



Environmental & Safety Solutions, Inc.

**Humphrey-Queen
Soil and Groundwater Investigation**

SE/4 of the NW/4 of Section 3, T-25-S, R-37-E
Approximately Three Miles Northeast of Jal
Lea County, New Mexico

Prepared For:

**Arena Resources, Inc.
2130 W. Bender
Hobbs, NM 88240**

Prepared By:

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**Date Prepared:
Project Number:**

**February 25, 2009
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Executive Summary

A large open-top in-ground concrete tank (60 feet by 60 feet by 6 feet deep) was purchased as part of the Humphrey-Queen production facility by Arena Resources, Inc. (Arena). Recent changes to the New Mexico Environment Department Oil Conservation Division (OCD) rules require the timely closure of the tank. Etech Environmental and Safety Solutions, Inc. (Etech) was retained by Arena to develop a closure plan for the in-ground concrete tank.

The Humphrey-Queen production facility (Site) is located in the southeast quarter of the northwest quarter of Section 3, Township 25 South, Range 37 East in Lea county New Mexico. The site is located approximately three miles northeast of Jal and approximately one and one-half miles north of the Lea County, Jal Airport. The Site is located on the western slope of Cheyenne Draw which is located approximately three miles west of Monument Draw, and in this area, parallels, the north-south trend of Monument draw. Surface water and groundwater flow at the Site appears to run to the south-southeast towards Cheyenne Draw.

Soil borings were advanced near the outside edges of the tank by Etech. Five of the borings were advanced until moisture was noted in the samples indicating that the boring was near groundwater, approximately 60 feet below ground surface (bgs). In addition, a coring tool was used to remove a portion of the concrete tank floor near the center of the tank and the soil beneath the tank was sampled to a depth of 14 feet. The analyses of soil samples collected from the borings indicated that contaminate levels in several of the samples taken just above the anticipated groundwater level exceeded regulatory limits and indicated the potential that the groundwater had been affected.

Three groundwater monitor wells were drilled and completed to investigate the quality of the groundwater in the area of the concrete tank. The analysis of water samples collected from the monitor wells confirmed elevated concentrations of dissolved solids as would be consistent with produced water leaking from the tank or discharged onto the ground around the tank. The installation of additional monitor wells will be needed to determine the extent to which the groundwater has been affected by the tank and the significance of what appears to be the naturally occurring elevated dissolved solids in the draw.

The closure of the concrete tank remains to be completed, but the extent of the affected soil has been delineated by the soil borings. Etech recommends that the affected portions of the soil surrounding the in-ground concrete tank be excavated and remediated using the concrete tank as a treatment cell. Following the remediation of the soil, Etech recommends the treated soils and impoundment be closed in place by folding the concrete walls into the interior of the pit, then backfilling the site to grade. The bottom of the undisturbed concrete tank will then act as a cap eliminating the percolation of precipitation dissolving any remaining salts in the soil.

Introduction

A large open-top in-ground concrete tank (60 feet by 60 feet by 6 feet deep) was purchased as part of the Humphrey-Queen production facility by Arena Resources, Inc. (Arena). Recent changes to the New Mexico Environment Department Oil Conservation Division (OCD) rules require the timely closure of the tank. The following report details our investigations to identify contamination associated with the tank and develop a closure plan.

The Humphrey-Queen production facility is located in the southeast quarter of the northwest quarter of Section 3, Township 25 South, Range 37 East in Lea county New Mexico. The site is located approximately six miles northeast of Jal and approximately one and one-half miles north of the Lea County, Jal Airport.

The tank was no longer in use at the time of the purchase. The tank was empty, ancillary piping had been removed, and its interior appeared to have been cleaned. The former use of the tank is not fully known, but observations indicate that it was used for produced water storage. There was no visible evidence of discharges from the tank, such as soil staining. There was; however, evidence of below-grade piping penetrating the concrete walls of the tank and the resulting potential for leakage.

Etech was retained by the Hobbs office of Arena to develop a closure plan for the in-ground concrete tank located at the Site; submit the completed plan to the OCD; and after receiving OCD approval, close the sites. The need for the timely closure of the tank was made all the more important because of the OCD's adoption of new regulations pertaining to pits and below grade tanks. Etech developed and submitted the closure plan utilizing the site contamination delineation reports completed by another contractor and supplied to Etech by Arena Resources, Inc. OCD representatives, in a cursory review of the site closure work plans, noted that the previous contractor's delineation of the environmental contamination at the site was insufficient and required additional work. Etech advanced additional soil borings around and in the pits and soil samples were obtained and analyzed. The results of the soil boring sample analyses indicated that the produced brine water once stored in the tanks may have affected the soil and groundwater beneath the tanks. Etech then advanced, completed, and sampled three monitor wells in the area of the concrete tank.

The purpose of this document is to report all of the scientific data collected to date; provide details for the proposed closure of the concrete in-ground tank; and provide information on a proposed groundwater investigation. Maps showing the general location and topography are attached in Appendix A.

Physiographic and Hydrogeologic Setting

Geography

The Site is located in Pecos Valley portion of the Great Plains physiographic province. The area containing the Site has been further divided into the Eunice Plain as described by Nicholson and Glebsch¹ (1961). The Eunice Plain is bound on the north by the Llano Estacado and to the southwest by San Simon Ridge and Antelope Ridge. Grama Ridge lies to the west of the Eunice plain and Rattlesnake ridge to the east. Custer Mountain and the associated south facing scarf bound the Eunice plain to the south. Surface water flow in the Eunice Plain is generally to the east towards Monument Draw, but drainage in the area of the Site is to the south along Cheyenne Draw which flows, eventually, to the Pecos River and then to the Rio Grande River.

The Humphrey-Queen site is located on the western slope of Cheyenne Draw which is located approximately three miles west of, and in the subject area parallels, the north-south trend of Monument draw. Surface water and groundwater flow at the Site appears to run to the south-southeast towards Cheyenne Draw. Maps and aerial photographs depicting the location of the Site and the surrounding topography are located in Figures 1 and 2.

Hydrogeology

The Site is located in the northwest portion of the Central Basin Platform of the Permian Basin of Southeastern New Mexico and West Texas. Only Mesozoic and younger rocks produce usable quantities of fresh water in the southern portion of Lea County; therefore, this brief review of the area geology will be limited to those rocks.

The oldest rocks exposed at the surface in southern Lea County are Mesozoic, Late Triassic in age. The younger Mesozoic rocks (Jurassic and Cretaceous) are very seldom seen and appear to have been almost completely eroded throughout the area. One of the notable exceptions is Cretaceous limestone identified in a caliche pit near Eunice.

Triassic rocks in the area are predominately sandstones, siltstones, and clay red beds of the Dockum Group which is divided into the Santa Rosa sandstone and the Chinle formation. Both yield small amounts of water from the sands. Cenozoic rocks yield most of the usable groundwater near the Site and are represented at the Site by the Tertiary Ogallala formation.

¹ Alexander Nicholson, Jr. and Alfred Clebsch, Jr., Ground-Water Report 6 - Geology and Ground-Water Conditions in Southern Lea County, New Mexico, (Socorro, New Mexico: New Mexico Bureau of Mines & Mineral Resources, 1961) pp. 8-13.

Investigation Results

Soil and Vadose Zone Investigations

On March 31, 2008, an earlier contractor (Sport Environmental Services) advanced and sampled ten soil borings around the perimeter of the Humphrey-Queen Tank. The rectangular, steel-reinforced concrete, open topped, in ground tanks had apparently been used to store produced brine water. The maximum depth of the soil borings was six feet below ground surface (bgs). A review of the report revealed that the horizontal and vertical extent of the contamination had not been fully delineated.

On June 27, 2008, a tank closure work plan, utilizing site contamination delineation reports developed by the earlier contractor was submitted to the OCD in Hobbs. It was hoped that the OCD would allow the necessary delineation of the contamination at each site during the remediation and removal process. On September 15, 2008, a cursory review of the tank closure work plan was completed by the OCD's Environmental Engineer Specialist in Hobbs. The OCD noted that site contamination delineation was insufficient for the Site and required additional delineation.

On July 30, 2008, a coring tool was used to remove a portion of the concrete tank floor near the center of the tank. The soil beneath the tank was sampled with a hand auger. Samples were collected at two foot intervals beginning at 6 feet bgs (just below the concrete) and continuing to first refusal at 14 feet bgs. The auger was decontaminated following each sample. The samples were analyzed for total Chloride concentrations in the field with the following results: 6 feet bgs (6'bgs) = 1112 mg/Kg, 8' bgs = 596 mg/Kg, 10' bgs = 794 mg/Kg, 12' bgs = 1310 mg/Kg, and 14' bgs = 1271 mg/Kg.

On August 20 through 22, 2008, five additional borings were advanced at the site to further delineate the extent of the contamination associated with the tank. The borings were advanced near the outside edges of the tank until moisture was noted in the samples indicating that the boring was near groundwater. The five borings near the Humphrey-Queen tank were advanced to 60 feet bgs. The drill cuttings samples were evaluated for total chloride concentrations during drilling and selected samples were prepared and submitted to a commercial laboratory for analysis of total Chloride and total petroleum. Both the field and laboratory analyses indicated that contaminate levels in several of the boring samples taken just above the anticipated groundwater level exceeded regulatory limits. The cuttings samples were also visually inspected by a geologist while on site and boring lithology logs were drafted. A map showing the locations of the soil borings can be found in Figure 3. Copies of the boring logs are attached as Figures 4 through 8.

A series of isopleth maps were drafted to present the extent of contamination in the vadose zone and to aid in the estimation of affected soil volumes. Copies of those maps are attached as Figures 9 through 15.

Groundwater Hydrogeology

On September 8 through 13, 2008, three groundwater monitoring wells were drilled and completed to investigate the groundwater quality in the area of the Humphrey-Queen in-ground concrete tank. The Humphrey-Queen production facility is located on the western slope of Cheyenne Draw. One well (HMW-1) was placed approximately 46 feet to the west of, and up hydraulic gradient to the concrete tank. HMW-1 was advanced to a total depth of 75 feet bgs. Two monitor wells (HMW-2 and HMW-3) were placed at the far-east side of the production facility to monitor down-gradient groundwater. HMW-2 was placed approximately 129 feet east-southeast of the concrete tank and advanced to a depth of 65 feet bgs, HMW-3 was placed approximately 199 feet east-northeast of the concrete tank and advanced to a depth of 65 feet bgs. A map showing the locations of the wells as well as the locations of the previously advanced soil borings can be found in Figures 1 and 2. Boring logs detailing the lithologies encountered during the drilling of the monitor wells can be found in Figures 16, 17, and 18.

The maximum depth of a boring at the Site was HMW-1; it was advanced to a total depth (TD) of 75 feet bgs. Red silty-clays, interbedded with sandstone and gravel, were encountered at 61 feet bgs and continued to the total depth of 75 feet bgs. This appears to be the top of the Triassic red-bed erosional surface and may correlate to the Triassic Chinle formation. Small amounts of water appear to be produced by the interbedded sandstones and gravels. Tan, brown, and some red sandstones, siltstones, and clays lay above the red beds. Beds of hard siliceous sandstone and siltstone were noted from 43 to 34 feet bgs in HMW-1; 46 to 37 feet bgs in HMW-2, and 59 to 58, 48 to 47, and 31 to 24 feet in HMW-3. These sandstones and siltstones appear to correlate with the Tertiary Ogallala formation. Relatively thin layers of gravels, coarse sands, and clays are interbedded throughout the Ogallala section. There is no clear boundary between the Ogallala and the Holocene and Pleistocene colluvial deposits which are made up of sand, silt, and gravel deposited by slope wash and talus from the Ogallala Formation.

Sandy Caliche was noted from eleven to two feet bgs and appeared to be fairly consistent in thickness and depth across the Site. Two to three feet of sandy topsoil is present across the site and a caliche pad tops the production facility.

HMW-1 was screened from TD (75 feet) to 55 feet bgs and the filter pack 75 feet TD to 49 feet bgs. The static groundwater level was approximately 59 feet bgs or 3086 feet above mean sea level (AMSL). HMW-2 was screened from TD (65 feet) to 55 feet bgs and the filter pack from 65 feet (TD) to 51 feet bgs. The static groundwater level was approximately 60 feet bgs or 3083 feet AMSL. HMW-3 was screened from TD (65 feet) to 55 feet bgs and the filter pack from 65 feet (TD) to 51 feet bgs. The static groundwater level was approximately 60 feet bgs or 3084 feet AMSL.

All of the monitor well borings were seven inches in diameter and were screened with four-inch, flush thread, schedule 40 polyvinyl chloride (PVC) with 0.010 inch mill slots. 20/40 Brady sand was used for the filter pack and hydrated, 3/8-inch bentonite hole plug was used as a seal from two feet bgs. The top two feet of the hole were sealed with concrete and the surface completion consisted of a four-foot concrete pad with a locking steel sleeve.

On October 16, 2008, the Monitor wells were gauged to determine the elevations of static groundwater levels in each well. A table listing the measured depths to groundwater and groundwater elevations can be found in Appendix B, Table 2. The groundwater elevations were used to draft an isopleth map to illustrate potentiometric surface of the groundwater in the area of the Site (see Appendix A, Figure 3). The groundwater gradient appears to dip to the southeast at approximately 8 feet of dip per 100 feet of distance. Groundwater flow appears to be towards Cheyenne Draw and the potentiometric surface appears to nearly mirror the topography (see the topographic map Figure 1 and the Groundwater Potentiometric Surface map Figure 19).

Groundwater Chemistry

On August 13, 2008, the depth to groundwater was gauged at a well on the property owned by Ms. Julia Seyler. The depth to groundwater was measured at 66.31 feet bgs. Ms. Seyler said that the well water was not potable and was only used to irrigate the lawn and garden. She also said that her residence and the other area residence, located to the south of hers, were both served by City of Jal public water supply. Ms. Seyler residence and water well are located on the eastern slope of Cheyenne Draw approximately 1.5 miles south, and 35 feet lower in elevation from the Site.

On August 29, 2008, groundwater samples were collected from two area domestic water wells and submitted for laboratory analysis on September 2, 2008. These two wells were the nearest accessible wells to the Site, but they are located at significant distances from the Site, and therefore, were not expected to have been affected by possible discharges associated with the tank. The intent of this sampling was to determine background concentrations of dissolved solids in the area. One of the wells sampled was on the property of Ms. Julia Seyler which had been previously gauged on August 13, 2008. A map and an aerial photo showing the locations of the tank site and the domestic water wells sampled can be found in Figures 1 and 2. The samples were analyzed for the major minerals. A table listing the results of the laboratory analysis for all of the groundwater samples can be found in Appendix B, Table 1.

The sample from the Seyler well indicated that the groundwater was of relatively poor quality, but did not appear to have been contaminated by oil field brine water. The Total Dissolved Solids concentration in the samples was 3259 milligrams per liter (mg/L). The Chloride and Sulfate concentrations were 1020 and 1160 respectively.

The groundwater in the area of the three monitor wells were sampled on October 16, 2008, and the samples were submitted for laboratory analysis. The groundwater samples were analyzed for the major minerals or dissolved solids (Chloride (Cl), Sulfate (SO₄), Hydroxide Alkalinity, Carbonate Alkalinity, Bicarbonate Alkalinity, Fluoride (F), Nitrate as Nitrogen (NO₃), Calcium (Ca), Magnesium (Mg), Potassium (K), and Sodium (Na)), Total Dissolved Solids (TDS), pH, Specific Conductance, Total Petroleum Hydrocarbon (TPH) – Diesel Ratio Organics (DRO), and TPH - Gasoline Ratio Organics (GRO). A table listing the results of the sampling event can be found in Table 1 of Appendix A.

The concentration of dissolved solids, cations, and anions were significantly higher in the up-gradient monitor well (HMW-1) than in the two down-gradient wells (HMW-2 and HMW-3). Elevated concentrations of Chloride were found in all three monitor wells. This may be the result of the well's proximity to the tank and/or a remnant of hydraulic mounding beneath the concrete tank caused by leaks.

During the October 16, 2008, sampling event HMW-1 contained a Chloride concentration of 19,900 milligrams per liter (mg/L)) and Sulfate concentration was 1840 mg/L (Cl/SO₄ ratio = 10.9). In the HMW-2 groundwater sample the Chloride concentration was 649 mg/L and Sulfate concentration was 399 mg/L (Cl/SO₄ ratio = 1.63). The Chloride concentration in the HMW-3 sample was 1180 mg/L and Sulfate concentration was 314 mg/L (Cl/SO₄ ratio = 3.76).

A letter dated November 20, 2008, was transmitted to the OCD offices in Santa Fe and Hobbs via Email. The letter stated that elevated concentrations dissolved solids had been identified in the groundwater consistent with oil field brine water contamination.

Additional groundwater data is needed to determine the naturally occurring dissolved solids concentrations existing near the Site and the extent and effect of any discharges that have emanated from the in-ground concrete tank.

Conclusions and Recommendations

The large, in-ground concrete tank appeared to have been used for the storage of produced water. That produced water contained elevated levels of dissolved solids. The elevated levels of dissolved solids found in the soil beneath and adjacent to the tank indicated that produced water leaked from the tank and/or was discharged onto the ground around the tank. Sufficient amounts of water appear to have been discharged to develop sufficient hydraulic head to drive the produced water to the groundwater. Additional monitor wells will be needed to determine the extent to which the groundwater has been affected by the tank and the extent of the elevated dissolved solids in the draw. Etech recommends that three additional monitor wells be installed. One well will be located approximately 100 feet to the northwest and up-gradient of the present up-gradient well HMW-1. Two monitor wells will be installed approximately 200 feet to the southeast and down-gradient of the concrete tank and the two present down-gradient wells HMW-2 and HMW-3. These additional monitor wells should provide additional information on the groundwater contamination associated with the site and nature of the apparently naturally occurring elevated dissolved solids in the groundwater associated with Cheyenne Draw.

The affected soil appears to have been delineated by the soil borings. Etech recommends that portions of the soil surrounding the in-ground concrete tank be excavated and remediated

Tank Area Remediation and Closure Recommendation

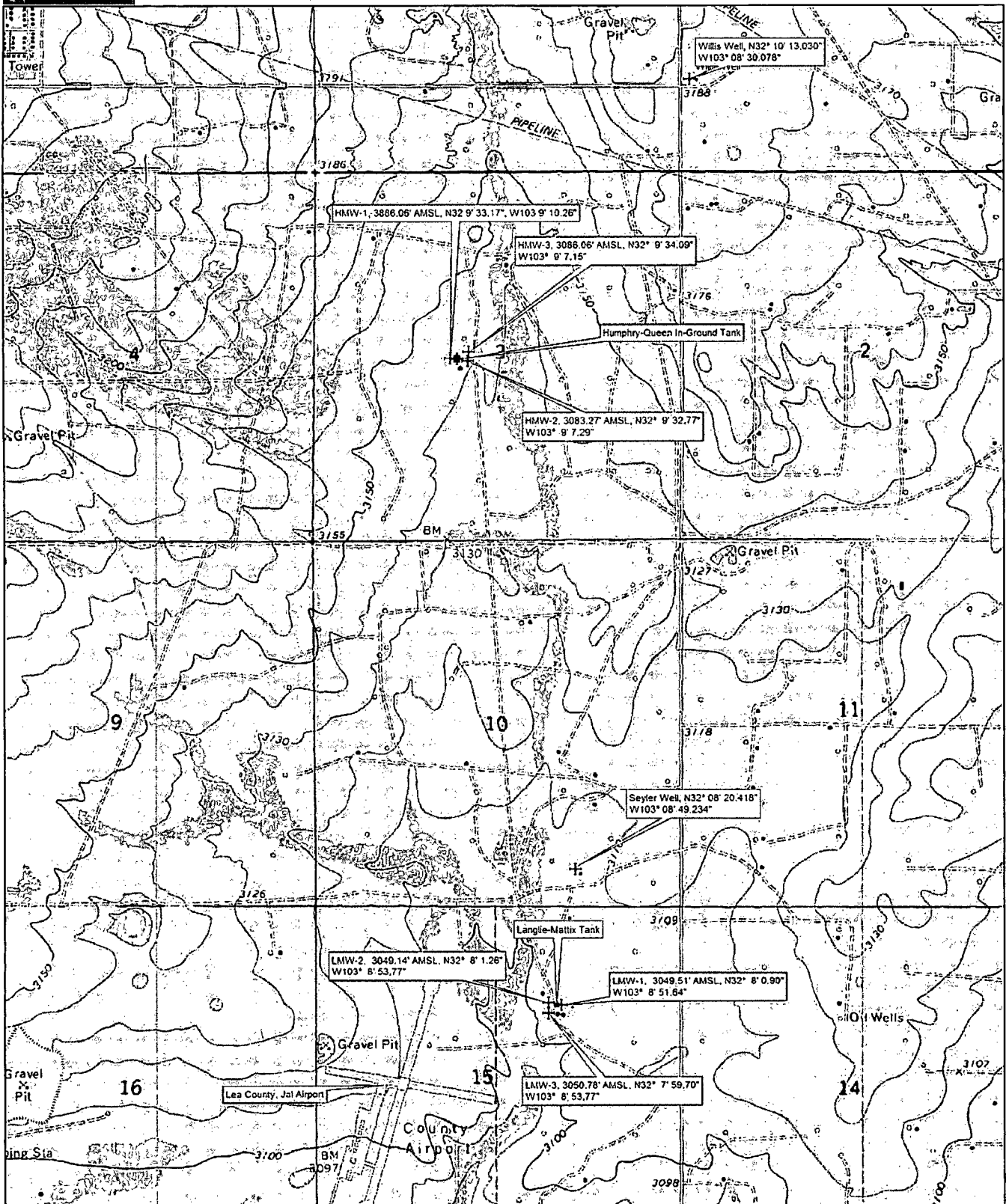
Remediation of the affected soils will involve utilization of the concrete impoundment as a treatment cell for the washing of soils to remove the elevated levels of salt. In order to complete this task, the cell will require some modification to the area around the sump. Modifications will include the pouring of a curb in the corner containing the drain pipes and the installation of a gravel drain bed.

The impacted soil surrounding the tank will be excavated to an average depth of three feet below ground level (an estimated 130 cubic yards) and placed in the treatment cell. Fresh water will then be added to dissolve and flush the salts. The water from the flushing operations will be collected after it has percolated through the affected soils and then transferred to the produced water tanks presently on the site for disposal. The water and soil will be periodically tested for chlorides until the objective concentration have been met.

At the completion of the remediation process, the treated soils and impoundment will be closed in place by folding the concrete walls into the interior of the pit, then backfilling the site to grade. The bottom of the undisturbed concrete tank will then act as a cap eliminating the potential for the percolation of precipitation dissolving and transporting any remaining salts in the soil. Following the completion of all activities, a report will be prepared documenting the remediation and closure activities and submitted to the OCD.

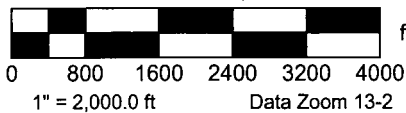
Figures

Site and Water Locations, Topographic Map	Figure 1
Site and Water Well Locations, Aerial Photo Map.....	Figure 2
Site Map	Figure 3
Boring Log HB-1	Figure 4
Boring Log HB-2.....	Figure 5
Boring Log HB-3.....	Figure 6
Boring Log HB-4.....	Figure 7
Boring Log HB-5.....	Figure 8
Soil Chloride 2 to 4 Feet bgs	Figure 9
Soil Chloride 6 to 10 Feet bgs	Figure 10
Soil Chloride 16 to 20 Feet bgs	Figure 11
Soil Chloride 26 to 30 Feet bgs	Figure 12
Soil Chloride 32 to 40 Feet bgs	Figure 13
Soil Chloride 50 to 52 Feet bgs	Figure 14
Soil Chloride 58 to 60 Feet bgs	Figure 15
Monitor Well Boring Log HMW-1	Figure 16
Monitor Well Boring Log HMW-2.....	Figure 17
Monitor Well Boring Log HMW-3.....	Figure 18
Water Table Elevations Isopleth Map.....	Figure 19
Chloride Concentrations Isopleth Map	Figure 20



MN (7.7° E)

Scale 1:24,000

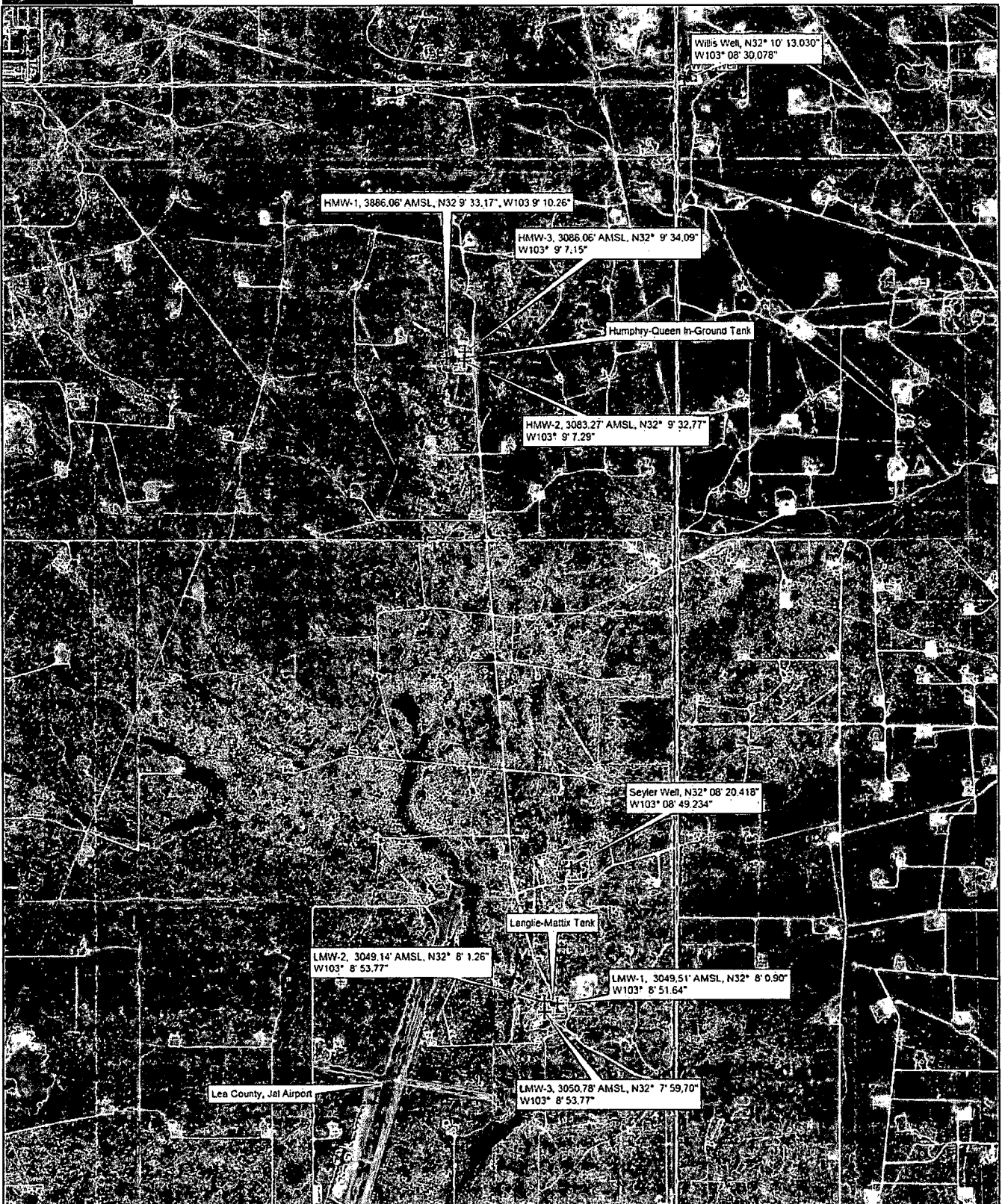


Arena Resources
Topographic Map
Contour Interval 1"=2,000'
NE of Jal, Lea Co, NM

Data use subject to license.

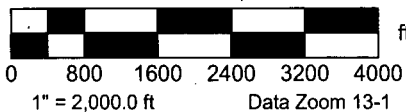
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MN (7.7° E)

Scale 1:24,000



1" = 2,000.0 ft

Data Zoom 13-1

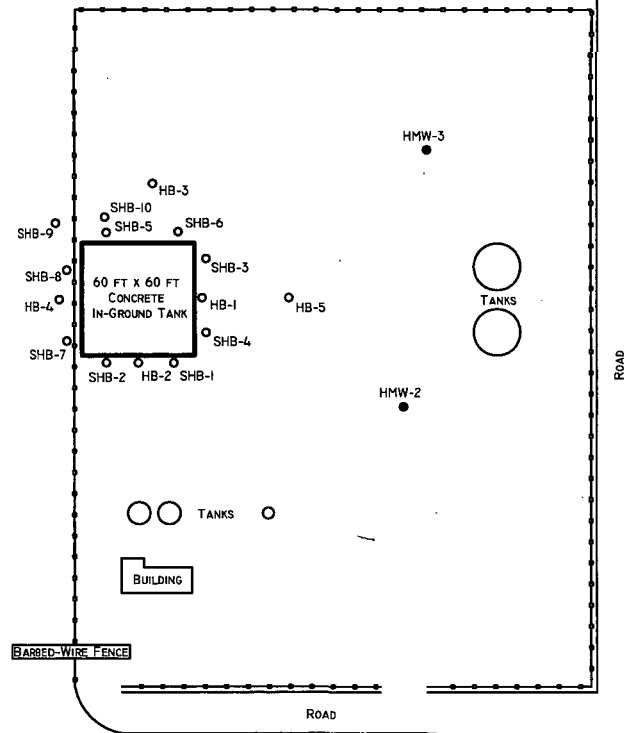
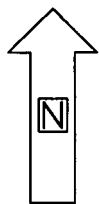
Arena Resources
Aerial Photo with Sites

NE of Jal, Lea Co, NM

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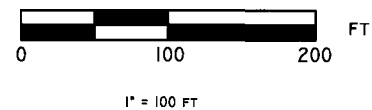
SITE MAP

HUMPHREY-QUEEN PRODUCTION FACILITY
ARENA RESOURCES INC.
SECTION 3, T-25-S, R-37-E
LEA COUNTY, NEW MEXICO

LEGEND

- HMW-1 MONITOR WELLS
- SHB-1, HB-1 SOIL BORINGS

SCALE



PREPARED BY:

ESTECH 
Environmental & Safety Solutions, Inc.

HB-1

Client	Arena Resources	Project	Humphrey- Queen Tan New Mexico
Project Number		Latitude	
Geologist	Mike Hagan	Longitude	
Date Drilled	August 20, 2008	Total Depth of Borehole	62 Feet
Borehole Diameter	6 3/8 Inches	Depth to Water	Feet

Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
SM	Topsoil, Brown 7.5YR 4/4, Sand, Fine to Medium Grained, Subrounded, Unconsolidated							
Limestone	Sandy Caliche, Pink 7.5YR 8/3, Sand, Coarse Grained with some Medium Grained Well Rounded Grains	5						
		10						
SP	Sand, Reddish Yellow 7.5 YR 6/6, Medium to Fine Grained, Moderately Sorted, Subangular	15						
		20						
SM	Silty Sand, Pinkish White 7.5YR 8/2, Very Fine Grained, Moderately Sorted, Very Calcareous, Subrounded with some Medium Grained Well Rounded Grains	25						
		30						
		35						
SC	Sandstone, Strong Brown 7.5YR 5/6, Very Fine Grained, Hard, Dense, Silicious and Calcareous, some Coarse Grained Loose Clear Sand Grains	40						
	Sand nad Sandstone, Yellowish Red 5YR 4/6,							

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HB-1

Client	Arena Resources	Project	Humphrey-Queen Tank New Mexico
Project Number		Latitude	
Geologist	Mike Hagan	Longitude	
Date Drilled	August 20, 2008	Total Depth of Borehole	62 Feet
Borehole Diameter	6 3/8 Inches	Depth to Water	Feet

Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
	GC Fine to Coarse Grained, Poorly Sorted, Subrounded, Hard Siliceous Sandstone near the top and 5% Fine Gravel at the base.	50						
	GP Sand, Reddish Brown 5YR 4/4, Fine to Coarse Grained, Poorly Sorted, Subrounded, 10% Fine Gravel	55						
	GW Gravel, Redish Brown 5YR 4/4, Fine to Coarse, Rounded	60						
		65						
		70						
		75						
		80						
		85						

HB-2

Client	Arena Resources	Project	Humphrey- Queen/TanNew Mexico
Project Number		Latitude	
Geologist	Mike Hagan	Longitude	
Date Drilled	August 20, 2008	Total Depth of Borehole	60 Feet
Borehole Diameter	6 3/8 Inches	Depth to Water	Feet

Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
SM	Topsoil, Brown 7.5YR 4/4, Sand, Fine to Medium Grained, Subrounded, Unconsolidated							
Limestone	Sandy Caliche, Pink 7.5YR 8/3, Sand, Coarse Grained with some Medium Grained Well Rounded Grains	5						
		10						
		15						
		20						
		25						
SP	Sand, Reddish Yellow 7.5 YR 6/6, Medium to Fine Grained, Moderately Sorted, Subangular	30						
		35						
SM	Silty Sand, Pinkish White 7.5YR 8/2, Very Fine Grained, Moderately Sorted, Very Calcareous, Subrounded with some Medium Grained Well Rounded Grains	40						
GC	Sand and Sandstone, Yellowish Red 5YR 4/6, Fine to Coarse Grained, Poorly Sorted, Subrounded, Hard Siliceous Sandstone near the top and 5% Fine Gravel at the base.							

HB-2

Client	Arena Resources	Project	Humphrey-Queen Tank New Mexico
Project Number		Latitude	
Geologist	Mike Hagan	Longitude	
Date Drilled	August 20, 2008	Total Depth of Borehole	60 Feet
Borehole Diameter	6 3/8 Inches	Depth to Water	Feet

Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
	GP Sand, Reddish Brown 5YR 4/4, Fine to Coarse Grained, Poorly Sorted, Subrounded, 10% Fine Gravel	50						
	GW Gravel, Redish Brown 5YR 4/4, Fine to Coarse, Rounded	55						
		60						
		65						
		70						
		75						
		80						
		85						

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HB-3

Client	Arena Resources	Project	Humphrey-Queen, New Mexico
Project Number		Latitude	
Geologist	Mike Hagan	Longitude	
Date Drilled	August 20, 2008	Total Depth of Borehole	62 Feet
Borehole Diameter	6 3/8 Inches	Depth to Water	Feet

Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
SM	Topsoil, Brown 7.5YR 4/4, Sand, Fine to Medium Grained, Subrounded, Unconsolidated	0						
Limestone	Sandy Caliche, Pink 7.5YR 8/3, Sand, Coarse Grained with some Medium Grained Well Rounded Grains	5						
		10						
		15						
SP	Sand, Redish Yellow 7.5 YR 6/6, Medium to Fine Grained, Moderately Sorted, Subangular	20						
		25						
SM	Silty Sand, Pinkish White 7.5YR 8/2, Very Fine Grained, Moderately Sorted, Very Calcareous, Subrounded with some Medium Grained Well Rounded Grains	30						
		35						
SC	Sandstone, Strong Brown 7.5YR 5/6, Very Fine Grained, Hard, Dense, Siliceous and Calcareous, some Coarse Grained Loose Clear Sand Grains	40						
	Sand and Sandstone, Yellowish Red 5YR 4/6, Fine to Coarse Grained, Poorly Sorted, Subrounded, Hard Siliceous Sandstone near the top and 5% Fine Gravel at the base.							

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HB-3

Client		Arena Resources		Project		Humphrey- Queen		New Mexico	
Project Number				Latitude					
Geologist				Mike Hagan					
Date Drilled				August 20, 2008					
Borehole Diameter				6 3/8 Inches					
				Total Depth of Borehole 62 Feet					
				Depth to Water Feet					

Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
	GC	50						
	GP	55						
	Sand, Reddish Brown 5YR 4/4, Fine to Coarse Grained, Poorly Sorted, Subrounded, 10% Fine Gravel	60						
		65						
		70						
		75						
		80						
		85						

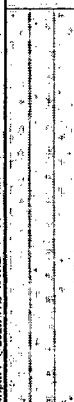
HB-4

Client	Arena Resources	Project	Humphrey- Queen , New Mexico
Project Number		Latitude	
Geologist	Mike Hagan	Longitude	
Date Drilled	August 20, 2008	Total Depth of Borehole	62 Feet
Borehole Diameter	6 3/8 Inches	Depth to Water	Feet

Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
	GP 20% Fine Gravel	50						
	GP Graveley Sand, Reddish Brown 5YR 4/4, Sand is Medium Grained, Well Sorted, Subrounded; 10% Fine Gravel	55						
	SC Silt and Sand, Reddish Brown 5YR 4/4, Moist Gummy	60						
		65						
		70						
		75						
		80						
		85						

HB-5

Client	Arena Resources	Project	Humphrey- Queen , New Mexico
Project Number		Latitude	
Geologist	Mike Hagan	Longitude	
Date Drilled	August 20, 2008	Total Depth of Borehole	62 Feet
Borehole Diameter	6 3/8 Inches	Depth to Water	Feet

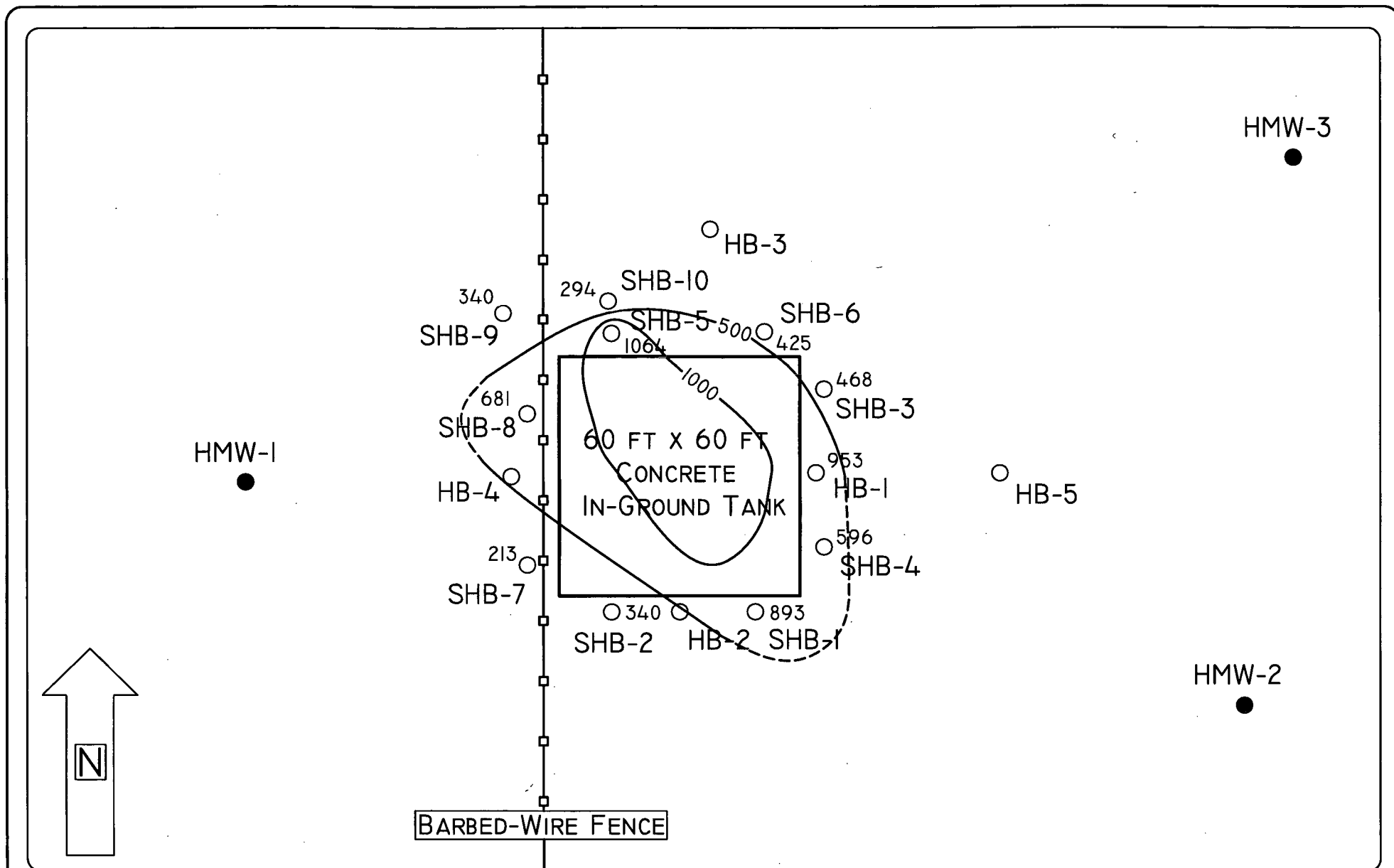
Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
	SM Topsoil, Brown 7.5YR 4/4, Sand, Fine to Medium Grained, Subrounded, Unconsolidated							
	Lime stone Sandy Caliche, Pink 7.5YR 8/3, Sand, Coarse Grained with some Medium Grained Well Rounded Grains	5						
		10						
	SP Sand, Redish Yellow 7.5 YR 6/6, Medium to Fine Grained, Moderately Sorted, Subangular	15						
		20						
	SM Silty Sand, Pinkish White 7.5YR 8/2, Very Fine Grained, Moderately Sorted, Very Calcareous, Subrounded with some Medium Grained Well Rounded Grains	25						
		30						
		35						
	SC Sandstone, Strong Brown 7.5YR 5/6, Very Fine Grained, Hard, Dense, Siliceous and Calcareous, some Coarse Grained Loose Clear Sand Grains	40						

C:\Program Files\Etech Environmental & Safety Solutions\Arena\Humphrey-Queen\HB-5

HB-5

Client	Arena Resources	Project	Humphrey- Queen	New Mexico
Project Number		Latitude		
Geologist	Mike Hagan	Longitude		
Date Drilled	August 20, 2008	Total Depth of Borehole	62 Feet	
Borehole Diameter	6 3/8 Inches	Depth to Water	Feet	

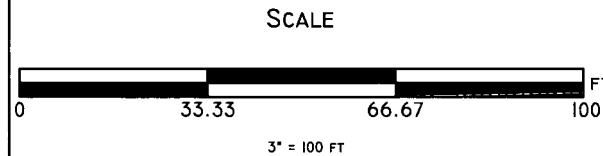
Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
	GC Sand and Sandstone, Yellowish Red 5YR 4/6, Fine to Coarse Grained, Poorly Sorted, Subrounded, Hard Siliceous Sandstone near the top and 5% Fine Gravel at the base,	50						
	GP Sand, Reddish Brown 5YR 4/4, Fine to Coarse Grained, Poorly Sorted, Subrounded, 2% Fine Gravel	55						
		60						
		65						
		70						
		75						
		80						
		85						



SOIL CHLORIDE 2'-4' BGS
 HUMPHREY-QUEEN PRODUCTION FACILITY
 ARENA RESOURCES INC.
 SECTION 3, T-25-S, R-37-E
 LEA COUNTY, NEW MEXICO

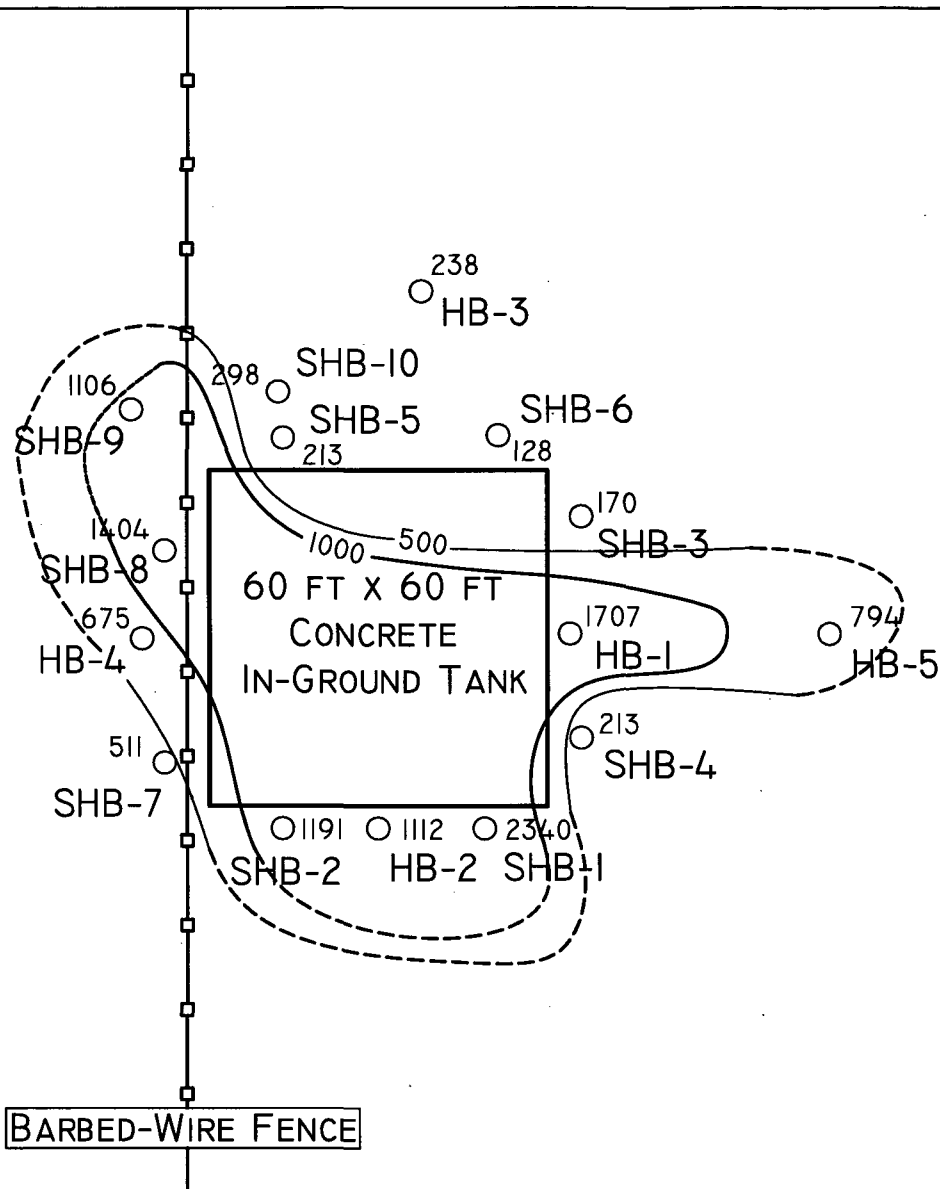
LEGEND

- HMW-1 MONITOR WELLS
- SHB-1, HB-1 SOIL BORINGS
- 468 = CHLORIDE MG/KG
- 500-- = ISOPLETH



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STECH 
 Environmental & Safety Solutions, Inc.

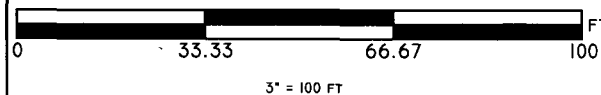


SOIL CHLORIDE 6'-10' BGS
HUMPHREY-QUEEN PRODUCTION FACILITY
ARENA RESOURCES INC.
SECTION 3, T-25-S, R-37-E
LEA COUNTY, NEW MEXICO

LEGEND

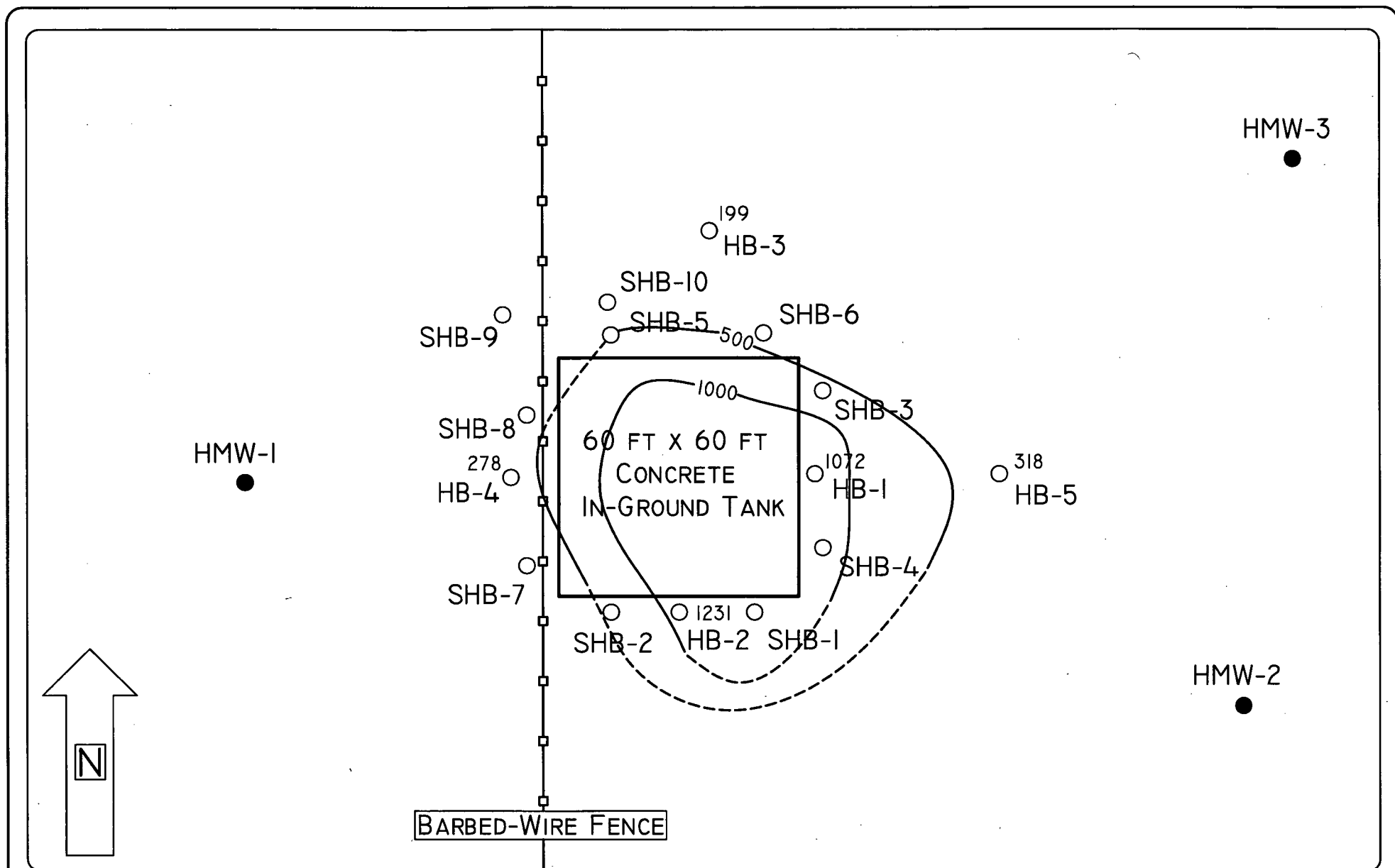
- HMW-1 MONITOR WELLS
- SHB-1, HB-1 SOIL BORINGS
468 = CHLORIDE MG/KG
--500-- = ISOPLETH

SCALE



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ETECH
Environmental & Safety Solutions, Inc.



SOIL CHLORIDE 16'-20' BGS
HUMPHREY-QUEEN PRODUCTION FACILITY
ARENA RESOURCES INC.
SECTION 3, T-25-S, R-37-E
LEA COUNTY, NEW MEXICO

LEGEND

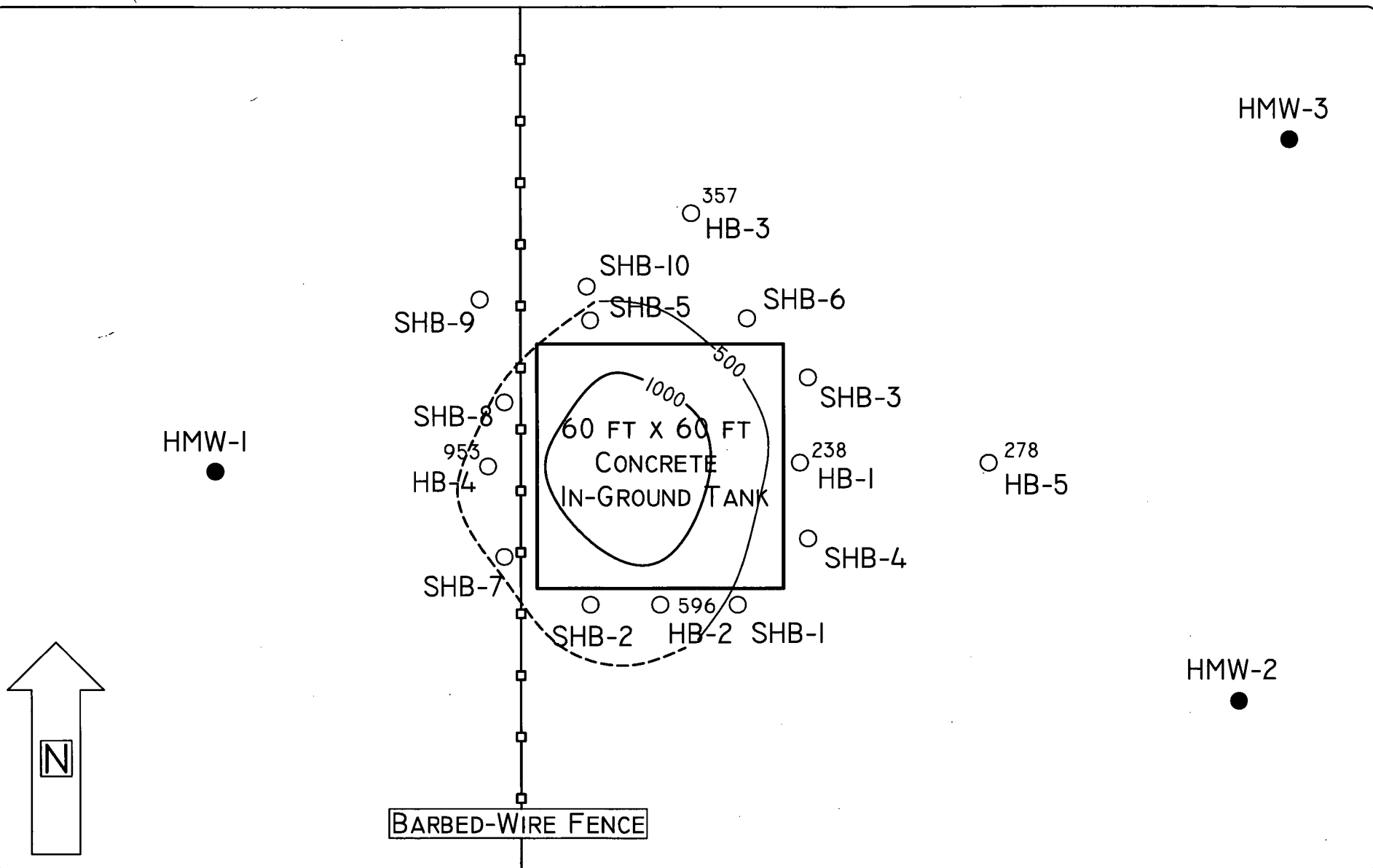
- HMW-1 MONITOR WELLS
- SHB-1, HB-1 SOIL BORINGS
- 468 = CHLORIDE MG/KG
- 500-- = ISOPLETH

SCALE

0 33.33 66.67 100 FT
3" = 100 FT

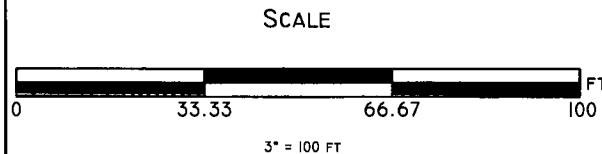
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Environmental & Safety Solutions, Inc.



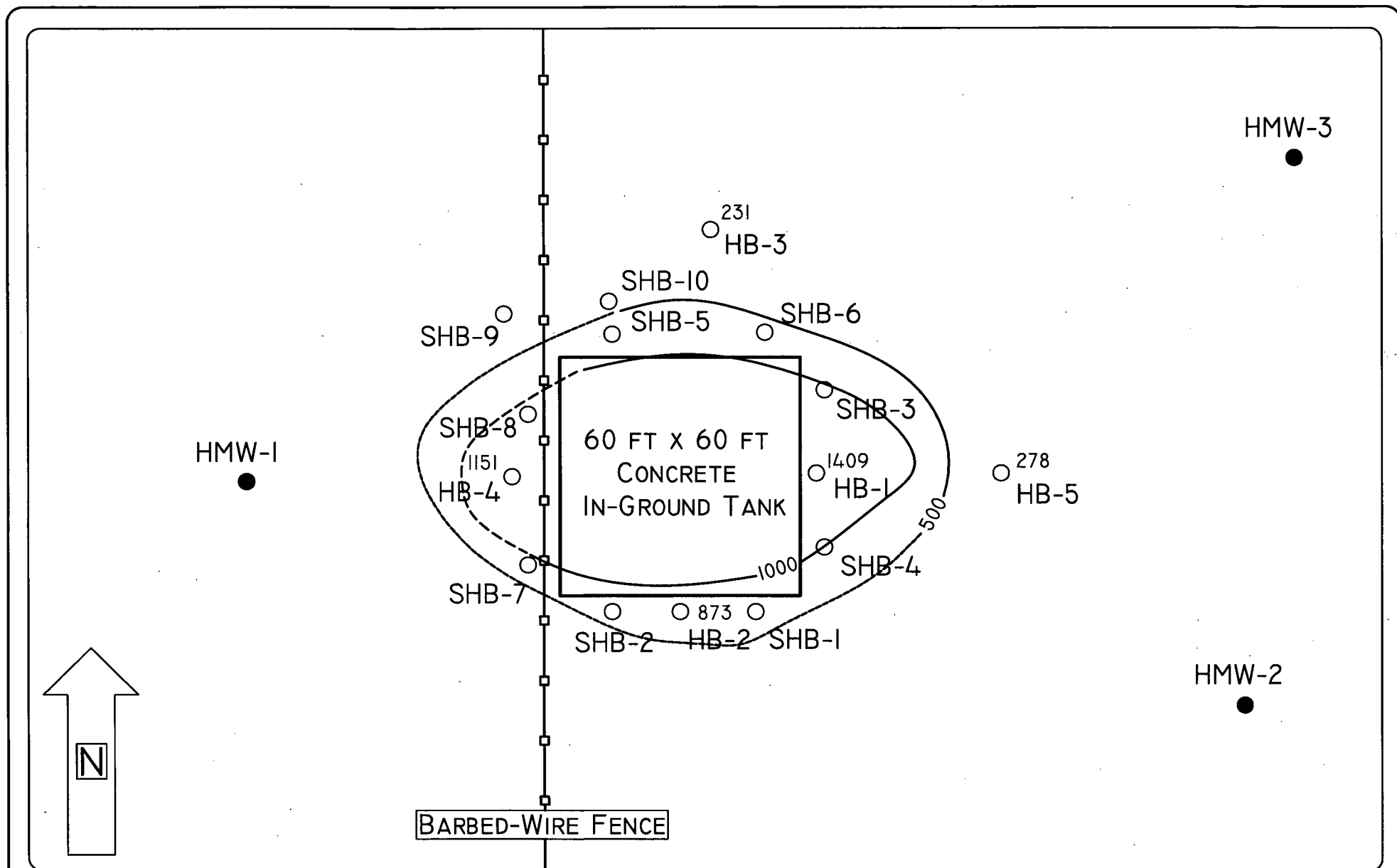
SOIL CHLORIDE 26'-30' BGS
 HUMPHREY-QUEEN PRODUCTION FACILITY
 ARENA RESOURCES INC.
 SECTION 3, T-25-S, R-37-E
 LEA COUNTY, NEW MEXICO

- LEGEND
- HMW-1 MONITOR WELLS
 - SHB-1, HB-1 SOIL BORINGS
 - 468 = CHLORIDE MG/KG
 - 500-- = ISOPLETH



PREPARED BY:

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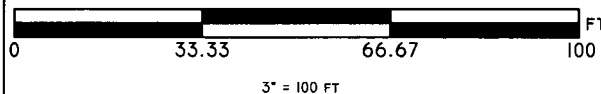


SOIL CHLORIDE 32'-40' BGS
HUMPHREY-QUEEN PRODUCTION FACILITY
ARENA RESOURCES INC.
SECTION 3, T-25-S, R-37-E
LEA COUNTY, NEW MEXICO

LEGEND

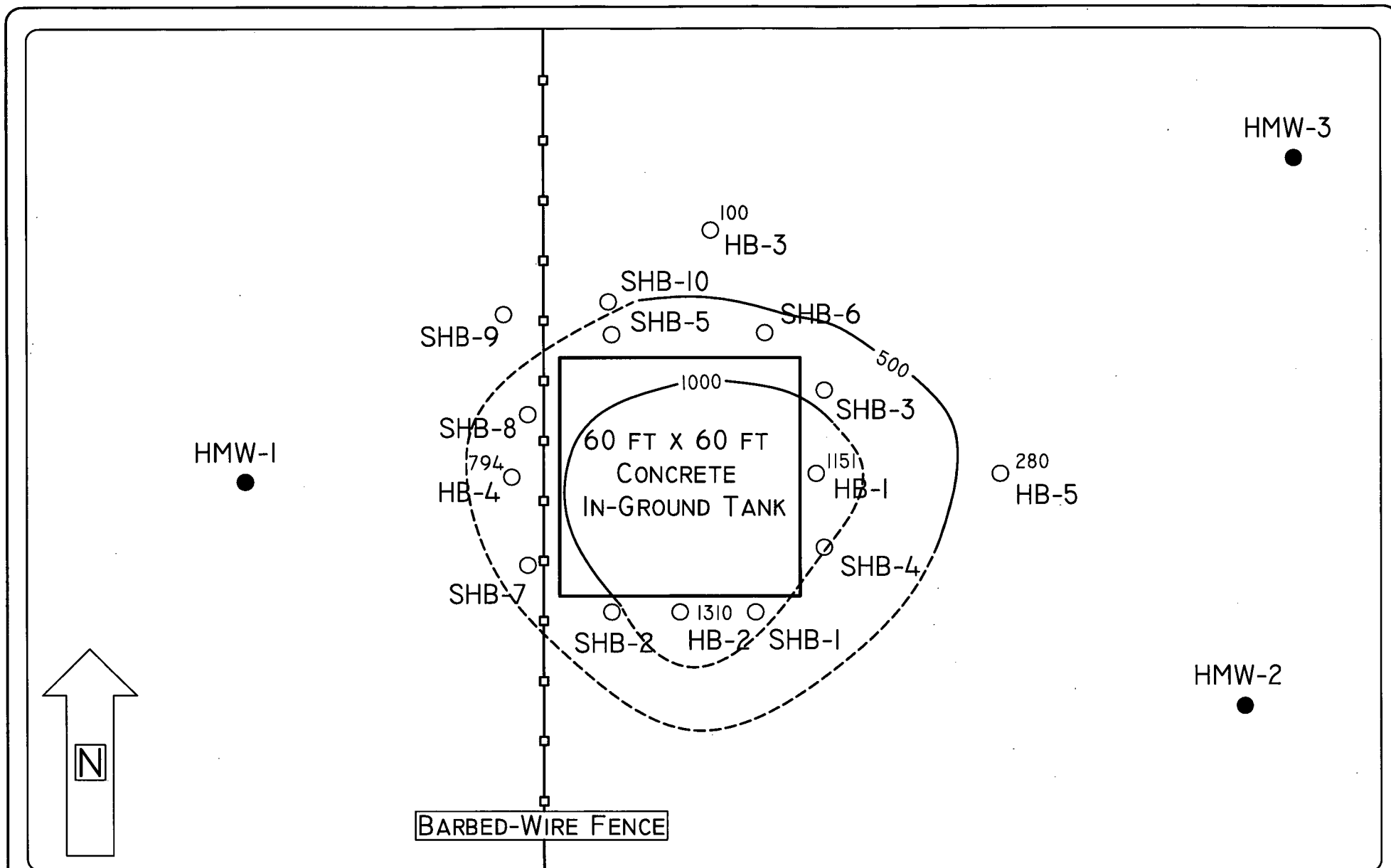
- HMW-1 MONITOR WELLS
- SHB-1, HB-1 SOIL BORINGS
- 468 = CHLORIDE MG/KG
- 500-- = ISOPLETH

SCALE



PREPARED BY:

STECH 
Environmental & Safety Solutions, Inc.

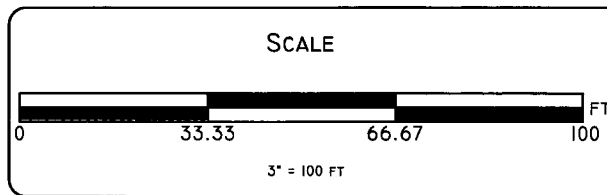


SOIL CHLORIDE 50'-52' BGS
 HUMPHREY-QUEEN PRODUCTION FACILITY
 ARENA RESOURCES INC.
 SECTION 3, T-25-S, R-37-E
 LEA COUNTY, NEW MEXICO

LEGEND

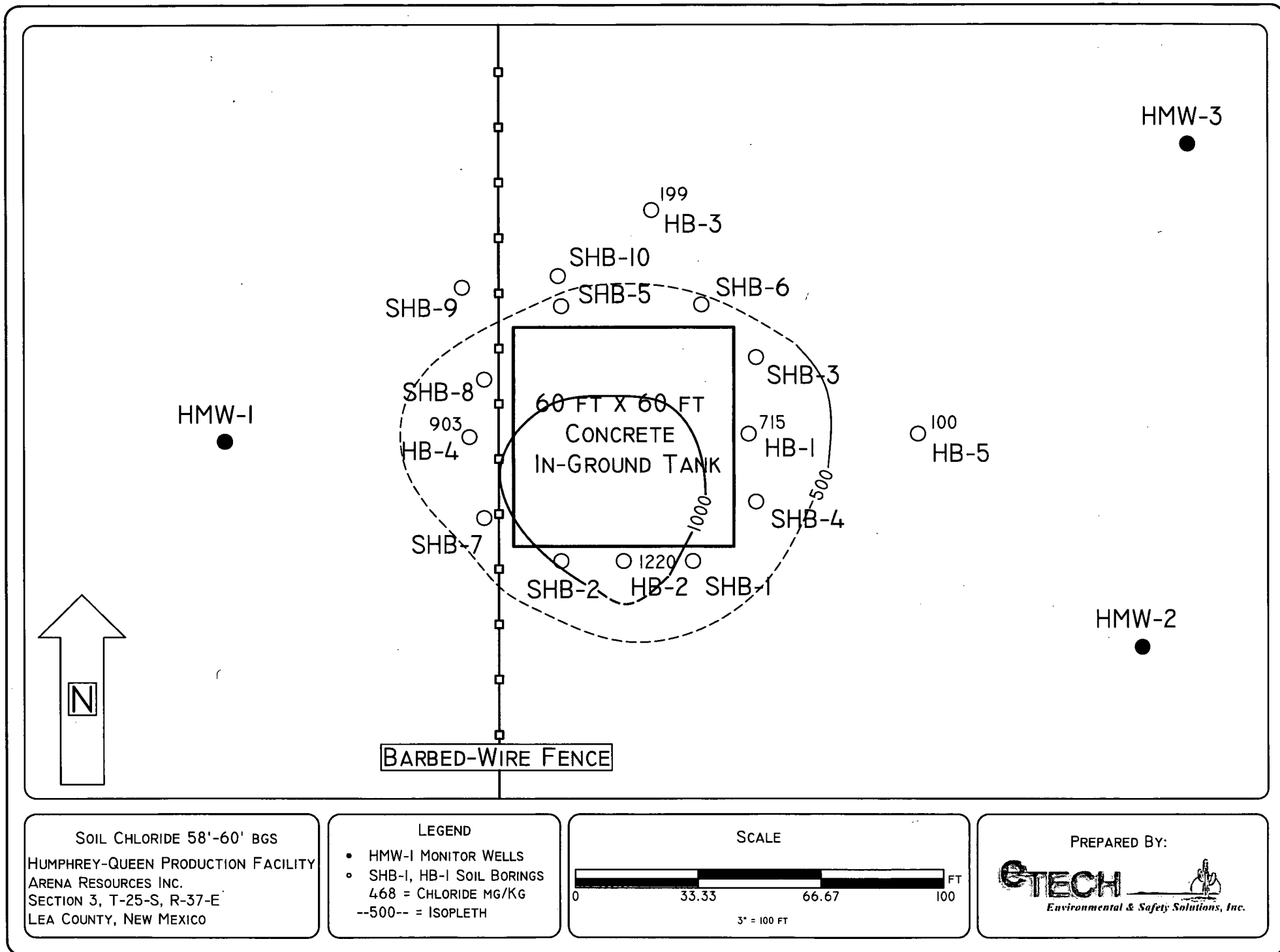
- HMW-1 MONITOR WELLS
- SHB-1, HB-1 SOIL BORINGS

468 = CHLORIDE MG/KG
 --500-- = ISOPLETH



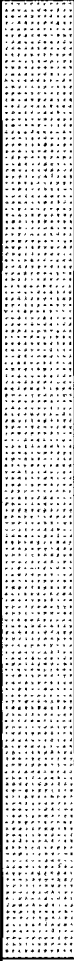
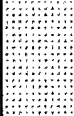
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 Environmental & Safety Solutions, Inc.



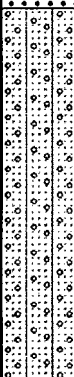
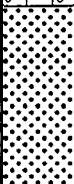
HMW-1

Client		Arena Resources, Inc.		Project		Humphrey-Queen Jal, New Mexico	
Project Number		094 1685 000		Latitude		N 32 09' 33"	
Geologist		M. Hagan		Longitude		W 103 09' 09"	
Date Drilled		10-10-08		Total Depth of Borehole		75 Feet	
Borehole Diameter		7 Inches		Depth to Water		>75 Feet	

Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
	SM							
	SW							
	SAND, Brown 7.5YR 4/4, Fine to Medium Grained, Subrounded, Moderate to Well Sorted, Loose SAND and CALICHE, Redish Yellow 7.5YR 6/6, Medium to Fine Grained, Subrounded, Poorly Sorted.	5						
		10						
		15						
		20						
		25						
	SP	35						
								
	SP							
	SAND and CALICHE, Pinkish White 7.5YR 8/2, Very Fine Grained to SILTy, Subrounded, Moderately to Poorly Sorted, with some Medium Grained Rounded, Very Calcareous, Hard.							
	SANDSTONE, Strong Brown 7.5YR 5/6, Vey Fine Grained with some Loose Coarse Graind							

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HMW-1

HMW-1									
Client		Arena Resources, Inc.		Project		Humphrey-Queen Jal, New Mexico			
Project Number		094 1685 000		Latitude		N 32 09' 33"			
Geologist		M. Hagan		Longitude		W 103 09' 09"			
Date Drilled		10-10-08		Total Depth of Borehole		75 Feet			
Borehole Diameter		7 Inches		Depth to Water		>75 Feet			
Graphic Log		Description		Depth	Sample	Undefined	Undefined	Undefined	Completion
	SW	Clear SAND, Moderately to Well Sorted, Siliceous Matrix, Hard.							
	SM	SAND and SANDSTONE, Yellowish Red 5YR 5/6, Coarse to Very Fine Grained, Poorly Sorted, Subrounded to Subangular, 5% GRAVEL, Fine to Medium Pebble		45					
	SW	SAND and SANDSTONE, Yellowish Red 5YR 5/6, Fine Grained, Moderately Sorted, Subrounded to Subangular, Dense		55					
	GC	TD CLAYey GRAVEley SAND, Redish Brown 5YR 4/4, Medium to Fine Grained, Moderately Sorted, GRAVEL is Medium to Large Pebble.		60					
				65					
				70					
				75					

Program Files\GPSS MEDIA\WHEN LOGGED\VENUE RESOURCES\Arena-Queen Jal, NM

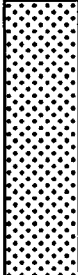
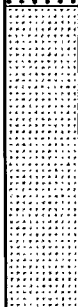
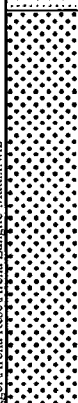
eTech Environmental and Safety Solutions

Page 2

C:\Program Files\Porpoise Media\Well Logger\Arena Reso\Arena Langlie-Matrix.w/2

HMW-2

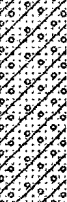
Client		Arena Resources, Inc.		Project		Humphry-Queen Jal, New Mexico	
Project Number		094 1436 000		Latitude		N 32 09' 34"	
Geologist		M. Hagan		Longitude		W 103 09' 07"	
Date Drilled		10-09-08		Total Depth of Borehole		65 Feet	
Borehole Diameter		7 Inches		Depth to Water		60.3 Feet	

Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
	SM	TOPSOIL						
	SW	SAND and CALICHE, Redish Yellow 7.5YR 6/6, Medium to Fine Grained, Subrounded, Poorly Sorted.						
	SP	SAND, Redish Yellow 7.5YR 6/6, Fine Grained, Subrounded, Moderately Sorted, Calcareous Matrix, Hard.						
	SW	SAND and CALICHE, Pinkish White 7.5YR 8/2, Fine Grained, Subrounded, Well Sorted, mostly QUARTZ with Caliche Matrix, 30 to 40% Hard SANDSTONE.						
	SW	SAND and SANDSTONE, Yellowish Red 7.5YR 8/2, Fine Grained, Well sorted.						
		SANDSTONE, Strong Brown 7.5YR 5/6, Vey Fine Grained with some Loose Coarse Graind Clear SAND, Moderately to Well Sorted,						

C:\Program Files\Porpoise Media\Well Logger\Arena Reso\Arena Logfile-Matrix.wl2

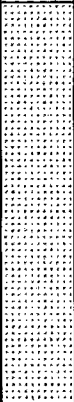
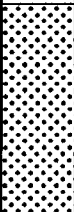
HMW-2

Client	Arena Resources, Inc.	Project	Humphry-Queen Jal, New Mexico
Project Number	094 1436 000	Latitude	N 32 09' 34"
Geologist	M. Hagan	Longitude	W 103 09' 07"
Date Drilled	10-09-08	Total Depth of Borehole	65 Feet
Borehole Diameter	7 Inches	Depth to Water	60.3 Feet

Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
	SW	45						
	SM	50						
	SC	55						
	SW	60						
	SC	60						
	GC	65						
		70						
		75						

C:\Program Files\Pompoise Media\Well Logger\Arena Rescue\Arena Langlie-Mattix.w/2

HMW-3

HMW-3										
Client		Arena Resources, Inc.		Project		Humphry-Queen Jal, New Mexico				
Project Number		094 1436 000		Latitude		N 32 09' 34"				
Geologist		M. Hagan		Longitude		W 103 09' 07"				
Date Drilled		10-10-08		Total Depth of Borehole		65 Feet				
Borehole Diameter		7 Inches		Depth to Water		60.1 Feet				
Graphic Log	Description			Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
	SM	TOPSOIL								
	SW	SAND and CALICHE, Redish Yellow 7.5YR 6/6, Medium to Fine Grained, Subrounded, Poorly Sorted.		5						
	SP	SAND, Redish Yellow 7.5YR 6/6, Fine Grained, Subrounded, Moderately Sorted, Calcareous Matrix, Hard.		10						
	SW	SAND and CALICHE, Pinkish White 7.5YR 8/2, Fine Grained, Subrounded, Well Sorted, mostly QUARTZ with Caliche Matrix, 30 to 40% Hard SANDSTONE.		15						
	SW	SAND and SANDSTONE, Yellowish Red 7.5YR 8/2, Fine Grained, Well sorted.		20						
	SW	SANDSTONE, Strong Brown 7.5YR 5/6, Vey Fine Grained with some Loose Coarse Graind Clear SAND, Moderately to Well Sorted, Siliceous Matrix, Hard, Layers/Fractured?.		25						
	SW			30						
	SW			35						

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Page 1

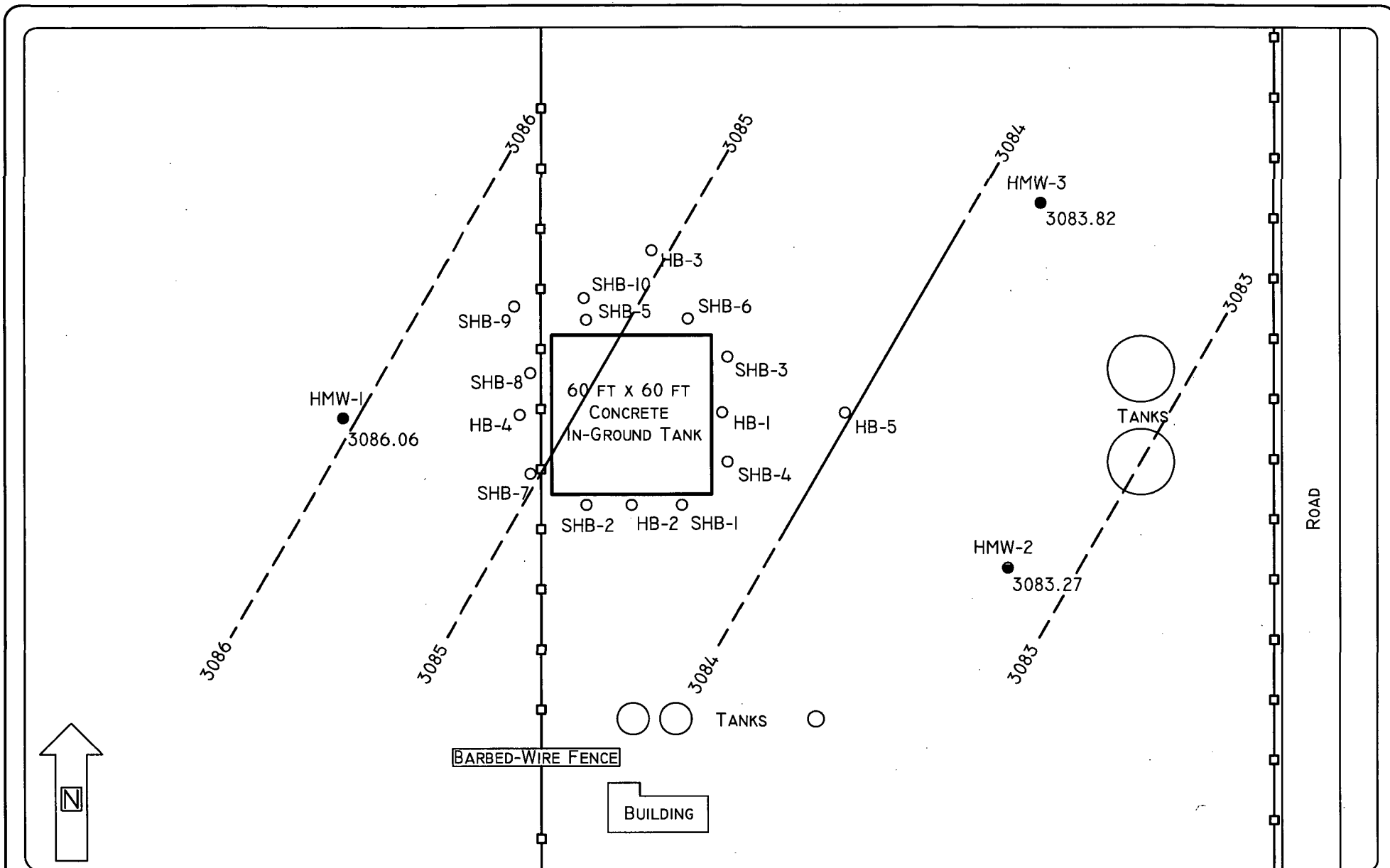
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HMW-3

Client	Arena Resources, Inc.	Project	Humphry-Queen Jal, New Mexico
Project Number	094 1436 000	Latitude	N 32 09' 34"
Geologist	M. Hagan	Longitude	W 103 09' 07"
Date Drilled	10-10-08	Total Depth of Borehole	65 Feet
Borehole Diameter	7 Inches	Depth to Water	60.1 Feet

Graphic Log	Description	Depth	Sample	Undefined	Undefined	Undefined	Undefined	Completion
	SW SANDSTONE, Strong Brown 7.5YR 5/6, Vey Fine Grained with some Loose Coarse Graind Clear SAND, Moderately to Well Sorted, Siliceous Matrix, Hard, Dense.	45						
	SM SAND, Yellowish Red 5YR 5/6, Fine Grained, Well Sorted, Subrounded to Subangular.							
	SW SANDSTONE, Yellowish Red 5YR 5/6, Fine Grained, Well Sorted, Subrounded to Subangular, Siliceous, Very Hard	50						
		55						
	SW SAND and SANDSTONE, Yellowish Red 5YR 5/6, Fine Grained, Moderately Sorted, Subrounded to Subangular, Dense, Hard	60						
	GC TD CLAYey GRAVEley SAND, Redish Brown 5YR 4/4, Medium to Fine Grained, Moderately Sorted, GRAVEL is Medium to Large Pebble.	65						
		70						
		75						

C:\Program Files\Porpoise Media\Well Logger\Arena Resc\Arena Langlie-Mattix.w12



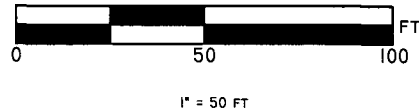
WATER TABLE ELEVATIONS (FEET ABOVE MEAN SEA LEVEL)

HUMPHREY-QUEEN PRODUCTION FACILITY
ARENA RESOURCES INC.
SECTION 3, T-25-S, R-37-E
LEA COUNTY, NEW MEXICO

LEGEND

- HMW-1 MONITOR WELLS
- SHB-1, HB-1 SOIL BORINGS
- 3083.82 GROUNDWATER ELEVATION
- 3084-- GROUNDWATER ELEVATION ISOPLETH

SCALE



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ETECH 
Environmental & Safety Solutions, Inc.

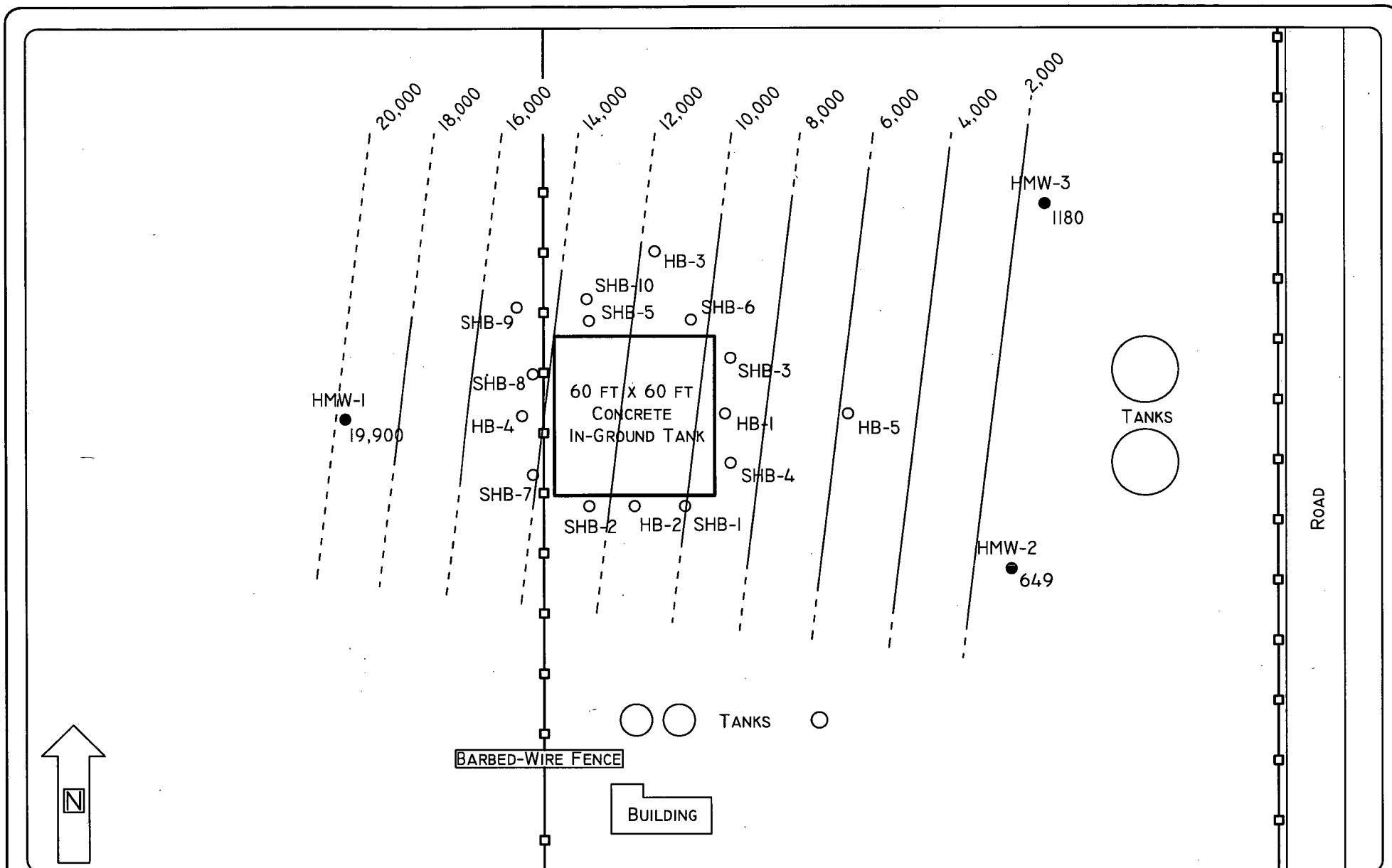


FIGURE 20
CHLORIDE CONCENTRATIONS (MG/KG)
HUMPHREY-QUEEN PRODUCTION FACILITY
ARENA RESOURCES INC.
SECTION 3, T-25-S, R-37-E
LEA COUNTY, NEW MEXICO

LEGEND

- HMW-1 MONITOR WELLS
- SHB-1, HB-1 SOIL BORINGS

1200 CHLORIDE CONCENTRATION (MG/KG)
--1200-- CHLORIDE CONCENTRATION ISOPLETH

SCALE

0 50 100 FT

1" = 50 FT

PREPARED BY:

STECH 
Environmental & Safety Solutions, Inc.

Tables

Groundwater Quality	Table 1
Static Groundwater Levels (Water Table)	Table 2
Chloride Concentrations from Soil Borings	Table 3

Table 1
Groundwater Quality
Arena Resources - Humphrey-Queen Tank
Lea County, NM
Milligrams Per Liter (mg/L unless noted)

Well No.	Sampling Date	Chloride	Sulfate	Hydroxide Alkalinity	Carbonate Alkalinity	Bicarbonate Alkalinity	Total Alkalinity	Fluoride	Nitrate as Nitrogen	Calcium	Magnesium	Potassium	Sodium	Dissolved Solids	pH (s.u.)	Specific Conductance (uMOS/cm)	TPH DRO	TPH GRO
Seyler	8/29/2008	1020	1160	<1.00	<1.00	167.0	167.0	<1.00	15.20	396	127.0	10.6	363	3259	NA	NA	NA	NA
HMW-1	10/16/2008	19900	1840	<1.00	<1.00	89.0	89.0	<1.00	9.12	3250	1040.0	136.00	8200.00	35000	6.94	51100	<5.00	<0.100
HMW-2	10/16/2008	649	399	<1.00	<1.00	142.0	142.0	3.09	2.55	257	78.2	9.17	190.00	1510	8.04	3050	<5.00	<0.100
HMW-3	10/16/2008	1180	314	<1.00	<1.00	143.0	143.0	3.23	2.50	359	114.0	11.40	3.72	2400	7.54	4300	<5.00	<0.100

Table 2
Humphrey-Queen Static Groundwater Levels
Feet Above Mean Sea Level (MSL)

Well	Measurment Date	Top of Cement ¹	Measuring Point	Depth to GW	GW Elevation
Seyler ¹	8/13/2008	3105.40	3144	66.31	3077.69
HMW-1	10/16/2008	3142.07	3145.07	59.01	3086.06
HMW-2	10/16/2008	3140.41	3143.52	60.25	3083.27
HMW-3	10/16/2008	3140.97	3143.93	60.11	3083.82

¹Top of cement elevation estimated from topographic data.

Table 3
Chloride Concentrations from 8il Brings
Feld and Laboratory Analysis (mg/L)
Arena Resources, hc, Humphrey-Queen Tank Area

[illegible]

AppendixA

Sport Environmental Report Confirmation Sampling

Pit Closure Confirmation Sampling

Arena Resources, Inc.
Humphrey Queen
Section 3, T-25-S, R-37-E
Lea County, New Mexico



O'Briant and Associates, Inc. dba
SPORT ENVIRONMENTAL SERVICES
505 N. Big Spring Street, Suite 303, Midland, Texas 79701
Business: 432.683.1100 Fax: 432.683.5903

April 28, 2008

Mr. Danny Palmer
Arena Resources, Inc.
2130 W. Bender
Hobbs, NM 88240

Re: Confirmation Sampling
Humphrey Queen Pit
T-25-S, R-37-E, Section 3
Lea County, New Mexico

Dear Mr. Palmer,

Thank you for choosing Sport Environmental Services to perform confirmation sampling at Arena Resources' aforementioned Humphrey Queen pit.

Attached please find a site plan denoting sample locations at the site along with the associated analytical results. Two (2) samples were collected from each soil boring (with the exception of SB5) by drilling with the use of anchor equipment. Samples were collected at a depth of three feet (3') and at six feet (6'). In addition, the SB5-003 sample was collected at a depth of nine feet (9'). Each soil sample was analyzed for **Total Petroleum Hydrocarbons** (C₆-C₁₂ Gasoline Range Hydrocarbons; C₁₂-C₁₈ Diesel Range Hydrocarbons; C₂₈-C₃₅ Oil Range Hydrocarbons; and Total TPH) and **Chloride (Cl)** content as directed.

Analytical results for each soil sample are provided herein and condensed for your convenience within the attached **Sample Data Summary** table. In summary, the TPH levels within all soil samples analyzed are primarily Non-Detect (ND) with the exception of SB5. Visual hydrocarbon contamination was encountered while drilling SB5. At the time of confirmation sampling, delineation sampling was conducted. Results of delineation sampling can be found herein for SB9 and SB10.

As previously discussed, particular attention should be given to the chloride levels within the following samples which exceed NMOCD 'practiced' limitations. The NMOCD has a regulatory limitation for chlorides (Cl) in groundwater of 250 mg/kg. In lieu of a chloride limit in soil, 250 mg/kg is utilized by the NMOCD as a soil limit as well. The sample results shown in **green** have a chloride level above 250 mg/kg. Please note that the chloride levels in SB1, SB4, SB6, SB7 and SB8 do not demonstrate a complete vertical delineation of the chloride-impacted soils.

Soil Boring 1 (SB1): SB1-001 (3'), 893 mg/kg
SB1-002 (6'), 2,340 mg/kg

Soil Boring 2 (SB2): SB2-001 (3'), 340 mg/kg
SB2-002 (6'), 1,191 mg/kg

Soil Boring 3 (SB3): SB3-001 (3'), 468 mg/kg
SB3-002 (6'), 170 mg/kg

Soil Boring 4 (SB4): SB4-001 (3'), 596 mg/kg
SB4-002 (6'), 213 mg/kg

Soil Boring 5 (SB5): SB5-001 (3'), 1,064 mg/kg
SB5-002 (6'), 213 mg/kg
SB5-003 (9'), 383 mg/kg

Soil Boring 6 (SB6): SB6-001 (3'), 425 mg/kg
SB6-002 (6'-6''), 128 mg/kg

Soil Boring 7 (SB7): SB7-001 (3'), 213 mg/kg
SB7-002 (6'), 511 mg/kg

Soil Boring 8 (SB8): SB8-001 (3'), 681 mg/kg
SB8-002 (6'), 1,404 mg/kg

Soil Boring 9 (SB9): SB9-001 (3'), 340 mg/kg
SB9-002 (6'), 1,106 mg/kg

Soil Boring 10 (SB10): SB10-001 (3'), 294 mg/kg
SB10-002 (6'), 298 mg/kg

If you have any questions or comments with regard to this matter, please contact me at either my office (432.683.1100) or on my cell (432.553.8555). We would be more than happy to review these results with you.

Sincerely,



Debi S. Smith, M.E., R.E.P.A.

Enclosures: 2 Pit Closure Confirmation Sampling reports

cc: Coleen Robinson, Arena Resources, Inc. (via e-mail)
Bob Akin, Arena Resources, Inc. (via e-mail)

Arena Resources, Inc.
Humphrey Queen
Section 3-1-25-S, R-37-E
Lea County, New Mexico

SITE PLAN DENOTING CONFIRMATION SAMPLING LOCATIONS

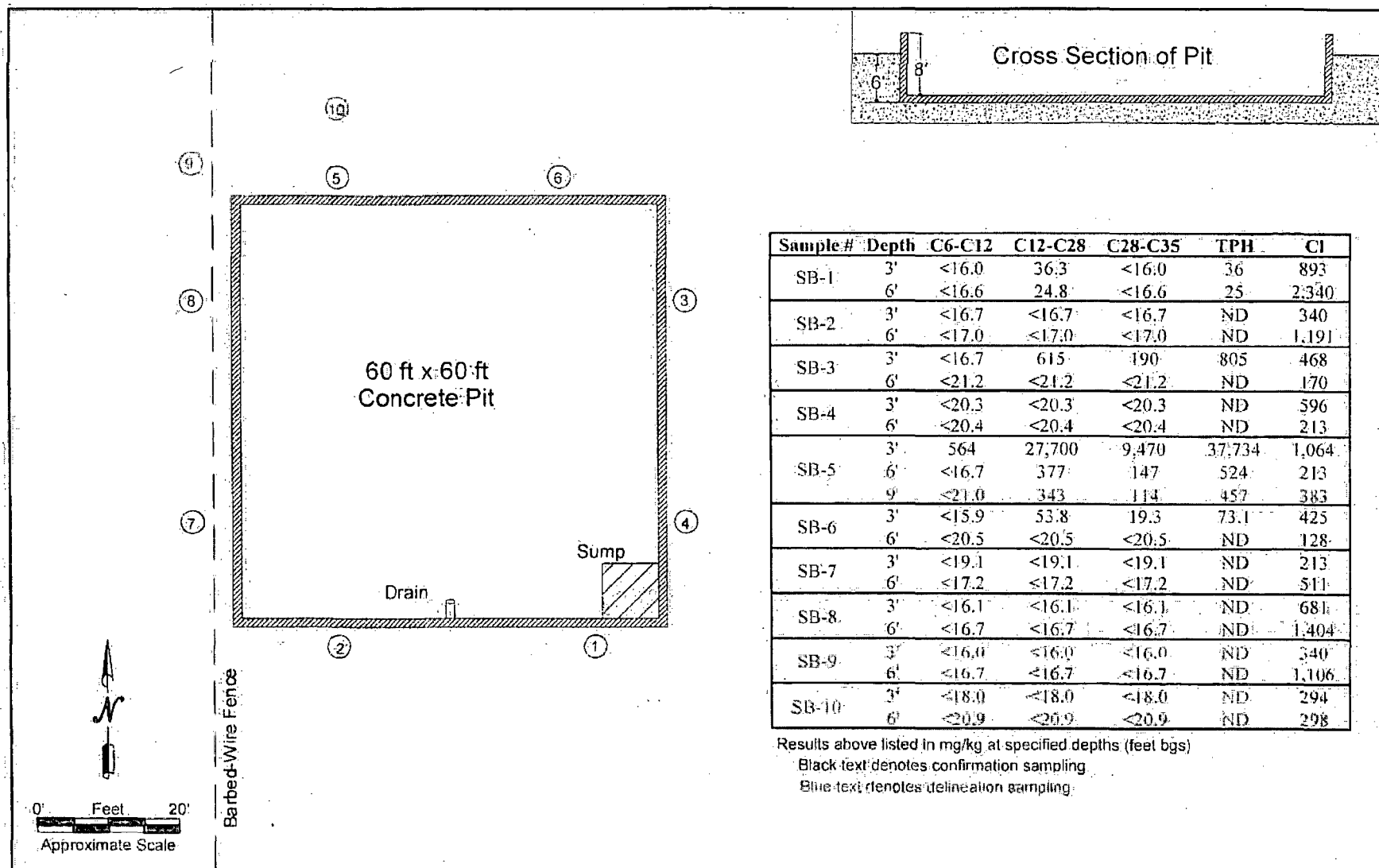
March 31, 2008

Humphrey Queen



ARENA RESOURCES INC
 HUMPHREY QUEEN SITE
 T-25-S, R-37-E, Section 3
 LEA COUNTY, NEW MEXICO

SITE AERIAL VIEW
 AND SURROUNDING
 FACILITIES MAP



ARENA RESOURCES INC
 HUMPHREY QUEEN SITE
 T-25-S, R-37-E, Section 3
 LEA COUNTY, NEW MEXICO

SOIL BORING SAMPLE
 MAP AND ANALYTICAL
 RESULTS

Arena Resources, Inc.
Humphrey Queen
Section 3, T-25-S-R-37-E
Lea County, New Mexico

SAMPLE DATA SUMMARY

Humphrey Queen



Project Name: Arena Resources, Inc. - Humphrey Queen
Project Location: Lea County, New Mexico

[illegible]

Arena Resources, Inc.
Humphrey Queen
Section 3 T-25-S R-37-E
Lea County, New Mexico

ANALYTICAL RESULTS
ENVIRONMENTAL LAB OF TEXAS
Humphrey Queen

Analytical Report 300808

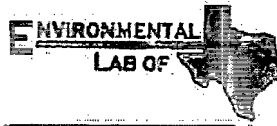
for

O'Briant & Assoc., Inc. dba Sport Environmental Svcs.

Project Manager: Debi Smith, M.E., R.E.P.A

Arena Resources, Inc. - Humphrey Queen

08-APR-08



12600 West I-20 East Odessa, Texas 79765

Texas certification numbers:
Houston, TX T104704215

Florida certification numbers:
Houston, TX E871002 - Miami, FL E86678 - Tampa, FL E86675
Norcross(Atlanta), GA E87429

South Carolina certification numbers:
Norcross(Atlanta), GA 98015

North Carolina certification numbers:
Norcross(Atlanta), GA 483

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08-APR-08

Project Manager: **Debi Smith, M.E., R.E.P.A**
O'Briant & Assoc., Inc. dba Sport Environmental Svcs.
500 W. Texas Ave., Ste 303
Midland, TX 79701

Reference: XENCO Report No: **300808**
Arena Resources, Inc. - Humphrey Queen
Project Address: Pit Confirmation Sampling

Debi Smith, M.E., R.E.P.A:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number 300808. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. Estimation of data uncertainty for this report is found in the quality control section of this report unless otherwise noted. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 300808 will be filed for 60 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Brent Barron, II
Odessa Laboratory Manager

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Sample Cross Reference 300808



D'Briant & Assoc., Inc. dba Sport Environmental Svcs., Midland, TX
Arena Resources, Inc. - Humphrey Queen

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
SB1-001	S	Mar-31-08 11:30	3 - 3 ft	300808-001
SB1-002	S	Mar-31-08 11:40	6 - 6 ft	300808-002
SB2-001	S	Mar-31-08 11:50	3 - 3 ft	300808-003
SB2-002	S	Mar-31-08 12:00	6 - 6 ft	300808-004
SB3-001	S	Mar-31-08 12:15	3 - 3 ft	300808-005
SB3-002	S	Mar-31-08 12:30	6 - 6 ft	300808-006
SB4-001	S	Mar-31-08 12:35	3 - 3 ft	300808-007
SB4-002	S	Mar-31-08 12:45	6 - 6 ft	300808-008
SB5-001	S	Mar-31-08 12:55	3 - 3 ft	300808-009
SB5-002	S	Mar-31-08 12:57	6 - 6 ft	300808-010
SB5-003	S	Mar-31-08 13:05	9 - 9 ft	300808-011
SB6-001	S	Mar-31-08 13:10	3 - 3 ft	300808-012
SB6-002	S	Mar-31-08 13:15	6 - 6 ft	300808-013
SB7-001	S	Mar-31-08 13:20	3 - 3 ft	300808-014
SB7-002	S	Mar-31-08 13:25	6 - 6 ft	300808-015
SB8-001	S	Mar-31-08 13:30	3 - 3 ft	300808-016
SB8-002	S	Mar-31-08 13:35	6 - 6 ft	300808-017
SB9-001	S	Mar-31-08 13:40	3 - 3 ft	300808-018
SB9-002	S	Mar-31-08 13:45	6 - 6 ft	300808-019
SB10-001	S	Mar-31-08 13:55	3 - 3 ft	300808-020
SB10-002	S	Mar-31-08 14:05	6 - 6 ft	300808-021



Certificate of Analysis Summary 300808

O'Briant & Assoc., Inc. dba Sport Environmental Svcs., Midland, TX

Project Name: Arena Resources, Inc. - Humphrey Queen

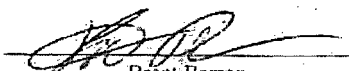
Project Id:
Contact: Debi Smith, M.E., R.E.P.A.
Project Location: Pit Confirmation Sampling

Date Received in Lab: Tue Apr-01-08 05:35 pm
Report Date: 08-APR-08
Project Manager: Brent Barron, II

Analysis Requested	Lab Id:	300808-001	300808-002	300808-003	300808-004	300808-005	300808-006
	Field Id:	SB1-001	SB1-002	SB2-001	SB2-002	SB3-001	SB3-002
	Depth:	3-3 ft	6-6 ft	3-3 ft	6-6 ft	3-3 ft	6-6 ft
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Mar-31-08 11:20	Mar-31-08 11:40	Mar-31-08 11:50	Mar-31-08 12:00	Mar-31-08 12:15	Mar-31-08 12:30
Chloride by SM4500-CL-B	Extracted:						
	Analyzed:	Apr-03-08 15:20	Apr-03-08 15:20	Apr-03-08 15:20	Apr-03-08 15:20	Apr-03-08 15:20	Apr-03-08 15:20
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		893.3 0.1000	2340 0.1000	340.3 0.1000	1191 0.1000	467.9 0.1000	170.2 0.1000
Percent Moisture	Extracted:						
	Analyzed:	Apr-02-08 16:30	Apr-02-08 16:30	Apr-02-08 16:30	Apr-02-08 16:30	Apr-02-08 16:30	Apr-02-08 16:30
	Units/RL:	% RL	% RL	% RL	% RL	% RL	% RL
Percent Moisture		6.4	9.54	10.2	11.8	10	29.1
TPH By SW8015 Mod	Extracted:	Apr-02-08 14:58	Apr-02-08 14:58	Apr-02-08 14:58	Apr-02-08 14:58	Apr-02-08 14:58	Apr-07-08 12:35
	Analyzed:	Apr-03-08 15:01	Apr-03-08 15:53	Apr-03-08 16:19	Apr-03-08 16:44	Apr-03-08 17:37	Apr-07-08 17:18
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
C6-C12 Gasoline Range Hydrocarbons		ND 16.0	ND 16.6	ND 16.7	ND 17.0	ND 16.7	ND 21.2
C12-C28 Diesel Range Hydrocarbons		36.3 16.0	24.8 16.6	ND 16.7	ND 17.0	615 16.7	ND 21.2
C28-C35 Oil Range Hydrocarbons		ND 16.0	ND 16.6	ND 16.7	ND 17.0	190 16.7	ND 21.2
Total TPH		36.3	24.8	ND	ND	805	ND

This analytical report, and the entire data package it represents, has been made for your exclusive and confidential use. The interpretations and results expressed throughout this analytical report represent the best judgment of XENCO Laboratories. XENCO Laboratories assumes no responsibility and makes no warranty to the end use of the data hereby presented. Our liability is limited to the amount invoiced for this work order unless otherwise agreed to in writing.

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 Brent Barron
 Odessa Laboratory Director



Certificate of Analysis Summary 300808

O'Briant & Assoc., Inc. dba Sport Environmental Svcs., Midland, TX

Project Name: Arena Resources, Inc. - Humphrey Queen

Project Id:
 Contact: Debi Smith, M.E., R.E.P.A.
 Project Location: Pit Confirmation Sampling

Date Received in Lab: Tue Apr-01-08 05:35 pm
 Report Date: 08-APR-08
 Project Manager: Brent Barron, II

<i>Analysis Requested</i>	<i>Lab Id:</i>	300808-007	300808-008	300808-009	300808-010	300808-011	300808-012
	<i>Field Id:</i>	SB4-001	SB4-002	SB5-001	SB5-002	SB5-003	SB6-001
	<i>Depth:</i>	3-3 ft	6-6 ft	3-3 ft	6-6 ft	9-9 ft	3-3 ft
	<i>Matrix:</i>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<i>Sampled:</i>	Mar-31-08 12:35	Mar-31-08 12:45	Mar-31-08 12:55	Mar-31-08 12:57	Mar-31-08 13:05	Mar-31-08 13:10
Chloride by SM4500-Cl- B	<i>Extracted:</i>						
	<i>Analyzed:</i>	Apr-03-08 15:20	Apr-03-08 15:20	Apr-03-08 15:20	Apr-03-08 15:20	Apr-03-08 15:20	Apr-03-08 15:20
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
Chloride		595.6 0.1000	212.7 0.1000	1064 0.1000	212.7 0.1000	382.9 0.1000	425.4 0.1000
Percent Moisture	<i>Extracted:</i>						
	<i>Analyzed:</i>	Apr-02-08 16:30	Apr-02-08 16:30	Apr-02-08 16:30	Apr-02-08 16:30	Apr-02-08 16:30	Apr-02-08 16:30
	<i>Units/RL:</i>	% RL	% RL	% RL	% RL	% RL	% RL
Percent Moisture		26.2	26.5	13	9.91	28.5	5.83
TPH By SW8015 Mod	<i>Extracted:</i>	Apr-02-08 14:58	Apr-02-08 14:58	Apr-02-08 14:55	Apr-02-08 14:55	Apr-07-08 12:35	Apr-02-08 14:55
	<i>Analyzed:</i>	Apr-03-08 18:28	Apr-03-08 18:54	Apr-04-08 12:34	Apr-03-08 13:34	Apr-07-08 17:44	Apr-03-08 14:26
	<i>Units/RL:</i>	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
C6-C12 Gasoline Range Hydrocarbons		ND 20.3	ND 20.4	564 172	ND 16.7	ND 21.0	ND 15.9
C12-C28 Diesel Range Hydrocarbons		ND 20.3	ND 20.4	27700 172	377 16.7	343 21.0	53.8 15.9
C28-C35 Oil Range Hydrocarbons		ND 20.3	ND 20.4	9470 172	147 16.7	114 21.0	19.3 15.9
Total TPH		ND	ND	37734	524	457	73.1

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 Brent Barron
 Odessa Laboratory Director



Certificate of Analysis Summary 300808
O'Briant & Assoc., Inc. dba Sport Environmental Svcs., Midland, TX
Project Name: Arena Resources, Inc. - Humphrey Queen

Project Id:

Contact: Debi Smith, M.E., R.E.P.A.

Project Location: Pit Confirmation Sampling

Date Received in Lab: Tue Apr-01-08 05:35 pm

Report Date: 08-APR-08

Project Manager: Brent Barron, II

Analysis Requested:	Lab Id:	300808-013	300808-014	300808-015	300808-016	300808-017	300808-018
	Field Id:	SB6-002	SB7-001	SB7-002	SB8-001	SB8-002	SB9-001
	Depth:	6-6 ft	3-3 ft	6-6 ft	3-3 ft	6-6 ft	3-3 ft
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sampled:	Mar-31-08 13:15	Mar-31-08 13:20	Mar-31-08 13:25	Mar-31-08 13:30	Mar-31-08 13:35	Mar-31-08 13:40
Chloride by SM4500-Cl-B		Extracted:					
		Analyzed:		Analyzed:		Analyzed:	
		Units/RL:		Units/RL:		Units/RL:	
Chloride		mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
		127.6 0.1000	212.7 0.1000	510.5 0.1000	680.6 0.1000	1404 0.1000	340.1 0.1000
Percent Moisture		Extracted:					
		Analyzed:		Analyzed:		Analyzed:	
		Units/RL:		Units/RL:		Units/RL:	
Percent Moisture		% RL	% RL	% RL	% RL	% RL	% RL
		26.8	21.4	12.8	6.57	10	6
TPH By SW8015 Mod		Extracted:					
		Analyzed:		Analyzed:		Analyzed:	
		Units/RL:		Units/RL:		Units/RL:	
C6-C12 Gasoline Range Hydrocarbons		mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL	mg/kg RL
		ND 20.5	ND 19.1	ND 17.2	ND 16.1	ND 16.7	ND 16.0
C12-C28 Diesel Range Hydrocarbons		ND 20.5	ND 19.1	ND 17.2	ND 16.1	ND 16.7	ND 16.0
C28-C35 Oil Range Hydrocarbons		ND 20.5	ND 19.1	ND 17.2	ND 16.1	ND 16.7	ND 16.0
Total TPH		ND	ND	ND	ND	ND	ND

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Brent Barron
Odessa Laboratory Director



Certificate of Analysis Summary 300808
O'Briant & Assoc., Inc. dba Sport Environmental Svcs., Midland, TX
Project Name: Arena Resources, Inc. - Humphrey Queen

Project Id:
Contact: Debi Smith, M.E., R.E.P.A.
Project Location: Pit Confirmation Sampling.

Date Received in Lab: Tue Apr-01-08 05:35 pm
Report Date: 08-APR-08
Project Manager: Brent Barron, II

Analysis Requested	Lab Id:	300808-019	300808-020	300808-021		
	Field Id:	SB9-002	SB10-001	SB10-002		
	Depth:	6-6 ft	3-3 ft	6-6 ft		
	Matrix:	SOIL	SOIL	SOIL		
	Sampled:	Mar-31-08 13:45	Mar-31-08 13:55	Mar-31-08 14:05		
Chloride by SM4500-CI- B	Extracted:					
	Analyzed:	Apr-03-08 16:15	Apr-03-08 16:15	Apr-03-08 16:15		
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL		
Chloride		1106 0.1000	293.5 0.1000	297.8 0.1000		
Percent Moisture	Extracted:					
	Analyzed:	Apr-02-08 16:30	Apr-02-08 16:30	Apr-02-08 16:30		
	Units/RL:	% RL	% RL	% RL		
Percent Moisture		10.1	16.7	28.2		
TPH By SW8015-Mod	Extracted:	Apr-02-08 14:55	Apr-02-08 14:55	Apr-02-08 14:55		
	Analyzed:	Apr-03-08 18:16	Apr-03-08 18:42	Apr-03-08 19:06		
	Units/RL:	mg/kg RL	mg/kg RL	mg/kg RL		
C6-C12 Gasoline Range Hydrocarbons		ND 16.7	ND 18.0	ND 20.9		
C12-C28 Diesel Range Hydrocarbons		ND 16.7	ND 18.0	ND 20.9		
C28-C35 Oil Range Hydrocarbons		ND 16.7	ND 18.0	ND 20.9		
Total TPH		ND	ND	ND		

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Brent Barron
Odessa Laboratory Director



Flagging Criteria

- X** In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to effect the recovery of the spike concentration. This condition could also effect the relative percent difference in the MS/MSD.
- B** A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.
- D** The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.
- E** The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.
- F** RPD exceeded lab control limits.
- J** The target analyte was positively identified below the MQL(PQL) and above the SQL(MDL).
- U** Analyte was not detected.
- L** The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.
- H** The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.
- K** Sample analyzed outside of recommended hold time.

* Outside XENCO'S scope of NELAC Accreditation

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(214) 902-0300	(214) 351-9139
(210) 509-3334	(210) 509-3335
(813) 620-2000	(813) 620-2033
(305) 823-8500	(305) 823-8555
(770) 449-8800	(770) 449-5477



Form 2 - Surrogate Recoveries



Project Name: Arena Resources, Inc. - Humphrey Queen

Work Order #: 300808

Project ID:

Lab Batch #: 719160

Sample: 300800-002 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	88.6	100	89	70-135	
o-Terphenyl	49.2	50.0	98	70-135	

Lab Batch #: 719160

Sample: 300800-002 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	86.2	100	86	70-135	
o-Terphenyl	47.7	50.0	95	70-135	

Lab Batch #: 719160

Sample: 300808-009 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	81.3	100	81	70-135	
o-Terphenyl	53.3	50.0	107	70-135	

Lab Batch #: 719160

Sample: 300808-010 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	78.8	100	79	70-135	
o-Terphenyl	49.2	50.0	98	70-135	

Lab Batch #: 719160

Sample: 300808-012 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	82.8	100	83	70-135	
o-Terphenyl	47.8	50.0	96	70-135	

** Surrogates outside limits: data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 \times A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries



Project Name: Arena Resources, Inc. - Humphrey Queen

Work Order #: 300808

Project ID:

Lab Batch #: 719160

Sample: 300808-013 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	79.3	100	79	70-135	
o-Terphenyl	47.7	50.0	95	70-135	

Lab Batch #: 719160

Sample: 300808-014 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	78.9	100	79	70-135	
o-Terphenyl	46.6	50.0	93	70-135	

Lab Batch #: 719160

Sample: 300808-015 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	76.9	100	77	70-135	
o-Terphenyl	45.6	50.0	91	70-135	

Lab Batch #: 719160

Sample: 300808-016 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	80.6	100	81	70-135	
o-Terphenyl	47.2	50.0	94	70-135	

Lab Batch #: 719160

Sample: 300808-017 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	78.9	100	79	70-135	
o-Terphenyl	46.5	50.0	93	70-135	

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries



Project Name: Arena Resources, Inc. - Humphrey Queen

Work Order #: 300808

Project ID:

Lab Batch #: 719160

Sample: 300808-018 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	78.7	100	79	70-135	
o-Terphenyl	44.8	50.0	90	70-135	

Lab Batch #: 719160

Sample: 300808-019 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	80.6	100	81	70-135	
o-Terphenyl	47.3	50.0	95	70-135	

Lab Batch #: 719160

Sample: 300808-020 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	79.4	100	79	70-135	
o-Terphenyl	46.6	50.0	93	70-135	

Lab Batch #: 719160

Sample: 300808-021 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	78.6	100	79	70-135	
o-Terphenyl	46.2	50.0	92	70-135	

Lab Batch #: 719160

Sample: 507012-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	88.4	100	88	70-135	
o-Terphenyl	50.5	50.0	101	70-135	

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 \times A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries



Project Name: Arena Resources, Inc. - Humphrey Queen

Work Order #: 300808

Project ID:

Lab Batch #: 719207

Sample: 300808-004 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	82.6	100	83	70-135	
o-Terphenyl	46.5	50.0	93	70-135	

Lab Batch #: 719207

Sample: 300808-005 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	86.5	100	87	70-135	
o-Terphenyl	48.3	50.0	97	70-135	

Lab Batch #: 719207

Sample: 300808-007 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	84.5	100	85	70-135	
o-Terphenyl	46.3	50.0	93	70-135	

Lab Batch #: 719207

Sample: 300808-008 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	83.6	100	84	70-135	
o-Terphenyl	45.9	50.0	92	70-135	

Lab Batch #: 719207

Sample: 507040-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	94.5	100	95	70-135	
o-Terphenyl	46.2	50.0	92	70-135	

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries



Project Name: Arena Resources, Inc. - Humphrey Queen

Work Order #: 300808

Project ID:

Lab Batch #: 719207

Sample: 507040-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	90.6	100	91	70-135	
o-Terphenyl	50.5	50.0	101	70-135	

Lab Batch #: 719207

Sample: 507040-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	89.8	100	90	70-135	
o-Terphenyl	44.2	50.0	88	70-135	

Lab Batch #: 719296

Sample: 300808-006 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	85.0	100	85	70-135	
o-Terphenyl	49.7	50.0	99	70-135	

Lab Batch #: 719296

Sample: 300808-011 / SMP

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	86.8	100	87	70-135	
o-Terphenyl	52.8	50.0	106	70-135	

Lab Batch #: 719296

Sample: 301006-001 S / MS

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	82.9	100	83	70-135	
o-Terphenyl	48.6	50.0	97	70-135	

** Surrogates outside limits: data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 * A / B$

All results are based on MDL and validated for QC purposes.



Form 2 - Surrogate Recoveries



Project Name: Arena Resources, Inc. - Humphrey Queen

Work Order #: 300808

Project ID:

Lab Batch #: 719296

Sample: 301006-001 SD / MSD

Batch: 1 Matrix: Soil

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	82.6	100	83	70-135	
o-Terphenyl	48.4	50.0	97	70-135	

Lab Batch #: 719296

Sample: 507104-1-BKS / BKS

Batch: 1 Matrix: Solid

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	91.4	100	91	70-135	
o-Terphenyl	50.9	50.0	102	70-135	

Lab Batch #: 719296

Sample: 507104-1-BLK / BLK

Batch: 1 Matrix: Solid

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	85.6	100	86	70-135	
o-Terphenyl	47.5	50.0	95	70-135	

Lab Batch #: 719296

Sample: 507104-1-BSD / BSD

Batch: 1 Matrix: Solid

Units: mg/kg

SURROGATE RECOVERY STUDY					
TPH By SW8015 Mod	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
Analytes					
1-Chlorooctane	91.2	100	91	70-135	
o-Terphenyl	50.0	50.0	100	70-135	

** Surrogates outside limits; data and surrogates confirmed by reanalysis

*** Poor recoveries due to dilution

Surrogate Recovery [D] = $100 \times A / B$

All results are based on MDL and validated for QC purposes.



Blank Spike Recovery



Project Name: Arena Resources, Inc. - Humphrey Queen

Work Order #: 300808

Project ID:

Lab Batch #: 719007

Sample: 719007-1-BKS

Matrix: Solid

Date Analyzed: 04/03/2008

Date Prepared: 04/03/2008

Analyst: IRO

Reporting Units: mg/kg

Batch #: 1

BLANK /BLANK SPIKE RECOVERY STUDY

Chloride by SM4500-CI- B Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
Chloride	ND	100.0	87.21	87	70-125	

Lab Batch #: 719009

Sample: 719009-1-BKS

Matrix: Solid

Date Analyzed: 04/03/2008

Date Prepared: 04/03/2008

Analyst: IRO

Reporting Units: mg/kg

Batch #: 1

BLANK /BLANK SPIKE RECOVERY STUDY

Chloride by SM4500-CI- B Analytes	Blank Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Control Limits %R	Flags
Chloride	ND	100.0	87.20	87	70-125	

Blank Spike Recovery [D] = $100 * [C] / [B]$

All results are based on MDL and validated for QC purposes.



BS / BSD Recoveries



Project Name: Arena Resources, Inc. - Humphrey Queen

Work Order #: 300808

Analyst: ASA

Date Prepared: 04/02/2008

Project ID:

Date Analyzed: 04/03/2008

Lab Batch ID: 719160

Sample: 507012-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK / BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
C6-C12 Gasoline Range Hydrocarbons	ND	1000	794	79	1000	788	79	1	70-135	35	
C12-C28 Diesel Range Hydrocarbons	ND	1000	809	81	1000	814	81	1	70-135	35	

Analyst: ASA

Date Prepared: 04/02/2008

Date Analyzed: 04/03/2008

Lab Batch ID: 719207

Sample: 507040-1-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK / BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
C6-C12 Gasoline Range Hydrocarbons	ND	1000	936	94	1000	919	92	2	70-135	35	
C12-C28 Diesel Range Hydrocarbons	ND	1000	899	90	1000	872	87	3	70-135	35	

Relative Percent Difference RPD = $200 * [(D-F)/(D+F)]$

Blank Spike Recovery [D] = $100 * (C)/(B)$

Blank Spike Duplicate Recovery [G] = $100 * (F)/(E)$

All results are based on MDL and Validated for QC Purposes



BS / BSD Recoveries



Project Name: Arena Resources, Inc. - Humphrey Queen

Work Order #: 300808

Analyst: ASA

Date Prepared: 04/07/2008

Project ID:

Date Analyzed: 04/07/2008

Lab Batch ID: 719296

Sample: 507104-I-BKS

Batch #: 1

Matrix: Solid

Units: mg/kg

BLANK / BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
C6-C12 Gasoline Range Hydrocarbons	ND	1000	762	76	1000	749	75	2	70-135	35	
C12-C28 Diesel Range Hydrocarbons	ND	1000	742	74	1000	733	73	1	70-135	35	

Relative Percent Difference RPD = $200 * (D - F) / (D + F)$

Blank Spike Recovery [D] = $100 * (C) / (B)$

Blank Spike Duplicate Recovery [G] = $100 * (F) / (E)$

All results are based on MDL and Validated for QC Purposes



Form 3 - MS / MSD Recoveries



Project Name: Arena Resources, Inc. - Humphrey Queen

Work Order #: 300808

Project ID:

Lab Batch ID: 719007

QC-Sample ID: 300800-015.S

Batch #: 1 Matrix: Soil

Date Analyzed: 04/03/2008

Date Prepared: 04/03/2008

Analyst: IRO

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by SM4500-Cl- B	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	2340	10000	12340	100	10000	12340	100	0	70-125	25	

Lab Batch ID: 719009

QC-Sample ID: 300950-007.S

Batch #: 1 Matrix: Soil

Date Analyzed: 04/03/2008

Date Prepared: 04/03/2008

Analyst: IRO

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Chloride by SM4500-Cl- B	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
Chloride	1276	10000	11270	100	10000	11270	100	0	70-125	25	

Lab Batch ID: 719160

QC-Sample ID: 300800-002.S

Batch #: 1 Matrix: Soil

Date Analyzed: 04/03/2008

Date Prepared: 04/02/2008

Analyst: ASA

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Analytes											
C6-C12 Gasoline Range Hydrocarbons	ND	1090	962	88	1090	941	86	2	70-135	35	
C12-C28 Diesel Range Hydrocarbons	ND	1090	992	91	1090	975	89	2	70-135	35	

Matrix Spike Percent Recovery: $[D] = 100 \times (C-A)/B$
Relative Percent Difference: $RPD = 200 \times (D-G)/(D+G)$

Matrix Spike Duplicate Percent Recovery: $[G] = 100 \times (F-A)/E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable, N = See Narrative, EQL = Estimated Quantitation Limit



Form 3 - MS / MSD Recoveries



Project Name: Arena Resources, Inc. - Humphrey Queen

Work Order #: 300808

Project ID:

Lab Batch ID: 719296

QC-Sample ID: 301006-001 S

Batch #: 1 Matrix: Soil

Date Analyzed: 04/07/2008

Date Prepared: 04/07/2008

Analyst: ASA

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
C6-C12 Gasoline Range Hydrocarbons	ND	1020	726	71	1020	772	76	7	70-135	35	
C12-C28 Diesel Range Hydrocarbons	ND	1020	731	72	1020	796	78	8	70-135	35	

Matrix Spike Percent Recovery $[D] = 100 * (C - A) / B$
Relative Percent Difference $RPD = 200 * (D - G) / (D + G)$

Matrix Spike Duplicate Percent Recovery $[G] = 100 * (F - A) / E$

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable, N = See Narrative, EQL = Estimated Quantitation Limit



Sample Duplicate Recovery



Project Name: Arena Resources, Inc. - Humphrey Queen

Work Order #: 300808

Lab Batch #: 718871

Date Analyzed: 04/02/2008

QC- Sample ID: 300808-001 D

Reporting Units: %

Project ID:

Analyst: RBA

Date Prepared: 04/02/2008

Batch #: 1

Matrix: Soil

SAMPLE / SAMPLE DUPLICATE RECOVERY					
Percent Moisture	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Percent Moisture	6.40	5.52	15	20	

Lab Batch #: 718872

Date Analyzed: 04/02/2008

QC- Sample ID: 300808-021 D

Reporting Units: %

Date Prepared: 04/02/2008

Batch #: 1

Analyst: RBA

Matrix: Soil

SAMPLE / SAMPLE DUPLICATE RECOVERY					
Percent Moisture	Parent Sample Result [A]	Sample Duplicate Result [B]	RPD	Control Limits %RPD	Flag
Analyte					
Percent Moisture	28.2	28.8	2	20	

Spike Relative Difference RPD $200 * |(B-A)/(B+A)|$

All Results are based on MDL and validated for QC purposes.

Environmental Lab of Texas

A Xonco Laboratories Company

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

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Page 1 of 4

Project Manager: Debi S. Smith, M.E. NEPA Environmental Consultant
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Sampler Signature: Debi S. Smith
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Project Name: Arena Resources, Inc. - Humphrey Queen
Project Loc: Pit Confirmation Sampling
PO #:
Report Format: ☐ Standard ☐ TRRP ☐ NPDES

(lab use only)
ORDER #: 300808

LAB # (lab use only)	FIELD CODE	Beginning Depth	Ending Depth	Date Sampled	Time Sampled (TX)	Field Notes	Preservation & # of Containers										Matrix										RUSH 1A (Per Screen) 24, 48, 72 hrs	Standard 1A																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
							Total # of Containers	PH	HNO ₃	HCl	H ₂ SO ₄	HNOH	Na ₂ S ₂ O ₈	None	Other (Specify)	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846			SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846	SW-846

Special Instructions: Invoices should be sent to Arena Resources, Inc. dba O'Brian and Associates Sport Environmental Services
505 N. Big Spring Street, Suite 303 Midland, Texas 79701

Laboratory Comments:
Sample Containers Intact? ☒ N
VOCs Free of Headspace? ☒ N
Labels on container(s) ☒ N
Custody seals on container(s) ☒ N
Custody seals on cooler(s) ☒ N
Sample Hand Delivered ☒ N
by Sample Client Rep? ☒ N
by Courier? ☒ UPS DHL FedEx Loro Star
Temperature Upon Receipt: 0.5 °C

Relinquished by: Debi S. Smith Date: 4/1/08 Time: 5:35 P
Received by: Jean Fitch Date: 04-01-08 Time: 1735

Environmental Lab of Texas

A Xonco Laboratories Company

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

12600 West I-20 East
Odessa, Texas 79765

Phone: 432-563-1800
Fax: 432-563-1713

page 2 of 4

Project Manager: Debi S. Smith, ME, REPA Environmental Consultant
Company Name: O'Brian and Associates, Inc. dba Sport Environmental Services
Company Address: 605 N. Big Spring Street, Suite 303
City/State/Zip: Midland, TX 79701
Telephone No: (432) 683-1100 Fax No: (432) 683-5903
Sampler Signature: Debi S. Smith e-mail: sportenvironmental@t3wireless.com

Project Name: Arena Resources, Inc. - Humphrey Ocean
Pit Confirmation Sampling
Project Loc: _____
PO #: _____

Report Format: ☐ Standard ☐ TRRP ☐ NPDES

(lab use only)		FIELD CODE		Beginning Depth	Ending Depth	Date Sampled	Time Sampled (TX)	Total # of Containers	Matrix	Analyze For:												RUSH TAT (pre-processed) 24, 48, 72 hrs						
LAB # (lab use only)	ORDER #									TOTAL																		
										TPH	TX 1005	TX 1006	TX 1007	TX 1008	TX 1009	TX 1010	TX 1011	TX 1012	TX 1013	TX 1014	TX 1015	TX 1016	TX 1017	TX 1018	TX 1019	TX 1020		
07	SB4-001	3'	3'	3-31-08	12:35 P	1	X		S	X																		X
08	SB4-002	6'	6'	3-31-08	12:45 P	1	X		S	X																		X
09	SB5-001	3'	3'	3-31-08	12:55 P	1	X		S	X																		X
10	SB5-002	6'	6'	3-31-08	12:57 P	1	X		S	X																		X
11	SB5-003	9'	9'	3-31-08	1:05 P	1	X		S	X																		X
12	SB6-001	3'	3'	3-31-08	1:10 P	1	X		S	X																		X
13	SB6-002	6'	6'	3-31-08	1:15 P	1	X		S	X																		X

Special Instructions: Invoices should be sent to Arena Resources, Inc. dba Sport Environmental Services, 605 N. Big Spring Street, Suite 303, Midland, Texas 79701.

Relinquished by: Debi S. Smith Date: 4/1/08 Time: 5:35 P Received by: _____ Date: _____ Time: _____

Relinquished by: _____ Date: _____ Time: _____ Received by: _____ Date: _____ Time: _____

Relinquished by: _____ Date: _____ Time: _____ Received by: James Fitch Date: 4-1-08 Time: 11:35

Laboratory Comments: Sample Containers Intact? Y VOCs Free of Headspace? Y Labels on container(s)? Y Custody seals on container(s)? Y Custody seals on cooler(s)? Y Sample Hand-Delivered by Sampler/Client Rep.? Y by Courier? Y UPS Y DHL Y FedEx Y Lone Star Y Temperature Upon Receipt: 0.5 °C

Environmental Lab of Texas

A Xenica Laboratories Company

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

12600 West I-20 East
Odessa, Texas 79765

Phone: 432-563-1800
Fax: 432-563-1713

page 4 of 4

Project Manager: Dobl S. Smith, ME, REPA - Environmental Consultant

Project Name: Arena Resources, Inc. - Humphrey Queen

Company Name: O'Brian and Associates, Inc. dba Sport Environmental Services

Pit Confirmation Sampling

Company Address: 605 N. Big Spring Street, Suite 303

Project Loc: _____

City/State/Zip: Midland, TX 79701

PO #: _____

Telephone No: (432) 663-1100

Fax No: (432) 663-5903

Report Format: ☐ Standard ☐ TRRP ☐ NPDES

Sampler Signature: J. S. Smith

e-mail: sportenvironmental@tswireless.com

(lab use only)

ORDER #: 300808

LAB # (lab use only)	FIELD CODE	Beginning Depth	Ending Depth	Date Sampled	Time Sampled (TX)	Field Filtered	Total # of Containers	Ice	HNO ₃	HCl	H ₂ SO ₄	HNO ₃	NaOH	Na ₂ SO ₄	None	Other (Specify)	DW = Drinking Water 500-5000	GW = Groundwater 500-5000	SP = Non-Petroleum 500-5000	TPH	418.1	8015B	TPH	TX 1005	TX 1008	Calcium (Cat. Mg, Na, K)	Arsenic (Cat. SO ₄ Alkalinity)	SAR/ESP/CLC	Metals: As, Ag, Ba, Cd, Cr, Pb, Hg, Se	Volatiles	Semivolatiles	BTEX 80210/5000 or BTEX 8076	HCI	NORM	RUSH TAT (per Schedule N, 48, 72 hr)	Standard TAT	
				3-23-2008																																	
20	SB10-C01	3'	3'	3-31-08	1:55 P	1	1	X									S			X						X										X	
21	SB10-C02	6'	6'	3-31-08	2:05 P	1	1	X									S			X						X										X	

Special Instructions:

Invoices should be sent to Arena Resources, Inc. dba OBRAN dba Sport Environmental Services
605 N. Big Spring Street, Suite 303 Midland, Texas 79701

Laboratory Comments:

Sample Containers (intact)? ☒ N
VOCs Free of Headspace? ☒ N
Labels on container(s) ☒ N
Custody seals on container(s) ☒ N
Custody seals on cooler(s) ☒ N
Sample Hand Delivered by Sampler/Client, Rep. ? ☒ N
by Courier? UPS ☒ DHL ☒ FedEx ☒ Lone Star
Temperature Upon Receipt: 0.5 °C

Relinquished by:

J. S. Smith

Date

4/1/08

Time

5:35 P

Received by:

Date

Time

Relinquished by:

Date

Time

Received by:

Date

Time

Relinquished by:

Date

Time

Received by ELOT:

Date

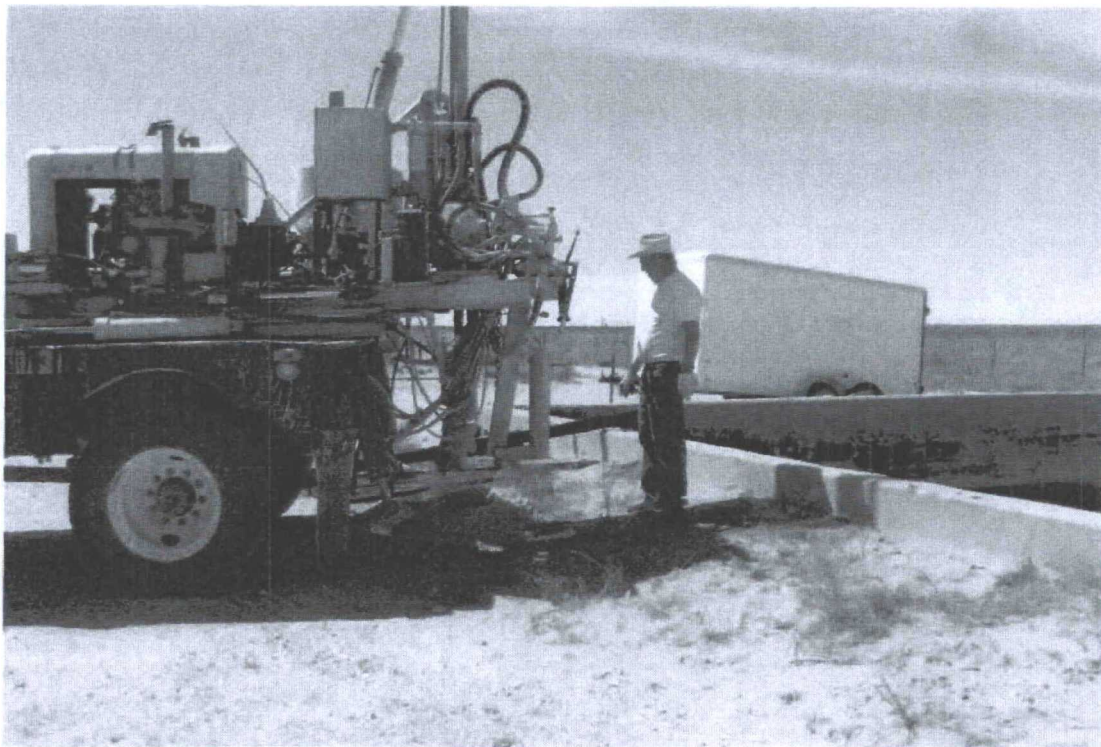
Time

Kenne Filer

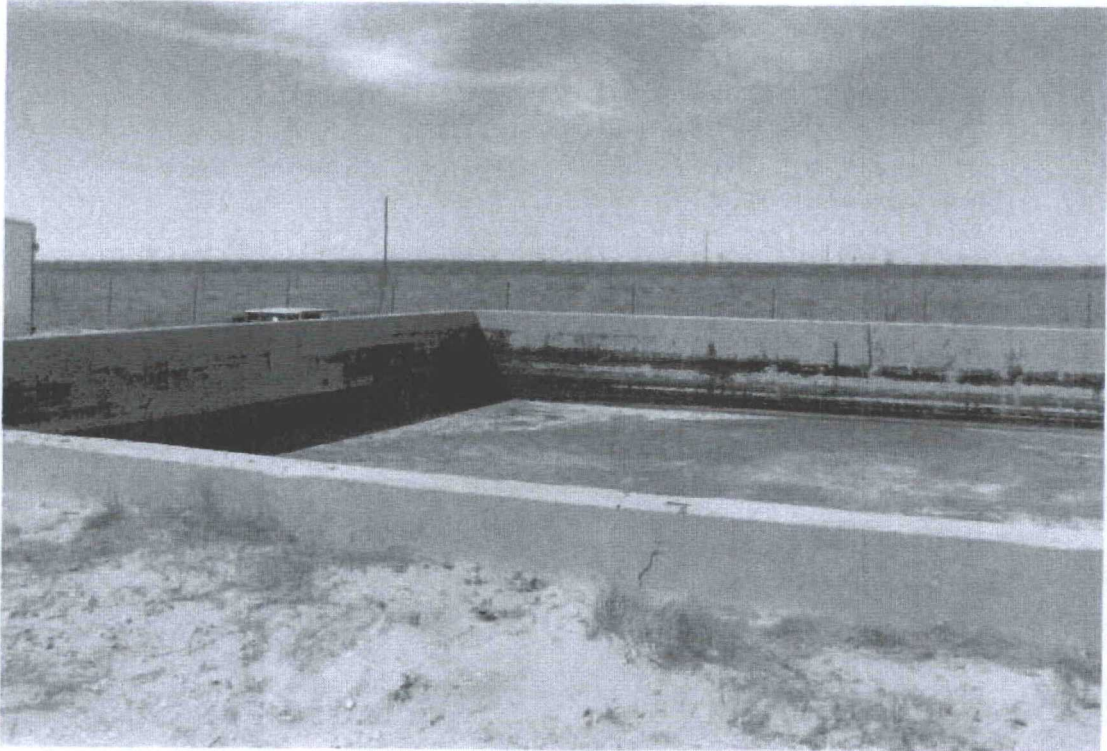
04-01-08 1:35

Arena Resources, Inc.
Humphrey Queen
Section 3, T-25-S, R-37-E
Lea County, New Mexico

CONFIRMATION SAMPLING PHOTOGRAPHS
TAKEN MARCH 31, 2008
Humphrey Queen



Arena Resources, Inc.
Humphrey Queen
Pit Closure Confirmation Sampling
Photos taken March 31, 2008



Arena Resources, Inc.
Humphrey Queen
Pit Closure Confirmation Sampling
Photos taken March 31, 2008



Appendix B

Sample Analysis-Lab Sheets

Report Date: August 28, 2008
094-1685-000

Work Order: 8082616
Humphrey Queen Pit Closure

Page Number: 1 of 2
New Mexico

Summary Report

Mike Hagan
Etech Environmental Safety

Report Date: August 28, 2008

P.O. Box 8469
Midland, TX, 79708

Work Order: 8082616



Project Location: New Mexico
Project Name: Humphrey Queen Pit Closure
Project Number: 094-1685-000

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
171816	HB-1 58-60	soil	2008-08-20	00:00	2008-08-26
171817	HB-2 55-60	soil	2008-08-20	00:00	2008-08-26
171818	HB-3 35-40	soil	2008-08-20	00:00	2008-08-26
171819	HB-3 45-50	soil	2008-08-20	00:00	2008-08-26
171820	HB-4 55-60	soil	2008-08-20	00:00	2008-08-26
171821	HB-5 45-50	soil	2008-08-20	00:00	2008-08-26
171822	HB-5 55-60	soil	2008-08-20	00:00	2008-08-26

Sample: 171816 - HB-1 58-60

Param	Flag	Result	Units	RL
Chloride		437	mg/Kg	2.00

Sample: 171817 - HB-2 55-60

Param	Flag	Result	Units	RL
Chloride		1220	mg/Kg	2.00

Sample: 171818 - HB-3 35-40

Param	Flag	Result	Units	RL
Chloride		231	mg/Kg	2.00

Report Date: August 28, 2008
094-1685-000

Work Order: 8082616
Humphrey Queen Pit Closure

Page Number: 2 of 2
New Mexico

Sample: 171819 - HB-3 45-50

Param	Flag	Result	Units	RL
Chloride		<100	mg/Kg	2.00

Sample: 171820 - HB-4 55-60

Param	Flag	Result	Units	RL
Chloride		903	mg/Kg	2.00

Sample: 171821 - HB-5 45-50

Param	Flag	Result	Units	RL
Chloride		280	mg/Kg	2.00

Sample: 171822 - HB-5 55-60

Param	Flag	Result	Units	RL
Chloride		<100	mg/Kg	2.00

TRACE ANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9
200 East Sunset Road, Suite E
5002 Basin Street, Suite A1
8808 Camp Bowie Blvd. West, Suite 180

Lubbock, Texas 79424 800•378•1296
El Paso, Texas 79922 888•588•3443
Midland, Texas 79703
Ft. Worth, Texas 76116

806•794•1296 FAX 806•794•1298
915•585•3443 FAX 915•585•4944
432•689•6301 FAX 432•689•6313
817•201•5260 FAX 817•560•4336

E-Mail: lab@traceanalysis.com

NELAP Certifications

Lubbock: T104704219-08-TX
LELAP-02003
Kansas E-10317

El Paso: T104704221-08-TX
LELAP-02002

Midland: T104704392-08-TX

Analytical and Quality Control Report

Mike Hagan
Etech Environmental Safety

Report Date: August 28, 2008

P.O. Box 8469
Midland, TX, 79708

Work Order: S082616



Project Location: New Mexico
Project Name: Humphrey Queen Pit Closure
Project Number: 094-1685-000

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
171816	HB-1 58-60	soil	2008-08-20	00:00	2008-08-26
171817	HB-2 55-60	soil	2008-08-20	00:00	2008-08-26
171818	HB-3 35-40	soil	2008-08-20	00:00	2008-08-26
171819	HB-3 45-50	soil	2008-08-20	00:00	2008-08-26
171820	HB-4 55-60	soil	2008-08-20	00:00	2008-08-26
171821	HB-5 45-50	soil	2008-08-20	00:00	2008-08-26
171822	HB-5 55-60	soil	2008-08-20	00:00	2008-08-26

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 7 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.


Dr. Blair Leftwich, Director

Standard Flags

B - The sample contains less than ten times the concentration found in the method blank.

Case Narrative

Samples for project Humphrey Queen Pit Closure were received by TraceAnalysis, Inc. on 2008-08-26 and assigned to work order 8082616. Samples for work order 8082616 were received intact at a temperature of 3.3 deg. C.

Samples were analyzed for the following tests using their respective methods.

Test	Method
Chloride (Titration)	SM 4500-Cl B

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 8082616 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Report Date: August 28, 2008
094-1685-000

Work Order: S082616
Humphrey Queen Pit Closure

Page Number: 4 of 7
New Mexico

Analytical Report

Sample: 171816 - HB-1 58-60

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2008-08-28	Analyzed By:	AR
QC Batch:	51882	Sample Preparation:	2008-08-28	Prepared By:	AR
Prep Batch:	44492				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		437	mg/Kg	50	2.00

Sample: 171817 - HB-2 55-60

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2008-08-28	Analyzed By:	AR
QC Batch:	51882	Sample Preparation:	2008-08-28	Prepared By:	AR
Prep Batch:	44492				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		1220	mg/Kg	50	2.00

Sample: 171818 - HB-3 35-40

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2008-08-28	Analyzed By:	AR
QC Batch:	51882	Sample Preparation:	2008-08-28	Prepared By:	AR
Prep Batch:	44492				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		231	mg/Kg	50	2.00

Sample: 171819 - HB-3 45-50

Laboratory:	Midland	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
Analysis:	Chloride (Titration)	Date Analyzed:	2008-08-28	Analyzed By:	AR
QC Batch:	51882	Sample Preparation:	2008-08-28	Prepared By:	AR
Prep Batch:	44492				

continued...

Report Date: August 28, 2008
094-1685-000

Work Order: 8082616
Humphrey Queen Pit Closure

Page Number: 5 of 7
New Mexico

sample 171819 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		<100	mg/Kg	50	2.00

Sample: 171820 - HB-4 55-60

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 51882

Prep Batch: 44492

Analytical Method: SM 4500-Cl B

Date Analyzed: 2008-08-28

Sample Preparation: 2008-08-28

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		903	mg/Kg	50	2.00

Sample: 171821 - HB-5 45-50

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 51882

Prep Batch: 44492

Analytical Method: SM 4500-Cl B

Date Analyzed: 2008-08-28

Sample Preparation: 2008-08-28

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		280	mg/Kg	50	2.00

Sample: 171822 - HB-5 55-60

Laboratory: Midland

Analysis: Chloride (Titration)

QC Batch: 51882

Prep Batch: 44492

Analytical Method: SM 4500-Cl B

Date Analyzed: 2008-08-28

Sample Preparation: 2008-08-28

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		<100	mg/Kg	50	2.00

Report Date: August 28, 2008
094-1685-000

Work Order: 8082616
Humphrey Queen Pit Closure

Page Number: 6 of 7
New Mexico

Method Blank (1) QC Batch: 51882

QC Batch: 51882
Prep Batch: 44492

Date Analyzed: 2008-08-28
QC Preparation: 2008-08-28

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Chloride		<0.500	mg/Kg	2

Laboratory Control Spike (LCS-1)

QC Batch: 51882
Prep Batch: 44492

Date Analyzed: 2008-08-28
QC Preparation: 2008-08-28

Analyzed By: AR
Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	98.6	mg/Kg	1	100	<0.500	99	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	99.1	mg/Kg	1	100	<0.500	99	85 - 115	0	20

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

Matrix Spike (MS-1) Spiked Sample: 171824

QC Batch: 51882
Prep Batch: 44492

Date Analyzed: 2008-08-28
QC Preparation: 2008-08-28

Analyzed By: AR
Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	5310	mg/Kg	50	5000	231	102	85 - 115

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	5340	mg/Kg	50	5000	231	102	85 - 115	1	20

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

Standard (ICV-1)

QC Batch: 51882

Date Analyzed: 2008-08-28

Analyzed By: AR

Report Date: August 28, 2008
094-1685-000

Work Order: 8082616
Humphrey Queen Pit Closure

Page Number: 7 of 7
New Mexico

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/Kg	100	99.4	99	85 - 115	2008-08-28

Standard (CCV-1)

QC Batch: 51882

Date Analyzed: 2008-08-28

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/Kg	100	100	100	85 - 115	2008-08-28

TraceAnalysis, Inc.

email: lab@traceanalysis.com

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El Paso, Texas 79922
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Fax (915) 585-4944
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Ft. Worth, Texas 76116
Tel (817) 201-5260
Fax (817) 560-4336

Company Name:	E-Tech	Phone #:	(432) 563-2200
Address:	(Street, City, Zip)	Fax #:	(432) 563-2213
Contact Person:	Mike Hagan	E-mail:	mike@etechenv.com
Invoice to:	(If different from above)		
Project #:	094-1L85-000	Project Name:	Humphrey Queen P. Closure
Project Location (including state):	New Mexico	Sampler Signatures:	[Signature]

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX				PRESERVATIVE METHOD				SAMPLING		DATE	TIME	Turn Around Time if different from standard	Hold
				WATER	SOIL	AIR	SLUDGE	HCl	HNO ₃	H ₂ SO ₄	NaOH	ICE	NONE				
171816	HB-1 58-60	1	4oz	X								X		8/20			
817	HB-2 55-60																
818	HB-3 35-40																
819	HB-3 45-50																
820	HB-4 55-60																
821	HB-5 45-50																
822	HB-5 55-60	1	4oz	X								X		8/20			

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp °C:
[Signature]	E-Tech	8/26/08	1327	[Signature]	Trace	8-26-08	13:27	3.3
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp °C:
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp °C:

LAB USE ONLY
 Inactive: ☒ N/A
 Headspace: ☒ N/A
 3.31°C
 Log-in Review
REMARKS:

All tests Midland

- ☐
- Dry Weight Basis Required
-
- ☐
- TRRP Report Required
-
- ☐
- Check if Special Reporting Limits Are Needed

Submission of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

Carrier # CARRY-10

ORIGINAL COPY

TraceAnalysis, Inc.

email: lab@traceanalysis.com

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1 (888) 588-3443

8808 Camp Bowie Blvd, West, Suite 180
Ft. Worth, Texas 76116
Tel (817) 201-5260
Fax (817) 560-4336

Company Name:	E-Tech	Phone #:	(432) 563-2200
Address:	(Street, City, Zip)	Fax #:	(432) 563-2213
Contact Person:	Mike Hagan	E-mail:	mike@etech.env.com

Invoice to:
(if different from above)

Project #: 094-1285-000

Project Location (including state):
New Mexico

Project Name: Humphrey Queen P4 Closure
 Sampler Signature: _____

ANALYSIS REQUEST
(Circle or Specify Method No.)

[illegible]

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp °C:
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Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp.:
	E-Tech	8/26/08	1327		Lindsey M. Trace	8-26-08	13:27	3.

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp °C:
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp °C:

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp °C:
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LAB USE ONLY

Intact Y N
 Headspace Y N NA
33
 Log-in-Review 1

REMARKS:

REMARKS: All tests Midland

- ☐ Dry Weight Basis Required
- ☐ TRRP Report Required
- ☐ Check If Special Reporting Limits Are Needed

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

Carrier # CARRY-ID

8/28 EP

ORIGINAL COPY

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Tel (817) 201-5260
Fax (817) 560-4336

Company Name: E. T. L.	Phone #: (487) 913-7700
Address: (Street, City, Zip)	Fax #: (487) 913-7700
Contact Person: A. K. H.	E-mail: a.k.h. @ e. t. l. . com
Invoice to: (If different from above)	
Project #: 09-1115-100	Project Name: Riverton Area - 1115-100
Project Location (including state): New Mexico	Sampler Signature: [Signature]

ANALYSIS REQUEST
(Circle or Specify Method No.)[illegible]

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp ^o c:
<i>[Signature]</i>	<i>[Signature]</i>	<i>11/1/00</i>	<i>1327</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>11/1/00</i>	<i>1327</i>	
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp ^o c:
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp ^o c:

LAB USE ONLY

Intact: Y / N
Headspace: Y / N / NA
Log-in: Review

REMARKS:

- ☐ Dry Weight Basis Required
- ☐ TRRP Report Required
- ☐ Check If Special Reporting Limits Are Needed

Field Analysis Sheet

Date: 7/30/2008 Client: Arena Resources

Site: Humphrey Queen Pit

Project Number: 094-1685-000

Technic: James Wilson

Contaminant: Chlorides

Sample ID		Milliliters of Sample Used	Dilution	AgNO ₃ 0.028(N)	Result (mg/kg)	Notations
ID	Depth					
SB-1	6	10	4	7.100	2819	
SB-1	9	10	4	6.800	2700	
SB-1	12	10	4	5.600	2223	
SB-2	6	10	4	8.800	3494	
SB-2	9	10	4	7.500	2978	
SB-2	12	10	4	5.500	2184	
SB-3	6	10	4	6.400	2541	
SB-3	9	10	4	2.500	993	
SB-3	12	10	4	2.400	953	
SB-4	6	10	4	4.300	1707	
SB-4	9	10	4	3.400	1350	
SB-4	12	10	4	3.800	1509	
SB-5	6	10	4	3.100	1231	
SB-5	9	10	4	2.900	1151	
SB-5	12	10	4	3.700	1469	
SB-6	6	10	4	2.300	913	
SB-6	9	10	4	3.400	1350	
SB-6	12	10	4	3.500	1390	
Center	6	10	4	2.800	1112	
Center	8	10	4	1.500	596	
Center	9	10	4	2.000	794	
Center	11	10	4	3.300	1310	
Center	13	10	4	3.200	1271	
		1	2		0	
		1	2		0	
		1	2		0	
		1	2		0	
		1	2		0	
		1	2		0	
		1	2		0	
		1	2		0	
		1	2		0	

F = (ml AgNO₃)(N)(35450)/ml. sample used

Soil Sample Volume: 10 Grams

Deionized Water Volume = 20 ml

Field Analysis Sheet

Date: 8/20/2008 **Client:** Arena

Site: Humphrey Queen

Project Number:

Technican: Johnny Tittsworth

Contaminant:

[illegible]
$$F = (\text{ml AgNO}_3)(N)(35450)/\text{ml. sample used}$$

Soil Sample Volume: 10 Grams

Deionized Water Volume = 20 ml

Field Analysis Sheet

Date: 8/20/2008 **Client:** Arena

Site: Humphrey Queen

Project Number: 094-1685-000

Technician: Johnny Titsworth

Contaminant: Chlorides:

[illegible]
$$F = (\text{ml AgNO}_3)(N)(35450)/\text{ml. sample used}$$

Soil Sample Volume: 10 Grams

Deionized Water Volume = 20 ml

Field Analysis Sheet

Date: 8/20/2008 Client: Arena

Site: humphrey Queen

Project Number: 094-1685-000

Technican: Johnny Tittsworth

Contaminant: Chlorides

[illegible]
$$F = (\text{ml AgNO}_3)(N)(35450)/\text{ml. sample used}$$

Soil Sample Volume: 10 Grams

Deionized Water Volume = 20 ml

Field Analysis Sheet

Date: 8/20/2008 **Client:** Arena

Site: Humphery Queen

Project Number: 094-1685-000

Technican: Johnny Titsworth

Contaminant: Chlorides

[illegible]
$$F = (\text{ml AgNO}_3)(N)(35450)/\text{ml. sample used}$$

Soil Sample Volume: 10 Grams

Deionized Water Volume = 20 ml

Field Analysis Sheet

Date: 8/20/2008 **Client:** Arena

Site: Humphrey Queen

Project Number: 094-1685-000

Technician: Johnny Titsworth

Contaminant: Chlorides

[illegible]
$$F = (\text{ml AgNO}_3)(N)(35450)/\text{ml. sample used}$$

Soil Sample Volume: 10 Grams

Deionized Water Volume = 20 ml

Field Analysis Sheet

Date: 8/21/2008 Client: Arena

Site: Langlie Mattix

Project Number: 094-1690-000

Technican: Johnny Titsworth

Contaminant: Chlorides

[illegible]
$$F = (\text{ml AgNO}_3)(N)(35450)/\text{ml. sample used}$$

Soil Sample Volume: 10 Grams

Deionized Water Volume = 20 ml

Field Analysis Sheet

Date: 8/21/2008 **Client:** Arena

Site: Langlie Mattix

Project Number: 094-1690-000

Technician: Johnny Titsworth.

Contaminant: Chlorides

[illegible]
$$F = (\text{ml AgNO}_3)(N)(35450)/\text{ml. sample used}$$

Soil Sample Volume: 10 Grams

Deionized Water Volume = 20 ml

Field Analysis Sheet

Date: 8/21/2008 Client: Arena

Site: Langlie Mattix

Project Number: 094-1690-000

Technician: Johnny Titsworth

Contaminant: Chlorides

[illegible]
$$F = (\text{ml AgNO}_3)(N)(35450)/\text{ml. sample used}$$

Soil Sample Volume: 10 Grams

Deionized Water Volume = 20 ml

Field Analysis Sheet

Date: 8/21/2008 **Client:** Arena

Site: Langlie Matix

Project Number: 094-1690-000

Technician: Johnny Tittsworth

Contaminant: Chlorides

[illegible]
$$F = (\text{ml AgNO}_3)(N)(35450)/\text{ml. sample used}$$

Soil Sample Volume: 10 Grams

Deionized Water Volume = 20 ml

Field Analysis Sheet

Date: 8/21/2008 **Client:** Arena

Site: Langlie Matix

Project Number: 094-1690-00

Technician: Johnny Tittsworth

Contaminant: Chlorides

[illegible]
$$F = (\text{ml AgNO}_3)(N)(35450)/\text{ml. sample used}$$

Soil Sample Volume: 10 Grams

Deionized Water Volume = 20 ml

Summary Report

Mike Hagan
Etech Environmental Safety

Report Date: September 22, 2008

P.O. Box 8469
Midland, TX, 79708

Work Order: 8090230

Project Location: NE Jal, NM
Project Name: Humphrey-Queen

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
172503	Seyler Well	water	2008-08-29	10:42	2008-09-02
172504	Willis Well	water	2008-08-29	10:20	2008-09-02

Sample: 172503 - Seyler Well

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1.00
Bicarbonate Alkalinity		167	mg/L as CaCo3	4.00
Total Alkalinity		167	mg/L as CaCo3	4.00
Dissolved Calcium		396	mg/L	1.00
Chloride		1020	mg/L	0.500
Fluoride		<1.00	mg/L	0.200
Dissolved Potassium		10.6	mg/L	1.00
Dissolved Magnesium		127	mg/L	1.00
Dissolved Sodium		363	mg/L	1.00
Nitrate-N		15.2	mg/L	0.200
Sulfate		1160	mg/L	0.500

TDS = 2,274

Sample: 172504 - Willis Well

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1.00
Bicarbonate Alkalinity		217	mg/L as CaCo3	4.00

continued ...

sample 172504 continued

Param	Flag	Result	Units	RL
Total Alkalinity		217	mg/L as CaCo3	4.00
Dissolved Calcium		149	mg/L	1.00
Chloride		273	mg/L	0.500
Fluoride		2.01	mg/L	0.200
Dissolved Potassium		6.31	mg/L	1.00
Dissolved Magnesium		43.1	mg/L	1.00
Dissolved Sodium		160	mg/L	1.00
Nitrate-N		3.12	mg/L	0.200
Sulfate		253	mg/L	0.500

TDS 1324

TRACE ANALYSIS, INC.

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FAX 432•689•6313

FAX 817•560•4336

E-Mail: lab@traceanalysis.com

Certifications

WBENC: 237019

HUB: 1752439743100-86536

DBE: VN 20657

NCTRCA WFWB38444Y0909

NELAP Certifications

Lubbock: T104704219-08-TX

El Paso: T104704221-08-TX

Midland: T104704392-08-TX

LELAP-02003

LELAP-02002

Kansas E-10317

Analytical and Quality Control Report

Mike Hagan

Etech Environmental Safety

Report Date: September 22, 2008

P.O. Box 8469

Midland, TX 79708

Work Order: 8090230



Project Location: NE Jal, NM

Project Name: Humphrey-Queen

Project Number: Humphrey-Queen

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

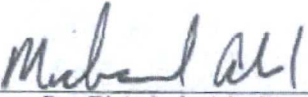
Sample	Description	Matrix	Date Taken	Time Taken	Date Received
172503	Seyler Well	water	2008-08-29	10:42	2008-09-02
172504	Willis Well	water	2008-08-29	10:20	2008-09-02

NOTE

Work Order 8090230: Nitrate relieved out of hold time.

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 25 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.


Dr. Blair Leftwich, Director

Standard Flags

B - The sample contains less than ten times the concentration found in the method blank.

Case Narrative

Samples for project Humphrey-Queen were received by TraceAnalysis, Inc. on 2008-09-02 and assigned to work order 8090230. Samples for work order 8090230 were received intact at a temperature of 4.0 deg. C.

Samples were analyzed for the following tests using their respective methods.

Test	Method
Alkalinity	SM 2320B
Ca, Dissolved	S 6010B
Chloride (IC)	E 300.0
Fluoride (IC)	E 300.0
K, Dissolved	S 6010B
Mg, Dissolved	S 6010B
Na, Dissolved	S 6010B
NO3 (IC)	E 300.0
SO4 (IC)	E 300.0

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 8090230 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 4 of 25
NE Jal, NM

Analytical Report

Sample: 172503 - Seyler Well

Laboratory:	Midland	Analytical Method:	SM 2320B	Prep Method:	N/A
Analysis:	Alkalinity	Date Analyzed:	2008-09-05	Analyzed By:	AR
QC Batch:	52104	Sample Preparation:	2008-09-05	Prepared By:	AR
Prep Batch:	44671				

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Bicarbonate Alkalinity		167	mg/L as CaCo3	1	4.00
Total Alkalinity		167	mg/L as CaCo3	1	4.00

Sample: 172503 - Seyler Well

Laboratory:	Lubbock	Analytical Method:	S 6010B	Prep Method:	S 3005A
Analysis:	Ca, Dissolved	Date Analyzed:	2008-09-08	Analyzed By:	TP
QC Batch:	52186	Sample Preparation:	2008-09-05	Prepared By:	KV
Prep Batch:	44670				

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		396	mg/L	10	1.00

Sample: 172503 - Seyler Well

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Chloride (IC)	Date Analyzed:	2008-09-03	Analyzed By:	AR
QC Batch:	52009	Sample Preparation:	2008-09-03	Prepared By:	AR
Prep Batch:	44594				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		1020	mg/L	100	0.500

Sample: 172503 - Seyler Well

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Fluoride (IC)	Date Analyzed:	2008-09-03	Analyzed By:	AR
QC Batch:	52009	Sample Preparation:	2008-09-03	Prepared By:	AR
Prep Batch:	44594				

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 5 of 25
NE Jal, NM

Parameter	Flag	RL Result	Units	Dilution	RL
Fluoride		<1.00	mg/L	5	0.200

Sample: 172503 - Seyler Well

Laboratory: Lubbock

Analysis: K, Dissolved

QC Batch: 52186

Prep Batch: 44670

Analytical Method: S 6010B

Date Analyzed: 2008-09-08

Sample Preparation: 2008-09-05

Prep Method: S 3005A

Analyzed By: TP

Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Potassium		10.6	mg/L	1	1.00

Sample: 172503 - Seyler Well

Laboratory: Lubbock

Analysis: Mg, Dissolved

QC Batch: 52186

Prep Batch: 44670

Analytical Method: S 6010B

Date Analyzed: 2008-09-08

Sample Preparation: 2008-09-05

Prep Method: S 3005A

Analyzed By: TP

Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Magnesium		127	mg/L	1	1.00

Sample: 172503 - Seyler Well

Laboratory: Lubbock

Analysis: Na, Dissolved

QC Batch: 52186

Prep Batch: 44670

Analytical Method: S 6010B

Date Analyzed: 2008-09-08

Sample Preparation: 2008-09-05

Prep Method: S 3005A

Analyzed By: TP

Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Sodium		363	mg/L	10	1.00

Sample: 172503 - Seyler Well

Laboratory: Midland

Analysis: NO3 (IC)

QC Batch: 52009

Prep Batch: 44594

Analytical Method: E 300.0

Date Analyzed: 2008-09-03

Sample Preparation: 2008-09-03

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 6 of 25
NE Jal, NM

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		15.2	mg/L	5	0.200

Sample: 172503 - Seyler Well

Laboratory: Midland
Analysis: SO4 (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 52009 Date Analyzed: 2008-09-03 Analyzed By: AR
Prep Batch: 44594 Sample Preparation: 2008-09-03 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		1160	mg/L	100	0.500

Sample: 172504 - Willis Well

Laboratory: Midland
Analysis: Alkalinity Analytical Method: SM 2320B Prep Method: N/A
QC Batch: 52104 Date Analyzed: 2008-09-05 Analyzed By: AR
Prep Batch: 44671 Sample Preparation: 2008-09-05 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Bicarbonate Alkalinity		217	mg/L as CaCo3	1	4.00
Total Alkalinity		217	mg/L as CaCo3	1	4.00

Sample: 172504 - Willis Well

Laboratory: Lubbock
Analysis: Ca, Dissolved Analytical Method: S 6010B Prep Method: S 3005A
QC Batch: 52185 Date Analyzed: 2008-09-08 Analyzed By: TP
Prep Batch: 44670 Sample Preparation: 2008-09-05 Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		149	mg/L	1	1.00

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 7 of 25
NE Jal, NM

Sample: 172504 - Willis Well

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Chloride (IC)	Date Analyzed:	2008-09-03	Analyzed By:	AR
QC Batch:	52009	Sample Preparation:	2008-09-03	Prepared By:	AR
Prep Batch:	44594				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		273	mg/L	10	0.500

Sample: 172504 - Willis Well

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Fluoride (IC)	Date Analyzed:	2008-09-03	Analyzed By:	AR
QC Batch:	52009	Sample Preparation:	2008-09-03	Prepared By:	AR
Prep Batch:	44594				

Parameter	Flag	RL Result	Units	Dilution	RL
Fluoride		2.01	mg/L	5	0.200

Sample: 172504 - Willis Well

Laboratory:	Lubbock	Analytical Method:	S 6010B	Prep Method:	S 3005A
Analysis:	K, Dissolved	Date Analyzed:	2008-09-08	Analyzed By:	TP
QC Batch:	52185	Sample Preparation:	2008-09-05	Prepared By:	KV
Prep Batch:	44670				

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Potassium		6.31	mg/L	1	1.00

Sample: 172504 - Willis Well

Laboratory:	Lubbock	Analytical Method:	S 6010B	Prep Method:	S 3005A
Analysis:	Mg, Dissolved	Date Analyzed:	2008-09-08	Analyzed By:	TP
QC Batch:	52185	Sample Preparation:	2008-09-05	Prepared By:	KV
Prep Batch:	44670				

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Magnesium		43.1	mg/L	1	1.00

Report Date: September 22, 2008
Humphrey-Queen

Work Order: S090230
Humphrey-Queen

Page Number: 8 of 25
NE Jal, NM

Sample: 172504 - Willis Well

Laboratory:	Lubbock	Analytical Method:	S 6010B	Prep Method:	S 3005A
Analysis:	Na, Dissolved	Date Analyzed:	2008-09-08	Analyzed By:	TP
QC Batch:	52185	Sample Preparation:	2008-09-05	Prepared By:	KV
Prep Batch:	44670				

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Sodium		160	mg/L	1	1.00

Sample: 172504 - Willis Well

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	NO3 (IC)	Date Analyzed:	2008-09-03	Analyzed By:	AR
QC Batch:	52009	Sample Preparation:	2008-09-03	Prepared By:	AR
Prep Batch:	44594				

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		3.12	mg/L	5	0.200

Sample: 172504 - Willis Well

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	SO4 (IC)	Date Analyzed:	2008-09-03	Analyzed By:	AR
QC Batch:	52009	Sample Preparation:	2008-09-03	Prepared By:	AR
Prep Batch:	44594				

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		253	mg/L	10	0.500

Method Blank (1) QC Batch: 52009

QC Batch:	52009	Date Analyzed:	2008-09-03	Analyzed By:	AR
Prep Batch:	44594	QC Preparation:	2008-09-03	Prepared By:	AR

Parameter	Flag	MDL Result	Units	RL
Chloride		<0.172	mg/L	0.5

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 9 of 25
NE Job NM

Method Blank (1) QC Batch: 52009

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Fluoride		<0.199	mg/L	0.2

Method Blank (1) QC Batch: 52009

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Nitrate-N		<0.0120	mg/L	0.2

Method Blank (1) QC Batch: 52009

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Sulfate		<0.0320	mg/L	0.5

Method Blank (1) QC Batch: 52104

QC Batch: 52104
Prep Batch: 44671

Date Analyzed: 2008-09-05
QC Preparation: 2008-09-05

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1
Bicarbonate Alkalinity		<4.00	mg/L as CaCO3	4
Total Alkalinity		<4.00	mg/L as CaCO3	4

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 10 of 25
NE-Jal, NM

Method Blank (1) QC Batch: 52185

QC Batch: 52185 Date Analyzed: 2008-09-08 Analyzed By: TP
Prep Batch: 44670 QC Preparation: 2008-09-05 Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Calcium		<0.175	mg/L	1

Method Blank (1) QC Batch: 52185

QC Batch: 52185 Date Analyzed: 2008-09-08 Analyzed By: TP
Prep Batch: 44670 QC Preparation: 2008-09-05 Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Potassium		<0.327	mg/L	1

Method Blank (1) QC Batch: 52185

QC Batch: 52185 Date Analyzed: 2008-09-08 Analyzed By: TP
Prep Batch: 44670 QC Preparation: 2008-09-05 Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Magnesium		<0.148	mg/L	1

Method Blank (1) QC Batch: 52185

QC Batch: 52185 Date Analyzed: 2008-09-08 Analyzed By: TP
Prep Batch: 44670 QC Preparation: 2008-09-05 Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Sodium		<0.244	mg/L	1

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 11 of 25
NE-Jal, NM

Method Blank (1) QC Batch: 52186

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Calcium		<0.175	mg/L	1

Method Blank (1) QC Batch: 52186

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Potassium		<0.327	mg/L	1

Method Blank (1) QC Batch: 52186

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Magnesium		<0.148	mg/L	1

Method Blank (1) QC Batch: 52186

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Sodium		<0.244	mg/L	1

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 12 of 25
NE Jal, NM

Duplicates (1)

QC Batch: 52104
Prep Batch: 44671

Date Analyzed: 2008-09-05
QC Preparation: 2008-09-05

Analyzed By: AR
Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity	<1.00	<1.00	mg/L as CaCO3	1	0	20
Carbonate Alkalinity	<1.00	<1.00	mg/L as CaCO3	1	0	20
Bicarbonate Alkalinity	85.0	88.0	mg/L as CaCO3	1	4	20
Total Alkalinity	85.0	88.0	mg/L as CaCO3	1	4	20

Laboratory Control Spike (LCS-1)

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	11.3	mg/L	1	12.5	<0.172	90	90 - 110

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

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	11.3	mg/L	1	12.5	<0.172	90	90 - 110	0	

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

Laboratory Control Spike (LCS-1)

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Fluoride	2.30	mg/L	1	2.50	<0.199	92	90 - 110

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

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Fluoride	2.37	mg/L	1	2.50	<0.199	95	90 - 110	3	

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

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 13 of 25
NE Jal, NM

Laboratory Control Spike (LCS-1)

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Nitrate-N	2.26	mg/L	1	2.50	<0.0120	90	90 - 110

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Nitrate-N	2.26	mg/L	1	2.50	<0.0120	90	90 - 110	0	

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

Laboratory Control Spike (LCS-1)

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Sulfate	11.2	mg/L	1	12.5	<0.0320	90	90 - 110

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Sulfate	11.2	mg/L	1	12.5	<0.0320	90	90 - 110	0	

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

Laboratory Control Spike (LCS-1)

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	49.6	mg/L	1	50.0	<0.175	99	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	49.4	mg/L	1	50.0	<0.175	99	85 - 115	0	20

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

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 14 of 25
NE Jal, NM

Laboratory Control Spike (LCS-1)

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	49.4	mg/L	1	50.0	<0.327	99	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	49.2	mg/L	1	50.0	<0.327	98	85 - 115	0	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Magnesium	48.6	mg/L	1	50.0	<0.148	97	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Magnesium	48.2	mg/L	1	50.0	<0.148	96	85 - 115	1	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	50.1	mg/L	1	50.0	<0.244	100	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	49.2	mg/L	1	50.0	<0.244	98	85 - 115	2	20

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

Report Date: September 22, 2008
Humphrey-Queen

Work Order: S090230
Humphrey-Queen

Page Number: 15 of 25
NE Jal, NM

Laboratory Control Spike (LCS-1)

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	49.6	mg/L	1	50.0	<0.175	99	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	49.4	mg/L	1	50.0	<0.175	99	85 - 115	0	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	49.4	mg/L	1	50.0	<0.327	99	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	49.2	mg/L	1	50.0	<0.327	98	85 - 115	0	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Magnesium	48.6	mg/L	1	50.0	<0.148	97	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Magnesium	48.2	mg/L	1	50.0	<0.148	96	85 - 115	1	20

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

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 16 of 25
NE Jal, NM

Laboratory Control Spike (LCS-1)

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	50.1	mg/L	1	50.0	<0.244	100	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	49.2	mg/L	1	50.0	<0.244	98	85 - 115	2	20

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	329	mg/L	5	62.5	280	78	90 - 110

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	328	mg/L	5	62.5	280	77	90 - 110	0	

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Fluoride	11.7	mg/L	5	12.5	2	78	90 - 110

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

¹ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

² Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

³ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 17 of 25
NE Jal, NM

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Fluoride	11.7	mg/L	5	12.5	2	78	90 - 110	0	

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Nitrate-N	14.4	mg/L	5	12.5	3.1	90	90 - 110

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Nitrate-N	14.3	mg/L	5	12.5	3.1	90	90 - 110	1	

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Sulfate	307	mg/L	5	62.5	263	70	90 - 110

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Sulfate	308	mg/L	5	62.5	263	72	90 - 110	0	

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

^aMatrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

^bMatrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

^cMatrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

^dMatrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 18 of 25
NE Jal, NM

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	194	mg/L	1	50.0	149	90	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	191	mg/L	1	50.0	149	84	75 - 125	2	20

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	55.9	mg/L	1	50.0	6.31	99	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	56.2	mg/L	1	50.0	6.31	100	75 - 125	0	20

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Magnesium	91.0	mg/L	1	50.0	43.1	96	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Magnesium	91.8	mg/L	1	50.0	43.1	97	75 - 125	1	20

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 19 of 25
NE Jal, NM

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	204	mg/L	1	50.0	160	88	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	202	mg/L	1	50.0	160	84	75 - 125	1	20

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

Matrix Spike (MS-1) Spiked Sample: 172503

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	443	mg/L	1	50.0	396	94	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	434	mg/L	1	50.0	396	76	75 - 125	2	20

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

Matrix Spike (MS-1) Spiked Sample: 172503

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	60.4	mg/L	1	50.0	10.6	100	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	61.4	mg/L	1	50.0	10.6	102	75 - 125	2	20

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

Matrix Spike (MS-1) Spiked Sample: 172503

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 20 of 25
NE Jal, NM

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Magnesium	173	mg/L	1	50.0	127	92	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Magnesium	176	mg/L	1	50.0	127	98	75 - 125	2	20

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

Matrix Spike (MS-1) Spiked Sample: 172503

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	408	mg/L	1	50.0	363	90	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	412	mg/L	1	50.0	363	98	75 - 125	1	20

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

Standard (ICV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.2	90	90 - 110	2008-09-03

Standard (ICV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Fluoride		mg/L	2.50	2.43	97	90 - 110	2008-09-03

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 21 of 25
NE Jal, NM

Standard (ICV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.27	91	90 - 110	2008-09-03

Standard (ICV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	11.2	90	90 - 110	2008-09-03

Standard (CCV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.3	90	90 - 110	2008-09-03

Standard (CCV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Fluoride		mg/L	2.50	2.38	95	90 - 110	2008-09-03

Standard (CCV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.26	90	90 - 110	2008-09-03

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 22 of 25
NE Jal. NM

Standard (CCV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	11.3	90	90 - 110	2008-09-03

Standard (ICV-1)

QC Batch: 52104

Date Analyzed: 2008-09-05

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0.00	<1.00		0 - 200	2008-09-05
Carbonate Alkalinity		mg/L as CaCo3	0.00	248		0 - 200	2008-09-05
Bicarbonate Alkalinity		mg/L as CaCo3	0.00	5.00		0 - 200	2008-09-05
Total Alkalinity		mg/L as CaCo3	250	253	101	90 - 110	2008-09-05

Standard (CCV-1)

QC Batch: 52104

Date Analyzed: 2008-09-05

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0.00	2.00		0 - 200	2008-09-05
Carbonate Alkalinity		mg/L as CaCo3	0.00	252		0 - 200	2008-09-05
Bicarbonate Alkalinity		mg/L as CaCo3	0.00	<4.00		0 - 200	2008-09-05
Total Alkalinity		mg/L as CaCo3	250	254	102	90 - 110	2008-09-05

Standard (ICV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	51.2	102	90 - 110	2008-09-08

Standard (ICV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 23 of 25
NE Jal, NM

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Potassium		mg/L	50.0	50.3	101	90 - 110	2008-09-08

Standard (ICV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Magnesium		mg/L	50.0	51.5	103	90 - 110	2008-09-08

Standard (ICV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		mg/L	50.0	51.5	103	90 - 110	2008-09-08

Standard (CCV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	49.8	100	90 - 110	2008-09-08

Standard (CCV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Potassium		mg/L	50.0	49.4	99	90 - 110	2008-09-08

Standard (CCV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

TraceAnalysis, Inc.

email: lab@traceanalysis.com

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Company Name:	Etech Env.	Phone #:	432/ 563 - 2200
Address:	(Street, City, Zip) P.O. Box 8469, Midland, TX 79708	Fax #:	432/ 563 2213
Contact Person:	Mike Itagan	E-mail:	mike@etechenv.com

Invoice to:	
(If different from above)	
Project #:	Project Name:

Project Location (including state): NE Jal, NM Sampler Signature: [Signature]

ANALYSIS REQUEST
(Circle or Specify Method No.)[illegible]

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp °C:
W. L. H.	Excal	9-2-08	13:57	L. L. H.	Trace	9-2-08	13:57	40

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp °C:
Lindsey Wilson	Travis	9-2-08	17:00					

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp°:
				<i>[Signature]</i>		09/08/08	0945	3.1

LAB USE ONLY

Intact Y / N
Headspace Y / N / NA
40
Log-in-Review

REMARKS:

Ca, K, Mg, Na - Cations - Lubbock
Alkalinity, Cl, F, NO₃, SO₄ - Anions -
Dry Weight Basis Required

- ☐ Dry Weight Basis Required
- ☐ TRRP Report Required
- ☐ Check If Special Reporting Limits Are Needed

9/22 ET

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

Carrier # CARRY-IN / LSP3114027

ORIGINAL COPY

Cation-Anion Balance Sheet

DATE: 9/22/2008

Sample #	Calcium ppm	Magnesium ppm	Sodium ppm	Potassium ppm	Alkalinity ppm	Sulfate ppm	Chloride ppm	Nitrate ppm	Fluoride ppm	Bromide ppm	TDS ppm	EC µMHOS/cm
172503	396	127	363	10.6	167	1160	1020	15.2	0			
172504	149	43.1	160	8.91	217	253	273	3.12	2.01			

Sample #	Calcium in meq/L	Magnesium in meq/L	Sodium in meq/L	Potassium in meq/L	Alkalinity in meq/L	Sulfate in meq/L	Chloride in meq/L	Nitrate in meq/L	Fluoride in meq/L	Bromide in meq/L	Cations in meq/L	Anions in meq/L	Percentage Error
172503	19.76	10.45	15.79	0.27	3.34	24.15	28.77	1.085128	0	0	46.27	57.35	21.38059426
172504	7.44	3.55	6.96	0.16	4.34	5.27	7.70	0.2227368	0.1058064	0	18.10	17.64	2.606986786

TRACE ANALYSIS, INC.

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 7115 Equity Parkway, Suite 110 • El Paso, Texas 79907 • (917) 300-6260

Certifications

WBENC: 237019 **HUB:** 1752439743100-86536 **DBE:** VN 20657
NCTRCA WFWB38444Y0909

NELAP Certifications

Lubbock: T104704219-08-TX **El Paso:** T104704221-08-TX **Midland:** T104704392-08-TX
 LELAP-02003 LELAP-02002
 Kansas E-10317

Analytical and Quality Control Report

Mike Hagan
 Etch Environmental Safety

Report Date: September 22, 2008

P.O. Box 8469
 Midland, TX, 79708

Work Order: 8090230



Project Location: NE Jal, NM
 Project Name: Humphrey-Queen
 Project Number: Humphrey-Queen

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
172503	Seyler Well	water	2008-08-29	10:42	2008-09-02
172504	Willis Well	water	2008-08-29	10:20	2008-09-02

NOTE

Work Order 8090230: Nitrate recieved out of hold time.

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 25 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

A handwritten signature in black ink, appearing to read "Michael Abel".

Dr. Blair Leftwich, Director

Standard Flags

B - The sample contains less than ten times the concentration found in the method blank.

Case Narrative

Samples for project Humphrey-Queen were received by TraceAnalysis, Inc. on 2008-09-02 and assigned to work order 8090230. Samples for work order 8090230 were received intact at a temperature of 4.0 deg. C.

Samples were analyzed for the following tests using their respective methods.

Test	Method
Alkalinity	SM 2320B
Ca, Dissolved	S 6010B
Chloride (IC)	E 300.0
Fluoride (IC)	E 300.0
K, Dissolved	S 6010B
Mg, Dissolved	S 6010B
Na, Dissolved	S 6010B
NO3 (IC)	E 300.0
SO4 (IC)	E 300.0

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 8090230 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 4 of 25
NE Jal, NM

Analytical Report

Sample: 172503 - Seyler Well

Laboratory:	Midland	Analytical Method:	SM 2320B	Prep Method:	N/A
Analysis:	Alkalinity	Date Analyzed:	2008-09-05	Analyzed By:	AR
QC Batch:	52104	Sample Preparation:	2008-09-05	Prepared By:	AR
Prep Batch:	44671				

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Bicarbonate Alkalinity		167	mg/L as CaCo3	1	4.00
Total Alkalinity		167	mg/L as CaCo3	1	4.00

Sample: 172503 - Seyler Well

Laboratory:	Lubbock	Analytical Method:	S 6010B	Prep Method:	S 3005A
Analysis:	Ca, Dissolved	Date Analyzed:	2008-09-08	Analyzed By:	TP
QC Batch:	52186	Sample Preparation:	2008-09-05	Prepared By:	KV
Prep Batch:	44670				

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		396	mg/L	10	1.00

Sample: 172503 - Seyler Well

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Chloride (IC)	Date Analyzed:	2008-09-03	Analyzed By:	AR
QC Batch:	52009	Sample Preparation:	2008-09-03	Prepared By:	AR
Prep Batch:	44594				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		1020	mg/L	100	0.500

Sample: 172503 - Seyler Well

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Fluoride (IC)	Date Analyzed:	2008-09-03	Analyzed By:	AR
QC Batch:	52009	Sample Preparation:	2008-09-03	Prepared By:	AR
Prep Batch:	44594				

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 5 of 25
NE Jal, NM

Parameter	Flag	RL Result	Units	Dilution	RL
Fluoride		<1.00	mg/L	5	0.200

Sample: 172503 - Seyler Well

Laboratory: Lubbock
Analysis: K, Dissolved
QC Batch: 52186
Prep Batch: 44670

Analytical Method: S 6010B
Date Analyzed: 2008-09-08
Sample Preparation: 2008-09-05

Prep Method: S 3005A
Analyzed By: TP
Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Potassium		10.6	mg/L	1	1.00

Sample: 172503 - Seyler Well

Laboratory: Lubbock
Analysis: Mg, Dissolved
QC Batch: 52186
Prep Batch: 44670

Analytical Method: S 6010B
Date Analyzed: 2008-09-08
Sample Preparation: 2008-09-05

Prep Method: S 3005A
Analyzed By: TP
Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Magnesium		127	mg/L	1	1.00

Sample: 172503 - Seyler Well

Laboratory: Lubbock
Analysis: Na, Dissolved
QC Batch: 52186
Prep Batch: 44670

Analytical Method: S 6010B
Date Analyzed: 2008-09-08
Sample Preparation: 2008-09-05

Prep Method: S 3005A
Analyzed By: TP
Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Sodium		363	mg/L	10	1.00

Sample: 172503 - Seyler Well

Laboratory: Midland
Analysis: NO3 (IC)
QC Batch: 52009
Prep Batch: 44594

Analytical Method: E 300.0
Date Analyzed: 2008-09-03
Sample Preparation: 2008-09-03

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 6 of 25
NE Jal, NM

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		15.2	mg/L	5	0.200

Sample: 172503 - Seyler Well

Laboratory: Midland
Analysis: SO4 (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 52009 Date Analyzed: 2008-09-03 Analyzed By: AR
Prep Batch: 44594 Sample Preparation: 2008-09-03 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		1160	mg/L	100	0.500

Sample: 172504 - Willis Well

Laboratory: Midland
Analysis: Alkalinity Analytical Method: SM 2320B Prep Method: N/A
QC Batch: 52104 Date Analyzed: 2008-09-05 Analyzed By: AR
Prep Batch: 44671 Sample Preparation: 2008-09-05 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Bicarbonate Alkalinity		217	mg/L as CaCO3	1	4.00
Total Alkalinity		217	mg/L as CaCO3	1	4.00

Sample: 172504 - Willis Well

Laboratory: Lubbock
Analysis: Ca, Dissolved Analytical Method: S 6010B Prep Method: S 3005A
QC Batch: 52185 Date Analyzed: 2008-09-08 Analyzed By: TP
Prep Batch: 44670 Sample Preparation: 2008-09-05 Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		149	mg/L	1	1.00

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 7 of 25
NE Jal, NM

Sample: 172504 - Willis Well

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Chloride (IC)	Date Analyzed:	2008-09-03	Analyzed By:	AR
QC Batch:	52009	Sample Preparation:	2008-09-03	Prepared By:	AR
Prep Batch:	44594				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		273	mg/L	10	0.500

Sample: 172504 - Willis Well

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Fluoride (IC)	Date Analyzed:	2008-09-03	Analyzed By:	AR
QC Batch:	52009	Sample Preparation:	2008-09-03	Prepared By:	AR
Prep Batch:	44594				

Parameter	Flag	RL Result	Units	Dilution	RL
Fluoride		2.01	mg/L	5	0.200

Sample: 172504 - Willis Well

Laboratory:	Lubbock	Analytical Method:	S 6010B	Prep Method:	S 3005A
Analysis:	K, Dissolved	Date Analyzed:	2008-09-08	Analyzed By:	TP
QC Batch:	52185	Sample Preparation:	2008-09-05	Prepared By:	KV
Prep Batch:	44670				

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Potassium		6.31	mg/L	1	1.00

Sample: 172504 - Willis Well

Laboratory:	Lubbock	Analytical Method:	S 6010B	Prep Method:	S 3005A
Analysis:	Mg, Dissolved	Date Analyzed:	2008-09-08	Analyzed By:	TP
QC Batch:	52185	Sample Preparation:	2008-09-05	Prepared By:	KV
Prep Batch:	44670				

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Magnesium		43.1	mg/L	1	1.00

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 8 of 25
NE Jal, NM

Sample: 172504 - Willis Well

Laboratory: Lubbock
Analysis: Na, Dissolved
QC Batch: 52185
Prep Batch: 44670

Analytical Method: S 6010B
Date Analyzed: 2008-09-08
Sample Preparation: 2008-09-05

Prep Method: S 3005A
Analyzed By: TP
Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Sodium		160	mg/L	1	1.00

Sample: 172504 - Willis Well

Laboratory: Midland
Analysis: NO3 (IC)
QC Batch: 52009
Prep Batch: 44594

Analytical Method: E 300.0
Date Analyzed: 2008-09-03
Sample Preparation: 2008-09-03

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		3.12	mg/L	5	0.200

Sample: 172504 - Willis Well

Laboratory: Midland
Analysis: SO4 (IC)
QC Batch: 52009
Prep Batch: 44594

Analytical Method: E 300.0
Date Analyzed: 2008-09-03
Sample Preparation: 2008-09-03

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		253	mg/L	10	0.500

Method Blank (1) QC Batch: 52009

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Chloride		<0.172	mg/L	0.5

Report Date: September 22, 2008
Humphrey-Queen

Work Order: S090230
Humphrey-Queen

Page Number: 9 of 25
NE Jal, NM

Method Blank (1) QC Batch: 52009

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Fluoride		<0.199	mg/L	0.2

Method Blank (1) QC Batch: 52009

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Nitrate-N		<0.0120	mg/L	0.2

Method Blank (1) QC Batch: 52009

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Sulfate		<0.0320	mg/L	0.5

Method Blank (1) QC Batch: 52104

QC Batch: 52104
Prep Batch: 44671

Date Analyzed: 2008-09-05
QC Preparation: 2008-09-05

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1
Bicarbonate Alkalinity		<4.00	mg/L as CaCO3	4
Total Alkalinity		<4.00	mg/L as CaCO3	4

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 10 of 25
NE Jal, NM

Method Blank (1) QC Batch: 52185

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Calcium		<0.175	mg/L	1

Method Blank (1) QC Batch: 52185

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Potassium		<0.327	mg/L	1

Method Blank (1) QC Batch: 52185

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Magnesium		<0.148	mg/L	1

Method Blank (1) QC Batch: 52185

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Sodium		<0.244	mg/L	1

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 11 of 25
NE Jal, NM

Method Blank (1) QC Batch: 52186

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Calcium		<0.175	mg/L	1

Method Blank (1) QC Batch: 52186

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Potassium		<0.327	mg/L	1

Method Blank (1) QC Batch: 52186

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Magnesium		<0.148	mg/L	1

Method Blank (1) QC Batch: 52186

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Sodium		<0.244	mg/L	1

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 12 of 25
NE Jal, NM

Duplicates (1)

QC Batch: 52104
Prep Batch: 44671

Date Analyzed: 2008-09-05
QC Preparation: 2008-09-05

Analyzed By: AR
Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity	<1.00	<1.00	mg/L as CaCO3	1	0	20
Carbonate Alkalinity	<1.00	<1.00	mg/L as CaCO3	1	0	20
Bicarbonate Alkalinity	85.0	88.0	mg/L as CaCO3	1	4	20
Total Alkalinity	85.0	88.0	mg/L as CaCO3	1	4	20

Laboratory Control Spike (LCS-1)

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	11.3	mg/L	1	12.5	<0.172	90	90 - 110

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

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	11.3	mg/L	1	12.5	<0.172	90	90 - 110	0	

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

Laboratory Control Spike (LCS-1)

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Fluoride	2.30	mg/L	1	2.50	<0.199	92	90 - 110

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

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Fluoride	2.37	mg/L	1	2.50	<0.199	95	90 - 110	3	

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

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 13 of 25
NE Jal, NM

Laboratory Control Spike (LCS-1)

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Nitrate-N	2.26	mg/L	1	2.50	<0.0120	90	90 - 110

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Nitrate-N	2.26	mg/L	1	2.50	<0.0120	90	90 - 110	0	

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

Laboratory Control Spike (LCS-1)

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Sulfate	11.2	mg/L	1	12.5	<0.0320	90	90 - 110

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Sulfate	11.2	mg/L	1	12.5	<0.0320	90	90 - 110	0	

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

Laboratory Control Spike (LCS-1)

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	49.6	mg/L	1	50.0	<0.175	99	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	49.4	mg/L	1	50.0	<0.175	99	85 - 115	0	20

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

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 14 of 25
NE Jal, NM

Laboratory Control Spike (LCS-1)

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	49.4	mg/L	1	50.0	<0.327	99	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	49.2	mg/L	1	50.0	<0.327	98	85 - 115	0	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Magnesium	48.6	mg/L	1	50.0	<0.148	97	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Magnesium	48.2	mg/L	1	50.0	<0.148	96	85 - 115	1	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	50.1	mg/L	1	50.0	<0.244	100	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	49.2	mg/L	1	50.0	<0.244	98	85 - 115	2	20

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

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 15 of 25
NE Jal, NM

Laboratory Control Spike (LCS-1)

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	49.6	mg/L	1	50.0	<0.175	99	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	49.4	mg/L	1	50.0	<0.175	99	85 - 115	0	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	49.4	mg/L	1	50.0	<0.327	99	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	49.2	mg/L	1	50.0	<0.327	98	85 - 115	0	20

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

Laboratory Control Spike (LCS-1)

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Magnesium	48.6	mg/L	1	50.0	<0.148	97	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Magnesium	48.2	mg/L	1	50.0	<0.148	96	85 - 115	1	20

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

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 16 of 25
NE Jal, NM

Laboratory Control Spike (LCS-1)

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	50.1	mg/L	1	50.0	<0.244	100	85 - 115

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	49.2	mg/L	1	50.0	<0.244	98	85 - 115	2	20

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	329	mg/L	5	62.5	280	78	90 - 110

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	328	mg/L	5	62.5	280	77	90 - 110	0	

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Fluoride	11.7	mg/L	5	12.5	2	78	90 - 110

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

¹Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

²Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

³Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 17 of 25
NE Jal, NM

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Fluoride	⁴ 11.7	mg/L	5	12.5	2	78	90 - 110	0	

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Nitrate-N	14.4	mg/L	5	12.5	3.1	90	90 - 110

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Nitrate-N	⁵ 14.3	mg/L	5	12.5	3.1	90	90 - 110	1	

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52009
Prep Batch: 44594

Date Analyzed: 2008-09-03
QC Preparation: 2008-09-03

Analyzed By: AR
Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Sulfate	⁶ 307	mg/L	5	62.5	263	70	90 - 110

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Sulfate	308	mg/L	5	62.5	263	72	90 - 110	0	

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

⁴Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

⁵Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

⁶Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

⁷Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 18 of 25
NE Jal, NM

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	194	mg/L	1	50.0	149	90	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	191	mg/L	1	50.0	149	84	75 - 125	2	20

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	55.9	mg/L	1	50.0	6.31	99	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	56.2	mg/L	1	50.0	6.31	100	75 - 125	0	20

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Magnesium	91.0	mg/L	1	50.0	43.1	96	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Magnesium	91.8	mg/L	1	50.0	43.1	97	75 - 125	1	20

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

Matrix Spike (MS-1) Spiked Sample: 172504

QC Batch: 52185
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 19 of 25
NE Jal, NM

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	204	mg/L	1	50.0	160	88	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	202	mg/L	1	50.0	160	84	75 - 125	1	20

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

Matrix Spike (MS-1) Spiked Sample: 172503

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	443	mg/L	1	50.0	396	94	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	434	mg/L	1	50.0	396	76	75 - 125	2	20

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

Matrix Spike (MS-1) Spiked Sample: 172503

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	60.4	mg/L	1	50.0	10.6	100	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	61.4	mg/L	1	50.0	10.6	102	75 - 125	2	20

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

Matrix Spike (MS-1) Spiked Sample: 172503

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 20 of 25
NE Jal, NM

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Magnesium	173	mg/L	1	50.0	127	92	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Magnesium	176	mg/L	1	50.0	127	98	75 - 125	2	20

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

Matrix Spike (MS-1) Spiked Sample: 172503

QC Batch: 52186
Prep Batch: 44670

Date Analyzed: 2008-09-08
QC Preparation: 2008-09-05

Analyzed By: TP
Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	408	mg/L	1	50.0	363	90	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	412	mg/L	1	50.0	363	98	75 - 125	1	20

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

Standard (ICV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.2	90	90 - 110	2008-09-03

Standard (ICV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Fluoride		mg/L	2.50	2.43	97	90 - 110	2008-09-03

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 21 of 25
NE Jal, NM

Standard (ICV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.27	91	90 - 110	2008-09-03

Standard (ICV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	11.2	90	90 - 110	2008-09-03

Standard (CCV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.3	90	90 - 110	2008-09-03

Standard (CCV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Fluoride		mg/L	2.50	2.38	95	90 - 110	2008-09-03

Standard (CCV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.26	90	90 - 110	2008-09-03

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 22 of 25
NE Jal, NM

Standard (CCV-1)

QC Batch: 52009

Date Analyzed: 2008-09-03

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	11.3	90	90 - 110	2008-09-03

Standard (ICV-1)

QC Batch: 52104

Date Analyzed: 2008-09-05

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0.00	<1.00		0 - 200	2008-09-05
Carbonate Alkalinity		mg/L as CaCo3	0.00	248		0 - 200	2008-09-05
Bicarbonate Alkalinity		mg/L as CaCo3	0.00	5.00		0 - 200	2008-09-05
Total Alkalinity		mg/L as CaCo3	250	253	101	90 - 110	2008-09-05

Standard (CCV-1)

QC Batch: 52104

Date Analyzed: 2008-09-05

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0.00	2.00		0 - 200	2008-09-05
Carbonate Alkalinity		mg/L as CaCo3	0.00	252		0 - 200	2008-09-05
Bicarbonate Alkalinity		mg/L as CaCo3	0.00	<4.00		0 - 200	2008-09-05
Total Alkalinity		mg/L as CaCo3	250	254	102	90 - 110	2008-09-05

Standard (ICV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	51.2	102	90 - 110	2008-09-08

Standard (ICV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 23 of 25
NE Jal, NM

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Potassium		mg/L	50.0	50.3	101	90 - 110	2008-09-08

Standard (ICV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Magnesium		mg/L	50.0	51.5	103	90 - 110	2008-09-08

Standard (ICV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		mg/L	50.0	51.5	103	90 - 110	2008-09-08

Standard (CCV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	49.8	100	90 - 110	2008-09-08

Standard (CCV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Potassium		mg/L	50.0	49.4	99	90 - 110	2008-09-08

Standard (CCV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 24 of 25
NE Jal, NM

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Magnesium		mg/L	50.0	50.0	100	90 - 110	2008-09-08

Standard (CCV-1)

QC Batch: 52185

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		mg/L	50.0	53.1	106	90 - 110	2008-09-08

Standard (ICV-1)

QC Batch: 52186

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	51.2	102	90 - 110	2008-09-08

Standard (ICV-1)

QC Batch: 52186

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Potassium		mg/L	50.0	50.3	101	90 - 110	2008-09-08

Standard (ICV-1)

QC Batch: 52186

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Magnesium		mg/L	50.0	51.5	103	90 - 110	2008-09-08

Standard (ICV-1)

QC Batch: 52186

Date Analyzed: 2008-09-08

Analyzed By: TP

Report Date: September 22, 2008
Humphrey-Queen

Work Order: 8090230
Humphrey-Queen

Page Number: 25 of 25
NE Jal, NM

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		mg/L	50.0	51.5	103	90 - 110	2008-09-08

Standard (CCV-1)

QC Batch: 52186

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	51.6	103	90 - 110	2008-09-08

Standard (CCV-1)

QC Batch: 52186

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Potassium		mg/L	50.0	49.8	100	90 - 110	2008-09-08

Standard (CCV-1)

QC Batch: 52186

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Magnesium		mg/L	50.0	51.8	104	90 - 110	2008-09-08

Standard (CCV-1)

QC Batch: 52186

Date Analyzed: 2008-09-08

Analyzed By: TP

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		mg/L	50.0	51.4	103	90 - 110	2008-09-08

TraceAnalysis, Inc.

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8800 Camp Bowie Blvd. West, Suite 180
Ft. Worth, Texas 76116
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Fax (817) 560-4335

Company Name: Etech Env. Phone #: 432/563-2200
Address: P.O. Box 8469, Midland, TX 79702 Fax #: 432/563-2213
Contact Person: Mike Hagan E-mail: mike@etechenv.com

Invoice to:
(If different from above)

Project #: Project Name: Humphrey - Queen
Project Location (including state): NE Jal, NM Sampler Signature: [Signature]

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX				PRESERVATIVE METHOD				SAMPLING		DATE	TIME	MTBE 8021B / 602 / 8260B / 624	BTX 8021B / 602 / 8260B / 624	TPH 418.1 / TX1005 / TX1005 Ext(C35)	TPH 8015 GRO / DRO / TVHC	PAH 8270C / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 60108/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GCMS Vol. 8260B / 624	GCMS Semi Vol. 8270C / 625	PCBs 8082 / 608	Pesticides 8081A / 608	BOD, TSS, pH	Moisture Content	Major Minerals (Cation/Anions)	Turn Around Time if different from standard	Hold
				WATER	SOIL	AIR	SLUDGE	HCl	HNO ₃	H ₂ SO ₄	NaOH	ICE	NONE																						
72503	Seyler well	1	1L	✓									✓	8/29/08	1042																				
504	Willis Well	1	1L	✓									✓	8/29/08	1020																				

Relinquished by: [Signature] Company: Etech Date: 9-2-08 Time: 13:57 Temp: 40
Received by: [Signature] Company: Trace Date: 9-2-08 Time: 13:57 Temp: 40

Relinquished by: Company: Date: Time: Temp: Received by: Company: Date: Time: Temp:

Relinquished by: Company: Date: Time: Temp: Received by: Company: Date: Time: Temp:

LAB USE ONLY

REMARKS:

Ca, K, Mg, Na - Cations - Lubbock
Alkalinity, Cl, F, NO₃, SO₄ - Anions - Midland

- ☐ Dry Weight Basis Required
☐ TRRP Report Required.
☐ Check If Special Reporting Limits Are Needed

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

Carrier # Cargill

ORIGINAL COPY

Summary Report

Mike Hagan
Etech Environmental Safety

Report Date: September 22, 2008

P.O. Box 8469
Midland, TX, 79708

Work Order: 8090230



Project Location: NE Jal, NM
Project Name: Humphrey-Queen

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
172503	Seyler Well	water	2008-08-29	10:42	2008-09-02
172504	Willis Well	water	2008-08-29	10:20	2008-09-02

Sample: 172503 - Seyler Well

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1.00
Bicarbonate Alkalinity		167	mg/L as CaCo3	4.00
Total Alkalinity		167	mg/L as CaCo3	4.00
Dissolved Calcium		396	mg/L	1.00
Chloride		1020	mg/L	0.500
Fluoride		<1.00	mg/L	0.200
Dissolved Potassium		10.6	mg/L	1.00
Dissolved Magnesium		127	mg/L	1.00
Dissolved Sodium		363	mg/L	1.00
Nitrate-N		15.2	mg/L	0.200
Sulfate		1160	mg/L	0.500

Sample: 172504 - Willis Well

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1.00
Bicarbonate Alkalinity		217	mg/L as CaCo3	4.00

continued ...

Report Date: September 22, 2008

Work Order: 8090230
Humphrey-Queen

Page Number: 2 of 2
NE Jal, NM

sample 172504 continued ...

Param	Flag	Result	Units	RL
Total Alkalinity		217	mg/L as CaCO ₃	4.00
Dissolved Calcium		149	mg/L	1.00
Chloride		273	mg/L	0.500
Fluoride		2.01	mg/L	0.200
Dissolved Potassium		6.31	mg/L	1.00
Dissolved Magnesium		43.1	mg/L	1.00
Dissolved Sodium		160	mg/L	1.00
Nitrate-N		3.12	mg/L	0.200
Sulfate		253	mg/L	0.500

Cation-Anion Balance Sheet

DATE: 9/22/2008

Sample #	Calcium ppm	Magnesium ppm	Sodium ppm	Potassium ppm	Alkalinity ppm	Sulfate ppm	Chloride ppm	Nitrate ppm	Fluoride ppm	Bromide ppm	TDS ppm	EC µMHOS/cm
172503	396	127	353	10.6	167	1160	1020	15.2	0			
172504	149	43.1	160	0.31	217	253	273	3.12	2.01			

Sample #	Calcium in meq/L	Magnesium in meq/L	Sodium in meq/L	Potassium in meq/L	Alkalinity in meq/L	Sulfate in meq/L	Chloride in meq/L	Nitrate in meq/L	Fluoride in meq/L	Bromide in meq/L	Cations in meq/L	Anions in meq/L	Percentage Error
172503	19.76	10.45	15.79	0.27	3.34	24.15	28.77	1.085128	0	0	46.27	57.35	21.38059426
172504	7.44	3.55	6.96	0.16	4.34	5.27	7.70	0.2227368	0.1058064	0	18.10	17.64	2.606986766

email: lab@traceanalysis.com

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8808 Camp Bowie Blvd. West, Suite 180
Ft. Worth, Texas 76116
Tel (817) 201-5260
Fax (817) 580-4336

Company Name:	E Tech Env.	Phone #:	402/563-2200
Address:	(Street, City, Zip) P.O. Box 8469, Midland TX 79706	Fax #:	402/563-2213
Contact Person:	Mike Hagan	E-mail:	mike@etechenv.com
Invoice to:			
(If different from above)			
Project #:		Project Name:	Hummer - Green
Project Location (including state):	NE TOL NM	Sampler Signature:	Mike Hagan

ANALYSIS REQUEST
(Circle or Specify Method No.)

[illegible]

Relinquished by: <u>W. H. Fiedler</u>	Company: <u>Fiedler</u>	Date: <u>12-01-1957</u>	Time: <u></u>	Received by: <u>London</u>	Company: <u>Union Trust</u>	Date: <u>12-01-1957</u>	Time: <u>10</u>	Temp: <u>10</u>	LAB USE ONLY Intact: <u>Y/N</u> Headspace: <u>Y/N/NA</u> Log-in-Review: <u></u>	REMARKS: ☐ Dry Weight Basis Required ☐ TRRP Report Required ☐ Check If Special Reporting Limits Are Needed
Relinquished by: <u></u>	Company: <u></u>	Date: <u></u>	Time: <u></u>	Received by: <u></u>	Company: <u></u>	Date: <u></u>	Time: <u></u>	Temp: <u></u>		
Relinquished by: <u></u>	Company: <u></u>	Date: <u></u>	Time: <u></u>	Received by: <u></u>	Company: <u></u>	Date: <u></u>	Time: <u></u>	Temp: <u></u>		

Summary Report

Mike Hagan
Etech Environmental Safety

Report Date: October 29, 2008

P.O. Box 8469
Midland, TX, 79708

Work Order: 8101705



Project Location: NE of Jal, NM
Project Name: Arena Langlie-Mattix & Humphrey

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
176705	HMW-1	water	2008-10-16	12:35	2008-10-16
176706	HMW-2	water	2008-10-16	09:50	2008-10-16
176707	HMW-3	water	2008-10-16	11:52	2008-10-16
176708	HMW-1	water	2008-10-16	14:05	2008-10-16
176709	HMW-2	water	2008-10-16	14:43	2008-10-16
176710	HMW-3	water	2008-10-16	15:12	2008-10-16

Sample - Field Code	TPH DRO	TPH GRO
	DRO (mg/L)	GRO (mg/L)
176705 - HMW-1	<5.00	<0.100
176706 - HMW-2	<5.00	<0.100
176707 - HMW-3	<5.00	<0.100
176708 - HMW-1	<5.00	<0.100
176709 - HMW-2	<5.00	<0.100
176710 - HMW-3	<5.00	<0.100

Sample: 176705 - HMW-1

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO ₃	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO ₃	1.00
Bicarbonate Alkalinity		89.0	mg/L as CaCO ₃	4.00
Total Alkalinity		89.0	mg/L as CaCO ₃	4.00
Specific Conductance		51100	µMHOS/cm	0.00
Chloride		19900	mg/L	0.500
Fluoride		<1.00	mg/L	0.200
Sulfate		1840	mg/L	0.500

continued ...

sample 176705 continued . . .

Param	Flag	Result	Units	RL
Nitrate-N		9.12	mg/L	0.200
pH		6.94	s.u.	0.00
Dissolved Calcium		3250	mg/L	1.00
Dissolved Magnesium		1040	mg/L	1.00
Dissolved Potassium		136	mg/L	1.00
Dissolved Sodium		8200	mg/L	1.00
Total Dissolved Solids		35000	mg/L	10.0

Sample: 176706 - HMW-2

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1.00
Bicarbonate Alkalinity		142	mg/L as CaCO3	4.00
Total Alkalinity		142	mg/L as CaCO3	4.00
Specific Conductance		3050	uMHOS/cm	0.00
Chloride		649	mg/L	0.500
Fluoride		3.09	mg/L	0.200
Sulfate		399	mg/L	0.500
Nitrate-N		2.55	mg/L	0.200
pH		8.04	s.u.	0.00
Dissolved Calcium		257	mg/L	1.00
Dissolved Magnesium		78.2	mg/L	1.00
Dissolved Potassium		9.17	mg/L	1.00
Dissolved Sodium		190	mg/L	1.00
Total Dissolved Solids		1510	mg/L	10.0

Sample: 176707 - HMW-3

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1.00
Bicarbonate Alkalinity		143	mg/L as CaCO3	4.00
Total Alkalinity		143	mg/L as CaCO3	4.00
Specific Conductance		4300	uMHOS/cm	0.00
Chloride		1180	mg/L	0.500
Fluoride		3.23	mg/L	0.200
Sulfate		314	mg/L	0.500
Nitrate-N		2.50	mg/L	0.200
pH		7.54	s.u.	0.00
Dissolved Calcium		359	mg/L	1.00
Dissolved Magnesium		114	mg/L	1.00
Dissolved Potassium		11.4	mg/L	1.00
Dissolved Sodium		372	mg/L	1.00

continued . . .

sample 176707 continued

Param	Flag	Result	Units	RL
Total Dissolved Solids		2400	mg/L	10.0

Sample: 176708 - HMW-1

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1.00
Bicarbonate Alkalinity		167	mg/L as CaCO3	4.00
Total Alkalinity		167	mg/L as CaCO3	4.00
Specific Conductance		36500	uMHOS/cm	0.00
Chloride		13500	mg/L	0.500
Fluoride		<1.00	mg/L	0.200
Sulfate		1700	mg/L	0.500
Nitrate-N		17.6	mg/L	0.200
pH		6.82	s.u.	0.00
Dissolved Calcium		2000	mg/L	1.00
Dissolved Magnesium		738	mg/L	1.00
Dissolved Potassium		63.8	mg/L	1.00
Dissolved Sodium		5740	mg/L	1.00
Total Dissolved Solids		24600	mg/L	10.0

Sample: 176709 - HMW-2

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1.00
Bicarbonate Alkalinity		112	mg/L as CaCO3	4.00
Total Alkalinity		112	mg/L as CaCO3	4.00
Specific Conductance		2520	uMHOS/cm	0.00
Chloride		639	mg/L	0.500
Fluoride		3.57	mg/L	0.200
Sulfate		245	mg/L	0.500
Nitrate-N		6.86	mg/L	0.200
pH		7.87	s.u.	0.00
Dissolved Calcium		259	mg/L	1.00
Dissolved Magnesium		81.5	mg/L	1.00
Dissolved Potassium		10.7	mg/L	1.00
Dissolved Sodium		171	mg/L	1.00
Total Dissolved Solids		1460	mg/L	10.0

Sample: 176710 - HMW-3

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO ₃	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO ₃	1.00
Bicarbonate Alkalinity		86.0	mg/L as CaCO ₃	4.00
Total Alkalinity		86.0	mg/L as CaCO ₃	4.00
Specific Conductance		3950	uMHOS/cm	0.00
Chloride		999	mg/L	0.500
Fluoride		3.88	mg/L	0.200
Sulfate		632	mg/L	0.500
Nitrate-N		7.10	mg/L	0.200
pH		7.52	s.u.	0.00
Dissolved Calcium		433	mg/L	1.00
Dissolved Magnesium		146	mg/L	1.00
Dissolved Potassium		12.5	mg/L	1.00
Dissolved Sodium		222	mg/L	1.00
Total Dissolved Solids		1980	mg/L	10.0

TRACE ANALYSIS, INC.

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Certifications

WBENC: 237019

HUB: 1752439743100-86536

DBE: VN 20657

NCTRCA WFWB38444Y0909

NELAP Certifications

Lubbock: T104704219-08-TX

El Paso: T104704221-08-TX

Midland: T104704392-08-TX

LELAP-02003

LELAP-02002

Kansas E-10317

Analytical and Quality Control Report

Mike Hagan
Etech Environmental Safety

Report Date: October 29, 2008

P.O. Box 8469
Midland, TX, 79708

Work Order: 8101705



Project Location: NE of Jal, NM
Project Name: Arena Langlie-Mattix & Humphrey
Project Number: Arena Langlie-Mattix & Humphrey

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
176705	HMW-1	water	2008-10-16	12:35	2008-10-16
176706	HMW-2	water	2008-10-16	09:50	2008-10-16
176707	HMW-3	water	2008-10-16	11:52	2008-10-16
176708	HMW-1	water	2008-10-16	14:05	2008-10-16
176709	HMW-2	water	2008-10-16	14:43	2008-10-16
176710	HMW-3	water	2008-10-16	15:12	2008-10-16

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 31 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Standard Flags

B - The sample contains less than ten times the concentration found in the method blank.

Case Narrative

Samples for project Arena Banglie-Mattix & Humphrey were received by TraceAnalysis, Inc. on 2008-10-16 and assigned to work order S101705. Samples for work order S101705 were received intact without headspace and at a temperature of 2.8 deg. C.

Samples were analyzed for the following tests using their respective methods:

Test	Method
Alkalinity	SM 2320B
Ca, Dissolved	S 6010B
Chloride (IC)	E 300.0
Conductivity	SM 2510B
Fluoride (IC)	E 300.0
K, Dissolved	S 6010B
Mg, Dissolved	S 6010B
Na, Dissolved	S 6010B
NO3 (IC)	E 300.0
pH	SM 4500-H+
SO4 (IC)	E 300.0
TDS	SM 2540C
TPH DRO	Mod. S015B
TPH GRO	S S015B

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order S101705 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Analytical Report

Sample: 176705 - HMW-1

Laboratory:	Midland	Analytical Method:	SM 2320B	Prep Method:	N/A
Analysis:	Alkalinity	Date Analyzed:	2008-10-20	Analyzed By:	AR
QC Batch:	53497	Sample Preparation:	2008-10-20	Prepared By:	AR
Prep Batch:	45810				

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Bicarbonate Alkalinity		89.0	mg/L as CaCO3	1	1.00
Total Alkalinity		89.0	mg/L as CaCO3	1	1.00

Sample: 176705 - HMW-1

Laboratory:	Midland	Analytical Method:	SM 2510B	Prep Method:	N/A
Analysis:	Conductivity	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53418	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45720				

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		51100	µMHOS/cm	1	0.00

Sample: 176705 - HMW-1

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Ion Chromatography	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53457	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45743				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		19900	mg/L	1000	0.500
Fluoride		<1.00	mg/L	5	0.200
Sulfate		1840	mg/L	100	0.500

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 4 of 31
NE of Jal, NM

Sample: 176705 - HMW-1

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	NO3 (IC)	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53457	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45743				

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		9.12	mg/L	5	0.200

Sample: 176705 - HMW-1

Laboratory:	Midland	Analytical Method:	SM 4500-H+	Prep Method:	N/A
Analysis:	pH	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53386	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45721				

Parameter	Flag	RL Result	Units	Dilution	RL
pH		6.94	s.u.	1	0.00

Sample: 176705 - HMW-1

Laboratory:	Eublock	Analytical Method:	S 6010B	Prep Method:	S 3005A
Analysis:	Salts, Dissolved	Date Analyzed:	2008-10-28	Analyzed By:	KV
QC Batch:	53680	Sample Preparation:	2008-10-20	Prepared By:	KV
Prep Batch:	45759				

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		3250	mg/L	100	1.00
Dissolved Magnesium		1040	mg/L	10	1.00
Dissolved Potassium		136	mg/L	10	1.00
Dissolved Sodium		8200	mg/L	100	1.00

Sample: 176705 - HMW-1

Laboratory:	Midland	Analytical Method:	SM 2540C	Prep Method:	N/A
Analysis:	TDS	Date Analyzed:	2008-10-24	Analyzed By:	AR
QC Batch:	53662	Sample Preparation:	2008-10-20	Prepared By:	AR
Prep Batch:	45794				

Report Date: October 29, 2008
Arena Langlie-Matrix & Humphrey

Work Order: 8101705
Arena Langlie-Matrix & Humphrey

Page Number: 5 of 31
NE of Jal, NM

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		35000	mg/L	100	10.0

Sample: 176705 - HMW-1

Laboratory: Midland
Analysis: TPH DRO Analytical Method: Mod. 8015B Prep Method: N/A
QC Batch: 53437 Date Analyzed: 2008-10-20 Analyzed By: LD
Prep Batch: 45754 Sample Preparation: 2008-10-20 Prepared By: LD

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		15.3	mg/L	1	10.0	153	70 - 130

Sample: 176705 - HMW-1

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015B Prep Method: S 5030B
QC Batch: 53423 Date Analyzed: 2008-10-19 Analyzed By: AG
Prep Batch: 45748 Sample Preparation: 2008-10-19 Prepared By: AG

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.100	mg/L	1	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0793	mg/L	1	0.100	79	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0827	mg/L	1	0.100	83	70 - 130

Sample: 176706 - HMW-2

Laboratory: Midland
Analysis: Alkalinity Analytical Method: SM 2320B Prep Method: N/A
QC Batch: 53497 Date Analyzed: 2008-10-20 Analyzed By: AR
Prep Batch: 45810 Sample Preparation: 2008-10-20 Prepared By: AR

continued

¹ High surrogate recovery. Sample non-detect, result bias high.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 6 of 31
NE of Jal, NM

sample 176706 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Bicarbonate Alkalinity		142	mg/L as CaCO3	1	4.00
Total Alkalinity		142	mg/L as CaCO3	1	4.00

Sample: 176706 - HMW-2

Laboratory: Midland
Analysis: Conductivity
QC Batch: 53418
Prep Batch: 45720

Analytical Method: SM 2510B
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		3050	µMHOS/cm	1	0.00

Sample: 176706 - HMW-2

Laboratory: Midland
Analysis: Ion Chromatography
QC Batch: 53457
Prep Batch: 45743

Analytical Method: E 300.0
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		649	mg/L	50	0.500
Fluoride		3.09	mg/L	5	0.200
Sulfate		399	mg/L	50	0.500

Sample: 176706 - HMW-2

Laboratory: Midland
Analysis: NO3 (IC)
QC Batch: 53457
Prep Batch: 45743

Analytical Method: E 300.0
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 7 of 31
NE of Jal. NM

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		2.55	mg/L	5	0.200

Sample: 176706 - HMW-2

Laboratory: Midland

Analysis: pH

QC Batch: 53386

Prep Batch: 45721

Analytical Method: SM 4500-H+

Date Analyzed: 2008-10-17

Sample Preparation: 2008-10-17

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
pH		8.04	s.u.	1	0.00

Sample: 176706 - HMW-2

Laboratory: Lubbock

Analysis: Salts: Dissolved

QC Batch: 53680

Prep Batch: 45759

Analytical Method: S 6010B

Date Analyzed: 2008-10-28

Sample Preparation: 2008-10-20

Prep Method: S 3005A

Analyzed By: KV

Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		257	mg/L	1	1.00
Dissolved Magnesium		78.2	mg/L	1	1.00
Dissolved Potassium		9.17	mg/L	1	1.00
Dissolved Sodium		190	mg/L	1	1.00

Sample: 176706 - HMW-2

Laboratory: Midland

Analysis: TDS

QC Batch: 53662

Prep Batch: 45794

Analytical Method: SM 2540C

Date Analyzed: 2008-10-24

Sample Preparation: 2008-10-20

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		1510	mg/L	2	10.0

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 8 of 31
NE of Jal, NM

Sample: 176706 - HMW-2

Laboratory:	Midland	Analytical Method:	Mod. 8015B	Prep Method:	N/A
Analysis:	TPH DRO	Date Analyzed:	2008-10-20	Analyzed By:	LD
QC Batch:	53437	Sample Preparation:	2008-10-20	Prepared By:	LD
Prep Batch:	45754				

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		15.7	mg/L	1	10.0	157	70 - 130

Sample: 176706 - HMW-2

Laboratory:	Midland	Analytical Method:	S 8015B	Prep Method:	S 5030B
Analysis:	TPH GRO	Date Analyzed:	2008-10-19	Analyzed By:	AG
QC Batch:	53423	Sample Preparation:	2008-10-19	Prepared By:	AG
Prep Batch:	45748				

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.100	mg/L	1	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0792	mg/L	1	0.100	79	70 - 130
4-Bromofluorobenzene (4BFB)		0.0836	mg/L	1	0.100	84	70 - 130

Sample: 176707 - HMW-3

Laboratory:	Midland	Analytical Method:	SM 2320B	Prep Method:	N/A
Analysis:	Alkalinity	Date Analyzed:	2008-10-20	Analyzed By:	AR
QC Batch:	53497	Sample Preparation:	2008-10-20	Prepared By:	AR
Prep Batch:	45810				

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Bicarbonate Alkalinity		143	mg/L as CaCO3	1	1.00
Total Alkalinity		143	mg/L as CaCO3	1	1.00

²High surrogate recovery. Sample non-detect, result bias high.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: S101705
Arena Langlie-Mattix & Humphrey

Page Number: 9 of 31
NE of Jal, NM

Sample: 176707 - HMW-3

Laboratory:	Midland	Analytical Method:	SM 2510B	Prep Method:	N/A
Analysis:	Conductivity	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53418	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45720				

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		4300	µMHOS/cm	1	0.00

Sample: 176707 - HMW-3

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Ion Chromatography	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53457	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45743				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		1180	mg/L	100	0.500
Fluoride		3.23	mg/L	5	0.200
Sulfate		314	mg/L	5	0.500

Sample: 176707 - HMW-3

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	NO3 (IC)	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53457	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45743				

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		2.50	mg/L	5	0.200

Sample: 176707 - HMW-3

Laboratory:	Midland	Analytical Method:	SM 4500-H+	Prep Method:	N/A
Analysis:	pH	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53386	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45721				

continued ...

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 10 of 31
NE of Jal, NM

sample 176707 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Parameter	Flag	RL Result	Units	Dilution	RL
pH		7.54	s.u.	1	0.00

Sample: 176707 - HMW-3

Laboratory: Lubbock
Analysis: Salts, Dissolved
QC Batch: 53680
Prep Batch: 45759

Analytical Method: S 6010B
Date Analyzed: 2008-10-28
Sample Preparation: 2008-10-20

Prep Method: S 3005A
Analyzed By: KV
Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		359	mg/L	10	1.00
Dissolved Magnesium		114	mg/L	1	1.00
Dissolved Potassium		11.4	mg/L	1	1.00
Dissolved Sodium		372	mg/L	10	1.00

Sample: 176707 - HMW-3

Laboratory: Midland
Analysis: TDS
QC Batch: 53662
Prep Batch: 45794

Analytical Method: SM 2540C
Date Analyzed: 2008-10-24
Sample Preparation: 2008-10-20

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		2400	mg/L	5	10.0

Sample: 176707 - HMW-3

Laboratory: Midland
Analysis: TPH DRO
QC Batch: 53437
Prep Batch: 45754

Analytical Method: Mod. S015B
Date Analyzed: 2008-10-20
Sample Preparation: 2008-10-20

Prep Method: N/A
Analyzed By: LD
Prepared By: LD

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	1	5.00

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 11 of 31
NE of Jal, NM

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	3	14.5	mg/L	1	10.0	145	70 - 130

Sample: 176707 - HMW-3

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015B Prep Method: S 5030B
QC Batch: 53423 Date Analyzed: 2008-10-19 Analyzed By: AG
Prep Batch: 45748 Sample Preparation: 2008-10-19 Prepared By: AG

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.100	mg/L	1	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TET)		0.0823	mg/L	1	0.100	82	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0861	mg/L	1	0.100	86	70 - 130

Sample: 176708 - HMW-1

Laboratory: Midland
Analysis: Alkalinity Analytical Method: SM 2320B Prep Method: N/A
QC Batch: 53497 Date Analyzed: 2008-10-20 Analyzed By: AR
Prep Batch: 45810 Sample Preparation: 2008-10-20 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Bicarbonate Alkalinity		167	mg/L as CaCO3	1	4.00
Total Alkalinity		167	mg/L as CaCO3	1	4.00

Sample: 176708 - HMW-1

Laboratory: Midland
Analysis: Conductivity Analytical Method: SM 2510B Prep Method: N/A
QC Batch: 53418 Date Analyzed: 2008-10-17 Analyzed By: AR
Prep Batch: 45720 Sample Preparation: 2008-10-17 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		36500	uMHOS/cm	1	0.00

High surrogate recovery. Sample non-detect; result bias high.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 12 of 31
NE of Jal, NM

Sample: 176708 - HMW-1

Laboratory: Midland
Analysis: Ion Chromatography
QC Batch: 53457
Prep Batch: 45743

Analytical Method: E 300.0
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		13500	mg/L	1000	0.500
Fluoride		<1.00	mg/L	5	0.200
Sulfate		1700	mg/L	100	0.500

Sample: 176708 - HMW-1

Laboratory: Midland
Analysis: NO3 (IC)
QC Batch: 53457
Prep Batch: 45743

Analytical Method: E 300.0
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		17.6	mg/L	5	0.200

Sample: 176708 - HMW-1

Laboratory: Midland
Analysis: pH
QC Batch: 53386
Prep Batch: 45721

Analytical Method: SM 4500-H+

Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
pH		6.82	s.u.	1	0.00

Sample: 176708 - HMW-1

Laboratory: Lubbock
Analysis: Salts, Dissolved
QC Batch: 53650
Prep Batch: 45759

Analytical Method: S 6010B
Date Analyzed: 2008-10-28
Sample Preparation: 2008-10-20

Prep Method: S 3005A
Analyzed By: KV
Prepared By: KV

continued

sample 176708 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		2000	mg/L	10	1.00
Dissolved Magnesium		738	mg/L	10	1.00
Dissolved Potassium		63.8	mg/L	1	1.00
Dissolved Sodium		5740	mg/L	100	1.00

Sample: 176708 - HMW-1

Laboratory: Midland
 Analysis: TDS
 QC Batch: 53662
 Prep Batch: 45794

Analytical Method: SM 2540C
 Date Analyzed: 2008-10-24
 Sample Preparation: 2008-10-20

Prep Method: N/A
 Analyzed By: AR
 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		24600	mg/L	100	10.0

Sample: 176708 - HMW-1

Laboratory: Midland
 Analysis: TPH DRO
 QC Batch: 53437
 Prep Batch: 45754

Analytical Method: Mod. 8015B
 Date Analyzed: 2008-10-20
 Sample Preparation: 2008-10-20

Prep Method: N/A
 Analyzed By: LD
 Prepared By: LD

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		15.2	mg/L	1	10.0	152	70 - 130

Sample: 176708 - HMW-1

Laboratory: Midland
 Analysis: TPH GRO
 QC Batch: 53423
 Prep Batch: 45748

Analytical Method: S 8015B
 Date Analyzed: 2008-10-19
 Sample Preparation: 2008-10-19

Prep Method: S 5030B
 Analyzed By: AG
 Prepared By: AG

¹High surrogate recovery. Sample non-detect, result bias high.

Report Date: October 29, 2008
 Arena Langlie-Mattix & Humphrey

Work Order: 8101705
 Arena Langlie-Mattix & Humphrey

Page Number: 14 of 31
 NE of Jal, NM

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.100	mg/L	1	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0802	mg/L	1	0.100	80	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0839	mg/L	1	0.100	84	70 - 130

Sample: 176709 - HMW-2

Laboratory: Midland
 Analysis: Alkalinity
 QC Batch: 53497
 Prep Batch: 45810

Analytical Method: SM 2320B
 Date Analyzed: 2008-10-20
 Sample Preparation: 2008-10-20

Prep Method: N/A
 Analyzed By: AR
 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Bicarbonate Alkalinity		112	mg/L as CaCO3	1	1.00
Total Alkalinity		112	mg/L as CaCO3	1	1.00

Sample: 176709 - HMW-2

Laboratory: Midland
 Analysis: Conductivity
 QC Batch: 53418
 Prep Batch: 45720

Analytical Method: SM 2510B
 Date Analyzed: 2008-10-17
 Sample Preparation: 2008-10-17

Prep Method: N/A
 Analyzed By: AR
 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		2520	µMHOS/cm	1	0.00

Sample: 176709 - HMW-2

Laboratory: Midland
 Analysis: Ion Chromatography
 QC Batch: 53457
 Prep Batch: 45743

Analytical Method: E 300.0
 Date Analyzed: 2008-10-17
 Sample Preparation: 2008-10-17

Prep Method: N/A
 Analyzed By: AR
 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		639	mg/L	50	0.500

continued

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 15 of 31
NE of Jal, NM

sample 176709 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Fluoride		3.57	mg/L	5	0.200
Sulfate		245	mg/L	5	0.500

Sample: 176709 - HMW-2

Laboratory: Midland
Analysis: NO3 (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 53457 Date Analyzed: 2008-10-17 Analyzed By: AR
Prep Batch: 45743 Sample Preparation: 2008-10-17 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		6.86	mg/L	5	0.200

Sample: 176709 - HMW-2

Laboratory: Midland
Analysis: pH Analytical Method: SM 4500-H+ Prep Method: N/A
QC Batch: 53386 Date Analyzed: 2008-10-17 Analyzed By: AR
Prep Batch: 45721 Sample Preparation: 2008-10-17 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
pH		7.87	s.u.	1	0.00

Sample: 176709 - HMW-2

Laboratory: Lubbock
Analysis: Salts, Dissolved Analytical Method: S 6010B Prep Method: S 3005A
QC Batch: 53680 Date Analyzed: 2008-10-28 Analyzed By: KV
Prep Batch: 45759 Sample Preparation: 2008-10-20 Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		259	mg/L	1	1.00
Dissolved Magnesium		81.5	mg/L	1	1.00
Dissolved Potassium		10.7	mg/L	1	1.00
Dissolved Sodium		171	mg/L	1	1.00

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 16 of 31
NE of Jal, NM

Sample: 176709 - HMW-2

Laboratory: Midland
Analysis: TDS
QC Batch: 53662
Prep Batch: 45794

Analytical Method: SM 2540C
Date Analyzed: 2008-10-24
Sample Preparation: 2008-10-20

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		1460	mg/L	2	10.0

Sample: 176709 - HMW-2

Laboratory: Midland
Analysis: TPH DRO
QC Batch: 53437
Prep Batch: 45754

Analytical Method: Mod. 8015B
Date Analyzed: 2008-10-20
Sample Preparation: 2008-10-20

Prep Method: N/A
Analyzed By: LD
Prepared By: LD

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		13.1	mg/L	1	10.0	134	70 - 130

Sample: 176709 - HMW-2

Laboratory: Midland
Analysis: TPH GRO
QC Batch: 53423
Prep Batch: 45748

Analytical Method: S 8015B
Date Analyzed: 2008-10-19
Sample Preparation: 2008-10-19

Prep Method: S 5030B
Analyzed By: AG
Prepared By: AG

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.100	mg/L	1	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0803	mg/L	1	0.100	80	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0839	mg/L	1	0.100	84	70 - 130

High surrogate recovery. Sample non-detect, result bias high.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 17 of 31
NE of Jal, NM

Sample: 176710 - HMW-3

Laboratory:	Midland	Analytical Method:	SM 2320B	Prep Method:	N/A
Analysis:	Alkalinity	Date Analyzed:	2008-10-20	Analyzed By:	AR
QC Batch:	53497	Sample Preparation:	2008-10-20	Prepared By:	AR
Prep Batch:	45810				

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Bicarbonate Alkalinity		86.0	mg/L as CaCO3	1	4.00
Total Alkalinity		86.0	mg/L as CaCO3	1	4.00

Sample: 176710 - HMW-3

Laboratory:	Midland	Analytical Method:	SM 2510B	Prep Method:	N/A
Analysis:	Conductivity	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53418	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45720				

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		3950	uMHOS/cm	1	0.00

Sample: 176710 - HMW-3

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Ion Chromatography	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53457	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45743				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		999	mg/L	100	0.500
Fluoride		3.88	mg/L	5	0.200
Sulfate		632	mg/L	100	0.500

Sample: 176710 - HMW-3

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	NO3 (IC)	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53457	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45743				

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 18 of 31
NE of Jal, NM

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		7.10	mg/L	5	0.200

Sample: 176710 - HMW-3

Laboratory: Midland

Analysis: pH

QC Batch: 53386

Prep Batch: 45721

Analytical Method: SM 4500-H+

Date Analyzed: 2008-10-17

Sample Preparation: 2008-10-17

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
pH		7.52	s.u.	1	0.00

Sample: 176710 - HMW-3

Laboratory: Lubbock

Analysis: Salts, Dissolved

QC Batch: 53680

Prep Batch: 45759

Analytical Method: S 6010B

Date Analyzed: 2008-10-28

Sample Preparation: 2008-10-20

Prep Method: S 3005A

Analyzed By: KV

Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		433	mg/L	10	1.00
Dissolved Magnesium		146	mg/L	1	1.00
Dissolved Potassium		12.5	mg/L	1	1.00
Dissolved Sodium		222	mg/L	1	1.00

Sample: 176710 - HMW-3

Laboratory: Midland

Analysis: TDS

QC Batch: 53662

Prep Batch: 45794

Analytical Method: SM 2540C

Date Analyzed: 2008-10-24

Sample Preparation: 2008-10-20

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		1980	mg/L	5	10.0

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 19 of 31
NE of Jal, NM

Sample: 176710 - HMW-3

Laboratory:	Midland	Analytical Method:	Mod. 8015B	Prep Method:	N/A
Analysis:	TPH DRO	Date Analyzed:	2008-10-20	Analyzed By:	LD
QC Batch:	53437	Sample Preparation:	2008-10-20	Prepared By:	LD
Prep Batch:	45754				

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		16.6	mg/L	1	10.0	166	70 - 130

Sample: 176710 - HMW-3

Laboratory:	Midland	Analytical Method:	S 8015B	Prep Method:	S 5030B
Analysis:	TPH GRO	Date Analyzed:	2008-10-19	Analyzed By:	AG
QC Batch:	53423	Sample Preparation:	2008-10-19	Prepared By:	AG
Prep Batch:	45748				

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.100	mg/L	1	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0830	mg/L	1	0.100	83	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0874	mg/L	1	0.100	87	70 - 130

Method Blank (1) QC Batch: 53418

QC Batch:	53418	Date Analyzed:	2008-10-17	Analyzed By:	AR
Prep Batch:	45720	QC Preparation:	2008-10-17	Prepared By:	AR

Parameter	Flag	MDL Result	Units	RL
Specific Conductance		7.30	µMHOS/cm	0

^aHigh surrogate recovery: Sample non-detected, result bias high.

Method Blank (1) QC Batch: 53423

QC Batch: 53423
Prep Batch: 45748

Date Analyzed: 2008-10-19
QC Preparation: 2008-10-19

Analyzed By: AG
Prepared By: AG

Parameter	Flag	MDL Result	Units	RL
GRO		0.0801	mg/L	0.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0813	mg/L	1	0.100	81	70 - 130
4-Bromofluorobenzene (4BFB)		0.0878	mg/L	1	0.100	88	50 - 130

Method Blank (1) QC Batch: 53437

QC Batch: 53437
Prep Batch: 45754

Date Analyzed: 2008-10-20
QC Preparation: 2008-10-20

Analyzed By: LD
Prepared By: LD

Parameter	Flag	MDL Result	Units	RL
DRO		<2.44	mg/L	5

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		12.8	mg/L	1	10.0	128	70 - 130

Method Blank (1) QC Batch: 53457

QC Batch: 53457
Prep Batch: 45743

Date Analyzed: 2008-10-17
QC Preparation: 2008-10-17

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Nitrate-N		<0.0120	mg/L	0.2

Method Blank (1) QC Batch: 53457

QC Batch: 53457
Prep Batch: 45743

Date Analyzed: 2008-10-17
QC Preparation: 2008-10-17

Analyzed By: AR
Prepared By: AR

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 21 of 31
NE of Jal, NM

Parameter	Flag	MDL Result	Units	RL
Chloride		<0.172	mg/L	0.5
Fluoride		<0.199	mg/L	0.2
Sulfate		<0.0320	mg/L	0.5

Method Blank (1) QC Batch: 53497

QC Batch: 53497
Prep Batch: 45810

Date Analyzed: 2008-10-20
QC Preparation: 2008-10-20

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO ₃	1
Carbonate Alkalinity		<1.00	mg/L as CaCO ₃	1
Bicarbonate Alkalinity		<4.00	mg/L as CaCO ₃	4
Total Alkalinity		<4.00	mg/L as CaCO ₃	4

Method Blank (1) QC Batch: 53662

QC Batch: 53662
Prep Batch: 45794

Date Analyzed: 2008-10-24
QC Preparation: 2008-10-20

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Total Dissolved Solids		<5.00	mg/L	10

Method Blank (1) QC Batch: 53680

QC Batch: 53680
Prep Batch: 45759

Date Analyzed: 2008-10-28
QC Preparation: 2008-10-20

Analyzed By: KV
Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Calcium		<0.175	mg/L	1
Dissolved Magnesium		<0.148	mg/L	1
Dissolved Potassium		<0.327	mg/L	1
Dissolved Sodium		<0.244	mg/L	1

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 22 of 31
NE of Jal, NM

Duplicates (1) Duplicated Sample: 176710

QC Batch: 53386
Prep Batch: 45721

Date Analyzed: 2008-10-17
QC Preparation: 2008-10-17

Analyzed By: AR
Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH	7.47	7.52	s.u.	1	1	1.5

Duplicates (1) Duplicated Sample: 176710

QC Batch: 53418
Prep Batch: 45720

Date Analyzed: 2008-10-17
QC Preparation: 2008-10-17

Analyzed By: AR
Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Specific Conductance	4030	3950	uMHOS/cm	1	2	20

Duplicates (1) Duplicated Sample: 176827

QC Batch: 53497
Prep Batch: 45810

Date Analyzed: 2008-10-20
QC Preparation: 2008-10-20

Analyzed By: AR
Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity	<1.00	<1.00	mg/L as CaCo3	1	0	20
Carbonate Alkalinity	<1.00	<1.00	mg/L as CaCo3	1	0	20
Bicarbonate Alkalinity	188	195	mg/L as CaCo3	1	4	20
Total Alkalinity	188	195	mg/L as CaCo3	1	4	20

Duplicates (2) Duplicated Sample: 176832

QC Batch: 53662
Prep Batch: 45794

Date Analyzed: 2008-10-24
QC Preparation: 2008-10-20

Analyzed By: AR
Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	1560	1840	mg/L	2	8	20
Total Dissolved Solids	1560	1430	mg/L	2	8	20

Laboratory Control Spike (LCS-1)

QC Batch: 53423
 Prep Batch: 45748

Date Analyzed: 2008-10-19
 QC Preparation: 2008-10-19

Analyzed By: AG
 Prepared By: AG

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	0.783	mg/L	1	1.00	0.0801	70	70 - 130

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	0.757	mg/L	1	1.00	0.0801	68	70 - 130	3	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	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0830	0.0821	mg/L	1	0.100	83	82	70 - 130
4-Bromofluorobenzene (4-BFB)	0.0900	0.0900	mg/L	1	0.100	90	90	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 53437
 Prep Batch: 45754

Date Analyzed: 2008-10-20
 QC Preparation: 2008-10-20

Analyzed By: LD
 Prepared By: LD

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	23.7	mg/L	1	25.0	<2.44	95	70 - 130

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO	20.0	mg/L	1	25.0	<2.44	80	70 - 130	17	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	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Triacontane	12.7	10.7	mg/L	1	10.0	127	107	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 53457
 Prep Batch: 45743

Date Analyzed: 2008-10-17
 QC Preparation: 2008-10-17

Analyzed By: AR
 Prepared By: AR

¹LCSD analyte out of range. LCS/LCSD has a RPD within limits. Therefore, LCS shows extraction occurred properly.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 24 of 31
NE of Jal, NM

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Nitrate-N	2.62	mg/L	1	2.50	<0.0120	105	90 - 110

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Nitrate-N	2.62	mg/L	1	2.50	<0.0120	105	90 - 110	0	

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

Laboratory Control Spike (LCS-1)

QC Batch: 53457
Prep Batch: 45743

Date Analyzed: 2008-10-17
QC Preparation: 2008-10-17

Analyzed By: AR
Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	11.5	mg/L	1	12.5	<0.172	92	90 - 110
Fluoride	2.38	mg/L	1	2.50	<0.199	95	90 - 110
Sulfate	12.7	mg/L	1	12.5	<0.0320	102	90 - 110

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

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	12.2	mg/L	1	12.5	<0.172	98	90 - 110	6	
Fluoride	2.37	mg/L	1	2.50	<0.199	95	90 - 110	0	
Sulfate	12.7	mg/L	1	12.5	<0.0320	102	90 - 110	0	

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

Laboratory Control Spike (LCS-1)

QC Batch: 53680
Prep Batch: 45759

Date Analyzed: 2008-10-28
QC Preparation: 2008-10-20

Analyzed By: KV
Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	50.7	mg/L	1	50.0	<0.175	101	85 - 115
Dissolved Magnesium	50.0	mg/L	1	50.0	<0.148	100	85 - 115
Dissolved Potassium	47.7	mg/L	1	50.0	<0.327	95	85 - 115
Dissolved Sodium	48.3	mg/L	1	50.0	<0.244	97	85 - 115

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

continued...

control spikes continued...

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	50.5	mg/L	1	50.0	<0.175	101	85 - 115	0	20
Dissolved Magnesium	49.6	mg/L	1	50.0	<0.148	99	85 - 115	1	20
Dissolved Potassium	47.6	mg/L	1	50.0	<0.327	95	85 - 115	0	20
Dissolved Sodium	48.3	mg/L	1	50.0	<0.244	97	85 - 115	0	20

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

Matrix Spike (MS-1) Spiked Sample: 176706

QC Batch: 53423
 Prep Batch: 45748

Date Analyzed: 2008-10-19
 QC Preparation: 2008-10-19

Analyzed By: AG
 Prepared By: AG

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	0.667	mg/L	1	1.00	<0.0590	67	70 - 130

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	0.720	mg/L	1	1.00	<0.0590	72	70 - 130	8	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0778	0.0778	mg/L	1	0.1	78	78	70 - 130
4-Bromofluorobenzene (4-BFB)	0.0836	0.0831	mg/L	1	0.1	84	83	70 - 130

Matrix Spike (MS-1) Spiked Sample: 176705

QC Batch: 53437
 Prep Batch: 45754

Date Analyzed: 2008-10-20
 QC Preparation: 2008-10-20

Analyzed By: LD
 Prepared By: LD

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	24.6	mg/L	1	25.0	<2.44	98	70 - 130

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

*Matrix spike recovery out of control limits due to peak interference. Use LCS/LCSD to demonstrate analysis is under control.

Report Date: October 29, 2008
 Arena Langlie-Mattix & Humphrey

Work Order: 8101705
 Arena Langlie-Mattix & Humphrey

Page Number: 26 of 31
 NE of Jal, NM

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO	23.7	mg/L	1	25.0	<2.44	95	70 - 130	4	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Triacetonane	10.5	10.4	mg/L	1	10	105	104	70 - 130

Matrix Spike (MS-1) Spiked Sample: 176710

QC Batch: 53457
 Prep Batch: 45743

Date Analyzed: 2008-10-17
 QC Preparation: 2008-10-17

Analyzed By: AR
 Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Nitrate-N	18.9	mg/L	5	12.5	7.1	94	90 - 110

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Nitrate-N	19.1	mg/L	5	12.5	7.1	96	90 - 110	1	

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

Matrix Spike (MS-1) Spiked Sample: 176710

QC Batch: 53457
 Prep Batch: 45743

Date Analyzed: 2008-10-17
 QC Preparation: 2008-10-17

Analyzed By: AR
 Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	⁹ 1120	mg/L	5	62.5	1099	34	90 - 110
Fluoride	¹⁰ 14.3	mg/L	5	12.5	3.88	83	90 - 110
Sulfate	¹¹ 651	mg/L	5	62.5	636	24	90 - 110

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	¹² 1110	mg/L	5	62.5	1099	18	90 - 110	1	

continued...

⁹Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

¹⁰Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

¹¹Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

¹²Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: S101705
Arena Langlie-Mattix & Humphrey

Page Number: 27 of 31
NE of Jal, NM

matrix spikes continued ...

Param.		MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Fluoride	¹³	14.5	mg/L	5	12.5	3.88	85	90 - 110	1	
Sulfate	¹⁴	645	mg/L	5	62.5	636	14	90 - 110	1	

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

Matrix Spike (MS-1) Spiked Sample: 176705

QC Batch: 53680
Prep Batch: 45759

Date Analyzed: 2008-10-28
QC Preparation: 2008-10-20

Analyzed By: KV
Prepared By: KV

Param.		MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	¹⁵	3040	mg/L	100	50.0	3250	-420	75 - 125
Dissolved Magnesium		1100	mg/L	10	50.0	1040	120	75 - 125
Dissolved Potassium	¹⁶	161	mg/L	10	50.0	136	50	75 - 125
Dissolved Sodium	¹⁷	7590	mg/L	100	50.0	8200	-1220	75 - 125

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

Param.		MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	¹⁸	3420	mg/L	100	50.0	3250	340	75 - 125	12	20
Dissolved Magnesium	¹⁹	1110	mg/L	10	50.0	1040	140	75 - 125	1	20
Dissolved Potassium	²⁰	151	mg/L	10	50.0	136	30	75 - 125	6	20
Dissolved Sodium	²¹	8440	mg/L	100	50.0	8200	480	75 - 125	11	20

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

Standard (ICV-1)

QC Batch: 53386

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7.00	7.05	101	98 - 102	2008-10-17

¹³Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

¹⁴Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

¹⁵Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

¹⁶Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

¹⁷Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

¹⁸Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

¹⁹Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

²⁰Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

²¹Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 28 of 31
NE of Jal, NM

Standard (CCV-1)

QC Batch: 53386

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7.00	7.12	102	98 - 102	2008-10-17

Standard (ICV-1)

QC Batch: 53418

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		uMHOS/cm	1410	1480	105	90 - 110	2008-10-17

Standard (CCV-1)

QC Batch: 53418

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		uMHOS/cm	1410	1450	102	90 - 110	2008-10-17

Standard (ICV-1)

QC Batch: 53423

Date Analyzed: 2008-10-19

Analyzed By: AG

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1.00	0.900	90	85 - 115	2008-10-19

Standard (CCV-1)

QC Batch: 53423

Date Analyzed: 2008-10-19

Analyzed By: AG

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1.00	0.956	96	85 - 115	2008-10-19

Standard (ICV-1)

QC Batch: 53437

Date Analyzed: 2008-10-20

Analyzed By: LD

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	233	93	85 - 115	2008-10-20

Standard (CCV-1)

QC Batch: 53437

Date Analyzed: 2008-10-20

Analyzed By: LD

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	226	90	85 - 115	2008-10-20

Standard (ICV-1)

QC Batch: 53457

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.64	106	90 - 110	2008-10-17

Standard (ICV-1)

QC Batch: 53457

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.4	91	90 - 110	2008-10-17
Fluoride		mg/L	2.50	2.39	96	90 - 110	2008-10-17
Sulfate		mg/L	12.5	12.7	102	90 - 110	2008-10-17

Standard (CCV-1)

QC Batch: 53457

Date Analyzed: 2008-10-17

Analyzed By: AR

Report Date: October 29, 2008
 Arena Langlie-Mattix & Humphrey

Work Order: 8101705
 Arena Langlie-Mattix & Humphrey

Page Number: 30 of 31
 NE of Jal. NM

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.60	104	90 - 110	2008-10-17

Standard (CCV-1)

QC Batch: 53457

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.5	92	90 - 110	2008-10-17
Fluoride		mg/L	2.50	2.38	95	90 - 110	2008-10-17
Sulfate		mg/L	12.5	12.7	102	90 - 110	2008-10-17

Standard (ICV-1)

QC Batch: 53497

Date Analyzed: 2008-10-20

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0.00	<1.00		0 - 200	2008-10-20
Carbonate Alkalinity		mg/L as CaCo3	0.00	210		0 - 200	2008-10-20
Bicarbonate Alkalinity		mg/L as CaCo3	0.00	45.0		0 - 200	2008-10-20
Total Alkalinity		mg/L as CaCo3	250	255	102	90 - 110	2008-10-20

Standard (CCV-1)

QC Batch: 53497

Date Analyzed: 2008-10-20

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0.00	<1.00		0 - 200	2008-10-20
Carbonate Alkalinity		mg/L as CaCo3	0.00	244		0 - 200	2008-10-20
Bicarbonate Alkalinity		mg/L as CaCo3	0.00	9.00		0 - 200	2008-10-20
Total Alkalinity		mg/L as CaCo3	250	253	101	90 - 110	2008-10-20

Standard (ICV-1)

QC Batch: 53662

Date Analyzed: 2008-10-24

Analyzed By: AR

Report Date: October 29, 2008
 Arena Langlie-Mattix & Humphrey

Work Order: S101705
 Arena Langlie-Mattix & Humphrey

Page Number: 31 of 31
 NE of Jal, NM

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	933	93	90 - 110	2008-10-24

Standard (CCV-1)

QC Batch: 53662

Date Analyzed: 2008-10-24

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	996	100	90 - 110	2008-10-24

Standard (ICV-1)

QC Batch: 53680

Date Analyzed: 2008-10-28

Analyzed By: KV

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	51.5	103	90 - 110	2008-10-28
Dissolved Magnesium		mg/L	50.0	51.1	102	90 - 110	2008-10-28
Dissolved Potassium		mg/L	50.0	50.3	101	90 - 110	2008-10-28
Dissolved Sodium		mg/L	50.0	50.6	101	90 - 110	2008-10-28

Standard (CCV-1)

QC Batch: 53680

Date Analyzed: 2008-10-28

Analyzed By: KV

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	51.1	102	90 - 110	2008-10-28
Dissolved Magnesium		mg/L	50.0	50.3	101	90 - 110	2008-10-28
Dissolved Potassium		mg/L	50.0	47.4	95	90 - 110	2008-10-28
Dissolved Sodium		mg/L	50.0	49.8	100	90 - 110	2008-10-28

TraceAnalysis, Inc.

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Company Name: Etech Environmental Phone #: 432/6610543
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 Contact Person: Mike Hagan E-mail: mike@etchenv.com
 Invoice to:
 (If different from above)
 Project #: Project Name: Arena Langlie-Mattix + Haysburg
 Project Location (including state): NE of Jax, NM Sampler Signature: [Signature]

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX				PRESERVATIVE METHOD						SAMPLING		MTBE 8021B / 602	BTEX 8021B / 602	TPH 413.1 / TX1005	TPH 8015 GRO / D / DD	EPAH 8270C / 625	Total Metals Ag As Ba Cd	TCLP Metals Ag As	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B / 6	GC/MS Semi. Vol. 8	PCB's 8082 / 508	Pesticides 8081A / 6	BOD, TSS, pH	Moisture Content	General Water with Arsenic on H ₂ Cond.	Turn Around Time if	Hold	
				WATER	SOIL	AIR	SLUDGE	HCl	HNO ₃	H ₂ SO ₄	NaOH	ICE	NONE	DATE	TIME																					
705	H MW-1	7	1/2 6VOC	✓				✓						10-16-08	1235	✓	✓	✓																		
706	H MW-2	7		✓				✓							0950	✓	✓	✓																		
707	H MW-3	7		✓				✓							1152	✓	✓	✓																		
708	L MW-1	7		✓				✓							1405	✓	✓	✓																		
709	L MW-2	7		✓				✓							1443	✓	✓	✓																		
710	L MW-3	7		✓				✓							1512	✓	✓	✓																		

Relinquished by: <u>[Signature]</u> Company: <u>Etech</u> Date: <u>10-16-08</u> Time: <u>1724</u>	Received by: <u>[Signature]</u> Company: <u>TRACE</u> Date: <u>10/16/08</u> Time: <u>17:14</u> Temp: <u>2.8C</u>	LAB USE ONLY Intact: <u>Y/N</u> Headspace: <u>Y/N/NA</u> Log-In-Review: <u>2.9</u>	REMARKS: X Cell w/ 8015 results before running box TPH, U, SO ₄ , F, NO ₃ , alkalinity, TDS, pH, and - M. H. ☐ Dry Weight Basis Required ☐ TRRP Report Required ☐ Check If Special Reporting Limits Are Needed
Relinquished by: <u>[Signature]</u> Company: <u>Trace</u> Date: <u>10/17/08</u> Time: <u>17:00</u>	Received by: <u>[Signature]</u> Company: <u>Trace</u> Date: <u>10/17/08</u> Time: <u>17:00</u> Temp: <u>2.8C</u>		
Relinquished by: <u>[Signature]</u> Company: <u>Trace</u> Date: <u>10/17/08</u> Time: <u>17:00</u>	Received by: <u>[Signature]</u> Company: <u>Trace</u> Date: <u>10/17/08</u> Time: <u>17:00</u> Temp: <u>2.8C</u>		

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

Carrier # Langin

ORIGINAL COPY

Summary Report

Mike Hagan
Etech Environmental Safety

Report Date: October 29, 2008

P.O. Box 8469
Midland, TX, 79708

Work Order: 8101705



Project Location: NE of Jal, NM.
Project Name: Arena Langlie-Mattix & Humphrey

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
176705	HMW-1	water	2008-10-16	12:35	2008-10-16
176706	HMW-2	water	2008-10-16	09:50	2008-10-16
176707	HMW-3	water	2008-10-16	11:52	2008-10-16
176708	HMW-1	water	2008-10-16	14:05	2008-10-16
176709	HMW-2	water	2008-10-16	14:43	2008-10-16
176710	HMW-3	water	2008-10-16	15:12	2008-10-16

Sample - Field Code	TPH DRO	TPH GRO
	DRO (mg/L)	GRO (mg/L)
176705 - HMW-1	<5.00	<0.100
176706 - HMW-2	<5.00	<0.100
176707 - HMW-3	<5.00	<0.100
176708 - HMW-1	<5.00	<0.100
176709 - HMW-2	<5.00	<0.100
176710 - HMW-3	<5.00	<0.100

Sample: 176705 - HMW-1

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1.00
Bicarbonate Alkalinity		89.0	mg/L as CaCO3	4.00
Total Alkalinity		89.0	mg/L as CaCO3	4.00
Specific Conductance		51100	uMHOS/cm	0.00
Chloride		19900	mg/L	0.500
Fluoride		<1.00	mg/L	0.200
Sulfate		1840	mg/L	0.500

continued ...

sample 176705 continued ...

Param	Flag	Result	Units	RL
Nitrate-N		9.12	mg/L	0.200
pH		6.94	s.u.	0.00
Dissolved Calcium		3250	mg/L	1.00
Dissolved Magnesium		1040	mg/L	1.00
Dissolved Potassium		136	mg/L	1.00
Dissolved Sodium		8200	mg/L	1.00
Total Dissolved Solids		35000	mg/L	10.0

Sample: 176706 - HMW-2

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1.00
Bicarbonate Alkalinity		142	mg/L as CaCo3	4.00
Total Alkalinity		142	mg/L as CaCo3	4.00
Specific Conductance		3050	uMHOS/cm	0.00
Chloride		649	mg/L	0.500
Fluoride		3.09	mg/L	0.200
Sulfate		399	mg/L	0.500
Nitrate-N		2.55	mg/L	0.200
pH		8.04	s.u.	0.00
Dissolved Calcium		257	mg/L	1.00
Dissolved Magnesium		78.2	mg/L	1.00
Dissolved Potassium		9.17	mg/L	1.00
Dissolved Sodium		190	mg/L	1.00
Total Dissolved Solids		1510	mg/L	10.0

Sample: 176707 - HMW-3

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1.00
Bicarbonate Alkalinity		143	mg/L as CaCo3	4.00
Total Alkalinity		143	mg/L as CaCo3	4.00
Specific Conductance		4300	uMHOS/cm	0.00
Chloride		1180	mg/L	0.500
Fluoride		3.23	mg/L	0.200
Sulfate		314	mg/L	0.500
Nitrate-N		2.50	mg/L	0.200
pH		7.54	s.u.	0.00
Dissolved Calcium		359	mg/L	1.00
Dissolved Magnesium		114	mg/L	1.00
Dissolved Potassium		11.4	mg/L	1.00
Dissolved Sodium		372	mg/L	1.00

continued ...

sample 176707 continued ...

Param	Flag	Result	Units	RL
Total Dissolved Solids		2400	mg/L	10.0

Sample: 176708 - HMW-1

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1.00
Bicarbonate Alkalinity		167	mg/L as CaCO3	4.00
Total Alkalinity		167	mg/L as CaCO3	4.00
Specific Conductance		36500	uMHOS/cm	0.00
Chloride		13500	mg/L	0.500
Fluoride		<1.00	mg/L	0.200
Sulfate		1700	mg/L	0.500
Nitrate-N		17.6	mg/L	0.200
pH		6.82	s.u.	0.00
Dissolved Calcium		2000	mg/L	1.00
Dissolved Magnesium		738	mg/L	1.00
Dissolved Potassium		63.8	mg/L	1.00
Dissolved Sodium		5740	mg/L	1.00
Total Dissolved Solids		24600	mg/L	10.0

Sample: 176709 - HMW-2

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1.00
Bicarbonate Alkalinity		112	mg/L as CaCO3	4.00
Total Alkalinity		112	mg/L as CaCO3	4.00
Specific Conductance		2520	uMHOS/cm	0.00
Chloride		639	mg/L	0.500
Fluoride		3.57	mg/L	0.200
Sulfate		245	mg/L	0.500
Nitrate-N		6.86	mg/L	0.200
pH		7.87	s.u.	0.00
Dissolved Calcium		259	mg/L	1.00
Dissolved Magnesium		81.5	mg/L	1.00
Dissolved Potassium		10.7	mg/L	1.00
Dissolved Sodium		171	mg/L	1.00
Total Dissolved Solids		1460	mg/L	10.0

Sample: 176710 - HMW-3

Param	Flag	Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1.00
Bicarbonate Alkalinity		86.0	mg/L as CaCO3	4.00
Total Alkalinity		86.0	mg/L as CaCO3	4.00
Specific Conductance		3950	uMHOS/cm	0.00
Chloride		999	mg/L	0.500
Fluoride		3.88	mg/L	0.200
Sulfate		632	mg/L	0.500
Nitrate-N		7.10	mg/L	0.200
pH		7.52	s.u.	0.00
Dissolved Calcium		433	mg/L	1.00
Dissolved Magnesium		146	mg/L	1.00
Dissolved Potassium		12.5	mg/L	1.00
Dissolved Sodium		222	mg/L	1.00
Total Dissolved Solids		1980	mg/L	10.0

TRACE ANALYSIS, INC.

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Certifications

WBENC: 237019

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DBE: VN 20657

NCTRC A WFWB38444Y0909

NELAP Certifications

Lubbock: T104704219-08-TX

El Paso: T104704221-08-TX

Midland: T104704392-08-TX

LELAP-02003

LELAP-02002

Kansas E-10317

Analytical and Quality Control Report

Mike Hagan

Etech Environmental Safety

Report Date: October 29, 2008

P.O. Box 8469

Midland, TX, 79708

Work Order: 8101705



Project Location: NE of Jal, NM

Project Name: Arena Langlie-Mattix & Humphrey

Project Number: Arena Langlie-Mattix & Humphrey

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
176705	HMW-1	water	2008-10-16	12:35	2008-10-16
176706	HMW-2	water	2008-10-16	09:50	2008-10-16
176707	HMW-3	water	2008-10-16	11:52	2008-10-16
176708	HMW-1	water	2008-10-16	14:05	2008-10-16
176709	HMW-2	water	2008-10-16	14:43	2008-10-16
176710	HMW-3	water	2008-10-16	15:12	2008-10-16

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 31 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Standard Flags

B - The sample contains less than ten times the concentration found in the method blank.

Case Narrative

Samples for project Arena Langlie-Mattix & Humphrey were received by TraceAnalysis, Inc. on 2008-10-16 and assigned to work order 8101705. Samples for work order 8101705 were received intact without headspace and at a temperature of 2.8 deg. C.

Samples were analyzed for the following tests using their respective methods:

Test	Method
Alkalinity	SM 2320B
Ca, Dissolved	S 6010B
Chloride (IC)	E 300.0
Conductivity	SM 2510B
Fluoride (IC)	E 300.0
K, Dissolved	S 6010B
Mg, Dissolved	S 6010B
Na, Dissolved	S 6010B
NO3 (IC)	E 300.0
pH	SM 4500-H+
SO4 (IC)	E 300.0
TDS	SM 2540C
TPH DRO	Mod. 8015B
TPH GRO	S 8015B

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 8101705 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: S101705
Arena Langlie-Mattix & Humphrey

Page Number: 3 of 31
NE of Jal, NM

Analytical Report

Sample: 176705 - HMW-1

Laboratory: Midland
Analysis: Alkalinity
QC Batch: 53497
Prep Batch: 45810

Analytical Method: SM 2320B
Date Analyzed: 2008-10-20
Sample Preparation: 2008-10-20

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO ₃	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO ₃	1	1.00
Bicarbonate Alkalinity		89.0	mg/L as CaCO ₃	1	4.00
Total Alkalinity		89.0	mg/L as CaCO ₃	1	4.00

Sample: 176705 - HMW-1

Laboratory: Midland
Analysis: Conductivity
QC Batch: 53418
Prep Batch: 45720

Analytical Method: SM 2510B
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		51100	µMHOS/cm	1	0.00

Sample: 176705 - HMW-1

Laboratory: Midland
Analysis: Ion Chromatography
QC Batch: 53457
Prep Batch: 45743

Analytical Method: E 300.0
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		19900	mg/L	1000	0.500
Fluoride		<1.00	mg/L	5	0.200
Sulfate		1840	mg/L	100	0.500

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 4 of 31
NE of Jal, NM

Sample: 176705 - HMW-1

Laboratory: Midland
Analysis: NO3 (IC)
QC Batch: 53457
Prep Batch: 45743

Analytical Method: E 300.0
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		9.12	mg/L	5	0.200

Sample: 176705 - HMW-1

Laboratory: Midland
Analysis: pH
QC Batch: 53386
Prep Batch: 45721

Analytical Method: SM 4500-H+
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
pH		6.94	s.u.	1	0.00

Sample: 176705 - HMW-1

Laboratory: Lubbock
Analysis: Salts, Dissolved
QC Batch: 53680
Prep Batch: 45759

Analytical Method: S 6010B
Date Analyzed: 2008-10-28
Sample Preparation: 2008-10-20

Prep Method: S 3005A
Analyzed By: KV
Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		3250	mg/L	100	1.00
Dissolved Magnesium		1040	mg/L	10	1.00
Dissolved Potassium		136	mg/L	10	1.00
Dissolved Sodium		8200	mg/L	100	1.00

Sample: 176705 - HMW-1

Laboratory: Midland
Analysis: TDS
QC Batch: 53662
Prep Batch: 45794

Analytical Method: SM 2540C
Date Analyzed: 2008-10-24
Sample Preparation: 2008-10-20

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		35000	mg/L	100	10.0

Sample: 176705 - HMW-1

Laboratory: Midland
 Analysis: TPH DRO Analytical Method: Mod. 8015B Prep Method: N/A
 QC Batch: 53437 Date Analyzed: 2008-10-20 Analyzed By: LD
 Prep Batch: 45754 Sample Preparation: 2008-10-20 Prepared By: ED

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	1	15.3	mg/L	1	10.0	153	70 - 130

Sample: 176705 - HMW-1

Laboratory: Midland
 Analysis: TPH GRO Analytical Method: S 8015B Prep Method: S 5030B
 QC Batch: 53423 Date Analyzed: 2008-10-19 Analyzed By: AC
 Prep Batch: 45748 Sample Preparation: 2008-10-19 Prepared By: AC

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.100	mg/L	1	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0793	mg/L	1	0.100	79	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0827	mg/L	1	0.100	83	70 - 130

Sample: 176706 - HMW-2

Laboratory: Midland
 Analysis: Alkalinity Analytical Method: SM 2320B Prep Method: N/A
 QC Batch: 53497 Date Analyzed: 2008-10-20 Analyzed By: AR
 Prep Batch: 45810 Sample Preparation: 2008-10-20 Prepared By: AR

continued ...

1 High surrogate recovery. Sample non-detect, result bias high.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: S101705
Arena Langlie-Mattix & Humphrey

Page Number: 6 of 31
NE of Jal, NM

sample 176706 continued

Parameter	Flag	RL Result	Units	Dilution	RL
Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Bicarbonate Alkalinity		142	mg/L as CaCO3	1	4.00
Total Alkalinity		142	mg/L as CaCO3	1	4.00

Sample: 176706 - HMW-2

Laboratory: Midland
Analysis: Conductivity
QC Batch: 53418
Prep Batch: 45720

Analytical Method: SM 2510B
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		3050	uMHOS/cm	1	0.00

Sample: 176706 - HMW-2

Laboratory: Midland
Analysis: Ion Chromatography
QC Batch: 53457
Prep Batch: 45743

Analytical Method: E 300.0
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		649	mg/L	50	0.500
Fluoride		3.09	mg/L	5	0.200
Sulfate		399	mg/L	50	0.500

Sample: 176706 - HMW-2

Laboratory: Midland
Analysis: NO3 (IC)
QC Batch: 53457
Prep Batch: 45743

Analytical Method: E 300.0
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 7 of 31
NE of Jal. NM

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		2.55	mg/L	5	0.200

Sample: 176706 - HMW-2

Laboratory: Midland

Analysis: pH

QC Batch: 53386

Prep Batch: 45721

Analytical Method: SM 4500-H+

Date Analyzed: 2008-10-17

Sample Preparation: 2008-10-17

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
pH		8.04	s.u.	1	0.00

Sample: 176706 - HMW-2

Laboratory: Lubbock

Analysis: Salts, Dissolved

QC Batch: 53680

Prep Batch: 45759

Analytical Method: S 6010B

Date Analyzed: 2008-10-28

Sample Preparation: 2008-10-20

Prep Method: S 3005A

Analyzed By: KV

Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		257	mg/L	1	1.00
Dissolved Magnesium		78.2	mg/L	1	1.00
Dissolved Potassium		9.17	mg/L	1	1.00
Dissolved Sodium		190	mg/L	1	1.00

Sample: 176706 - HMW-2

Laboratory: Midland

Analysis: TDS

QC Batch: 53662

Prep Batch: 45794

Analytical Method: SM 2540C

Date Analyzed: 2008-10-24

Sample Preparation: 2008-10-20

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		1510	mg/L	2	10.0

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: S101705
Arena Langlie-Mattix & Humphrey

Page Number: 8 of 31
NE of Jal, NM

Sample: 176706 - HMW-2

Laboratory: Midland
Analysis: TPH DRO Analytical Method: Mod. 8015B Prep Method: N/A
QC Batch: 53437 Date Analyzed: 2008-10-20 Analyzed By: LD
Prep Batch: 45754 Sample Preparation: 2008-10-20 Prepared By: LD

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		15.7	mg/L	1	10.0	157	70 - 130

Sample: 176706 - HMW-2

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015B Prep Method: S 5030B
QC Batch: 53423 Date Analyzed: 2008-10-19 Analyzed By: AG
Prep Batch: 45748 Sample Preparation: 2008-10-19 Prepared By: AG

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.100	mg/L	1	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0792	mg/L	1	0.100	79	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0836	mg/L	1	0.100	84	70 - 130

Sample: 176707 - HMW-3

Laboratory: Midland
Analysis: Alkalinity Analytical Method: SM 2320B Prep Method: N/A
QC Batch: 53497 Date Analyzed: 2008-10-20 Analyzed By: AR
Prep Batch: 45810 Sample Preparation: 2008-10-20 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Bicarbonate Alkalinity		143	mg/L as CaCO3	1	4.00
Total Alkalinity		143	mg/L as CaCO3	1	4.00

* High surrogate recovery. Sample non-detect; result bias high.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 9 of 31
NE of Jal, NM

Sample: 176707 - HMW-3

Laboratory:	Midland	Analytical Method:	SM 2510B	Prep Method:	N/A
Analysis:	Conductivity	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53418	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45720				

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		4300	µMHOS/cm	1	0.00

Sample: 176707 - HMW-3

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Ion Chromatography	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53457	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45743				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		1180	mg/L	100	0.500
Fluoride		3.23	mg/L	5	0.200
Sulfate		314	mg/L	5	0.500

Sample: 176707 - HMW-3

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	NO3 (IC)	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53457	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45743				

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		2.50	mg/L	5	0.200

Sample: 176707 - HMW-3

Laboratory:	Midland	Analytical Method:	SM 4500-H+	Prep Method:	N/A
Analysis:	pH	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53386	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45721				

continued ...

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 10 of 31
NE of Jal, NM

sample 176707 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Parameter	Flag	RL Result	Units	Dilution	RL
pH		7.54	s.u.	1	0.00

Sample: 176707 - HMW-3

Laboratory: Lubbock
Analysis: Salts, Dissolved
QC Batch: 53680
Prep Batch: 45759

Analytical Method: S 6010B
Date Analyzed: 2008-10-28
Sample Preparation: 2008-10-20

Prep Method: S 3005A
Analyzed By: KV
Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		359	mg/L	10	1.00
Dissolved Magnesium		114	mg/L	1	1.00
Dissolved Potassium		11.4	mg/L	1	1.00
Dissolved Sodium		372	mg/L	10	1.00

Sample: 176707 - HMW-3

Laboratory: Midland
Analysis: TDS
QC Batch: 53662
Prep Batch: 45794

Analytical Method: SM 2540C
Date Analyzed: 2008-10-24
Sample Preparation: 2008-10-20

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		2400	mg/L	5	10.0

Sample: 176707 - HMW-3

Laboratory: Midland
Analysis: TPH DRO
QC Batch: 53437
Prep Batch: 45754

Analytical Method: Mod. 8015B
Date Analyzed: 2008-10-20
Sample Preparation: 2008-10-20

Prep Method: N/A
Analyzed By: LD
Prepared By: LD

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	1	5.00

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 11 of 31
NE of Jal. NM

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		145	mg/L	1	10.0	145	70 - 130

Sample: 176707 - HMW-3

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015B Prep Method: S 5030B
QC Batch: 53423 Date Analyzed: 2008-10-19 Analyzed By: AG
Prep Batch: 45748 Sample Preparation: 2008-10-19 Prepared By: AG

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.100	mg/L	1	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0823	mg/L	1	0.100	82	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0861	mg/L	1	0.100	86	70 - 130

Sample: 176708 - HMW-1

Laboratory: Midland
Analysis: Alkalinity Analytical Method: SM 2320B Prep Method: N/A
QC Batch: 53497 Date Analyzed: 2008-10-20 Analyzed By: AR
Prep Batch: 45810 Sample Preparation: 2008-10-20 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Bicarbonate Alkalinity		167	mg/L as CaCO3	1	4.00
Total Alkalinity		167	mg/L as CaCO3	1	4.00

Sample: 176708 - HMW-1

Laboratory: Midland
Analysis: Conductivity Analytical Method: SM 2510B Prep Method: N/A
QC Batch: 53418 Date Analyzed: 2008-10-17 Analyzed By: AR
Prep Batch: 45720 Sample Preparation: 2008-10-17 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		36500	µMHOS/cm	1	0.00

*High surrogate recovery. Sample non-detect, result bias high.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 12 of 31
NE of Jal, NM

Sample: 176708 - HMW-1

Laboratory: Midland
Analysis: Ion Chromatography
QC Batch: 53457
Prep Batch: 45743

Analytical Method: E 300.0
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		13500	mg/L	1000	0.500
Fluoride		<1.00	mg/L	5	0.200
Sulfate		1700	mg/L	100	0.500

Sample: 176708 - HMW-1

Laboratory: Midland
Analysis: NO3 (IC)
QC Batch: 53457
Prep Batch: 45743

Analytical Method: E 300.0
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		17.6	mg/L	5	0.200

Sample: 176708 - HMW-1

Laboratory: Midland
Analysis: pH
QC Batch: 53386
Prep Batch: 45721

Analytical Method: SM 4500-H+

Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
pH		6.82	s.u.	1	0.00

Sample: 176708 - HMW-1

Laboratory: Lubbock
Analysis: Salts, Dissolved
QC Batch: 53680
Prep Batch: 45759

Analytical Method: S 6010B
Date Analyzed: 2008-10-28
Sample Preparation: 2008-10-20

Prep Method: S 3005A
Analyzed By: KV
Prepared By: KV

continued ...

sample 176708 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		2000	mg/L	10	1.00
Dissolved Magnesium		738	mg/L	10	1.00
Dissolved Potassium		63.8	mg/L	1	1.00
Dissolved Sodium		5740	mg/L	100	1.00

Sample: 176708 - HMW-1

Laboratory: Midland
 Analysis: TDS
 QC Batch: 53662
 Prep Batch: 45794

Analytical Method: SM 2540C
 Date Analyzed: 2008-10-24
 Sample Preparation: 2008-10-20

Prep Method: N/A
 Analyzed By: AR
 Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		24600	mg/L	100	10.0

Sample: 176708 - HMW-1

Laboratory: Midland
 Analysis: TPH DRO
 QC Batch: 53437
 Prep Batch: 45754

Analytical Method: Mod. 8015B
 Date Analyzed: 2008-10-20
 Sample Preparation: 2008-10-20

Prep Method: N/A
 Analyzed By: LD
 Prepared By: LD

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		15.2	mg/L	1	10.0	152	70 - 130

Sample: 176708 - HMW-1

Laboratory: Midland
 Analysis: TPH GRO
 QC Batch: 53423
 Prep Batch: 45748

Analytical Method: S 8015B
 Date Analyzed: 2008-10-19
 Sample Preparation: 2008-10-19

Prep Method: S 5030B
 Analyzed By: AG
 Prepared By: AG

¹High surrogate recovery. Sample non-detect, result bias high.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 14 of 31
NE of Jal, NM

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.100	mg/L	1	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0802	mg/L	1	0.100	80	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0839	mg/L	1	0.100	84	70 - 130

Sample: 176709 - HMW-2

Laboratory: Midland
Analysis: Alkalinity
QC Batch: 53497
Prep Batch: 45810

Analytical Method: SM 2320B
Date Analyzed: 2008-10-20
Sample Preparation: 2008-10-20

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Bicarbonate Alkalinity		112	mg/L as CaCO3	1	4.00
Total Alkalinity		112	mg/L as CaCO3	1	4.00

Sample: 176709 - HMW-2

Laboratory: Midland
Analysis: Conductivity
QC Batch: 53418
Prep Batch: 45720

Analytical Method: SM 2510B
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		2520	uMHOS/cm	1	0.00

Sample: 176709 - HMW-2

Laboratory: Midland
Analysis: Ion Chromatography
QC Batch: 53457
Prep Batch: 45743

Analytical Method: E 300.0
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		639	mg/L	50	0.500

continued . . .

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 15 of 31
NE of Jal, NM

sample 176709 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Fluoride		3.57	mg/L	5	0.200
Sulfate		245	mg/L	5	0.500

Sample: 176709 - HMW-2

Laboratory: Midland
Analysis: NO3 (IC)
QC Batch: 53457
Prep Batch: 45743

Analytical Method: E 300.0
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		6.86	mg/L	5	0.200

Sample: 176709 - HMW-2

Laboratory: Midland
Analysis: pH
QC Batch: 53386
Prep Batch: 45721

Analytical Method: SM 4500-H+
Date Analyzed: 2008-10-17
Sample Preparation: 2008-10-17

Prep Method: N/A
Analyzed By: AR
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
pH		7.87	s.u.	1	0.00

Sample: 176709 - HMW-2

Laboratory: Lubbock
Analysis: Salts, Dissolved
QC Batch: 53680
Prep Batch: 45759

Analytical Method: S 6010B
Date Analyzed: 2008-10-28
Sample Preparation: 2008-10-20

Prep Method: S 3005A
Analyzed By: KV
Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		259	mg/L	1	1.00
Dissolved Magnesium		81.5	mg/L	1	1.00
Dissolved Potassium		10.7	mg/L	1	1.00
Dissolved Sodium		171	mg/L	1	1.00

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 16 of 31
NE of Jal, NM

Sample: 176709 - HMW-2

Laboratory:	Midland	Analytical Method:	SM 2540C	Prep Method:	N/A
Analysis:	TDS	Date Analyzed:	2008-10-24	Analyzed By:	AR
QC Batch:	53662	Sample Preparation:	2008-10-20	Prepared By:	AR
Prep Batch:	45794				

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		1460	mg/L	2	10.0

Sample: 176709 - HMW-2

Laboratory:	Midland	Analytical Method:	Mod. 8015B	Prep Method:	N/A
Analysis:	TPH DRO	Date Analyzed:	2008-10-20	Analyzed By:	LD
QC Batch:	53437	Sample Preparation:	2008-10-20	Prepared By:	LD
Prep Batch:	45754				

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	5	13.4	mg/L	1	10.0	134	70 - 130

Sample: 176709 - HMW-2

Laboratory:	Midland	Analytical Method:	S 8015B	Prep Method:	S 5030B
Analysis:	TPH GRO	Date Analyzed:	2008-10-19	Analyzed By:	AG
QC Batch:	53423	Sample Preparation:	2008-10-19	Prepared By:	AG
Prep Batch:	45748				

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.100	mg/L	1	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0803	mg/L	1	0.100	80	70 - 130
+ Bromofluorobenzene (4-BFB)		0.0839	mg/L	1	0.100	84	70 - 130

⁵High surrogate recovery. Sample non-detect; result bias high.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 17 of 31
NE of Jal, NM

Sample: 176710 - HMW-3

Laboratory:	Midland	Analytical Method:	SM 2320B	Prep Method:	N/A
Analysis:	Alkalinity	Date Analyzed:	2008-10-20	Analyzed By:	AR
QC Batch:	53497	Sample Preparation:	2008-10-20	Prepared By:	AR
Prep Batch:	45810				

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCO3	1	1.00
Bicarbonate Alkalinity		86.0	mg/L as CaCO3	1	4.00
Total Alkalinity		86.0	mg/L as CaCO3	1	4.00

Sample: 176710 - HMW-3

Laboratory:	Midland	Analytical Method:	SM 2510B	Prep Method:	N/A
Analysis:	Conductivity	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53418	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45720				

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		3950	µMHOS/cm	1	0.00

Sample: 176710 - HMW-3

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Ion Chromatography	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53457	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45743				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		999	mg/L	100	0.500
Fluoride		3.88	mg/L	5	0.200
Sulfate		632	mg/L	100	0.500

Sample: 176710 - HMW-3

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	NO3 (IC)	Date Analyzed:	2008-10-17	Analyzed By:	AR
QC Batch:	53457	Sample Preparation:	2008-10-17	Prepared By:	AR
Prep Batch:	45743				

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 18 of 31
NE of Jal, NM

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N		7.10	mg/L	5	0.200

Sample: 176710 - HMW-3

Laboratory: Midland

Analysis: pH

QC Batch: 53386

Prep Batch: 45721

Analytical Method: SM 4500-H+

Date Analyzed: 2008-10-17

Sample Preparation: 2008-10-17

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
pH		7.52	s.u.	1	0.00

Sample: 176710 - HMW-3

Laboratory: Lubbock

Analysis: Salts, Dissolved

QC Batch: 53680

Prep Batch: 45759

Analytical Method: S 6010B

Date Analyzed: 2008-10-28

Sample Preparation: 2008-10-20

Prep Method: S 3005A

Analyzed By: KV

Prepared By: KV

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Calcium		433	mg/L	10	1.00
Dissolved Magnesium		146	mg/L	1	1.00
Dissolved Potassium		12.5	mg/L	1	1.00
Dissolved Sodium		222	mg/L	1	1.00

Sample: 176710 - HMW-3

Laboratory: Midland

Analysis: TDS

QC Batch: 53662

Prep Batch: 45794

Analytical Method: SM 2540C

Date Analyzed: 2008-10-24

Sample Preparation: 2008-10-20

Prep Method: N/A

Analyzed By: AR

Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		1980	mg/L	5	10.0

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 19 of 31
NE of Jal, NM

Sample: 176710 - HMW-3

Laboratory: Midland
Analysis: TPH DRO Analytical Method: Mod. 8015B Prep Method: N/A
QC Batch: 53437 Date Analyzed: 2008-10-20 Analyzed By: LD
Prep Batch: 45754 Sample Preparation: 2008-10-20 Prepared By: LD

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	"	16.6	mg/L	1	10.0	166	70 - 130

Sample: 176710 - HMW-3

Laboratory: Midland
Analysis: TPH GRO Analytical Method: S 8015B Prep Method: S 5030B
QC Batch: 53423 Date Analyzed: 2008-10-19 Analyzed By: AG
Prep Batch: 45748 Sample Preparation: 2008-10-19 Prepared By: AG

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.100	mg/L	1	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0830	mg/L	1	0.100	83	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0874	mg/L	1	0.100	87	70 - 130

Method Blank (1) QC Batch: 53418

QC Batch: 53418 Date Analyzed: 2008-10-17 Analyzed By: AR
Prep Batch: 45720 QC Preparation: 2008-10-17 Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Specific Conductance		7.30	uMHOS/cm	0

^aHigh surrogate recovery. Sample non-detect, result bias high.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 20 of 31
NE of Jal, NM

Method Blank (1) QC Batch: 53423

QC Batch: 53423
Prep Batch: 45748

Date Analyzed: 2008-10-19
QC Preparation: 2008-10-19

Analyzed By: AG
Prepared By: AG

Parameter	Flag	MDL Result	Units	RL
GRO		0.0801	mg/L	0.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0813	mg/L	1	0.100	81	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0878	mg/L	1	0.100	88	50 - 130

Method Blank (1) QC Batch: 53437

QC Batch: 53437
Prep Batch: 45754

Date Analyzed: 2008-10-20
QC Preparation: 2008-10-20

Analyzed By: LD
Prepared By: LD

Parameter	Flag	MDL Result	Units	RL
DRO		<2.44	mg/L	5

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Tricosane		12.8	mg/L	1	10.0	128	70 - 130

Method Blank (1) QC Batch: 53457

QC Batch: 53457
Prep Batch: 45743

Date Analyzed: 2008-10-17
QC Preparation: 2008-10-17

Analyzed By: AR
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Nitrate-N		<0.0120	mg/L	0.2

Method Blank (1) QC Batch: 53457

QC Batch: 53457
Prep Batch: 45743

Date Analyzed: 2008-10-17
QC Preparation: 2008-10-17

Analyzed By: AR
Prepared By: AR

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: S101705
Arena Langlie-Mattix & Humphrey

Page Number: 21 of 31
NE of Jal, NM

Parameter	Flag	MDL Result	Units	RL
Chloride		<0.172	mg/L	0.5
Fluoride		<0.199	mg/L	0.2
Sulfate		<0.0320	mg/L	0.5

Method Blank (1) QC Batch: 53497

QC Batch: 53497 Date Analyzed: 2008-10-20 Analyzed By: AR
Prep Batch: 45810 QC Preparation: 2008-10-20 Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1
Bicarbonate Alkalinity		<4.00	mg/L as CaCo3	4
Total Alkalinity		<4.00	mg/L as CaCo3	4

Method Blank (1) QC Batch: 53662

QC Batch: 53662 Date Analyzed: 2008-10-24 Analyzed By: AR
Prep Batch: 45794 QC Preparation: 2008-10-20 Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Total Dissolved Solids		<5.00	mg/L	10

Method Blank (1) QC Batch: 53680

QC Batch: 53680 Date Analyzed: 2008-10-28 Analyzed By: KV
Prep Batch: 45759 QC Preparation: 2008-10-20 Prepared By: KV

Parameter	Flag	MDL Result	Units	RL
Dissolved Calcium		<0.175	mg/L	1
Dissolved Magnesium		<0.148	mg/L	1
Dissolved Potassium		<0.327	mg/L	1
Dissolved Sodium		<0.244	mg/L	1

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 22 of 31
NE of Jol, NM

Duplicates (1) Duplicated Sample: 176710

QC Batch: 53386
Prep Batch: 45721

Date Analyzed: 2008-10-17
QC Preparation: 2008-10-17

Analyzed By: AR
Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH	7.47	7.52	s.u.	1	1	1.5

Duplicates (1) Duplicated Sample: 176710

QC Batch: 53418
Prep Batch: 45720

Date Analyzed: 2008-10-17
QC Preparation: 2008-10-17

Analyzed By: AR
Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Specific Conductance	4030	3950	uMHOS/cm	1	2	20

Duplicates (1) Duplicated Sample: 176827

QC Batch: 53497
Prep Batch: 45810

Date Analyzed: 2008-10-20
QC Preparation: 2008-10-20

Analyzed By: AR
Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity	<1.00	<1.00	mg/L as CaCO3	1	0	20
Carbonate Alkalinity	<1.00	<1.00	mg/L as CaCO3	1	0	20
Bicarbonate Alkalinity	188	195	mg/L as CaCO3	1	4	20
Total Alkalinity	188	195	mg/L as CaCO3	1	4	20

Duplicates (2) Duplicated Sample: 176832

QC Batch: 53662
Prep Batch: 45794

Date Analyzed: 2008-10-24
QC Preparation: 2008-10-20

Analyzed By: AR
Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	1560	1840	mg/L	2	8	20
Total Dissolved Solids	1560	1430	mg/L	2	8	20

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 23 of 31
NE of Jal, NM

Laboratory Control Spike (LCS-1)

QC Batch: 53423
Prep Batch: 45748

Date Analyzed: 2008-10-19
QC Preparation: 2008-10-19

Analyzed By: AG
Prepared By: AG

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	0.783	mg/L	1	1.00	0.0801	70	70 - 130

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

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	0.757	mg/L	1	1.00	0.0801	68	70 - 130	3	20

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

Surrogate	LCS Result	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0830	0.0821	mg/L	1	0.100	83	82	70 - 130
4-Bromofluorobenzene (4-BFB)	0.0900	0.0900	mg/L	1	0.100	90	90	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 53437
Prep Batch: 45754

Date Analyzed: 2008-10-20
QC Preparation: 2008-10-20

Analyzed By: LD
Prepared By: LD

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	23.7	mg/L	1	25.0	<2.44	95	70 - 130

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

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO	20.0	mg/L	1	25.0	<2.44	80	70 - 130	17	20

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

Surrogate	LCS Result	LCS Result	Units	Dil.	Spike Amount	LCS Rec.	LCS Rec.	Rec. Limit
n-Triacontane	12.7	10.7	mg/L	1	10.0	127	107	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 53457
Prep Batch: 45743

Date Analyzed: 2008-10-17
QC Preparation: 2008-10-17

Analyzed By: AR
Prepared By: AR

¹ LCS/D analyte out of range. LCS/LCSD has a RPD within limits. Therefore, LCS shows extraction occurred properly.

Report Date: October 29, 2008
 Arena Langlie-Mattix & Humphrey

Work Order: 8101705
 Arena Langlie-Mattix & Humphrey

Page Number: 24 of 31
 NE of Jal, NM

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Nitrate-N	2.62	mg/L	1	2.50	<0.0120	105	90 - 110

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

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Nitrate-N	2.62	mg/L	1	2.50	<0.0120	105	90 - 110	0	

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

Laboratory Control Spike (LCS-1)

QC Batch: 53457
 Prep Batch: 45743

Date Analyzed: 2008-10-17
 QC Preparation: 2008-10-17

Analyzed By: AR
 Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	11.5	mg/L	1	12.5	<0.172	92	90 - 110
Fluoride	2.38	mg/L	1	2.50	<0.199	95	90 - 110
Sulfate	12.7	mg/L	1	12.5	<0.0320	102	90 - 110

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

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	12.2	mg/L	1	12.5	<0.172	98	90 - 110	6	
Fluoride	2.37	mg/L	1	2.50	<0.199	95	90 - 110	0	
Sulfate	12.7	mg/L	1	12.5	<0.0320	102	90 - 110	0	

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

Laboratory Control Spike (LCS-1)

QC Batch: 53680
 Prep Batch: 45759

Date Analyzed: 2008-10-28
 QC Preparation: 2008-10-20

Analyzed By: KV
 Prepared By: KV

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	50.7	mg/L	1	50.0	<0.175	101	85 - 115
Dissolved Magnesium	50.0	mg/L	1	50.0	<0.148	100	85 - 115
Dissolved Potassium	47.7	mg/L	1	50.0	<0.327	95	85 - 115
Dissolved Sodium	48.3	mg/L	1	50.0	<0.244	97	85 - 115

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

continued...

control spikes continued

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	50.5	mg/L	1	50.0	<0.175	101	85 - 115	0	20
Dissolved Magnesium	49.6	mg/L	1	50.0	<0.148	99	85 - 115	1	20
Dissolved Potassium	47.6	mg/L	1	50.0	<0.327	95	85 - 115	0	20
Dissolved Sodium	48.3	mg/L	1	50.0	<0.244	97	85 - 115	0	20

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

Matrix Spike (MS-1) Spiked Sample: 176706

QC Batch: 53423
 Prep Batch: 45748

Date Analyzed: 2008-10-19
 QC Preparation: 2008-10-19

Analyzed By: AG
 Prepared By: AG

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
GRO	0.667	mg/L	1	1.00	<0.0590	67	70 - 130

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
GRO	0.720	mg/L	1	1.00	<0.0590	72	70 - 130	8	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0778	0.0778	mg/L	1	0.1	78	78	70 - 130
4-Bromofluorobenzene (4-BFB)	0.0836	0.0831	mg/L	1	0.1	84	83	70 - 130

Matrix Spike (MS-1) Spiked Sample: 176705

QC Batch: 53437
 Prep Batch: 45754

Date Analyzed: 2008-10-20
 QC Preparation: 2008-10-20

Analyzed By: LD
 Prepared By: LD

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
DRO	24.6	mg/L	1	25.0	<2.44	98	70 - 130

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

*Matrix/spike recovery out of control limits due to peak interference. Use LCS/LCSD to demonstrate analysis is under control.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 26 of 31
NE of Jal, NM

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
DRO	23.7	mg/L	1	25.0	<2.44	95	70 - 130	4	20

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

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Triacontane	10.5	10.4	mg/L	1	10	105	104	70 - 130

Matrix Spike (MS-1) Spiked Sample: 176710

QC Batch: 53457
Prep Batch: 45743

Date Analyzed: 2008-10-17
QC Preparation: 2008-10-17

Analyzed By: AR
Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Nitrate-N	18.9	mg/L	5	12.5	7.1	94	90 - 110

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Nitrate-N	19.1	mg/L	5	12.5	7.1	96	90 - 110	1	

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

Matrix Spike (MS-1) Spiked Sample: 176710

QC Batch: 53457
Prep Batch: 45743

Date Analyzed: 2008-10-17
QC Preparation: 2008-10-17

Analyzed By: AR
Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	⁹ 1120	mg/L	5	62.5	1099	34	90 - 110
Fluoride	¹⁰ 14.3	mg/L	5	12.5	3.88	83	90 - 110
Sulfate	¹¹ 651	mg/L	5	62.5	636	24	90 - 110

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	¹² 1110	mg/L	5	62.5	1099	18	90 - 110	1	

continued ...

⁹ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

¹⁰ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

¹¹ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

¹² Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 27 of 31
NE of Jol, NM

matrix spikes continued . . .

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Fluoride	¹³ 14.5	mg/L	5	12.5	3.88	85	90 - 110	1	
Sulfate	¹⁴ 645	mg/L	5	62.5	636	14	90 - 110	1	

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

Matrix Spike (MS-1) Spiked Sample: I76705

QC Batch: 53680
Prep Batch: 45759

Date Analyzed: 2008-10-28
QC Preparation: 2008-10-20

Analyzed By: KV
Prepared By: KV

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Calcium	¹⁵ 3040	mg/L	100	50.0	3250	-420	75 - 125
Dissolved Magnesium	1100	mg/L	10	50.0	1040	120	75 - 125
Dissolved Potassium	¹⁶ 161	mg/L	10	50.0	136	50	75 - 125
Dissolved Sodium	¹⁷ 7590	mg/L	100	50.0	8200	-1220	75 - 125

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

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Calcium	¹⁸ 3420	mg/L	100	50.0	3250	340	75 - 125	12	20
Dissolved Magnesium	¹⁹ 1110	mg/L	10	50.0	1040	140	75 - 125	1	20
Dissolved Potassium	²⁰ 151	mg/L	10	50.0	136	30	75 - 125	6	20
Dissolved Sodium	²¹ 8440	mg/L	100	50.0	8200	480	75 - 125	11	20

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

Standard (ICV-1)

QC Batch: 53386

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7.00	7.05	101	98 - 102	2008-10-17

- ¹³ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.
¹⁴ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.
¹⁵ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.
¹⁶ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.
¹⁷ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.
¹⁸ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.
¹⁹ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.
²⁰ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.
²¹ Matrix spike recovery out of control limits due to matrix interference. Use LCS/LCSD to demonstrate analysis is under control.

Standard (CCV-1)

QC Batch: 53386

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		std	7.00	7.12	102	98 - 102	2008-10-17

Standard (ICV-1)

QC Batch: 53418

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		uMHOS/cm	1410	1480	105	90 - 110	2008-10-17

Standard (CCV-1)

QC Batch: 53418

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		uMHOS/cm	1410	1450	102	90 - 110	2008-10-17

Standard (ICV-1)

QC Batch: 53423

Date Analyzed: 2008-10-19

Analyzed By: AG

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/E	1.00	0.900	90	85 - 115	2008-10-19

Standard (CCV-1)

QC Batch: 53423

Date Analyzed: 2008-10-19

Analyzed By: AG

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1.00	0.956	96	85 - 115	2008-10-19

Report Date: October 29, 2008
Arena Langlie-Mattix & Humphrey

Work Order: 8101705
Arena Langlie-Mattix & Humphrey

Page Number: 29 of 31
NE of Jal. NM

Standard (ICV-1)

QC Batch: 53437

Date Analyzed: 2008-10-20

Analyzed By: LD

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	233	93	85 - 115	2008-10-20

Standard (CCV-1)

QC Batch: 53437

Date Analyzed: 2008-10-20

Analyzed By: LD

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	226	90	85 - 115	2008-10-20

Standard (ICV-1)

QC Batch: 53457

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.64	106	90 - 110	2008-10-17

Standard (ICV-1)

QC Batch: 53457

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.4	91	90 - 110	2008-10-17
Fluoride		mg/L	2.50	2.39	96	90 - 110	2008-10-17
Sulfate		mg/L	12.5	12.7	102	90 - 110	2008-10-17

Standard (CCV-1)

QC Batch: 53457

Date Analyzed: 2008-10-17

Analyzed By: AR

Report Date: October 29, 2008
 Arena Langlie-Mattix & Humphrey

Work Order: 8101705
 Arena Langlie-Mattix & Humphrey

Page Number: 30 of 31
 NE of Jal, NM

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.60	104	90 - 110	2008-10-17

Standard (CCV-1)

QC Batch: 53457

Date Analyzed: 2008-10-17

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.5	92	90 - 110	2008-10-17
Fluoride		mg/L	2.50	2.38	95	90 - 110	2008-10-17
Sulfate		mg/L	12.5	12.7	102	90 - 110	2008-10-17

Standard (ICV-1)

QC Batch: 53497

Date Analyzed: 2008-10-20

Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0.00	<1.00		0 - 200	2008-10-20
Carbonate Alkalinity		mg/L as CaCo3	0.00	210		0 - 200	2008-10-20
Bicarbonate Alkalinity		mg/L as CaCo3	0.00	45.0		0 - 200	2008-10-20
Total Alkalinity		mg/L as CaCo3	250	255	102	90 - 110	2008-10-20

Standard (CCV-1)

QC Batch: 53497

Date Analyzed: 2008-10-20

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0.00	<1.00		0 - 200	2008-10-20
Carbonate Alkalinity		mg/L as CaCo3	0.00	244		0 - 200	2008-10-20
Bicarbonate Alkalinity		mg/L as CaCo3	0.00	9.00		0 - 200	2008-10-20
Total Alkalinity		mg/L as CaCo3	250	253	101	90 - 110	2008-10-20

Standard (ICV-1)

QC Batch: 53662

Date Analyzed: 2008-10-24

Analyzed By: AR

Report Date: October 29, 2008
 Arena Langlie-Matrix & Humphrey

Work Order: 8101705
 Arena Langlie-Matrix & Humphrey

Page Number: 31 of 31
 NE of Jal, NM

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	933	93	90 - 110	2008-10-24

Standard (CCV-1)

QC Batch: 53662

Date Analyzed: 2008-10-24

Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	996	100	90 - 110	2008-10-24

Standard (ICV-1)

QC Batch: 53680

Date Analyzed: 2008-10-28

Analyzed By: KV

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	51.5	103	90 - 110	2008-10-28
Dissolved Magnesium		mg/L	50.0	51.1	102	90 - 110	2008-10-28
Dissolved Potassium		mg/L	50.0	50.3	101	90 - 110	2008-10-28
Dissolved Sodium		mg/L	50.0	50.6	101	90 - 110	2008-10-28

Standard (CCV-1)

QC Batch: 53680

Date Analyzed: 2008-10-28

Analyzed By: KV

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	50.0	51.1	102	90 - 110	2008-10-28
Dissolved Magnesium		mg/L	50.0	50.3	101	90 - 110	2008-10-28
Dissolved Potassium		mg/L	50.0	47.4	95	90 - 110	2008-10-28
Dissolved Sodium		mg/L	50.0	49.8	100	90 - 110	2008-10-28

TraceAnalysis, Inc.

email: lab@traceanalysis.com

6701 Aberdeen Avenue, Suite 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1296
1 (800) 378-1296

5002 Basin Street, Suite A1
Midland, Texas 79703
Tel (432) 689-6301
Fax (432) 689-6313

200 East Sunset Rd., Suite E
El Paso, Texas 79922
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

8808 Camp Bowie Blvd. West, Suite 180
Ft. Worth, Texas 76116
Tel (817) 201-5260
Fax (817) 560-4336

Company Name: Etech Environmental Phone #: 432/6610543
Address: (Street, City, Zip) P.O. Box 8469, Midland, TX 79708 Fax #:
Contact Person: Mike Hagan E-mail: mike@etechenv.com
Invoice to: (If different from above)
Project #: Project Name: Arena Langlie-Mattix/Hughes
Project Location (including state): NE of JAL, NM Sampler Signature: [Signature]

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX				PRESERVATIVE METHOD						SAMPLING		MTBE 8021B / 602	BTX 8021B / 602	TPH 418.1 / TX1005 / TX1005 Ex(C35)	TPH 8015 GRO / DRO / TVHC	PAH 8270C / 625	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	GCMS Vol. 8260B / 624	GCMS Semi. Vol. 8270C / 625	PCB's 8082 / 608	Pesticides 8081A / 608	BOD, TSS, pH	Moisture Content	General / Water Analysis	Turn Around Time if different from standard	Hold		
				WATER	SOIL	AIR	SLUDGE	HCl	HNO ₃	H ₂ SO ₄	NaOH	ICE	NONE	DATE	TIME																						
70605	H MW-1	7	1/2 600ml	✓				✓						10-16-08	1235	✓	✓																				
706	H MW-2	7		✓				✓							0950	✓	✓																				
707	H MW-3	7		✓				✓							1192	✓	✓																				
708	L MW-1	7		✓				✓							1405	✓	✓																				
709	L MW-2	7		✓				✓							1443	✓	✓																				
710	L MW-3	7		✓				✓							1512	✓	✓																				

Relinquished by: [Signature] Company: Etech Date: 10-16-08 Time: 1724 Temp°C: 2.8°C
Received by: [Signature] Company: TRACE Date: 10/16/08 Time: 17:04 Temp°C: 2.8°C
Relinquished by: [Signature] Company: Etech Date: 10/17/08 Time: 07:00 Temp°C: 2.8°C
Received by: [Signature] Company: TRACE Date: 10/17/08 Time: 10:15 Temp°C: 4.3°C

LAB USE ONLY
Intact ☒ N
Headspace ☒ N/NA
Log-In/Review ☒

REMARKS:
X Cell w/ 8015 results, before running 8015
TPH, U.S.O., F., NO₃, alkalinity, TDS, pH, and - M.H.W.
☐ Dry Weight Basis Required
☐ TRRP Report Required
☐ Check If Special Reporting Limits Are Needed

Cation-Anion Balance Sheet

DATE: 10/30/2008

Sample #	Calcium ppm	Magnesium ppm	Sodium ppm	Potassium ppm	Alkalinity ppm	Sulfate ppm	Chloride ppm	Nitrate ppm	Fluoride ppm	Bromide ppm	TDS ppm	EC µMHOs/cm
176705	3250	1040	8200	136	89	1840	19900	9.12	0		35000	51128
176706	257	78.2	190	9.17	142	399	649	2.55	3.09		1514	3047
176707	359	114	372	11.4	143	314	1180	2.5	3.23		2395	4303
176708	2000	738	5740	63.8	167	1700	13500	17.6	0		24600	36522
176709	259	81.5	171	10.7	112	245	639	6.86	3.57		1462	2622
176710	433	146	222	12.5	66	632	999	7.1	3.88		1975	3950

Sample #	Calcium in meq/L	Magnesium in meq/L	Sodium in meq/L	Potassium in meq/L	Alkalinity in meq/L	Sulfate in meq/L	Chloride in meq/L	Nitrate in meq/L	Fluoride in meq/L	Bromide in meq/L	Cations in meq/L	Anions in meq/L	Percentage Error
176705	162.18	85.58	336.70	3.48	1.78	38.31	561.38	0.6510768	0	0	607.94	602.12	0.901378829
176706	12.82	6.44	9.27	0.23	2.84	8.31	18.31	0.1820445	0.1628576	0	27.76	29.80	7.092622494
176707	17.91	9.38	16.18	0.29	2.86	6.54	33.29	0.178475	0.1700272	0	43.77	43.03	1.693475052
176708	99.80	60.73	249.69	1.63	3.34	35.39	380.84	1.256464	0	0	411.85	420.83	2.155321869
176709	12.92	6.71	7.44	0.27	2.21	5.10	18.03	0.4897354	0.1879248	0	27.34	26.04	4.863258818
176710	21.61	12.01	9.66	0.32	1.72	13.16	28.18	0.506869	0.2042432	0	43.60	43.77	0.396928016

	EC/Cation	EC/Anion
176705	60793.548	60211.8877
176706	2775.89466	2980.01721
176707	4376.8772	4303.37822
176708	41185.2024	42082.5464
176709	2734.2941	2604.47502
176710	4359.779	4377.11422

range 46015.2 to 56240.8
range 2742.3 to 3351.7
range 3872.7 to 4733.3
range 32869.8 to 40174.2
range 2269.8 to 2774.2
range 3555 to 4345

TDS/EC	TDS/Cat	TDS/Anion	
0.68	0.58	0.58	needs to be 0.55-0.77
0.50	0.55	0.51	needs to be 0.55-0.77
0.56	0.55	0.56	needs to be 0.55-0.77
0.67	0.60	0.58	needs to be 0.55-0.77
0.58	0.53	0.56	needs to be 0.55-0.77
0.50	0.45	0.45	needs to be 0.55-0.77

email: lab@traceanalysis.com

6808 Camp Bowie Blvd. West, Suite 180
Ft. Worth, Texas 76116
Tel (817) 201-5260
Fax (817) 560-4336

Company Name:	Etch Environmental	Phone #:	432/661-0543
Address:	(Street, City, Zip) P.O. Box 8469, Midland, TX 79708	Fax #:	
Contact Person:	Mike Hogan	E-mail:	mike@etchenv.com
Invoice to:			
(If different from above)			
Project #:		Project Name:	Arcosa Landfill-Mattix & Humphrey
Project Location (including state):	NE of Tal, NM	Sampler Signature:	[Signature]

ANALYSIS REQUEST
(Circle or Specify Method No.)[illegible]

Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp °C:	LAB USE ONLY Impact <u>Y/N</u> Headspace <u>Y/N/NA</u> Log-In: Review	REMARKS: * Cell #1/50g vial
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp °C:		
Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:	Temp °C:		

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

Carrier # 100-100000

CHART COPY

Cation-Anion Balance Sheet

DATE: 10/30/2008

Sample #	Calcium ppm	Magnesium ppm	Sodium ppm	Potassium ppm	Alkalinity ppm	Sulfate ppm	Chloride ppm	Nitrate ppm	Fluoride ppm	Bromide ppm	TDS ppm	EC µMHOs/cm
176705	3250	1040	8200	138	89	1840	19900	9.12	0		35000	51128
176706	257	78.2	190	9.17	142	399	649	2.55	3.09		1514	3047
176707	359	114	372	11.4	143	314	1180	2.5	3.23		2395	4303
176708	2000	738	5740	63.8	167	1700	13500	17.6	0		24600	36522
176709	259	81.5	171	10.7	112	245	639	6.86	3.57		1462	2522
176710	433	146	222	12.5	86	632	909	7.1	3.88		1975	3950

Sample #	Calcium in meq/L	Magnesium in meq/L	Sodium in meq/L	Potassium in meq/L	Alkalinity in meq/L	Sulfate in meq/L	Chloride in meq/L	Nitrate in meq/L	Fluoride in meq/L	Bromide in meq/L	Cations in meq/L	Anions in meq/L	Percentage Error
176705	162.18	85.58	356.70	3.48	1.78	38.31	561.38	0.6510758	0	0	607.94	602.12	-0.961378820
176706	12.82	6.44	8.27	0.23	2.84	8.31	18.31	0.1820445	0.1626576	0	27.76	29.80	7.092622494
176707	17.91	9.58	18.18	0.29	2.86	6.54	33.29	0.178475	0.1700272	0	43.77	43.03	1.693475052
176708	99.80	60.73	249.68	1.63	3.34	35.39	380.84	1.256464	0	0	411.85	420.83	2.155321869
176709	12.92	6.71	7.44	0.27	2.24	5.10	18.03	0.4897354	0.1879248	0	27.34	26.04	-4.863256818
176710	21.61	12.01	9.86	0.32	1.72	13.16	28.18	0.5058662	0.2042432	0	43.60	43.77	-0.396828016

	EC/Cation	EC/Anion
176705	60793.548	60211.8877
176706	2775.89466	2980.01721
176707	4376.8772	4303.37822
176708	41185.2024	42082.5464
176709	2734.2941	2604.47502
176710	4359.779	4377.11422

range	46015.2	to	56240.8
range	2742.3	to	3351.7
range	3872.7	to	4733.3
range	32869.8	to	40174.2
range	2269.8	to	2774.2
range	3555	to	4345

TDS/EC	TDS/Cat	TDS/Anion	
0.68	0.58	0.58	needs to be 0.55-0.77
0.50	0.55	0.51	needs to be 0.55-0.77
0.56	0.55	0.56	needs to be 0.55-0.77
0.67	0.60	0.58	needs to be 0.55-0.77
0.58	0.53	0.56	needs to be 0.55-0.77
0.50	0.45	0.45	needs to be 0.55-0.77

AppendixC

Well Record and Log
(Driller's Reports)



WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

www.ose.state.nm.us

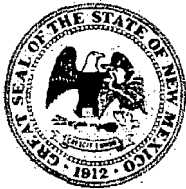
1. GENERAL AND WELL LOCATION	POD NUMBER (WELL NUMBER) HUMPHRY QUEEN TANK BATTERY UNIT HB-5				OSE FILE NUMBER(S)			
	WELL OWNER NAME(S) ARENA RESOURCES, INC				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS 2130 W BENDER BLVD				CITY HOBBS		STATE NM	ZIP 88240
	WELL LOCATION (FROM GPS)	DEGREES 32	MINUTES 9	SECONDS 33.00 N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND * DATUM REQUIRED: WGS 84			
		LONGITUDE 103	9	8.00 W				
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS FROM LANGLEY MATTIX GO N ON CALICHE RD FOR 1.8 MI TURN L INTO HUMPHRY T BATTERY FOLLOW GPS #'s								
2. OPTIONAL	(2.5 ACRE) 1/4	(10 ACRE) 1/4	(40 ACRE) 1/4	(160 ACRE) 1/4	SECTION	TOWNSHIP ☐ NORTH ☐ SOUTH	RANGE ☐ EAST ☐ WEST	
	SUBDIVISION NAME				LOT NUMBER	BLOCK NUMBER	UNIT/TRACT	
	HYDROGRAPHIC SURVEY				MAP NUMBER		TRACT NUMBER	
3. DRILLING INFORMATION	LICENSE NUMBER WD1478		NAME OF LICENSED DRILLER EDWARD BRYAN		NAME OF WELL DRILLING COMPANY STRAUB CORPORATION			
	DRILLING STARTED 8-20-08	DRILLING ENDED 8-20-08	DEPTH OF COMPLETED WELL (FT) 0	BORE HOLE DEPTH (FT) 60	DEPTH WATER FIRST ENCOUNTERED (FT) 59'			
	COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED)				STATIC WATER LEVEL IN COMPLETED WELL (FT) N/A			
	DRILLING FLUID: ☒ AIR ☐ MUD ☐ ADDITIVES - SPECIFY:							
	DRILLING METHOD: ☒ ROTARY ☐ HAMMER ☐ CABLE TOOL ☐ OTHER - SPECIFY:							
	DEPTH (FT)		BORE HOLE DIA. (IN)	CASING MATERIAL	CONNECTION TYPE (CASING)	INSIDE DIA. CASING (IN)	CASING WALL THICKNESS (IN)	SLOT SIZE (IN)
	FROM	TO						
	0	60	5	N/A	N/A	N/A	N/A	N/A
4. WATER BEARING STRATA	DEPTH (FT)		THICKNESS (FT)	FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)			YIELD (GPM)	
	FROM	TO						
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA					TOTAL ESTIMATED WELL YIELD (GPM)			

FOR OSE INTERNAL USE

WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION	PAGE 1 OF 2	

PAGE 2 OF 2



WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

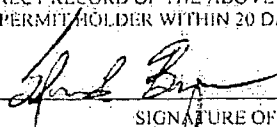
www.ose.state.nm.us

1. GENERAL AND WELL LOCATION	POD NUMBER (WELL NUMBER) HUMPHRY QUEEN TANK BATTERY UNIT HB-4				OSE FILE NUMBER(S)			
	WELL OWNER NAME(S) ARENA RESOURCES, INC				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS 2130 W BENDER BLVD				CITY HOBBS		STATE NM	ZIP 88240
	WELL LOCATION (FROM GPS)	DEGREES 32	MINUTES 9	SECONDS 33.00 N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND * DATUM REQUIRED: WGS 84			
		LONGITUDE 103	9	8.00 W				
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS FROM LANGLEIE MATTIX GO N. ON CALICHE RD FOR 1.8 MI TURN L INTO HUMPHRY T BATTERY FOLLOW GPS #'s								
2. OPTIONAL	(2.5 ACRE) 1/4		(10 ACRE) 1/4		(40 ACRE) 1/4		(160 ACRE) 1/4	
	SUBDIVISION NAME				LOT NUMBER		BLOCK NUMBER	
	HYDROGRAPHIC SURVEY				MAP NUMBER		TRACT NUMBER	
	TOWNSHIP ☐ NORTH ☐ SOUTH		RANGE ☐ EAST ☐ WEST					
3. DRILLING INFORMATION	LICENSE NUMBER WD1478		NAME OF LICENSED DRILLER EDWARD BRYAN			NAME OF WELL DRILLING COMPANY STRAUB CORPORATION		
	DRILLING STARTED 8-20-08		DRILLING ENDED 8-20-08		DEPTH OF COMPLETED WELL (FT) 0		BORE HOLE DEPTH (FT) 60	
	DEPTH WATER FIRST ENCOUNTERED (FT) 59'		STATIC WATER LEVEL IN COMPLETED WELL (FT) N/A					
	COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED)							
	DRILLING FLUID: ☒ AIR ☐ MUD ☐ ADDITIVES - SPECIFY:							
	DRILLING METHOD: ☒ ROTARY ☐ HAMMER ☐ CABLE TOOL ☐ OTHER - SPECIFY:							
	DEPTH (FT)		BORE HOLE DIA. (IN)		CASING MATERIAL		CONNECTION TYPE (CASING)	
	FROM	TO						
	0	60	5		N/A		N/A	
4. WATER BEARING STRATA	DEPTH (FT)		THICKNESS (FT)		FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)			YIELD (GPM)
	FROM	TO						
	METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA						TOTAL ESTIMATED WELL YIELD (GPM)	

FOR OSE INTERNAL USE

WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER	
LOCATION			PAGE 1 OF 2

5. SEAL AND PUMP	TYPE OF PUMP: ☐ SUBMERSIBLE ☐ JET ☐ NO PUMP - WELL NOT EQUIPPED ☐ TURBINE ☐ CYLINDER ☐ OTHER - SPECIFY:						
	ANNULAR SEAL AND GRAVEL PACK	DEPTH (FT)		BORE HOLE DIA. (IN)	MATERIAL TYPE AND SIZE	AMOUNT (CUBIC FT)	METHOD OF PLACEMENT
		FROM	TO				
		0	2				
	2	60	5	12 BAGS OF 3/8" PLUG		TOPLOAD	
6. GEOLOGIC LOG OF WELL	DEPTH (FT)		THICKNESS (FT)	COLOR AND TYPE OF MATERIAL ENCOUNTERED (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	WATER BEARING?		
	FROM	TO					
	0	1	1	TAN FINE SAND - SANDSTONE - CALICHE	☐ YES	☒ NO	
	1	35	34	TAN FINE SAND - SANDSTONE	☐ YES	☒ NO	
	35	44	9	TAN FINE SAND - SILICEOUS SANDSTONE (HARD)	☐ YES	☒ NO	
	44	48	4	RED FINE SAND - SANDSTONE - GRAVEL	☐ YES	☒ NO	
	48	57	9	RED FINE SAND - SANDSTONE	☐ YES	☒ NO	
	57	60	3	TAN SILTY CLAY - SILTY SAND	☐ YES	☒ NO	
	TD	60			☐ YES	☐ NO	
					☐ YES	☐ NO	
					☐ YES	☐ NO	
					☐ YES	☐ NO	
					☐ YES	☐ NO	
					☐ YES	☐ NO	
					☐ YES	☐ NO	
					☐ YES	☐ NO	
					☐ YES	☐ NO	
					☐ YES	☐ NO	
	ATTACH ADDITIONAL PAGES AS NEEDED TO FULLY DESCRIBE THE GEOLOGIC LOG OF THE WELL						
	7. TEST & ADDITIONAL INFO	WELL TEST METHOD: ☐ BAILER ☐ PUMP ☐ AIR LIFT ☐ OTHER - SPECIFY:					
TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.							
ADDITIONAL STATEMENTS OR EXPLANATIONS: SOIL BORING ONLY- SOIL BORING WAS PLUGGED AND ABANDONED UPON COMPLETION OF SAMPLING							
8. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:						
	 SIGNATURE OF DRILLER			4/6/08 DATE			

FOR OSE INTERNAL USE		WELL RECORD & LOG (Version 6/9/08)	
FILE NUMBER	POD NUMBER	TRN NUMBER	
LOCATION			PAGE 2 OF 2



WELL RECORD & LOG

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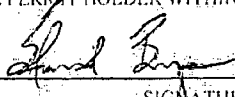
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1. GENERAL AND WELL LOCATION	POD NUMBER (WELL NUMBER) HUMPHRY QUEEN TANK BATTERY UNIT HB-3				OSE FILE NUMBER(S)				
	WELL OWNER NAME(S) ARENA RESOURCES, INC				PHONE (OPTIONAL)				
	WELL OWNER MAILING ADDRESS 2130 W BENDER BLVD				CITY HOBBS		STATE NM		
					ZIP 88240				
	WELL LOCATION (FROM GPS)		DEGREES 32	MINUTES 9	SECONDS 33.00 N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND			
		LONGITUDE 103	9	8.00 W	* DATUM REQUIRED: WGS 84				
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS: FROM LANGLEIE MATTIX GO N. ON CALICHE RD FOR 1.8 MI TURN L INTO HUMPHRY T BATTERY FOLLOW GPS #'s									
2. OPTIONAL	(2.5 ACRE) 1/4		(10 ACRE) 1/4		(40 ACRE) 1/4		(160 ACRE) 1/4		
	SECTION		TOWNSHIP ☐ NORTH ☐ SOUTH		RANGE ☐ EAST ☐ WEST				
	SUBDIVISION NAME				LOT NUMBER		BLOCK NUMBER		
	HYDROGRAPHIC SURVEY				MAP NUMBER		TRACT NUMBER		
3. DRILLING INFORMATION	LICENSE NUMBER WD1478		NAME OF LICENSED DRILLER EDWARD BRYAN			NAME OF WELL DRILLING COMPANY STRAUB CORPORATION			
	DRILLING STARTED 8-20-08		DRILLING ENDED 8-20-08		DEPTH OF COMPLETED WELL (FT) 0		BORE HOLE DEPTH (FT) 60		
					DEPTH WATER FIRST ENCOUNTERED (FT) 59'				
	COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED)						STATIC WATER LEVEL IN COMPLETED WELL (FT) N/A		
	DRILLING FLUID: ☒ AIR ☐ MUD ☐ ADDITIVES - SPECIFY:								
	DRILLING METHOD: ☒ ROTARY ☐ HAMMER ☐ CABLE TOOL ☐ OTHER - SPECIFY:								
	DEPTH (FT)		BORE HOLE DIA. (IN)		CASING MATERIAL		CONNECTION TYPE (CASING)		
	FROM	TO							
	0	60	5		N/A		N/A		
4. WATER BEARING STRATA	DEPTH (FT)		THICKNESS (FT)		FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)			YIELD (GPM)	
	FROM	TO							
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA							TOTAL ESTIMATED WELL YIELD (GPM)		

FOR OSE INTERNAL USE

WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER		POD NUMBER		TRN NUMBER	
LOCATION					PAGE 1 OF 2

5. SEAL AND PUMP	TYPE OF PUMP: ☐ SUBMERSIBLE ☐ JET ☐ NO PUMP - WELL NOT EQUIPPED ☐ TURBINE ☐ CYLINDER ☐ OTHER - SPECIFY:						
	ANNULAR SEAL AND GRAVEL PACK	DEPTH (FT)		BORE HOLE DIA. (IN)	MATERIAL TYPE AND SIZE	AMOUNT (CUBIC FT)	METHOD OF PLACEMENT
		FROM	TO				
		0	2				
	2'	60'	5	12 BAGS OF 3/8 PLUG		TOPLOAD	
6. GEOLOGIC LOG OF WELL	DEPTH (FT)		THICKNESS (FT)	COLOR AND TYPE OF MATERIAL ENCOUNTERED (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	WATER BEARING?		
	FROM	TO			☐ YES ☒ NO	☐ YES ☒ NO	
	0	8	8	TAN FINE SAND - SANDSTONE - CALICHE	☐ YES ☒ NO	☐ YES ☒ NO	
	8	37	29	TAN FINE SAND - SANDSTONE	☐ YES ☒ NO	☐ YES ☒ NO	
	37	42	5	TAN FINE SAND - SILICEOUS SANDSTONE (HARD)	☐ YES ☒ NO	☐ YES ☒ NO	
	42	46	4	TAN FINE SAND - SANDSTONE	☐ YES ☒ NO	☐ YES ☒ NO	
	46	57	11	RED FINE SAND - SANDSTONE WITH CLAY	☐ YES ☒ NO	☐ YES ☒ NO	
	57	58	1	RED FINE SAND - SILICEOUS SANDSTONE	☐ YES ☒ NO	☐ YES ☒ NO	
	58	60	2	TAN FINE SAND - GRAVEL	☐ YES ☒ NO	☐ YES ☒ NO	
	TD	60			☐ YES ☐ NO	☐ YES ☐ NO	
					☐ YES ☐ NO	☐ YES ☐ NO	
					☐ YES ☐ NO	☐ YES ☐ NO	
					☐ YES ☐ NO	☐ YES ☐ NO	
					☐ YES ☐ NO	☐ YES ☐ NO	
					☐ YES ☐ NO	☐ YES ☐ NO	
					☐ YES ☐ NO	☐ YES ☐ NO	
					☐ YES ☐ NO	☐ YES ☐ NO	
					☐ YES ☐ NO	☐ YES ☐ NO	
					☐ YES ☐ NO	☐ YES ☐ NO	
	ATTACH ADDITIONAL PAGES AS NEEDED TO FULLY DESCRIBE THE GEOLOGIC LOG OF THE WELL						
7. TEST & ADDITIONAL INFO	WELL TEST METHOD: ☐ BAILER ☐ PUMP ☐ AIR LIFT ☐ OTHER - SPECIFY:						
	TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.						
	ADDITIONAL STATEMENTS OR EXPLANATIONS: SOIL BORING ONLY- SOIL BORING WAS PLUGGED AND ABANDONED UPON COMPLETION OF SAMPLING						
8. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING.						
	 SIGNATURE OF DRILLER			9/6/08 DATE			

FOR USE INTERNAL USE		WELL RECORD & LOG (Version 6/9/08)	
FILE NUMBER	POD NUMBER	TRN NUMBER	
LOCATION			PAGE 2 OF 2



WELL RECORD & LOG

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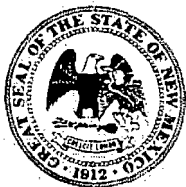
1: GENERAL AND WELL LOCATION	POD NUMBER (WELL NUMBER) HUMPHRY QUEEN TANK BATTERY UNIT HB-2				OSE FILE NUMBER(S)							
	WELL OWNER NAME(S) ARENA RESOURCES, INC				PHONE (OPTIONAL)							
	WELL OWNER MAILING ADDRESS 2130 W BENDER BLVD				CITY HOBBS		STATE NM		ZIP 88240			
	WELL LOCATION (FROM GPS)	DEGREES		MINUTES	SECONDS	* ACCURACY REQUIRED: ONE TENTH OF A SECOND * DATUM REQUIRED: WGS 84						
		LATITUDE		32	9							33.00 N
		LONGITUDE		103	9	8.00 W						
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS FROM LANGLIE MATTIX GO N. ON CALICHE RD FOR 1.8 MI TURN L INTO HUMPHRY T BATTERY FOLLOW GPS #'s												
2: OPTIONAL	(2.5 ACRE) 1/4	(10 ACRE) 1/4	(40 ACRE) 1/4	(160 ACRE) 1/4	SECTION	TOWNSHIP ☐ NORTH ☐ SOUTH	RANGE ☐ EAST ☐ WEST					
	SUBDIVISION NAME				LOT NUMBER	BLOCK NUMBER	UNIT/TRACT					
	HYDROGRAPHIC SURVEY				MAP NUMBER		TRACT NUMBER					
3: DRILLING INFORMATION	LICENSE NUMBER WD1478		NAME OF LICENSED DRILLER EDWARD BRYAN			NAME OF WELL DRILLING COMPANY STRAUB CORPORATION						
	DRILLING STARTED 8-20-08		DRILLING ENDED 8-20-08		DEPTH OF COMPLETED WELL (FT) 0	BORE HOLE DEPTH (FT) 60	DEPTH WATER FIRST ENCOUNTERED (FT) 59'					
	COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED)					STATIC WATER LEVEL IN COMPLETED WELL (FT) N/A						
	DRILLING FLUID: ☒ AIR ☐ MUD ☐ ADDITIVES - SPECIFY:											
	DRILLING METHOD: ☒ ROTARY ☐ HAMMER ☐ CABLE TOOL ☐ OTHER - SPECIFY:											
	DEPTH (FT)		BORE HOLE DIA. (IN)	CASING MATERIAL	CONNECTION TYPE (CASING)	INSIDE DIA. CASING (IN)	CASING WALL THICKNESS (IN)	SLOT SIZE (IN)				
	FROM	TO										
	0		60	5	N/A	N/A	N/A	N/A	N/A			
4: WATER BEARING STRATA	DEPTH (FT)		THICKNESS (FT)	FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	YIELD (GPM)							
	FROM	TO										
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA					TOTAL ESTIMATED WELL YIELD (GPM)							

FOR OSE INTERNAL USE

WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION		PAGE 1 OF 2

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION	PAGE 2 OF 2	



WELL RECORD & LOG

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1. GENERAL AND WELL LOCATION	POD NUMBER (WELL NUMBER) HUMPHRY QUEEN TANK BATTERY UNIT HB-1				OSE FILE NUMBER(S)				
	WELL OWNER NAME(S) ARENA RESOURCES, INC.				PHONE (OPTIONAL)				
	WELL OWNER MAILING ADDRESS 2130 W BENDER BLVD				CITY HOBBS		STATE NM	ZIP 88240	
	WELL LOCATION (FROM GPS)	DEGREES 32	MINUTES 9	SECONDS 33.00 N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND * DATUM REQUIRED: WGS 84				
		LONGITUDE 103	9	8.00 W					
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS FROM LANGLEIE MATTIX GO N. ON CALICHE RD FOR 1.8 MI TURN L INTO HUMPHRY T BATTERY FOLLOW GPS #'s									
2. OPTIONAL	(2.5 ACRE) 1/4		(10 ACRE) 1/4		(40 ACRE) 1/4		(160 ACRE) 1/4		
	SUBDIVISION NAME				LOT NUMBER		BLOCK NUMBER		
	HYDROGRAPHIC SURVEY				MAP NUMBER		TRACT NUMBER		
3. DRILLING INFORMATION	LICENSE NUMBER WD1478		NAME OF LICENSED DRILLER EDWARD BRYAN			NAME OF WELL DRILLING COMPANY STRAUB CORPORATION			
	DRILLING STARTED 8-20-08		DRILLING ENDED 8-20-08		DEPTH OF COMPLETED WELL (FT) 0		BORE HOLE DEPTH (FT) 62		
					DEPTH WATER FIRST ENCOUNTERED (FT) 59'				
	COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED)						STATIC WATER LEVEL IN COMPLETED WELL (FT) N/A		
	DRILLING FLUID: ☒ AIR ☐ MUD ☐ ADDITIVES - SPECIFY:								
	DRILLING METHOD: ☒ ROTARY ☐ HAMMER ☐ CABLE TOOL ☐ OTHER - SPECIFY:								
	DEPTH (FT)		BORE HOLE DIA. (IN)		CASING MATERIAL		CONNECTION TYPE (CASING)		
	FROM	TO							
	0	62	5		N/A		N/A		
4. WATER BEARING STRATA	DEPTH (FT)		THICKNESS (FT)		FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)			YIELD (GPM)	
	FROM	TO							
	METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA						TOTAL ESTIMATED WELL YIELD (GPM)		

FOR OSE INTERNAL USE

WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER	
LOCATION			PAGE 1 OF 2

5. SEAL AND PUMP	TYPE OF PUMP: ☐ SUBMERSIBLE ☐ JET ☐ NO PUMP - WELL NOT EQUIPPED ☐ TURBINE ☐ CYLINDER ☐ OTHER - SPECIFY:						
	ANNULAR SEAL AND GRAVEL PACK	DEPTH (FT)		BORE HOLE DIA. (IN)	MATERIAL TYPE AND SIZE	AMOUNT (CUBIC FT)	METHOD OF PLACEMENT
		FROM	TO				
		0	2				
	2	62	5	12 BAGS OF 3/8 PLUG	TOPLOAD		

6. GEOLOGIC LOG OF WELL	DEPTH (FT)		THICKNESS (FT)	COLOR AND TYPE OF MATERIAL ENCOUNTERED (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	WATER BEARING?	
	FROM	TO				
		0	1	1	BROWN FINE SAND - CALICHE	☐ YES ☒ NO
		1	3	2	BROWN FINE SAND	☐ YES ☒ NO
		3	19	16	TAN FINE SAND - SANDSTONE	☐ YES ☒ NO
		19	22	3	TAN FINE SAND - SANDSTONE - CALICHE	☐ YES ☒ NO
		22	37	15	TAN FINE SAND - SANDSTONE	☐ YES ☒ NO
		37	43	6	TAN FINE SAND - SILICEOUS SANDSTONE (HARD)	☐ YES ☒ NO
		43	44	1	RED SILTY CLAY - SILTY SAND (RED)	☐ YES ☒ NO
		44	57	13	RED FINE SAND - SANDSTONE WITH CLAY	☐ YES ☒ NO
		57	58	1	RED FINE SAND - (DENCE) SANDSTONE	☐ YES ☒ NO
		58	62	4	RED FINE SAND - SANDSTONE WITH CLAY	☐ YES ☒ NO
		TD	62			☐ YES ☐ NO
	ATTACH ADDITIONAL PAGES AS NEEDED TO FULLY DESCRIBE THE GEOLOGIC LOG OF THE WELL					

7. TEST & ADDITIONAL INFO	WELL TEST	METHOD: ☐ BAILER ☐ PUMP ☐ AIR LIFT ☐ OTHER - SPECIFY:	
		TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.	
	ADDITIONAL STATEMENTS OR EXPLANATIONS: SOIL BORING ONLY- SOIL BORING WAS PLUGGED AND ABANDONED UPON COMPLETION OF SAMPLING		

8. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:	
	 SIGNATURE OF DRILLER	9/4/08 DATE



WELL RECORD & LOG

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1. GENERAL AND WELL LOCATION	POD NUMBER (WELL NUMBER) HUMPHRY QUEEN TANK BATTERY UNIT MW-1				OSE FILE NUMBER(S)											
	WELL OWNER NAME(S) ARENA RESOURCES, INC				PHONE (OPTIONAL)											
	WELL OWNER MAILING ADDRESS 2130 W BENDER BLVD				CITY HOBBS		STATE NM		ZIP 88240							
	WELL LOCATION (FROM GPS)		DEGREES 32		MINUTES 9		SECONDS 33.00 N		* ACCURACY REQUIRED: ONE TENTH OF A SECOND							
		LONGITUDE 103		9		10.00 W		* DATUM REQUIRED: WGS 84								
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS FROM LANGLEY MATTIX GO N. ON CALICHE RD FOR 1.8 MI TURN L INTO HUMPHRY T BATTERY FOLLOW GPS #'s																
2. OPTIONAL	(2.5 ACRE) 1/4		(10 ACRE) 1/4		(40 ACRE) 1/4		(160 ACRE) 1/4		SECTION							
	SUBDIVISION NAME				LOT NUMBER		TOWNSHIP ☐ NORTH ☐ SOUTH		RANGE ☐ EAST ☐ WEST							
	HYDROGRAPHIC SURVEY				BLOCK NUMBER		UNIT/TRACT		MAP NUMBER							
					TRACT NUMBER											
3. DRILLING INFORMATION	LICENSE NUMBER WD1478		NAME OF LICENSED DRILLER EDWARD BRYAN				NAME OF WELL DRILLING COMPANY STRAUB CORPORATION									
	DRILLING STARTED 10-8-08		DRILLING ENDED 10-8-08		DEPTH OF COMPLETED WELL (FT) 75		BORE HOLE DEPTH (FT) 75		DEPTH WATER FIRST ENCOUNTERED (FT)							
	COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED)						STATIC WATER LEVEL IN COMPLETED WELL (FT) N/A									
	DRILLING FLUID: ☒ AIR ☐ MUD ☐ ADDITIVES - SPECIFY:															
	DRILLING METHOD: ☒ ROTARY ☐ HAMMER ☐ CABLE TOOL ☐ OTHER - SPECIFY:															
	DEPTH (FT)		BORE HOLE DIA. (IN)		CASING MATERIAL		CONNECTION TYPE (CASING)		INSIDE DIA. CASING (IN)		CASING WALL THICKNESS (IN)		SLOT SIZE (IN)			
	FROM		TO													
	75		55		7		SCH 40 .010 SCREEN		FJ		4		0.154		.010	
	55		+43		7		SCH 40 PVC RISER		FJ		4		0.154		RISER	
4. WATER BEARING STRATA	DEPTH (FT)		THICKNESS (FT)		FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)						YIELD (GPM)					
	FROM		TO													
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA										TOTAL ESTIMATED WELL YIELD (GPM)						

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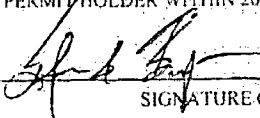
WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION	PAGE 1 OF 2	

5. SEAL AND PUMP	TYPE OF PUMP: ☐ SUBMERSIBLE ☐ JET ☐ NO PUMP - WELL NOT EQUIPPED ☐ TURBINE ☐ CYLINDER ☐ OTHER - SPECIFY:						
	ANNULAR SEAL AND GRAVEL PACK	DEPTH (FT)		BORE HOLE DIA. (IN)	MATERIAL TYPE AND SIZE	AMOUNT (CUBIC FT)	METHOD OF PLACEMENT
		FROM	TO				
		75	49				
	49	2	7	12 BAGS OF 3/8 PLUG		TOPLOAD	
	2	0	7	1 BAG OF CEMENT		TORLOAD	

6. GEOLOGIC LOG OF WELL	DEPTH (FT)		THICKNESS (FT)	COLOR AND TYPE OF MATERIAL ENCOUNTERED (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	WATER BEARING?	
	FROM	TO				
	0	1	1	TAN FINE SAND	☐ YES	☒ NO
	1	3	2	BROWN FINE SAND	☐ YES	☒ NO
	3	11	8	TAN FINE SAND - SANDSTONE - CALICHE	☐ YES	☒ NO
	11	13	2	TAN FINE SAND - SANDSTONE	☐ YES	☒ NO
	13	16	3	RED FINE SAND - SANDSTONE	☐ YES	☒ NO
	16	34	18	TAN FINE SAND - SANDSTONE	☐ YES	☒ NO
	34	38	4	TAN FINE SAND - CALCAREOUS SANDSTONE (HARD)	☐ YES	☒ NO
	38	43	5	RED SILICEOUS SANDSTONE (EXTRA HARD)	☐ YES	☒ NO
	43	47	4	RED FINE MEDIUM SAND - SANDSTONE WITH GRAVEL	☐ YES	☒ NO
	47	49	2	RED SILICEOUS SANDSTONE	☐ YES	☒ NO
	49	55	6	RED FINE SAND - GRAVEL WITH CLAY	☐ YES	☒ NO
	55	61	6	TAN SILTY SAND - CLAY	☐ YES	☒ NO
	61	75	14	RED SILTY CLAY	☐ YES	☐ NO
					☐ YES	☐ NO
				☐ YES	☐ NO	
				☐ YES	☐ NO	
ATTACH ADDITIONAL PAGES AS NEEDED TO FULLY DESCRIBE THE GEOLOGIC LOG OF THE WELL.						

7. TEST & ADDITIONAL INFO	WELL TEST	METHOD: ☐ BAILER ☐ PUMP ☐ AIR LIFT ☐ OTHER - SPECIFY:	
		TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.	
	ADDITIONAL STATEMENTS OR EXPLANATIONS: 4X4 PAD - 6X6X60 HIGH RISER		

8. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING.	
	 SIGNATURE OF DRILLER	10/16/08 DATE

FOR USE INTERNAL USE		WELL RECORD & LOG (Version 6/9/08)	
FILE NUMBER	POD NUMBER	TRN NUMBER	
LOCATION			PAGE 2 OF 2



WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

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1. GENERAL AND WELL LOCATION	POD NUMBER (WELL NUMBER): HUMPHRY QUEEN TANK BATTERY UNIT MW-2				OSE FILE NUMBER(S)					
	WELL OWNER NAME(S): ARENA RESOURCES, INC				PHONE (OPTIONAL)					
	WELL OWNER MAILING ADDRESS: 2130 W BENDER BLVD				CITY: HOBBS		STATE: NM		ZIP: 88240	
	WELL LOCATION (FROM GPS)	DEGREES		MINUTES	SECONDS	• ACCURACY REQUIRED: ONE TENTH OF A SECOND • DATUM REQUIRED: WGS 84				
		LATITUDE	32	9	32.00 N					
	LONGITUDE	103	9	7.00 W						
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS: FROM LANGLIE MATTIX GO N. ON CALICHE RD FOR 1.8 MI TURN L INTO HUMPHRY T BATTERY FOLLOW GPS #'s										
2. OPTIONAL	(2.5 ACRE) 1/4	(10 ACRE) 1/4	(40 ACRE) 1/4	(160 ACRE) 1/4	SECTION	TOWNSHIP ☐ NORTH ☐ SOUTH	RANGE ☐ EAST ☐ WEST			
	SUBDIVISION NAME				LOT NUMBER	BLOCK NUMBER	UNIT/TRACT			
	HYDROGRAPHIC SURVEY				MAP NUMBER		TRACT NUMBER			
3. DRILLING INFORMATION	LICENSE NUMBER WD1478		NAME OF LICENSED DRILLER EDWARD BRYAN			NAME OF WELL DRILLING COMPANY STRAUB CORPORATION				
	DRILLING STARTED 10-9-08		DRILLING ENDED 10-9-08		DEPTH OF COMPLETED WELL (FT) 65		BORE HOLE DEPTH (FT) 65		DEPTH WATER FIRST ENCOUNTERED (FT)	
	COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED)					STATIC WATER LEVEL IN COMPLETED WELL (FT) N/A				
	DRILLING FLUID: ☒ AIR ☐ MUD ☐ ADDITIVES - SPECIFY:									
	DRILLING METHOD: ☒ ROTARY ☐ HAMMER ☐ CABLE TOOL ☐ OTHER - SPECIFY:									
	DEPTH (FT)		BORE HOLE DIA. (IN)	CASING MATERIAL	CONNECTION TYPE (CASING)	INSIDE DIA. CASING (IN)	CASING WALL THICKNESS (IN)	SLOT SIZE (IN)		
	FROM	TO								
	65		55	7	SCH 40 .010 SCREEN	FJ	4	0.154	.010	
	55		+43"	7	SCH 40 PVC RISER	FJ	4	0.154	RISER	
4. WATER BEARING STRATA	DEPTH (FT)		THICKNESS (FT)	FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)				YIELD (GPM)		
	FROM	TO								
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA							TOTAL ESTIMATED WELL YIELD (GPM)			

FOR OSE INTERNAL USE

WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION	PAGE 1 OF 2	

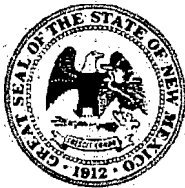
5. SEAL AND PUMP	TYPE OF PUMP: ☐ SUBMERSIBLE ☐ JET ☐ NO PUMP - WELL NOT EQUIPPED ☐ TURBINE ☐ CYLINDER ☐ OTHER - SPECIFY:						
	ANNULAR SEAL AND GRAVEL PACK	DEPTH (FT)		BORE HOLE DIA. (IN)	MATERIAL TYPE AND SIZE	AMOUNT (CUBIC FT)	METHOD OF PLACEMENT
		FROM	TO				
		65	51				
	51	2	7	12 BAGS OF 3/8 PLUG		TOPLOAD	
	2	0	7	1 BAG OF CEMENT		TOPLOAD	

6. GEOLOGIC LOG OF WELL	DEPTH (FT)		THICKNESS (FT)	COLOR AND TYPE OF MATERIAL ENCOUNTERED (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	WATER BEARING?		
	FROM	TO			☐ YES	☐ NO	
		0	2	2	BROWN FINE SAND - CALICHE	☐ YES	☒ NO
		2	11	9	TAN FINE SAND - CALICHE - SANDSTONE	☐ YES	☒ NO
		11	21	10	TAN FINE SAND - SANDSTONE	☐ YES	☒ NO
		21	34	13	TAN FINE SAND - CALICHE - SANDSTONE	☐ YES	☒ NO
		34	37	3	TAN FINE SAND - SANDSTONE	☐ YES	☒ NO
		37	46	9	PALE TAN SILICEOUS SANDSTONE (HARD)	☐ YES	☒ NO
		46	51	5	RED FINE SAND - P GRAVEL	☐ YES	☒ NO
		51	58	7	RED SAND (MEDIUM) - WITH CLAY	☐ YES	☒ NO
		58	59	1	RED SILICEOUS SANDSTONE	☐ YES	☒ NO
		59	60	1	RED FINE SAND - GRAVEL	☐ YES	☒ NO
		60	65	5	RED VERY FINE SAND - CLAY	☐ YES	☒ NO
		TD	65			☐ YES	☐ NO
						☐ YES	☐ NO
						☐ YES	☐ NO
						☐ YES	☐ NO
						☐ YES	☐ NO
ATTACH ADDITIONAL PAGES AS NEEDED TO FULLY DESCRIBE THE GEOLOGIC LOG OF THE WELL.							

7. TEST & ADDITIONAL INFO	WELL TEST	METHOD: ☐ BAILER ☐ PUMP ☐ AIR LIFT ☐ OTHER - SPECIFY:	
		TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.	
	ADDITIONAL STATEMENTS OR EXPLANATIONS: 4X4 PAD - 6X6X60 HIGH RISER		

8. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING.	
	 SIGNATURE OF DRILLER	 DATE

FOR USE INTERNAL USE		WELL RECORD & LOG (Version 6/9/08)	
FILE NUMBER	POD NUMBER	TRN NUMBER	
LOCATION			PAGE 2 OF 2



WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

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1. GENERAL AND WELL LOCATION	POD NUMBER (WELL NUMBER) HUMPHRY QUEEN TANK BATTERY UNIT MW-3					OSE FILE NUMBER(S)		
	WELL OWNER NAME(S) ARENA RESOURCES, INC					PHONE (OPTIONAL)		
	WELL OWNER MAILING ADDRESS 2130 W BENDER BLVD					CITY HOBBS	STATE NM	ZIP 88240
	WELL LOCATION (FROM GPS)	DEGREES 32	MINUTES 9	SECONDS 33.00	N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND * DATUM REQUIRED: WGS 84		
	LONGITUDE 103	9	7.00	W				
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS FROM LANGLEIE MATTIX GO N. ON CALICHE RD FOR 1.8 MI TURN L INTO HUMPHRY T BATTERY FOLLOW GPS #'s								
2. OPTIONAL	(2.5 ACRE) 1/4	(10 ACRE) 1/4	(40 ACRE) 1/4	(160 ACRE) 1/4	SECTION	TOWNSHIP ☐ NORTH ☐ SOUTH	RANGE ☐ EAST ☐ WEST	
	SUBDIVISION NAME				LOT NUMBER	BLOCK NUMBER	UNIT/TRACT	
	HYDROGRAPHIC SURVEY					MAP NUMBER	TRACT NUMBER	
3. DRILLING INFORMATION	LICENSE NUMBER WD1478		NAME OF LICENSED DRILLER EDWARD BRYAN			NAME OF WELL DRILLING COMPANY STRAUB CORPORATION		
	DRILLING STARTED 10-10-08		DRILLING ENDED 10-10-08		DEPTH OF COMPLETED WELL (FT) 65	BORE HOLE DEPTH (FT) 65	DEPTH WATER FIRST ENCOUNTERED (FT)	
	COMPLETED WELL IS: ☐ ARTESIAN ☐ DRY HOLE ☒ SHALLOW (UNCONFINED)						STATIC WATER LEVEL IN COMPLETED WELL (FT) N/A	
	DRILLING FLUID: ☒ AIR ☐ MUD ☐ ADDITIVES - SPECIFY:							
	DRILLING METHOD: ☒ ROTARY ☐ HAMMER ☐ CABLE TOOL ☐ OTHER - SPECIFY:							
	DEPTH (FT)		BORE HOLE DIA. (IN)	CASING MATERIAL	CONNECTION TYPE (CASING)	INSIDE DIA. CASING (IN)	CASING WALL THICKNESS (IN)	SLOT SIZE (IN)
	FROM	TO						
	65	55	7	SCH 40 .010 SCREEN	FJ	4	0.154	.010
	55	+43"	7	SCH 40 PVC RISER	FJ	4	0.154	RISER
4. WATER BEARING STRATA	DEPTH (FT)		THICKNESS (FT)	FORMATION DESCRIPTION OF PRINCIPAL WATER-BEARING STRATA (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)				YIELD (GPM)
	FROM	TO						
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA						TOTAL ESTIMATED WELL YIELD (GPM)		

FOR OSE INTERNAL USE

WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER	
LOCATION			PAGE 1 OF 2

5. SEAL AND PUMP	TYPE OF PUMP: ☐ SUBMERSIBLE ☐ JET ☐ NO PUMP - WELL NOT EQUIPPED ☐ TURBINE ☐ CYLINDER ☐ OTHER - SPECIFY:						
	ANNULAR SEAL AND GRAVEL PACK	DEPTH (FT)		BORE HOLE DIA. (IN)	MATERIAL TYPE AND SIZE	AMOUNT (CUBIC FT)	METHOD OF PLACEMENT
		FROM	TO				
		65	51				
		51	2				
	2	0	7	1 BAG OF CEMENT		TOPLOAD	

6. GEOLOGIC LOG OF WELL	DEPTH (FT)		THICKNESS (FT)	COLOR AND TYPE OF MATERIAL ENCOUNTERED (INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES)	WATER BEARING?	
	FROM	TO				
		0	3	2	BROWN FINE SAND	☐ YES ☒ NO
		3	11	8	TAN FINE SAND - CALICHE - SANDSTONE	☐ YES ☒ NO
		11	24	13	TAN FINE SAND - SANDSTONE	☐ YES ☒ NO
		24	31	7	TAN FINE SAND - TAN SILICEOUS SANDSTONE (HARD)	☐ YES ☒ NO
		31	36	5	TAN FINE SAND - SANDSTONE	☐ YES ☒ NO
		36	38	2	TAN SILICEOUS SANDSTONE (FRACTURED LAYERS)	☐ YES ☒ NO
		38	46	8	TAN SILICEOUS SANDSTONE (SOLID)	☐ YES ☒ NO
		46	47	1	RED FINE SAND - GRAVEL	☐ YES ☒ NO
		47	48	1	RED SILICEOUS SANDSTONE (HARD)	☐ YES ☒ NO
		48	51	3	RED FINE SAND - GRAVEL WITH CLAY	☐ YES ☒ NO
		51	58	7	RED FINE SAND- CLAY	☐ YES ☒ NO
		58	59	1	RED SILICEOUS SANDSTONE (HARD)	☐ YES ☒ NO
		59	65	6	RED SILTY SAND - CLAY	☐ YES ☒ NO
		TD	65			☐ YES ☐ NO
						☐ YES ☐ NO
						☐ YES ☐ NO
						☐ YES ☐ NO

ATTACH ADDITIONAL PAGES AS NEEDED TO FULLY DESCRIBE THE GEOLOGIC LOG OF THE WELL

7. TEST & ADDITIONAL INFO	WELL TEST	METHOD: ☐ BAILER ☐ PUMP ☐ AIR LIFT ☐ OTHER - SPECIFY:
		TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.
	ADDITIONAL STATEMENTS OR EXPLANATIONS: 4X4 PAD - 6X6X60 HIGH RISER	

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	 SIGNATURE OF DRILLER	DATE

FOR USE INTERNAL USE

WELL RECORD & LOG (Version 6/9/08)

FILE NUMBER	POD NUMBER	TRN NUMBER
LOCATION	PAGE 2 OF 2	