and on adjacent private property on 6, 7, 8, and 9 August 2001. Soil samples were obtained from the borings for field screening for volatile organic compounds (VOCs) during the drilling operation and eight (8) water samples (from seven wells and one duplicate sample) were obtained from the newly installed wells following well development.

Headspace readings from a photoionization detector (PID) indicated a maximum of 13.8 ppm from a soil sample obtained from MW-6 at a depth of 20 feet below ground surface (bgs). Most other field screening results were non-detectable.

Representative ground water samples obtained on 9 and 10 August 2001 from the monitor wells indicated benzene concentrations were 0.943 parts per million (ppm) in MW-1, less than detection limits (ND) in MW-2, ND in MW-3, 10 ppm in MW-4, 0.217 ppm in MW-5, 0.6 ppm in MW-6 and ND in MW-7. Gasoline range total petroleum hydrocarbons (GRO -TPH) concentrations detected were 4.36 ppm in MW-1, ND in MW-2, and in MW-3, 31.9 ppm in MW-4, 1.67 ppm in MW-5, 9.09 ppm in MW-6 and ND in MW-7. No diesel range TPH (DRO-TPH) concentrations were detected from the samples obtained during the project.

Elevated levels of aluminum, barium, chromium, iron, and manganese were also detected in ground water at the site. At this time, it is unknown whether these metals are naturally occurring in ground water in the site vicinity or are from an outside source.

Depth to ground water measured from ground level in the monitor wells ranged from 15.1 feet bgs in MW-5 to 24.15 feet bgs in MW-7. Using ground water elevations based on measurements provided by a licensed professional surveyor, the ground water flow direction was determined to be toward the south and southwest with a measured gradient of 0.000625 feet/foot (ft/ft).

At this time, AMEC is unable to determine the source of the hydrocarbon contamination in the site vicinity, however, it is likely originating from the north, northeast or an east direction.

2.0 PURPOSE AND SCOPE

This report presents the results of the installation of ground water monitoring wells and sampling conducted by AMEC at the Eldridge Ranch (the site) in Lea County, near Monument, New Mexico. AMEC submitted a work plan dated 7 March 2001 outlining the scope of services to be performed for the investigation. The project was authorized by the OCD in correspondence to AMEC dated 23 March 2001. Access to drill on adjacent property to the north was granted on 3 July 2001. The location of the project site is shown on Figure 1. This study was performed to evaluate the horizontal extent of petroleum hydrocarbon concentrations in groundwater at the site vicinity after laboratory analysis from an irrigation and domestic well at the Eldridge Ranch confirmed the presence of dissolved hydrocarbons.

The study consisted of drilling seven (7) exploratory borings and completing them as monitor wells, screening soils for VOCs during drilling and obtaining and submitting ground water samples for laboratory analysis.

3.0 SITE CONDITIONS

The site is occupied by the Eldridge residence, a garage, and three water wells. One water well was used for domestic purposes at the residence and two wells were used for irrigation of farm crops. The wells are no longer in use since the ground water was confirmed to be impacted by petroleum hydrocarbons following sampling by the Eldridges' (18 August, 2000), the New Mexico Environment Department (26 October, 2000), (28 February, 2001), and the OCD (26 October, 2000).

Two petroleum pipelines oriented north-south are located directly to the west of the site. Another pipeline right-of-way runs southwest-northeast approximately 1,400 feet north of the Eldridge Ranch. Other oil field facilities are located within one-quarter mile of the site in each direction.

During this project, one well was drilled on the Eldridge property and six wells were drilled north of the site on property owned by the estate of Katherine Leonard and James H. Foley. Permission was granted by the estate to the OCD for access to perform the scope of work for this evaluation. A copy of the access agreement is presented in Appendix A.

Surface drainage across the site is influenced by Monument Draw, an ephemeral stream which runs south to southeast along the eastern portion of the site. Specific details of the site are presented in Figure 2.

4.0 SUBSURFACE INVESTIGATION

The soil borings/monitor wells installed for this project were designated as MW-1, MW-2, MW-3, MW-4, MW-5, MW-6 and MW-7. The borings were drilled to depths ranging from 27 to 35 feet bgs with 8-inch outside diameter (O.D.) hollow stem augers. A site plan showing the locations of the boring/monitor wells is shown on Figure 2. Exploratory boring logs are shown in Appendix B.

4.1 Investigation Procedures

The drilling contractor, Enviroworks, provided a CME-75 drill rig for the project. The drill rig and hollow stem augers were steam cleaned prior to use on-site. In addition, split-spoon samplers were decontaminated with a cleaning reagent and two clean water rinses between sampling intervals, while used augers were steam cleaned between borings.

A Photovac Model 2020 photoionization detector (PID) calibrated to 100 ppm isobutylene, was used to qualitatively detect the presence of VOCs which may be related to potential petroleum hydrocarbon contamination. Samples were collected and measured using field headspace tests.

To conduct field headspace tests, soil samples were obtained every five feet to the top of the water table with split spoon samplers and were collected in glass jars, sealed with aluminum foil. Readings were obtained by puncturing the foil seal with the PID probe and field-screening the headspace gases. Results of field screening tests performed on selected soil samples are shown on the exploratory logs presented in Appendix B and summarized in Table 1.

All drilling and sampling were completed in accordance with AMEC's standard Quality Assurance/Quality Control (QA/QC) procedures. These procedures have been designed to ensure that sampling is performed in a manner to minimize cross-contamination between samples and to collect representative samples that provide reliable, reproducible laboratory results. Copies of the field notes are presented in Appendix C. A copy of AMEC's Health & Safety Plan for the project is presented in Appendix D.

4.2 Ground Water Monitor Wells

Ground water monitor wells were constructed with 2-inch diameter, flush-joint, threaded PVC riser pipe and 15 feet of factory slotted 0.01-inch screen. The annular space was filled with silica sand (graded to match screen slot size) 10-20 gradation to 2 to 3 feet above the screen, followed by a bentonite pellet plug (2 feet thick) above the sand pack. The remainder of the annular space was backfilled with a cement/bentonite slurry to the ground surface. The screened interval intersected the top of the water table and provided for seasonal fluctuations of water levels. Above ground

protective casings with locked covers were installed to prevent potential damage or tampering with the finished monitor wells. Monitor well completion diagrams are presented in Appendix E.

After well development and prior to subsequent water quality sampling, water depths were measured to the nearest one-hundredth (0.01) foot at the ground surface. The reference point elevations were surveyed by a professional licensed surveyor, Basin Surveys of Hobbs, New Mexico. A summary of ground water measurements and elevations are shown in Table 2.

4.3 Soil and Ground Water Sampling Procedures

Soil samples were obtained every five feet during the drilling operation with split-spoon samplers. Field headspace readings were obtained every five feet until ground water was encountered at approximately 15 to 25 feet bgs. Headspace readings obtained during the project were generally low, between 0 and 13.8 ppm. No soil samples were selected for laboratory analysis.

Prior to sampling ground water, each well was developed and purged until water temperature, pH, and conductivity stabilized. Water samples were obtained at least 24 hours after completion. A total of eight (8) ground water samples were collected from the installed monitor wells including one duplicate sample collected from MW-5 for quality assurance purposes. The samples were submitted to Trace Analysis of Lubbock, Texas for chemical analysis by EPA methods listed below. Each ground water sample was collected, containerized, and preserved according to standard laboratory protocol.

The water samples were analyzed for BTEX by EPA Method 8021 and for GRO-TPH and DRO-TPH by EPA Method 8015B. In addition, the samples were tested for pH, alkalinity, specific conductance, chloride, total dissolved solids, fluoride, nitrate, sulfate, calcium, magnesium, potassium, sodium, and a list of 16 metals by approved EPA methods. Copies of the chain-of-custodies and chemical analyses for ground water samples are provided in with the laboratory reports in Appendix F.

5.0 SUBSURFACE CONDITIONS

Surface soils at the site are Quaternary alluvium and caliche which occur in the Monument Draw area. Soils encountered during this drilling program consisted of tan to brown, very fine grained silty sand containing white caliche nodules or caliche at the surface. White to light brown caliche was encountered in all borings to depths of 20 to 35 feet. In several of the borings, tan to brown, very fine grained silty sand was also encountered below the top of the water table. A brown, clayey, silty sand was encountered at 32 feet bgs in MW-7. A noticeable hydrocarbon odor was encountered in soils during drilling in MW-1, MW-4, and MW-5 but not reflected in headspace readings.

The depth to ground water measured from the ground surface in the monitor wells ranged from 15.1 feet bgs in MW-5 to 24.15 feet bgs in MW-7. The aquifer appears to be unconfined and occurs in both the caliche and the silty sand and clayey, silty sand. Using ground water elevations based on measurements provided by a licensed professional surveyor, the ground water flow direction was determined to be toward the south and southwest with a measured gradient of 0.000625 ft/ft. A ground water elevation contour map is presented as Figure 3.

6.0 GROUND WATER LABORATORY ANALYSES AND RESULTS

The ground water samples indicated benzene concentrations were 0.943 parts per million (ppm) in MW-1, less than detection limits (ND) in MW-2, ND in MW-3, 10 ppm in MW-4, 0.217 ppm in MW-5, 0.6 ppm in MW-6 and ND in MW-7. GRO - TPH concentrations detected were 4.36 ppm in MW-1, ND in MW-2, ND in MW-3, 31.9 ppm in MW-4, 1.67 ppm in MW-5, 9.09 ppm in MW-6 and ND in MW-7. Table 3 summarizes the laboratory testing results for hydrocarbons detected in ground water. No DRO-TPH concentrations were detected from the samples obtained during the project. A benzene contaminant concentration map is presented as Figure 4. A GRO-TPH contaminant concentration map is presented as Figure 5.

Water quality constituents such as total dissolved solids (TDS) ranged from 432 milligrams per liter (mg/l) in MW-3 and 770 mg/l in MW-7. Chlorides ranged from 47.0 mg/l to 120 mg/l. These analytes are within New Mexico Water Quality Control Commission (NMWQCC) standards. As previously mentioned, methods and results for each analyses are presented in Appendix F.

Other analyses performed included a list of 16 metal using EPA Method 6010B. Selected results include 8.13 mg/l aluminum, 6.11 mg/l iron, 0.28 manganese in MW-1; 17.8 mg/l aluminum, 1.39 mg/l barium, 0.07 mg/l chromium, 12.8 mg/l iron in MW-2, 50.7 mg/l aluminum, 0.137 mg/l chromium, 29.4 mg/l iron, 0.334 mg/l manganese in MW-3, 50.6 mg/l aluminum, 2.87 mg/l barium, 0.268 mg/l chromium, 30.9 mg/l iron, 0.588 manganese mg/l in MW-4, 52.3 mg/l aluminum, 1.32 mg/l barium, 0.09 mg/l chromium, 34.1 mg/l iron, 0.646 mg/l manganese in MW-5, 99.1 mg/l aluminum, 18.8 mg/l barium, 0.605 mg/l chromium, 69 mg/l iron, 1.08 manganese in MW-6, and 72.7 mg/l aluminum, 3.64 mg/l barium, 0.267 mg/l chromium, 56.2 mg/l iron, 0.843 manganese in MW-7. Concentrations of these constituents are above NMWQCC standards for these analytes.

7.0 GENERATED WASTE

Soils with high hydrocarbon odor were segregated and placed inside a 55-gallon drum which was labeled and sealed. Ground water development and purged water from each well was placed in separate 55-gallon drums which were labeled and sealed. Ground water from wells which contained non-detectable hydrocarbons, MW-2, MW-3 and MW-7, will be disposed of at the site.

Ground water from monitor wells MW-1, MW-4, MW-5, and MW-6 will be containerized together at a later date.

The drums of soil and water will be stored at the site until the project is complete. At that time, the drummed soil and water will be disposed of at a OCD approved disposal facility.

8.0 CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER STUDY

- A release of refined gasoline, condensate, or other petroleum products has impacted ground water in the vicinity of the Eldridge Ranch and the adjacent property to the north as indicated by hydrocarbon concentrations from MW-1, MW-4, MW-5, and MW-6. Benzene concentrations are above NMWQCC standards in these wells. Toluene and xylenes concentrations were also above NMWQCC standards in MW-4.

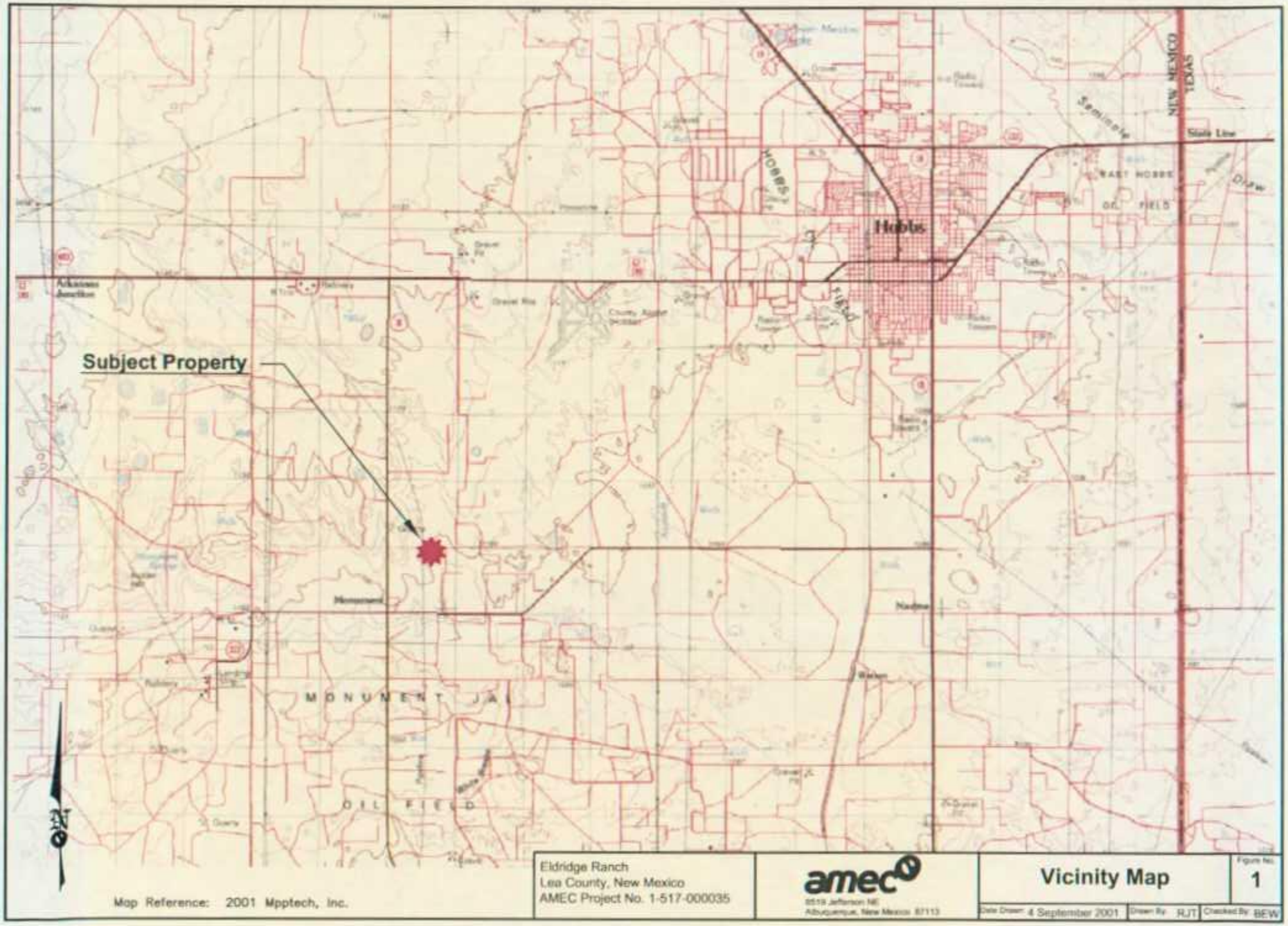
- Ground water elevations obtained during the project indicate ground water flow direction is to the south and southwest in the site vicinity, with a hydraulic gradient of 0.000625 ft/ft. Additional data points and continued monitoring will assist in defining the ground water flow direction and if seasonal variations occur in the area.

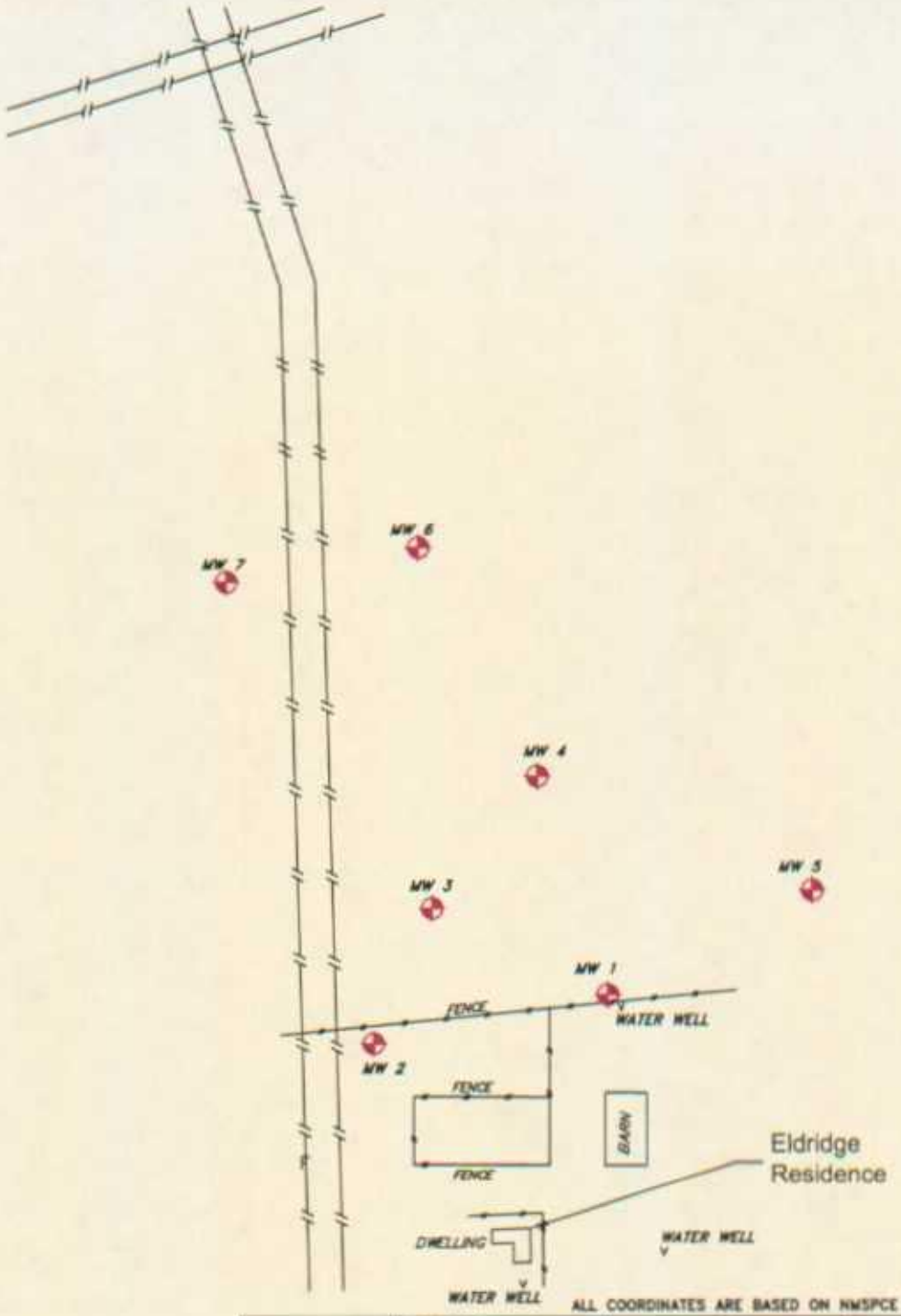
- The vertical extent of hydrocarbons appears to have been defined to the west and northwest of the vicinity of the Eldridge Ranch. The ground water contour and contaminant plume maps suggest the source of the contamination emanates from the north, northeast or east of the site vicinity.

- Ground water analytical results obtained from the monitor wells installed during the project indicate the presence of concentrations of aluminum, barium, chromium, iron, and manganese above NMWQCC standards. It is not known if these concentrations are background levels for the site vicinity or if the concentrations are the result of a release.

At this time, AMEC recommends that additional monitors well be installed to the north, northeast and east of the site. The location of nearby pipelines and other oil field facilities in these directions should be documented to determine possible contaminant sources.

The elevated concentrations of metals detected at the site should be examined to determine if the concentrations are naturally occurring in the area or are from an outside source.


Subject Property
Hobbs
NEW MEXICO
TEXAS
State Line
Seminole
Arkansas Junction
Monument
Nadine
MONUMENT
OIL FIELD
EAST HOBBS
OIL FIELD
Eldridge Ranch
Lea County, New Mexico
AMEC Project No. 1-517-000035
amec
8519 Jefferson NE
Albuquerque, New Mexico 87113
Vicinity Map
Figure No. 1
Date Drawn: 4 September 2001
Drawn By: RJT
Checked By: BEW
Map Reference: 2001 Mpptech, Inc.



ALL COORDINATES ARE BASED ON NMSPCE (NAD83)

NAME	GRND ELEV.	NORTHING	EASTING	LATITUDE	LONGITUDE
MW #1	3615.92'	N598909.904	E873341.295	N32°38'30.5"	W103°15'17.1"
MW #2	3619.03'	N598841.675	E873003.306	N32°38'29.9"	W103°15'21.1"
MW #3	3619.07'	N599032.175	E873088.416	N32°38'31.8"	W103°15'20.1"
MW #4	3618.96'	N599218.110	E873238.974	N32°38'33.6"	W103°15'18.3"
MW #5	3615.58'	N599058.001	E873633.255	N32°38'32.0"	W103°15'13.7"
MW #6	3622.54'	N599541.832	E873069.786	N32°38'36.8"	W103°15'20.2"
MW #7	3628.17'	N599493.020	E872793.895	N32°38'36.4"	W103°15'23.5"

0' 125' 250'

LEGEND
- Monitor Well Location
- Pipe Line
- Water Well

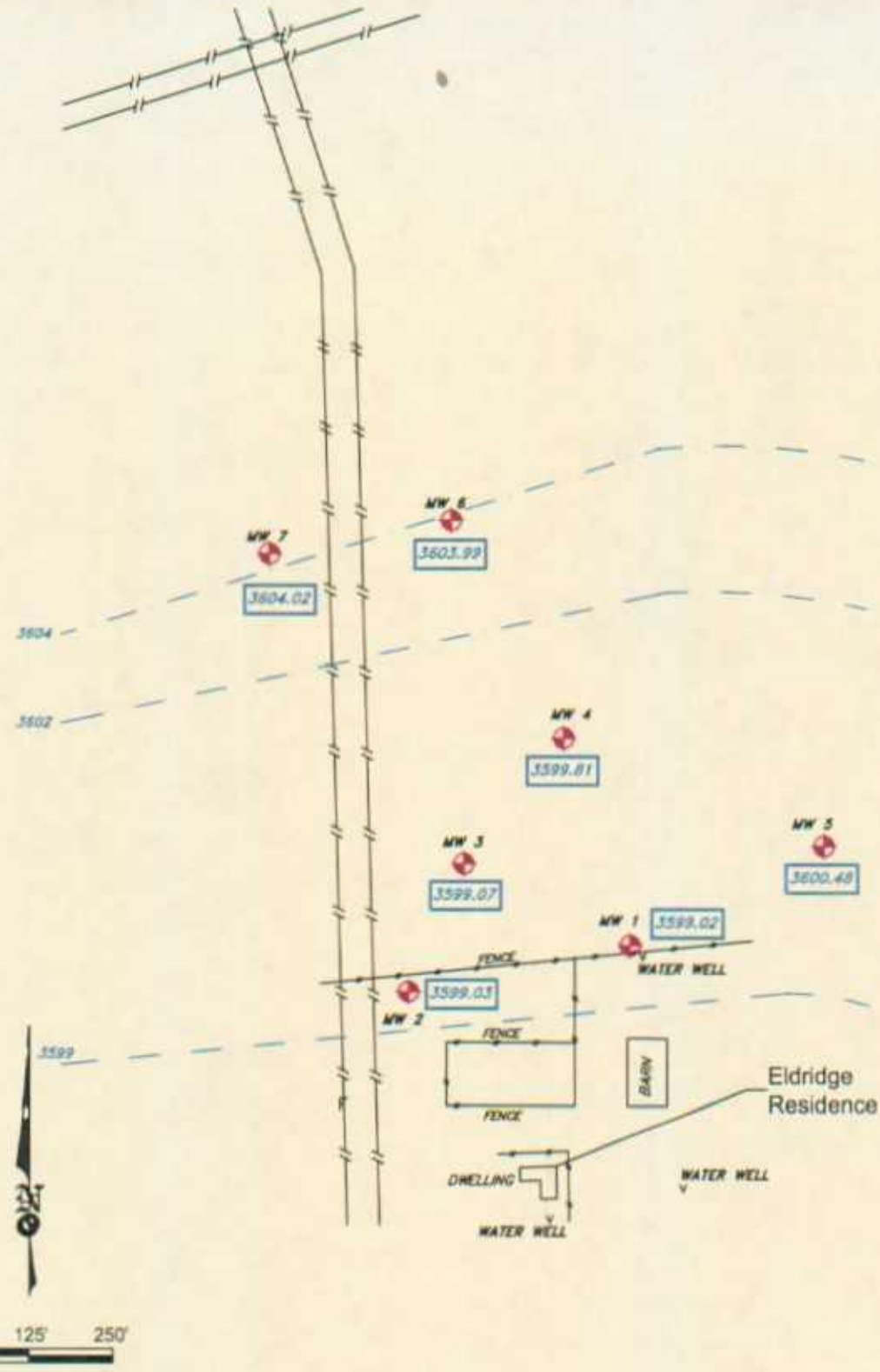
Eldridge Ranch
Lea County, New Mexico
AMEC Project No. 1-517-000035

amec
8519 Jefferson NE
Albuquerque, New Mexico 87113

Site Plan

Figure No. 2

Date Drawn: 4 September 2001 | Drawn By: RJT | Checked By: BEW



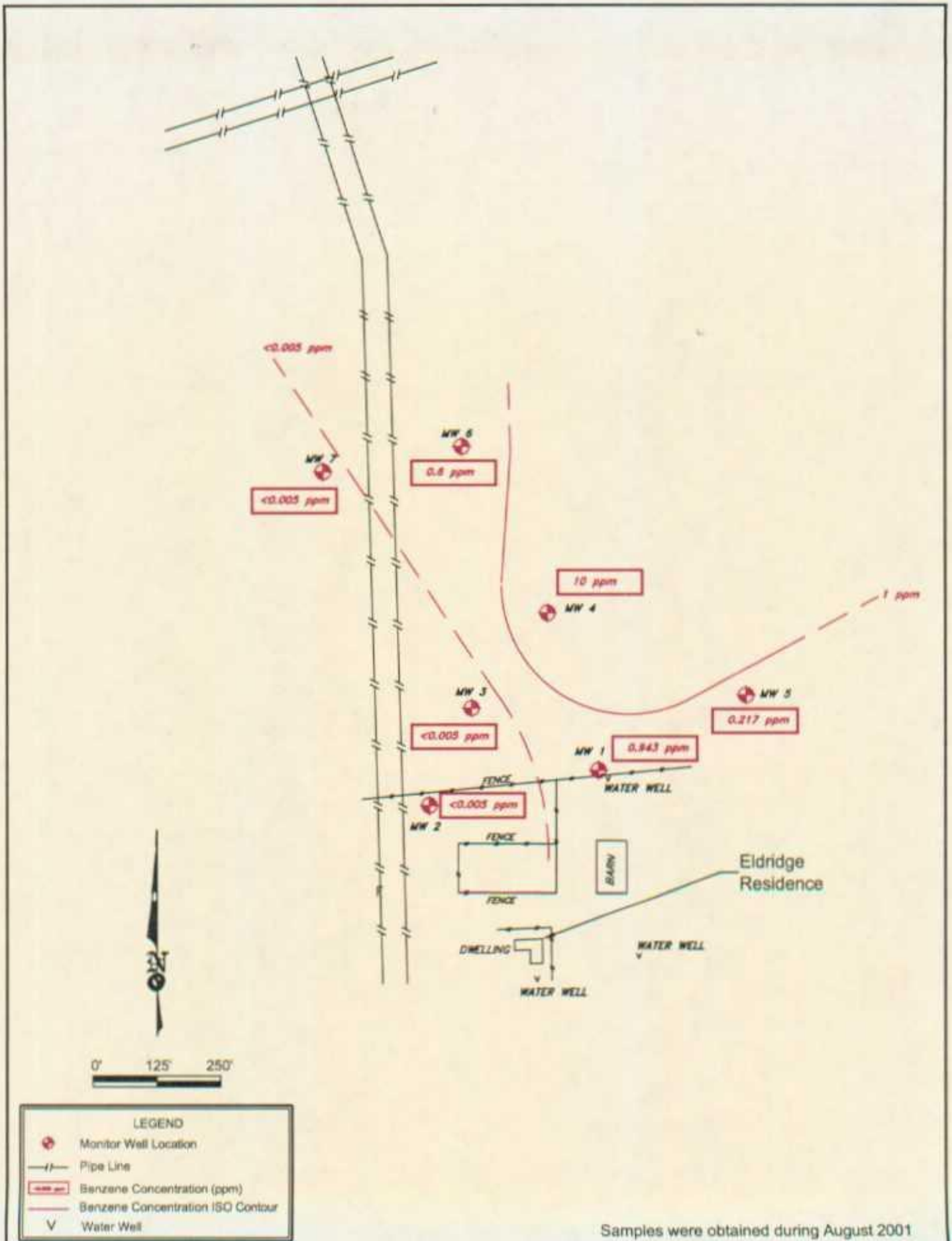
Eldridge Ranch
Lea County, New Mexico
AMEC Project No. 1-517-000035

amec
5519 Jefferson NE
Albuquerque, New Mexico 87113

Ground Water Elevation Contour Map

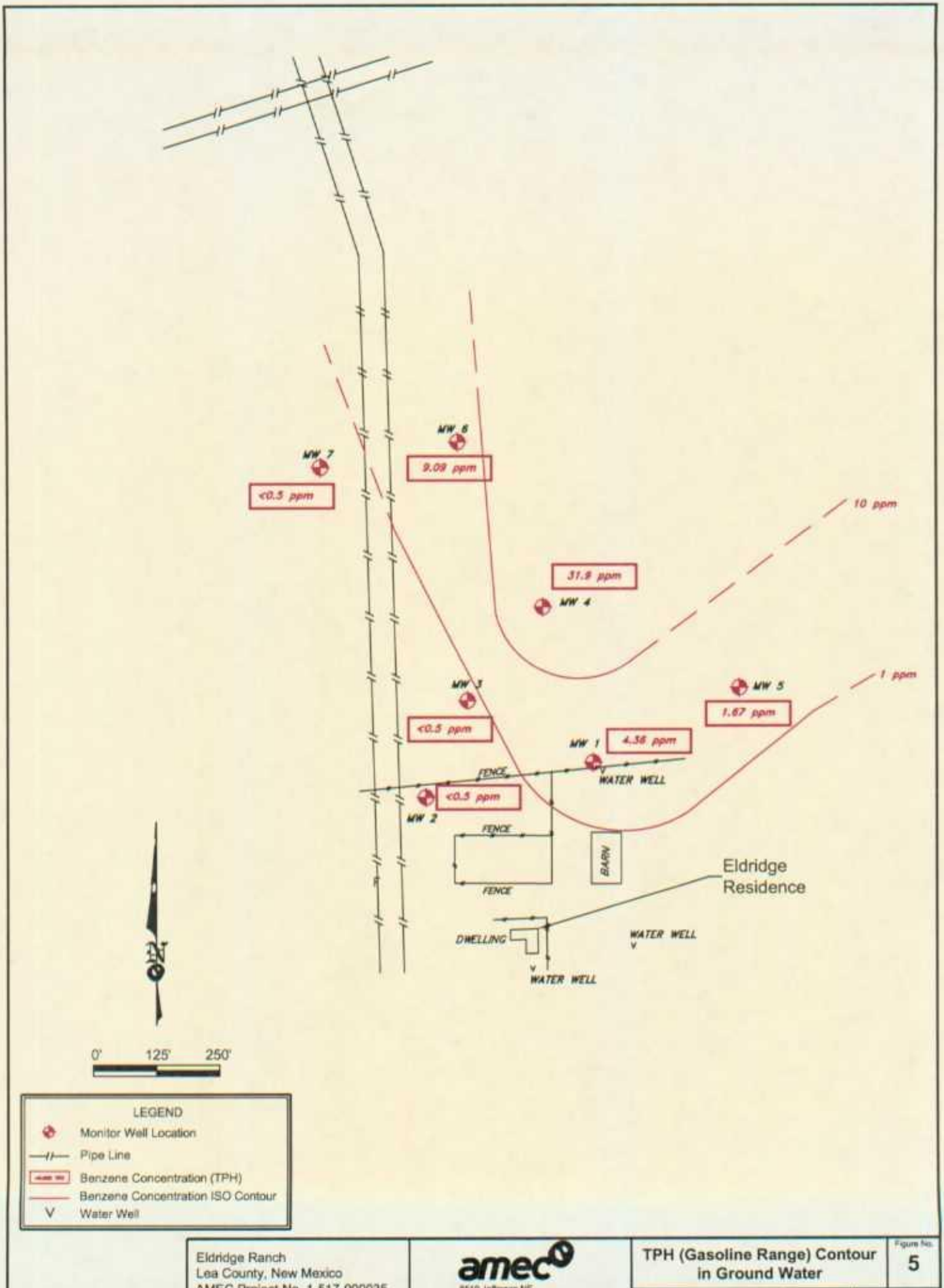
Figure No. 3

Date Drawn: 4 September 2001 | Drawn By: RJT | Checked By: BEW



Samples were obtained during August 2001

Eldridge Ranch Lea County, New Mexico AMEC Project No. 1-517-000035	amec 8519 Jefferson NE Albuquerque, New Mexico 87113	**Benzene Concentration Contours in Ground Water**	Figure No. 4
		Date Drawn: 4 September 2001	Drawn By: RJT Checked By: BEW



Eldridge Ranch
Lea County, New Mexico
AMEC Project No. 1-517-000035

amec
8519 Jefferson NE
Albuquerque, New Mexico 87113

TPH (Gasoline Range) Contour in Ground Water

Figure No. 5

Date Drawn: 4 September 2001 | Drawn By: RJT | Checked By: BEW

New Mexico Oil Conservation Division
Monitoring Well Installation and Sampling
Eldridge Ranch
Lea County, New Mexico
AMEC Project No. 1-517-000035
1 October 2001

TABLE 1
SUMMARY OF FIELD SCREENING

Boring No.	Headspace Reading (ppm) Sample Depth (feet)						
	5	10	15	20	25	30	35
MW-1	0	0	0	0	0	NS	NS
MW-2	0	0	0	0	NS	NS	NS
MW-3	0	0	0	0	0	NS	NS
MW-4	0	0	0	0	0	NS	NS
MW-5	0	0	0	0.4	NS	NS	NS
MW-6	0	0	0	13.8	0	NS	NS
MW-7	0	0	0	0	0	NS	NS

Note: A Potomac Model 2020 Photoionization Detector calibrated to 100 ppm isobutylene was used to perform the headspace testing.
NS- No sample obtained

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New Mexico Oil Conservation Division
Monitoring Well Installation and Sampling
Eldridge Ranch
Lea County, New Mexico
AMEC Project No. 1-517-000035
1 October 2001

TABLE 2
SUMMARY OF GROUND WATER ELEVATIONS

Monitor Well	Ground Elevation (feet)	Depth to Water (feet)	Ground water Elevation (feet)
MW-1	3615.92	16.02	3599.02
MW-2	3619.03	20.00	3599.03
MW-3	3619.07	20.00	3599.07
MW-4	3618.96	19.15	3599.81
MW-5	3615.58	15.10	3600.48
MW-6	3622.54	18.55	3603.99
MW-7	3628.17	24.15	3604.02

Note: Ground water levels were measured on 7, 8, and 9 August 2001.
Elevations are referenced to mean sea level.

New Mexico Oil Conservation Division
Monitoring Well Installation and Sampling
Eldridge Ranch
Lea County, New Mexico
AMEC Project No. 1-517-000035
1 October 2001

TABLE 3
SUMMARY OF ANALYTICAL TESTING RESULTS - WATER [8]
CONCENTRATIONS IN PARTS PER MILLION (ppm)

Well ID.	Date	B[1] (ppm)	T[2] (ppm)	E[3] (ppm)	X[4] (ppm)	TPH[5] GRO (ppm)	TPH[6] DRO (ppm)
MW-1		0.943[9]	0.12	0.052	0.06	4.36	<5
MW-2		<0.005	<0.005	<0.005	<0.005	<0.5	<5
MW-3		<0.005	<0.005	<0.005	<0.005	<0.5	<5
MW-4		10	6.960	0.190	0.632	31.9	<5
MW-5		0.217	0.185	0.024	0.129	1.67	<5
MW-5 Duplicate		0.182	0.159	0.020	0.109	1.23	<5
MW-6		0.600	0.502	0.024	0.100	<0.5	<5
MW-7		<0.005	<0.005	<0.005	<0.005	<0.5	<5
NMWQCC[7]		0.0010	0.750	0.750	0.620	NS	NS

Notes:

[1] Benzene
[2] Toluene
[3] Ethylbenzene
[4] Total xylenes
[5] Total Petroleum Hydrocarbons Gasoline Range
[6] Total Petroleum Hydrocarbons Diesel Range
[7] NMWQCC - New Mexico Water Quality Control Commission
[8] Samples were obtained on 9 and 10 August 2001, and analyzed by EPA Methods 8021 and 8015B. Reports of test results provided by the analytical laboratory are presented in Appendix F.
[9] Shaded values shown exceed NMWQCC standards.
[10] No Standard

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APPENDIX A

ACCESS AGREEMENT

TEMPORARY GRANT OF EASEMENT

MARK LEONARD, individually and as personal representative of the ESTATE OF KATHERINE LEONARD, and JAMES H. FOLEY, grant to the NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES ("EMNRD") and its OIL CONSERVATION DIVISION ("OCD"), its agents, employees and contractors, a temporary and limited easement in, to, upon and over all that portion of the following described real estate in Lea County, New Mexico, to wit:

> The South 1320 feet of the Northeast Quarter of the Southwest Quarter (NE1/4SW1/4) and the South 1320 feet of the North Half of the Southeast Quarter (N1/2SE1/4) of Section 21, Township 19 South, Range 37 East, N.M.P.M., Lea County, New Mexico,

together with reasonable access thereto.

Said easement is given for the limited purpose of drilling, constructing and maintaining upon the premises a monitor well or wells with which the Oil Conservation Division will use to assess and monitor contaminants below the surface, and for the purpose of routinely visiting, sampling and inspecting the aforementioned monitor wells following initial construction and for no other purpose. Said easement shall not include the right to place roads on the above-described lands or the right to blade or scrape the surface or remove top soil. Said temporary easement shall terminate automatically two years from the date of execution of this document. Alternatively, said easement may be terminated earlier when the monitor wells are no needed for the purpose described at which time they shall be removed and the premises restored to its condition prior to the time this easement was granted.

Witness my hand and seal this 31st day of July, 2001.

MARK LEONARD, individually and as personal representative of the Estate of Katherine Leonard

By: James H Foley
JAMES H. FOLEY, Attorney in Fact for Mark Leonard

James H Foley
JAMES H. FOLEY

ACKNOWLEDGMENT

STATE OF NEW MEXICO)
:ss
COUNTY OF VALENCIA)

The foregoing instrument was acknowledged before me this 3rd day of July, 2001, by James H. Foley, attorney in fact for Mark Leonard, individually and as personal representative of the Estate of Katherine Leonard.

NOTARY PUBLIC

My Commission Expires:

3/23/05

STATE OF NEW MEXICO)
:ss
COUNTY OF VALENCIA)

The foregoing instrument was acknowledged before me this 3rd day of July, 2001, by James H. Foley.

NOTARY PUBLIC

My Commission Expires:

3/23/05

APPENDIX B

BORING LOGS

PROJECT Eldridge Ranch
Lea County, New Mexico

JOB NO. 1-517-000035 **DATE** 8/6/01

LOG OF TEST BORING NO. MW-1

LOCATION Eldridge Ranch
RIG TYPE CME-75
BORING TYPE Hollow Stem Auger 8" Diameter O.D.
SURFACE ELEV. 3615.92'
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphic Soil Log	Sample	Sample Type	Total Blows 140 lb. 30" free-fall drop hammer		Headspace PID (ppm)	Unified Soil Classification	Remarks	VISUAL CLASSIFICATION
0				S	29		0	SM		**SILTY SAND**, very fine grained, loose, slightly moist, some organic matter (Roots)
				S	50/6"		0			@ 4.5' Caliche nodules
5										**CALICHE**, whittish tan, slightly moist, very fine grained, well uniformed
										@ 8.0' Tan
10				S	50/10"		0			
15				S	50/9"		0			
20				S	50/2"		0			
										Soft / easy drilling between 22.0' - 24.0', moist cuttings
25				S	50/2"		0			Water smells like crude oil, some sulfur
										@ 26.0' fragments of sandstone, very fine grained, tan to light brown, hard, saturated
										Stopped Auger @ 28.0'
30										Stopped Sampler @ 24.2'
35										
40										
45										
50										

ENV BH NO WELL 1517-035.GPJ AGRA_ALB.GDT 9/28/01

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.8	15:40	8/6/01
▼	16.9	8:00	8/7/01

SAMPLE TYPE

A-ANALYTICAL SAMPLE
S-STRATIGRAPHIC SAMPLE

amec

PROJECT Eldridge Ranch
Lea County, New Mexico

JOB NO. 1-517-000035 DATE 8/7/01

LOG OF TEST BORING NO. MW-2

LOCATION Eldridge Ranch
RIG TYPE CME-75
BORING TYPE Hollow Stem Auger 8" Diameter O.D.
SURFACE ELEV. 3619.03'
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphic Soil Log	Sample	Sample Type	Total Blows 140 lb. 30" free-fall drop hammer		Headspace PID (ppm)	Unified Soil Classification	Remarks	VISUAL CLASSIFICATION
0								SM		**SILTY SAND**, nonplastic, slightly moist, predominantly fine grained, light brown to brown
5				S	50/10"		0			**CALICHE**, whittish tan, very fine grained, slightly moist @ 5.5' light brown tan, soft, slightly moist
10				S	50/10"		0			
15				S	50/3.5"		0			@ 14.0' more cementation
▼ 20				S	55		0			@ 18.0' increased moisture, slightly moist to damp, slightly weathered caliche, some fine sand grains last 6" brown @ 22.0' cuttings wet, low plasticity
25				S	34					
30										Stopped Auger @ 28.0' Stopped Sampler @ 24.0'
35										
40										
45										
50										

ENV BH NO WELL 1517-035.GPJ AGRA_ALB.GDT 9/28/01

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.0	13:10	8/7/01
▼	20.0	17:00	8/9/01

SAMPLE TYPE

A-ANALYTICAL SAMPLE
S-STRATIGRAPHIC SAMPLE

amec

PROJECT Eldridge Ranch
Lea County, New Mexico

JOB NO. 1-517-000035 **DATE** 8/7/01

LOG OF TEST BORING NO. MW-3

LOCATION Estate of Katherine Leonard and James Foley
RIG TYPE CME-75
BORING TYPE Hollow Stem Auger 8" Diameter O.D.
SURFACE ELEV. 3619.07'
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphic Soil Log	Sample	Sample Type	Total Blows 140 lb. 30" free-fall drop hammer		Headspace PID (ppm)	Unified Soil Classification	Remarks	VISUAL CLASSIFICATION
0								SM		**SILTY SAND**, loose, slightly moist, predominantly fine grained, light brown to brown
										CALICHE, whittish - tan, very fine grained, slightly moist
5				S	60		0			
10				S	50/5"		0			@ 2" fragments of limestone
15				S	84		0			
▼ 20				S	50/9"		0			@ 19.5' moist to wet, caliche, soft with limestone fragements
25				S	50/3"		0			Saturated @ 24.0' - 25.0'
										@ 27.0' - 30.0' less moisture
30										Stopped Auger @ 30.0' Stopped Sampler @ 25.0'
35										
40										
45										
50										

ENV BH NO WELL 1517-035.GPJ AGRA_ALB.GDT 9/28/01

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.0	16:50	8/7/01
▼	20.0	8:00	8/8/01

SAMPLE TYPE

A-ANALYTICAL SAMPLE
S-STRATIGRAPHIC SAMPLE

amec

PROJECT Eldridge Ranch
Lea County, New Mexico

JOB NO. 1-517-000035 DATE 8/7/01

LOG OF TEST BORING NO. MW-4

LOCATION Estate of Katherine Leonard and James Foley
RIG TYPE CME-75
BORING TYPE Hollow Stem Auger 8" Diameter O.D.
SURFACE ELEV. 3618.96'
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphic Soil Log	Sample	Sample Type	Total Blows 140 lb. 30" free-fall drop hammer		Headspace PID (ppm)	Unified Soil Classification	Remarks	VISUAL CLASSIFICATION
0								SM		**SILTY SAND**, loose, slightly moist, predominantly fine grained, light brown to brown
5				S	38					**CALICHE**, well cemented with limestone fragments, angular to sub-angular, slightly moist, tan
10				S	50/4"					Hard Drilling
15				S	50/4"					
20				S	74			SC-SM		**CLAYEY SILT SAND**, loose, very fine grained, moist to wet, light brown, smells like pesticide (chem.)
25				S	46					
30										Stopped Auger @ 30.0' Stopped Sampler @ 25.0'
35										
40										
45										
50										

ENV BH NO WELL 1517-035.GPJ AGRA_ALB.GDT 9/28/01

GROUNDWATER

	DEPTH	HOUR	DATE
▽	19.0	8:45	8/8/01
▼	19.2	7:20	8/9/01

SAMPLE TYPE

A-ANALYTICAL SAMPLE
S-STRATIGRAPHIC SAMPLE

amec

PROJECT Eldridge Ranch
Lea County, New Mexico

JOB NO. 1-517-000035 **DATE** 8/8/01

LOG OF TEST BORING NO. MW-5

LOCATION Estate of Katherine Leonard and James Foley
RIG TYPE CME-75
BORING TYPE Hollow Stem Auger 8" Diameter O.D.
SURFACE ELEV. 3615.58'
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphic Soil Log	Sample	Sample Type	Total Blows 140 lb. 30" free-fall drop hammer		Headspace PID (ppm)	Unified Soil Classification	Remarks	VISUAL CLASSIFICATION
0								SM		**SILTY SAND**, loose, slightly moist, predominantly fine grained, light brown to brown
										CALICHE, whitish-tan, fine grained, slightly moist, soft, fairly well cemented
5				S	50/5"		0			
										@ 8.0' light brown - tan
10				S	67		0			
▼ 15				S	78		0			@ 14.0' damp
										@ 19.0' cuttings damp to almost wet
20				S	41			SC-SM		**CLAYEY SILTY SAND**, fine grained, loose, tan-light brown, smells like crude oil, some sulfur, saturated 19.0' - 20.0'
25										@ 25.0' Strong crude oil smell @ 25.0' cuttings showing less moisture
										Stopped Auger @ 27.0' Stopped Sampler @ 20.0'
30										
35										
40										
45										
50										

ENV BH NO WELL 1517-035.GPJ AGRA_ALB.GDT 9/28/01

GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.1	15:00	8/8/01
▼	15.1	7:15	8/9/01

SAMPLE TYPE

A-ANALYTICAL SAMPLE
S-STRATIGRAPHIC SAMPLE

amec

PROJECT Eldridge Ranch
Lea County, New Mexico

JOB NO. 1-517-000035 DATE 8/8/01

LOG OF TEST BORING NO. MW-6

LOCATION Estate of Katherine Leonard and James Foley
RIG TYPE CME-75
BORING TYPE Hollow Stem Auger 8" Diameter O.D.
SURFACE ELEV. 3622.54'
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphic Soil Log	Sample	Sample Type	Total Blows 140 lb. 30" free-fall drop hammer		Headspace PID (ppm)	Unified Soil Classification	Remarks	VISUAL CLASSIFICATION
0								SM		**SILTY SAND**, loose, slightly moist, predominantly fine grained, light brown to brown
										CALICHE, fine grained, slightly moist, whittish - tan
5				S	50/7"					
10				S	66					**CALICHE**, fine grained, slightly moist, whittish - tan
15				S	40					@ 14.5' tan to light brown, slightly moist, fine grained
▽										@ 18.0' Cuttings damp
20				S	67					@ 19.0' wet
25								SC-SM		**CLAYEY SILTY SAND**, loose, wet to moist, tan, fine grained
30										Stopped Auger @ 30.0' Stopped Sampler @ 20.0'
35										
40										
45										
50										

ENV BH NO WELL 1517-035.GPJ AGRA_ALB.GDT 9/28/01

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.6	13:30	8/9/01
▼			

SAMPLE TYPE

A-ANALYTICAL SAMPLE
S-STRATIGRAPHIC SAMPLE

amec

PROJECT Eldridge Ranch
Lea County, New Mexico

JOB NO. 1-517-000035 DATE 8/9/01

LOG OF TEST BORING NO. MW-7

LOCATION Estate of Katherine Leonard and James Foley
RIG TYPE CME-75
BORING TYPE Hollow Stem Auger 8" Diameter O.D.
SURFACE ELEV. 3628.17'
DATUM

Depth in Feet	Continuous Penetration Resistance	Graphic Soil Log	Sample	Sample Type	Total Blows 140 lb. 30" free-fall drop hammer		Headspace PID (ppm)	Unified Soil Classification	Remarks	VISUAL CLASSIFICATION
0								SM		**SILTY SAND**, loose, slightly moist, predominantly fine grained, light brown to brown
										CALICHE, whittish tan, fine grained, well cemented, moderately hard to hard, slightly moist
5				S	64		0			
10				S	83		0			
15				S	59		0	SM		**SILTY SAND**, very fine grained, loose, slightly moist, light brown - tan
				S	50/3"		0			@ 19.0' gravel like caliche pebbles up to ½" diameter subrounded to rounded
20				S	50/0"		0			**CALICHE**
25				S	50/2"		0			@ 25.0' fragments of limestone, angular
30										@ 31.5' damp
								SM		**SILTY SAND**, predominantly fine grained, loose, well graded, brown
35				S	45					Stopped Auger @ 34.0' Stopped Sampler @ 35.0'
40										
45										
50										

ENV BH NO WELL 1517-035.GPJ AGRA_ALB.GDT 9/28/01

GROUNDWATER

	DEPTH	HOUR	DATE
▽	24.6	14:15	8/9/01
▼	24.2	7:55	8/10/01

SAMPLE TYPE

A-ANALYTICAL SAMPLE
S-STRATIGRAPHIC SAMPLE

amec

APPENDIX C

FIELD NOTES

ELDRIDGE RANCH

MONUMENT - RT 8

Sheet 1 of 1

Date:

By: M.S

Ch. By:

Job/Prop. No.: 1517000035

WELL #	DEPTH		H_2O LEVEL		PPM
	TOP OF PVC	GROUND LEVEL	TOP OF PVC	GROUND LEV	TOP OF PVC
MW-1	29.4	26.9	19.2	16.90	22.1 ppm. (@ 13:00 08.10.01)
MW-2	29.3	26.9	22.3	20.0	0.0 ppm
MW-3	28.4 (PVC @ GROUND LEVEL)	28.4	?	20.0	0.0 ppm
MW-4	30.8½	28.4½	21.5½	19.1½	0.0 ppm
MW-5	27.8½	25.5½	17.6	15.1	0.0 ppm
MW-6	31.1	28.7	21.0	18.5½	0.0 ppm
MW-7	36.2½	33.7½	26.6	24 1½	107 ppm (@ 11 AM 08.10.01)

Sheet 1 of 1

Date:

By: M.S

Ch. By:

Job/Prop. No.: 151A000035

ELDRIDGE RANCH

MONUMENT - RT 8

WELL DEVELOPMENT

WELL #	PH	TEMP	TIME	DATE	
MW-1	7.57	21.9	13:15	08-10-01	5gal.
	7.56	21.0	13:25		5gal.
	7.58	20.6	13:35		5gal.
	7.59	20.6	13:45		
MW-2			17:10 START		
	7.74	22.4	17:35	08-9-01	5gal.
	7.82	20.5	17:45		2.5gal.
	7.83	20.3	18:00		4.5gal.
	7.84	20.4	18:15		5.0gal
MW-3			19:05 START		
	7.86	21.4	10:15	08-9-01	5gal
	7.78	19.9	10:30		4.5gal
	7.77	19.9	10:40		4.0gal
	7.77	19.8	19:50		4.0gal
MW-4			08:25 START		
	7.57	21.4	08:40	08-10-01	5gal.
	7.58	20.3	08:50		4.5gal.
	7.57	20.3	09:00		5.0gal.
MW-5	7.61	21.0	11:30	08-10-01	5gal.
	7.59	19.6	11:40		3.5gal.
	7.60	19.4	11:50		4.5gal.
	7.59	19.4	12:00		5gal.
MW-6	7.65	20.7	10:10	08-10-01	BEFORE
	7.64	19.5	10:20		4gal. DEVELOPED BY
	7.65	19.5	10:30		4gal. ENVIROWORKS
MW-7	78.1	22.4	14:10	08-10-01	DEVELOPED BEFORE
	78.2	21.7	14:15		BY ENVIROWORKS
	78.0	21.7	14:20		
	78.1	21.7	14:25		

Top of PVC
22.1 ppm
@ 13:00
(08-10-01)

Top of PVC
107 ppm
@ 11:00
(08-10-01)

304 SS BAILER
ϕ1.66 x 36"L

BUFFER #7 = 6.97
BUFFER #4 = 4.07
BUFFER #10 = 9.58

AGRA Earth & Environmental

151700000 35

08.6.01 MONDAY

ON 04:30 AM
OFF 1800 +HRS 13.5
LUNCH - NO

04:30 → 10:15 TRAVEL / ALBQ → HOBBS

10:15 CALL DRILLERS + GARY WINK OCD, MEET AT INTERSECTION OF 62 & 8. TRAVEL TO SITE.

@ 10:45 SAFETY MEETING, SCOPE OF WORK, WALK SITE LOOKING FOR WELL LOCATIONS. IDENTIFIED ONLY 3 WELL LOCATIONS.

@ 12:00 SET UP ON MW-1 (NW of PUMP HOUSE).

@ 12:20 START DRILLING - USED:
CME 75
φ 8" OD H.S.A (BULLET TEETH CUTTING BIT)
φ 2 1/2 x 2' SPLIT SPOON
FOR AIR MONITORING & SOIL SCREENING USE PID + LEL SEE LOGS FOR DRILLING
PID + LEL LOGS.
PID IDENTIF. # ED JE 314
LEL EAGLE # 71-0028 RK
"

151700000 35

@ 14:05 CHECK H2O LEVEL INSIDE H.S.A = 16.9
@ 14:30 H2O LEVEL = 18.6 WITH H.S.A @ 28'
@ 14:45 PULL H.S.A. BOREHOLE STAYED OPEN.
65 ppm from open BOREHOLE
~ 2/3 ft. of MUCK @ BOTTOM / CLEAN IT UP WITH φ 3" x 5'L SAMPLER
@ 15:30 INSTALL MW-1
φ 2" PVC SCREEN = 15' (27' → 12')
φ 2" PVC RISER = 15'
SILICA SAND 10-20 6 BAGS (2 ft. ABOVE TOP OF SCREEN
φ 3/8" BENT. CHIPS - 1 BAG (2 ft.)
@ 15:45 H2O LEVEL INSIDE PVC WELL = 16' 7 1/2 83 ppm top of PVC.
OFF SITE 16:30
17:18" PAPER WORK, CALL ENV. WORKS ABOUT S.S BAILER FOR WELL DEVELOPMENT.

08.7.01 TUESDAY

ON 0700
OFF 1800 11.0 +HRS
LUNCH - NO

1517000035

@ SITE ⇒07:00

DEMOB FROM MW-1 & SET UP ON MW-2 (W" OF MW-1) SEE BORING LOGS FOR DISTANCE.

@ 08:00 CHECK H_2O LEVEL @ MW-1 = 16.6

@ 08:20 55 GAL. DRUMS DELIVERED TO SITE

@ 08:35 START DRILLING MW-2

@ 09:55 CALLED ENVIRO-LOGICS - NEED NEW SPLIT SPOONS

@ 10:40 STAND BY FOR H_2O TO STABILIZE

@ 10:50 H_2O LEVEL = 21'

@ 11:00 -"- = 20.9

@ 11:05 STRAIGHT DRILLING (NO SAMPLING) TO 28'

@ 11:15 START PULLING H.S.A

@ 11:35 INSTALL MW-2

SAND - 6 BAGS

CHIPS - 1 BAG

SCREEN - 15'

@ 11:55 DEMOB & SET UP ON MW-3

@ 12:05 START DRILLING MW-3

@ 12:50 WITH H.S.A @ 24' - STARTED

@ 13:00 CHECK H_2O LEVEL INSIDE H.S.A = 20.6

@ 13:15 BILL OLSON @ SITE

BRIEF DISCUSSION ABOUT PAST EVENTS

1517-000035

@ 13:30 DRILL STRAIGHT TO 30' (NO SAMPLING)

@ 13:45 PULL H.S.A - CHECK H_2O LEVEL = 19.8½

NO PID/LEL READING (SOIL, H_2O, OPEN HOLE)

@ 14:05 INSTALL MW-3

@ 14:20 DEMOB + SET UP ON MW-4 (6" OF SHALLOW DRILL)

@ 14:40 START DRILLING MW-4

@ 15:15 PULL H.S.A CLEAN WEDGED ROCK INSIDE LEAD AUGER

@ BACK IN BUSINESS

@ 15:45 AUGER REFUSAL @ 16½'

USED "FINGER TYPE BIT" ALL BULLET TYPE BIT'S DIRTY - NEED DECON.

@ 16:00 SECURE SITE, CLEAN UP.

@ 16:20 CHECK H_2O LEVEL IN MW-1, 2, 3

OFF SITE 17:10 + 1 HR. PAPER WORK.

08.8.01 WEDNESDAY

ON 07:00

OFF 18:00 HRS. 11.0

"L" - NO

@ 07:00 CHANGE LEAD AUGER & BIT FOR BULLET TEES. FINGER TYPE BIT

1517000035

USED A DAY BEFORE - BURNED UP

09:30 START DRILLING / CONTIN. ON MW-4 @ 16'

@ 08:40 INSTALL MW-4 SAND 5 BAGS, CHIPS - 1

@ 08:50 CHECK H2O LEVEL = 19.0 INSIDE PVC CASING'S (GROUND LEVEL)

@ 08:50 STAND BY FOR MW-5 LOCATION WALK SITE + CONFERENCE.

@ 10:15 MOB TO SITE + SET UP

@ 10:17 BOB W. CALLED + SPEAK WITH OLSON

@ 10:30 START DRILLING MW-5

@ 11:15 STAND BY - PID TROUBLE SHOOTING (SHOWS CONSTANT 0.0 PPM EVEN WITH FUEL TANK TEST) - CLEAN "UV" LAMP - OK.

@ 12:00 POH H.S.A

@ 12:30 INSTALL MW-5 SAND - 6, CHIPS: 1

@ 12:45 CHECK H2O INITIAL READING FROM INSIDE OF PVC (GROUND LEVEL) = 13.4 SURVEY MW-5, CHECK ALL WELLS WITH PID, FREQUENT RECHECKING H2O LEVEL IN MW-5 BEFORE WELL COMPLETION.

DRILLER'S CREW TO TOWN TO DECON (WASH) ALL H.S.A + BITS) left @ 13:10

AFTER TALKING WITH B. OLSON ABOUT H2O SAMPLING HE SUGGESTED TO TAKE

1517000035

DUPLICATE SAMPLES @ HIGHEST PPM READING WELL (MW-5?) AND ONE RINSET SAMPLE AT THE END OF DAY. IN ADDITION TO SAMPLES REQUIRED IN SCOPE OF WORK.

BETWEEN 13:00 --> 15:30

PASSING T-STORM + LIGHTNING / LIGHTNING TURNING TO DOWNPOUR AND HAIL

@ 15:30 DEMOB FROM MW-5 TO #6

@ 16:00 SET UP

@ 16:25 START MW-6 "N" OF WASH

@ 16:30 STAND BY - AT HAMMER CHAIN ADJUST

@ 16:40 RESUME DRILLING.

@ 17:00 TOWER DOWN, SECURE SITE - DONE FOR DAY DUE TO APPROACHING T-STORMS

17:00 - 18:00 P. WORK, SET UP SAMPLING JARS FOR NEXT DAY, CAN B. W"

08-9-01 THURSDAY

ON 07:00

OFF 21:00 TIME 14.0

" NO

1517000035

- SITE 7:00 - CHECK H_2O LEVEL
- # 4 & 5
- 07:20 RESUME DRILLING @ MW-6, NO PROGRESS, PULL H.S.A, CHECK BIT - ONLY ONE TOOTH LEFT, DRESS IT UP.
- 07:55 START AGAIN
- 08:40 PULL H.S.A
- 08:55 INSTALL MW-6
  SAND 6 CHIPS - 1
- 9:45 CALLED OCD + LAB ABOUT EXTRA BOTTLES FOR RINSATE & DUPLICATE HOBBS OCD WILL DELIVER IT TOMORROW (PAUL SHEELY)
- 10:00 DEMOB #6 & SET ON MW #7
- 10:20 START DRILLING MW 7
- 11:05 STAND BY ~ 15 MIN. FIX LOOSE BOLTS (TOP GEAR DRIVE)
- 11:30 TD' @ 35' CHECK H_2O LEVEL STAND BY FOR H_2O TO STABILIZE
- 12:40 PULL H.S.A (AUGER BIT GONE - ONLY 2 TEETH LEFT).
- 13:10 INSTALL MW-7 - CAVE IN TO 22', BACK WITH H.S.A TO CLEAN BOREHOLE
- 13:20 CHECK H_2O @ MW-6
- 13:30 INSTALL MW-7 AGAIN (INSIDE H.S.A)
- 13:40 START PUMING H.S.A

1517000035

- 14:10 H.S.A OUT OF THE BOREHOLE
- SAND 6 CHIPS - 1
- H_2O LEVEL @ 14:30 = 24.6'
- 14:30 APPROACHING T-STORM"
- 14:45 FINISHED SAND PACK PLACEMENT
- 15:30 → 16:30 BACK TO TOWN FOR MORE ICE + DISTILLED H_2O
- 16:30 BACK @ SITE. DRILLER'S WENT BACK TO RENT GROUT MIXER / DID NOT RETURNED FOR REST OF THE DAY.
- 16:45 CALIBRATE YSI (H2O QUALITY METER) USED BUFFER #7 = 6.97
  #4 = 4.07
  #10 = 9.85
- 17:00 SET UP ON MW-2 FOR DEVELOPMENT SAMPLING

TOTAL DEPTH (GROUND) LEVEL 26.9
H_2O (— " — 20.0
USED S.S BAILER 1.66" X 36" (304 S.S)

PID READ (TOP OF PIPE) = 0.0 ppm

- 18:20 COLLECT SAMPLES

26.9
-20.0
6.9
× 0.171
1.18

1517000035

@ 18:55 MW-3
@ 19:05 START DEVEL.
@ 19:55 COLLECT SAMPLES
OFF SITE 20:20 + CHAIN OF CUSTODY LETTER / BUY MORE ICE

08.10.01 FRIDAY

ON 06:30
OFF 24:00 +HRS 17.5
L" NO

CONTIN. ON DEVELOPING MW-4/6/7/5
+1 SEE LOG'S

* FOR BILLING PURPOSE: ENVIRODRUM
DEVELOPED ONLY 2 (TWO) WELLS MW-6&7

RESI DONE BY AMEC
DRILLERS GROUTING ALL WELLS USING GROUT MIXER & PORTLAND/BENTON. MIX. SET UP @ 4" STEEL WELL PROTECTORS WITH KEYS ALIKE, PAINT IT ALL YELLOW. INSTALL 2'x2' CONCR. PADS.

1517000035

@ 17:25 LEFT WITH SAMPLES FOR SHIPMENT TO THE LAB.
POST OFFICE + BUS STATION CLOSED
UPS - OPEN BUT DELIVERY ONLY NEXT WEEK (TUESDAY).
CALL B.W" - WILL BRING SAMPLE TO ALPHA & KEEP IT ON ICE UNTIL MONDAY UPS P-UP.
CALLED LAB ABOUT TIME LIMIT FOR TDS - ~~THERE~~ | 7 DAY LIMIT APPLY
@ 18:30 BACK TO SITE
DRIVERS LOAD UP READY TO LEAVE.
@ 19:00 LEFT SITE
19:00 - 24:00 TRAVEL.

TOTAL DRUMS USED:
7 x 55 gal - DEVEL. H_2O
1 x 55 gal - SOIL CUTTINGS (MW-1 & 5)

PORTLAND - 2 per Well
READY MIX - 1.5 to 2 per Well
BENTONITE 1/2 TOTAL GROUTING

APPENDIX D

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN
HYDROGEOLOGICAL INVESTIGATION
OIL CONSERVATION DIVISION
ELDRIDGE RANCH PROJECT
MONUMENT, NEW MEXICO

AMEC Project No. 1-517-000035

6 August 2001

Prepared By:

Bob Wilcox
Project Manager

Reviewed By:

Otto C. Holmquist
Safety Officer

SITE HEALTH & SAFETY PLAN
HYDROGEOLOGICAL INVESTIGATION

OIL CONSERVATION DIVISION
ELDRIDGE RANCH PROJECT
MONUMENT, NEW MEXICO
AMEC Project No. 1-517-000035

I have read the Site Health and Safety Plan developed for use during environmental investigations at the above referenced project site. I have discussed any questions which I have regarding these materials with my supervisor, and I understand the requirements.

Signed:	Date: 08.6.01
Delbert McKibben	Delbert McKibben 08.6.01
MARK STRICKLAND	
GARY W. WINK	Gary W. Wink 08.6.01
Paul Sheeley	8-6-01
Bill Olson	

Emergency Phone Numbers

Fire	911
First Aid	911
Ambulance	911
Police	911
Lea Regional Medical Center	(505) 492-5000
AMEC - Albuquerque	(800) 821-1801
AMEC - Farmington	(888) 840-2472
AMEC Project Manager - Bob Wilcox - Mobile	(505) 250-1942
Oil Conservation Division Project Manager - Bill Olson - Mobile	(505) 660-1067
Oil Conservation Division - Project Manager - Bill Olson - Office	(505) 476-3491
Oil Conservation Division - Gary Wink - Hobbs Office	(505) 393-6161, x114

Nearest Medical Facility

Lea Regional Medical Center
5419 N. Lovington Hwy/Highway 18.
Hobbs, New Mexico
(505) 492-5000

A map showing the route is presented on the following page. Directions from the site to the Lea Regional Medical Center are as follows:

Turn Right onto Hwy 8, Proceed 4 miles to Highway 180
Turn Right on Highway 160, Proceed 8 miles to South Dal Paso/State Highway 18
Turn Left on South Dal Paso/Hwy 18/Lovington Highway, Proceed 2 miles to Hwy 18
Turn Left on Hwy 18/Lovington Highway, Proceed 4.1 miles to Hospital on the right at 5419 N. Lovington Hwy/Highway 18.

TABLE OF CONTENTS

SITE HEALTH & SAFETY PLAN
HYDROGEOLOGICAL INVESTIGATION
OIL CONSERVATION DIVISION
ELDRIDGE RANCH PROJECT
MONUMENT, NEW MEXICO

1.0 INTRODUCTION

1.1 Purpose And Scope

This document details the health and safety guidelines which are to be followed by all AMEC Earth & Environmental, Inc. (AMEC) employees and personnel of AMEC subcontractors involved in the Hydrogeologic Investigation for the Oil Conservation Division Eldridge Ranch Project. It supplements, but does not supersede the standard AMEC health and safety plan. All general health and safety guidelines contained in the standard AMEC health and safety plan will also apply to this investigation.

This document also does not supersede the standard health and safety plans and/or normal operating health and safety guidelines established by AMEC subcontractors for the use of their employees.

All personnel must read and sign the site health and safety plan prior to conducting field work. These signed acknowledgments will be retained in AMEC's project files.

1.2 Project Description

Project efforts will consist of drilling 7 groundwater monitor wells to approximate depths of 40 feet bgs and collecting soil and ground water samples.

1.3 Responsibilities

1.3.1 Site Health & Safety Officer

Mark Strzelczyk has been designated as the site Health and Safety Officer. At least one Health and Safety Officer must be present at the project site during all field activities.

The overall responsibilities of the Health and Safety Officer during field work at the referenced site include, but are not limited to, the following:

- First aid and emergency procedures and equipment.
- Delineation of restricted work zones and barricading of openings in ground.
- Securing of equipment and materials against accident or tampering.
- Air monitoring for detection of possible explosive or toxic vapors, or oxygen deficient atmospheres.
- Designated "No Smoking" areas.
- Personal protective equipment requirements.
- Employee training in pertinent safety procedures including fire and explosion prevention and toxic vapors identification.
- Designation of sanitation/eating/drinking facilities.
- Dust control.
- Housekeeping.
- Site restoration, including filling excavations and removing dirt piles and mud pits incidental to drilling operations.
- Proper disposal of hydrocarbon-contaminated soil and sludge.
- Posting, if necessary, of any unsafe areas.

1.3.2 Other Personnel

Other personnel subject to the provisions of the site health and safety plan include the following:

- All AMEC project personnel.
- All AMEC subcontracted project personnel.

It is the responsibility of each and every one of the above named individuals to read the site health and safety plan prior to beginning field work at the site, and to sign the acknowledgment of it in the presence of the designated site Health and Safety Officer. The signature of the individual implies that he/she has read and clearly understands all aspects of the site health and safety plan and agrees to comply with all of its provisions. If any of the information contained herein is not clear to the individual, it is his/ her responsibility to contact the designated site Health and Safety Officer for clarification prior to signing the site health and safety plan. No individual who has not read and signed the site health and safety plan will be allowed to perform environmental investigation work on the project site. Individuals who fail to comply with the provisions of the site health and safety plan will be ordered to cease work and leave the project site immediately.

1.3.3 Disclaimer of Responsibility

This health and safety plan has been prepared by AMEC for the exclusive use of AMEC personnel and AMEC subcontractor's personnel only. It has been developed specifically for their use during AMEC project related activities at the referenced site only.

Under no circumstances will AMEC be responsible for health and safety guidelines or procedures established or followed by any other persons.

AMEC will assume no responsibility for any injury or damages to any other persons or their property, except those caused by the gross negligence of AMEC employees.

2.0 EVALUATION OF SITE HAZARDS

2.1 Fire And Explosion Hazards

A potential could exist for explosion, fire or flash burns due to the following causes:

- Concentrations of combustible vapors in native soils, tank and/or pipeline backfill, boreholes or in the atmosphere.
- Sparks caused by excavating and sampling equipment.
- Sparks caused by other (non AMEC and non AMEC contracted) personnel or equipment in the project area.
- Any other potential sources of heat, sparks or flame in the work area.

2.2 Personal Injury

Potential causes for personal injury during field operations at the project site may include, but are not necessarily limited to the following:

- Operation of drill rigs and other drilling and sampling equipment.
- Non-project related vehicular traffic through the project site area.

Risk factors which could result in physical injury include loss of footing, falling, rotating equipment, surface failure or surface collapse, puncture wounds, cuts, abrasions, electrical shock and burns. Potential for eye injuries should also be considered when site personnel use tools or are in an area where tools are used or machinery is being operated.

2.3 Chemical Exposure

Chemical exposure risks at the project site include potential inhalation, ingestion or contact with petroleum projects. These contain a number of components which are potentially hazardous to human health. These components may include, but are not necessarily limited to, the following:

· Benzene	x	· MTBE	x		
· Ethyl Benzene	x	· EDC		x	
· Toluene	x	· EDB			x
· Xylene	x	· Total Naphthalenes		x	
· Lead	x				

Attachment A is a listing of the available information for benzene, ethlye benzene, toluene, zylenes and lead components. This information includes Permissible Exposure Limits (PEL), and Immediately Dangerous to Life or Health (IDLH) Limits for these components, as well as routes of exposure, target organs, possible carcinogenicity and exposure symptoms.

2.4 Heat Stress

Project activities are proposed for the month August in open, unshaded areas. There is a high potential for heat related problems.

2.5 Cold Stress

Because this work is being performed during the summer months, the potential for workers to experience cold stress is remote.

2.5 Snake Bites

The project area is known for the presence of rattlesnakes. There is a potential for encounters with rattlesnakes and snakebites.

3.0 HEALTH & SAFETY GUIDELINES

3.1 Personal Protection

The basic work uniform C and D is considered to be adequate for all field activities planned at the project site. Personal protective equipment should include the following:

- Long pants and shirt or coveralls
- Safety shoes or boots
- Safety glasses
- Hard hat
- Gloves
- Respirators with VOC filters.

Since drilling and sampling activities will take place in an open area, respirator protection will not be required.

Should site conditions at any time warrant upgrading the specified level of protection, the site Health and Safety Officer will suspend operations until the appropriate protective equipment is provided.

3.2 Fire And Explosion Hazards

The following procedures will be followed to reduce the potential risk to the safety of project personnel from fire and explosions:

- Monitoring of combustible vapor concentrations will be performed by the site Health and Safety Officer. Records of combustible vapor concentrations will be maintained during all site activities and retained in project files.
- Two fire extinguishers of the dry chemical type shall be available within easy access of the work area. All on-site project personnel shall be aware of their locations and familiar with their use.
- Smoking or open flames shall be prohibited within 100 feet of the work area or as directed by the site Health and Safety Officer.
- Construction equipment shall be equipped with a vertical exhaust at least 5 feet above grade and/or with spark arresters.
- Motors utilized in the excavation area shall be explosion proof.
- No welding shall be permitted in or within 50 feet of the work area.
- Startup and shutdown of equipment shall not be done in areas possible subject to flammable hydrocarbon level.

3.3 Personal Injury

The general range of personal injury hazards common to environmental investigations will exist on the project site. No additional site-specific personal injury hazards are recognized in the project area, other than the specific hazards detailed elsewhere in this document.

AMEC project personnel will be responsible for adherence to all general health and safety guidelines contained in the standard AMEC Health and Safety plan.

Subcontracted personnel will be responsible for adherence to the standard health and safety plans and/or normal operating health and safety guidelines established by AMEC subcontractors for the use of their employees.

3.4 Chemical Exposure

Contact with contaminated or suspected contaminated surfaces should be avoided. Whenever possible, project personnel should avoid walking through puddles, mud and other discolored surfaces; kneeling on ground; leaning, sitting or placing equipment on drums, containers, vehicles or the ground.

Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking or any other activities.

Eating, drinking, chewing gum or tobacco, smoking or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in any area except those areas designated by the Health and Safety Officer.

Periodic monitoring of ambient air in the work area will be performed to determine whether toxic gases or vapors are present. The results of the monitoring will be recorded by the Health and Safety Officer and kept in project files. An initial air quality survey should be done before work on the site begins.

3.5 Heat Stress

Working under warm to hot conditions is most likely to affect workers who have not been acclimatized to heat. Personnel who have not been given time to adjust to working in the heat should be gradually acclimatized to the hot environment before performing stressful work.

To avoid the excessive heat of midday, as much strenuous work as possible should be scheduled for the cooler early morning hours. All project personnel should be given periodic rest periods throughout the course of the work day. The frequency and duration of rest periods should be adequate for the ambient temperature, and should be based on the degree of acclimatization of project personnel. Fans or air blowers provided for the purpose of venting possible flammable or toxic vapors may also be used to cool down the work area, if possible.

Adequate supplies of clean, cool drinking water should be on hand for all project personnel. If salt replacement is necessary, this should be accomplished by adding extra salt to food at meals.

The consumption of alcoholic beverages during prolonged periods of heat can cause additional dehydration and should be avoided. Persons taking certain medications (e.g., medications for blood pressure control, diuretics, or water pills) should consult their physicians in order to determine if any side effects could occur during excessive heat exposure. Daily fluid intake must be sufficient to prevent significant weight loss during the work day and over the work week.

3.6 Cold Stress

The potential for experiencing cold stress can be reduced by workers wearing adequate clothing and protective coverings, particularly on the hands and head. Temporary wind blocks can be constructed on windy days to help reduce wind chill.

3.7 Snake Bites

There is a potential for snake bites at the job site location. Be aware at all times in the area in which you are working or walking for the presence of snakes in the ground cover and on the ground around and under equipment. If a snake bite occurs, identify the type of snake, call the hospital and communicate the emergency details, take the bite victim immediately to the hospital.

4.0 EMERGENCY PROCEDURES

4.1 Fire or Explosion

The following procedures should be performed if a fire or explosion occurs, or if an imminent risk of either is suspected:

- Evacuate all personnel from the area of danger.
- If possible, shut down all mechanical operations and equipment.
- Attempt to extinguish fires with fire extinguishers or soil. Do not attempt to extinguish petroleum or electrical fires with water.
- Immediately contact the Fire Department by dialing 911 from the nearest telephone.
- Administer first aid if necessary to any personnel suffering from burns or other injuries.
- Request emergency medical assistance if needed by dialing 911 from the nearest telephone.
- If appropriate, conduct air monitoring.
- Evacuate persons in the surrounding area if necessary.

4.2 Personal Injury

In the event of an injury requiring medical attention, all work should stop and appropriate emergency medical care should commence.

To obtain emergency medical care, the site Health and Safety Officer or someone delegated by him should call 911 from the nearest telephone and request assistance from the paramedics.

Serious emergency cases can be transported directly from the accident site (dial 911 or 505 492-5000) to the Lea Regional Medical Center.

For injuries not requiring emergency medical assistance (minor cuts, scrapes or burns) the site Health and Safety Officer should administer first aid as required.

4.3 Chemical Exposure

In the event that any field personnel experience adverse symptoms of exposure while working on-site, or if air monitoring indicates the presence of hazardous concentrations of toxic chemicals, all work shall stop immediately. The site Health and Safety Officer should be notified immediately. The site Health and Safety Officer will be responsible for assessing the situation and issuing appropriate instructions to field personnel.

Any personnel who have been exposed to toxic chemicals shall be administered first aid immediately. If appropriate, the Health and Safety Officer or someone delegated by him will dial 911 from the nearest telephone to summon emergency medical assistance.

ATTACHMENT A

CHEMICAL EXPOSURE DATA

BENZENE

Colorless liquid with an aromatic odor.

ROUTES OF EXPOSURE:

Skin Absorption:	Yes
Inhalation:	Yes
Ingestion:	Yes

POSSIBLE SYMPTOMS OF EXPOSURE:

Eye irritation, nausea, headaches, staggering gait, abdominal pain, drunkenness symptoms, and blood and bone marrow abnormalities.

TARGET ORGANS:

Blood, CNS, bone marrow, eyes and respiratory system.

CARCINOGENESIS:

ACGIH considers this a potential human carcinogen.

EXPOSURE LIMITS

PEL	1:00 ppm
REL	10.00 ppm
TLV	10.00 ppm
STEL	25.00 ppm
IDLH	2000.00 ppm
TWA-C	25.00 ppm
AL	N.E.

ETHYL BENZENE

Colorless liquid with an aromatic odor.

ROUTES OF EXPOSURE:

Skin Absorption:	Yes
Inhalation:	Yes
Ingestion:	Yes

POSSIBLE SYMPTOMS OF EXPOSURE:

Eye and mucous membrane irritation, headaches, dermatitis, a stupor-like feeling and coma.

TARGET ORGANS:

Eyes, upper respiratory system, skin and the CNS.

CARCINOGENESIS:

This chemical is not considered carcinogenic.

EXPOSURE LIMITS

PEL	100.00 ppm
REL	N.E.
TLV	100.00 ppm
STEL	125.00 ppm
IDLH	2000.00 ppm
TWA-C	N.E.
AL	N.E.

TOLUENE

Colorless liquid with an odor similar to benzene.

ROUTES OF EXPOSURE:

Skin Absorption:	Yes
Inhalation:	Yes
Ingestion:	Yes

POSSIBLE SYMPTOMS OF EXPOSURE:

Fatigue, weakness, dizziness, headache, insomnia, a confused, nervous, or euphoric feeling, dilated eyes, prickly feeling, and sun sensitivity.

TARGET ORGANS:

CNS, liver, kidneys and the skin.

CARCINOGENESIS:

This chemical is not considered carcinogenic.

EXPOSURE LIMITS

PEL	200.00 ppm
REL	100.00 ppm
TLV	100.00 ppm
STEL	150.00 ppm
IDLH	2000.00 ppm
TWA-C	300.00 ppm
AL	N.E.

XYLENE (O-, M-, and P-ISOMERS)

Colorless liquid with an aromatic odor.

ROUTES OF EXPOSURE:

Skin Absorption:	Yes
Inhalation:	Yes
Ingestion:	Yes

POSSIBLE SYMPTOMS OF EXPOSURE:

Dizziness, excited feeling, drowsiness, incoherent eye, nose, and throat irritation, vomiting, corneal vacuolation and abdominal pain.

TARGET ORGANS:

CNS, eyes, gastrointestinal tract, blood, liver, kidneys and skin.

CARCINOGENESIS:

This chemical is not considered carcinogenic.

EXPOSURE LIMITS

PEL	100.00 ppm
REL	100.00 ppm
TLV	100.00 ppm
STEL	150.00 ppm
IDLH	1000.00 ppm
TWA-C	N.E.
AL	N.E.

LEAD

Bluish-gray, soft metal, inorganic, dust or fumes; physical properties vary for specific compounds.

ROUTES OF EXPOSURE:

Skin Absorption:	Yes
Inhalation:	Yes
Ingestion:	Yes

POSSIBLE SYMPTOMS OF EXPOSURE:

Lassitude, insomnia, pallor, anorexia, colic, low weight, abdominal pain, constipation, anemia, tremors and paralysis.

TARGET ORGANS:

Gastrointestinal tract, CNS, kidneys, and blood.

CARCINOGENESIS:

This chemical is not considered carcinogenic.

EXPOSURE LIMITS

PEL	50.00 ug/kg
REL	0.00 mg/kg
TLV	0.15 mg/kg
STEL	N.E.
IDLH	N.E.
TWA-C	30.00 ug/kg
AL	N.E.

ACRONYMS

ACGIH American Conference of Governmental Industrial Hygienists.

AL Action Level - Established by OSHA - A concentration of a chemical above which the governmental regulations require specific personnel protection and monitoring.

CNS Central Nervous System - Brain and Spinal cord.

CVS Cardiovascular System - Heart and blood vessels.

IDLH Immediately Dangerous to Life and Health - Established by OSHA - for concentrations that can be tolerated only 30 minutes without irreversible health effects.

N.E. Not Established.

NIOSH National Institute of Occupational Safety and Health.

OSHA Occupational Safety and Health Administration.

PEL Permissible Exposure Limit - Established by OSHA - Based on an 8-hour day, 40-hour week.

PNS Peripheral Nervous Limit - Cranial nerves, spinal nerves, and the autonomic nervous system.

ppm Parts per million.

REL Relative Exposure Limit - Established by NIOSH - Based on a 10-hour day, 40-hour week.

STEL Short Term Exposure Limit - Established by ACGIH - Maximum exposure for 15 minutes, four times per day.

TLV Threshold Limiting Value - Established by ACGIH - Based on an 8-hour day, 40-hour week.

TWA-C Time Weighted Average - Ceiling Limits - Established by OSHA - The concentration of a chemical that should not be exceeded during any part of the working exposure.

REFERENCES FOR CHEMICAL EXPOSURE DATA

NIOSH POCKET GUIDE TO CHEMICAL HAZARDS, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health, September, 1985.

Threshold Limit Values and Biological Exposure Indices for 1987-1988, American Conference of Governmental Industrial Hygienists.

The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, Tenth Edition, Published by Merck & co., Inc., Rahway, N.J., U.S.A., 1983.

Handbook of Dangerous Materials, by N. Irving Sax, Reinhold Publishing Corporation, 330 West Forty-Second Street, New York, N.Y., U.S.A., 1951.

Code of Federal Regulations, 29 1900-1910, Published by Office of the Federal Register, National Archives and Records Administration, July 1, 1986.

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MAPS & DRIVING DIRECTIONS

MORE INFO

Lea Regional Medical Center
5419 Lovington Hwy, Hobbs, NM 88240
(505) 492-5000
(505) 392-2487 (fax)
(877) 492-8001 (toll-free)
learegional@triadhospitals.com
http://gtesupersite.com/leamedical

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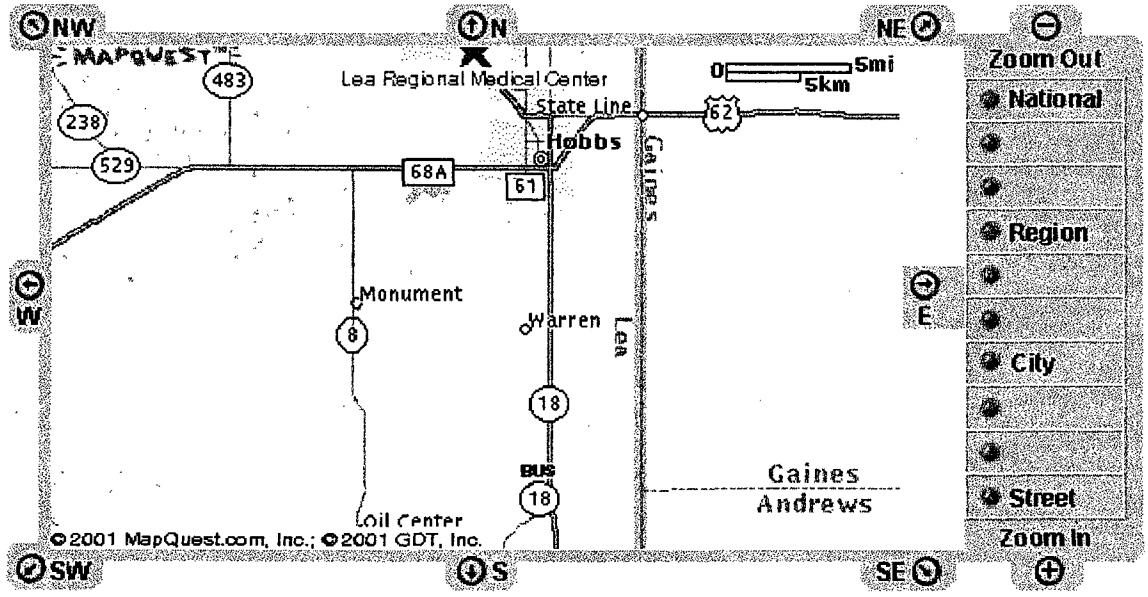
Appears in the Categories:

Clinics & Medical Centers , Hospitals ,
Physicians & Surgeons MD & DO Surgery
Orthoscopic , Therapists Physical Rehabilitation



Driving Directions Options

Driving Directions Results

HELP ?

FROM: HOBBS, NM US

TO: MONUMENT, NM US

Total Distance: 12.6 miles (20.3 km) **Total Estimated Time:** 35 minutes

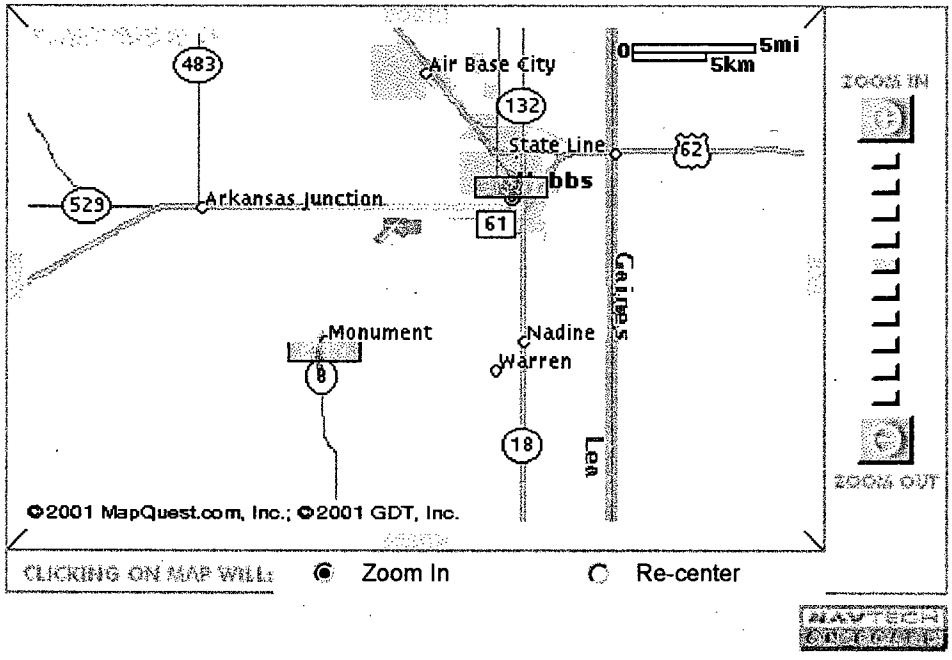
FASTEST ROUTE | SHORTEST ROUTE | AVOID HIGHWAYS

Yellow Search

Selec

Sear

DIRECTIONS	DISTANCE
There are 0.2 miles (0.2km) between the start of the directions and your origin. Use the map below to get to US-180 W/US-62 S.	
1: Start out going South on US-180 W/US-62 S.	7.5 miles (12.1 km)
2: Turn LEFT onto NM-8.	5.0 miles (8.1 km)
TOTAL ESTIMATED TIME: **35 minutes**	**TOTAL DISTANCE:** **12.6 miles** (20.3km)



TO:
MONUMENT, NM US

ROAD TO HOSPITAL
"LEA REGIONAL MEDICAL CTR"

APPENDIX E

MONITOR WELL COMPLETION DIAGRAMS

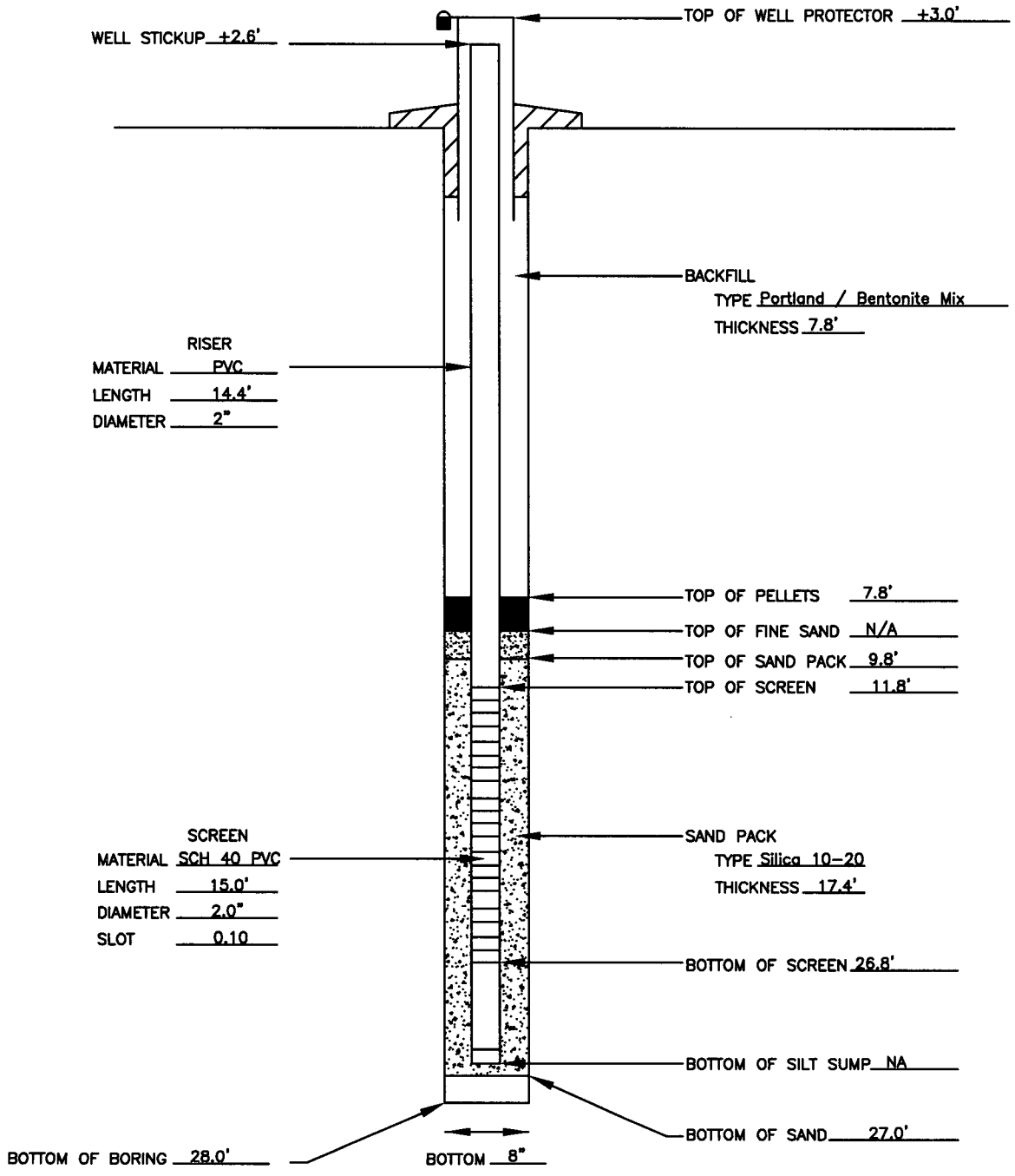
amec
8519 Jefferson NE
Albuquerque, New Mexico 87113

WELL CONSTRUCTION DIAGRAM

PROJECT NAME: ELDRIDGE RANCH DATE INSTALLED: AUGUST 6, 2001 WELL NUMBER: MW-1

PROJECT NUMBER: 1-517-000035 DRILLING COMPANY: ENVIRO WORKS METHOD: HOLLOW STEM AUGER

REMARKS: SAND - 6 CHIPS 1 PORTLAND 2, DRUM WATER - 4, SOIL ½ MW-4 & 5 = 1 DRUM TOTAL) INSPECTOR: M.S



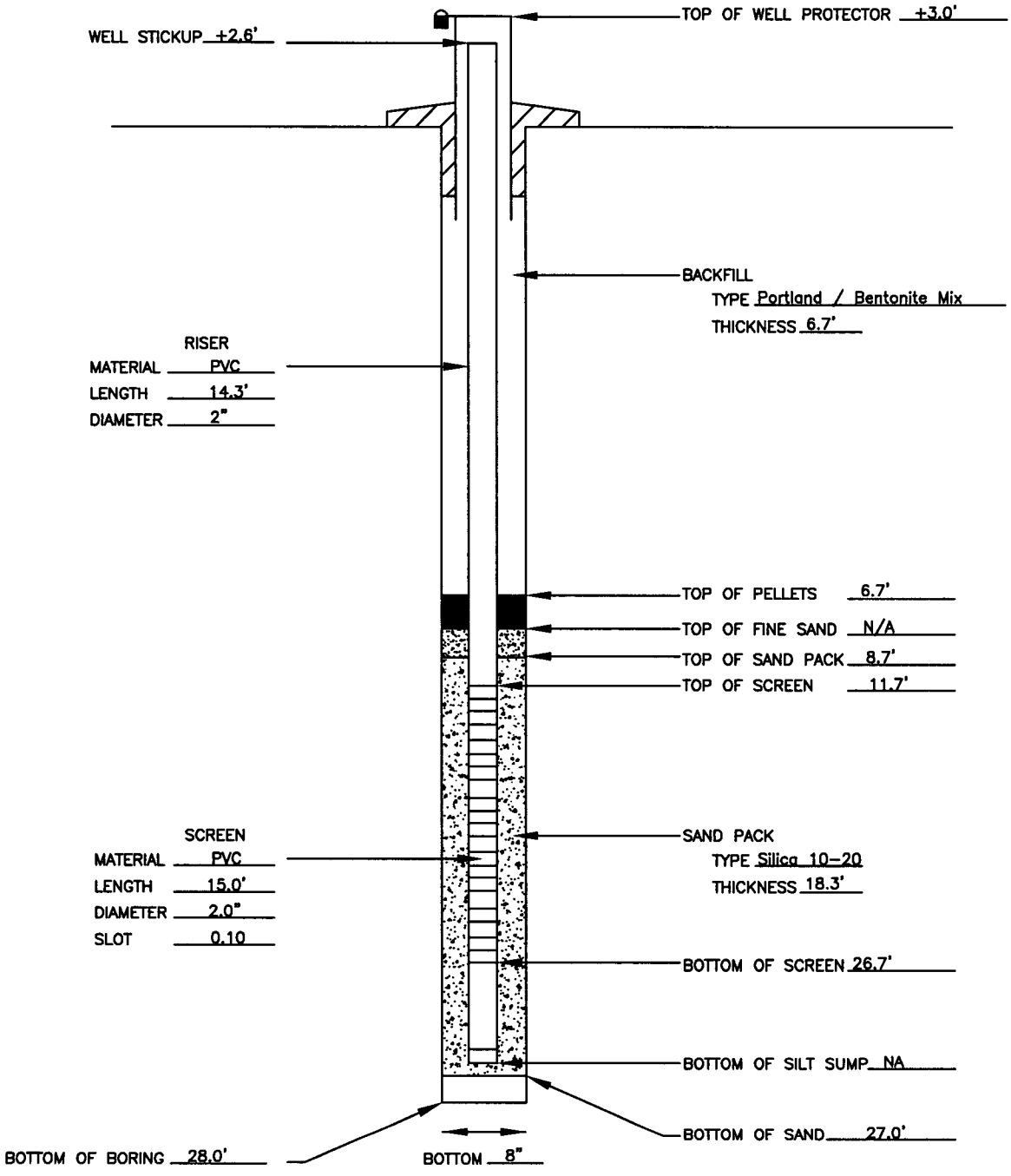
amec
8519 Jefferson NE
Albuquerque, New Mexico 87113

WELL CONSTRUCTION DIAGRAM

PROJECT NAME: ELDRIDGE RANCH DATE INSTALLED: AUGUST 7, 2001 WELL NUMBER: MW-2

PROJECT NUMBER: 1-517-000035 DRILLING COMPANY: ENVIRO WORKS METHOD: HOLLOW STEM AUGER

REMARKS: SAND - 6 CHIPS 1
PORTLAND 2, DRUM WATER - 1 INSPECTOR: M.S



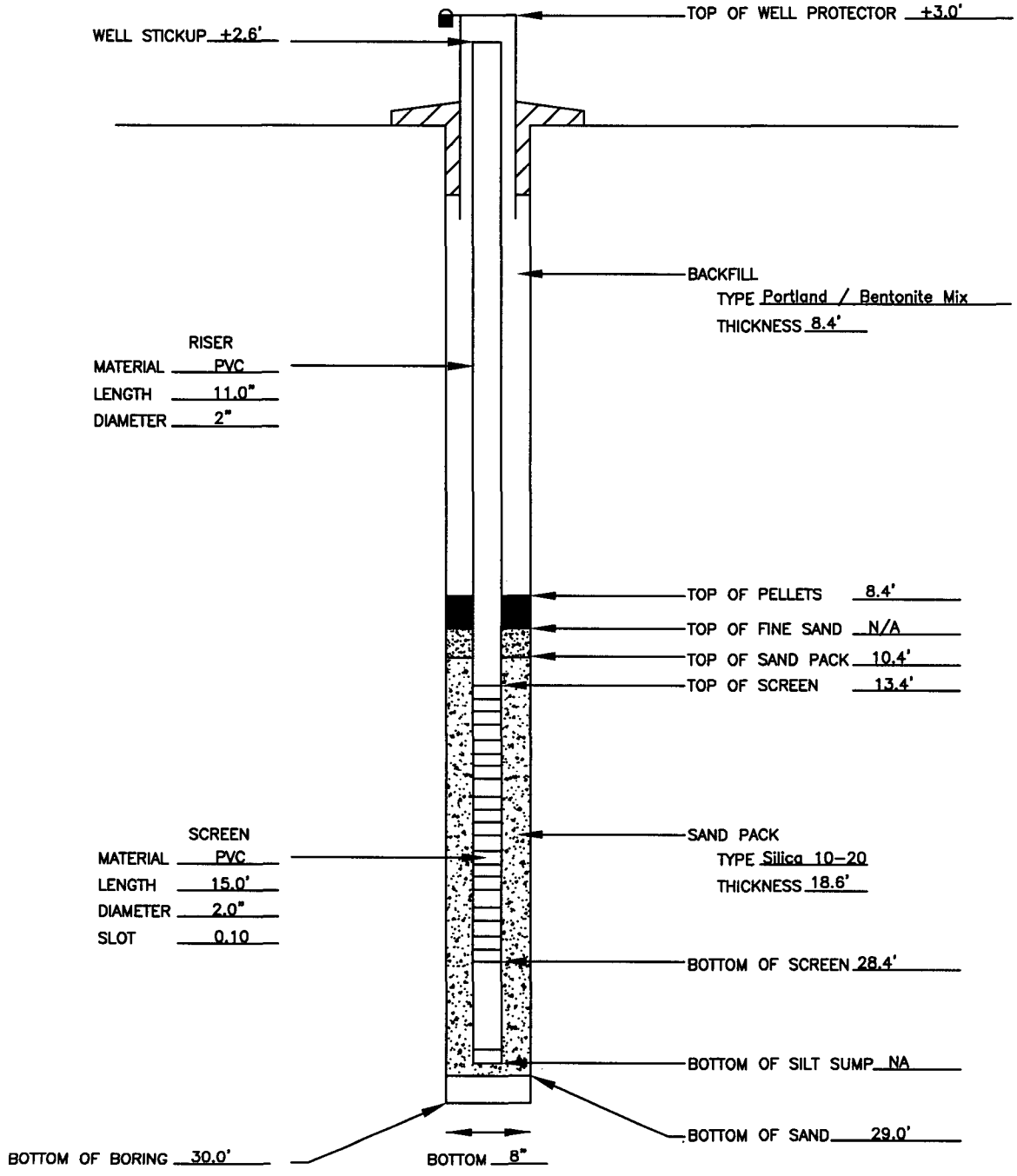
amec
8519 Jefferson NE
Albuquerque, New Mexico 87113

WELL CONSTRUCTION DIAGRAM

PROJECT NAME: ELDRIDGE RANCH DATE INSTALLED: AUGUST 7, 2001 WELL NUMBER: MW-3

PROJECT NUMBER: 1-517-000035 DRILLING COMPANY: ENVIRO WORKS METHOD: HOLLOW STEM AUGER

REMARKS: SAND - 6 CHIPS 1
PORTLAND 1, DRUM WATER - 4 INSPECTOR: M.S



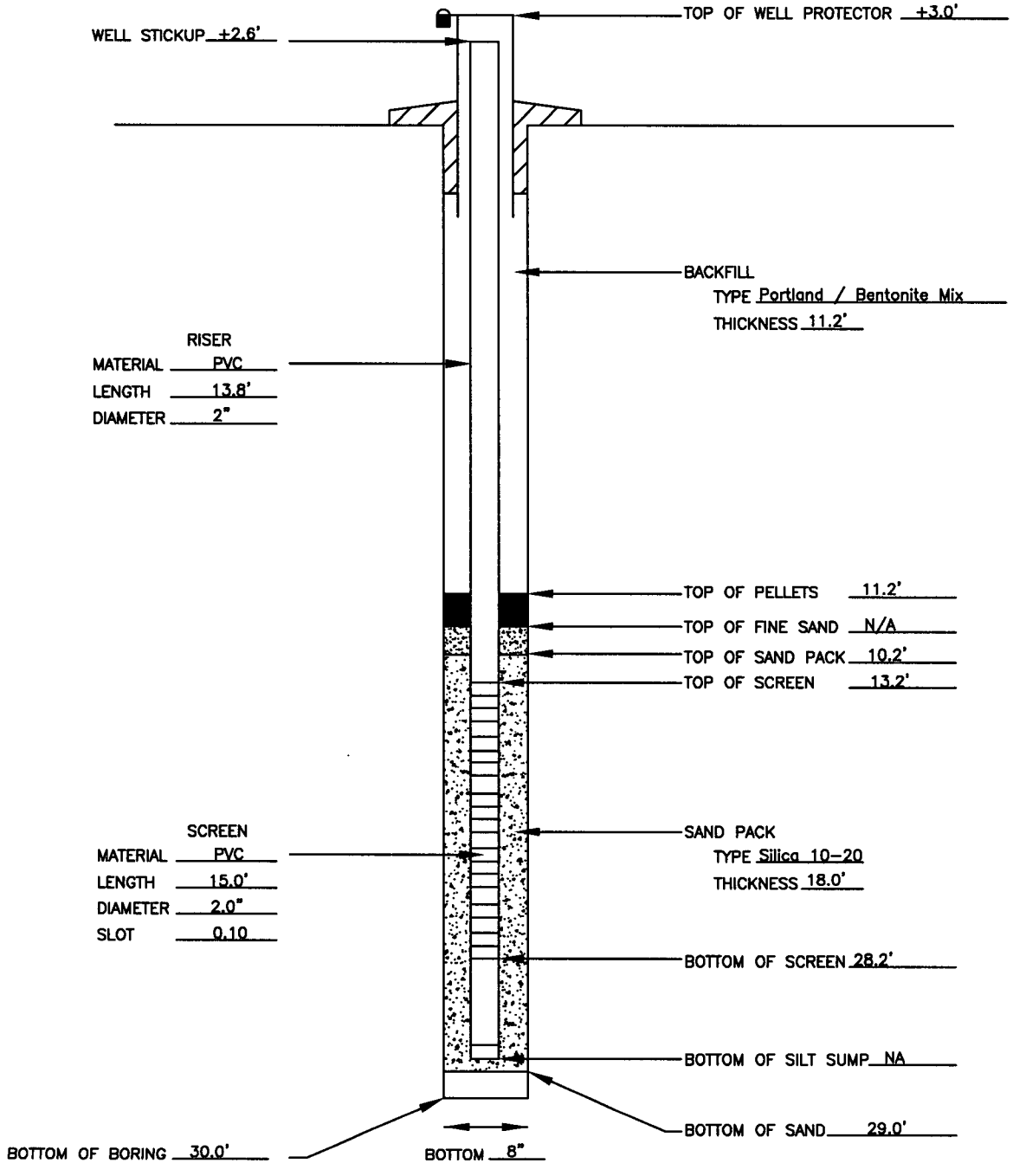
amec
8519 Jefferson NE
Albuquerque, New Mexico 87113

WELL CONSTRUCTION DIAGRAM

PROJECT NAME: ELDRIDGE RANCH DATE INSTALLED: AUGUST 8, 2001 WELL NUMBER: MW-4

PROJECT NUMBER: 1-517-000035 DRILLING COMPANY: ENVIRO WORKS METHOD: HOLLOW STEM AUGER

REMARKS: SAND - 5 CHIPS 1
PORTLAND 2, DRUM WATER - 1 INSPECTOR: M.S



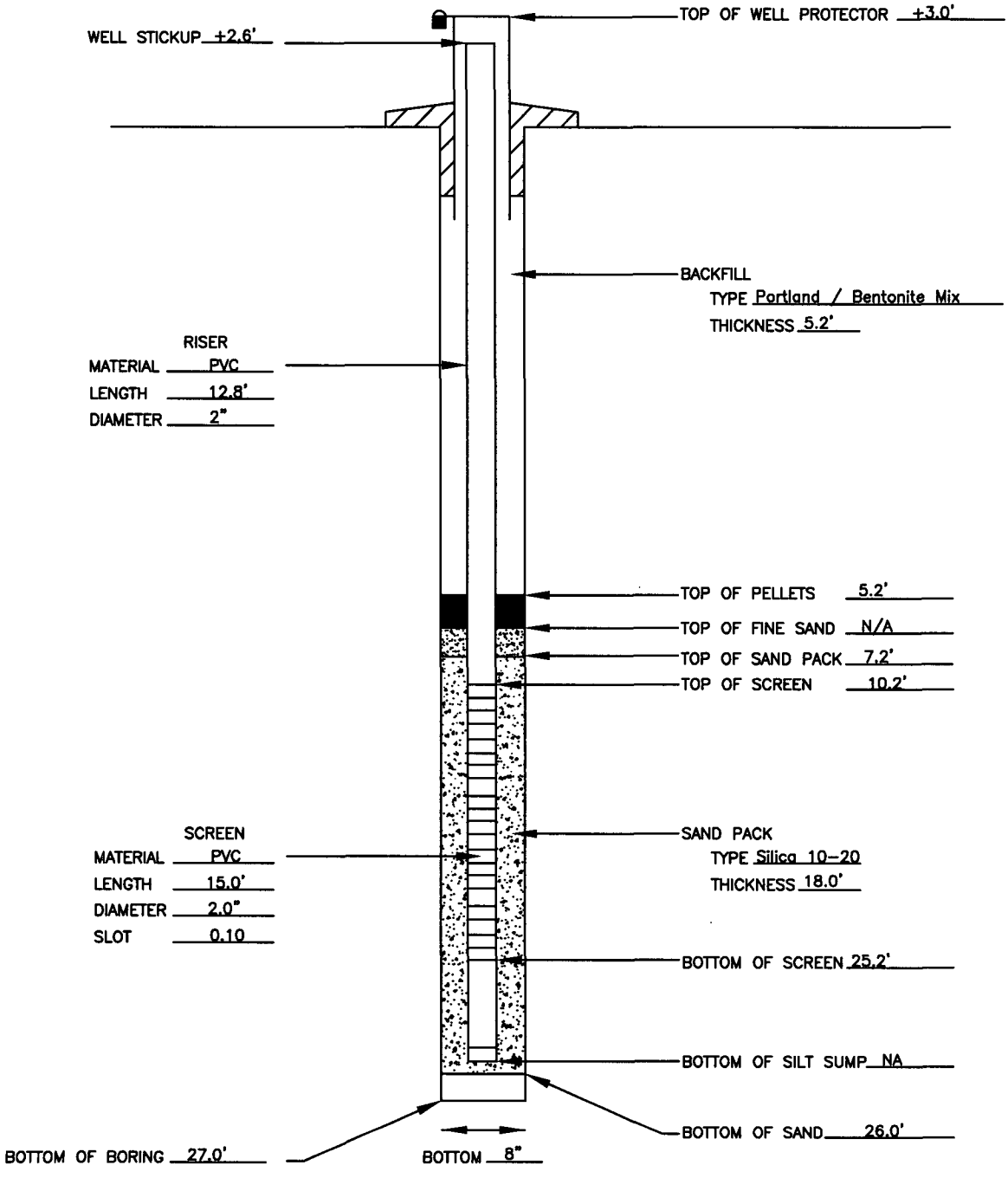
amec
8519 Jefferson NE
Albuquerque, New Mexico 87113

WELL CONSTRUCTION DIAGRAM

PROJECT NAME: ELDRIDGE RANCH DATE INSTALLED: AUGUST 8, 2001 WELL NUMBER: MW-5

PROJECT NUMBER: 1-517-000035 DRILLING COMPANY: ENVIRO WORKS METHOD: HOLLOW STEM AUGER

REMARKS: SAND - 6 CHIPS 1
PORTLAND 2 DRUMS (WATER @ ½ SOIL) INSPECTOR: M.S



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Albuquerque, New Mexico 87113

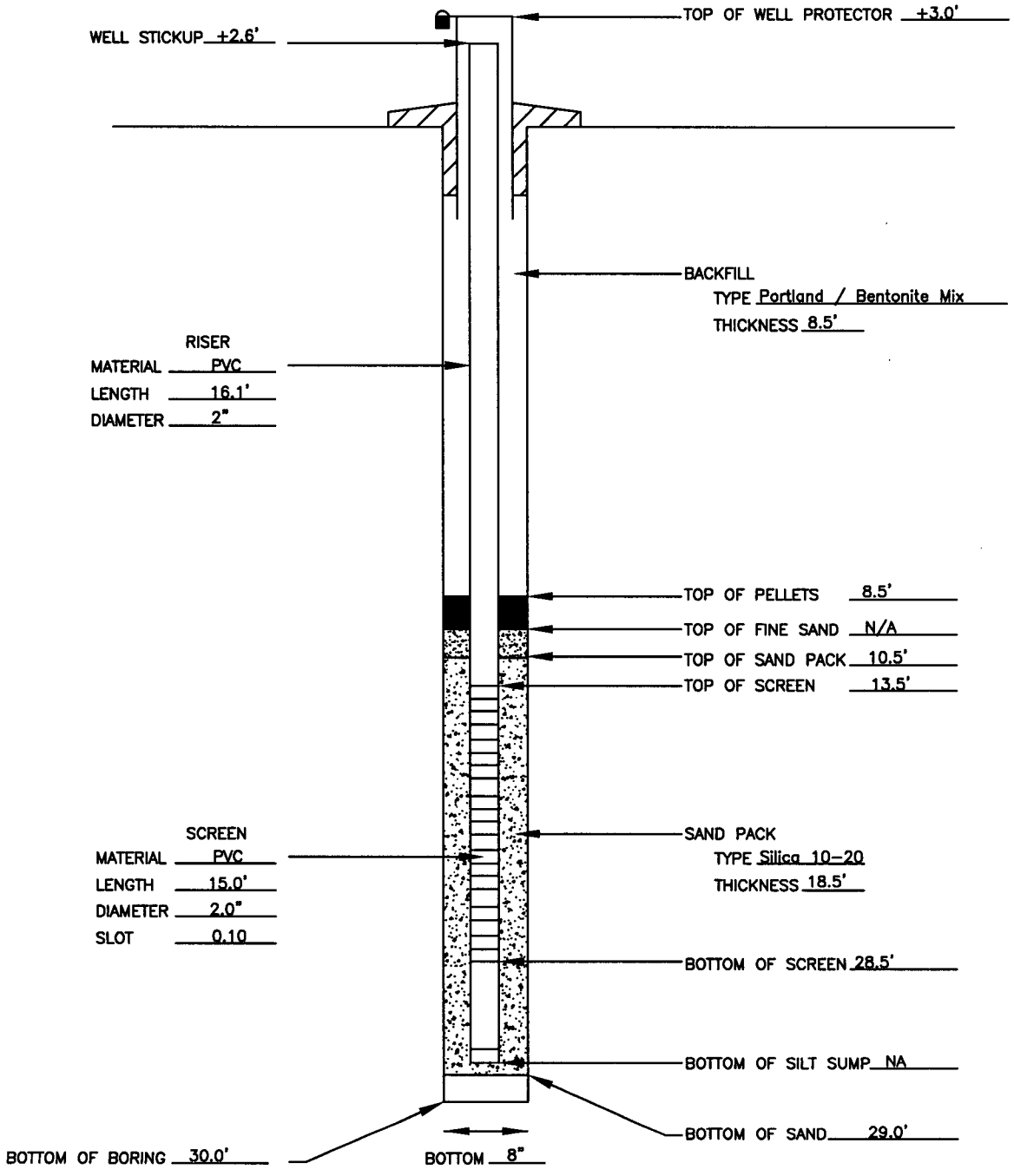
WELL CONSTRUCTION DIAGRAM

PROJECT NAME: ELDRIDGE RANCH | DATE INSTALLED: AUGUST 8, 2001 | WELL NUMBER: MW-6

PROJECT NUMBER: 1-517-000035 | DRILLING COMPANY: ENVIRO WORKS | METHOD: HOLLOW STEM AUGER

REMARKS: SAND - 6 CHIPS 1
PORTLAND 2 DRUMS - 1 WATER

INSPECTOR: M.S



amec
8519 Jefferson NE
Albuquerque, New Mexico 87113

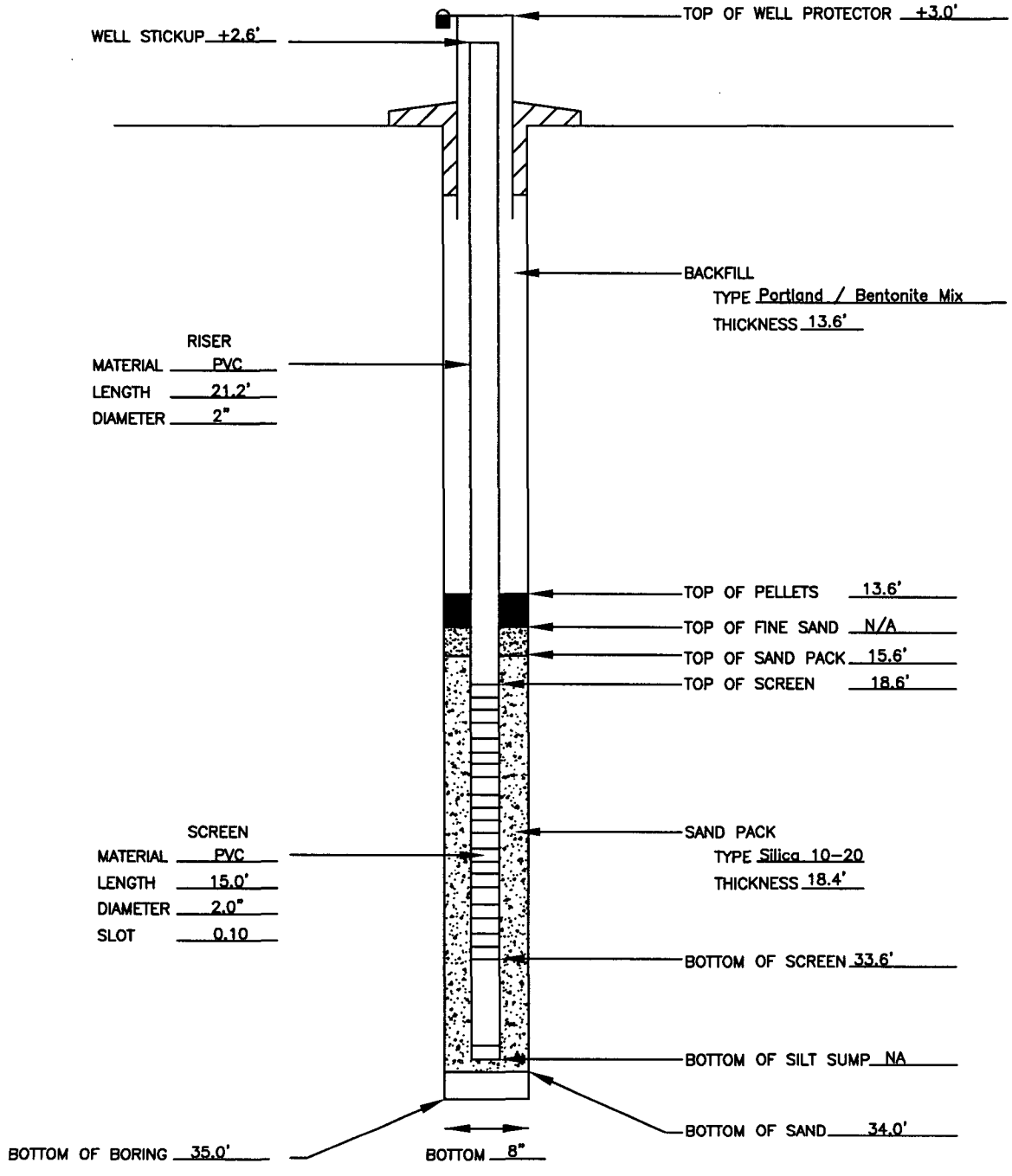
WELL CONSTRUCTION DIAGRAM

PROJECT NAME: ELDRIDGE RANCH DATE INSTALLED: AUGUST 9, 2001 WELL NUMBER: MW-7

PROJECT NUMBER: 1-517-000035 DRILLING COMPANY: ENVIRO WORKS METHOD: HOLLOW STEM AUGER

REMARKS: SAND - 6 CHIPS 1
PORTLAND 2 DRUMS - 1 WATER

INSPECTOR: M.S



APPENDIX F

LABORATORY REPORTS

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Bill Wilcox
AMEC
8519 Jefferson NE
Albuquerqe, NM 87113

Report Date: September 5, 2001

Order ID Number: A01081410

Project Number: 1517000035
Project Name: Eldrich Ranch
Project Location: Monument,NM

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
177064	MW-1	Water	8/10/01	13:50	8/14/01
177065	MW-2	Water	8/10/01	18:20	8/14/01
177066	MW-3	Water	8/10/01	19:55	8/14/01
177067	MW-4	Water	8/10/01	9:05	8/14/01
177068	MW-5	Water	8/10/01	12:05	8/14/01
177069	MW-5 (Duplicate)	Water	8/10/01	12:05	8/14/01
177070	MW-6	Water	8/10/01	10:35	8/14/01
177071	MW-7	Water	8/10/01	12:30	8/14/01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 32 pages and shall not be reproduced except in its entirety including the chain of custody (COC), without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 177064 - MW-1

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC13443	Date Analyzed:	8/16/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11461	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		234	mg/L as CaCo3	1	1
Total Alkalinity		234	mg/L as CaCo3	1	1

Sample: 177064 - MW-1

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13479	Date Analyzed:	8/20/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11493	Date Prepared:	8/20/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.943	mg/L	5	0.001
Toluene		0.12	mg/L	5	0.001
Ethylbenzene		0.052	mg/L	5	0.001
M,P,O-Xylene		0.06	mg/L	5	0.001
Total BTEX		1.18	mg/L	5	0.001

Sample: 177064 - MW-1

Analysis:	Conductivity	Analytical Method:	SM 2510B	QC Batch:	QC13407	Date Analyzed:	8/16/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11435	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		684	μMHOS/cm	1	

Sample: 177064 - MW-1

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC13341	Date Analyzed:	8/14/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11380	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
CL		59.8	mg/L	5	0.50
Fluoride		2.17	mg/L	5	0.20
Nitrate-N	[1]	<1.0	mg/L	5	0.20
Sulfate		19.6	mg/L	5	0.50

Sample: 177064 - MW-1

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC13561	Date Analyzed:	8/23/01
Analyst:	LDB	Preparation Method:	E 3005 A	Prep Batch:	PB11433	Date Prepared:	8/16/01

[1] Sample out of hold time for NO3.

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		84.7	mg/L	1	0.50
Dissolved Magnesium		16.7	mg/L	1	0.50
Dissolved Potassium		6.65	mg/L	1	0.50
Dissolved Sodium		36.6	mg/L	1	0.50

Sample: 177064 - MW-1

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC13415	Date Analyzed:	8/17/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11441	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		496	mg/L	1	10

Sample: 177064 - MW-1

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	QC Batch:	QC13498	Date Analyzed:	8/19/01
Analyst:	JJ	Preparation Method:	3510C - Mod.	Prep Batch:	PB11511	Date Prepared:	8/17/01

Param	Flag	Result	Units	Dilution	RDL
DRO		<5	mg/L	0.10	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Octane		22.3	mg/L	0.10	25	892	70 - 130

Sample: 177064 - MW-1

Analysis:	TPH GRO	Analytical Method:	8015B	QC Batch:	QC13480	Date Analyzed:	8/20/01
Analyst:	CG	Preparation Method:	5030	Prep Batch:	PB11493	Date Prepared:	8/20/01

Param	Flag	Result	Units	Dilution	RDL
GRO		4.36	mg/L	5	0.10

Sample: 177064 - MW-1

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13465	Date Analyzed:	8/20/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11427	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		8.13	mg/L	10	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		0.738	mg/L	1	0.10
Total Boron		0.155	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		0.02	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		<0.0125	mg/L	1	0.01
Total Iron		6.11	mg/L	10	0.05
Total Lead		<0.01	mg/L	1	0.01
Total Manganese		0.28	mg/L	1	0.02

Continued ...

... *Continued* Sample: 177064 Analysis: Total Metals

Param	Flag	Result	Units	Dilution	RDL
Total Molybdenum		<0.05	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Zinc		<0.025	mg/L	1	0.02

Sample: 177064 - MW-1

Analysis: pH Analytical Method: E 150.1 QC Batch: QC13327 Date Analyzed: 8/14/01
Analyst: RS Preparation Method: N/A Prep Batch: PB11372 Date Prepared: 8/14/01

Param	Flag	Result	Units	Dilution	RDL
pH	[2]	7.4	s.u.	1	1

Sample: 177065 - MW-2

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC13443 Date Analyzed: 8/16/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11461 Date Prepared: 8/16/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		188	mg/L as CaCo3	1	1
Total Alkalinity		188	mg/L as CaCo3	1	1

Sample: 177065 - MW-2

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC13479 Date Analyzed: 8/20/01
Analyst: CG Preparation Method: E 5030B Prep Batch: PB11493 Date Prepared: 8/20/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Sample: 177065 - MW-2

Analysis: Conductivity Analytical Method: SM 2510B QC Batch: QC13407 Date Analyzed: 8/16/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11435 Date Prepared: 8/16/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		679	μMHOS/cm	1	

Sample: 177065 - MW-2

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC13341 Date Analyzed: 8/14/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11380 Date Prepared: 8/14/01

[2] out of holding time

Param	Flag	Result	Units	Dilution	RDL
CL		47.0	mg/L	5	0.50
Fluoride		2.09	mg/L	5	0.20
Nitrate-N	[3]	3.08	mg/L	5	0.20
Sulfate		70.9	mg/L	5	0.50

Sample: 177065 - MW-2

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC13561	Date Analyzed:	8/23/01
Analyst:	LDB	Preparation Method:	E 3005 A	Prep Batch:	PB11433	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		87.5	mg/L	1	0.50
Dissolved Magnesium		13.2	mg/L	1	0.50
Dissolved Potassium		6.5	mg/L	1	0.50
Dissolved Sodium		34.9	mg/L	1	0.50

Sample: 177065 - MW-2

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC13415	Date Analyzed:	8/17/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11441	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		578	mg/L	1	10

Sample: 177065 - MW-2

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	QC Batch:	QC13498	Date Analyzed:	8/19/01
Analyst:	JJ	Preparation Method:	3510C - Mod.	Prep Batch:	PB11511	Date Prepared:	8/17/01

Param	Flag	Result	Units	Dilution	RDL
DRO		<5	mg/L	0.10	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Octane		21	mg/L	0.10	25	840	70 - 130

Sample: 177065 - MW-2

Analysis:	TPH GRO	Analytical Method:	8015B	QC Batch:	QC13480	Date Analyzed:	8/20/01
Analyst:	CG	Preparation Method:	5030	Prep Batch:	PB11493	Date Prepared:	8/20/01

Param	Flag	Result	Units	Dilution	RDL
GRO		<0.5	mg/L	5	0.10

Sample: 177065 - MW-2

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13465	Date Analyzed:	8/20/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11427	Date Prepared:	8/16/01

[3]Sample out of hold time for NO3.

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		17.8	mg/L	10	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		1.39	mg/L	1	0.10
Total Boron		0.171	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		0.07	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		<0.0125	mg/L	1	0.01
Total Iron		12.8	mg/L	10	0.05
Total Lead		0.017	mg/L	1	0.01
Total Manganese		0.169	mg/L	1	0.02
Total Molybdenum		<0.05	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Zinc		<0.025	mg/L	1	0.02

Sample: 177065 - MW-2

Analysis: pH | Analytical Method: E 150.1 | QC Batch: QC13327 | Date Analyzed: 8/14/01
Analyst: RS | Preparation Method: N/A | Prep Batch: PB11372 | Date Prepared: 8/14/01

Param	Flag	Result	Units	Dilution	RDL
pH	[4]	7.5	s.u.	1	1

Sample: 177066 - MW-3

Analysis: Alkalinity | Analytical Method: E 310.1 | QC Batch: QC13443 | Date Analyzed: 8/16/01
Analyst: JS | Preparation Method: N/A | Prep Batch: PB11461 | Date Prepared: 8/16/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		172	mg/L as CaCo3	1	1
Total Alkalinity		172	mg/L as CaCo3	1	1

Sample: 177066 - MW-3

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC13479 | Date Analyzed: 8/20/01
Analyst: CG | Preparation Method: E 5030B | Prep Batch: PB11493 | Date Prepared: 8/20/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

[4] out of holding time

Sample: 177066 - MW-3

Analysis:	Conductivity	Analytical Method:	SM 2510B	QC Batch:	QC13407	Date Analyzed:	8/16/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11435	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		570	μMHOS/cm	1	

Sample: 177066 - MW-3

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC13341	Date Analyzed:	8/14/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11380	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
CL		29.0	mg/L	5	0.50
Fluoride		2.33	mg/L	5	0.20
Nitrate-N	[5]	2.73	mg/L	5	0.20
Sulfate		57.0	mg/L	5	0.50

Sample: 177066 - MW-3

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC13561	Date Analyzed:	8/23/01
Analyst:	LDB	Preparation Method:	E 3005 A	Prep Batch:	PB11433	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		70.6	mg/L	1	0.50
Dissolved Magnesium		10.9	mg/L	1	0.50
Dissolved Potassium		5.79	mg/L	1	0.50
Dissolved Sodium		25.3	mg/L	1	0.50

Sample: 177066 - MW-3

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC13415	Date Analyzed:	8/17/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11441	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		432	mg/L	1	10

Sample: 177066 - MW-3

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	QC Batch:	QC13498	Date Analyzed:	8/19/01
Analyst:	JJ	Preparation Method:	3510C - Mod.	Prep Batch:	PB11511	Date Prepared:	8/17/01

Param	Flag	Result	Units	Dilution	RDL
DRO		<5	mg/L	0.10	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Octane		21.7	mg/L	0.10	25	868	70 - 130

[5]Sample out of hold time for NO3.

Sample: 177066 - MW-3

Analysis:	TPH GRO	Analytical Method:	8015B	QC Batch:	QC13480	Date Analyzed:	8/20/01
Analyst:	CG	Preparation Method:	5030	Prep Batch:	PB11493	Date Prepared:	8/20/01

Param	Flag	Result	Units	Dilution	RDL
GRO		<0.5	mg/L	5	0.10

Sample: 177066 - MW-3

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13465	Date Analyzed:	8/20/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11427	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		50.7	mg/L	100	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		0.556	mg/L	1	0.10
Total Boron		0.233	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		0.137	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		0.017	mg/L	1	0.01
Total Iron		29.4	mg/L	100	0.05
Total Lead		0.016	mg/L	1	0.01
Total Manganese		0.334	mg/L	1	0.02
Total Molybdenum		<0.05	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Zinc		0.06	mg/L	1	0.02

Sample: 177066 - MW-3

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC13327	Date Analyzed:	8/14/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB11372	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
pH	[6]	7.6	s.u.	1	1

Sample: 177067 - MW-4

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC13443	Date Analyzed:	8/16/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11461	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		230	mg/L as CaCo3	1	1
Total Alkalinity		230	mg/L as CaCo3	1	1

[6] out of holding time

Sample: 177067 - MW-4

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13479	Date Analyzed:	8/20/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11493	Date Prepared:	8/20/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		10	mg/L	50	0.001
Toluene		6.96	mg/L	50	0.001
Ethylbenzene		0.19	mg/L	50	0.001
M,P,O-Xylene		0.632	mg/L	50	0.001
Total BTEX		17.8	mg/L	50	0.001

Sample: 177067 - MW-4

Analysis:	Conductivity	Analytical Method:	SM 2510B	QC Batch:	QC13407	Date Analyzed:	8/16/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11435	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		803	μMHOS/cm	1	

Sample: 177067 - MW-4

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC13341	Date Analyzed:	8/14/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11380	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
CL		72.0	mg/L	5	0.50
Fluoride		2.02	mg/L	5	0.20
Nitrate-N	[7]	<1.0	mg/L	5	0.20
Sulfate		57.2	mg/L	5	0.50

Sample: 177067 - MW-4

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC13561	Date Analyzed:	8/23/01
Analyst:	LDB	Preparation Method:	E 3005 A	Prep Batch:	PB11433	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		76.5	mg/L	1	0.50
Dissolved Magnesium		15.8	mg/L	1	0.50
Dissolved Potassium		6.28	mg/L	1	0.50
Dissolved Sodium		35.2	mg/L	1	0.50

Sample: 177067 - MW-4

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC13415	Date Analyzed:	8/17/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11441	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		548	mg/L	1	10

[7]Sample out of hold time for NO3.

Sample: 177067 - MW-4

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	QC Batch:	QC13498	Date Analyzed:	8/19/01
Analyst:	JJ	Preparation Method:	3510C - Mod.	Prep Batch:	PB11511	Date Prepared:	8/17/01

Param	Flag	Result	Units	Dilution	RDL
DRO		<5	mg/L	0.10	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Octane		30.5	mg/L	0.10	25	1220	70 - 130

Sample: 177067 - MW-4

Analysis:	TPH GRO	Analytical Method:	8015B	QC Batch:	QC13480	Date Analyzed:	8/20/01
Analyst:	CG	Preparation Method:	5030	Prep Batch:	PB11493	Date Prepared:	8/20/01

Param	Flag	Result	Units	Dilution	RDL
GRO		31.9	mg/L	50	0.10

Sample: 177067 - MW-4

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13465	Date Analyzed:	8/20/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11427	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		50.6	mg/L	100	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		2.87	mg/L	1	0.10
Total Boron		0.263	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		0.268	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		0.021	mg/L	1	0.01
Total Iron		30.9	mg/L	100	0.05
Total Lead		0.022	mg/L	1	0.01
Total Manganese		0.588	mg/L	1	0.02
Total Molybdenum		<0.05	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Zinc		<0.05	mg/L	1	0.02

Sample: 177067 - MW-4

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC13327	Date Analyzed:	8/14/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB11372	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
pH	[8]	7.4	s.u.	1	1

[8] out of holding time

Sample: 177068 - MW-5

Analysis: Alkalinity | Analytical Method: E 310.1 | QC Batch: QC13443 | Date Analyzed: 8/16/01
Analyst: JS | Preparation Method: N/A | Prep Batch: PB11461 | Date Prepared: 8/16/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		232	mg/L as CaCo3	1	1
Total Alkalinity		232	mg/L as CaCo3	1	1

Sample: 177068 - MW-5

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC13479 | Date Analyzed: 8/20/01
Analyst: CG | Preparation Method: E 5030B | Prep Batch: PB11493 | Date Prepared: 8/20/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.217	mg/L	5	0.001
Toluene		0.185	mg/L	5	0.001
Ethylbenzene		0.024	mg/L	5	0.001
M,P,O-Xylene		0.129	mg/L	5	0.001
Total BTEX		0.555	mg/L	5	0.001

Sample: 177068 - MW-5

Analysis: Conductivity | Analytical Method: SM 2510B | QC Batch: QC13407 | Date Analyzed: 8/16/01
Analyst: JS | Preparation Method: N/A | Prep Batch: PB11435 | Date Prepared: 8/16/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		729	μMHOS/cm	1	

Sample: 177068 - MW-5

Analysis: Ion Chromatography (IC) | Analytical Method: E 300.0 | QC Batch: QC13341 | Date Analyzed: 8/14/01
Analyst: JS | Preparation Method: N/A | Prep Batch: PB11380 | Date Prepared: 8/14/01

Param	Flag	Result	Units	Dilution	RDL
CL		62.6	mg/L	5	0.50
Fluoride		1.88	mg/L	5	0.20
Nitrate-N	[9]	<1.0	mg/L	5	0.20
Sulfate		37.0	mg/L	5	0.50

Sample: 177068 - MW-5

Analysis: Salts | Analytical Method: E 200.7 | QC Batch: QC13561 | Date Analyzed: 8/23/01
Analyst: LDB | Preparation Method: E 3005 A | Prep Batch: PB11433 | Date Prepared: 8/16/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		96	mg/L	1	0.50
Dissolved Magnesium		17.4	mg/L	1	0.50
Dissolved Potassium		8	mg/L	1	0.50
Dissolved Sodium		36.9	mg/L	1	0.50

[9]Sample out of hold time for NO3.

Sample: 177068 - MW-5

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC13415	Date Analyzed:	8/17/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11441	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		521	mg/L	1	10

Sample: 177068 - MW-5

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	QC Batch:	QC13498	Date Analyzed:	8/19/01
Analyst:	JJ	Preparation Method:	3510C - Mod.	Prep Batch:	PB11511	Date Prepared:	8/17/01

Param	Flag	Result	Units	Dilution	RDL
DRO		<5	mg/L	0.10	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Octane		22.9	mg/L	0.10	25	916	70 - 130

Sample: 177068 - MW-5

Analysis:	TPH GRO	Analytical Method:	8015B	QC Batch:	QC13480	Date Analyzed:	8/20/01
Analyst:	CG	Preparation Method:	5030	Prep Batch:	PB11493	Date Prepared:	8/20/01

Param	Flag	Result	Units	Dilution	RDL
GRO		1.67	mg/L	5	0.10

Sample: 177068 - MW-5

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13465	Date Analyzed:	8/20/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11427	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		52.3	mg/L	100	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		1.32	mg/L	1	0.10
Total Boron		0.265	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		0.09	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		0.019	mg/L	1	0.01
Total Iron		34.1	mg/L	100	0.05
Total Lead		0.023	mg/L	1	0.01
Total Manganese		0.646	mg/L	1	0.02
Total Molybdenum		<0.05	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Zinc		0.08	mg/L	1	0.02

Sample: 177068 - MW-5

Analysis: pH | Analytical Method: E 150.1 | QC Batch: QC13327 | Date Analyzed: 8/14/01
Analyst: RS | Preparation Method: N/A | Prep Batch: PB11372 | Date Prepared: 8/14/01

Param	Flag	Result	Units	Dilution	RDL
pH	[10]	7.4	s.u.	1	1

Sample: 177069 - MW-5 (Duplicate)

Analysis: Alkalinity | Analytical Method: E 310.1 | QC Batch: QC13443 | Date Analyzed: 8/16/01
Analyst: JS | Preparation Method: N/A | Prep Batch: PB11461 | Date Prepared: 8/16/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		240	mg/L as CaCo3	1	1
Total Alkalinity		240	mg/L as CaCo3	1	1

Sample: 177069 - MW-5 (Duplicate)

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC13479 | Date Analyzed: 8/20/01
Analyst: CG | Preparation Method: E 5030B | Prep Batch: PB11493 | Date Prepared: 8/20/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.182	mg/L	5	0.001
Toluene		0.159	mg/L	5	0.001
Ethylbenzene		0.02	mg/L	5	0.001
M,P,O-Xylene		0.109	mg/L	5	0.001
Total BTEX		0.47	mg/L	5	0.001

Sample: 177069 - MW-5 (Duplicate)

Analysis: Conductivity | Analytical Method: SM 2510B | QC Batch: QC13407 | Date Analyzed: 8/16/01
Analyst: JS | Preparation Method: N/A | Prep Batch: PB11435 | Date Prepared: 8/16/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		745	μMHOS/cm	1	

Sample: 177069 - MW-5 (Duplicate)

Analysis: Ion Chromatography (IC) | Analytical Method: E 300.0 | QC Batch: QC13341 | Date Analyzed: 8/14/01
Analyst: JS | Preparation Method: N/A | Prep Batch: PB11380 | Date Prepared: 8/14/01

Param	Flag	Result	Units	Dilution	RDL
CL		62.6	mg/L	5	0.50
Fluoride		3.29	mg/L	5	0.20
Nitrate-N	[11]	1.04	mg/L	5	0.20
Sulfate		35.1	mg/L	5	0.50

[10] out of holding time
[11] Sample out of hold time for NO3.

Sample: 177069 - MW-5 (Duplicate)

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC13561	Date Analyzed:	8/23/01
Analyst:	LDB	Preparation Method:	E 3005 A	Prep Batch:	PB11433	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		89.4	mg/L	1	0.50
Dissolved Magnesium		17.7	mg/L	1	0.50
Dissolved Potassium		8.16	mg/L	1	0.50
Dissolved Sodium		36.3	mg/L	1	0.50

Sample: 177069 - MW-5 (Duplicate)

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC13415	Date Analyzed:	8/17/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11441	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		642	mg/L	1	10

Sample: 177069 - MW-5 (Duplicate)

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	QC Batch:	QC13498	Date Analyzed:	8/19/01
Analyst:	JJ	Preparation Method:	3510C - Mod.	Prep Batch:	PB11511	Date Prepared:	8/17/01

Param	Flag	Result	Units	Dilution	RDL
DRO		<5	mg/L	0.10	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Octane		23.9	mg/L	0.10	25	956	70 - 130

Sample: 177069 - MW-5 (Duplicate)

Analysis:	TPH GRO	Analytical Method:	8015B	QC Batch:	QC13480	Date Analyzed:	8/20/01
Analyst:	CG	Preparation Method:	5030	Prep Batch:	PB11493	Date Prepared:	8/20/01

Param	Flag	Result	Units	Dilution	RDL
GRO		1.23	mg/L	5	0.10

Sample: 177069 - MW-5 (Duplicate)

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13466	Date Analyzed:	8/20/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11428	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		40.7	mg/L	100	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		1.27	mg/L	10	0.10
Total Boron		0.277	mg/L	10	0.01
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		0.078	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02

Continued ...

... *Continued* Sample: 177069 Analysis: Total Metals

Param	Flag	Result	Units	Dilution	RDL
Total Copper		0.016	mg/L	1	0.01
Total Iron		31.7	mg/L	100	0.05
Total Lead		0.026	mg/L	1	0.01
Total Manganese		0.621	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Zinc		0.069	mg/L	1	0.02

Sample: 177069 - MW-5 (Duplicate)

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC13327	Date Analyzed:	8/14/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB11372	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
pH	[12]	7.4	s.u.	1	1

Sample: 177070 - MW-6

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC13443	Date Analyzed:	8/16/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11461	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		220	mg/L as CaCo3	1	1
Total Alkalinity		220	mg/L as CaCo3	1	1

Sample: 177070 - MW-6

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13479	Date Analyzed:	8/20/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11493	Date Prepared:	8/20/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.6	mg/L	5	0.001
Toluene		0.502	mg/L	5	0.001
Ethylbenzene		0.024	mg/L	5	0.001
M,P,O-Xylene		0.1	mg/L	5	0.001
Total BTEX		1.23	mg/L	5	0.001

Sample: 177070 - MW-6

Analysis:	Conductivity	Analytical Method:	SM 2510B	QC Batch:	QC13407	Date Analyzed:	8/16/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11435	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		792	μMHOS/cm	1	

[12] out of holding time

Sample: 177070 - MW-6

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC13341 Date Analyzed: 8/14/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11380 Date Prepared: 8/14/01

Param	Flag	Result	Units	Dilution	RDL
CL		70.0	mg/L	5	0.50
Fluoride		3.46	mg/L	5	0.20
Nitrate-N	[13]	2.11	mg/L	5	0.20
Sulfate		72.0	mg/L	5	0.50

Sample: 177070 - MW-6

Analysis: Salts Analytical Method: E 200.7 QC Batch: QC13561 Date Analyzed: 8/23/01
Analyst: LDB Preparation Method: E 3005 A Prep Batch: PB11433 Date Prepared: 8/16/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		93.6	mg/L	1	0.50
Dissolved Magnesium		16.2	mg/L	1	0.50
Dissolved Potassium		7.85	mg/L	1	0.50
Dissolved Sodium		35.9	mg/L	1	0.50

Sample: 177070 - MW-6

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC13415 Date Analyzed: 8/17/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11441 Date Prepared: 8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		573	mg/L	1	10

Sample: 177070 - MW-6

Analysis: TPH DRO Analytical Method: Mod. 8015B QC Batch: QC13498 Date Analyzed: 8/19/01
Analyst: JJ Preparation Method: 3510C - Mod. Prep Batch: PB11511 Date Prepared: 8/17/01

Param	Flag	Result	Units	Dilution	RDL
DRO		<5	mg/L	0.10	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Octane		22.3	mg/L	0.10	25	892	70 - 130

Sample: 177070 - MW-6

Analysis: TPH GRO Analytical Method: 8015B QC Batch: QC13480 Date Analyzed: 8/20/01
Analyst: CG Preparation Method: 5030 Prep Batch: PB11493 Date Prepared: 8/20/01

Param	Flag	Result	Units	Dilution	RDL
GRO		9.69	mg/L	5	0.10

[13]Sample out of hold time for NO3.

Sample: 177070 - MW-6

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13466	Date Analyzed:	8/20/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11428	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		99.1	mg/L	100	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		18.8	mg/L	10	0.10
Total Boron		0.505	mg/L	10	0.01
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		0.605	mg/L	1	0.01
Total Cobalt		0.039	mg/L	1	0.02
Total Copper		0.058	mg/L	1	0.01
Total Iron		69	mg/L	100	0.05
Total Lead		0.04	mg/L	1	0.01
Total Manganese		1.03	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Zinc		0.14	mg/L	1	0.02

Sample: 177070 - MW-6

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC13327	Date Analyzed:	8/14/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB11372	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
pH	[14]	7.6	s.u.	1	1

Sample: 177071 - MW-7

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC13443	Date Analyzed:	8/16/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11461	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		650	mg/L as CaCo3	1	1
Total Alkalinity		650	mg/L as CaCo3	1	1

Sample: 177071 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13479	Date Analyzed:	8/20/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11493	Date Prepared:	8/20/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

[14] out of holding time

Sample: 177071 - MW-7

Analysis:	Conductivity	Analytical Method:	SM 2510B	QC Batch:	QC13407	Date Analyzed:	8/16/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11435	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		1070	μMHOS/cm	1	

Sample: 177071 - MW-7

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC13342	Date Analyzed:	8/14/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11380	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
CL		120	mg/L	5	0.50
Fluoride		4.18	mg/L	5	0.20
Nitrate-N	[15]	1.99	mg/L	5	0.20
Sulfate		189	mg/L	5	0.50

Sample: 177071 - MW-7

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC13561	Date Analyzed:	8/23/01
Analyst:	LDB	Preparation Method:	E 3005 A	Prep Batch:	PB11433	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		113	mg/L	1	0.50
Dissolved Magnesium		22.5	mg/L	1	0.50
Dissolved Potassium		8.93	mg/L	1	0.50
Dissolved Sodium		56.5	mg/L	1	0.50

Sample: 177071 - MW-7

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC13415	Date Analyzed:	8/17/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11441	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		740	mg/L	1	10

Sample: 177071 - MW-7

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	QC Batch:	QC13498	Date Analyzed:	8/19/01
Analyst:	JJ	Preparation Method:	3510C - Mod.	Prep Batch:	PB11511	Date Prepared:	8/17/01

Param	Flag	Result	Units	Dilution	RDL
DRO		<5	mg/L	0.10	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Octane		23.5	mg/L	0.10	25	940	70 - 130

[15] Sample out of hold time for NO3.

Sample: 177071 - MW-7

Analysis:	TPH GRO	Analytical Method:	8015B	QC Batch:	QC13480	Date Analyzed:	8/20/01
Analyst:	CG	Preparation Method:	5030	Prep Batch:	PB11493	Date Prepared:	8/20/01

Param	Flag	Result	Units	Dilution	RDL
GRO		<0.5	mg/L	5	0.10

Sample: 177071 - MW-7

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13466	Date Analyzed:	8/20/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11428	Date Prepared:	8/16/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		72.7	mg/L	100	0.10
Total Arsenic		0.07	mg/L	1	0.05
Total Barium		3.64	mg/L	1	0.10
Total Boron		0.490	mg/L	10	0.01
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		0.267	mg/L	1	0.01
Total Cobalt		0.029	mg/L	1	0.02
Total Copper		0.069	mg/L	1	0.01
Total Iron		56.2	mg/L	100	0.05
Total Lead		0.041	mg/L	1	0.01
Total Manganese		0.843	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Zinc		0.119	mg/L	1	0.02

Sample: 177071 - MW-7

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC13327	Date Analyzed:	8/14/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB11372	Date Prepared:	8/14/01

Param	Flag	Result	Units	Dilution	RDL
pH	[16]	7.7	s.u.	1	1

[16] out of holding time

Quality Control Report
Method Blank

Method Blank QCBatch: QC13341

Param	Flag	Results	Units	Reporting Limit
CL		<2.0	mg/L	0.50
Fluoride		<0.2	mg/L	0.20
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<2.0	mg/L	0.50

Method Blank QCBatch: QC13342

Param	Flag	Results	Units	Reporting Limit
CL		<2.0	mg/L	0.50
Fluoride		<0.2	mg/L	0.20
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<2.0	mg/L	0.50

Method Blank QCBatch: QC13407

Param	Flag	Results	Units	Reporting Limit
Specific Conductance		10.6	μMHOS/cm	

Method Blank QCBatch: QC13415

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Method Blank QCBatch: QC13443

Param	Flag	Results	Units	Reporting Limit
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1
Bicarbonate Alkalinity		<4.0	mg/L as CaCo3	1
Total Alkalinity		<4.0	mg/L as CaCo3	1

Method Blank QCBatch: QC13465

Param	Flag	Results	Units	Reporting Limit
Total Aluminum		<0.10	mg/L	0.10
Total Arsenic		<0.05	mg/L	0.05
Total Barium		<0.10	mg/L	0.10
Total Boron		<0.01	mg/L	0.01
Total Cadmium		<0.025	mg/L	0.02
Total Chromium		<0.01	mg/L	0.01
Total Cobalt		<0.025	mg/L	0.02
Total Copper		<0.0125	mg/L	0.01
Total Iron		<0.05	mg/L	0.05
Total Lead		<0.01	mg/L	0.01
Total Manganese		<0.025	mg/L	0.02
Total Molybdenum		<0.050	mg/L	0.05
Total Nickel		<0.025	mg/L	0.02
Total Selenium		<0.05	mg/L	0.05
Total Silver		<0.0125	mg/L	0.01
Total Zinc		<0.025	mg/L	0.02

Method Blank

QCBatch: QC13466

Param	Flag	Results	Units	Reporting Limit
Total Aluminum		<0.1	mg/L	0.10
Total Arsenic		<0.05	mg/L	0.05
Total Barium		<0.1	mg/L	0.10
Total Boron		<0.01	mg/L	0.01
Total Cadmium		<0.025	mg/L	0.02
Total Chromium		<0.01	mg/L	0.01
Total Cobalt		<0.025	mg/L	0.02
Total Copper		<0.0125	mg/L	0.01
Total Iron		<0.05	mg/L	0.05
Total Lead		<0.01	mg/L	0.01
Total Manganese		<0.025	mg/L	0.02
Total Molybdenum		<0.050	mg/L	0.05
Total Nickel		<0.025	mg/L	0.02
Total Selenium		<0.05	mg/L	0.05
Total Silver		<0.0125	mg/L	0.01
Total Zinc		<0.025	mg/L	0.02

Method Blank

QCBatch: QC13479

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Method Blank

QCBatch: QC13480

Param	Flag	Results	Units	Reporting Limit
GRO		<0.1	mg/L	0.10

Method Blank QCBatch: QC13498

Param	Flag	Results	Units	Reporting Limit
DRO		<5	mg/L	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Octane		21.7	mg/L	0.10	25	86	70 - 130

Method Blank QCBatch: QC13561

Param	Flag	Results	Units	Reporting Limit
Dissolved Calcium		<0.50	mg/L	0.50
Dissolved Magnesium		<0.50	mg/L	0.50
Dissolved Potassium		<0.50	mg/L	0.50
Dissolved Sodium		<0.50	mg/L	0.50

Quality Control Report
Duplicate Samples

Duplicate QCBatch: QC13327

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH		7.7	7.7	s.u.	1	0	0.99

Duplicate QCBatch: QC13407

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Specific Conductance		15.7	15.8	μMHOS/cm	1	0	5.9

Duplicate QCBatch: QC13415

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		1240	1280	mg/L	1	3	8.9

Duplicate

QCBatch: QC13443

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	7
Carbonate Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	7
Bicarbonate Alkalinity		50	52	mg/L as CaCo3	1	3	7
Total Alkalinity		50	52	mg/L as CaCo3	1	3	7

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC13341

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
CL	11.99	11.67	mg/L	1	12.50	<2.0	95	2	90 - 110	20
Fluoride	2.46	2.32	mg/L	1	2.50	<0.2	98	5	90 - 110	20
Nitrate-N	2.40	2.38	mg/L	1	2.50	<0.2	96	0	90 - 110	20
Sulfate	11.92	11.69	mg/L	1	12.50	<2.0	95	1	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC13342

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
CL	11.88	11.79	mg/L	1	12.50	<2.0	95	0	90 - 110	20
Fluoride	2.35	2.40	mg/L	1	2.50	<0.2	94	2	90 - 110	20
Nitrate-N	2.36	2.35	mg/L	1	2.50	<0.2	94	0	90 - 110	20
Sulfate	11.75	11.83	mg/L	1	12.50	<2.0	94	0	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC13465

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Copper	0.126	0.126	mg/L	1	0.12	<0.0125	100	0	75 - 125	20
Total Molybdenum	0.517	0.528	mg/L	1	0.50	<0.050	103	2	75 - 125	20
Total Zinc	0.251	0.251	mg/L	1	0.25	<0.025	100	0	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC13466

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	1.01	0.839	mg/L	1	1	<0.1	101	18	75 - 125	20

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Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Arsenic	0.609	0.615	mg/L	1	0.50	<0.05	121	0	75 - 125	20
Total Barium	1.03	0.98	mg/L	1	1	<0.1	103	4	75 - 125	20
Total Boron	0.0507	0.0478	mg/L	1	0.05	<0.01	101	5	75 - 125	20
Total Cadmium	0.25	0.254	mg/L	1	0.25	<0.025	100	1	75 - 125	20
Total Chromium	0.101	0.103	mg/L	1	0.10	<0.01	101	1	75 - 125	20
Total Cobalt	0.251	0.257	mg/L	1	0.25	<0.025	100	2	75 - 125	20
Total Copper	0.127	0.129	mg/L	1	0.12	<0.0125	101	1	75 - 125	20
Total Iron	0.522	0.496	mg/L	1	0.50	<0.05	104	5	75 - 125	20
Total Lead	0.503	0.518	mg/L	1	0.50	<0.01	100	6	75 - 125	20
Total Manganese	0.249	0.254	mg/L	1	0.25	<0.025	99	1	75 - 125	20
Total Molybdenum	0.515	0.527	mg/L	1	0.50	<0.050	103	2	75 - 125	20
Total Nickel	0.246	0.257	mg/L	1	0.25	<0.025	98	4	75 - 125	20
Total Selenium	0.464	0.481	mg/L	1	0.50	<0.05	92	3	75 - 125	20
Total Silver	0.124	0.126	mg/L	1	0.12	<0.0125	99	1	75 - 125	20
Total Zinc	0.254	0.257	mg/L	1	0.25	<0.025	101	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC13479

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.098	0.097	mg/L	1	0.10	<0.001	98	1	80 - 120	20
Benzene	0.098	0.097	mg/L	1	0.10	<0.001	98	1	80 - 120	20
Toluene	0.101	0.101	mg/L	1	0.10	<0.001	101	0	80 - 120	20
Ethylbenzene	0.104	0.103	mg/L	1	0.10	<0.001	104	0	80 - 120	20
M,P,O-Xylene	0.313	0.31	mg/L	1	0.30	<0.001	104	0	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.096	0.092	mg/L	1	0.10	96	92	72 - 128
4-BFB	0.105	0.101	mg/L	1	0.10	105	101	72 - 128

Laboratory Control Spikes

QCBatch: QC13480

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
GRO	0.948	0.898	mg/L	1	1	<0.1	94	5	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.096	0.095	mg/L	1	0.10	96	95	70 - 130
4-BFB	0.092	0.092	mg/L	1	0.10	92	92	70 - 130

Laboratory Control Spikes

QCBatch: QC13498

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
DRO	20.9	20.9	mg/L	0.10	250	<5	83	0	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
n-Octane	27.9	27.5	mg/L	0.10	25	111	110	70 - 130

Laboratory Control Spikes

QCBatch: QC13561

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Dissolved Calcium	98.2	99.5	mg/L	1	100	<0.50	98	1	75 - 125	20
Dissolved Magnesium	93.2	94.5	mg/L	1	100	<0.50	93	1	75 - 125	20
Dissolved Potassium	94.8	96.6	mg/L	1	100	<0.50	94	1	75 - 125	20
Dissolved Sodium	91.6	93	mg/L	1	100	<0.50	91	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Matrix Spikes and Duplicate Spikes

Matrix Spikes

QCBatch: QC13341

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
CL	134.63	132.95	mg/L	1	62.50	70.0	103	1	52 - 131	20
Fluoride	13.77	13.10	mg/L	1	12.50	3.46	82	5	80 - 113	20
Nitrate-N	13.48	13.77	mg/L	1	12.50	2.11	90	2	84 - 105	20
Sulfate	136.11	136.66	mg/L	1	62.50	72.0	102	0	79 - 104	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC13342

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
CL	3734.90	3699.14	mg/L	1	1250	2420	105	1	52 - 131	20
Fluoride	234.22	239.92	mg/L	1	250		93	2	80 - 113	20
Nitrate-N	247.27	254.47	mg/L	1	250		90	3	84 - 105	20
Sulfate	1606.68	1661.50	mg/L	1	1250		97	3	79 - 104	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC13465

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	[17] 11	[18] 10	mg/L	10	1	8.13	287	42	75 - 125	20
Total Arsenic	0.587	0.581	mg/L	1	0.50	<0.05	117	1	75 - 125	20
Total Barium	1.67	1.65	mg/L	1	1	0.738	93	2	75 - 125	20
Total Boron	0.201	0.203	mg/L	1	0.05	0.155	92	4	75 - 125	20
Total Cadmium	0.222	0.222	mg/L	1	0.25	<0.025	88	0	75 - 125	20
Total Chromium	0.113	0.113	mg/L	1	0.10	0.02	93	0	75 - 125	20
Total Cobalt	0.237	0.237	mg/L	1	0.25	<0.025	94	0	75 - 125	20
Total Copper	0.135	0.136	mg/L	1	0.12	<0.0125	108	0	75 - 125	20
Total Iron	7	7	mg/L	10	0.50	6.11	200	0	75 - 125	20
Total Lead	0.482	0.481	mg/L	1	0.50	<0.01	96	0	75 - 125	20
Total Manganese	0.511	0.508	mg/L	1	0.25	0.28	92	1	75 - 125	20
Total Molybdenum	0.575	0.563	mg/L	10	0.50	<0.05	12	2	75 - 125	20
Total Nickel	0.224	0.223	mg/L	1	0.25	<0.025	89	0	75 - 125	20
Total Selenium	0.437	0.449	mg/L	1	0.50	<0.05	87	2	75 - 125	20
Total Silver	0.118	0.119	mg/L	1	0.12	<0.0125	94	0	75 - 125	20
Total Zinc	0.236	0.234	mg/L	1	0.25	<0.025	94	0	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC13466

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	[19] 49	[20] 36.2	mg/L	100	1	40.7	830	673	75 - 125	20
Total Arsenic	0.62	0.588	mg/L	1	0.50	<0.05	124	5	75 - 125	20
Total Barium	2.42	2.4	mg/L	10	1	1.27	101	2	75 - 125	20
Total Boron	0.322000	0.319000	mg/L	10	0.05	0.277	90	6	75 - 125	20
Total Cadmium	0.218	0.213	mg/L	1	0.25	<0.025	87	2	75 - 125	20
Total Chromium	0.177	0.165	mg/L	1	0.10	0.078	99	12	75 - 125	20
Total Cobalt	0.246	0.242	mg/L	1	0.25	<0.025	98	1	75 - 125	20
Total Copper	0.148	0.145	mg/L	1	0.12	0.016	105	2	75 - 125	20
Total Iron	[21] 37.8	32.2	mg/L	100	0.50	31.7	1220	169	75 - 125	20
Total Lead	0.485	0.475	mg/L	1	0.50	0.026	97	4	75 - 125	20
Total Manganese	0.881	0.824	mg/L	1	0.25	0.621	104	24	75 - 125	20
Total Molybdenum	0.461	0.444	mg/L	1	0.50	<0.050	92	4	75 - 125	20
Total Nickel	[22] 0.115	[23] 0.131	mg/L	1	0.25	<0.025	46	13	75 - 125	20
Total Selenium	0.424	0.419	mg/L	1	0.50	<0.05	84	1	75 - 125	20
Total Silver	0.112	0.112	mg/L	1	0.12	<0.0125	89	0	75 - 125	20
Total Zinc	0.29	0.277	mg/L	1	0.25	0.069	88	6	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC13561

[17]Matrix spike recovery invalid due to required dilution. LCS demonstrates process under control
[18]Matrix spike recovery invalid due to required dilution. LCS demonstrates process under control.
[19]Matrix spike recovery invalid due to required dilution. LCS demonstrates process under control.
[20]Matrix spike recovery invalid due to required dilution. LCS demonstrates process under control.
[21]Matrix spike invalid due to required dilution. LCS demonstrates process under control.
[22]Matrix spike recovery invalid due to matrix difficulties. LCS demonstrates process under control.
[23]Matrix spike recovery invalid due to matrix difficulties. LCS demonstrates process under control.

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Dissolved Calcium	162	165	mg/L	1	100	65.2	96	3	75 - 125	20
Dissolved Magnesium	117	120	mg/L	1	100	23.1	93	3	75 - 125	20
Dissolved Potassium	115	116	mg/L	1	100	9	106	0	75 - 125	20
Dissolved Sodium	197	196	mg/L	1	100	107.7	89	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Continuing Calibration Verification Standards

ICV (1) QCBatch: QC13327

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7	7.0	100	-0.1 s.u. - +0.1 s.u.	8/14/01

CCV (1) QCBatch: QC13341

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
CL		mg/L	12.50	11.83	94	90 - 110	8/14/01
Fluoride		mg/L	2.50	2.33	93	90 - 110	8/14/01
Nitrate-N		mg/L	2.50	2.36	94	90 - 110	8/14/01
Sulfate		mg/L	12.50	11.64	93	90 - 110	8/14/01

ICV (1) QCBatch: QC13341

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
CL		mg/L	12.50	12.01	96	90 - 110	8/14/01
Fluoride		mg/L	2.50	2.46	98	90 - 110	8/14/01
Nitrate-N		mg/L	2.50	2.42	96	90 - 110	8/14/01
Sulfate		mg/L	12.50	12.11	96	90 - 110	8/14/01

CCV (1) QCBatch: QC13342

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
CL		mg/L	12.50	12.68	101	90 - 110	8/14/01
Fluoride		mg/L	2.50	2.31	92	90 - 110	8/14/01

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.41	96	90 - 110	8/14/01
Sulfate		mg/L	12.50	12.88	103	90 - 110	8/14/01

ICV (1) QCBatch: QC13342

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
CL		mg/L	12.50	11.83	94	90 - 110	8/14/01
Fluoride		mg/L	2.50	2.33	93	90 - 110	8/14/01
Nitrate-N		mg/L	2.50	2.36	94	90 - 110	8/14/01
Sulfate		mg/L	12.50	11.64	93	90 - 110	8/14/01

CCV (1) QCBatch: QC13407

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		μMHOS/cm	1412	1411	99	90 - 110	8/16/01

ICV (1) QCBatch: QC13407

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		μMHOS/cm	1400	1424	101	90 - 110	8/16/01

CCV (1) QCBatch: QC13415

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	961	96	90 - 110	8/17/01

ICV (1) QCBatch: QC13415

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	954	95	90 - 110	8/17/01

CCV (1) QCBatch: QC13443

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	20	0	90 - 110	8/16/01
Carbonate Alkalinity		mg/L as CaCo3	0	220	0	90 - 110	8/16/01
Bicarbonate Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	8/16/01
Total Alkalinity		mg/L as CaCo3	250	240	96	90 - 110	8/16/01

ICV (1) QCBatch: QC13443

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	8/16/01
Carbonate Alkalinity		mg/L as CaCo3	0	232	0	90 - 110	8/16/01
Bicarbonate Alkalinity		mg/L as CaCo3	0	12	0	90 - 110	8/16/01
Total Alkalinity		mg/L as CaCo3	250	244	97	90 - 110	8/16/01

CCV (1) QCBatch: QC13465

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Copper		mg/L	0.25	0.262	104	90 - 110	8/20/01
Total Molybdenum		mg/L	1	1.050000	105	90 - 110	8/20/01
Total Zinc		mg/L	0.50	0.529	105	90 - 110	8/20/01

ICV (1) QCBatch: QC13465

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Copper		mg/L	0.25	0.251	100	90 - 110	8/20/01
Total Molybdenum		mg/L	1	0.999	100	90 - 110	8/20/01
Total Zinc		mg/L	0.50	0.501	100	90 - 110	8/20/01

CCV (1) QCBatch: QC13466

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	2.13	106	90 - 110	8/20/01
Total Arsenic		mg/L	1	1.09	109	90 - 110	8/20/01
Total Barium		mg/L	2	2.1	105	90 - 110	8/20/01
Total Boron		mg/L	0.10	0.106000	106	90 - 110	8/20/01
Total Cadmium		mg/L	0.50	0.536	107	90 - 110	8/20/01

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Chromium		mg/L	0.20	0.219	109	90 - 110	8/20/01
Total Cobalt		mg/L	0.50	0.545	109	90 - 110	8/20/01
Total Copper		mg/L	0.25	0.269	107	90 - 110	8/20/01
Total Iron		mg/L	1	1.06	106	90 - 110	8/20/01
Total Lead		mg/L	1	1.08	108	90 - 110	8/20/01
Total Manganese		mg/L	0.50	0.534	106	90 - 110	8/20/01
Total Molybdenum		mg/L	1	1.090000	109	90 - 110	8/20/01
Total Nickel		mg/L	0.50	0.541	108	90 - 110	8/20/01
Total Selenium		mg/L	1	1.1	110	90 - 110	8/20/01
Total Silver		mg/L	0.25	0.263	105	90 - 110	8/20/01
Total Zinc		mg/L	0.50	0.54	108	90 - 110	8/20/01

ICV (1) QCBatch: QC13466

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	2.04	102	90 - 110	8/20/01
Total Arsenic		mg/L	1	1.02	102	90 - 110	8/20/01
Total Barium		mg/L	2	2.01	100	90 - 110	8/20/01
Total Boron		mg/L	0.10	0.103000	103	90 - 110	8/20/01
Total Cadmium		mg/L	0.50	0.506	101	90 - 110	8/20/01
Total Chromium		mg/L	0.20	0.202	101	90 - 110	8/20/01
Total Cobalt		mg/L	0.50	0.505	101	90 - 110	8/20/01
Total Copper		mg/L	0.25	0.251	100	90 - 110	8/20/01
Total Iron		mg/L	1	1.01	101	90 - 110	8/20/01
Total Lead		mg/L	1	1	100	90 - 110	8/20/01
Total Manganese		mg/L	0.50	0.504	100	90 - 110	8/20/01
Total Molybdenum		mg/L	1	1.000000	100	90 - 110	8/20/01
Total Nickel		mg/L	0.50	0.502	100	90 - 110	8/20/01
Total Selenium		mg/L	1	1.02	102	90 - 110	8/20/01
Total Silver		mg/L	0.25	0.252	100	90 - 110	8/20/01
Total Zinc		mg/L	0.50	0.501	100	90 - 110	8/20/01

CCV (1) QCBatch: QC13479

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.094	94	85 - 115	8/20/01
Benzene		mg/L	0.10	0.094	94	85 - 115	8/20/01
Toluene		mg/L	0.10	0.096	96	85 - 115	8/20/01
Ethylbenzene		mg/L	0.10	0.098	98	85 - 115	8/20/01
M,P,O-Xylene		mg/L	0.30	0.296	98	85 - 115	8/20/01

CCV (2) QCBatch: QC13479

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.094	94	85 - 115	8/20/01
Benzene		mg/L	0.10	0.09	90	85 - 115	8/20/01
Toluene		mg/L	0.10	0.093	93	85 - 115	8/20/01
Ethylbenzene		mg/L	0.10	0.095	95	85 - 115	8/20/01
M,P,O-Xylene		mg/L	0.30	0.286	95	85 - 115	8/20/01

ICV (1) QCBatch: QC13479

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.091	91	85 - 115	8/20/01
Benzene		mg/L	0.10	0.089	89	85 - 115	8/20/01
Toluene		mg/L	0.10	0.092	92	85 - 115	8/20/01
Ethylbenzene		mg/L	0.10	0.093	93	85 - 115	8/20/01
M,P,O-Xylene		mg/L	0.30	0.282	94	85 - 115	8/20/01

CCV (1) QCBatch: QC13480

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1	0.951	95	85 - 115	8/20/01

CCV (2) QCBatch: QC13480

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1	1.05	105	85 - 115	8/20/01

ICV (1) QCBatch: QC13480

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1	0.908	90	85 - 115	8/20/01

CCV (1) QCBatch: QC13498

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	284	113	85 - 115	8/19/01
n-Octane		mg/L	250	306	122	85 - 115	8/19/01

CCV (2) QCBatch: QC13498

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	230	92	85 - 115	8/19/01
n-Octane		mg/L	250	298	119	85 - 115	8/19/01

ICV (1) QCBatch: QC13498

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	218	87	85 - 115	8/19/01
n-Octane		mg/L	250	277	110	85 - 115	8/19/01

CCV (1) QCBatch: QC13561

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	24.1	96	90 - 110	8/23/01
Dissolved Magnesium		mg/L	25	23.6	94	90 - 110	8/23/01
Dissolved Potassium		mg/L	25	23.3	93	90 - 110	8/23/01
Dissolved Sodium		mg/L	25	23.5	94	90 - 110	8/23/01

ICV (1) QCBatch: QC13561

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	24.9	99	95 - 105	8/23/01
Dissolved Magnesium		mg/L	25	24.9	99	95 - 105	8/23/01
Dissolved Potassium		mg/L	25	25.2	100	95 - 105	8/23/01
Dissolved Sodium		mg/L	25	25.2	100	95 - 105	8/23/01

17064[redacted]

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TraceAnalysis, Inc.

155 McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND

LAB Order ID #: A0108[illegible]

Company Name: AMEC
Phone #: 505/821-1801
Address: (Street, City, Zip) 3519 JEFFERSON NE, ALBUQUERQUE
Fax #: 505/821-7371
Contact Person: BOB WILCOX 505/821-1801 OR 505/327-7928
Invoice to: (If different from above)
Project #: 151700035
Project Name: "EUDRICH FARM"
Project Location: MONUMENT - PT B.
Sampler Signature: B. M. Hinkle

ANALYSIS REQUEST

(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME
17064	MW-1A	1	5L	X								X		8.10.01	13:50
	MW-1B	1	0.25L	X					X					8.10.01	13:50
	MW-1C	4	40ml	X				X						8.10.01	13:50
17065	MW-2A	1	1/2L	X								X		8.9.01	18:20
	MW-2B	1	1/4L	X					X					8.9.01	18:20
	MW-2C	4	40ml	X				X						8.9.01	18:20
17066	MW-3A	1	1/2L	X								X		8.9.01	19:55
	MW-3B	1	1/4L	X					X					8.9.01	19:55
	MW-3C	4	40ml	X				X						8.9.01	19:55
17067	MW-4A	1	1/2L	X								X		8.10.01	[illegible]
[illegible]	MW-4B	1	1/4L	X					X					8.10.01	[illegible]

Relinquished by:	Date:	Time:	Received by: Date: Time:
Relinquished by:	Date:	Time:	Received by: Date: Time:
Relinquished by:	Date:	Time:	Received at Laboratory by: Vicki Jones Date: 8-14-01 Time: 1020

	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005 TPH GRO + DRO	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	CATIONS/ANIONS	MMG CC - METALS	TDS	Turn Around Time if different from standard	Hold
17064																X	X	X		
																	X			
		X	X																	
17065																X	X			
																	X			
		X	X																	
17066																X	X			
																	X			
		X	X																	
17067																X	X			
[illegible]																	X			

REMARKS: SEND LAB RESULTS TO: WILLIAM OLSEN (SEE PAGE 2.)
#2 505/821-7371 } BOB
#3 505/326-5721 } WILLIAM

LAB USE ONLY

Intact Y / N
Headspace Y / N
Temp 4 °
Log-in Review M

☐ Check If Special Reporting Limits Are Needed

8/31

Carrier # 1Z 045 82W 01 4190 3421

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155 McCutcheon
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

Company Name: AMES | Phone #: 505 821-1801

Address: (Street, City, Zip) 8519 JEFFERSON NE, ALBUQUERQUE | Fax #: 505 821-7371

Contact Person: BOB WILCOX | 505 821-1801 OR 505 821-7928 327

Invoice to: (if different from above)

Project #: 151700035 | Project Name: ELDRICH RANCH "

Project Location: MONUMENT-RT 8 | Sampler Signature: B. M. Jwell IV

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME	MTBE 8021B/602	BTEX 8021B/602	~~TRH 418.1/TX1005~~ TPH 600, 080	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	CATIONS/ANIONS	NM WQCC METALS	TDS	Turn Around Time if different from standard	Hold
177067	MW-4C	4	500ml	X				X						08-10-01	9:05		X	X																
77068	MW-5A	1	1/2L	X								X		08-10-01	12:05															X	X			
	MW-5B	1	1/4L	X					X					8-10	12:05																X			
	MW-5C	4	500ml	X				X						8-10-01	12:05		X	X																
77069	MW-5D (DUPLIC)	1	1/2L	X								X		8-10-01	12:05															X	X			
	MW-5E (DUPLIC.)	1	1/4L	X					X					8-10-01	12:05																X			
	MW-5F (DUPLIC.)	4	500ml	X				X						8-10-01	12:05		X	X																
77070	MW-6A	1	1/2L	X								X		8-10-01	10:35															X	X			
	MW-6B	1	1/4L	X					X					8-10-01	10:35																X			
	MW-6C	4	500ml	X				X						8-10-01	10:35		X	X																
MW 177071 TRIP BLANK	MW-7A	1	1/2L	X								X		8-10-01	12:30															X	X			

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
B. M. Jwell IV	08-13-01	16:30			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by:	Date:	Time:
				8-14-01	10:00

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LAB USE ONLY (COPY)
Intact Y / N
Headspace Y / N (Copy)
Temp 4 °C (COPY)
Log-in Review MS

REMARKS: SEND LAB RESULTS TO:
WILLIAM C. OLSEN (ENVIRONM. BUREAU
1220 SOUTH ST. FRANCIS DR.
SANTA FE, NM 87505
COPY - FAX 505/821-7371 (BOB WILCOX)
COPY - FAX 505/326-5721

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Carrier # 17045 82W01 4190 3421

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
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TraceAnalysis, Inc.

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El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN OF CUSTODY

LAB Order ID:

Company Name: AMEC
Phone #: 505/821-1801
Address: (Street, City, Zip) 8519 JEFFERSON NE, ALBUQUERQUE
Fax #: 505/821-7371
Contact Person: BOB WILCOX 505/821-1801 OR 505/327-7928
Invoice to: (if different from above)
Project #: 151700035
Project Name: "ELDRICH RANCH"
Project Location: MONUMENT - FT. 8
Sampler Signature: Bill Hinely

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME
77071	MW-7B	1	1/4L	X					X					08.10.01	14:30
	MW-7C	4	60mL	X				X						08.10.01	14:30
	RINSATE (AMBER)	1	1/2L	X								X		8.10.01	15:15

MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	CATIONS/ANIONS Ca Mg Na K SO4 Cl HCO3	Turn Around Time if different from standard	Hold
															X		
	X	X													TDS		

Relinquished by: Date: Time: Received by: Date: Time:
08.13.01 16:30
Relinquished by: Date: Time: Received by: Date: Time:
Relinquished by: Date: Time: Received at Laboratory by: Date: Time:
8.14.01 10:02

LAB USE ONLY
Intact (Y) N
Headspace Y / N
Temp °C
Log-in Review

REMARKS: SEND TO OCEAN (ICE PACK #2)
#2 BOB WILCOX 505/821-7371
#3 FAX 505/326-5721

Check if Special Reporting Limits Are Needed

Carrier # 17 045 82 WD1 4196 3421

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