Whole Earth Environmental, Inc.
2103 Arbor Cove,
Katy, Tx. 77494
281.394.2050
whearth@msn.com

November 5, 2008

NMOCD
1301 West Grand Ave.
Artesia, NM 88210

Attn: Gerry Guye

Ref: NOV-30-015-29931-00-0

Dear Mr. Guye:

Enclosed, please find a copy of our closure report for the OXY Pronghorn State No. 2 site restoration project.

Please advise if you've any questions or comments.

Warmest personal regards,

Mike Griffin
President
Whole Earth Environmental, Inc.

2RP-11

Executive Summary

Location

The site is located approximately thirteen miles east of the City of Artesia, Eddy County, New Mexico on state lands. The primary land use is grazing of cattle however extensive oil and gas operations are prevalent in the area. The area is semi-arid with a net precipitation / evaporation amount of –73" per year. The legal description is: **S2, T21S, R28E**

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Investigation Activities

Arcadis Engineering prepared an earthen pit investigation report in February, 2008 using an EM-31 survey tool supplemented by borings and laboratory analysis. The report concluded that the site would best be remediated by folding in the containment berms and adding modest amounts of fertilizer and organics into the surface profile followed by seeding with BLM seed mixture # 2.

Restoration Activities

Site restoration was accomplished in accordance with the protocol. A composite chloride analysis taken at the conclusion of the project revealed average concentrations of 16 parts per million.

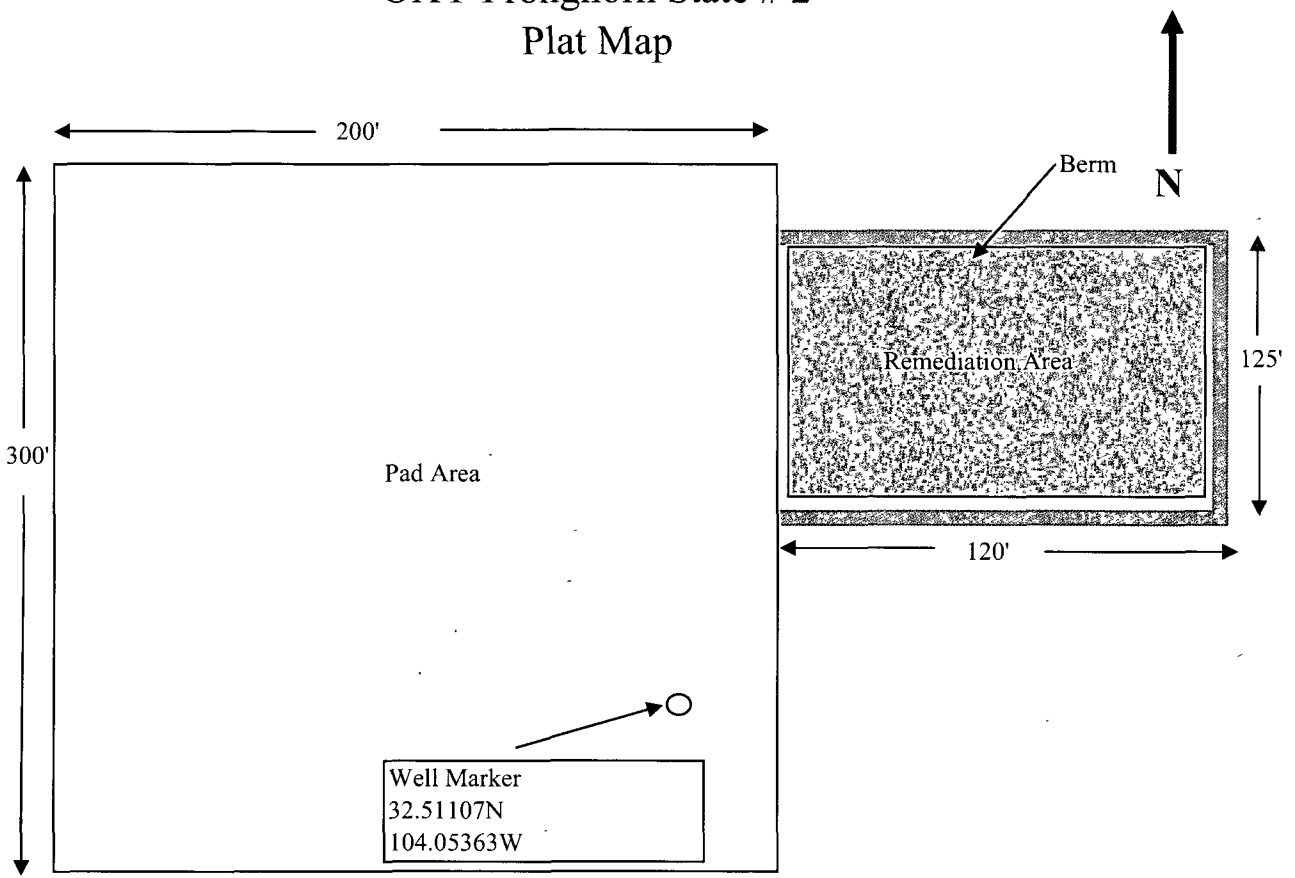
Exhibit Index

A. Driving Instructions
B. Plat Map of Location
C. Satellite View of Location – Zoom out
D. Satellite View of Location – Zoom in
E. Site Prior to Restoration
F. Windrow Detail
G. Seeding Detail

Driving Instructions To:
Pronghorn State #1

In Carlsbad, NM from the intersection of US 285 N and US 62/180 E, go east on US 62/180 (Hobbs Hwy) approx. 11.5 miles to caliche ranch road with cattle guard and chain gate and take a right. Go 0.3 miles to Judah Oil State 1 Battery and veer left at fork. Go 0.4 miles to road on left. Go down road 0.2 miles to location with caliche pad at end of road.

OXY Pronghorn State # 2
Plat Map

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N Canal St
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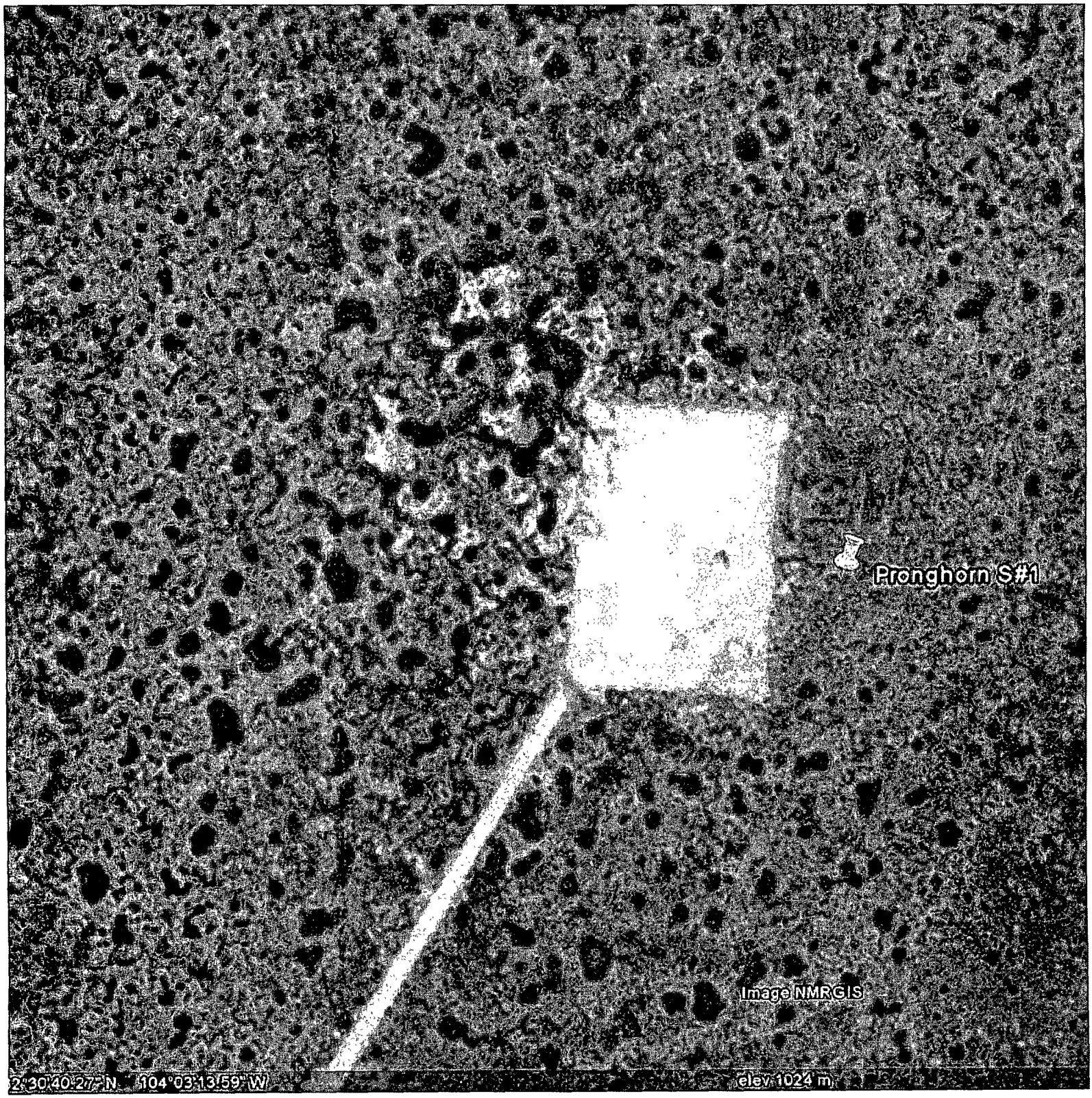
Image NMRGIS
©2008 Tele Atlas
Image ©2008 DigitalGlobe
elev 972 m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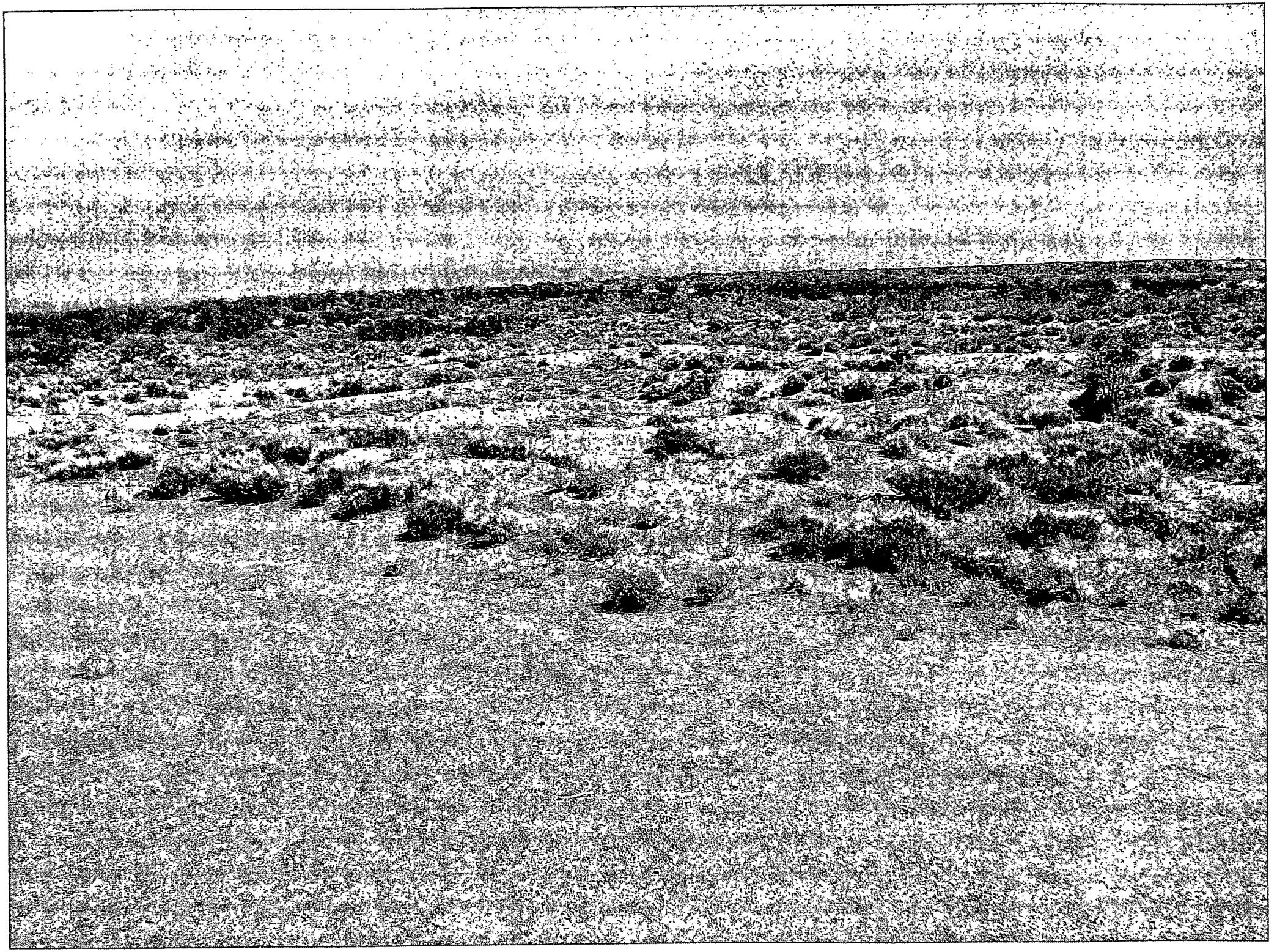
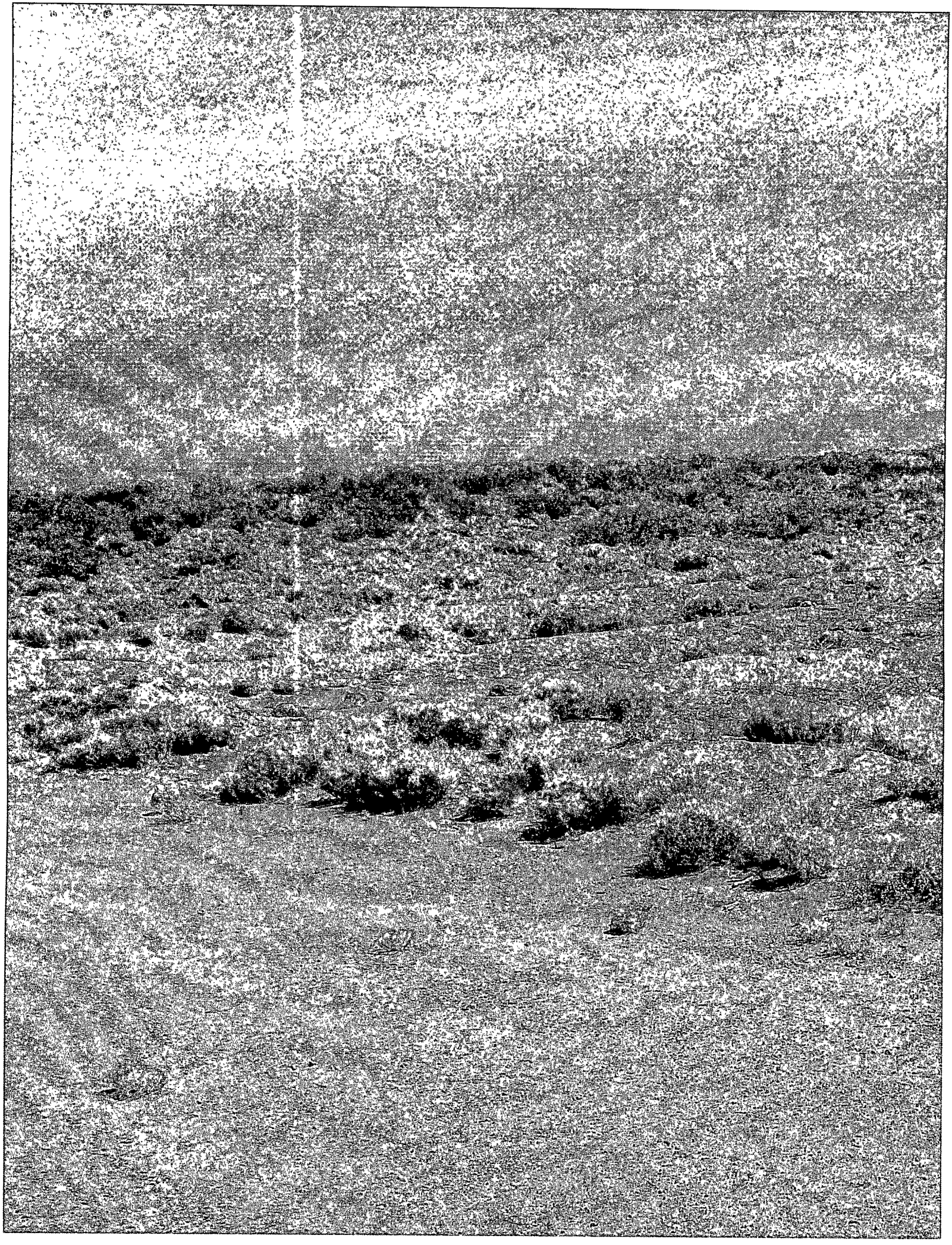
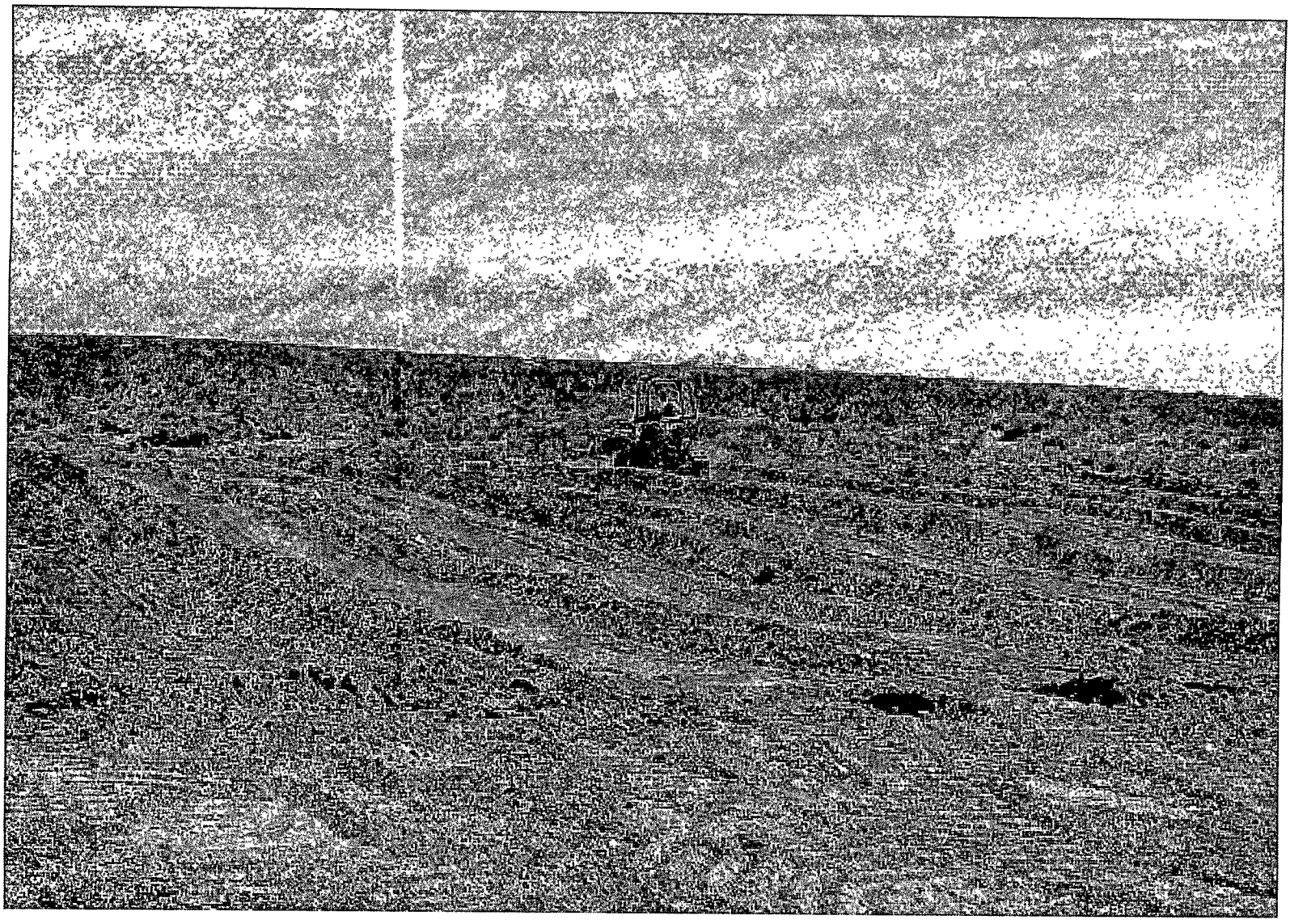
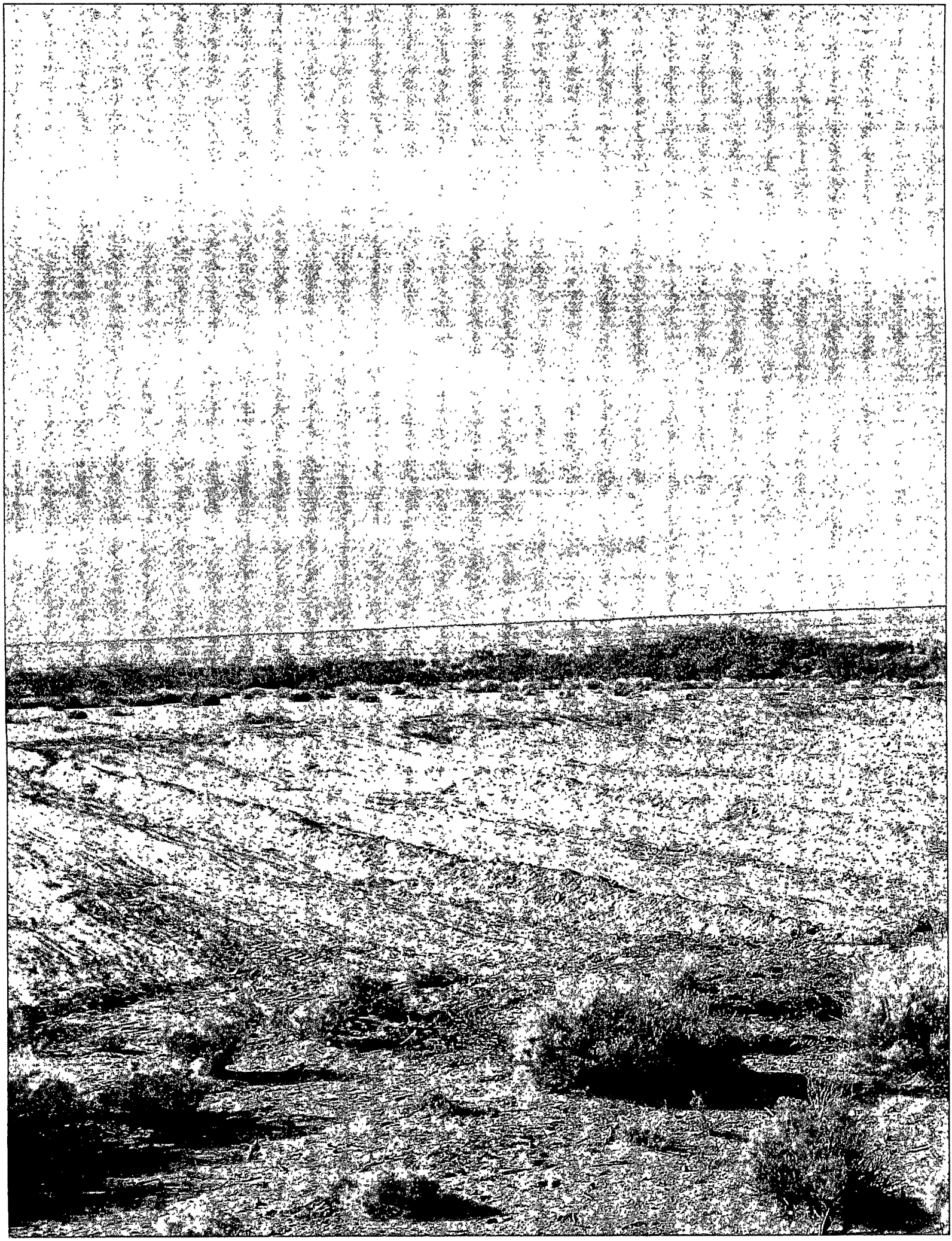
elev. 1024 m









CARDINAL LABORATORIES

PHONE (575) 393-2326 • 101 E MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
WHOLE EARTH ENVIRONMENTAL INC.
ATTN: ROY R. RASCON
2103 ARBOR COVE
KATY, TX 77494
FAX TO: (281) 394-2051

Receiving Date: 10/30/08
Reporting Date: 10/31/08
Project Owner: NOT GIVEN
Project Name: OXY PRONG HORN
Project Location: CARLSBAD, NM

Analysis Date: 10/30/08
Sampling Date: 10/29/08
Sample Type: SOIL
Sample Condition: INTACT
Sample Received By: ML
Analyzed By: AB

LAB NO.	SAMPLE ID	Cl^- (mg/kg)
H16228-1	DISTURBED AREA 137X143	16
	5 PT COMP	
Quality Control		500
True Value QC		500
% Recovery		100
Relative Percent Difference		< 0.1

METHOD: Standard Methods	4500-ClB

Note: Analysis performed on a 1:4 w:v aqueous extract.

Chemist

10/31/08
Date

H16228 WEE

CARDINAL LABORATORIES

101 East Marland, Hobbs, NM 88240
(575) 393-2326 Fax (575) 393-2476

Company Name: Whole Earth Environ	**BILL TO**
Project Manager: Ray R. Rascon	P.O. #:
Address:	Company:
City State Zip	Attn:
Phone #. Fax #:	Address.
Project #. Project Owner:	City:
Project Name: OXY PRONG HORN	State Zip:
Project Location. CARLSBAD, NM	Phone #:
Sampler Name. Ray R. RASCON	Fax #:

ANALY

FOR LAB USE ONLY				MATRIX						PRESERV			SAMPLING								
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACID/BASE:	ICE / COOL	OTHER:	DATE	TIME	Cl-						
H16228-1	Disturbed AREA 137X143 5PT Comp	C	1			✓					✓		10-29-08	1215	X						

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Terms and Conditions: I
30 days past due at the ra
and all costs of collections

Sampler Relinquished: Ray R. Rascon Date: 10-30-08 Time: 327 Received By: Marty LaBut

Relinquished By: Date: Time Received By:

Delivered By: (Circle One) Sampler - UPS - Bus - Other:

Temp. Sample Condition: Cool ☐ Yes ☐ No, Intact ☑ Yes ☐ No

CHECKED BY (Initials): MCAB

Phone Result. ☐ No Add'l Pho
Fax Result ☐ No Add'l Fax
REMARKS:
PLEASE email to M.
Ray R@VADOSE.US

† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476

ARCADIS
Infrastructure, environment, facilities

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Fax 918 664 9925
www.arcadis-us com

FEB 2 1 2008
OCD-ARTESIA

Mr Gerry Guye
Deputy Field Inspector
New Mexico Oil Conservation Division
1301 W Grand Avenue
Artesia, New Mexico 88210

Environmental Services

Subject
Earthen Pit Investigation Report Pronghorn State #2, Section 2, Township 21 South, Range 28 East, N M P.M , Eddy County, New Mexico

Date
February 20, 2008

Dear Mr. Guye

ARCADIS has completed the investigation of the earthen pit at the site referenced above I have included two (2) copies of the investigation report for your review. If you have any questions, please call me anytime.

Sincerely,

ARCADIS U S., Inc

Contact
Michael M Gates

Phone
918-664-9900

Email
Mike.Gates@arcadis-us.com

Michael M Gates
Project Advisor

Copies
NGX Company, c/o Charles K Purcell
GB Petroleum Services, c/o Paul Halajian
OXY USA, c/o Andrew Cloutier

2RP-11

Earthen Pit Investigation

Pronghorn State No. 2
Eddy County, New Mexico

February 2008

PREPARED FOR

NGX Company v. G.B.
Petroleum Services, LLC, et.al.:
USDC Case No. CV-07-268
BB/WDS

ARCADIS
Infrastructure, environment, buildings

ARCADIS

EARTHEN PIT INVESTIGATION
PRONGHORN STATE No. 2
EDDY COUNTY, NEW MEXICO

*Prepared by **ARCADIS, Inc.***

February 2008

Michael M. Gates, P.G.
Project Manager

CONTENTS

TABLES

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1. Site Location Map.
2. Path Traveled for EM 31 Horizontal and Vertical Dipole
3. Site Map; EM 31 Vertical Dipole Results
4. Site Map; EM 31 Horizontal Dipole Results

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1. Historical Pronghorn State No. 2 Well Pad Topo
2. Site Investigation Photographs
3. Field Notes/Soil Boring Logs
4. Laboratory Analytical Reports

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

ARCADIS prepared a scope of work to investigate the soil quality within and underlying an earthen pit associated with the Pronghorn State #2 site located in Section 2, Township 21 South, Range 28 East, N.M.P.M., Eddy County, New Mexico (Figure 1). An historical well pad topographic survey of the Pronghorn State #2 site is provided in Attachment 1. A work plan for an investigation of the pit was submitted on November 1, 2007 to the New Mexico Oil Conservation Division (OCD) for approval prior to implementation. The scope of work provided in the work plan is consistent with the discussions held between the interested parties at a meeting conducted at the site on August 23, 2007. On November 2, 2007 ARCADIS received approval from OCD to implement the scope of work.

The pit remains open but was never used during well construction because a well was not completed at this location. Photographs taken at the site during the investigation are provided in Attachment 2. The objective of the investigation was to sample soils within and underlying the pit to determine the presence or absence of impacts from brine and/or petroleum hydrocarbons that may have been discharged into the pit. Based on the results of the investigation recommendations are provided regarding the necessity of remediation and/or additional investigation activities associated with closure of the pit.

The scope of work to investigate soil quality within and underlying the earthen pit focused on the upper twenty (20) feet of the soil profile. Groundwater was not encountered within this interval. Two primary investigative tools were utilized for the investigation. Electromagnetic conductivity surveys were first conducted to provide information on the vertical and lateral extent, if any, of brine related impacts. This was immediately followed by confirmation soil sampling to determine the presence or absence of impacts from brine or petroleum hydrocarbons.

Two EM-31 electromagnetic conductivity surveys were conducted over a grid area covering approximately 200 feet by 130 feet and overlying and extending beyond the boundaries of the earthen pit. The objectives of these surveys were to determine background conductivity response and identify any conductivity anomalies within the surveyed area to target for confirmation soil sampling. The EM-31 was operated in two modes to target two vertical depth intervals; one to investigate the depth interval between ground surface and approximately nine feet and the other to investigate the depth interval between ground surface and approximately 19 feet.

Soil borings were conducted using direct-push technology and were located based on the EM-31 survey results. Soil borings were advanced to approximately 20 feet in depth at two locations; one in the center of the anomalous high conductivity area and one in the area of lowest conductivity outside of the pit boundaries. In addition, eight (8) shallow soil borings

were advanced to a depth of approximately five (5) feet within the surveyed area to confirm the results obtained from the EM survey.

Discrete soil samples were collected from each shallow soil boring at one (1) foot intervals. For the two deeper borings soil samples were collected at one foot intervals to six feet and then were collected by compositing samples from each two-foot interval to the total boring depth. Collected soil samples were submitted to an analytical laboratory for analysis of salinity and petroleum hydrocarbon parameters.

The results of the field investigation work are presented in this report to the OCD. The report includes conclusions and recommendations for closure of the pit.

2.0 FIELD METHODOLOGIES

ARCADIS conducted the field investigation of the pit from December 4 through December 7, 2007. Descriptions of the field methodologies utilized during the investigation are provided in the following.

2.1 ELECTROMAGNETIC CONDUCTIVITY SURVEYS

Electromagnetic (EM) conductivity surveys of the area encompassing the earthen pit were utilized to delineate areas potentially impacted by oil field brine. The particularly high electrical conductivity of oilfield production water (brine) makes the detection of brine related soil impacts by EM conductivity methods an especially reliable geophysical application. Electromagnetic conductivity instruments consist of a transmitter and receiver coil, and a power source that can be handled by one or two persons. During the operation of the instrument, the transmitter coil is energized by an alternating current and radiates an electromagnetic field into the earth. This primary field induces electrical currents (called eddy currents) in the earth below the instrument. The magnitude of these currents is proportional to the conductivity of the ground. These eddy currents, in turn, generate a secondary electromagnetic field that is detected by the receiver coil on the instrument. The receiver coil also detects the primary field and uses these two measurements to calculate the conductivity of the ground. This reading represents a bulk measurement of the conductivity of a volume of ground beneath the instrument down to its effective depth of penetration.

For this investigation, an EM-31 survey was conducted in both the horizontal and vertical dipole modes of orientation. The average depth of investigation in the vertical dipole mode is approximately 19 feet. In the horizontal dipole mode the average depth of investigation is about 9 feet. The effective depth difference allows for some vertical discrimination of conductivity within the soil profile throughout the surveyed area.

A survey grid of approximately 200 feet by 130 feet was utilized to overlap and extend beyond the boundaries of the earthen pit to allow a comparison of background soil conditions with those underlying the pit. The survey was completed by walking the area in a north-south orientation along survey lines that were about 5 feet apart. The survey grid for the EM-31 surveys is provided as Figure 2. Conductivity readings were recorded continuously as each survey line was traversed into an integrated DL600 data logger at a rate of 5 hertz (Hz; 5 data points per second) while global positioning system (GPS) coordinates were recorded at 1 Hz. Real time graphical presentation of the data was observed via computer.

2.2 SOIL BORINGS AND SOIL SAMPLING

Ten (10) soil borings were conducted for this investigation; two deep borings (20 feet) and eight shallow borings (5 feet). A comparison of the collected data allows for estimating the amount of produced water discharged to the pit and the potential threat to any underlying groundwater. The soil boring data is also used to confirm the results of the EM survey.

The borings were installed using direct-push technology and continuous soil cores were collected as the borings are advanced. A truck-mounted direct push rig operated by Harrison & Cooper, Inc from Lubbock, Texas was used to complete the soil borings. The two deeper borings were installed in the area of highest conductivity and a background location, respectively, based on the EM-31 survey. For these borings, soil samples were collected at one (1) foot intervals for the first six feet and then composited for each two foot interval throughout the depth of the boring. Each soil sample was analyzed for salinity parameters as described in Section 2.3. Two soil samples (collected from 0-5 feet and 5-10 feet) from each of the deeper borings were also analyzed for Total Petroleum Hydrocarbon (TPH) using Texas Method 1005. TPH analyses for additional samples were not indicated to be warranted based on visual and olfactory screening conducted at the time of sampling. The deep boring locations are shown on Figure 3 and the boring logs are provided in Attachment 3.

Eight (8) shallow soil borings were advanced to a depth of approximately five (5) feet within the surveyed area to confirm the results obtained from the EM-31 survey. For these borings, soil samples were collected at one (1) foot intervals throughout the depth of the boring. Each soil sample was analyzed for salinity parameters as described in Section 2.3. For the two borings located in the area of highest conductivity (SB1 and SB8), based on the EM-31 survey, two soil samples per boring were collected and analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), and TPH. The shallow boring locations are shown on Figure 4 and the boring logs are provided in Attachment 3.

2.3 INORGANIC ANALYSES

Soil samples for inorganic parameter analysis were delivered under chain of custody to the Texas A&M University Soil, Water and Forage Testing Laboratory, Department of Soil and Crop Sciences, College Station, Texas. A request for analysis form was prepared for each sample choosing routine analysis for fertility parameters and detailed salinity.

The routine analysis includes pH, electrical conductivity (EC), nitrate-nitrogen (NO3-N), phosphorus (P), potassium (K), magnesium (Mg), calcium (Ca), sodium (Na) and sulfur (S). Soil pH and EC were determined in a 1:2 soil:water extract using Methods 10-3.2 and 10-3.3.[1] Phosphorus, K, Ca, Mg, Na and S were extracted using the Mehlich III buffer

[1] Rhoades, J.D. 1982. Soluble salts. p. 171-173. *In* A.L. Page, et al. (ed.). Methods of Soil Analysis: Part 2. Agron. Monogr. 9. 2nd ed. ASA, Madison, WI.

solution[2], and analyzed by inductively coupled plasma (ICP)-atomic emission spectrometry described in Method 3-4.[3] Plant available nitrogen (NO3-N) was extracted using a 1 N KCl solution and measured by the cadmium reduction to nitrite followed by colorimetric spectrometry described in Method 33-9.[4]

Detailed salinity parameters include pH, EC, Na, K, Ca and Mg determined in a saturated paste soil:water extract prepared with deionized water. A saturated paste is a moisture equivalent produced where all the voids between soil particles are filled with water and the surface of the soil glistens as it reflects light as described in Method 10-2.3. The pH and EC is measured directly in the paste using a pH electrode and conductivity probe. The water is then extracted under vacuum and analyzed by ICP to determine levels of Na, K, Ca and Mg.

2.4 ORGANIC (PETROLEUM HYDROCARBON) ANALYSES

Soil samples for petroleum hydrocarbon parameter analysis were delivered under chain of custody to TraceAnalysis, Inc, Lubbock, Texas. Selected soil samples were analyzed for TPH using Texas Method 1005. Two specific carbon ranges were evaluated: C6-C12 and >C12-C35. The C6-C12 range represents the gasoline range fraction. The >C12-C35 range represents the diesel range fraction and above. Selected soil samples were also analyzed for BTEX using Method S8021B.

Two samples from each of the deeper soil borings (DSB1 and DSB2) were submitted for TPH analysis. The soil samples from each of these borings were collected from the 0 to 5 foot interval and the 5 to 10 foot interval. Two samples were collected from the shallow soil borings that corresponded to the area of highest conductivity based on the EM-31 results (SSB1 and SSB8). The soil samples from each of these borings were collected from the 0 to 2.5 foot interval and the 2.5 to 5 foot interval. These samples were analyzed for BTEX and TPH.

[2] Mehlich, A. 1984. Mehlich-3 soil test extractant: a modification of Mehlich-2 extractant. Commun. Soil Sci. Plant Anal. 15(12): 1409-1416.

[3] Soltanpour, P.N., J.B. Jones, Jr. and S.M. Workman. 1982. Optical Emission Spectrometry. p. 38-53. *In* A.L. Page, et al. (ed.). Methods of Soil Analysis: Part 2. Agron. Monogr. 9. 2nd ed. ASA, Madison, WI.

[4] Keeney, D.R. and D.W. Nelson. 1982. Nitrogen-Inorganic Forms. p. 682-686. *In* A.L. Page, et al. (ed.). Methods of Soil Analysis: Part 2. Agron. Monogr. 9. 2nd ed. ASA, Madison, WI.

3.0 INVESTIGATION RESULTS

ARCADIS conducted the field investigation of the pit from December 4 through December 7, 2007. The EM-31 survey was conducted first. The configuration of the soil boring locations was determined based on the results of the EM-31 survey. The results of the investigation are provided in the following.

3.1 EM-31 RESULTS

An EM-31 survey was conducted in both the horizontal and vertical dipole modes of orientation. The average depth of investigation in the vertical dipole mode is approximately 19 feet. In the horizontal dipole mode the average depth of investigation is about 9 feet. The effective depth difference allows for some vertical discrimination of conductivity within the soil profile throughout the surveyed area.

The results of the vertical dipole survey are provided on Figure 3. The conductivities are presented in millisiemens per meter (mS/m) and the values represent conductivities that are averaged over the entire effective depth (0 to 19 feet for the vertical dipole mode). As shown on Figure 3, the conductivities ranged from a background reading of near zero (and slightly negative) to a maximum reading approaching 80 mS/m within the pit area where the anomalous conductivity signature is obviously elevated above background.

The horizontal dipole survey results are shown on Figure 4. These conductivities are representative of the average conductivities within the depth interval of approximately 0 to 9 feet. As shown on Figure 4, the conductivities ranged from a background reading of near zero (and slightly negative) to a maximum reading approaching 32 mS/m within the pit area. As with the deeper survey, the anomalous conductivity signature is elevated above background within the pit area.

The conductivity anomalies are indicative of the presence of salts that are likely associated with a discharge of oil field brine. The shallow survey demonstrates a somewhat larger area of elevated conductivity than the deeper survey, but the deeper survey exhibits higher conductivities. While the EM-31 results are indicative of a the presence of oil field brine impacts, the overall amount of brine present appears to be limited based on the conductivity readings and confirmed by the salinity analysis discussed in the following section.

3.2 SOIL QUALITY RESULTS (INORGANICS)

Inorganic salinity parameters determined on a saturated paste basis are summarized in Table 1 for the shallow soil borings SSB1 through SSB8 and in Table 2 for deep soil borings DSB1 and DSB2. Soil pH tended to be slightly alkaline (pH 7.4 to pH 7.8) to moderately alkaline (pH 7.9 to pH 8.4) indicative of a calcium carbonate buffered system. Soil pH

readings of 8.5 and 8.6 measured in the deep background core (DSB2, Table 2) in soil layers from 5-14 ft reflect a strongly alkaline reaction suggesting a contribution from sodium bicarbonate to the buffer. The soil profile in shallow boring SSB1 from 0 to 5 ft was neutral in reaction ranging from pH 6.9 to pH 7.6.

Soil EC is a measurement of total soluble salts and reflects the distribution of both cations and anions in profile when determined for discreet sample intervals as a function of depth. Due to the requirement of electrical neutrality in water samples and in soil water extracts there is a balance between positively charged cations (+) and negatively charged anions (-) and the sum of either of these entities is equal to the EC in mmhos/cm x 10.[5] The relationship is as follows:

$$\sum \text{of the cations, meq/liter} = \sum \text{of the anions, meq/liter}$$

$$\text{EC mmhos/cm} \times 10 = \sum \text{cations (Na, K, Ca, Mg), meq/liter}$$

$$\text{EC mmhos/cm} \times 10 = \sum \text{anions (Cl, } NO_3, HCO_3, CO_3, SO_4\text{), meq/liter}$$

Cations and anions are typically measured and reported in ppm (mg/liter). To convert a cation or anion constituent to meq/liter one simply has to divide the ppm value by the given elements milliequivalent (meq) weight in mg/meq. The mg/meq constants for sodium, potassium, calcium and magnesium are 23, 39, 20 and 12.2, respectively. As an example the sum of cations and comparison to EC for SSB1, 2-3 ft is a follows:

Na, 2039 mg/liter ÷ 23 mg/meq = 88.7 meq/liter
K, 49 mg/liter ÷ 39 mg/meq = 1.3 meq/liter
Ca, 1346 mg/liter ÷ 20 mg/meq = 67.3 meq/liter
Mg, 86 mg/liter ÷ 12.2 mg/meq = 7.1 meq/liter
Total cation = 164.4 meq/liter

EC mmhos/cm = 164.4 meq/liter/10
EC (estimated) = 16.4 mmhos/cm

The actual EC was measured at 17.0 mmhos/cm compared to the calculated value of 16.4 mmhos/cm demonstrating that the cations normally found in soils conserve the charge measured as conductivity. The close agreement between the measured and the calculated EC values also point to the accuracy of the data.

Based on these relationships it is evident from the data that the EC values in Table 1 and Table 2 are predominantly the result of soluble sodium and calcium. Furthermore it was demonstrated that the salt level associated with these cations is orders of magnitude higher in the pit as compared to the background soil boring DSB2. Sodium is a reflection of brine water put into the pit. Soluble calcium is produced by reaction of brine with solid phase calcium in preparation of the soil:water extract. Fertility parameter analyses summarized in Tables 3 and 4 show high levels of extractable calcium in the deeper sample intervals (3-4 ft and 4-5 ft) of the shallow borings and extending throughout the profile in the deep soil

[5] Rhoades, J.D. 1982. Soluble salts. p. 173. *In* A.L. Page, et al. (ed.). Methods of Soil Analysis: Part 2. Agron. Monogr. 9. 2nd ed. ASA, Madison, WI.

borings constructed inside the pit (DSB1) and in the background soil boring (DSB2). Approximately 61% of the extractable sodium in the shallow borings is water soluble with the difference attributed to exchangeable sodium desorbed by the extraction process. The number increases to about 66% of the extractable sodium being water soluble in the deep borings. There is no discernible relationship between water soluble calcium and extractable calcium.

There was no indication of calcium redistribution (movement by leaching), based on the analytical data from the deep soil boring constructed inside the pit. However, the data does show sodium was distributed throughout the profile with some redistribution out of the surface layers to deeper strata. Total sodium salt at DSB1 corresponding to an EM-31 reading of 28 was calculated to be 114,070 lb/acre-20 ft compared to background EM-31 reading of -2 and sodium level of 1,646 lb/acre-20 ft. Using these two benchmarks and assuming a linear response it was determined that an EM-31 reading of 20 (measured at SSB1) corresponds to a sodium level of 84,000 lb/acre-20 ft.

The analytical laboratory reports are included as Attachment 4.

3.3 SOIL QUALITY RESULTS (HYDROCARBONS)

Based on visual inspection, staining of surface soils was observed in a small area of the northern portion of the pit. Dark staining was noted in shallow boring SSB-1 in this same area. A lesser degree of staining was also noted at boring SSB-2. Staining was not observed in any other boring or area of the pit.

TPH and BTEX were analyzed in samples collected from SSB1 and SSB8, the two shallow borings exhibiting the highest conductivity readings from the EM-31 survey. The results are summarized in Table 5. For the BTEX analysis, only a small amount of xylenes were identified ranging from 0.0311 mg/kg to 0.0494 mg/kg. No other BTEX parameter was detected. TPH in the carbon range C6 -C12 was only identified in one shallow soil sample (SSB1; 0-2.5 ft) at a concentration of 70.4 mg/kg. TPH in the carbon range >C12-C35 was identified in SSB1 at 0-2.5 ft at a concentration of 2,240 mg/kg. The TPH concentration decreased to 614 mg/kg in the 2.5 to 5 ft interval from this boring. The only other sample to exhibit a TPH concentration was from SSB8 at 0 to 2.5 ft which had a concentration of 102 mg/kg of TPH in the carbon range >C12-C35.

TPH was not detected in the deeper soil boring samples. The analytical laboratory reports are included as Attachment 4.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Total sodium salt in the pit was calculated based on the areal extent of EM-31 contours and corresponding total sodium in a 20 ft profile. Due to the tight grouping of EM contours, values were calculated at the high EM reading and by extrapolating this response over an area represented by 4 contour intervals. Although, the mass of sodium is large in terms of lb/acre-20 ft at corresponding high EM readings, the acreage represented by a grouping of 4 contour intervals is small, resulting in the total soluble sodium mass added to the pit at 821 lb. If a sodium chloride model (1:1 Na:Cl molar ratio) is assumed, the corresponding chloride is 1,268 lb. An equivalent mass of salt is recovered in 0.49 acre of native soil to a depth of 20-ft.

Limited staining of surface soils was observed in a small area of the northern portion of the pit. Dark staining was noted in shallow boring SSB-1 in this same area. A lesser degree of staining was also noted at boring SSB-2. Staining was not observed in any other boring or area of the pit. Based on analytical results of BTEX and TPH, and visual/olfactory observations, the impacts to soils within the pit from discharges of petroleum hydrocarbons appears minor and can be addressed in-situ in conjunction with pit restoration and closure activities discussed below.

Based on the quantity of salt recovered in the pit and distribution below a depth of about 3-ft it is recommended that the salt be left undisturbed and the pit backfilled with berm material and additional soil as necessary to establish the normal grade and contour. This would establish near salt free profile of 6 to 7 ft. In addition, it is proposed to add 1,000 lb of organic matter to the restored surface that will be blended to a depth of inches, followed by a surface application of 5-lb actual nitrogen and 3-lb phosphorus as P2O5. The final work element is to seed the disturbed area with a native grass mixture approved by the BLM and mulch cover of 250 lb coarse straw, crimped to hold. These restoration procedures should be adequate to achieve closure of this site.

ARCADIS

Table 1. Inorganic Salinity Parameters Analysis Summary
Pronghorn #2 Pit, Shallow Soil Borings
Eddy County, New Mexico

	Salinity Parameter							
Sample ID	pH	EC[1]	Na[2]	K[2]	Ca[2]	Mg[2]	SAR	ESP
SB1, 0-1ft	6 9	1.33	73	13	205	9	1.35	2.0
SB1, 1-2ft	7.1	1.9	146	14	224	9	2.61	3.9
SB1, 2-3ft	6 9	17.02	2039	49	1346	86	14.6	21.7
SB1, 3-4ft	7.6	0.77	89	21	62	7	2.86	4.3
SB1, 4-5ft	7 2	30	5689	128	1629	181	35.7	53.2
SB2, 0-1ft	7 6	1.33	132	13	108	5	3.39	5 1
SB2, 1-2ft	7.9	4.76	447	49	1004	41	3.76	5 6
SB2, 2-3ft	7.4	3 38	295	24	720	21	2.96	4.4
SB2, 3-4ft	7.5	12.76	1394	36	913	47	12.21	18 2
SB2, 4-5ft	7 6	0.46	49	8	46	3	1 88	2 8
SB3, 0-1ft	8.3	0 42	52	15	329	13	0 77	1.1
SB3, 1-2ft	8 5	0.4	53	22	156	17	1 06	1.6
SB3, 2-3ft	8.4	1.22	160	7	48	2	6.13	9.1
SB3, 3-4ft	8.4	3.89	462	8	92	5	12.74	19 0
SB3, 4-5ft	8.3	4.32	556	11	92	5	15.25	22.7
SB4, 0-1ft	7.8	0.63	48	46	52	3	1 75	2.6
SB4, 1-2ft	8.2	0.56	78	20	185	12	1 5	2.2
SB4, 2-3ft	8.3	0.66	102	207	189	106	1 47	2.2
SB4, 3-4ft	8.5	1.47	228	19	72	10	6.7	10.0
SB4, 4-5ft	8	19.02	1812	28	37	125	32	47.7
SB5, 0-1ft	8.6	0.5	63	19	254	15	1 04	1.5
SB5, 1-2ft	8 2	1 44	204	6	47	3	7.73	11 5
SB5, 2-3ft	8.5	3.35	539	6	55	4	18.97	28 3
SB5, 3-4ft	8.2	6 87	1369	13	138	8	30.61	45 6
SB5, 4-5ft	7.7	12 6	1428	21	734	40	13.92	20.7
SB6, 0-1ft	8 2	0.5	55	8	45	3	2.18	3.2
SB6, 1-2ft	8.5	0.42	58	80	134	51	1.09	1 6
SB6, 2-3ft	7.9	4.21	493	11	157	9	10.37	15.4
SB6, 3-4ft	7.9	13.32	1525	21	854	43	13.82	20.6
SB6, 4-5ft	8	14	1544	29	1027	59	12 7	18 9
SB7, 0-1ft	8 1	0.54	38	9	69	2	1.23	1 8
SB7, 1-2ft	8	1.65	193	14	106	5	4.99	7 4
SB7, 2-3ft	8.2	1.7	265	16	74	6	7.95	11.8
SB7, 3-4ft	8.4	2.14	359	70	224	37	5.86	8.7
SB7, 4-5ft	8.3	1 6	244	29	298	15	3.74	5.6
SB8, 0-1ft	8.1	2 4	304	13	197	8	5.78	8.6
SB8, 1-2ft	8.3	2.19	325	14	134	8	7.38	11.0
SB8, 2-3ft	8	2.78	457	23	202	11	8 49	12.6
SB8, 3-4ft	8	8.18	953	17	226	15	16 6	24.7
SB8, 4-5ft	8	10.2	1211	22	537	22	13.93	20.8

1. mmhos/cm
2. Parts per million (ppm)

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Table 2. Inorganic Salinity Parameters Analysis Summary
Pronghorn #2 Pit, Deep Soil Borings
Eddy County, New Mexico

Sample ID	Salinity Parameter							
	pH	EC[1]	Na[2]	K[2]	Ca[2]	Mg[2]	SAR	ESP
DSB1, 0-1ft	8	0.67	41	30	83	5	1.19	1.8
DSB1, 1-2ft	8.2	0.9	104	9	207	5	1.95	2.9
DSB1, 2-3ft	8	3.47	379	15	524	14	4.46	6 6
DSB1, 3-4ft	7 9	17.9	2117	37	1136	67	16.53	24 6
DSB1, 4-5ft	7.7	18.48	2104	42	1192	78	15.96	23.8
DSB1, 5-6ft	7.8	29.2	3507	57	2300	149	19.1	28.5
DSB1, 6-8ft	7.8	21.1	2627	37	1072	84	20.8	31.0
DSB1, 8-10ft	8	12.27	1521	28	638	37	15.85	23.6
DSB1,10-12ft	8.3	12.76	1426	32	404	39	18.16	27 1
DSB1,12-14ft	8	15.14	1844	33	759	47	17.56	26.2
DSB1,14-16ft	8 1	12.5	1567	25	375	34	20.78	31.0
DSB1,16-18ft	8	13.71	1853	30	676	39	18.77	28.0
DSB1,18-20ft	7.9	13.97	1655	24	848	61	14.8	22.0
DSB2, 0-1ft	7.9	0.32	23	8	54	3	0.82	1.2
DSB2, 1-2ft	8	0.34	21	5	67	5	0.68	1.0
DSB2, 2-3ft	8.3	0.25	24	3	34	2	1.1	1.6
DSB2, 3-4ft	8.4	0.26	19	4	50	2	0.72	1 1
DSB2, 4-5ft	8.3	0.33	34	3	37	2	1 48	2.2
DSB2, 5-6ft	8.6	0.28	25	3	31	3	1 14	1.7
DSB2, 6-8ft	8 6	0.22	25	3	17	2	1.57	2.3
DSB2, 8-10ft	8.5	0.34	42	3	14	2	2 83	4.2
DSB2,10-12ft	8.6	0.3	37	3	8	1	3 26	4.9
DSB2,12-14ft	8 5	0.38	45	3	17	1	2.81	4 2
DSB2,14-16ft	8 3	0.8	86	4	47	3	3.29	4.9
DSB2,16-18ft	8.4	0.44	49	4	27	2	2.47	3.7
DSB2,18-20ft	8.4	0.74	71	6	48	3	2.67	4.0

1. mmhos/cm
2. Parts per million (ppm)

Table 3 Soil Fertility Analysis Summary
Pronghorn #2 Pit, Shallow Soil Borings
Eddy County, New Mexico

	Soil Fertility Parameter						
Sample ID	NO_3-N	P	K	Extr Ca	Extr Mg	Sulfur	Extr Na
SB1, 0-1ft	3	6	161	4226	86	68	210
SB1, 1-2ft	0	3	126	3840	63	55	322
SB1, 2-3ft	2	8	207	3702	149	94	1790
SB1, 3-4ft	4	3	193	4506	186	47	2920
SB1, 4-5ft	9	0	112	30178	390	136	6677
SB2, 0-1ft	2	6	328	4743	135	42	296
SB2, 1-2ft	3	6	186	3382	101	49	388
SB2, 2-3ft	3	1	16	591	9	4	36
SB2, 3-4ft	8	13	151	2508	72	962	452
SB2, 4-5ft	60	3	161	24179	196	195	2269
SB3, 0-1ft	1	3	128	3493	100	17	236
SB3, 1-2ft	3	3	162	5725	118	20	305
SB3, 2-3ft	14	2	121	17196	142	65	558
SB3, 3-4ft	46	0	86	29086	192	134	1216
SB3, 4-5ft	65	1	237	24982	229	156	1884
SB4, 0-1ft	8	5	636	3879	158	16	177
SB4, 1-2ft	7	3	263	2802	84	10	194
SB4, 2-3ft	3	1	59	1778	31	3	188
SB4, 3-4ft	5	4	166	3973	97	54	881
SB4, 4-5ft	13	0	42	29459	259	126	2574
SB5, 0-1ft	3	4	113	2677	85	13	235
SB5, 1-2ft	3	3	133	3859	112	25	619
SB5, 2-3ft	3	0	62	28397	185	79	996
SB5, 3-4ft	10	0	112	29939	196	84	1785
SB5, 4-5ft	11	0	64	30490	210	90	2231
SB6, 0-1ft	6	5	106	3921	81	15	211
SB6, 1-2ft	3	5	132	3847	93	17	284
SB6, 2-3ft	6	3	65	15740	86	61	514
SB6, 3-4ft	28	0	76	30148	211	200	2232
SB6, 4-5ft	11	0	91	29996	256	147	2900
SB7, 0-1ft	5	5	145	4091	71	20	157
SB7, 1-2ft	3	9	179	3623	88	64	442
SB7, 2-3ft	6	8	181	1793	96	59	657
SB7, 3-4ft	6	5	133	1639	81	42	719
SB7, 4-5ft	7	7	139	2707	77	41	622
SB8, 0-1ft	4	4	127	3300	72	136	542
SB8, 1-2ft	5	6	150	3128	90	41	699
SB8, 2-3ft	5	7	154	1585	81	76	856
SB8, 3-4ft	28	0	104	29209	205	150	1873
SB8, 4-5ft	29	0	69	30675	199	160	1759

1 All parameters in parts per million (ppm)

Table 4. Soil Fertility Analysis Summary
Pronghorn #2 Pit, Deep Soil Borings
Eddy County, New Mexico

Sample ID	Soil Fertility Parameter						
	NO_3-N	P	K	Extr Ca	Extr Mg	Sulfur	Extr Na
DSB1, 0-1ft	11	5	269	4270	128	21	170
DSB1, 1-2ft	5	4	137	4084	100	22	368
DSB1, 2-3ft	3	1	98	11977	108	297	710
DSB1, 3-4ft	38	1	110	30095	247	215	3249
DSB1, 4-5ft	22	1	99	30128	288	187	3231
DSB1, 5-6ft	16	0	74	30793	307	156	4210
DSB1, 6-8ft	3	1	79	29743	283	133	4007
DSB1, 8-10ft	6	1	80	25962	197	113	2249
DSB1,10-12ft	3	1	77	15735	138	35	2660
DSB1,12-14ft	7	0	78	27534	214	91	2981
DSB1,14-16ft	3	1	74	7475	115	25	2812
DSB1,16-18ft	5	0	89	18600	187	84	2927
DSB1,18-20ft	6	1	67	7829	150	26	2732
DSB2, 0-1ft	3	3	192	1691	145	8	137
DSB2, 1-2ft	3	2	202	6187	337	17	133
DSB2, 2-3ft	3	1	40	30135	197	48	200
DSB2, 3-4ft	3	0	25	29882	192	55	209
DSB2, 4-5ft	4	0	37	31149	240	58	170
DSB2, 5-6ft	2	0	49	30424	349	63	194
DSB2, 6-8ft	2	0	60	13123	256	20	149
DSB2, 8-10ft	3	0	102	17742	383	44	281
DSB2,10-12ft	2	0	48	18473	178	23	179
DSB2,12-14ft	3	2	45	6542	118	12	187
DSB2,14-16ft	3	2	32	12527	94	32	205
DSB2,16-18ft	3	0	63	11357	162	27	186
DSB2,18-20ft	1	1	34	5646	68	17	180

1. All parameters in parts per million (ppm)

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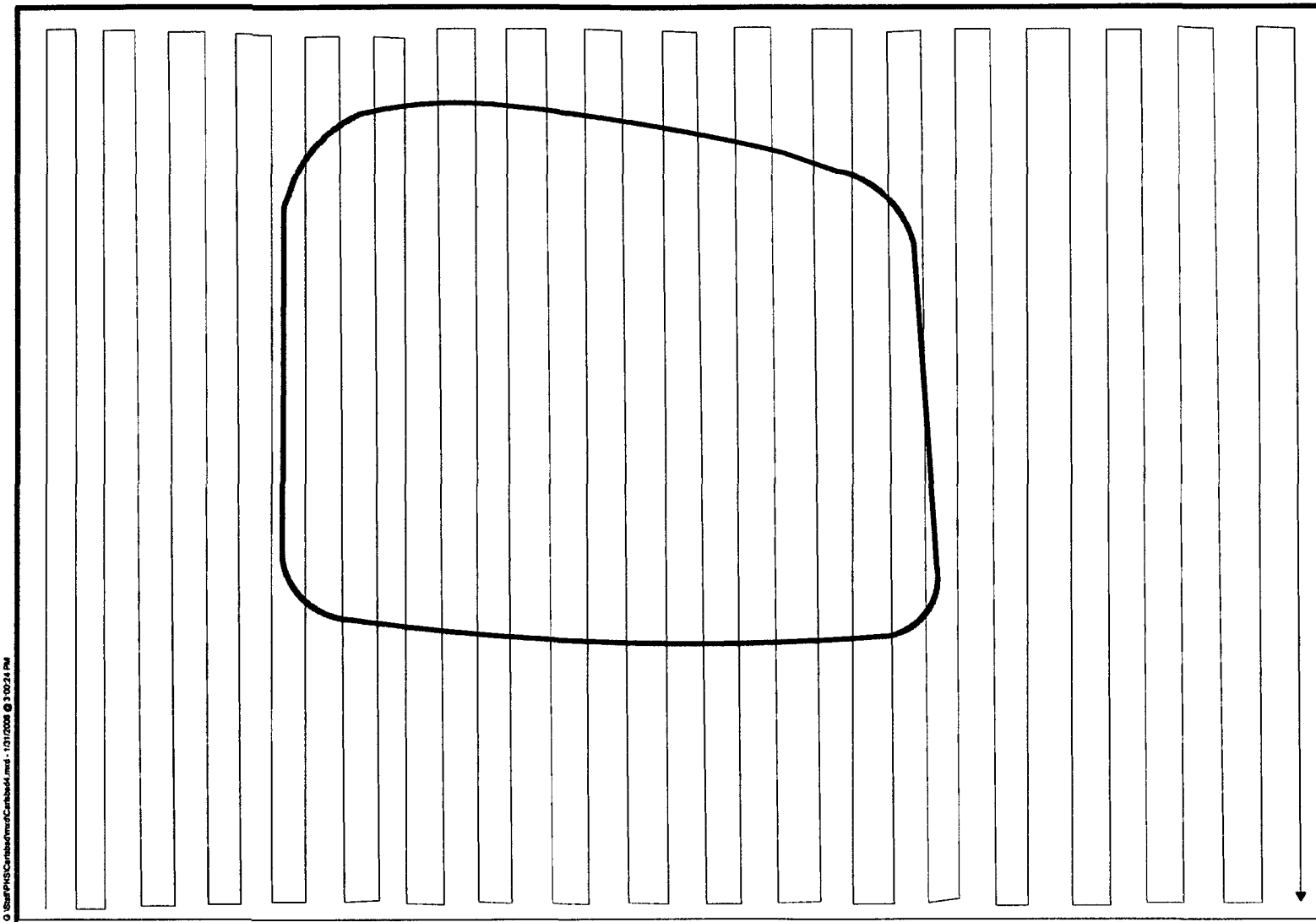
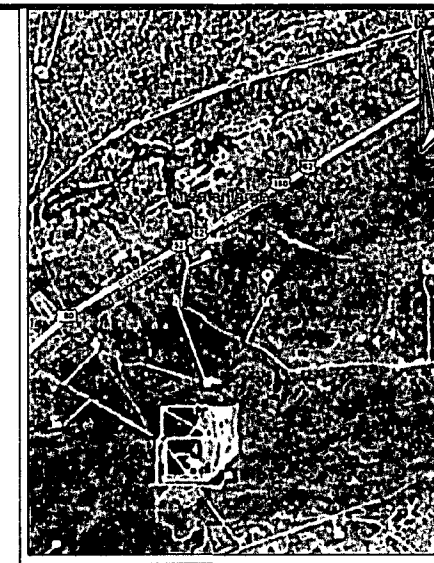
Table 5 Petroleum Hydrocarbon Parameters Analysis; Shallow and Deep Soil Borings
Pronghorn #2 Pit, Shallow Soil Borings
Eddy County, New Mexico

Sample - Field Code	BTEX				TX1005 Extended	
	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	C6-C12 (mg/Kg)	>C12-C35 (mg/Kg)
144974 - DSB-2 5-10'					<50.0	<50.0
144975 - DSB-2 0-5'					<50.0	<50.0
144976 - DSB-1 0-5'					<50 0	<50.0
144977 - DSB-1 5-10'					<50 0	<50.0
144978 - SSB-1 0-2.5'	<0 0100	<0.0100	<0.0100	**0.0370**	**70.4**	**2240**
144979 - SSB-1 2.5-5'	<0.0100	<0.0100	<0.0100	**0.0494**	<50.0	**614**
144980 - SSB-8 0-2.5'	<0.0100	<0.0100	<0.0100	**0.0311**	<50.0	**102**
144981 - SSB-8 2.5-5'	<0.0100	<0.0100	<0.0100	<0.0100	<50 0	<50 0

Program Manager	ARCADIS 8725 Rosehill, Suite 350 Lenexa, Kansas 66215 Tel: 913.492.0900 Fax: 913.492.0902 www.arcadis-us.com	Site Map Pronghorn State #2 Section 2 Township 21S Range 28E	Project Number OK001547.0001
Project Manager Mike Gates			Drawing Date 01/03/2008
Task Manager Jasmin Talbert			Figure 1
Technical Review Mike Gates			





Path Traveled

5 0 5 10 15 20 25

Feet

Program Manager	ARCADIS 8725 Rosehill, Suite 350 Lenexa, Kansas 66215 Tel: 913 492 0900 Fax: 913 492 0902 www.arcadis-us.com	Path Traveled for EM 31 Horizontal and Vertical Dipole Pronghorn State #2 Section 2 Township 21S Range 28E	Project Number OK001547 0001
Project Manager Mike Gates			Drawing Date 01/18/2008
Task Manager Jasmin Talbert			Figure 2
Technical Review Mike Gates			

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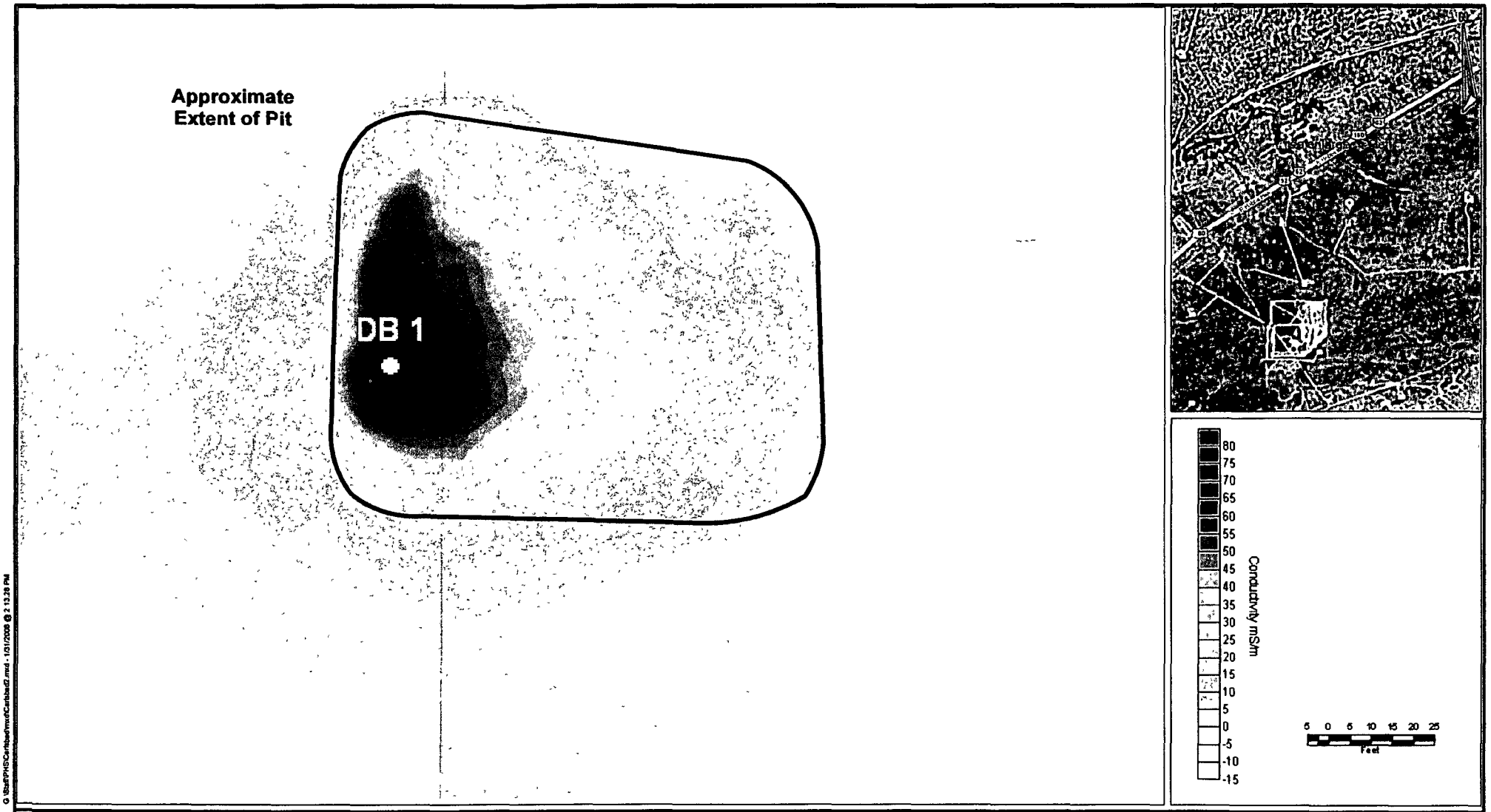

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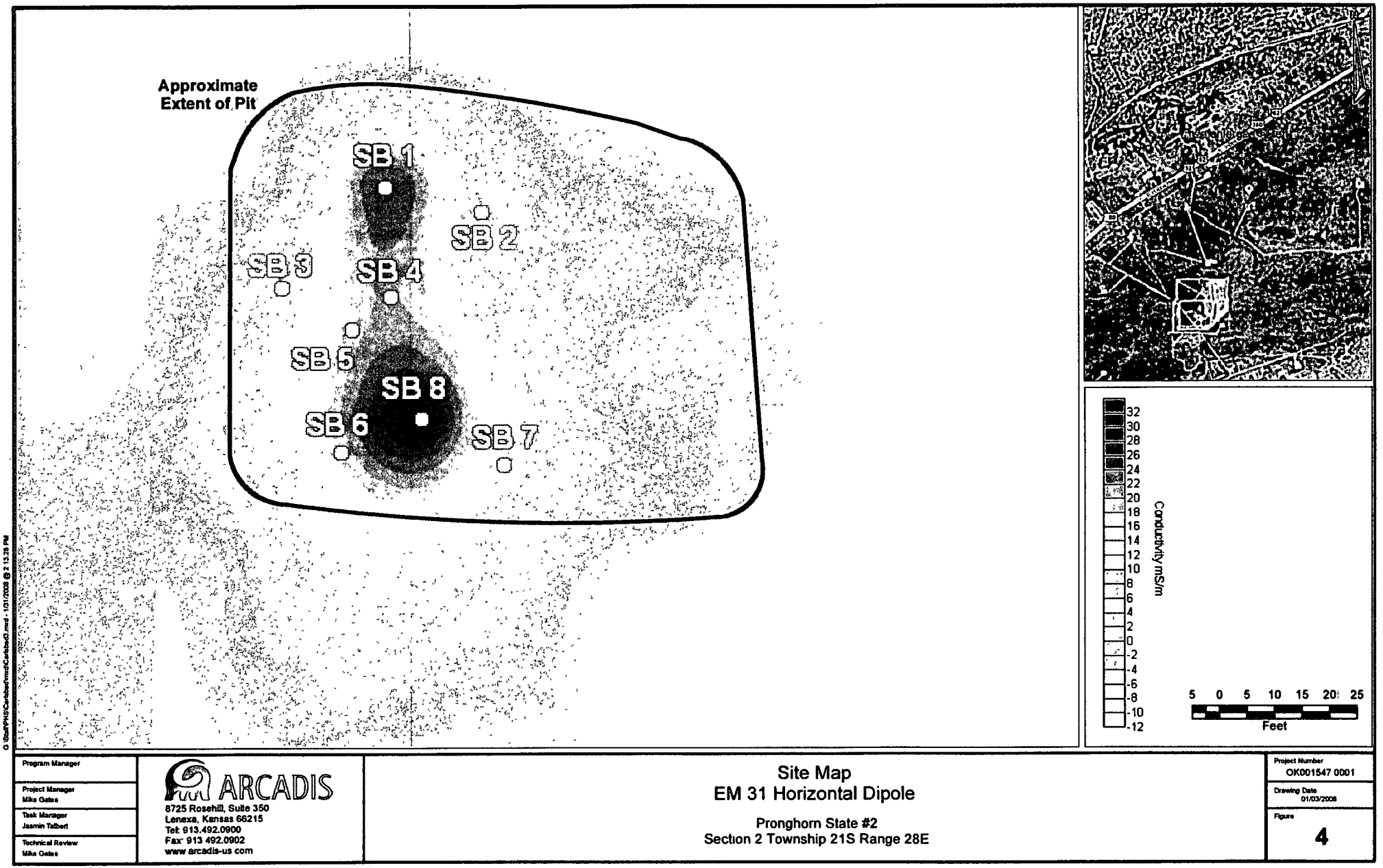
Program Manager	
Project Manager Mike Gates	
Task Manager Jasmin Talbert	
Technical Review Mike Gates	

ARCADIS
8725 Rosehill, Suite 350
Lenexa, Kansas 66215
Tel 913 492 0900
Fax 913 492 0902
www.arcadis-us.com

Site Map
EM 31 Vertical Dipole

Pronghorn State #2
Section 2 Township 21S Range 28E

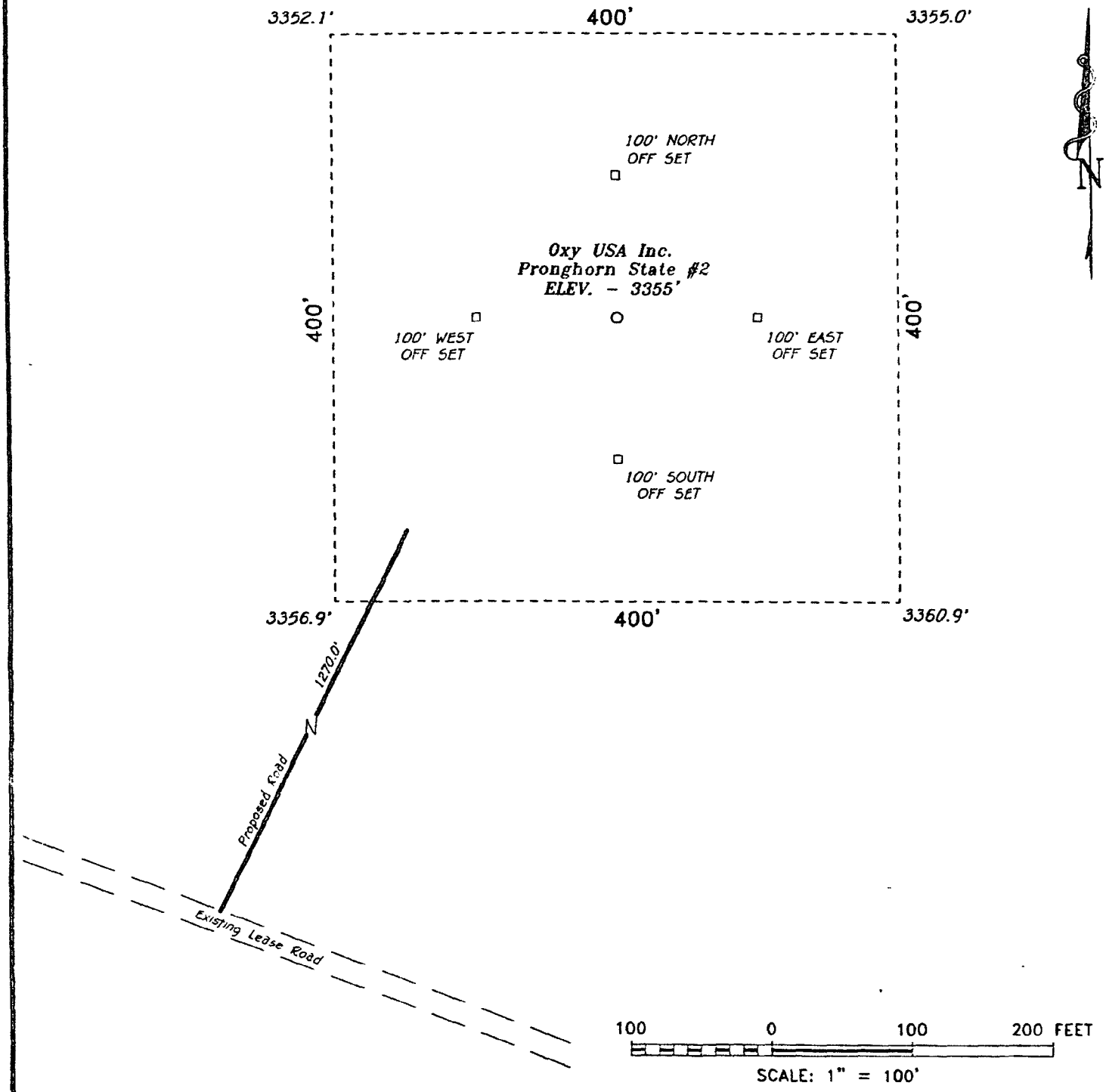
Project Number	OK001547 0001
Drawing Date	01/03/2008
Figure	3



Program Manager	ARCADIS 8725 Rosehill, Suite 350 Lenexa, Kansas 66215 Tel: 913.492.0900 Fax: 913 492.0902 www.arcadis-us.com	Site Map EM 31 Horizontal Dipole Pronghorn State #2 Section 2 Township 21S Range 28E	Project Number OK001547 0001
Project Manager Mike Gates			Drawing Date 01/03/2008
Task Manager Jasmin Talbert			Figure 4
Technical Review Mike Gates			

SECTION 2, TOWNSHIP 21 SOUTH, RANGE 28 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO.



Oxy USA Inc.

REF: Pronghorn State #2 / Well Pad Topo

THE PRONGHORN STATE No. 2 LOCATED 3300' FROM THE SOUTH LINE AND 1650' FROM THE EAST LINE OF SECTION 2, TOWNSHIP 21 SOUTH, RANGE 28 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

BASIN SURVEYS P.O BOX 1786 – HOBBS, NEW MEXICO

W.O. Number: 8119	Drawn By: K. GOAD		
Date: 02-27-98	Disk: KJG #93 – 8119A DWG	Survey Date. 02-28-98	Sheet 1 of 1 Sheets

PRONGHORN STATE No. 2
EDDY COUNTY, NEW MEXICO

PIT INVESTIGATION PHOTOGRAPHS

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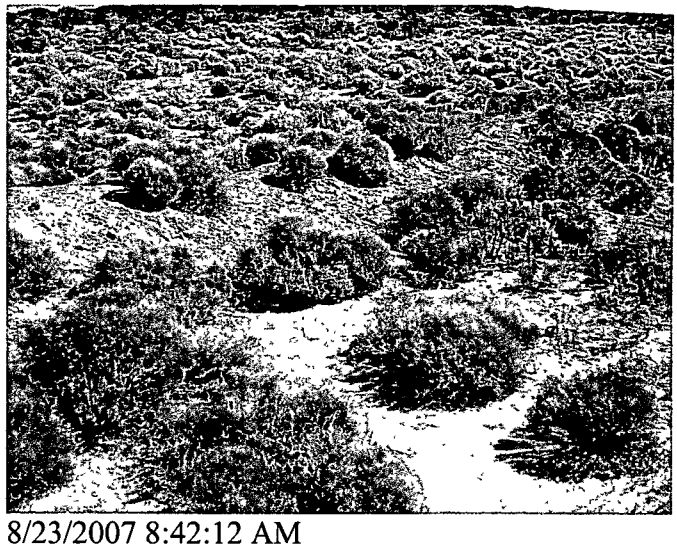

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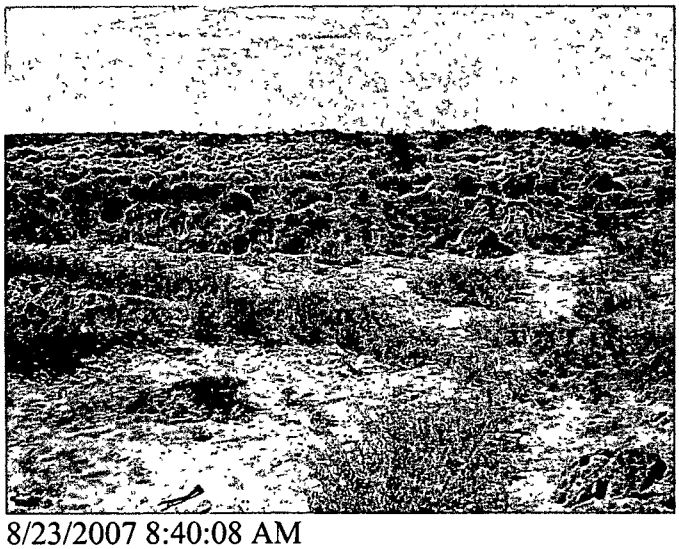

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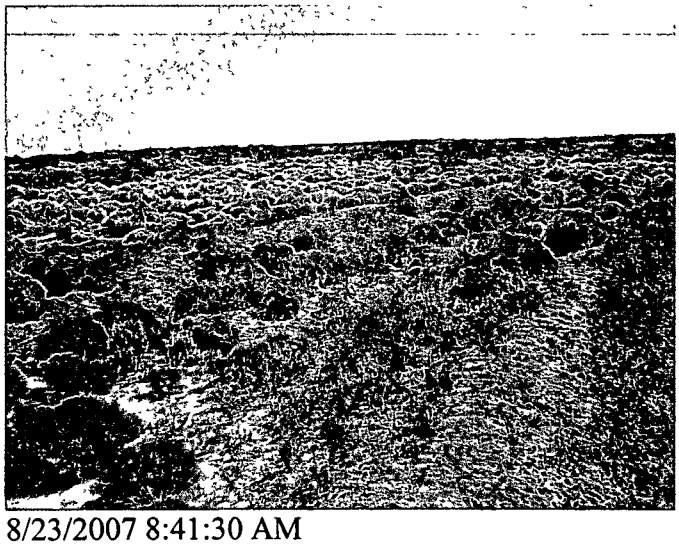

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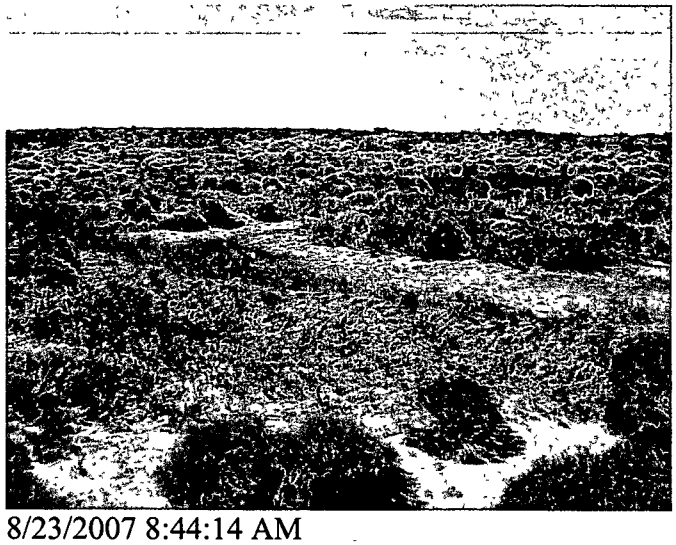

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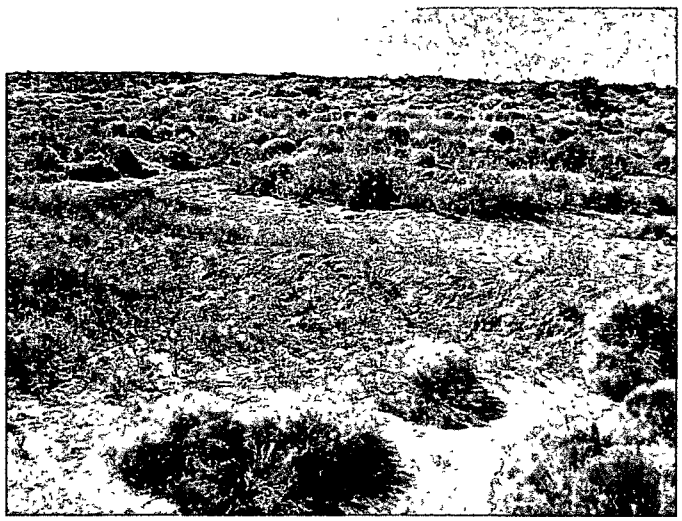
PRONGHORN STATE No. 2
EDDY COUNTY, NEW MEXICO

PIT INVESTIGATION PHOTOGRAPHS



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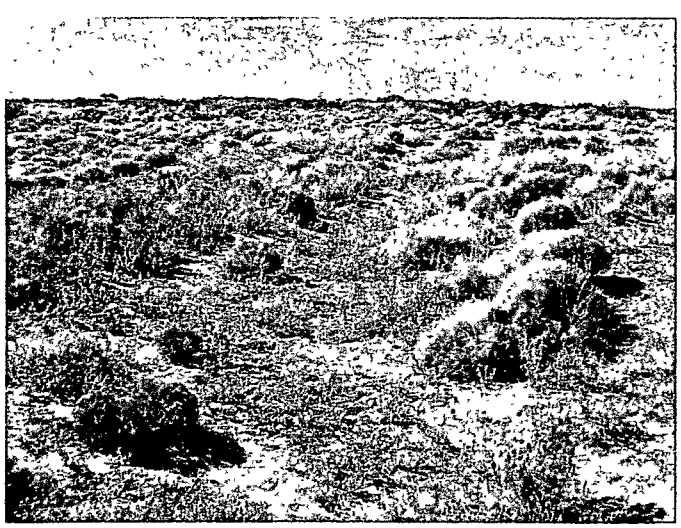

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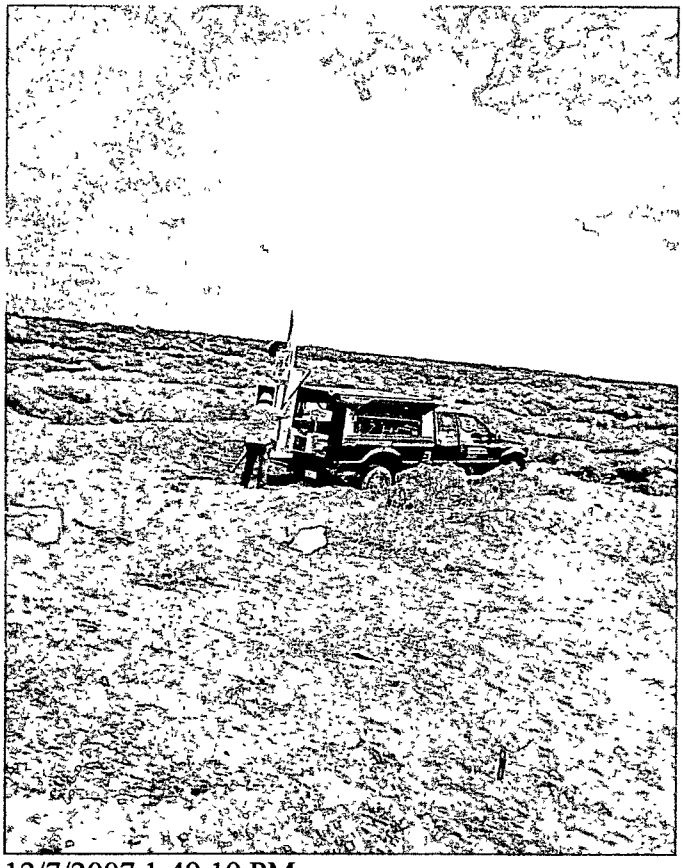
PRONGHORN STATE No. 2
PIT INVESTIGATION PHOTOGRAPHS



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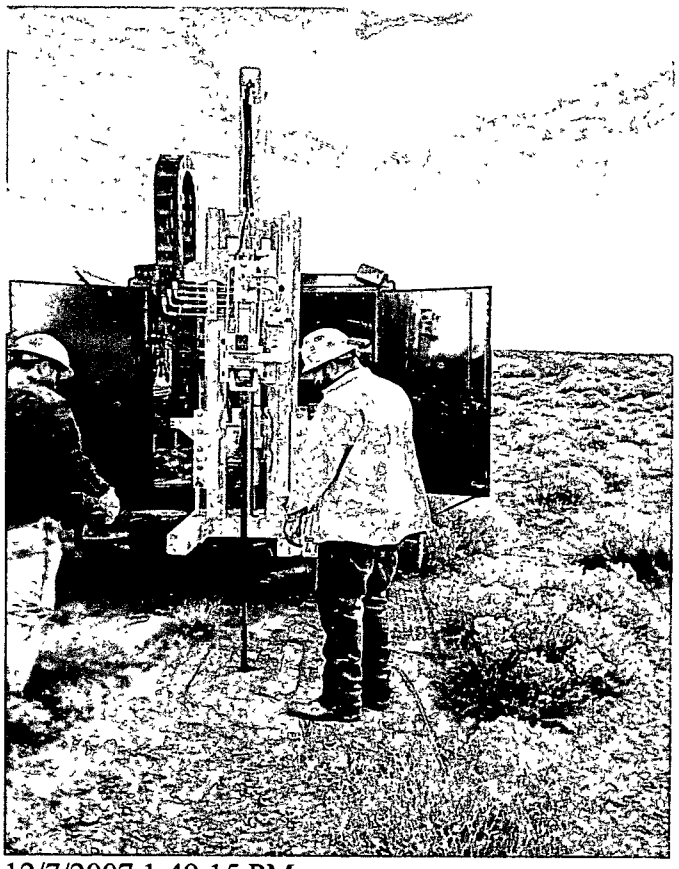

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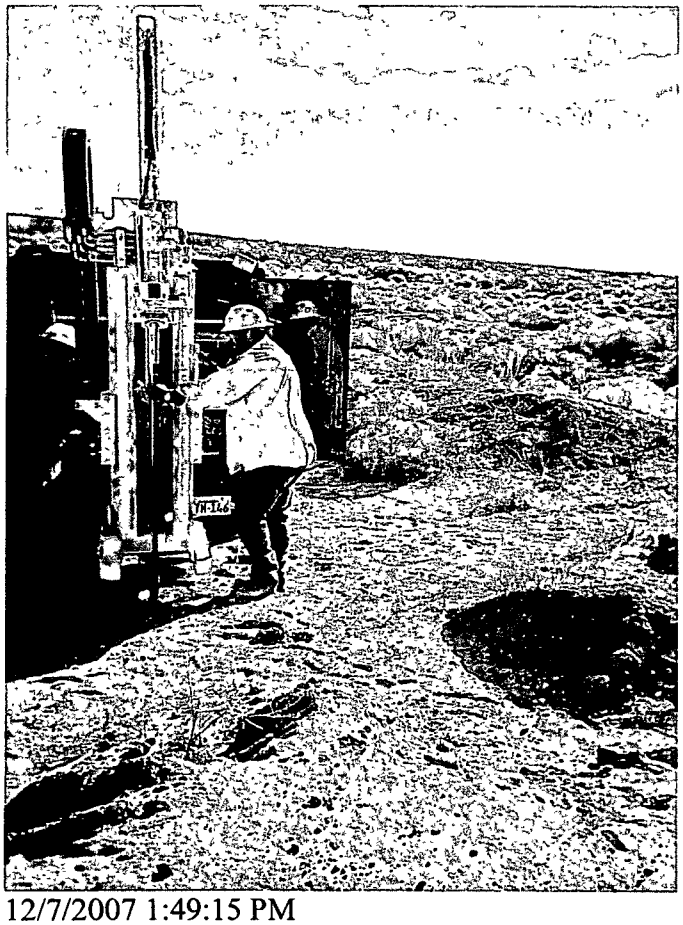

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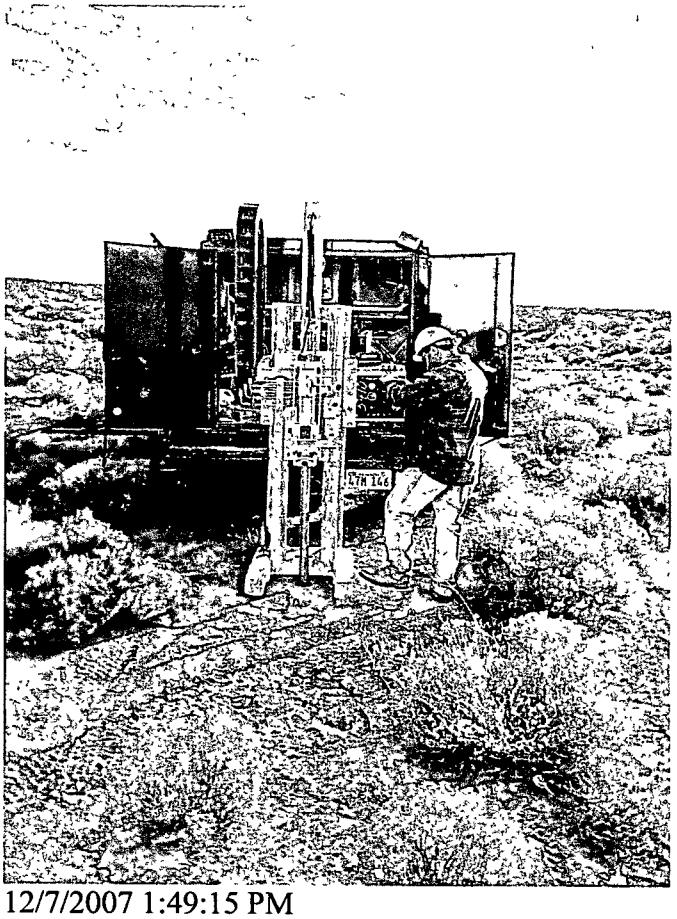

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BORING LOG

7

Well No.: SSB-1 Date Drilled: 12/6/07

Client Name: Oxy USA Et Al Prong horn Station

Site Location: Lot 18 sec 2 21S 28E Eddy Co. NM

Project No.: Ok 1547.1 Drilling Method: Geo probe

Logged By: RL, JT Sample Method: C

Drilling Co.: Harrison Driller: Leonard

Sample / Core Interval			P. I. D. (PPM)				Description Depth (ft)		Description
Device	Depth (ft)	Recovery (ft)	Depth (ft)	Reading	Sample Analysis	U. S. C. S.	from	to	(Lithology, Munsell Color, Grain Size w/percentages (most to least), Roundness, Sorting, Consistency/Hardness, Moisture Content, Bedding, Fractures, Additional Remarks)
C	0-4	3.1					0	4.6	SAND 2.5YR 6/6 light red medium grained subangular well sorted loose 2.5 odor, black staining
	4-5	1							
							4.6	5	CALICHE 2.5YR 8/1 white soft

BORING LOG 7

Well No.: SSB-2 Date Drilled: 12/5/07
Client Name: Oxy USA Et Al Pronghorn State #2
Site Location: Lot 18 sec 2 21S 28E Eddy Co. NM
Project No.: OK 1547.1 Drilling Method: Geoprobe
Logged By: RL, JT Sample Method: C
Drilling Co.: Harrison Driller: Leonard

Sample / Core Interval			P. I. D. (PPM)		Sample Analysis	U. S. C. S.	Description Depth (ft)		Description
Device	Depth (ft)	Recovery (ft)	Depth (ft)	Reading			from	to	(Lithology, Munsell Color, Grain Size w/percentages (most to least), Roundness, Sorting, Consistency/Hardness, Moisture Content, Bedding, Fractures, Additional Remarks)
C	~~0-4~~ 4-5	2.8 1					0	4.5	SAND 2.5YR 6/6 light red medium grained subangular well sorted faint odor some gray staining
							4.5	4.6	CALICHE 2.5YR 8/1 white
							4.6	5	soft SAND as above staining

BORING LOG

Well No.: SSB-3 Date Drilled: 12/7/07
Client Name: Oxy USA Et Al Pronghorn Station
Site Location: Lot 18 sec 2 21S 28E Eddy Co. NM
Project No.: Ok 15471 Drilling Method: Geoprobe
Logged By: RL, JT Sample Method: C
Drilling Co.: Harrison Driller: Leonard

Sample / Core Interval			P. I. D. (PPM)				Description Depth (ft)		Description
Device	Depth (ft)	Recovery (ft)	Depth (ft)	Reading	Sample Analysis	U. S. C. S.	from	to	(Lithology, Munsell Color, Grain Size w/percentages (most to least), Roundness, Sorting, Consistency/Hardness, Moisture Content, Bedding, Fractures, Additional Remarks)
C	0-4	3,4					0	3	SAND 2.5YR 6/6 light red medium grained subangular well sorted loose
	4-5	1							
							3	5	CALICHE 2.5YR 8/1 white soft

BORING LOG

Well No.: SSB-4 Date Drilled: 12/5/07

Client Name: Oxy USA Et Al Prong horn Station

Site Location: Lot 18 sec 2 21S 28E Eddy Co. NM

Project No.: Ok 1547.1 Drilling Method: Geo probe

Logged By: RL, JT Sample Method: C

Drilling Co.: Harrison Driller: Leonard

Sample / Core Interval			P. I. D. (PPM)				Description Depth (ft)		Description
Device	Depth (ft)	Recovery (ft)	Depth (ft)	Reading	Sample Analysis	U. S. C. S.	from	to	(Lithology, Munsell Color, Grain Size w/percentages (most to least), Roundness, Sorting, Consistency/Hardness, Moisture Content, Bedding, Fractures, Additional Remarks)
C	0-4	28					0	3.5	SAND 2.5YR 6/6 light red medium grained, subangular, well sorted loose
	4-8								
							3.5	5	CALICHE 2.5YR 8/1 White soft

BORING LOG

Well No.: SSB-5 Date Drilled: 12/7/07
Client Name: Oxy USA Et Al Prong horn Station
Site Location: Lot 18 sec 2 21S 28E Eddy Co. NM
Project No.: Ok 15471 Drilling Method: Geoprobe
Logged By: RL, JT Sample Method: C
Drilling Co.: Harrison Driller: Leonard

Sample / Core Interval			P. I. D. (PPM)		Sample Analysis	U. S. C. S.	Description Depth (ft)		Description (Lithology, Munsell Color, Grain Size w/percentages (most to least), Roundness, Sorting, Consistency/Hardness, Moisture Content, Bedding, Fractures, Additional Remarks)
Device	Depth (ft)	Recovery (ft)	Depth (ft)	Reading			from	to	
C	0-4	3.1					0	3.5	SAND 2.5YR 6/6 light red
	4-5	1.0							medium grained subangular
							3.5	5	well sorted loose
									CALICHE 2.5YR white soft

BORING LOG

Well No.: SSB-6 Date Drilled: 12/7/07
Client Name: Oxy USA Et Al Prong horn Station
Site Location: Lot 18 sec 2 21S 28E Eddy Co. NM
Project No.: Ok 15471 Drilling Method: Geo probe
Logged By: RL, JT Sample Method: C
Drilling Co.: Harrison Driller: Leonard

N32° 30' 40.6" Description W 104° 03' 13.2"

Sample / Core Interval			P. I. D. (PPM)				Description Depth (ft)		(Lithology, Munsell Color, Grain Size w/percentages (most to least), Roundness, Sorting, Consistency/Hardness, Moisture Content, Bedding, Fractures, Additional Remarks)
Device	Depth (ft)	Recovery (ft)	Depth (ft)	Reading	Sample Analysis	U. S. C. S.	from	to	
C	0-4	3.0					0	3	SAND 2.5YR 6/6 light red medium grained subangular well sorted loose
	4-5	1.0							
							3	5	CALICHE 2.5YR 8/1 soft

BORING LOG 7

Well No.: SSB-7 Date Drilled: 12/3/07
Client Name: Oxy USA Et Al Prong horn Station
Site Location: Lot 18 sec 2 21S 28E Eddy Co. NM
Project No.: Ok 1547.1 Drilling Method: Geo probe
Logged By: RL, JT Sample Method: C
Drilling Co.: Harrison Driller: Leonard

Sample / Core Interval			P. I. D. (PPM)				Description Depth (ft)		Description
Device	Depth (ft)	Recovery (ft)	Depth (ft)	Reading	Sample Analysis	U.S.C.S.	from	to	(Lithology, Munsell Color, Grain Size w/percentages (most to least), Roundness, Sorting, Consistency/Hardness, Moisture Content, Bedding, Fractures, Additional Remarks)
C	0-4	3.0					0	4	SAND 2.5YR 6/6 light red
	4-5	1.0							medium grained, subangular
									well sorted loose
							4	5	CALICHE 2.5YR 8/1 white Soft

BORING LOG

Well No.: SSB-8 Date Drilled: 12/7/07
Client Name: Oxy USA Et Al Prong horn Station
Site Location: Lot 18 sec 2 21S 28E Eddy Co. NM
Project No.: Ok 1547.1 Drilling Method: Geo probe
Logged By: RL, JT Sample Method: C
Drilling Co.: Harrison Driller: Leonard

N 32 30' 40.6" W 104 03 13.6

Sample / Core Interval			P. I. D. (PPM)		Sample Analysis	U.S.C.S.	Description Depth (ft)		Description (Lithology, Munsell Color, Grain Size w/percentages (most to least), Roundness, Sorting, Consistency/Hardness, Moisture Content, Bedding, Fractures, Additional Remarks)
Device	Depth (ft)	Recovery (ft)	Depth (ft)	Reading			from	to	
C	0-4	3.0					0	3	SAND 2.5YR 6/6 light red medium grained subangular well sorted loose
	4-5	3.6							
							3	5	CALICHE 2.5YR 8/1 white soft

BORING LOG

Well No.: DSB-1 Date Drilled: 12/5/07

Client Name: Oxy USA Et Al Pringhorn Station

Site Location: Lot 18 sec 2 21S 28E Eddy Co. NM

Project No.: Ok 15471 Drilling Method: Geoprobe

Logged By: RL, JT Sample Method: C

Drilling Co.: Harrison Driller: Leonard

Sample / Core Interval			P. I. D. (PPM)				Description Depth (ft)		Description
Device	Depth (ft)	Recovery (ft)	Depth (ft)	Reading	Sample Analysis	U.S.C.S.	from	to	(Lithology, Munsell Color, Grain Size w/percentages (most to least), Roundness, Sorting, Consistency/Hardness, Moisture Content, Bedding, Fractures, Additional Remarks)
									N32 30 40.6 W 104 03 13.6
C	0-4	3					0	3	SAND 2.5YR 6/6 light Red, medium grained SUB angular, well sorted loose
	4-8	3.8							
	8-12	3.7							
	12-16	3.8					3	6	CALICHE 2.5YR 8/1 white soft arenaceous
	16/20	3.3					6	7	CLAY 10R 4/6 Red firm
							7	20	SAND 10R 7/4 pale red, med lam to fine grained Subangular, fair sorting loose

BORING LOG

Well No.: PSB-2 Date Drilled: 12/5/07
Client Name: Oxy USA Et Al Pronghorn Station
Site Location: Lot 18 sec 2 21S 28E Eddy Co. NM
Project No.: OK 15471 Drilling Method: Geoprobe
Logged By: RL, JT Sample Method: C
Drilling Co.: Harrison Driller: Leonard

N 32° 30' 39.7" Description 104° 03' 13.9"

Sample / Core Interval			P. I. D. (PPM)				Description Depth (ft)		
Device	Depth (ft)	Recovery (ft)	Depth (ft)	Reading	Sample Analysis	U. S. C. S.	from	to	(Lithology, Munsell Color, Grain Size w/percentages (most to least), Roundness, Sorting, Consistency/Hardness, Moisture Content, Bedding, Fractures, Additional Remarks)
C	0-4	3.6					0	2.5	Sand 10R5/8 Red medium to fine sand, subangular, fair sorting loose,
	4-8	3.8							
	8-12	3.7							
	12-16	3.8					2.5	5.5	CALICHE 2.5YR 8/1 White, soft
	16-20	3.9					5.5	20	SAND 2.5YR 8/1 light Red fine grained, subangular well sorted, loose to very soft @ places

Summary Report

Michael Gates
Arcadis-Tulsa
5100 East Skelly Drive
Suite 1000
Tulsa, OK, 74135

Report Date: December 17, 2007

Work Order: 7121024

Project Location: OXY-Pronghorn State #2
Project Name: OK001547.0001
Project Number: OK001547.0001

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
144974	DSB-2 5-10'	soil	2007-12-07	10:03	2007-12-10
144975	DSB-2 0-5'	soil	2007-12-07	09:43	2007-12-10
144976	DSB-1 0-5'	soil	2007-12-07	10.30	2007-12-10
144977	DSB-1 5-10'	soil	2007-12-07	10:42	2007-12-10
144978	SSB-1 0-2.5'	soil	2007-12-07	12:12	2007-12-10
144979	SSB-1 2.5-5'	soil	2007-12-07	12:15	2007-12-10
144980	SSB-8 0-2.5'	soil	2007-12-07	11:05	2007-12-10
144981	SSB-8 2.5-5'	soil	2007-12-07	11:10	2007-12-10

	BTEX				TX1005 Extended	
Sample - Field Code	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethylbenzene (mg/Kg)	Xylene (mg/Kg)	C6-C12 (mg/Kg)	>C12-C35 (mg/Kg)
144974 - DSB-2 5-10'					<50 0	<50 0
144975 - DSB-2 0-5'					<50 0	<50.0
144976 - DSB-1 0-5'					<50.0	<50 0
144977 - DSB-1 5-10'					<50.0	<50.0
144978 - SSB-1 0-2.5'	<0 0100	<0.0100	<0.0100	**0.0370**	**70.4**	**2240**
144979 - SSB-1 2.5-5'	<0 0100	<0.0100	<0.0100	**0.0494**	<50.0	**614**
144980 - SSB-8 0-2.5'	<0.0100	<0.0100	<0 0100	**0.0311**	<50 0	**102**
144981 - SSB-8 2.5-5'	<0 0100	<0.0100	<0.0100	<0.0100	<50.0	<50.0

TRACEANALYSIS, INC.

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Analytical and Quality Control Report

Michael Gates
Arcadis-Tulsa
5100 East Skelly Drive
Suite 1000
Tulsa, OK, 74135

Report Date: December 17, 2007

Work Order: 7121024

Project Location: OXY-Pronghorn State #2
Project Name: OK001547.0001
Project Number: OK001547.0001

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
144974	DSB-2 5-10'	soil	2007-12-07	10:03	2007-12-10
144975	DSB-2 0-5'	soil	2007-12-07	09:43	2007-12-10
144976	DSB-1 0-5'	soil	2007-12-07	10:30	2007-12-10
144977	DSB-1 5-10'	soil	2007-12-07	10:42	2007-12-10
144978	SSB-1 0-2.5'	soil	2007-12-07	12:12	2007-12-10
144979	SSB-1 2.5-5'	soil	2007-12-07	12:15	2007-12-10
144980	SSB-8 0-2.5'	soil	2007-12-07	11:05	2007-12-10
144981	SSB-8 2.5-5'	soil	2007-12-07	11:10	2007-12-10

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.

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 OK001547.0001 were received by TraceAnalysis, Inc. on 2007-12-10 and assigned to work order 7121024. Samples for work order 7121024 were received intact at a temperature of 4.0 deg C.

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

Test	Method
BTEX	S 8021B
TX1005 Extended	TX1005

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 7121024 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: 144974 - DSB-2 5-10'

Analysis:	TX1005 Extended	Analytical Method:	TX1005	Prep Method:	N/A
QC Batch:	43867	Date Analyzed:	2007-12-13	Analyzed By:	LD
Prep Batch:	37803	Sample Preparation:	2007-12-13	Prepared By:	LD

Parameter	Flag	Result	RL	Units	Dilution	RL
C6-C12		<50.0		mg/Kg	1	50.0
>C12-C35		<50.0		mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		144	mg/Kg	1	100	144	13 - 219

Sample: 144975 - DSB-2 0-5'

Analysis:	TX1005 Extended	Analytical Method:	TX1005	Prep Method:	N/A
QC Batch:	43867	Date Analyzed:	2007-12-13	Analyzed By:	LD
Prep Batch:	37803	Sample Preparation:	2007-12-13	Prepared By:	LD

Parameter	Flag	Result	RL	Units	Dilution	RL
C6-C12		<50.0		mg/Kg	1	50.0
>C12-C35		<50.0		mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		173	mg/Kg	1	100	173	13 - 219

Sample: 144976 - DSB-1 0-5'

Analysis:	TX1005 Extended	Analytical Method:	TX1005	Prep Method:	N/A
QC Batch:	43867	Date Analyzed:	2007-12-13	Analyzed By:	LD
Prep Batch:	37803	Sample Preparation:	2007-12-13	Prepared By:	LD

Parameter	Flag	Result	RL	Units	Dilution	RL
C6-C12		<50.0		mg/Kg	1	50.0
>C12-C35		<50.0		mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		194	mg/Kg	1	100	194	13 - 219

Sample: 144977 - DSB-1 5-10'

Analysis:	TX1005 Extended	Analytical Method:	TX1005	Prep Method:	N/A
QC Batch:	43867	Date Analyzed:	2007-12-13	Analyzed By:	LD
Prep Batch.	37803	Sample Preparation:	2007-12-13	Prepared By:	LD

Parameter	Flag	Result	RL	Units	Dilution	RL
C6-C12		<50.0		mg/Kg	1	50.0
>C12-C35		<50.0		mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		207	mg/Kg	1	100	207	13 - 219

Sample: 144978 - SSB-1 0-2.5'

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	43870	Date Analyzed:	2007-12-13	Analyzed By:	DC
Prep Batch:	37751	Sample Preparation:	2007-12-12	Prepared By:	DC

Parameter	Flag	Result	RL	Units	Dilution	RL
Benzene		<0.0100		mg/Kg	1	0.0100
Toluene		<0.0100		mg/Kg	1	0.0100
Ethylbenzene		<0.0100		mg/Kg	1	0.0100
Xylene		**0.0370**		mg/Kg	1	0.0100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.09	mg/Kg	1	1.00	109	70 - 130
4-Bromofluorobenzene (4-BFB)		0.966	mg/Kg	1	1.00	97	70 - 130

Sample: 144978 - SSB-1 0-2.5'

Analysis:	TX1005 Extended	Analytical Method:	TX1005	Prep Method.	N/A
QC Batch:	43867	Date Analyzed:	2007-12-13	Analyzed By:	LD
Prep Batch:	37803	Sample Preparation:	2007-12-13	Prepared By:	LD

Parameter	Flag	Result	RL	Units	Dilution	RL
C6-C12		**70.4**		mg/Kg	1	50.0
>C12-C35		**2240**		mg/Kg	1	50 0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	[1]	712	mg/Kg	1	100	712	13 - 219

[1]High surrogate recovery due to peak interference

Sample: 144979 - SSB-1 2.5-5'

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	43870	Date Analyzed:	2007-12-13	Analyzed By:	DC
Prep Batch:	37751	Sample Preparation:	2007-12-12	Prepared By:	DC

Parameter	Flag	Result	RL	Units	Dilution	RL
Benzene		<0.0100		mg/Kg	1	0.0100
Toluene		<0 0100		mg/Kg	1	0.0100
Ethylbenzene		<0.0100		mg/Kg	1	0.0100
Xylene		**0.0494**		mg/Kg	1	0.0100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.10	mg/Kg	1	1.00	110	70 - 130
4-Bromofluorobenzene (4-BFB)		0.967	mg/Kg	1	1.00	97	70 - 130

Sample: 144979 - SSB-1 2.5-5'

Analysis:	TX1005 Extended	Analytical Method:	TX1005	Prep Method:	N/A
QC Batch:	43867	Date Analyzed:	2007-12-13	Analyzed By:	LD
Prep Batch:	37803	Sample Preparation:	2007-12-13	Prepared By:	LD

Parameter	Flag	Result	RL	Units	Dilution	RL
C6-C12		<50.0		mg/Kg	1	50.0
>C12-C35		**614**		mg/Kg	1	50 0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	[2]	267	mg/Kg	1	100	267	13 - 219

Sample: 144980 - SSB-8 0-2.5'

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	43870	Date Analyzed:	2007-12-13	Analyzed By:	DC
Prep Batch:	37751	Sample Preparation:	2007-12-12	Prepared By:	DC

Parameter	Flag	Result	RL	Units	Dilution	RL
Benzene		<0.0100		mg/Kg	1	0.0100
Toluene		<0.0100		mg/Kg	1	0.0100
Ethylbenzene		<0.0100		mg/Kg	1	0.0100
Xylene		**0.0311**		mg/Kg	1	0.0100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.08	mg/Kg	1	1.00	108	70 - 130
4-Bromofluorobenzene (4-BFB)		0.920	mg/Kg	1	1.00	92	70 - 130

[2]High surrogate recovery due to peak interference.

Sample: 144980 - SSB-8 0-2.5'

Analysis:	TX1005 Extended	Analytical Method:	TX1005	Prep Method:	N/A
QC Batch:	43867	Date Analyzed:	2007-12-13	Analyzed By:	LD
Prep Batch:	37803	Sample Preparation:	2007-12-13	Prepared By:	LD

Parameter	Flag	Result	RL	Units	Dilution	RL
C6-C12		<50.0		mg/Kg	1	50.0
>C12-C35		**102**		mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	[3]	414	mg/Kg	1	100	414	13 - 219

Sample: 144981 - SSB-8 2.5-5'

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5035
QC Batch:	43870	Date Analyzed:	2007-12-13	Analyzed By:	DC
Prep Batch:	37751	Sample Preparation:	2007-12-12	Prepared By:	DC

Parameter	Flag	Result	RL	Units	Dilution	RL
Benzene		<0.0100		mg/Kg	1	0.0100
Toluene		<0.0100		mg/Kg	1	0.0100
Ethylbenzene		<0.0100		mg/Kg	1	0.0100
Xylene		<0.0100		mg/Kg	1	0 0100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.01	mg/Kg	1	1.00	101	70 - 130
4-Bromofluorobenzene (4-BFB)		0.916	mg/Kg	1	1.00	92	70 - 130

Sample: 144981 - SSB-8 2.5-5'

Analysis:	TX1005 Extended	Analytical Method:	TX1005	Prep Method:	N/A
QC Batch:	43867	Date Analyzed:	2007-12-13	Analyzed By:	LD
Prep Batch:	37803	Sample Preparation:	2007-12-13	Prepared By:	LD

Parameter	Flag	Result	RL	Units	Dilution	RL
C6-C12		<50.0		mg/Kg	1	50 0
>C12-C35		<50 0		mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		208	mg/Kg	1	100	208	13 - 219

[3]High surrogate recovery due to peak interference

Method Blank (1) QC Batch: 43867

QC Batch: 43867 | Date Analyzed: 2007-12-13 | Analyzed By: LD
Prep Batch: 37803 | QC Preparation: 2007-12-13 | Prepared By: LD

Parameter	Flag	MDL Result	Units	RL
C6-C12		<11.2	mg/Kg	50
>C12-C35		<21.1	mg/Kg	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		133	mg/Kg	1	100	133	34.9 - 142.3

Method Blank (1) QC Batch: 43870

QC Batch: 43870 | Date Analyzed: 2007-12-13 | Analyzed By: DC
Prep Batch: 37751 | QC Preparation: 2007-12-12 | Prepared By: DC

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.00300	mg/Kg	0.01
Toluene		<0.00300	mg/Kg	0.01
Ethylbenzene		<0.00400	mg/Kg	0.01
Xylene		<0.0140	mg/Kg	0.01

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.993	mg/Kg	1	1.00	99	70 - 130
4-Bromofluorobenzene (4-BFB)		0.845	mg/Kg	1	1.00	84	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 43867 | Date Analyzed: 2007-12-13 | Analyzed By: LD
Prep Batch: 37803 | QC Preparation: 2007-12-13 | Prepared By: LD

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
C6-C12	208	mg/Kg	1	250	<11.2	83	38.9 - 133
>C12-C35	293	mg/Kg	1	250	<21.1	117	46.8 - 131.2

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
C6-C12	185	mg/Kg	1	250	<11.2	74	38.9 - 133	12	20
>C12-C35	246	mg/Kg	1	250	<21.1	98	46.8 - 131.2	17	20

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

continued ..

control spikes continued ...

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Triacontane	113	102	mg/Kg	1	100	113	102	44.6 - 120 8

Laboratory Control Spike (LCS-1)

QC Batch: 43870 | Date Analyzed: 2007-12-13 | Analyzed By: DC
Prep Batch: 37751 | QC Preparation: 2007-12-12 | Prepared By: DC

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	0.985	mg/Kg	1	1.00	<0.00300	98	70 - 130
Toluene	0.977	mg/Kg	1	1.00	<0.00300	98	70 - 130
Ethylbenzene	0.979	mg/Kg	1	1.00	<0.00400	98	70 - 130
Xylene	2.92	mg/Kg	1	3.00	<0.0140	97	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
Benzene	0.991	mg/Kg	1	1.00	<0.00300	99	70 - 130	1	
Toluene	0.981	mg/Kg	1	1.00	<0.00300	98	70 - 130	0	
Ethylbenzene	0 985	mg/Kg	1	1.00	<0.00400	98	70 - 130	1	
Xylene	2.94	mg/Kg	1	3.00	<0.0140	98	70 - 130	1	

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)	1.05	1.04	mg/Kg	1	1.00	105	104	70 - 130
4-Bromofluorobenzene (4-BFB)	0.854	0.850	mg/Kg	1	1.00	85	85	70 - 130

Matrix Spike (MS-1) Spiked Sample. 144974

QC Batch: 43867 | Date Analyzed: 2007-12-13 | Analyzed By: LD
Prep Batch: 37803 | QC Preparation: 2007-12-13 | Prepared By: LD

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
C6-C12	68.8	mg/Kg	1	250	<11.2	28	20 2 - 182.1
>C12-C35	124	mg/Kg	1	250	<21.1	49	38.8 - 184.9

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
C6-C12	[4]	88.8	mg/Kg	1	250	<11.2	36	20.2 - 182.1	25	20

continued ...

[4]MS/MSD RPD out of RPD Limits Use LCS/LCSD to demonstrate analysis is under control.

matrix spikes continued ...

Param		MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
>C12-C35	[5]	167	mg/Kg	1	250	<21.1	67	38.8 - 184.9	30	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	90.4	97.1	mg/Kg	1	100	90	97	22.2 - 162.2

Matrix Spike (MS-1) Spiked Sample: 144978

QC Batch: 43870 | Date Analyzed: 2007-12-13 | Analyzed By: DC
Prep Batch: 37751 | QC Preparation: 2007-12-12 | Prepared By: DC

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec Limit
Benzene	1.21	mg/Kg	1	1.00	<0.00300	121	70 - 130
Toluene	1.21	mg/Kg	1	1.00	<0.00300	121	70 - 130
Ethylbenzene	1.22	mg/Kg	1	1.00	<0.00400	122	70 - 130
Xylene	3.75	mg/Kg	1	3.00	0.037	124	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
Benzene	1.11	mg/Kg	1	1.00	<0.00300	111	70 - 130	9	
Toluene	1.11	mg/Kg	1	1.00	<0.00300	111	70 - 130	9	
Ethylbenzene	1.12	mg/Kg	1	1.00	<0.00400	112	70 - 130	8	
Xylene	3.40	mg/Kg	1	3.00	0.037	112	70 - 130	10	

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)	1.10	1 11	mg/Kg	1	1	110	111	70 - 130
4-Bromofluorobenzene (4-BFB)	0.966	0.964	mg/Kg	1	1	97	96	70 - 130

Standard (CCV-1)

QC Batch: 43867 | Date Analyzed: 2007-12-13 | Analyzed By: LD

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
C6-C12		mg/Kg	250	189	76	75 - 125	2007-12-13
>C12-C35		mg/Kg	250	251	100	75 - 125	2007-12-13

Standard (CCV-2)

QC Batch: 43867 | Date Analyzed: 2007-12-13 | Analyzed By: LD

[5]MS/MSD RPD out of RPD Limits. Use LCS/LCSD to demonstrate analysis is under control.

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
C6-C12		mg/Kg	250	191	76	75 - 125	2007-12-13
>C12-C35		mg/Kg	250	260	104	75 - 125	2007-12-13

Standard (CCV-3)

QC Batch: 43867 Date Analyzed: 2007-12-13 Analyzed By: LD

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
C6-C12		mg/Kg	250	223	89	75 - 125	2007-12-13
>C12-C35		mg/Kg	250	253	101	75 - 125	2007-12-13

Standard (ICV-1)

QC Batch: 43870 Date Analyzed: 2007-12-13 Analyzed By: DC

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/Kg	0.100	0.103	103	85 - 115	2007-12-13
Toluene		mg/Kg	0.100	0.102	102	85 - 115	2007-12-13
Ethylbenzene		mg/Kg	0.100	0.102	102	85 - 115	2007-12-13
Xylene		mg/Kg	0.300	0.304	101	85 - 115	2007-12-13

Standard (CCV-1)

QC Batch: 43870 Date Analyzed: 2007-12-13 Analyzed By: DC

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/Kg	0.100	0.108	108	85 - 115	2007-12-13
Toluene		mg/Kg	0.100	0.107	107	85 - 115	2007-12-13
Ethylbenzene		mg/Kg	0 100	0.107	107	85 - 115	2007-12-13
Xylene		mg/Kg	0.300	0.320	107	85 - 115	2007-12-13

ARCADIS

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 1 of 1

Project Number/Name OK001547.0001

Project Location OXY - Pronghorn State#2

Laboratory Trace Analysis

Project Manager Mike Gates

Sampler(s)/Affiliation ARCADIS

Sample ID/Location	Matrix	Date Sampled	Time	ANALYSIS / METHOD / SIZE: (1) 4 oz jar BTEX & TPH 1005	1 4oz jar TPH 1005					Remarks	Total
DSB-2(5-10')	S	12/7/07	10:03		1					144974	1
DSB-2(0-5')	S	12/7/07	9:45		1					975	1
DSB-1(0-5')	S	12/7/07	10:30		1					976	1
DSB-1(5-10')	S	12/7/07	10:42	B 1	1					977	1
SSB-1(0-2.5')	S	12/7/07	12:12	1						978	1
SSB-1(2.5-5')	S	12/7/07	12:15	1						979	1
SSB-8(0-2.5')	S	12/7/07	11:05	1						980	1
SSB-8(2.5-5')	S	12/7/07	11:10	1						981	1
				4	8						

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

Total No. of Bottles/Containers: 8

						Seal Intact?
Relinquished by: Ryan Long	Organization: ARCADIS	Date 12/10/07	Time 1141			
Received by: [illegible]	Organization: Trace Analysis	Date 12/10/07	Time 1141			(Yes) No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____			Seal Intact?
Received by: _____	Organization: _____	Date / /	Time _____			Yes No N/A

Special Instructions/Remarks:

Send invoice & results to Michael Gates in Tulsa, OK

All tests - Midland

12/17

Delivery Method: ☐ In Person ☐ Common Carrier _____ SPECIFY ☐ Lab Courier ☐ Other _____ SPECIFY

AG 05-12/01

Texas Cooperative EXTENSION
The Texas A&M University System

Soil Analysis Report

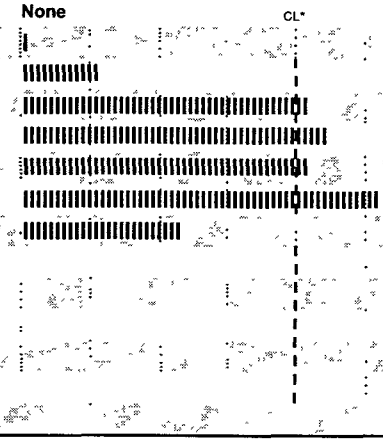
Soil, Water and Forage Testing Laboratory
Department of Soil and Crop Sciences
345 Heep Center, 2474 TAMU
College Station, TX 77843-2474
979-845-4816 (phone)
979-845-5958 (FAX)
Visit our website: http://soiltesting.tamu.edu

Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231270
Customer Sample ID: SSB1 0-1
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	7.9	(5.8)	-	Mod. Alkaline	
Conductivity	313	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	6	(50)	ppm		45 lbs P2O5/acre
Potassium	161	(125)	ppm		0 lbs K20/acre
Calcium	4,226	(180)	ppm		0 lbs Ca/acre
Magnesium	86	(50)	ppm		0 lbs Mg/acre
Sulfur	68	(13)	ppm		0 lbs S/acre
Sodium	210	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre



Detailed Salinity Test (Saturated Paste Extract)		
pH	6.9	
Conductivity	1.33 mmhos/cm	
Sodium	73 ppm	3.155 meq/L
Potassium	13 ppm	0.334 meq/L
Calcium	205 ppm	10.213 meq/L
Magnesium	9 ppm	0.706 meq/L
SAR	1.35	
SSP	21.90	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

Texas Cooperative EXTENSION
The Texas A&M University System

Soil Analysis Report

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Department of Soil and Crop Sciences
345 Heep Center, 2474 TAMU
College Station, TX 77843-2474
979-845-4816 (phone)
979-845-5958 (FAX)
Visit our website: http://soiltesting.tamu.edu

Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231271
Customer Sample ID: SSB1 1-2
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	7.8	(5.8)	-	Mod. Alkaline	
Conductivity	454	(-)	umho/cm	None	
Nitrate-N	0	(-)	ppm	CL*	35 lbs N/acre
Phosphorus	3	(50)	ppm		50 lbs P2O5/acre
Potassium	126	(125)	ppm		0 lbs K20/acre
Calcium	3,840	(180)	ppm		0 lbs Ca/acre
Magnesium	63	(50)	ppm		0 lbs Mg/acre
Sulfur	55	(13)	ppm		0 lbs S/acre
Sodium	322	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	7.1	
Conductivity	1.90 mmhos/cm	
Sodium	146 ppm	6.351 meq/L
Potassium	14 ppm	0.364 meq/L
Calcium	224 ppm	11.185 meq/L
Magnesium	9 ppm	0.699 meq/L
SAR	2.61	
SSP	34.15	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down

Methods: pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

Texas Cooperative EXTENSION
The Texas A&M University System

Soil Analysis Report

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345 Heep Center, 2474 TAMU
College Station, TX 77843-2474
979-845-4816 (phone)
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Visit our website: http://soiltesting.tamu.edu

Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231272
Customer Sample ID: SSB1 2-3
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.0	(5.8)	-	Mod. Alkaline	
Conductivity	1,720	(-)	umho/cm	High (CL*)	
Nitrate-N	2	(-)	ppm		35 lbs N/acre
Phosphorus	8	(50)	ppm		45 lbs P2O5/acre
Potassium	207	(125)	ppm		0 lbs K20/acre
Calcium	3,702	(180)	ppm		0 lbs Ca/acre
Magnesium	149	(50)	ppm		0 lbs Mg/acre
Sulfur	94	(13)	ppm		0 lbs S/acre
Sodium	1,790	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	6.9		
Conductivity	17.02	mmhos/cm	
Sodium	2039	ppm	88.720 meq/L
Potassium	49	ppm	1.248 meq/L
Calcium	1346	ppm	67.156 meq/L
Magnesium	86	ppm	7.092 meq/L
SAR	14.56		
SSP	54.03		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Texas A&M System

Soil Analysis Report

Soil, Water and Forage Testing Laboratory
Department of Soil and Crop Sciences
345 Heep Center, 2474 TAMU
College Station, TX 77843-2474
979-845-4816 (phone)
979-845-5958 (FAX)
Visit our website: http://soiltesting.tamu.edu

Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, OK 74135

Sample received on: 12/14/2007
Printed on: 2/4/2008
Area Represented: 1 acres

out of state County
Laboratory Number: 231273
Customer Sample ID: SSB1 3-4
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	7.7	(5.8)	-	Mod. Alkaline	
Conductivity	2,850	(-)	umho/cm	V. High	
Nitrate-N	4	(-)	ppm		30 lbs N/acre
Phosphorus	3	(50)	ppm		50 lbs P2O5/acre
Potassium	193	(125)	ppm		0 lbs K20/acre
Calcium	4,506	(180)	ppm		0 lbs Ca/acre
Magnesium	186	(50)	ppm		0 lbs Mg/acre
Sulfur	47	(13)	ppm		0 lbs S/acre
Sodium	2,920	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	7.6	
Conductivity	0.77 mmhos/cm	
Sodium	89 ppm	3.873 meq/L
Potassium	21 ppm	0.537 meq/L
Calcium	62 ppm	3.094 meq/L
Magnesium	7 ppm	0.575 meq/L
SAR	2.86	
SSP	47.94	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

FEB 0 6 REC'D

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Texas A&M System

Soil Analysis Report

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College Station, TX 77843-2474
979-845-4816 (phone)
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Visit our website: http://soiltesting.tamu.edu

Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, OK 74135

Sample received on: 12/14/2007
Printed on: 2/4/2008
Area Represented: 1 acres

out of state County
Laboratory Number: 231274
Customer Sample ID: SSB1 4-5
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.3	(5.8)	-	Mod. Alkaline	
Conductivity	5,270	(-)	umho/cm	V. High	
Nitrate-N	9	(-)	ppm		20 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	112	(125)	ppm		10 lbs K20/acre
Calcium	30,178	(180)	ppm		0 lbs Ca/acre
Magnesium	390	(50)	ppm		0 lbs Mg/acre
Sulfur	136	(13)	ppm		0 lbs S/acre
Sodium	6,677	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	7.2		
Conductivity	30.00	mmhos/cm	
Sodium	5689	ppm	247.563 meq/L
Potassium	128	ppm	3.274 meq/L
Calcium	1629	ppm	81.287 meq/L
Magnesium	181	ppm	14.879 meq/L
SAR	35.70		
SSP	71.34		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down

Methods. pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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The Texas A&M University System

Soil Analysis Report

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College Station, TX 77843-2474
979-845-4816 (phone)
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Visit our website: http://soiltesting.tamu.edu

Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231275
Customer Sample ID: SSB2 0-1
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.2	(5.8)	-	Mod. Alkaline	
Conductivity	407	(-)	umho/cm	None	
Nitrate-N	2	(-)	ppm		35 lbs N/acre
Phosphorus	6	(50)	ppm		45 lbs P2O5/acre
Potassium	328	(125)	ppm		0 lbs K20/acre
Calcium	4,743	(180)	ppm		0 lbs Ca/acre
Magnesium	135	(50)	ppm		0 lbs Mg/acre
Sulfur	42	(13)	ppm		0 lbs S/acre
Sodium	296	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	7.6	
Conductivity	1.33 mmhos/cm	
Sodium	132 ppm	5.759 meq/L
Potassium	13 ppm	0.338 meq/L
Calcium	108 ppm	5.372 meq/L
Magnesium	5 ppm	0.405 meq/L
SAR	3.39	
SSP	48.50	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

Texas Cooperative EXTENSION
The Texas A&M University System

Soil Analysis Report

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College Station, TX 77843-2474
979-845-4816 (phone)
979-845-5958 (FAX)
Visit our website: http://soiltesting.tamu.edu

Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231276
Customer Sample ID: SSB2 1-2
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.1	(5.8)	-	Mod. Alkaline	
Conductivity	303	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	6	(50)	ppm		45 lbs P2O5/acre
Potassium	186	(125)	ppm		0 lbs K20/acre
Calcium	3,382	(180)	ppm		0 lbs Ca/acre
Magnesium	101	(50)	ppm		0 lbs Mg/acre
Sulfur	49	(13)	ppm		0 lbs S/acre
Sodium	388	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	7.9		
Conductivity	4.76	mmhos/cm	
Sodium	447	ppm	19.431 meq/L
Potassium	49	ppm	1.250 meq/L
Calcium	1004	ppm	50.097 meq/L
Magnesium	41	ppm	3.337 meq/L
SAR	3.76		
SSP	26.22		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

Texas Cooperative EXTENSION
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Soil Analysis Report

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Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231277
Customer Sample ID: SSB2 2-3
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	7.7	(5.8)		Mod. Alkaline	
Conductivity	889	(-)	umho/cm	Slight	
Nitrate-N	3	(-)	ppm	II	30 lbs N/acre
Phosphorus	1	(50)	ppm	II	50 lbs P2O5/acre
Potassium	16	(125)	ppm	IIIIIIIIIII	100 lbs K20/acre
Calcium	591	(180)	ppm	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	0 lbs Ca/acre
Magnesium	9	(50)	ppm	IIIIIIIIII	15 lbs Mg/acre
Sulfur	4	(13)	ppm	IIIIIIIIIIIIIIIIIIII	15 lbs S/acre
Sodium	36	(-)	ppm	IIIIIII	
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	7.4		
Conductivity	3.38	mmhos/cm	
Sodium	295	ppm	12.830 meq/L
Potassium	24	ppm	0.608 meq/L
Calcium	720	ppm	35.932 meq/L
Magnesium	21	ppm	1.708 meq/L
SAR	2.96		
SSP	25.12		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

Potassium: Split apply potassium fertilizer if recommendation is for more than 75 lbs K2O per acre.

Sulfur: Available sulfur may be found deeper in soil profile, thus limiting any response to added sulfur

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

ProAnalysisVer 2 15cMar

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231278
Customer Sample ID: SSB2 3-4
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	7.7	(5.8)	-	Mod. Alkaline	
Conductivity	840	(-)	umho/cm	Slight	
Nitrate-N	8	(-)	ppm		20 lbs N/acre
Phosphorus	13	(50)	ppm		40 lbs P2O5/acre
Potassium	151	(125)	ppm		0 lbs K20/acre
Calcium	2,508	(180)	ppm		0 lbs Ca/acre
Magnesium	72	(50)	ppm		0 lbs Mg/acre
Sulfur	962	(13)	ppm		0 lbs S/acre
Sodium	452	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	7.5	
Conductivity	12.76 mmhos/cm	
Sodium	1394 ppm	60.680 meq/L
Potassium	36 ppm	0.926 meq/L
Calcium	913 ppm	45.542 meq/L
Magnesium	47 ppm	3.888 meq/L
SAR	12.21	
SSP	54.65	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down.

Methods: pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231280
Customer Sample ID: SSB2 4-5
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.0	(5.8)	-	Mod. Alkaline	
Conductivity	2,820	(-)	umho/cm	V. High	
Nitrate-N	60	(-)	ppm		0 lbs N/acre
Phosphorus	3	(50)	ppm		50 lbs P2O5/acre
Potassium	161	(125)	ppm		0 lbs K20/acre
Calcium	24,179	(180)	ppm		0 lbs Ca/acre
Magnesium	196	(50)	ppm		0 lbs Mg/acre
Sulfur	195	(13)	ppm		0 lbs S/acre
Sodium	2,269	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

CL*

Detailed Salinity Test (Saturated Paste Extract)

pH	7.6		
Conductivity	0.46	mmhos/cm	
Sodium	49	ppm	2.123 meq/L
Potassium	8	ppm	0.198 meq/L
Calcium	46	ppm	2.292 meq/L
Magnesium	3	ppm	0.251 meq/L
SAR	1.88		
SSP	43.66		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231281
Customer Sample ID: SSB3 0-1
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.6	(5.8)	-	Mod. Alkaline	
Conductivity	90	(-)	umho/cm	None	
Nitrate-N	1	(-)	ppm		35 lbs N/acre
Phosphorus	3	(50)	ppm		50 lbs P2O5/acre
Potassium	128	(125)	ppm		0 lbs K20/acre
Calcium	3,493	(180)	ppm		0 lbs Ca/acre
Magnesium	100	(50)	ppm		0 lbs Mg/acre
Sulfur	17	(13)	ppm		0 lbs S/acre
Sodium	236	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.3	
Conductivity	0.42 mmhos/cm	
Sodium	52 ppm	2.270 meq/L
Potassium	15 ppm	0.389 meq/L
Calcium	329 ppm	16.410 meq/L
Magnesium	13 ppm	1.033 meq/L
SAR	0.77	
SSP	11.29	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down.

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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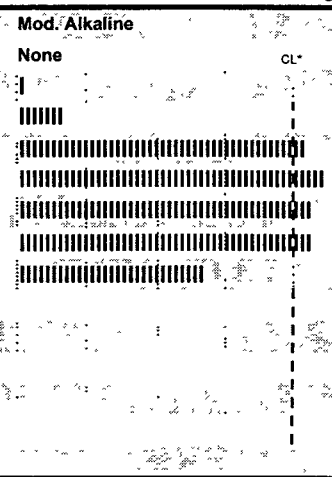
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231282
Customer Sample ID: SSB3 1-2
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.6	(5.8)	-	Mod. Alkaline	
Conductivity	125	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	3	(50)	ppm		50 lbs P2O5/acre
Potassium	162	(125)	ppm		0 lbs K20/acre
Calcium	5,725	(180)	ppm		0 lbs Ca/acre
Magnesium	118	(50)	ppm		0 lbs Mg/acre
Sulfur	20	(13)	ppm		0 lbs S/acre
Sodium	305	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre



Detailed Salinity Test (Saturated Paste Extract)			
pH	8.5		
Conductivity	0.40	mmhos/cm	
Sodium	53	ppm	2.286 meq/L
Potassium	22	ppm	0.570 meq/L
Calcium	156	ppm	7.802 meq/L
Magnesium	17	ppm	1.412 meq/L
SAR	1.06		
SSP	18.94		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
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Area Represented: 1 acres

out of state County
Laboratory Number: 231283
Customer Sample ID: SSB3 2-3
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.8	(5.8)	-	Strongly Alkaline	
Conductivity	270	(-)	umho/cm	None	
Nitrate-N	14	(-)	ppm		10 lbs N/acre
Phosphorus	2	(50)	ppm		50 lbs P2O5/acre
Potassium	121	(125)	ppm		0 lbs K20/acre
Calcium	17,196	(180)	ppm		0 lbs Ca/acre
Magnesium	142	(50)	ppm		0 lbs Mg/acre
Sulfur	65	(13)	ppm		0 lbs S/acre
Sodium	558	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.4	
Conductivity	1.22 mmhos/cm	
Sodium	160 ppm	6.974 meq/L
Potassium	7 ppm	0.178 meq/L
Calcium	48 ppm	2.399 meq/L
Magnesium	2 ppm	0.186 meq/L
SAR	6.13	
SSP	71.63	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231284
Customer Sample ID: SSB3 3-4
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.7	(5.8)	-	Strongly Alkaline	
Conductivity	768	(-)	umho/cm	Slight CL*	
Nitrate-N	46	(-)	ppm		0 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	86	(125)	ppm		35 lbs K20/acre
Calcium	29,086	(180)	ppm		0 lbs Ca/acre
Magnesium	192	(50)	ppm		0 lbs Mg/acre
Sulfur	134	(13)	ppm		0 lbs S/acre
Sodium	1,216	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	8.4	
Conductivity	3.89 mmhos/cm	
Sodium	462 ppm	20.115 meq/L
Potassium	8 ppm	0.194 meq/L
Calcium	92 ppm	4.605 meq/L
Magnesium	5 ppm	0.385 meq/L
SAR	12.74	
SSP	79.51	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231285
Customer Sample ID: SSB3 4-5
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.9	(5.8)	-	Strongly Alkaline	
Conductivity	853	(-)	umho/cm	Slight CL*	
Nitrate-N	65	(-)	ppm		0 lbs N/acre
Phosphorus	1	(50)	ppm		55 lbs P2O5/acre
Potassium	237	(125)	ppm		0 lbs K20/acre
Calcium	24,982	(180)	ppm		0 lbs Ca/acre
Magnesium	229	(50)	ppm		0 lbs Mg/acre
Sulfur	156	(13)	ppm		0 lbs S/acre
Sodium	1,884	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	8.3	
Conductivity	4.32 mmhos/cm	
Sodium	556 ppm	24.181 meq/L
Potassium	11 ppm	0.286 meq/L
Calcium	92 ppm	4.604 meq/L
Magnesium	5 ppm	0.423 meq/L
SAR	15.25	
SSP	81.99	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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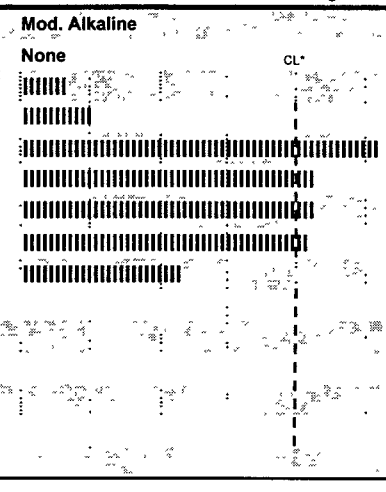
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231286
Customer Sample ID: SSB4 0-1
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.1	(5.8)	-	Mod. Alkaline	
Conductivity	165	(-)	umho/cm	None	
Nitrate-N	8	(-)	ppm		20 lbs N/acre
Phosphorus	5	(50)	ppm		50 lbs P2O5/acre
Potassium	636	(125)	ppm		0 lbs K20/acre
Calcium	3,879	(180)	ppm		0 lbs Ca/acre
Magnesium	158	(50)	ppm		0 lbs Mg/acre
Sulfur	16	(13)	ppm		0 lbs S/acre
Sodium	177	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre



Detailed Salinity Test (Saturated Paste Extract)

pH	7.8	
Conductivity	0.63 mmhos/cm	
Sodium	48 ppm	2.103 meq/L
Potassium	46 ppm	1.181 meq/L
Calcium	52 ppm	2.592 meq/L
Magnesium	3 ppm	0.286 meq/L
SAR	1.75	
SSP	34.13	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231287
Customer Sample ID: SSB4 1-2
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.5	(5.8)	-	Mod. Alkaline	
Conductivity	186	(-)	umho/cm	None	
Nitrate-N	7	(-)	ppm		25 lbs N/acre
Phosphorus	3	(50)	ppm		50 lbs P2O5/acre
Potassium	263	(125)	ppm		0 lbs K20/acre
Calcium	2,802	(180)	ppm		0 lbs Ca/acre
Magnesium	84	(50)	ppm		0 lbs Mg/acre
Sulfur	10	(13)	ppm		5 lbs S/acre
Sodium	194	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.2	
Conductivity	0.56 mmhos/cm	
Sodium	78 ppm	3.395 meq/L
Potassium	20 ppm	0.523 meq/L
Calcium	185 ppm	9.232 meq/L
Magnesium	12 ppm	1.016 meq/L
SAR	1.50	
SSP	23.96	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Sulfur: Available sulfur may be found deeper in soil profile, thus limiting any response to added sulfur

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231288
Customer Sample ID: SSB4 2-3
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	9.0	(5.8)	-	Strongly Alkaline	
Conductivity	167	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm	I	30 lbs N/acre
Phosphorus	1	(50)	ppm	II	50 lbs P2O5/acre
Potassium	59	(125)	ppm		60 lbs K20/acre
Calcium	1,778	(180)	ppm		0 lbs Ca/acre
Magnesium	31	(50)	ppm		10 lbs Mg/acre
Sulfur	3	(13)	ppm		15 lbs S/acre
Sodium	188	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.3	
Conductivity	0.66 mmhos/cm	
Sodium	102 ppm	4.428 meq/L
Potassium	207 ppm	5.304 meq/L
Calcium	189 ppm	9.445 meq/L
Magnesium	106 ppm	8.675 meq/L
SAR	1.47	
SSP	15.90	

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down

Sulfur: Available sulfur may be found deeper in soil profile, thus limiting any response to added sulfur.

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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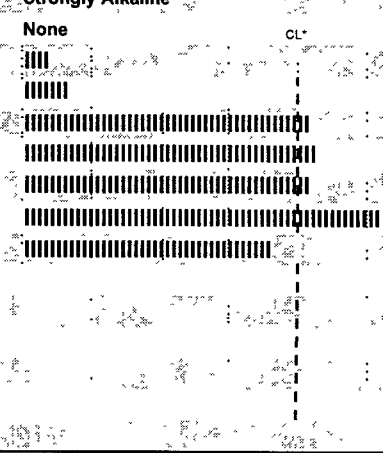
Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231289
Customer Sample ID: SSB4 3-4
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.9	(5.8)	-	Strongly Alkaline	
Conductivity	344	(-)	umho/cm	None	
Nitrate-N	5	(-)	ppm		25 lbs N/acre
Phosphorus	4	(50)	ppm		50 lbs P2O5/acre
Potassium	166	(125)	ppm		0 lbs K20/acre
Calcium	3,973	(180)	ppm		0 lbs Ca/acre
Magnesium	97	(50)	ppm		0 lbs Mg/acre
Sulfur	54	(13)	ppm		0 lbs S/acre
Sodium	881	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre



Detailed Salinity Test (Saturated Paste Extract)

pH	8.5		
Conductivity	1.47	mmhos/cm	
Sodium	228	ppm	9.913 meq/L
Potassium	19	ppm	0.483 meq/L
Calcium	72	ppm	3.585 meq/L
Magnesium	10	ppm	0.797 meq/L
SAR	6.70		
SSP	67.08		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Soil Analysis Report

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231290
Customer Sample ID: SSB4 4-5
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.5	(5.8)	-	Mod. Alkaline	
Conductivity	3,560	(-)	umho/cm	V. High	
Nitrate-N	13	(-)	ppm		10 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	42	(125)	ppm		75 lbs K20/acre
Calcium	29,459	(180)	ppm		0 lbs Ca/acre
Magnesium	259	(50)	ppm		0 lbs Mg/acre
Sulfur	126	(13)	ppm		0 lbs S/acre
Sodium	2,574	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.0	
Conductivity	19.02 mmhos/cm	
Sodium	1812 ppm	78.851 meq/L
Potassium	28 ppm	0.716 meq/L
Calcium	37 ppm	1.863 meq/L
Magnesium	125 ppm	10.310 meq/L
SAR	31.96	
SSP	85.95	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Potassium: Split apply potassium fertilizer if recommendation is for more than 75 lbs K2O per acre.

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231291
Customer Sample ID: SSB5 0-1
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	9.0	(5.8)	-	Strongly Alkaline	
Conductivity	125	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	4	(50)	ppm		50 lbs P2O5/acre
Potassium	113	(125)	ppm		10 lbs K20/acre
Calcium	2,677	(180)	ppm		0 lbs Ca/acre
Magnesium	85	(50)	ppm		0 lbs Mg/acre
Sulfur	13	(13)	ppm		0 lbs S/acre
Sodium	235	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.6	
Conductivity	0.50 mmhos/cm	
Sodium	63 ppm	2.738 meq/L
Potassium	19 ppm	0.494 meq/L
Calcium	254 ppm	12.693 meq/L
Magnesium	15 ppm	1.249 meq/L
SAR	1.04	
SSP	15.94	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down.

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231292
Customer Sample ID: SSB5 1-2
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.9	(5.8)	-	Strongly Alkaline	
Conductivity	288	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	3	(50)	ppm		50 lbs P2O5/acre
Potassium	133	(125)	ppm		0 lbs K20/acre
Calcium	3,859	(180)	ppm		0 lbs Ca/acre
Magnesium	112	(50)	ppm		0 lbs Mg/acre
Sulfur	25	(13)	ppm		0 lbs S/acre
Sodium	619	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.2	
Conductivity	1.44 mmhos/cm	
Sodium	204 ppm	8.874 meq/L
Potassium	6 ppm	0.165 meq/L
Calcium	47 ppm	2.369 meq/L
Magnesium	3 ppm	0.264 meq/L
SAR	7.73	
SSP	76.03	

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231293
Customer Sample ID: SSB5 2-3
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	9.0	(5.8)	-	Strongly Alkaline	
Conductivity	632	(-)	umho/cm	Slight CL*	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	62	(125)	ppm		60 lbs K20/acre
Calcium	28,397	(180)	ppm		0 lbs Ca/acre
Magnesium	185	(50)	ppm		0 lbs Mg/acre
Sulfur	79	(13)	ppm		0 lbs S/acre
Sodium	996	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.5	
Conductivity	3.35 mmhos/cm	
Sodium	539 ppm	23.446 meq/L
Potassium	6 ppm	0.144 meq/L
Calcium	55 ppm	2.749 meq/L
Magnesium	4 ppm	0.304 meq/L
SAR	18.97	
SSP	88.00	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231294
Customer Sample ID: SSB5 3-4
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.8	(5.8)	-	Strongly Alkaline	
Conductivity	1,350	(-)	umho/cm	Moderate CL*	
Nitrate-N	10	(-)	ppm		15 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	112	(125)	ppm		10 lbs K20/acre
Calcium	29,939	(180)	ppm		0 lbs Ca/acre
Magnesium	196	(50)	ppm		0 lbs Mg/acre
Sulfur	84	(13)	ppm		0 lbs S/acre
Sodium	1,785	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	8.2	
Conductivity	6.87 mmhos/cm	
Sodium	1369 ppm	59.574 meq/L
Potassium	13 ppm	0.320 meq/L
Calcium	138 ppm	6.910 meq/L
Magnesium	8 ppm	0.667 meq/L
SAR	30.61	
SSP	88.30	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231295
Customer Sample ID: SSB5 4-5
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.4	(5.8)	-	Mod. Alkaline	
Conductivity	2,570	(-)	umho/cm	V. High	
Nitrate-N	11	(-)	ppm		15 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	64	(125)	ppm		55 lbs K20/acre
Calcium	30,490	(180)	ppm		0 lbs Ca/acre
Magnesium	210	(50)	ppm		0 lbs Mg/acre
Sulfur	90	(13)	ppm		0 lbs S/acre
Sodium	2,231	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	7.7	
Conductivity	12.60 mmhos/cm	
Sodium	1428 ppm	62.153 meq/L
Potassium	21 ppm	0.546 meq/L
Calcium	734 ppm	36.628 meq/L
Magnesium	40 ppm	3.255 meq/L
SAR	13.92	
SSP	60.59	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231296
Customer Sample ID: SSB6 0-1
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.9	(5.8)		Strongly Alkaline	
Conductivity	135	(-)	umho/cm	None	
Nitrate-N	6	(-)	ppm		25 lbs N/acre
Phosphorus	5	(50)	ppm		50 lbs P2O5/acre
Potassium	106	(125)	ppm		15 lbs K20/acre
Calcium	3,921	(180)	ppm		0 lbs Ca/acre
Magnesium	81	(50)	ppm		0 lbs Mg/acre
Sulfur	15	(13)	ppm		0 lbs S/acre
Sodium	211	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.2	
Conductivity	0.50 mmhos/cm	
Sodium	55 ppm	2.414 meq/L
Potassium	8 ppm	0.207 meq/L
Calcium	45 ppm	2.245 meq/L
Magnesium	3 ppm	0.218 meq/L
SAR	2.18	
SSP	47.48	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231297
Customer Sample ID: SSB6 1-2
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	9.0	(5.8)		Strongly Alkaline	
Conductivity	129	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	5	(50)	ppm		50 lbs P2O5/acre
Potassium	132	(125)	ppm		0 lbs K20/acre
Calcium	3,847	(180)	ppm		0 lbs Ca/acre
Magnesium	93	(50)	ppm		0 lbs Mg/acre
Sulfur	17	(13)	ppm		0 lbs S/acre
Sodium	284	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.5	
Conductivity	0.42 mmhos/cm	
Sodium	58 ppm	2.531 meq/L
Potassium	80 ppm	2.052 meq/L
Calcium	134 ppm	6.670 meq/L
Magnesium	51 ppm	4.175 meq/L
SAR	1.09	
SSP	16.41	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231298
Customer Sample ID: SSB6 2-3
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.3	(5.8)	-	Mod. Alkaline	
Conductivity	1,000	(-)	umho/cm	Moderate	
Nitrate-N	6	(-)	ppm		25 lbs N/acre
Phosphorus	3	(50)	ppm		50 lbs P2O5/acre
Potassium	65	(125)	ppm		55 lbs K20/acre
Calcium	15,740	(180)	ppm		0 lbs Ca/acre
Magnesium	86	(50)	ppm		0 lbs Mg/acre
Sulfur	61	(13)	ppm		0 lbs S/acre
Sodium	514	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Detailed Salinity Test (Saturated Paste Extract)

pH	7.9	
Conductivity	4.21 mmhos/cm	
Sodium	493 ppm	21.458 meq/L
Potassium	11 ppm	0.278 meq/L
Calcium	157 ppm	7.835 meq/L
Magnesium	9 ppm	0.737 meq/L
SAR	10.37	
SSP	70.80	

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231299
Customer Sample ID: SSB6 3-4
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.3	(5.8)	-	Mod. Alkaline	
Conductivity	2,130	(-)	umho/cm	High	
Nitrate-N	28	(-)	ppm		0 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	76	(125)	ppm		45 lbs K20/acre
Calcium	30,148	(180)	ppm		0 lbs Ca/acre
Magnesium	211	(50)	ppm		0 lbs Mg/acre
Sulfur	200	(13)	ppm		0 lbs S/acre
Sodium	2,232	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	7.8	
Conductivity	13.32 mmhos/cm	
Sodium	1525 ppm	66.368 meq/L
Potassium	21 ppm	0.528 meq/L
Calcium	854 ppm	42.615 meq/L
Magnesium	43 ppm	3.514 meq/L
SAR	13.82	
SSP	58.72	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods: pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231300
Customer Sample ID: SSB6 4-5
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.3	(5.8)	-	Mod. Alkaline	
Conductivity	3,120	(-)	umho/cm	V. High	
Nitrate-N	11	(-)	ppm		15 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	91	(125)	ppm		30 lbs K20/acre
Calcium	29,996	(180)	ppm		0 lbs Ca/acre
Magnesium	256	(50)	ppm		0 lbs Mg/acre
Sulfur	147	(13)	ppm		0 lbs S/acre
Sodium	2,900	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

CL*

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.0	
Conductivity	14.00 mmhos/cm	
Sodium	1544 ppm	67.191 meq/L
Potassium	29 ppm	0.747 meq/L
Calcium	1027 ppm	51.252 meq/L
Magnesium	59 ppm	4.814 meq/L
SAR	12.69	
SSP	54.18	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

Texas Cooperative EXTENSION
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Soil Analysis Report

Soil, Water and Forage Testing Laboratory
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979-845-5958 (FAX)
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Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231301
Customer Sample ID: SSB7 0-1
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.4	(5.8)	-	Mod. Alkaline	
Conductivity	198	(-)	umho/cm	None	
Nitrate-N	5	(-)	ppm		25 lbs N/acre
Phosphorus	5	(50)	ppm		45 lbs P2O5/acre
Potassium	145	(125)	ppm		0 lbs K20/acre
Calcium	4,091	(180)	ppm		0 lbs Ca/acre
Magnesium	71	(50)	ppm		0 lbs Mg/acre
Sulfur	20	(13)	ppm		0 lbs S/acre
Sodium	157	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.1	
Conductivity	0.54 mmhos/cm	
Sodium	38 ppm	1.661 meq/L
Potassium	9 ppm	0.230 meq/L
Calcium	69 ppm	3.424 meq/L
Magnesium	2 ppm	0.200 meq/L
SAR	1.23	
SSP	30.11	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231302
Customer Sample ID: SSB7 1-2
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.4	(5.8)	-	Mod. Alkaline	
Conductivity	362	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	9	(50)	ppm		45 lbs P2O5/acre
Potassium	179	(125)	ppm		0 lbs K20/acre
Calcium	3,623	(180)	ppm		0 lbs Ca/acre
Magnesium	88	(50)	ppm		0 lbs Mg/acre
Sulfur	64	(13)	ppm		0 lbs S/acre
Sodium	442	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.0	
Conductivity	1.65 mmhos/cm	
Sodium	193 ppm	8.418 meq/L
Potassium	14 ppm	0.365 meq/L
Calcium	106 ppm	5.287 meq/L
Magnesium	5 ppm	0.395 meq/L
SAR	4.99	
SSP	58.19	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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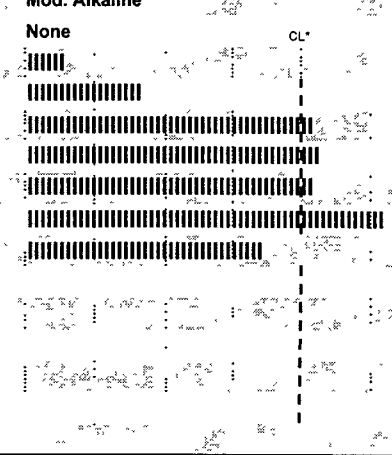
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231303
Customer Sample ID: SSB7 2-3
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.6	(5.8)	-	Mod. Alkaline	
Conductivity	425	(-)	umho/cm	None	
Nitrate-N	6	(-)	ppm		25 lbs N/acre
Phosphorus	8	(50)	ppm		45 lbs P2O5/acre
Potassium	181	(125)	ppm		0 lbs K20/acre
Calcium	1,793	(180)	ppm		0 lbs Ca/acre
Magnesium	96	(50)	ppm		0 lbs Mg/acre
Sulfur	59	(13)	ppm		0 lbs S/acre
Sodium	657	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre



Detailed Salinity Test (Saturated Paste Extract)		
pH	8.2	
Conductivity	1.70 mmhos/cm	
Sodium	265 ppm	11.532 meq/L
Potassium	16 ppm	0.406 meq/L
Calcium	74 ppm	3.696 meq/L
Magnesium	6 ppm	0.512 meq/L
SAR	7.95	
SSP	71.42	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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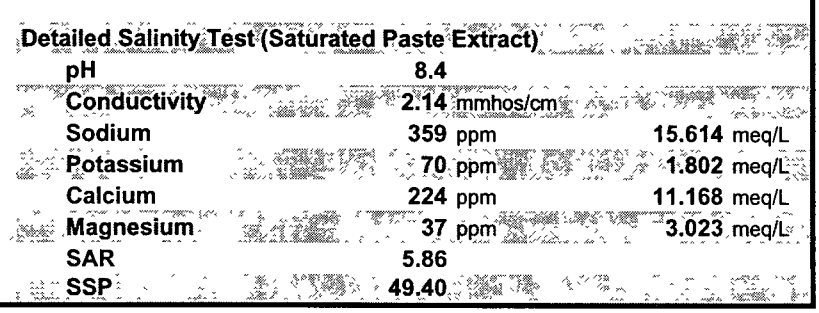
Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231304
Customer Sample ID: SSB7 3-4
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.8	(5.8)	-	Strongly Alkaline	
Conductivity	445	(-)	umho/cm	None	
Nitrate-N	6	(-)	ppm		25 lbs N/acre
Phosphorus	5	(50)	ppm		45 lbs P2O5/acre
Potassium	133	(125)	ppm		0 lbs K20/acre
Calcium	1,639	(180)	ppm		0 lbs Ca/acre
Magnesium	81	(50)	ppm		0 lbs Mg/acre
Sulfur	42	(13)	ppm		0 lbs S/acre
Sodium	719	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre



Detailed Salinity Test (Saturated Paste Extract)			
pH	8.4		
Conductivity	2.14	mmhos/cm	
Sodium	359	ppm	15.614 meq/L
Potassium	70	ppm	1.802 meq/L
Calcium	224	ppm	11.168 meq/L
Magnesium	37	ppm	3.023 meq/L
SAR	5.86		
SSP	49.40		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231305
Customer Sample ID: SSB7 4-5
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.7	(5.8)	-	Strongly Alkaline	
Conductivity	447	(-)	umho/cm	None	
Nitrate-N	7	(-)	ppm		25 lbs N/acre
Phosphorus	7	(50)	ppm		45 lbs P2O5/acre
Potassium	139	(125)	ppm		0 lbs K20/acre
Calcium	2,707	(180)	ppm		0 lbs Ca/acre
Magnesium	77	(50)	ppm		0 lbs Mg/acre
Sulfur	41	(13)	ppm		0 lbs S/acre
Sodium	622	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)				
pH	8.3			
Conductivity	1.60	mmhos/cm		
Sodium	244	ppm	10.620	meq/L
Potassium	29	ppm	0.730	meq/L
Calcium	298	ppm	14.845	meq/L
Magnesium	15	ppm	1.246	meq/L
SAR	3.74			
SSP	38.70			

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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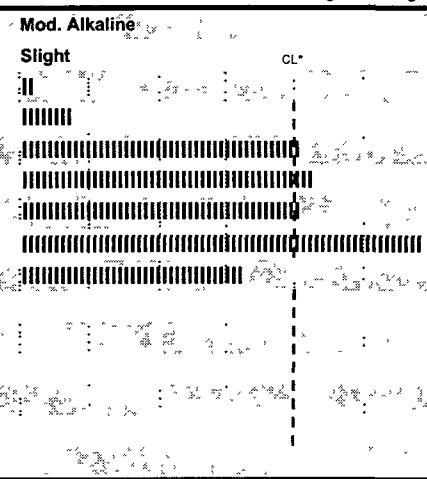
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231306
Customer Sample ID: SSB8 0-1
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.3	(5.8)	-	Mod. Alkaline	
Conductivity	574	(-)	umho/cm	Slight	
Nitrate-N	4	(-)	ppm		30 lbs N/acre
Phosphorus	4	(50)	ppm		50 lbs P2O5/acre
Potassium	127	(125)	ppm		0 lbs K20/acre
Calcium	3,300	(180)	ppm		0 lbs Ca/acre
Magnesium	72	(50)	ppm		0 lbs Mg/acre
Sulfur	136	(13)	ppm		0 lbs S/acre
Sodium	542	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre



Detailed Salinity Test (Saturated Paste Extract)		
pH	8.1	
Conductivity	2.40 mmhos/cm	
Sodium	304 ppm	13.219 meq/L
Potassium	13 ppm	0.343 meq/L
Calcium	197 ppm	9.847 meq/L
Magnesium	8 ppm	0.630 meq/L
SAR	5.78	
SSP	54.99	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231307
Customer Sample ID: SSB8 1-2
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.6	(5.8)	-	Mod. Alkaline	
Conductivity	480	(-)	umho/cm	Slight	
Nitrate-N	5	(-)	ppm		30 lbs N/acre
Phosphorus	6	(50)	ppm		45 lbs P2O5/acre
Potassium	150	(125)	ppm		0 lbs K20/acre
Calcium	3,128	(180)	ppm		0 lbs Ca/acre
Magnesium	90	(50)	ppm		0 lbs Mg/acre
Sulfur	41	(13)	ppm		0 lbs S/acre
Sodium	699	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.3	
Conductivity	2.19 mmhos/cm	
Sodium	325 ppm	14.133 meq/L
Potassium	14 ppm	0.367 meq/L
Calcium	134 ppm	6.697 meq/L
Magnesium	8 ppm	0.642 meq/L
SAR	7.38	
SSP	64.71	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231309
Customer Sample ID: SSB8 2-3
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.2	(5.8)	-	Mod. Alkaline	
Conductivity	580	(-)	umho/cm	Slight	
Nitrate-N	5	(-)	ppm		25 lbs N/acre
Phosphorus	7	(50)	ppm		45 lbs P2O5/acre
Potassium	154	(125)	ppm		0 lbs K20/acre
Calcium	1,585	(180)	ppm		0 lbs Ca/acre
Magnesium	81	(50)	ppm		0 lbs Mg/acre
Sulfur	76	(13)	ppm		0 lbs S/acre
Sodium	856	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	8.0		
Conductivity	2.78	mmhos/cm	
Sodium	457	ppm	19.906 meq/L
Potassium	23	ppm	0.589 meq/L
Calcium	202	ppm	10.057 meq/L
Magnesium	11	ppm	0.934 meq/L
SAR	8.49		
SSP	63.22		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down.

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231310
Customer Sample ID: SSB8 3-4
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.4	(5.8)	-	Mod. Alkaline	
Conductivity	1,520	(-)	umho/cm	Moderate	
Nitrate-N	28	(-)	ppm		0 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	104	(125)	ppm		20 lbs K20/acre
Calcium	29,209	(180)	ppm		0 lbs Ca/acre
Magnesium	205	(50)	ppm		0 lbs Mg/acre
Sulfur	150	(13)	ppm		0 lbs S/acre
Sodium	1,873	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.0	
Conductivity	8.18 mmhos/cm	
Sodium	953 ppm	41.475 meq/L
Potassium	17 ppm	0.431 meq/L
Calcium	226 ppm	11.294 meq/L
Magnesium	15 ppm	1.193 meq/L
SAR	16.60	
SSP	76.25	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down.

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231311
Customer Sample ID: SSB8 4-5
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.5	(5.8)	-	Mod. Alkaline	
Conductivity	1,330	(-)	umho/cm	Moderate	
Nitrate-N	29	(-)	ppm		0 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	69	(125)	ppm		50 lbs K20/acre
Calcium	30,675	(180)	ppm		0 lbs Ca/acre
Magnesium	199	(50)	ppm		0 lbs Mg/acre
Sulfur	160	(13)	ppm		0 lbs S/acre
Sodium	1,759	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	8.0	
Conductivity	10.20 mmhos/cm	
Sodium	1211 ppm	52.694 meq/L
Potassium	22 ppm	0.562 meq/L
Calcium	537 ppm	26.777 meq/L
Magnesium	22 ppm	1.829 meq/L
SAR	13.93	
SSP	64.37	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231312
Customer Sample ID: DSB1 0-1
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.5	(5.8)	-	Mod. Alkaline	
Conductivity	171	(-)	umho/cm	None	
Nitrate-N	11	(-)	ppm		15 lbs N/acre
Phosphorus	5	(50)	ppm		50 lbs P2O5/acre
Potassium	269	(125)	ppm		0 lbs K20/acre
Calcium	4,270	(180)	ppm		0 lbs Ca/acre
Magnesium	128	(50)	ppm		0 lbs Mg/acre
Sulfur	21	(13)	ppm		0 lbs S/acre
Sodium	170	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.0	
Conductivity	0.67 mmhos/cm	
Sodium	41 ppm	1.799 meq/L
Potassium	30 ppm	0.759 meq/L
Calcium	83 ppm	4.129 meq/L
Magnesium	5 ppm	0.446 meq/L
SAR	1.19	
SSP	25.22	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods: pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231313
Customer Sample ID: DSB1 1-2
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.7	(5.8)		Strongly Alkaline	
Conductivity	187	(-)	umho/cm	None	
Nitrate-N	5	(-)	ppm		30 lbs N/acre
Phosphorus	4	(50)	ppm		50 lbs P2O5/acre
Potassium	137	(125)	ppm		0 lbs K20/acre
Calcium	4,084	(180)	ppm		0 lbs Ca/acre
Magnesium	100	(50)	ppm		0 lbs Mg/acre
Sulfur	22	(13)	ppm		0 lbs S/acre
Sodium	368	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.2	
Conductivity	0.90 mmhos/cm	
Sodium	104 ppm	4.506 meq/L
Potassium	9 ppm	0.232 meq/L
Calcium	207 ppm	10.321 meq/L
Magnesium	5 ppm	0.386 meq/L
SAR	1.95	
SSP	29.18	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231314
Customer Sample ID: DSB1 2-3
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow	VLow	Low	Mod	High	VHigh	Excess	Fertilizer Recommended
pH	8.3	(5.8)	-	Mod. Alkaline							
Conductivity	603	(-)	umho/cm	Slight			CL*				
Nitrate-N	3	(-)	ppm								30 lbs N/acre
Phosphorus	1	(50)	ppm								50 lbs P2O5/acre
Potassium	98	(125)	ppm								25 lbs K20/acre
Calcium	11,977	(180)	ppm								0 lbs Ca/acre
Magnesium	108	(50)	ppm								0 lbs Mg/acre
Sulfur	297	(13)	ppm								0 lbs S/acre
Sodium	710	(-)	ppm								
Iron											
Zinc											
Manganese											
Copper											
Boron											
Limestone Requirement											0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.0	
Conductivity	3.47 mmhos/cm	
Sodium	379 ppm	16.481 meq/L
Potassium	15 ppm	0.389 meq/L
Calcium	524 ppm	26.170 meq/L
Magnesium	14 ppm	1.172 meq/L
SAR	4.46	
SSP	37.28	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Area Represented: 1 acres

out of state County
Laboratory Number: 231315
Customer Sample ID: DSB1 3-4
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.4	(5.8)	-	Mod. Alkaline	
Conductivity	3,100	(-)	umho/cm	V. High	
Nitrate-N	38	(-)	ppm		0 lbs N/acre
Phosphorus	1	(50)	ppm		55 lbs P2O5/acre
Potassium	110	(125)	ppm		10 lbs K20/acre
Calcium	30,095	(180)	ppm		0 lbs Ca/acre
Magnesium	247	(50)	ppm		0 lbs Mg/acre
Sulfur	215	(13)	ppm		0 lbs S/acre
Sodium	3,249	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	7.9	
Conductivity	17.88 mmhos/cm	
Sodium	2117 ppm	92.139 meq/L
Potassium	37 ppm	0.954 meq/L
Calcium	1136 ppm	56.682 meq/L
Magnesium	67 ppm	5.492 meq/L
SAR	16.53	
SSP	59.34	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231316
Customer Sample ID: DSB1 4-5
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.3	(5.8)	-	Mod. Alkaline	
Conductivity	3,720	(-)	umho/cm	V. High	
Nitrate-N	22	(-)	ppm		0 lbs N/acre
Phosphorus	1	(50)	ppm		55 lbs P2O5/acre
Potassium	99	(125)	ppm		20 lbs K20/acre
Calcium	30,128	(180)	ppm		0 lbs Ca/acre
Magnesium	288	(50)	ppm		0 lbs Mg/acre
Sulfur	187	(13)	ppm		0 lbs S/acre
Sodium	3,231	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

CL*

Detailed Salinity Test (Saturated Paste Extract)		
pH	7.7	
Conductivity	18.48 mmhos/cm	
Sodium	2104 ppm	91.568 meq/L
Potassium	42 ppm	1.075 meq/L
Calcium	1192 ppm	59.467 meq/L
Magnesium	78 ppm	6.379 meq/L
SAR	15.96	
SSP	57.78	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231317
Customer Sample ID: DSB1 5-6
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess
pH	8.3	(5.8)		Mod. Alkaline
Conductivity	5,100	(-)	umho/cm	V. High
Nitrate-N	16	(-)	ppm	
Phosphorus	0	(50)	ppm	
Potassium	74	(125)	ppm	
Calcium	30,793	(180)	ppm	
Magnesium	307	(50)	ppm	
Sulfur	156	(13)	ppm	
Sodium	4,210	(-)	ppm	
Iron				
Zinc				
Manganese				
Copper				
Boron				
Limestone Requirement				

CL*

Fertilizer Recommended

5	lbs N/acre
55	lbs P2O5/acre
45	lbs K20/acre
0	lbs Ca/acre
0	lbs Mg/acre
0	lbs S/acre
0.00	tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	7.8		
Conductivity	29.20	mmhos/cm	
Sodium	3507	ppm	152.602 meq/L
Potassium	57	ppm	1.459 meq/L
Calcium	23	ppm	1.125 meq/L
Magnesium	149	ppm	12.258 meq/L
SAR	58.99		
SSP	91.14		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231318
Customer Sample ID: DSB1 6-8
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.3	(5.8)	-	Mod. Alkaline	
Conductivity	4,190	(-)	umho/cm	V. High	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	1	(50)	ppm		55 lbs P2O5/acre
Potassium	79	(125)	ppm		40 lbs K20/acre
Calcium	29,743	(180)	ppm		0 lbs Ca/acre
Magnesium	283	(50)	ppm		0 lbs Mg/acre
Sulfur	133	(13)	ppm		0 lbs S/acre
Sodium	4,007	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)				
pH	7.8			
Conductivity	21.10	mmhos/cm		
Sodium	2627	ppm	114.310	meq/L
Potassium	37	ppm	0.955	meq/L
Calcium	1072	ppm	53.513	meq/L
Magnesium	84	ppm	6.870	meq/L
SAR	20.80			
SSP	65.08			

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231319
Customer Sample ID: DSB1 8-10
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.6	(5.8)		Mod. Alkaline	
Conductivity	2,120	(-)	umho/cm	High	
Nitrate-N	6	(-)	ppm		25 lbs N/acre
Phosphorus	1	(50)	ppm		55 lbs P2O5/acre
Potassium	80	(125)	ppm		40 lbs K20/acre
Calcium	25,962	(180)	ppm		0 lbs Ca/acre
Magnesium	197	(50)	ppm		0 lbs Mg/acre
Sulfur	113	(13)	ppm		0 lbs S/acre
Sodium	2,249	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	8.0		
Conductivity	12.27	mmhos/cm	
Sodium	1521	ppm	66.175 meq/L
Potassium	28	ppm	0.719 meq/L
Calcium	638	ppm	31.813 meq/L
Magnesium	37	ppm	3.059 meq/L
SAR	15.85		
SSP	65.03		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
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Area Represented: 1 acres

out of state County
Laboratory Number: 231320
Customer Sample ID: DSB1 10-12
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.6	(5.8)	-	Mod. Alkaline	
Conductivity	2,270	(-)	umho/cm	High	
Nitrate-N	3	(-)	ppm	I	30 lbs N/acre
Phosphorus	1	(50)	ppm	II	50 lbs P2O5/acre
Potassium	77	(125)	ppm		45 lbs K20/acre
Calcium	15,735	(180)	ppm		0 lbs Ca/acre
Magnesium	138	(50)	ppm		0 lbs Mg/acre
Sulfur	35	(13)	ppm		0 lbs S/acre
Sodium	2,660	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

CL*

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.3	
Conductivity	12.76 mmhos/cm	
Sodium	1426 ppm	62.062 meq/L
Potassium	32 ppm	0.831 meq/L
Calcium	404 ppm	20.184 meq/L
Magnesium	39 ppm	3.168 meq/L
SAR	18.16	
SSP	71.96	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231321
Customer Sample ID: DSB1 12-14
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.5	(5.8)	-	Mod. Alkaline	
Conductivity	3,060	(-)	umho/cm	V. High	
Nitrate-N	7	(-)	ppm		25 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	78	(125)	ppm		40 lbs K20/acre
Calcium	27,534	(180)	ppm		0 lbs Ca/acre
Magnesium	214	(50)	ppm		0 lbs Mg/acre
Sulfur	91	(13)	ppm		0 lbs S/acre
Sodium	2,981	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	8.0	
Conductivity	15.14 mmhos/cm	
Sodium	1844 ppm	80.241 meq/L
Potassium	33 ppm	0.846 meq/L
Calcium	759 ppm	37.896 meq/L
Magnesium	47 ppm	3.873 meq/L
SAR	17.56	
SSP	65.31	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231322
Customer Sample ID: DSB1 14-16
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess
pH	8.6	(5.8)	-	Mod. Alkaline
Conductivity	3,010	(-)	umho/cm	V. High
Nitrate-N	3	(-)	ppm	II
Phosphorus	1	(50)	ppm	II
Potassium	74	(125)	ppm	
Calcium	7,475	(180)	ppm	
Magnesium	115	(50)	ppm	
Sulfur	25	(13)	ppm	
Sodium	2,812	(-)	ppm	
Iron				
Zinc				
Manganese				
Copper				
Boron				
Limestone Requirement				

CL*

Fertilizer Recommended

30	lbs N/acre
50	lbs P2O5/acre
45	lbs K20/acre
0	lbs Ca/acre
0	lbs Mg/acre
0	lbs S/acre
0.00	tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	8.1	
Conductivity	12.50 mmhos/cm	
Sodium	1567 ppm	68.171 meq/L
Potassium	25 ppm	0.632 meq/L
Calcium	375 ppm	18.718 meq/L
Magnesium	34 ppm	2.805 meq/L
SAR	20.78	
SSP	75.47	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
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Area Represented: 1 acres

out of state County
Laboratory Number: 231323
Customer Sample ID: DSB1 16-18
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.6	(5.8)	-	Mod. Alkaline	
Conductivity	2,400	(-)	umho/cm	V. High	
Nitrate-N	5	(-)	ppm		30 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	89	(125)	ppm		30 lbs K20/acre
Calcium	18,600	(180)	ppm		0 lbs Ca/acre
Magnesium	187	(50)	ppm		0 lbs Mg/acre
Sulfur	84	(13)	ppm		0 lbs S/acre
Sodium	2,927	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.0	
Conductivity	13.71 mmhos/cm	
Sodium	1853 ppm	80.649 meq/L
Potassium	30 ppm	0.765 meq/L
Calcium	676 ppm	33.725 meq/L
Magnesium	39 ppm	3.216 meq/L
SAR	18.77	
SSP	68.14	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

Texas Cooperative EXTENSION
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Soil Analysis Report

Soil, Water and Forage Testing Laboratory
Department of Soil and Crop Sciences
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College Station, TX 77843-2474
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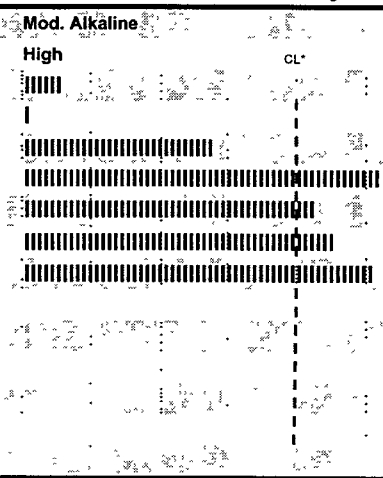
Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231324
Customer Sample ID: DSB1 18-20
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.3	(5.8)	-	Mod. Alkaline	
Conductivity	2,160	(-)	umho/cm	High	
Nitrate-N	6	(-)	ppm		25 lbs N/acre
Phosphorus	1	(50)	ppm		55 lbs P2O5/acre
Potassium	67	(125)	ppm		55 lbs K20/acre
Calcium	7,829	(180)	ppm		0 lbs Ca/acre
Magnesium	150	(50)	ppm		0 lbs Mg/acre
Sulfur	26	(13)	ppm		0 lbs S/acre
Sodium	2,732	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre



Detailed Salinity Test (Saturated Paste Extract)		
pH	7.9	
Conductivity	13.97 mmhos/cm	
Sodium	1655 ppm	72.003 meq/L
Potassium	24 ppm	0.615 meq/L
Calcium	848 ppm	42.309 meq/L
Magnesium	61 ppm	5.015 meq/L
SAR	14.80	
SSP	60.03	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Conductivity: Salinity levels are becoming elevated, monitor levels or remove salts with 10-15 inches of clean leach water.
Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down.

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231325
Customer Sample ID: DSB2 0-1
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	8.2	(5.8)		Mod. Alkaline	
Conductivity	139	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	3	(50)	ppm		50 lbs P2O5/acre
Potassium	192	(125)	ppm		0 lbs K20/acre
Calcium	1,691	(180)	ppm		0 lbs Ca/acre
Magnesium	145	(50)	ppm		0 lbs Mg/acre
Sulfur	8	(13)	ppm		5 lbs S/acre
Sodium	137	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	7.9	
Conductivity	0.32 mmhos/cm	
Sodium	23 ppm	1.005 meq/L
Potassium	8 ppm	0.216 meq/L
Calcium	54 ppm	2.712 meq/L
Magnesium	3 ppm	0.277 meq/L
SAR	0.82	
SSP	23.88	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

Sulfur: Available sulfur may be found deeper in soil profile, thus limiting any response to added sulfur

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231326
Customer Sample ID: DSB2 1-2
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.2	(5.8)	-	Mod. Alkaline	
Conductivity	190	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm	I	30 lbs N/acre
Phosphorus	2	(50)	ppm	III	50 lbs P2O5/acre
Potassium	202	(125)	ppm		0 lbs K20/acre
Calcium	6,187	(180)	ppm		0 lbs Ca/acre
Magnesium	337	(50)	ppm		0 lbs Mg/acre
Sulfur	17	(13)	ppm		0 lbs S/acre
Sodium	133	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.0	
Conductivity	0.34 mmhos/cm	
Sodium	21 ppm	0.932 meq/L
Potassium	5 ppm	0.116 meq/L
Calcium	67 ppm	3.366 meq/L
Magnesium	5 ppm	0.386 meq/L
SAR	0.68	
SSP	19.42	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231327
Customer Sample ID: DSB2 2-3
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.5	(5.8)	-	Mod. Alkaline	
Conductivity	79	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	1	(50)	ppm		55 lbs P2O5/acre
Potassium	40	(125)	ppm		80 lbs K20/acre
Calcium	30,135	(180)	ppm		0 lbs Ca/acre
Magnesium	197	(50)	ppm		0 lbs Mg/acre
Sulfur	48	(13)	ppm		0 lbs S/acre
Sodium	200	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)			
pH	8.3		
Conductivity	0.25	mmhos/cm	
Sodium	24	ppm	1.058 meq/L
Potassium	3	ppm	0.073 meq/L
Calcium	34	ppm	1.699 meq/L
Magnesium	2	ppm	0.144 meq/L
SAR	1.10		
SSP	35.57		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

Potassium: Split apply potassium fertilizer if recommendation is for more than 75 lbs K2O per acre

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231328
Customer Sample ID: DSB2 3-4
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.7	(5.8)		Mod. Alkaline	
Conductivity	74	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	25	(125)	ppm		95 lbs K20/acre
Calcium	29,882	(180)	ppm		0 lbs Ca/acre
Magnesium	192	(50)	ppm		0 lbs Mg/acre
Sulfur	55	(13)	ppm		0 lbs S/acre
Sodium	209	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.4	
Conductivity	0.26 mmhos/cm	
Sodium	19 ppm	0.837 meq/L
Potassium	4 ppm	0.090 meq/L
Calcium	50 ppm	2.495 meq/L
Magnesium	2 ppm	0.182 meq/L
SAR	0.72	
SSP	23.23	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Potassium: Split apply potassium fertilizer if recommendation is for more than 75 lbs K2O per acre

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231329
Customer Sample ID: DSB2 4-5
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.8	(5.8)		Strongly Alkaline	
Conductivity	70	(-)	umho/cm	None	
Nitrate-N	4	(-)	ppm		30 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	37	(125)	ppm		80 lbs K20/acre
Calcium	31,149	(180)	ppm		0 lbs Ca/acre
Magnesium	240	(50)	ppm		0 lbs Mg/acre
Sulfur	58	(13)	ppm		0 lbs S/acre
Sodium	170	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.3	
Conductivity	0.33 mmhos/cm	
Sodium	34 ppm	1.483 meq/L
Potassium	3 ppm	0.078 meq/L
Calcium	37 ppm	1.832 meq/L
Magnesium	2 ppm	0.166 meq/L
SAR	1.48	
SSP	41.67	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down

Potassium: Split apply potassium fertilizer if recommendation is for more than 75 lbs K2O per acre

Methods: pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231330
Customer Sample ID: DSB2 5-6
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.9	(5.8)	-	Strongly Alkaline	
Conductivity	79	(-)	umho/cm	None	
Nitrate-N	2	(-)	ppm		35 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	49	(125)	ppm		70 lbs K20/acre
Calcium	30,424	(180)	ppm		0 lbs Ca/acre
Magnesium	349	(50)	ppm		0 lbs Mg/acre
Sulfur	63	(13)	ppm		0 lbs S/acre
Sodium	194	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	8.6	
Conductivity	0.28 mmhos/cm	
Sodium	25 ppm	1.086 meq/L
Potassium	3 ppm	0.066 meq/L
Calcium	31 ppm	1.569 meq/L
Magnesium	3 ppm	0.233 meq/L
SAR	1.14	
SSP	36.77	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down.

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231331
Customer Sample ID: DSB2 6-8
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.8	(5.8)	-	Strongly Alkaline	
Conductivity	99	(-)	umho/cm	None	
Nitrate-N	2	(-)	ppm		35 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	60	(125)	ppm		60 lbs K20/acre
Calcium	13,123	(180)	ppm		0 lbs Ca/acre
Magnesium	256	(50)	ppm		0 lbs Mg/acre
Sulfur	20	(13)	ppm		0 lbs S/acre
Sodium	149	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	8.6	
Conductivity	0.22 mmhos/cm	
Sodium	25 ppm	1.100 meq/L
Potassium	3 ppm	0.064 meq/L
Calcium	17 ppm	0.833 meq/L
Magnesium	2 ppm	0.152 meq/L
SAR	1.57	
SSP	51.19	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen *Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down*

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231332
Customer Sample ID: DSB2 8-10
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.8	(5.8)	-	Strongly Alkaline	
Conductivity	161	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm		35 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	102	(125)	ppm		20 lbs K20/acre
Calcium	17,742	(180)	ppm		0 lbs Ca/acre
Magnesium	383	(50)	ppm		0 lbs Mg/acre
Sulfur	44	(13)	ppm		0 lbs S/acre
Sodium	281	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.5	
Conductivity	0.34 mmhos/cm	
Sodium	42 ppm	1.845 meq/L
Potassium	3 ppm	0.066 meq/L
Calcium	14 ppm	0.720 meq/L
Magnesium	2 ppm	0.131 meq/L
SAR	2.83	
SSP	66.79	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods. pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231333
Customer Sample ID: DSB2 10-12
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess	Fertilizer Recommended
pH	9.1	(5.8)	-	Strongly Alkaline	
Conductivity	74	(-)	umho/cm	None	
Nitrate-N	2	(-)	ppm		35 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	48	(125)	ppm		70 lbs K20/acre
Calcium	18,473	(180)	ppm		0 lbs Ca/acre
Magnesium	178	(50)	ppm		0 lbs Mg/acre
Sulfur	23	(13)	ppm		0 lbs S/acre
Sodium	179	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.6	
Conductivity	0.30 mmhos/cm	
Sodium	37 ppm	1.629 meq/L
Potassium	3 ppm	0.075 meq/L
Calcium	8 ppm	0.421 meq/L
Magnesium	1 ppm	0.078 meq/L
SAR	3.26	
SSP	73.92	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Potassium: Split apply potassium fertilizer if recommendation is for more than 75 lbs K2O per acre.

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

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Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231334
Customer Sample ID: DSB2 12-14
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.1	(5.8)	-	Mod. Alkaline	
Conductivity	89	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	2	(50)	ppm		50 lbs P2O5/acre
Potassium	45	(125)	ppm		75 lbs K20/acre
Calcium	6,542	(180)	ppm		0 lbs Ca/acre
Magnesium	118	(50)	ppm		0 lbs Mg/acre
Sulfur	12	(13)	ppm		5 lbs S/acre
Sodium	187	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.5	
Conductivity	0.38 mmhos/cm	
Sodium	45 ppm	1.949 meq/L
Potassium	3 ppm	0.081 meq/L
Calcium	17 ppm	0.863 meq/L
Magnesium	1 ppm	0.100 meq/L
SAR	2.81	
SSP	65.12	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

Potassium: Split apply potassium fertilizer if recommendation is for more than 75 lbs K2O per acre

Sulfur: Available sulfur may be found deeper in soil profile, thus limiting any response to added sulfur.

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

Texas Cooperative EXTENSION
The Texas A&M University System

Soil Analysis Report

Soil, Water and Forage Testing Laboratory
Department of Soil and Crop Sciences
345 Heep Center, 2474 TAMU
College Station, TX 77843-2474
979-845-4816 (phone)
979-845-5958 (FAX)
Visit our website: http://soiltesting.tamu.edu

Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231335
Customer Sample ID: DSB2 14-16
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow / VLow / Low / Mod / High / VHigh / Excess	Fertilizer Recommended
pH	8.8	(5.8)	-	Strongly Alkaline	
Conductivity	167	(-)	umho/cm	None	
Nitrate-N	3	(-)	ppm	I	30 lbs N/acre
Phosphorus	2	(50)	ppm	III	50 lbs P2O5/acre
Potassium	32	(125)	ppm	IIIIIIIIIIIIII	85 lbs K20/acre
Calcium	12,527	(180)	ppm	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	0 lbs Ca/acre
Magnesium	94	(50)	ppm	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	0 lbs Mg/acre
Sulfur	32	(13)	ppm	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	0 lbs S/acre
Sodium	205	(-)	ppm	IIIIIIIIIIIIIIIIIIIIIII	
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	8.3		
Conductivity	0.80	mmhos/cm	
Sodium	86	ppm	3.754 meq/L
Potassium	4	ppm	0.100 meq/L
Calcium	47	ppm	2.326 meq/L
Magnesium	3	ppm	0.283 meq/L
SAR	3.29		
SSP	58.08		

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down.

Potassium: Split apply potassium fertilizer if recommendation is for more than 75 lbs K2O per acre.

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

ProAnalysisVer 2 15cMar

Texas Cooperative EXTENSION
The Texas A&M University System

Soil Analysis Report

Soil, Water and Forage Testing Laboratory
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979-845-4816 (phone)
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Visit our website: http://soiltesting.tamu.edu

Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231336
Customer Sample ID: DSB2 16-18
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	9.0	(5.8)	-	Strongly Alkaline	
Conductivity	112	(-)	umho/cm	None CL*	
Nitrate-N	3	(-)	ppm		30 lbs N/acre
Phosphorus	0	(50)	ppm		55 lbs P2O5/acre
Potassium	63	(125)	ppm		55 lbs K20/acre
Calcium	11,357	(180)	ppm		0 lbs Ca/acre
Magnesium	162	(50)	ppm		0 lbs Mg/acre
Sulfur	27	(13)	ppm		0 lbs S/acre
Sodium	186	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)

pH	8.4	
Conductivity	0.44 mmhos/cm	
Sodium	49 ppm	2.130 meq/L
Potassium	4 ppm	0.111 meq/L
Calcium	27 ppm	1.324 meq/L
Magnesium	2 ppm	0.160 meq/L
SAR	2.47	
SSP	57.19	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down..

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

Texas Cooperative EXTENSION
The Texas A&M University System

Soil Analysis Report

Soil, Water and Forage Testing Laboratory
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979-845-4816 (phone)
979-845-5958 (FAX)
Visit our website: http://soiltesting.tamu.edu

Report generated for:
ARCADIS - Mike Gates
5100 East Skelly Dr. Suite 1000 .
Tulsa, TX 74135

Sample received on: 12/14/2007
Printed on: 12/20/2007
Area Represented: 1 acres

out of state County
Laboratory Number: 231338
Customer Sample ID: DSB2 18-20
Crop Grown: BLUESTEM (GRAZING OR HAY)

Analysis	Results	CL*	Units	ExLow VLow Low Mod High VHigh Excess.	Fertilizer Recommended
pH	8.9	(5.8)	-	Strongly Alkaline	
Conductivity	129	(-)	umho/cm	None	
Nitrate-N	1	(-)	ppm		35 lbs N/acre
Phosphorus	1	(50)	ppm		50 lbs P2O5/acre
Potassium	34	(125)	ppm		85 lbs K20/acre
Calcium	5,646	(180)	ppm		0 lbs Ca/acre
Magnesium	68	(50)	ppm		0 lbs Mg/acre
Sulfur	17	(13)	ppm		0 lbs S/acre
Sodium	180	(-)	ppm		
Iron					
Zinc					
Manganese					
Copper					
Boron					
Limestone Requirement					0.00 tons 100ECCE/acre

Detailed Salinity Test (Saturated Paste Extract)		
pH	8.4	
Conductivity	0.74 mmhos/cm	
Sodium	71 ppm	3.085 meq/L
Potassium	6 ppm	0.147 meq/L
Calcium	48 ppm	2.401 meq/L
Magnesium	3 ppm	0.276 meq/L
SAR	2.67	
SSP	52.20	

*CL=Critical level is the point which no additional nutrient (excluding nitrate-N, sodium and conductivity) is recommended.

Nitrogen Apply an additional 30 lbs/A of nitrogen prior to each four to six week graze down .

Potassium: Split apply potassium fertilizer if recommendation is for more than 75 lbs K2O per acre.

Methods pH and conductivity/ 2 1, nitrate-N/Cd-red , P, K, Ca, Mg, Na, and S/Mehlich 3 by ICP, Fe, Zn, Mn, and Cu/DTPA by ICP, and B/hot water by ICP

Detailed Salinity Weights For Loyd Deuel
Reported: 12/20/2007

Lab #	Sample ID	Detailed Sal Soil Wt (g)	Detailed Sal H2O Vol (ml)	Sal moisture %
231270	SSB1 0-1	70.85	30	42.34
231271	SSB1 1-2	71.55	30	41.93
231272	SSB1 2-3	70.27	30	42.69
231273	SSB1 3-4	70.85	30	42.34
231274	SSB1 4-5	70.81	45	63.55
231275	SSB2 0-1	70.03	30	42.84
231276	SSB2 1-2	70.18	30	42.75
231277	SSB2 2-3	70.37	30	42.63
231278	SSB2 3-4	70.35	30	42.64
231280	SSB2 4-5	70.43	30	42.60
231281	SSB3 0-1	70.75	30	42.40
231282	SSB3 1-2	70.63	30	42.47
231283	SSB3 2-3	70.74	30	42.41
231284	SSB3 3-4	70.21	30	42.73
231285	SSB3 4-5	70.16	30	42.76
231286	SSB4 0-1	70.17	30	42.75
231287	SSB4 1-2	70.35	30	42.64
231288	SSB4 2-3	70.48	30	42.57
231289	SSB4 3-4	70.64	30	42.47
231290	SSB4 4-5	70 20	30	42.74
231291	SSB5 0-1	70.14	30	42.77
231292	SSB5 1-2	70.81	30	42.37
231293	SSB5 2-3	70.82	30	42.36
231294	SSB5 3-4	70.21	30	42.73
231295	SSB5 4-5	70.07	30	42.81
231296	SSB6 0-1	70.38	30	42.63
231297	SSB6 1-2	70.31	30	42.67
231298	SSB6 2-3	70.17	30	42.75
231299	SSB6 3-4	70.07	30	42.81
231300	SSB6 4-5	70.47	45	63 86
231301	SSB7 0-1	70.35	30	42.64
231302	SSB7 1-2	70.17	30	42.75
231303	SSB7 2-3	70.80	30	42.37
231304	SSB7 3-4	70.74	30	42.41
231305	SSB7 4-5	70.74	30	42.41
231306	SSB8 0-1	70.21	30	42.73
231307	SSB8 1-2	70.06	30	42 82
231309	SSB8 2-3	70 31	30	42.67
231310	SSB8 3-4	70 19	30	42.74
231311	SSB8 4-5	70.42	30	42.60
231312	DSB1 0-1	70.73	30	42.41
231313	DSB1 1-2	70.33	30	42.66
231314	DSB1 2-3	70.14	30	42.77
231315	DSB1 3-4	70.02	30	42.84
231316	DSB1 4-5	70.05	30	42.83
231317	DSB1 5-6	70.16	30	42.76
231318	DSB1 6-8	70.64	30	42.47

Detailed Salinity Weights For Loyd Deuel
Reported: 12/20/2007

Lab #	Sample ID	Detailed Sal Soil Wt (g)	Detailed Sal H2O Vol (ml)	Sal moisture %
231319	DSB1 8-10	70.04	30	42.83
231320	DSB1 10-12	70.26	30	42.70
231321	DSB1 12-14	70.13	30	42.78
231322	DSB1 14-16	70.50	30	42.55
231323	DSB1 16-18	70.47	30	42.57
231324	DSB1 18-20	70.06	30	42.82
231325	DSB2 0-1	70.53	30	42.54
231326	DSB2 1-2	70.25	45	64.06
231327	DSB2 2-3	70.37	45	63.95
231328	DSB2 3-4	70.13	45	64.17
231329	DSB2 4-5	70.20	30	42.74
231330	DSB2 5-6	70.64	45	63.70
231331	DSB2 6-8	70.87	45	63.50
231332	DSB2 8-10	70.98	45	63.40
231333	DSB2 10-12	70.29	30	42.68
231334	DSB2 12-14	70.64	30	42.47
231335	DSB2 14-16	70.53	30	42.54
231336	DSB2 16-18	70.26	30	42.70
231338	DSB2 18-20	70.63	30	42.47

ARCADIS

Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 2 of ____

Project Number/Name OK001547.0001

Project Location Oxy et al Pronghorn State #2

Laboratory _____

Project Manager Mike Gates

Sampler(s)/Affiliation Arcadis

Sample ID/Location	Matrix	Date/~~Time~~ Sampled	Time ~~Lab ID~~	ANALYSIS / METHOD / SIZE	Remarks	Total
DSB-2(0-1')	S	12/7/07	9:47			1
DSB-2(2-3')			9:50			1
DSB-2(3-4')			9:51			1
DSB-2(4-5')			9:52			1
DSB-2(5-6')			9:54			1
DSB-2(6-8')			10:00			1
DSB-2(8-10')			10:04			1
DSB-2(10-12')			10:05			1
DSB-2(12-14')			10:09			1
DSB-2(14-16')			10:10			1
DSB-2(16-18')			10:13			1
DSB-2(18-20')			10:14			1
SSB-6(0-1')			11:14			1
SSB-6(1-2')			11:19			1
SSB-6(2-3')			11:20			1

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

Total No. of Bottles/ Containers: 15

					Seal Intact?
Relinquished by: Ralph Lang	Organization: Arcadis	Date 12/10/07	Time 17:00		
Received by: Ronald Wood V	Organization: SAS E	Date 12/13/07	Time 18:00		Yes No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____		Seal Intact?
Received by: Monika Morales	Organization: Soil testing Lab	Date 12/13/07	Time 18:00		Yes No N/A

Special Instructions/Remarks:

Send Bill and Report to Mike Gates

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

AG 05-12/01

ARCADIS GERAGHTY & MILLER Laboratory Task Order No./P.O. No. _____ **CHAIN-OF-CUSTODY RECORD** Page 2 of ____

Project Number/Name 04001547.0001

Project Location Oxy et al Pronghorn State #2

Laboratory _____

Project Manager Mike Gates

Sampler(s)/Affiliation Arcadis

Sample ID/Location	Matrix	Date/~~Time~~ Sampled	Time ~~Lab ID~~	ANALYSIS / METHOD / SIZE	Remarks	Total
SSB-2 (0-1')	S	12/7/07	12:24			1
SSB-2 (1-2')			12:25			1
SSB-2 (2-3')			12:25			1
SSB-2 (3-4')			12:26			1
SSB-2 (4-5')			12:26			1
SSB-5 (0-1')			11:42			1
SSB-5 (1-2')			11:42			1
SSB-5 (2-3')			11:42			1
SSB-5 (3-4')			11:43			1
SSB-5 (4-5')			11:43			~~10~~ 9
						10

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

Total No of Bottles/ Containers

Relinquished by: Ralph Lang	Organization: Arcadis	Date 12/10/07	Time 17:00	Seal Intact?	
Received by: ~~Ken Reed~~	Organization: ESE	Date 12/13/07	Time 15:00	Yes No N/A	
Relinquished by: _____	Organization: _____	Date / /	Time _____	Seal Intact?	
Received by: Monika Morales	Organization: Soil Testing Lab	Date 12/13/07	Time 18:00	Yes No N/A	

Special Instructions/Remarks. _____

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

AG 05-0597

ARCADIS

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

CHAIN-OF-CUSTODY RECORD

Page 3 of _____

Project Number/Name OK 001347.0001

Project Location Oxy et al Pronghorn State #2

Laboratory _____

Project Manager Mike Gates

Sampler(s)/Affiliation Arcadis

Sample ID/Location	Matrix	Date/~~Time~~ Sampled	Time ~~Lab ID~~	ANALYSIS / METHOD / SIZE	Remarks	Total
SSB-6 (3-4')	S	12/7/07	11:21			1
SSB-6 (4-5')			11:22			1
SSB-7 (0-1')			11:30			1
SSB-7 (1-2')			11:31			1
SSB-7 (2-3')			11:33			1
SSB-7 (3-4')			11:34			1
SSB-7 (4-5')			11:34			1
SSB-8 (0-1')			11:02			1
SSB-8 (1-2')			11:05			1
SSB-8 (2-3')			11:07			1
SSB-8 (3-4')			11:08			1
SSB-8 (4-5')			11:09			1

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

Total No. of Bottles/ Containers 12

						Seal Intact?
Relinquished by: Ralph Lang	Organization: Arcadis	Date 12/10/07	Time 17:00			
Received by: [signature]	Organization: [illegible]	Date 12/13/07	Time 8:00			Yes No N/A
Relinquished by: _____	Organization: _____	Date / /	Time _____			Seal Intact?
Received by: Monika Morales	Organization: Cal Testing Labs	Date 12/13/07	Time 15:00			Yes No N/A

Special Instructions/Remarks:

Send Bill & Report to Mike Gates

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

AG 05-12/01

ARCADIS

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

CHAIN-OF-CUSTODY RECORD

Page 1 of ____

Project Number/Name: OK 001547.0001

Project Location: Oxy et al Pronghorn State #2

Laboratory: ______

Project Manager: Mike Gates

Sampler(s)/Affiliation: Arcadis

ANALYSIS / METHOD / SIZE

Sample ID/Location	Matrix	Date/~~Time~~ ~~Sampled~~	Time ~~Lab ID~~							Remarks	Total
DSB-1 (0-1)	S	12/7/07	10:28								1
DSB-1 (1-2')	↓	↓	10:30								1
DSB-1 (2-3')			10:31								1
DSB-1 (3-4')			10:33								1
DSB-1 (4-5')			10:39								1
DSB-1 (5-6)			10:40								1
DSB-1 (6-8')			10:41								1
DSB-1 (8-10')			10:46								1
DSB-1 (10-12')			10:47								1
DSB-1 (12-14')			10:49								1
DSB-1 (14-16')			10:50								1
DSB-1 (16-18')			10:52								1
DSB-1 (18-20')			10:53								1
DSB-2 (1-2')			9:48								1
DSB-2 (2-3')			9:50								1

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

Total No. of Bottles/Containers: 15

Relinquished by: Ralph Lang	Organization: Arcadis	Date 12/10/07	Time 17:08	Seal Intact?
Received by: Roger Dewell	Organization: SAST	Date 12/13/07	Time 18:00	Yes No N/A
Relinquished by:	Organization:	Date / /	Time	Seal Intact?
Received by: Monika Morales	Organization: soil testing Lab	Date 12/13/07	Time 18:00	Yes No N/A

Special Instructions/Remarks: Send Bill and Report to Mike Gates

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

AG 05-12/01

ARCADIS

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

CHAIN-OF-CUSTODY RECORD

Page 1 of _____

Project Number/Name OK 001547.0001

Project Location Oxy et al Pronghorn State #2

Laboratory _____

Project Manager Mike Gates

Sampler(s)/Affiliation Arcadis

Sample ID/Location	Matrix	Date/~~Time~~ ~~Sampled~~	Time ~~Lab ID~~	ANALYSIS / METHOD / SIZE	Remarks	Total
SSB-3 (0-1')	S	12/7/07	12:02			1
SSB-3 (1-2')			12:03			1
SSB-3 (2-3')			12:03			1
SSB-3 (3-4')			12:04			1
SSB-3 (4-5')			12:04			1
SSB-1 (0-1')			12:16			1
SSB-1 (1-2')			12:16			1
SSB-1 (2-3')			12:17			1
SSB-1 (3-4')			12:17			1
SSB-1 (4-5')			12:18			1
SSB-4 (0-1')			11:50			1
SSB-4 (1-2')			11:52			1
SSB-4 (2-3')			11:51			1
SSB-4 (3-4')			11:51			1
SSB-4 (4-5')	V	V	11:52			1

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

Total No. of Bottles/ Containers: 15

					Seal Intact?
Relinquished by: Ralph Lang	Organization: Arcadis	Date 12/10/07	Time 17:00		
Received by: Lloyd Kuel	Organization: SAS II	Date 12/13/07	Time 18:00		Yes No N/A
Relinquished by: ~~Ralph Lang~~ RL	Organization: Arcadis RL	Date / /	Time		Seal Intact?
Received by: Monika Morales	Organization: Soil Testing Lab	Date 12/13/	Time 1800		Yes No N/A

Special Instructions/Remarks:

Send Bill & Report to Mike Gates

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

AG 05-12/01

Bratcher, Mike, EMNRD

From: Bratcher, Mike, EMNRD
Sent: Tuesday, July 01, 2008 11:00 AM
To: 'Gates, Mike'
Cc: Andrew Cloutier; JRC@modrall.com; pth@modrall.com; KPurcell@rodey.com
Subject: RE: Earthen Pit Investigation; Pronghorn State No. 2, Eddy County, NM

Reference: Pronghorn State 002 2-21s-28e Eddy County New Mexico API: 30-015-29931

Mr. Gates,

The recommendations for closure of the Pronghorn State 2 pit are approved as presented. Please notify New Mexico Oil Conservation Division (NMOCD) District 2 Office 24 hours prior to commencement of activities. A closure report will be required to be submitted to the NMOCD District 2 Office upon completion of project.

Please be advised that this approval does not relieve NGX Company, or, any current and/or future operator, of liability should this operation have failed to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, this approval does not relieve the operator of record of responsibility for compliance with any other federal, state, local laws and/or regulations

Sincerely,

Mike Bratcher
NMOCD District 2
1301 W. Grand Ave.
Artesia, NM 88210
(575) 748-1283 Ext.108

From: Gates, Mike [mailto:Mike.Gates@arcadis-us.com]
Sent: Monday, June 30, 2008 1:01 PM
To: Bratcher, Mike, EMNRD
Cc: Andrew Cloutier; JRC@modrall.com; pth@modrall.com; KPurcell@rodey.com
Subject: Earthen Pit Investigation; Pronghorn State No. 2, Eddy County, NM

Mr. Bratcher:

ARCADIS conducted an investigation of an earthen pit associated with the Pronghorn State No. 2 in Eddy County, New Mexico. Based on the results of the investigation, recommendations for closure of the pit were included in the above-referenced report submitted to your office in February 2008. Based on our telephone conversation today it is our understanding that you have reviewed the report and approve the work recommended for an in-place closure.

In order for the parties to initiate the proposed work to close this pit, please send us confirmation (e-mail reply) of your approval to proceed with the closure recommendations included in the February 2008 report.

Thanks

Michael Gates
ARCADIS
5100 East Skelly Drive, Suite 1000
Tulsa, OK 74135
918.850.1052 (Cell)
918.664.9900 (Office)

RP-11

Bratcher, Mike, EMNRD

From: Guye, Gerry, EMNRD
Sent: Monday, April 21, 2008 9:31 AM
To: Bratcher, Mike, EMNRD; Bonham, Sherry, EMNRD
Subject: FW: Oxy Pronghorn State #2: Work Scope Change and Notice for Conducting Field Work

Have you seen the work plan he is talking about? If so, was it approved or what?

Gerry Guye
Compliance Officer
NMOCD - Artesia
Office (505)748-1283x105
Mobile (505)626-0843
E-Mail: gerry.guye@state.nm.us

From: Gates, Mike [mailto:Mike.Gates@arcadis-us.com]
Sent: Monday, April 21, 2008 9:20 AM
To: Guye, Gerry, EMNRD
Subject: RE: Oxy Pronghorn State #2: Work Scope Change and Notice for Conducting Field Work

Gerry,

This just approves the work plan. We competed all of the work in the work plan back in December and prepared a closure plan for the pit in a report dated February 2008. I need to know if you guys have reviewed/approved this closure plan for the pit.

Let me know if you need another copy of the investigation report.

Thanks
Mike

Michael Gates
ARCADIS
5100 East Skelly Drive. Suite 1000
Tulsa, OK 74135
918 850 1052 (Cell)
918.664.9900 (Office)

From: Guye, Gerry, EMNRD [mailto:gerry.guye@state.nm.us]
Sent: Monday, April 21, 2008 10:18 AM
To: Gates, Mike
Subject: RE: Oxy Pronghorn State #2: Work Scope Change and Notice for COnducting Field Work

Mike
I found this in the file. I think this is all you should need to complete this project.
If I can be of further service, feel free to contact me.

Gerry Guye

Compliance Officer
NMOCD - Artesia
Office (505)748-1283x105
Mobile (505)626-0843
E-Mail: gerry.guye@state.nm.us

From: Gates, Mike [mailto:Mike.Gates@arcadis-us.com]
Sent: Monday, November 19, 2007 8:52 AM
To: Guye, Gerry, EMNRD
Cc: 'Andrew Cloutier'; 'kpurcell@rodey.com'; 'jrc@modrall.com'; 'phalajian@modrall.com'; Lloyd Deuel; Talbert, Jasmin; Lang, Ralph; Perschnick, Kathy
Subject: Oxy Pronghorn State #2: Work Scope Change and Notice for COnducting Field Work

Gerry,
ARCADIS is correcting a scope of work item for our investigation of the above-referenced site. The work plan described field analyses for some of the collected soil samples. This is incorrect. All soil samples will be analyzed by the analytical laboratory. In addition, for the two deeper borings planned, the number of soil samples collected may be reduced by compositing for every couple of feet of depth below a depth of five feet and the laboratory analyses may vary from what was described in the work plan, The work plan had described samples every foot

For everyone's notification, ARCADIS is planning to conduct the field work the week of December 3. Feel free to call me for specific times that we will be in the field that week.

Michael Gates
ARCADIS
5100 East Skelly Drive, Suite 1000
Tulsa, OK 74135
918.850.1052 (Cell)
918.664.9900 (Office)

From: Guye, Gerry, EMNRD [mailto:gerry.guye@state.nm.us]
Sent: Friday, November 02, 2007 3:17 PM
To: Gates, Mike
Subject: Oxy Pronghorn State #2

Mike
The work plan submitted November 1, 2007 for this pit is approved. I would appreciate your forwarding this email to those personnel involved in this project.

Please keep me informed of the status of this project at regular intervals, not to exceed 30 days.

After sampling and testing the lab results must be submitted to OCD for approval before back filling of the pit may begin.

Please be advised that OCD approval of this plan does not relieve the company of liability should their operations have failed to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the company of responsibility for compliance with any other applicable federal, state, local laws

and/or regulations.

Gerry Guye
Compliance Officer
NMOCD - Artesia
Office (505)748-1283x105
Mobile (505)626-0843
E-Mail: gerry.guye@state.nm.us

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This inbound email has been scanned by the MessageLabs Email Security System.

Bratcher, Mike, EMNRD

From: Guye, Gerry, EMNRD
Sent: Wednesday, February 13, 2008 7:53 AM
To: Bratcher, Mike, EMNRD
Subject: FW: Oxy Pronghorn State #2

FYI

Gerry Guye
Compliance Officer
NMOCD - Artesia
Office (505)748-1283x105
Mobile (505)626-0843
E-Mail: gerry.guye@state.nm.us

From: Gates, Mike [mailto:Mike.Gates@arcadis-us.com]
Sent: Tuesday, February 12, 2008 3:06 PM
To: Guye, Gerry, EMNRD
Subject: RE: Oxy Pronghorn State #2

Gerry,

FYI, we are working on our investigation report for the Pronghorn State #2 pit investigation. We should have it to you next week.
Let me know if you have any questions.

Thanks
Mike

Michael Gates
ARCADIS
5100 East Skelly Drive, Suite 1000
Tulsa, OK 74135
918 850.1052 (Cell)
918.664.9900 (Office)

From: Guye, Gerry, EMNRD [mailto:gerry.guye@state.nm.us]
Sent: Tuesday, November 27, 2007 3:25 PM
To: Gates, Mike
Subject: RE: Oxy Pronghorn State #2

The work plan is ok. However I will not be available Tuesday to witness.

Gerry Guye

Compliance Officer
NMOCD - Artesia
Office (505)748-1283x105
Mobile (505)626-0843
E-Mail: gerry.guye@state.nm.us

From: Gates, Mike [mailto:Mike.Gates@arcadis-us.com]
Sent: Tuesday, November 27, 2007 1:44 PM
To: Guye, Gerry, EMNRD
Subject: RE: Oxy Pronghorn State #2

Gerry,

A couple of things Did you see our minor changes to the work plan? Are you OK with the changes?

Also, I wanted to know if you were planning on being there when we start our work next Tuesday morning I need someone to lead our field people to the site If you might be available to do that, let me know.

Thanks
Mike

Michael Gates
ARCADIS
5100 East Skelly Drive, Suite 1000
Tulsa, OK 74135
918.850.1052 (Cell)
918.664.9900 (Office)

From: Guye, Gerry, EMNRD [mailto:gerry.guye@state.nm.us]
Sent: Friday, November 02, 2007 3:17 PM
To: Gates, Mike
Subject: Oxy Pronghorn State #2

Mike
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Gerry Guye
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NOV 02 2007
OCD-ARTESIA

ARCADIS
Infrastructure, environment, facilities

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Environmental Services

Mr. Gerry Guye
Deputy Field Inspector
New Mexico Oil Conservation Division
1301 W Grand Avenue
Artesia, New Mexico 88210

COPY FROM WELL FILE
2RP-11

Subject 30-015-29931
Pronghorn State #2, Section 2, Township 21 South, Range 28 East, N.M.P M., Eddy County, New Mexico.

Date
November 1, 2007

Contact
Michael M. Gates

Phone
918-664-9900

Email
Mike.Gates@arcadis-us.com

Dear Mr. Guye:

The following scope of work has been prepared to investigate the soil quality within and underlying an earthen pit associated with the Pronghorn State #2 site located in Section 2, Township 21 South, Range 28 East, N.M.P.M., Eddy County, New Mexico The scope of work is being submitted to the New Mexico Oil Conservation Division (OCD) for approval prior to implementation. The scope is consistent with the discussions held between the interested parties at the meeting conducted at the site on August 23, 2007.

The pit remains open even though a well was not completed at this location. The objective of the investigation is to sample soils within and underlying the pit to determine the presence or absence of impacts from brine and/or petroleum hydrocarbons. The results of the investigation will allow a determination to be made as to whether remediation and/or additional investigation activities associated with closure of the pit are necessary.

SCOPE OF WORK

The scope of work to investigate soil quality within and underlying the earthen pit will focus on the upper twenty (20) feet of the soil profile assuming that groundwater will not be encountered within this interval. If groundwater is encountered within the upper 20 feet, then the depth of investigation for the soil profile will be adjusted accordingly.

Two primary investigative tools will be utilized for the investigation. Electromagnetic conductivity surveys will first be conducted to provide information on the vertical and

lateral extent, if any, of brine related impacts. This will be immediately followed by confirmation soil sampling to determine the presence or absence of impacts from brine or petroleum hydrocarbons. The following scope of work is proposed:

- An EM-31 and EM-38 electromagnetic conductivity survey will be conducted over a grid area covering approximately 200 feet by 200 feet and overlying and extending beyond the boundaries of the earthen pit. The objective of these surveys will be to determine background conductivity response and identify any conductivity anomalies within the surveyed area to target for confirmation soil sampling.

- Soil borings will be conducted using direct-push technology. Soil borings will be advanced to approximately 20 feet in depth at two locations; one in the center of the anomalous high conductivity area and one in the area of lowest conductivity based on the EM-31 survey results In addition, eight (8) shallow soil borings will be advanced to a depth of approximately five (5) feet within the surveyed area to confirm the results obtained from the EM-38 survey.

- Discrete soil samples will be collected from each soil boring at one (1) foot intervals, as discussed below. Collected soil samples will be submitted to an analytical laboratory acceptable to the State of New Mexico. Soil sample collection and the proposed analytical program are presented below

- The results of the field investigation work will be presented in a report to the OCD that will include conclusions and recommendations for additional investigation and/or remediation activities, if needed. At a minimum the report will include a proposed work scope that will be necessary to provide for pit closure and surface restoration.

Electromagnetic Conductivity Survey

Electromagnetic (EM) conductivity surveys of the area encompassing the earthen pit will be utilized to delineate areas potentially impacted by oil field brine. The particularly high electrical conductivity of oilfield production water (brine) makes the detection of brine related soil impacts by EM conductivity methods an especially reliable geophysical application. Electromagnetic conductivity instruments consist of

a transmitter and receiver coil, and a power source that can be handled by one or two persons. During the operation of the instrument, the transmitter coil is energized by an alternating current and radiates an electromagnetic field into the earth. This primary field induces electrical currents (called eddy currents) in the earth below the instrument. The magnitude of these currents is proportional to the conductivity of the ground. These eddy currents, in turn, generate a secondary electromagnetic field that is detected by the receiver coil on the instrument. The receiver coil also detects the primary field and uses these two measurements to calculate the conductivity of the ground This reading represents a bulk measurement of the conductivity of a volume of ground beneath the instrument down to its effective depth of penetration

For this site, EM-31 and EM-38 surveys are proposed. The EM-38 instrument has an effective investigation depth of 5 feet and the EM-31 instrument has an effective depth of 18 feet. The effective depth difference will allow for some vertical discrimination of conductivity within the soil profile throughout the surveyed area. Additional vertical discrimination will be obtained by running the EM surveys in both the vertical and horizontal dipole mode. A survey grid of approximately 200 feet by 200 feet should be adequate to overlap and extend beyond the boundaries of the earthen pit to allow a comparison of background soil conditions with those underlying the pit. The survey will be completed by walking the area along survey lines that are 10 feet apart. Conductivity readings are recorded continuously as each survey line is traversed.

Soil Sampling Program

Approximately 10 soil borings are planned for this investigation; two deep borings (20 feet) and eight shallow borings (5 feet). A comparison of the collected data should allow for estimating the amount of produced water discharged to the pit and the potential threat to any underlying groundwater.

The borings will be installed using direct-push technology and continuous soil cores will be collected as the borings are advanced. The two deeper borings will be installed in the area of highest and lowest conductivity based on the EM-31 survey. For these borings, soil samples will be collected at one (1) foot intervals throughout the depth of the boring. Each soil sample will be analyzed for percent moisture, electrical conductivity, soluble chloride and sodium (on a 1:1 soil · water extract), and exchangeable sodium. A minimum of two (2) soil samples (collected from 0-5 feet and 5-10 feet) from each of the deeper borings will be analyzed for Total Petroleum Hydrocarbon (TPH) using Texas Method 1005. Additional TPH analyses will be

included if warranted based on visual, olfactory, and/or photoionization screening conducted at the time of sampling.

Eight (8) shallow soil borings will be advanced to a depth of approximately five (5) feet within the surveyed area to confirm the results obtained from the EM-38 survey. For these borings, soil samples will be collected at one (1) foot intervals throughout the depth of the boring. Each soil sample will be tested in the field for electrical conductivity (saturated paste) to ground truth the EM-38 results. For the two borings located in the area of highest conductivity, based on the EM-38 survey, a minimum of two soil samples per boring will be collected and analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), TPH, and chloride.

SCHEDULE

The work described in this work plan can be scheduled within 45 days of the later of: (a) receipt of approval from OCD; or (b) agreement by the three parties to the litigation (NGX, Great Basin, and OXY) on a means for paying for the work. Concerning the latter issue, I have prepared an estimate of the cost for implementing this work plan and understand that the attorneys and parties are discussing how to proceed if the OCD approves this work plan. The proposed field work will require approximately two or three days to complete. A report covering the results of the investigation will be submitted within 60 days of completion of the field work

Sincerely,

ARCADIS U.S., Inc.

Michael M. Gates
Project Advisor

Copies
Charles K. (Kip) Purcell, Esq.
John R. Cooney, Esq.
Paul T. Halajian, Esq.