

# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

October 4, 2013

Mike Bratcher  
NMOCD District 2  
811 South First Street  
Artesia, New Mexico 88210

RE: Clayton Williams – Jenna Com

Mike:

We propose the remediation plan outlined below in response to the July release from this battery. This letter is copied to the BLM, although we are uncertain if the BLM retains an interest in this SWD as it is on State surface. Figure 1 shows the location of the site, north of the Lovington Highway and west of Bear Grass Draw. Figure 1 also shows the elevation of groundwater (blue contour lines), which is about 3525 feet above sea level at the site. The plan is simple, comprising several steps.

## Remedial Tasks Completed:

1. Removed all soil from the spill footprint that is visibly stained by crude oil. A total of 1-2 feet of soil removed from the footprint (see Appendix A for photographs of the completed work elements).
2. Placed the stained soil on a liner on the location.
3. Sampled the area of the spill footprint and the stockpiled soil. We obtained ten composite samples of the spill footprint. In the area due north of the battery and west of the lease road, each composite sample consisted of five discrete samples taken at each corner and from the center of nine a 58 x 50 foot grid cells. A 5-point composite sample was also obtained from an area east of the road for a total of ten samples (see Figure 2) and the stockpiled soil.
4. Determined vertical extent of impact by comparing the laboratory results from a background sampling trench with a deep trench located at the intersection of grid cells A/B1 and A/B2. The background sampling trench is located south of the well (See Figure 3), beneath the area that is being used for on-site bioremediation of the impacted soil.
5. Evaluated the potential for any residual produced water within the spill footprint to cause groundwater impacts using a vadose zone model (Appendix B – no impact to groundwater is reasonably foreseeable).
6. Mixed and graded the area impacted by the recent spill.
7. Spread the stockpiled soil on location for in-place bioremediation. The green box on Figure 3 shows the area of in-place bioremediation. Fertilizer was added to the impacted soil to enhance natural bioremediation.
8. Seeded all tilled soil with BLM No. 2 with a sufficient amount of seed for two acres (17.00 pounds). The mixture consists of:
  - a. 52.26% Bristlegrass, Plains “VNS” (*Setaria Vulpiseta*)
  - b. 23.36% Dropseed, Sand “VNS” (*Sporobolus Cryptandrus*)
  - c. 23.41% Lovegrass, Sand “Bend” (*Eragrostis trichodes*)

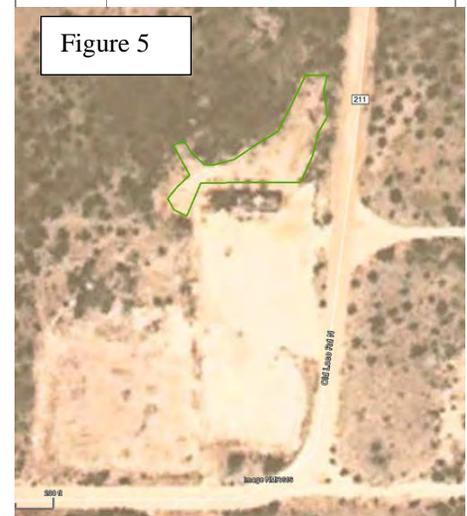
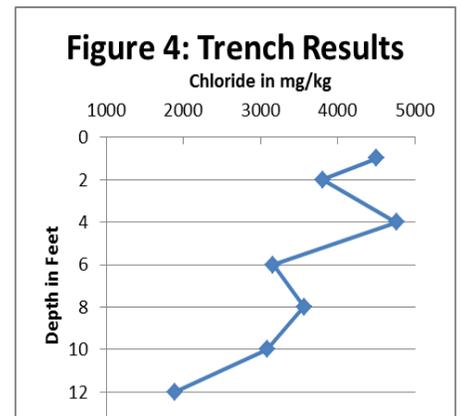


**Remedial Tasks Remaining**

9. Periodically conduct a visual inspection of the site for erosion of the remedy due to rain and for re-vegetation. If deleterious changes to the site are observed, provide e-mail report to OCD that describes proposed or implemented actions in response to observed changes.
10. In September 2014, conduct a visual site inspection to determine the efficacy of natural restoration and the seeding effort, prepare report to OCD and surface owner with recommendations for
  - a. additional work or
  - b. closure of the file.
11. After acceptable re-vegetation, leave the bio-remediated soil in-place or use the soil as fill where needed on location and seed all disturbed areas.

This proposed remedy is based upon the following data and interpretations:

- A. Figure 2 shows the results of the soil-sampling program within the footprint of the recent spill, the impacted soil removed from the spill footprint and two trench samples. These data and the Appendix C laboratory reports show
  - a. Neither regulated hydrocarbons (BTEX) nor GRO were detected by the laboratory
  - b. TPH results from Method 418.1 are high when compared against total hydrocarbons using Method 8015M
  - c. Background chloride concentrations in surface soil are 300-500 mg/kg based upon background sampling trench and results from samples C3 and B3.
  - d. Background chloride concentration below the root zone is slightly less than 2000 mg/kg, based upon the 5-foot sample at the background trench
  - e. Stained soil removed from the spill footprint excavation contains average chloride concentration of about 3000 mg/kg
  - f. The highest concentration of chloride observed in composite samples taken at the excavated surface is 6840 mg/kg from sample A-2.
- B. The chloride profile (Figure 4) shows that:
  - a. Background conditions (< 2000 mg/kg) exist at 14 feet below original land surface, which is 12 feet below the excavated surface.
  - b. the highest concentration is at a depth of 6 feet below original land surface (4760 mg/kg)
- C. Two earlier releases occurred at the battery site
  - a. 450 bbls of produced water in April 2004
  - b. A few barrels in July 2005
  - c. Figure 5 is a June 2005 Google Earth image showing the footprint of the 2004 release with the green outline.
- D. The Jenna Com well began producing in 1997 and was converted to an injection well in 2000.
- E. The chloride mass released by the 2013 spill was removed to the bioremediation pile.
- F. The AMIGO simulation of the 2-foot thick bioremediation pile (see Appendix D with identified input data) shows no impairment to groundwater (148 mg/L maximum concentration) using the following input data
- G. an initial chloride concentration of about 2700 mg/kg above background conditions for the 2-feet of material placed on location – based upon the analyses showing a background of about 300 mg/kg and a chloride concentration in the pile of about 3,000 mg/kg



- H. the length of the placed material parallel to groundwater flow is about 60 feet – based upon site measurements
  - a. a hydraulic conductivity of this placed material that is similar to medium sand due to tilling and mixing of the loamy excavated material – based upon professional judgment
  - b. a vadose zone profile similar to what is observed in the area: 1 part sandy clay, 1 part caliche and 1 part medium sand
  - c. an assumed background chloride concentration in groundwater of 100 mg/L
  - d. an aquifer porosity of 30% and a hydraulic conductivity of 20 ft/day – based upon professional judgment
  - e. a depth to groundwater of 70 feet and a slope of the water table of 0.004 - based upon the data shown in Figure 1
  - f. an aquifer thickness of 20 feet – based upon professional judgment
- I. The AMIGO simulation of the 2005 release (a 450 bbl release that, unlike the recent release, was not removed from the spill footprint) shows no impairment of groundwater quality (151 mg/L at year 79). The simulation uses the same input as that described above with the following exceptions (as shown below in Figure 6):
  - a. an initial chloride concentration of about 7000 mg/kg above background conditions for the uppermost 2-foot thick soil zone impacted by the spill. While we believe this concentration over estimates the actual conditions, this concentration creates a reasonable “match” with the chloride profile presented above.
  - b. the length of the impacted soil parallel to groundwater flow is about 100 feet – based upon site measurements
  - c. a hydraulic conductivity of surface soil that is similar to caliche. Although the surface soil is a loam, input of caliche as a surface layer creates a reasonable match with the observed vertical profile at year 7 (2013-2005=8 years)

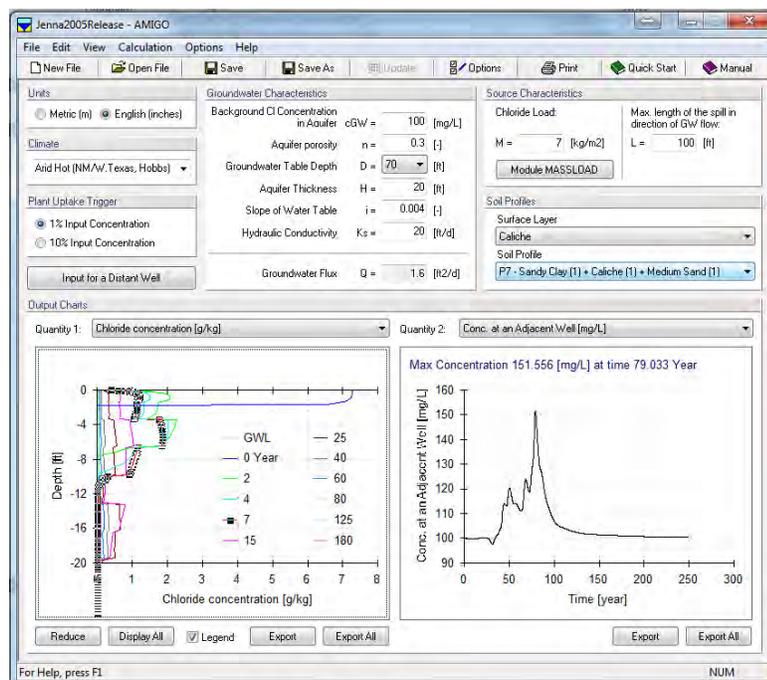


Figure 6: Screen shot of AMIGO graphical user interface. The profile for year 7 is highlighted in the left hand graphic. The profiles show chloride concentration above background versus depth with year 7 providing a relatively close match to the observed profile. For year 7, chloride is at background conditions at 10 feet below original grade and from 4-6 feet below original grade, chloride concentration is 2000 mg/kg (2 g/kg) higher than background.

October 4, 2013

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The AMIGO simulations, which are only as good as the input data, can be used to provide some reasonable predictions of impacts to groundwater quality from surface releases or small landfills. The input for two simulations presented in this remediation plan use field data and professional judgment. Where we make assumptions based upon judgment, we use data that will overestimate the impact to groundwater. At the Jenna Com release site, we conclude that the residual chloride in soil (beneath the footprint and in the bioremediation area) poses no threat to groundwater quality.

We also conclude that 5-10 years of normal precipitation (which may translate into two decades of below normal precipitation) will cause the chloride in the surface soil to move below the root zone, allowing the creation of a vegetative cap. Such a cap will effectively prevent infiltration and sequester the chloride well above groundwater. We could artificially add fresh water to accelerate the remedy, but we do not believe that such a use of fresh water is commensurate with any possible benefit.

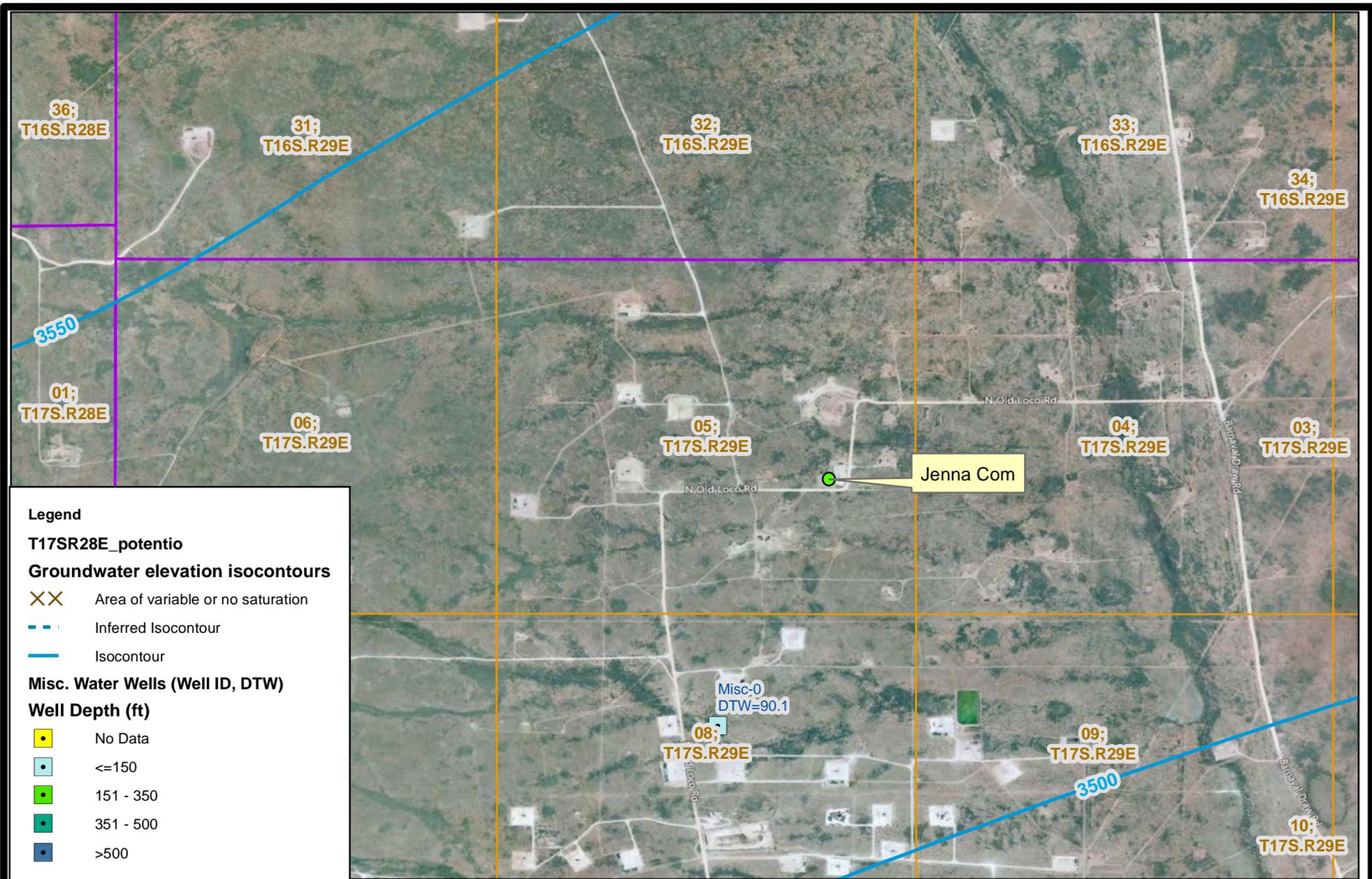
We will provide OCD with a report in September of 2014. We look forward to working with you on this project.

Sincerely,  
R.T. Hicks Consultants, Ltd.

A handwritten signature in black ink, appearing to read "Randall T. Hicks". The signature is written in a cursive, flowing style.

Randall T. Hicks  
Principal

Copy: State Land Office, Terry Warnell  
BLM, Jim Amos



**Legend**

**T17SR28E\_potentio**

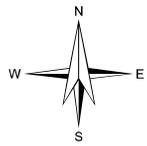
**Groundwater elevation isocontours**

- XX Area of variable or no saturation
- - - Inferred Isocontour
- Isocontour

**Misc. Water Wells (Well ID, DTW)**

**Well Depth (ft)**

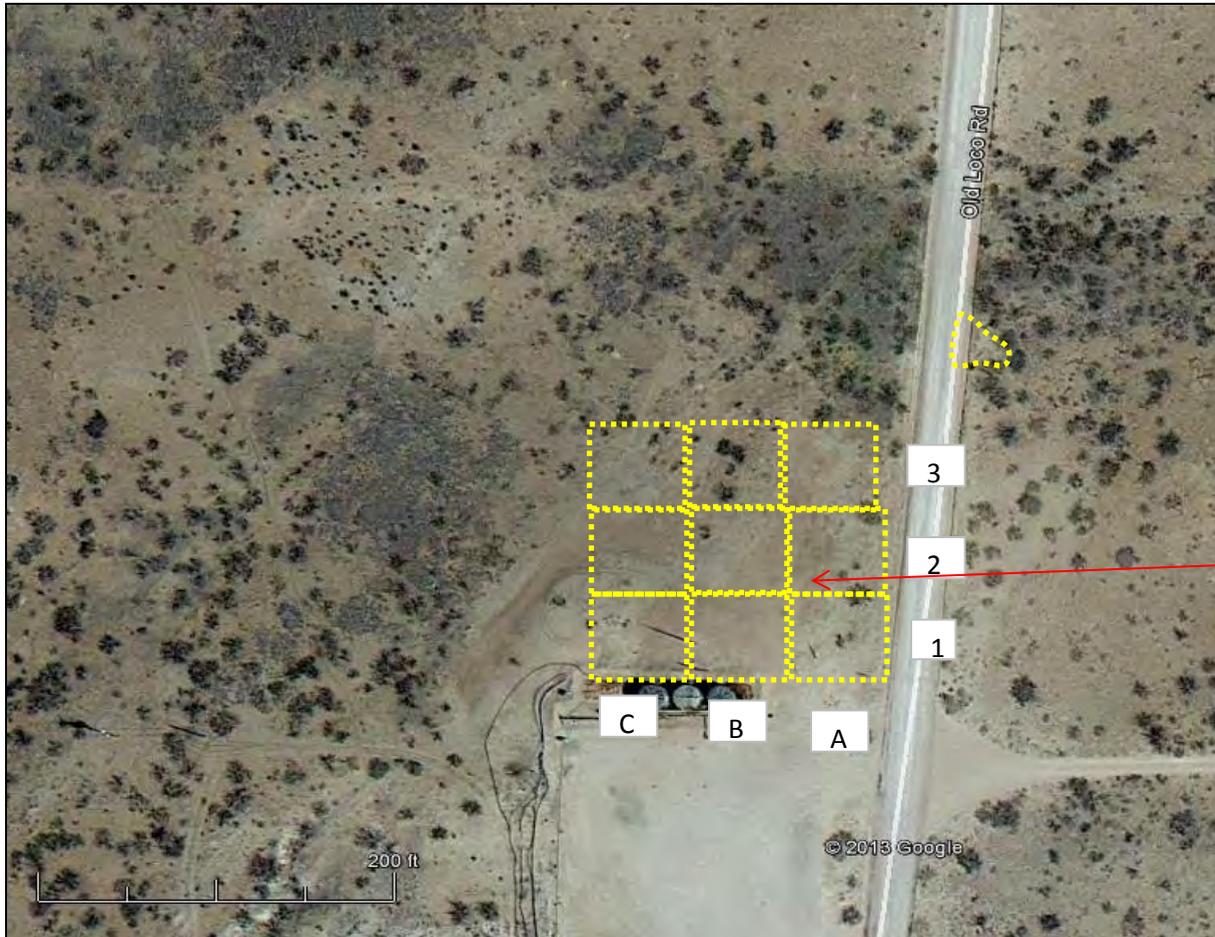
- No Data
- ≤150
- 151 - 350
- 351 - 500
- >500



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Air Photo and Groundwater Elevation  
 Clayton Williams - Jenna Com 01

Figure 1  
 August 2013



Excavated Soil from Spill Footprint - Results in mg/kg				
	Cl	DRO	EXT DRO	TPH
Top of Pile	3480	270	135	1610
Pile Bottom	2800	333	121	2300

Trench Results in mg/kg			
		depth (ft)	Cl - mg/kg
Average A1-B1-A2-B2		1	4500
Trench 1	T-1	2	3800
	T-1	4	4760
	T-1	6	3160
	T-1	8	3560
	T-1	10	3080
	T-1	12	1890
Depths at T-1 are below the 1-2 foot excavation surface			
Background Beneath On-Site Remediation of Pile			
Trench 2	T-2	2	432
		5	1940

Composite Grid Sampling Results of Excavated Surface						
	Cl		Cl		Cl	
C3	400	B3	304	A3	1280	mg/kg
C2	1680	B2	2600	A2	6480	mg/kg
C1	2440	B1	4680	A1	4240	mg/kg
East of Road			1500			

R.T. Hicks Consultants Albuquerque, NM	2013 Google Earth Image Showing Sampling Locations and Results	Figure 2
	Clayton Williams - Jenna Com	Sep-13



## **Appendix A**



View to the northwest of release footprint after excavation of soil stained by hydrocarbons.



View south of stockpiled soil showing three sampling trenches



View north northeast from tank battery firewall showing graded spill footprint.



The texture of the graded surface soil within the spill footprint is a loam. Clods of dirt are clay.



Bioremediation area south of location.



## **Appendix B**

**Project: Jenna2005Release**

Path: P:\Clayton Williams\JennaCom\Correspond\Jenna2005Release.ami

Date: 9/16/2013

Units: English (inches)

Climate: Arid Hot (NM/W.Texas, Hobbs)

Plant Uptake Trigger: 1% Input Concentration

Groundwater Characteristics

Background Cl Concentration in Aquifer: 100 [mg/L]

Aquifer porosity: 0.3 [-]

Groundwater Table Depth: 70 [ft]

Aquifer Thickness: 20 [ft]

Slope of Water Table: 0.004 [-]

Hydraulic Conductivity: 20 [ft/d]

Groundwater Flux: 1.6 [ft<sup>2</sup>/d]

Source Characteristics

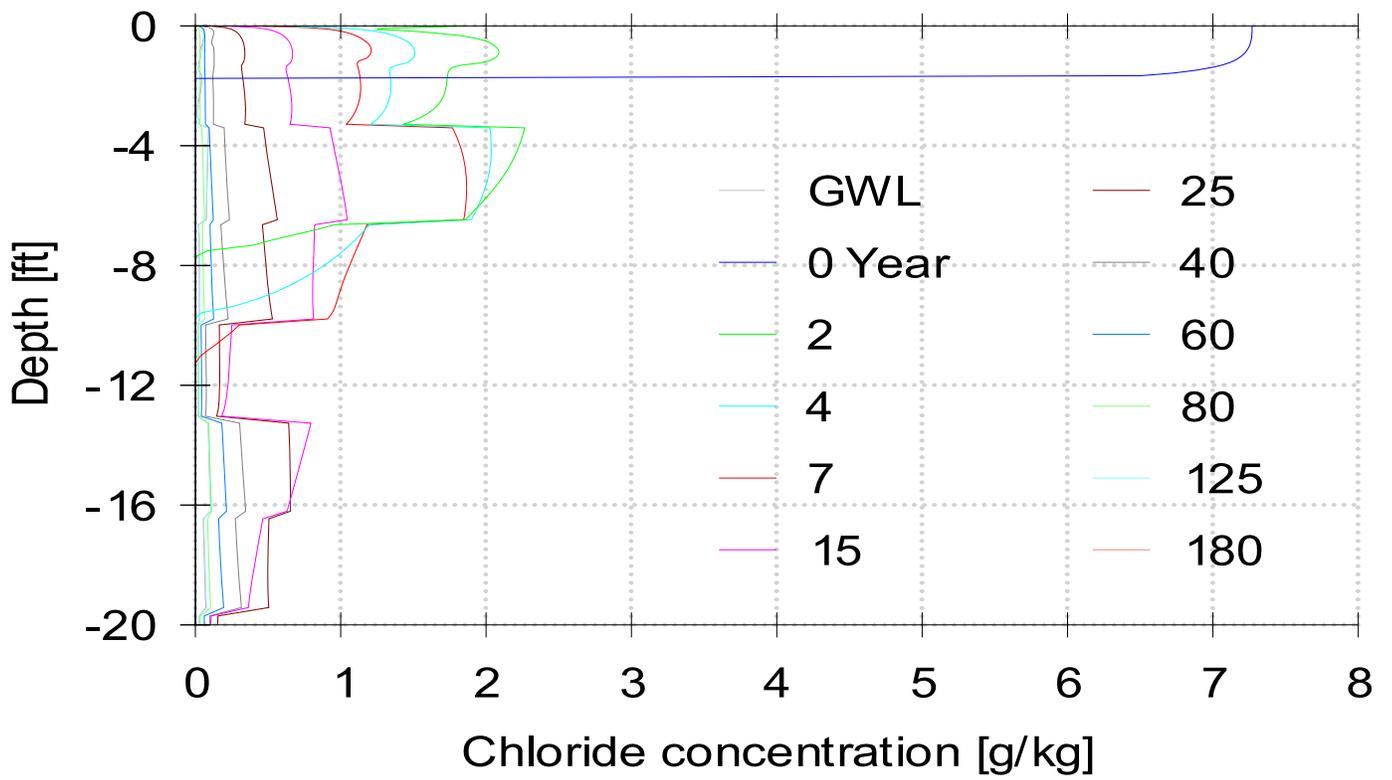
Chloride Load:: 7 [kg/m<sup>2</sup>]

Max. length of the spill in direction of GW flow:: 100 [ft]

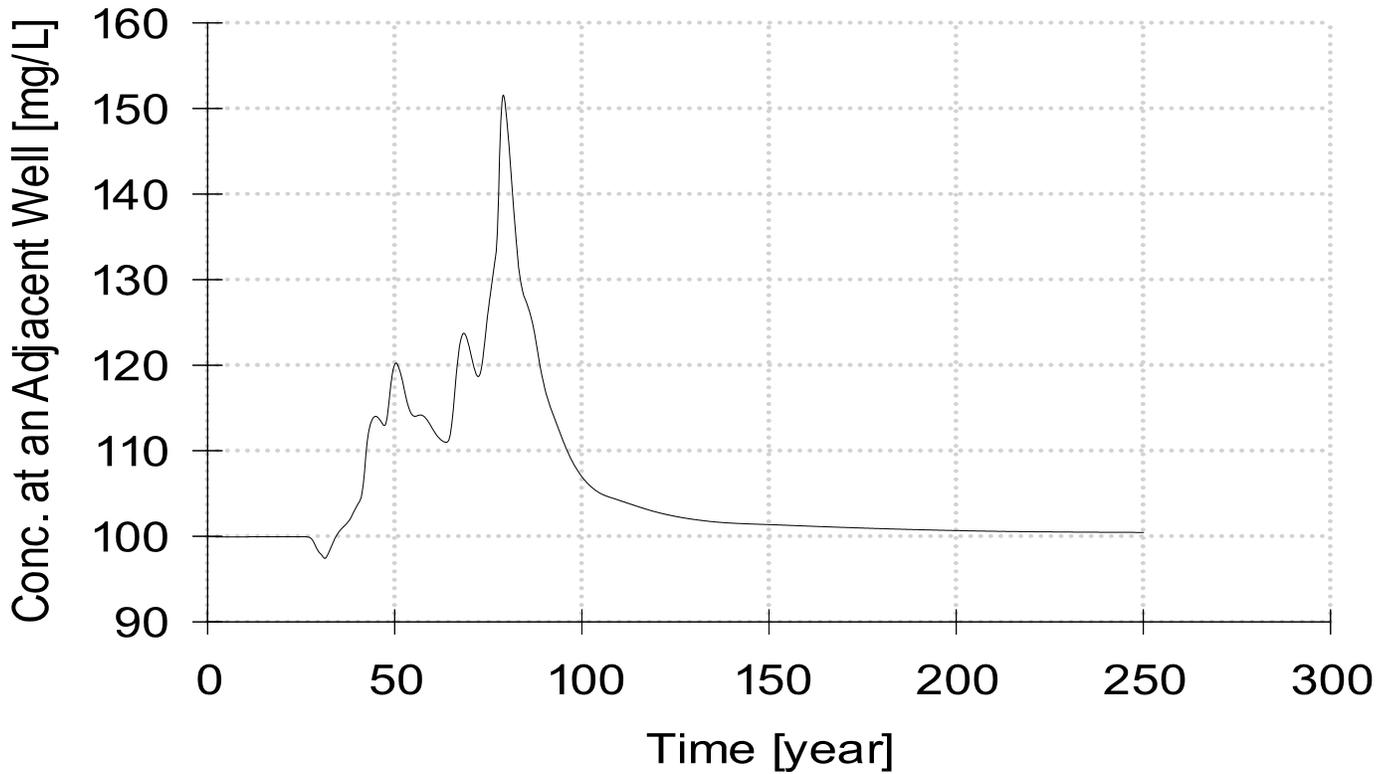
Soil Profiles

Surface Layer: Caliche

Soil Profile: P7 - Sandy Clay (1) + Caliche (1) + Medium Sand (1)



Max Concentration 151.556 [mg/L] at time 79.033 Year





## **Appendix C**

August 29, 2013

ERIC GARCIA

SOUTHWEST ROYALTIES

6 DESTA DRIVE, SUITE 2100

MIDLAND, TX 79705

RE: JENNA COM

Enclosed are the results of analyses for samples received by the laboratory on 08/23/13 8:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

 SOUTHWEST ROYALTIES  
 ERIC GARCIA  
 6 DESTA DRIVE, SUITE 2100  
 MIDLAND TX, 79705  
 Fax To: NOT GIVEN

 Received: 08/23/2013  
 Reported: 08/29/2013  
 Project Name: JENNA COM  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 08/22/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: T1-12 (H302025-01)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: DW						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>1890</b>	16.0	08/28/2013	ND	400	100	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AR/						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/28/2013	ND	169	84.4	200	3.72		
DRO >C10-C28	<10.0	10.0	08/28/2013	ND	162	81.2	200	5.75		
EXT DRO >C28-C35	<10.0	10.0	08/28/2013	ND						
<i>Surrogate: 1-Chlorooctane</i>		80.6 %	65.2-140							
<i>Surrogate: 1-Chlorooctadecane</i>		85.4 %	63.6-154							

**Sample ID: T2-2 (H302025-02)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: DW						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>432</b>	16.0	08/28/2013	ND	400	100	400	0.00		
TPH 8015M		mg/kg		Analyzed By: AR/						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	08/28/2013	ND	169	84.4	200	3.72		
DRO >C10-C28	<10.0	10.0	08/28/2013	ND	162	81.2	200	5.75		
EXT DRO >C28-C35	<10.0	10.0	08/28/2013	ND						
<i>Surrogate: 1-Chlorooctane</i>		80.6 %	65.2-140							
<i>Surrogate: 1-Chlorooctadecane</i>		86.6 %	63.6-154							

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 SOUTHWEST ROYALTIES  
 ERIC GARCIA  
 6 DESTA DRIVE, SUITE 2100  
 MIDLAND TX, 79705  
 Fax To: NOT GIVEN

 Received: 08/23/2013  
 Reported: 08/29/2013  
 Project Name: JENNA COM  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 08/22/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: T1-8 (H302025-03)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: DW					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>3560</b>	16.0	08/28/2013	ND	400	100	400	0.00	
TPH 8015M		mg/kg		Analyzed By: AR/					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/28/2013	ND	169	84.4	200	3.72	
DRO >C10-C28	<10.0	10.0	08/28/2013	ND	162	81.2	200	5.75	
EXT DRO >C28-C35	<10.0	10.0	08/28/2013	ND					
<i>Surrogate: 1-Chlorooctane</i>	73.7 %	65.2-140							
<i>Surrogate: 1-Chlorooctadecane</i>	80.4 %	63.6-154							

**Sample ID: T1-10 (H302025-04)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: DW					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>3080</b>	16.0	08/28/2013	ND	400	100	400	0.00	
TPH 8015M		mg/kg		Analyzed By: AR/					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/28/2013	ND	169	84.4	200	3.72	
DRO >C10-C28	<10.0	10.0	08/28/2013	ND	162	81.2	200	5.75	
EXT DRO >C28-C35	<10.0	10.0	08/28/2013	ND					
<i>Surrogate: 1-Chlorooctane</i>	80.7 %	65.2-140							
<i>Surrogate: 1-Chlorooctadecane</i>	86.6 %	63.6-154							

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

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 ERIC GARCIA  
 6 DESTA DRIVE, SUITE 2100  
 MIDLAND TX, 79705  
 Fax To: NOT GIVEN

 Received: 08/23/2013  
 Reported: 08/29/2013  
 Project Name: JENNA COM  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 08/22/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: T1-2 (H302025-05)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: DW					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>3800</b>	16.0	08/28/2013	ND	400	100	400	0.00	
TPH 8015M		mg/kg		Analyzed By: AR/					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/28/2013	ND	169	84.4	200	3.72	
DRO >C10-C28	<10.0	10.0	08/28/2013	ND	162	81.2	200	5.75	
EXT DRO >C28-C35	<10.0	10.0	08/28/2013	ND					
<i>Surrogate: 1-Chlorooctane</i>	<i>80.9 %</i>	<i>65.2-140</i>							
<i>Surrogate: 1-Chlorooctadecane</i>	<i>83.6 %</i>	<i>63.6-154</i>							

**Sample ID: T2-5 (H302025-06)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: DW					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>1940</b>	16.0	08/28/2013	ND	400	100	400	0.00	
TPH 8015M		mg/kg		Analyzed By: AR/					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/28/2013	ND	169	84.4	200	3.72	
DRO >C10-C28	<10.0	10.0	08/28/2013	ND	162	81.2	200	5.75	
EXT DRO >C28-C35	<10.0	10.0	08/28/2013	ND					
<i>Surrogate: 1-Chlorooctane</i>	<i>84.7 %</i>	<i>65.2-140</i>							
<i>Surrogate: 1-Chlorooctadecane</i>	<i>89.9 %</i>	<i>63.6-154</i>							

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\*=Accredited Analyte

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 Fax To: NOT GIVEN

 Received: 08/23/2013  
 Reported: 08/29/2013  
 Project Name: JENNA COM  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 08/22/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: T1-4 (H302025-07)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: DW					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>4760</b>	16.0	08/28/2013	ND	400	100	400	0.00	
TPH 8015M		mg/kg		Analyzed By: AR/					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/28/2013	ND	169	84.4	200	3.72	
DRO >C10-C28	<10.0	10.0	08/28/2013	ND	162	81.2	200	5.75	
EXT DRO >C28-C35	<10.0	10.0	08/28/2013	ND					
<i>Surrogate: 1-Chlorooctane</i>	80.3 %	65.2-140							
<i>Surrogate: 1-Chlorooctadecane</i>	85.9 %	63.6-154							

**Sample ID: T1-6 (H302025-08)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: DW					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>3160</b>	16.0	08/28/2013	ND	400	100	400	0.00	
TPH 8015M		mg/kg		Analyzed By: AR/					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	08/28/2013	ND	169	84.4	200	3.72	
DRO >C10-C28	<10.0	10.0	08/28/2013	ND	162	81.2	200	5.75	
EXT DRO >C28-C35	<10.0	10.0	08/28/2013	ND					
<i>Surrogate: 1-Chlorooctane</i>	86.4 %	65.2-140							
<i>Surrogate: 1-Chlorooctadecane</i>	94.8 %	63.6-154							

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- \*\* Samples not received at proper temperature of 6°C or below.
- \*\*\* Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
Samples reported on an as received basis (wet) unless otherwise noted on report



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Celey D. Keene, Lab Director/Quality Manager



# CARDINAL Laboratories

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

### ANALYSIS REQUEST

Company Name: *Southwest Logistics / Valley View*  
 Project Manager: *Chris Gonzalez*  
 Address: *6-Dorita Drive Suite 6700*  
 City: *Midland* State: *TX* Zip: *79705*  
 Phone #: \_\_\_\_\_ Fax #: \_\_\_\_\_  
 Project #: \_\_\_\_\_ Project Owner: \_\_\_\_\_  
 Project Name: *Terra Linn*  
 Project Location: *Terra Linn*  
 Sampler Name: *Ferr Garcia*  
 P.O. #: *5442*  
 Company: \_\_\_\_\_  
 Attn: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Phone #: \_\_\_\_\_ Fax #: \_\_\_\_\_

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						PRESERV.	SAMPLING	DATE	TIME	ANALYSIS REQUEST
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :					
H307025	T1-12		5								8/22	11:30 AM	Chlorides	
	T2-2		5								8/22	9:40 AM	DLO	
	T1-8		5								8/22	11:00 AM	6.0	
	T1-10		5								8/22	11:20 AM	DLO-Extended	
	T1-2		5								8/22	11:00 AM		
	T2-5		5								8/22	1:30 PM		
	T1-4		5								8/22	10:50 AM		
	T1-6		5								8/22	12:30 PM		

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Relinquished By: *Chris Stephens* Date: *8/23/13* Time: *6:30*  
 Received By: *Joeli Mendonca*  
 Delivered By: (Circle One)  UPS  Bus  Other: \_\_\_\_\_  
 Sample Condition:  Cool  Intact  Yes  No  
 CHECKED BY: *JK*  
 Phone Result:  Yes  No  Add'l Phone #: \_\_\_\_\_  
 Fax Result:  Yes  No  Add'l Fax #: \_\_\_\_\_  
 REMARKS: *Email ferrgarcia@294@hotmail.com*

\* Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

August 19, 2013

RANDALL HICKS

R T HICKS CONSULTANTS

901 RIO GRANDE BLVD SUITE F-142

ALBUQUERQUE, NM 87104

RE: JENNA COM

Enclosed are the results of analyses for samples received by the laboratory on 08/09/13 7:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

R T HICKS CONSULTANTS  
901 RIO GRANDE BLVD SUITE F-142  
ALBUQUERQUE NM, 87104

Project: JENNA COM  
Project Number: NONE GIVEN  
Project Manager: RANDALL HICKS  
Fax To: NONE

Reported:  
19-Aug-13 15:57

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PILE TOP	H301878-01	Soil	08-Aug-13 00:00	09-Aug-13 07:00
PILE BOTTOM	H301878-02	Soil	08-Aug-13 00:00	09-Aug-13 07:00

Cardinal Laboratories

\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 R T HICKS CONSULTANTS  
 901 RIO GRANDE BLVD SUITE F-142  
 ALBUQUERQUE, NM, 87104

 Project: JENNA COM  
 Project Number: NONE GIVEN  
 Project Manager: RANDALL HICKS  
 Fax To: NONE

 Reported:  
 19-Aug-13 15:57

**PILE TOP**  
**H301878-01 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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**Cardinal Laboratories**
**Inorganic Compounds**

<b>Chloride</b>	<b>3480</b>	16.0	mg/kg	4	3081308	AP	13-Aug-13	4500-Cl-B	
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**Petroleum Hydrocarbons by GC FID**

<b>GRO C6-C10</b>	ND	10.0	mg/kg	1	3081211	DW	13-Aug-13	8015B	
<b>DRO &gt;C10-C28</b>	<b>270</b>	10.0	mg/kg	1	3081211	DW	13-Aug-13	8015B	
<b>EXT DRO &gt;C28-C35</b>	<b>135</b>	10.0	mg/kg	1	3081211	DW	13-Aug-13	8015B	
<i>Surrogate: 1-Chlorooctane</i>		85.6 %			3081211	DW	13-Aug-13	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>		107 %			3081211	DW	13-Aug-13	8015B	

**Volatile Organic Compounds by EPA Method 8260B**

<b>Benzene*</b>	ND	0.050	mg/kg	50	3081405	MS	14-Aug-13	8260B	
<b>Toluene*</b>	ND	0.050	mg/kg	50	3081405	MS	14-Aug-13	8260B	
<b>Ethylbenzene*</b>	ND	0.050	mg/kg	50	3081405	MS	14-Aug-13	8260B	
<b>Total Xylenes*</b>	ND	0.150	mg/kg	50	3081405	MS	14-Aug-13	8260B	
<b>Total BTEX</b>	ND	0.300	mg/kg	50	3081405	MS	14-Aug-13	8260B	
<i>Surrogate: Dibromofluoromethane</i>		95.9 %			3081405	MS	14-Aug-13	8260B	
<i>Surrogate: Toluene-d8</i>		101 %			3081405	MS	14-Aug-13	8260B	
<i>Surrogate: 4-Bromofluorobenzene</i>		105 %			3081405	MS	14-Aug-13	8260B	

**Organic Compounds**

<b>TPH 418.1</b>	<b>1610</b>	100	mg/kg	10	3081609	CK	16-Aug-13	418.1	
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Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 R T HICKS CONSULTANTS  
 901 RIO GRANDE BLVD SUITE F-142  
 ALBUQUERQUE NM, 87104

 Project: JENNA COM  
 Project Number: NONE GIVEN  
 Project Manager: RANDALL HICKS  
 Fax To: NONE

 Reported:  
 19-Aug-13 15:57

**PILE BOTTOM**  
**H301878-02 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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**Cardinal Laboratories**
**Inorganic Compounds**

<b>Chloride</b>	<b>2800</b>	16.0	mg/kg	4	3081308	AP	13-Aug-13	4500-CI-B	
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**Petroleum Hydrocarbons by GC FID**

<b>GRO C6-C10</b>	ND	10.0	mg/kg	1	3081211	DW	13-Aug-13	8015B	
<b>DRO &gt;C10-C28</b>	<b>333</b>	10.0	mg/kg	1	3081211	DW	13-Aug-13	8015B	
<b>EXT DRO &gt;C28-C35</b>	<b>121</b>	10.0	mg/kg	1	3081211	DW	13-Aug-13	8015B	
<i>Surrogate: 1-Chlorooctane</i>		86.0 %		65.2-140	3081211	DW	13-Aug-13	8015B	
<i>Surrogate: 1-Chlorooctadecane</i>		111 %		63.6-154	3081211	DW	13-Aug-13	8015B	

**Volatile Organic Compounds by EPA Method 8260B**

<b>Benzene*</b>	ND	0.050	mg/kg	50	3081405	MS	14-Aug-13	8260B	
<b>Toluene*</b>	ND	0.050	mg/kg	50	3081405	MS	14-Aug-13	8260B	
<b>Ethylbenzene*</b>	ND	0.050	mg/kg	50	3081405	MS	14-Aug-13	8260B	
<b>Total Xylenes*</b>	ND	0.150	mg/kg	50	3081405	MS	14-Aug-13	8260B	
<b>Total BTEX</b>	ND	0.300	mg/kg	50	3081405	MS	14-Aug-13	8260B	
<i>Surrogate: Dibromofluoromethane</i>		96.0 %		61.3-142	3081405	MS	14-Aug-13	8260B	
<i>Surrogate: Toluene-d8</i>		103 %		71.3-129	3081405	MS	14-Aug-13	8260B	
<i>Surrogate: 4-Bromofluorobenzene</i>		106 %		65.7-141	3081405	MS	14-Aug-13	8260B	

**Organic Compounds**

<b>TPH 418.1</b>	<b>2300</b>	100	mg/kg	10	3081609	CK	16-Aug-13	418.1	
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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 R T HICKS CONSULTANTS  
 901 RIO GRANDE BLVD SUITE F-142  
 ALBUQUERQUE NM, 87104

 Project: JENNA COM  
 Project Number: NONE GIVEN  
 Project Manager: RANDALL HICKS  
 Fax To: NONE

 Reported:  
 19-Aug-13 15:57

**Inorganic Compounds - Quality Control**
**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3081308 - 1:4 DI Water</b>										
<b>Blank (3081308-BLK1)</b>										
Prepared & Analyzed: 13-Aug-13										
Chloride	ND	16.0	mg/kg							
<b>LCS (3081308-BS1)</b>										
Prepared & Analyzed: 13-Aug-13										
Chloride	432	16.0	mg/kg	400		108	80-120			
<b>LCS Dup (3081308-BSD1)</b>										
Prepared & Analyzed: 13-Aug-13										
Chloride	416	16.0	mg/kg	400		104	80-120	3.77	20	

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 R T HICKS CONSULTANTS  
 901 RIO GRANDE BLVD SUITE F-142  
 ALBUQUERQUE, NM, 87104

 Project: JENNA COM  
 Project Number: NONE GIVEN  
 Project Manager: RANDALL HICKS  
 Fax To: NONE

 Reported:  
 19-Aug-13 15:57

**Petroleum Hydrocarbons by GC FID - Quality Control**
**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3081211 - General Prep - Organics**
**Blank (3081211-BLK1)**

Prepared: 12-Aug-13 Analyzed: 13-Aug-13

GRO C6-C10	ND	10.0	mg/kg							
DRO >C10-C28	ND	10.0	mg/kg							
EXT DRO >C28-C35	ND	10.0	mg/kg							
Total TPH C6-C28	ND	10.0	mg/kg							
<i>Surrogate: 1-Chlorooctane</i>	47.4		mg/kg	50.0		94.8	65.2-140			
<i>Surrogate: 1-Chlorooctadecane</i>	53.4		mg/kg	50.0		107	63.6-154			

**LCS (3081211-BS1)**

Prepared: 12-Aug-13 Analyzed: 13-Aug-13

GRO C6-C10	176	10.0	mg/kg	200		88.0	66.4-124			
DRO >C10-C28	186	10.0	mg/kg	200		93.0	61.6-132			
Total TPH C6-C28	362	10.0	mg/kg	400		90.5	69.7-122			
<i>Surrogate: 1-Chlorooctane</i>	48.2		mg/kg	50.0		96.5	65.2-140			
<i>Surrogate: 1-Chlorooctadecane</i>	52.6		mg/kg	50.0		105	63.6-154			

**LCS Dup (3081211-BSD1)**

Prepared: 12-Aug-13 Analyzed: 13-Aug-13

GRO C6-C10	183	10.0	mg/kg	200		91.3	66.4-124	3.63	23.4	
DRO >C10-C28	192	10.0	mg/kg	200		95.8	61.6-132	2.90	23.1	
Total TPH C6-C28	374	10.0	mg/kg	400		93.5	69.7-122	3.26	20.6	
<i>Surrogate: 1-Chlorooctane</i>	50.5		mg/kg	50.0		101	65.2-140			
<i>Surrogate: 1-Chlorooctadecane</i>	55.1		mg/kg	50.0		110	63.6-154			

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 R T HICKS CONSULTANTS  
 901 RIO GRANDE BLVD SUITE F-142  
 ALBUQUERQUE, NM, 87104

 Project: JENNA COM  
 Project Number: NONE GIVEN  
 Project Manager: RANDALL HICKS  
 Fax To: NONE

 Reported:  
 19-Aug-13 15:57

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**
**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3081405 - Volatiles**
**Blank (3081405-BLK1)**

Prepared &amp; Analyzed: 14-Aug-13

Benzene	ND	0.050	mg/kg							
Toluene	ND	0.050	mg/kg							
Ethylbenzene	ND	0.050	mg/kg							
Total Xylenes	ND	0.150	mg/kg							
Total BTEX	ND	0.300	mg/kg							
<i>Surrogate: Dibromofluoromethane</i>	0.478		mg/kg	0.500		95.5	61.3-142			
<i>Surrogate: Toluene-d8</i>	0.513		mg/kg	0.500		103	71.3-129			
<i>Surrogate: 4-Bromofluorobenzene</i>	0.514		mg/kg	0.500		103	65.7-141			

**LCS (3081405-BS1)**

Prepared &amp; Analyzed: 14-Aug-13

Benzene	2.15	0.050	mg/kg	2.00		107	76.8-122			
Toluene	2.18	0.050	mg/kg	2.00		109	73.1-129			
Ethylbenzene	2.14	0.050	mg/kg	2.00		107	72.8-128			
m+p - Xylene	4.27	0.100	mg/kg				69.4-129			
o-Xylene	2.13	0.050	mg/kg	2.00		106	70.3-126			
Total Xylenes	6.39	0.150	mg/kg	6.00		107	72-127			
<i>Surrogate: Dibromofluoromethane</i>	0.472		mg/kg	0.500		94.4	61.3-142			
<i>Surrogate: Toluene-d8</i>	0.516		mg/kg	0.500		103	71.3-129			
<i>Surrogate: 4-Bromofluorobenzene</i>	0.513		mg/kg	0.500		103	65.7-141			

**LCS Dup (3081405-BSD1)**

Prepared &amp; Analyzed: 14-Aug-13

Benzene	2.21	0.050	mg/kg	2.00		111	76.8-122	3.13	18.7	
Toluene	2.26	0.050	mg/kg	2.00		113	73.1-129	3.47	19.4	
Ethylbenzene	2.22	0.050	mg/kg	2.00		111	72.8-128	3.45	21.8	
m+p - Xylene	4.41	0.100	mg/kg				69.4-129	3.39	25.3	
o-Xylene	2.19	0.050	mg/kg	2.00		109	70.3-126	2.79	23.6	
Total Xylenes	6.60	0.150	mg/kg	6.00		110	72-127	3.19	23.2	
<i>Surrogate: Dibromofluoromethane</i>	0.481		mg/kg	0.500		96.2	61.3-142			
<i>Surrogate: Toluene-d8</i>	0.512		mg/kg	0.500		102	71.3-129			
<i>Surrogate: 4-Bromofluorobenzene</i>	0.526		mg/kg	0.500		105	65.7-141			

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 R T HICKS CONSULTANTS  
 901 RIO GRANDE BLVD SUITE F-142  
 ALBUQUERQUE NM, 87104

 Project: JENNA COM  
 Project Number: NONE GIVEN  
 Project Manager: RANDALL HICKS  
 Fax To: NONE

 Reported:  
 19-Aug-13 15:57

**Organic Compounds - Quality Control**
**Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3081609 - Solvent Extraction**
**Blank (3081609-BLK1)**

Prepared &amp; Analyzed: 16-Aug-13

TPH 418.1                      ND                      100                      mg/kg

**LCS (3081609-BS1)**

Prepared &amp; Analyzed: 16-Aug-13

TPH 418.1                      5200                      100                      mg/kg                      5000                      104                      80-120

**LCS Dup (3081609-BSD1)**

Prepared &amp; Analyzed: 16-Aug-13

TPH 418.1                      5700                      100                      mg/kg                      5000                      114                      80-120                      9.17                      20

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



# CARDINAL Laboratories

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

### BILL TO

### ANALYSIS REQUEST

Company Name: <u>R. T. TICKETS CONSULTANTS</u>		P.O. #:	
Project Manager: <u>Randall Hdds</u>		Company:	
Address: <u>901 RIO GRANDE RD</u>		Attn:	
City: <u>ALBUQUERQUE</u>		Address:	
State: <u>NM</u> Zip: <u>87104</u>		City:	
Phone #: <u>505 238-9515 (505)</u> Fax #:		State:	
Project #: <u>Jenna Com</u>		Project Owner: <u>DAVID WILLIAMS</u>	
Project Name: <u>Jenna Com</u>		Phone #:	
Project Location: <u>EDDY Co</u>		Fax #:	
Sampler Name: <u>Randall Hdds</u>			

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						DATE	TIME	ANALYSIS
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:			
<u>H30187P</u>	<u>PILE TOP</u>	<u>C</u>	<u>2</u>									<u>Chloride</u>
	<u>PILE BOTTOM</u>	<u>C</u>	<u>2</u>									<u>BTEX</u>
												<u>GRO+DRO 8015 M</u>
												<u>TAT</u>

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Relinquished By: <u>Randall Hdds</u>	Date: <u>8/9/13</u>	Received By: <u>David Williams</u>
Relinquished By: <u>Randall Hdds</u>	Time: <u>7:00am</u>	Received By: <u>David Williams</u>
Relinquished By: _____	Date: _____	Received By: _____
Relinquished By: _____	Time: _____	Received By: _____

Delivered By: (Circle One)	Sample Condition	CHECKED BY: (Initials)
Sampler - UPS - Bus - Other:	Cool <input checked="" type="checkbox"/> Intact <input checked="" type="checkbox"/>	<u>David Williams</u>
	Yes <input type="checkbox"/> No <input type="checkbox"/>	

Phone Result:  Yes  No  Add'l Phone #:

Fax Result:  Yes  No  Add'l Fax #:

REMARKS:

\* Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326



August 15, 2013

RANDALL HICKS

R T HICKS CONSULTANTS

901 RIO GRANDE BLVD SUITE F-142

ALBUQUERQUE, NM 87104

RE: JENNA COM

Enclosed are the results of analyses for samples received by the laboratory on 08/09/13 7:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Celey D. Keene".

Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

 R T HICKS CONSULTANTS  
 RANDALL HICKS  
 901 RIO GRANDE BLVD SUITE F-142  
 ALBUQUERQUE NM, 87104  
 Fax To: NONE

Received:	08/09/2013	Sampling Date:	08/07/2013
Reported:	08/15/2013	Sampling Type:	Soil
Project Name:	JENNA COM	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Daniel Wade
Project Location:	EDDY COUNTY		

**Sample ID: A1 (H301877-01)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>4240</b>	16.0	08/14/2013	ND	432	108	400	3.77	

**Sample ID: A2 (H301877-02)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>6480</b>	16.0	08/13/2013	ND	432	108	400	3.64	

**Sample ID: A3 (H301877-03)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>1280</b>	16.0	08/13/2013	ND	432	108	400	3.64	

**Sample ID: B1 (H301877-04)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>4680</b>	16.0	08/13/2013	ND	432	108	400	3.64	

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 R T HICKS CONSULTANTS  
 RANDALL HICKS  
 901 RIO GRANDE BLVD SUITE F-142  
 ALBUQUERQUE NM, 87104  
 Fax To: NONE

 Received: 08/09/2013  
 Reported: 08/15/2013  
 Project Name: JENNA COM  
 Project Number: NONE GIVEN  
 Project Location: EDDY COUNTY

 Sampling Date: 08/07/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Daniel Wade

**Sample ID: B2 (H301877-05)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2600	16.0	08/13/2013	ND	432	108	400	3.64	

**Sample ID: B3 (H301877-06)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	304	16.0	08/13/2013	ND	432	108	400	3.64	

**Sample ID: C1 (H301877-07)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	2440	16.0	08/13/2013	ND	432	108	400	3.64	

**Sample ID: C2 (H301877-08)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1680	16.0	08/13/2013	ND	432	108	400	3.64	

**Sample ID: C3 (H301877-09)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	400	16.0	08/13/2013	ND	432	108	400	3.64	

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 R T HICKS CONSULTANTS  
 RANDALL HICKS  
 901 RIO GRANDE BLVD SUITE F-142  
 ALBUQUERQUE NM, 87104  
 Fax To: NONE

 Received: 08/09/2013  
 Reported: 08/15/2013  
 Project Name: JENNA COM  
 Project Number: NONE GIVEN  
 Project Location: EDDY COUNTY

 Sampling Date: 08/07/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Daniel Wade

**Sample ID: EAST OF ROAD (H301877-10)**
**Chloride, SM4500Cl-B**
**mg/kg**
**Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>1500</b>	16.0	08/13/2013	ND	432	108	400	3.64	

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report



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Celey D. Keene, Lab Director/Quality Manager

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

**CHAIN-OF-CUSTODY AND ANALYSIS REQUEST**

**BILL TO**

**ANALYSIS REQUEST**

Company Name: <u>R.T. Hicks CONSULTANTS</u>		P.O. #:				
Project Manager: <u>KANDACE HIGGS</u>		Company: <u>R.T. Hicks</u>				
Address:		Attn: <u>Randy Hicks</u>				
City:	State:	Address: <u>901 Rio Grande NW</u>				
Phone #:	Fax #:	City: <u>Albuquerque</u>				
Project #:	Project Owner: <u>CLAYTON WILLIAMS</u>	State: <u>Zip: 87104</u>				
Project Name: <u>Jenna Con</u>	City: <u>Albuquerque</u>	Phone #: <u>238-9515(505)</u>				
Project Location: <u>EDDY CO</u>	State: <u>Zip: 87104</u>	Fax #: <u>N/A</u>				
Sampler Name: <u>RNT</u>	Phone #: <u>238-9515(505)</u>	PRESERV: <u>N/A</u>				
FOR LAB USE ONLY	Matrix:	SAMPLING				
Lab I.D. # <u>301871</u>	Sample I.D.	(G)RAB OR (C)OMP.	DATE	TIME	Chloride	
		# CONTAINERS				
		GROUNDWATER				
		WASTEWATER				
		SOIL				
		OIL				
		SLUDGE				
		OTHER:				
		ACID/BASE:				
		ICE / COOL				
		OTHER:				
1	A1	C	1	8/7/13	1401	✓
2	A2	C	1	1462		✓
3	A3	C	1	1403		✓
4	B1	C	1	1404		✓
5	B2	C	1	1405		✓
6	B3	C	1	1406		✓
7	C1	C	1	1407		✓
8	C2	C	1	1408		✓
9	C3	C	1	1409		✓
10	EAST OF ROAD	C	1	1501		✓

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Relinquished By: [Signature] Date: 8/9/13 Time: 9:00a

Received By: [Signature] Date: \_\_\_\_\_ Time: \_\_\_\_\_

Relinquished By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

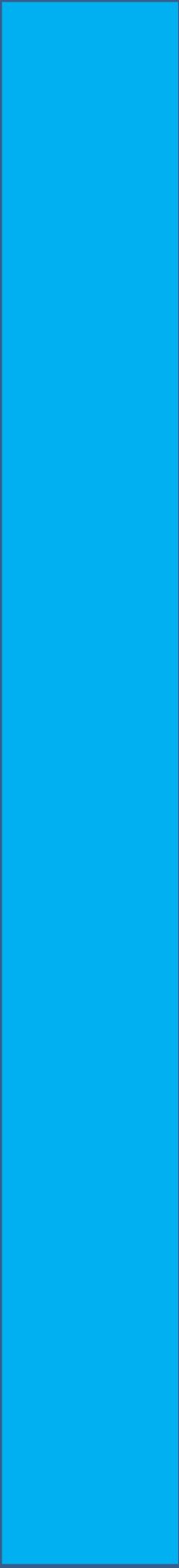
Received By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Delivered By: (Circle One)  UPS  Bus  Other: \_\_\_\_\_

Sample Condition: Cool  Intact  Yes  No

CHECKED BY: (Initials) [Signature]

REMARKS: INVOICE & RESULTS VIA EMAIL



## **Appendix D**

**Project: JennaOn-SiteBioremediation**

Path: P:\Clayton Williams\JennaCom\Correspond\JennaOn-SiteBioremediation.ami

Date: 9/16/2013

Units: English (inches)

Climate: Arid Hot (NM/W.Texas, Hobbs)

Plant Uptake Trigger: 1% Input Concentration

Groundwater Characteristics

Background Cl Concentration in Aquifer: 100 [mg/L]

Aquifer porosity: 0.3 [-]

Groundwater Table Depth: 70 [ft]

Aquifer Thickness: 20 [ft]

Slope of Water Table: 0.004 [-]

Hydraulic Conductivity: 20 [ft/d]

Groundwater Flux: 1.6 [ft<sup>2</sup>/d]

Source Characteristics

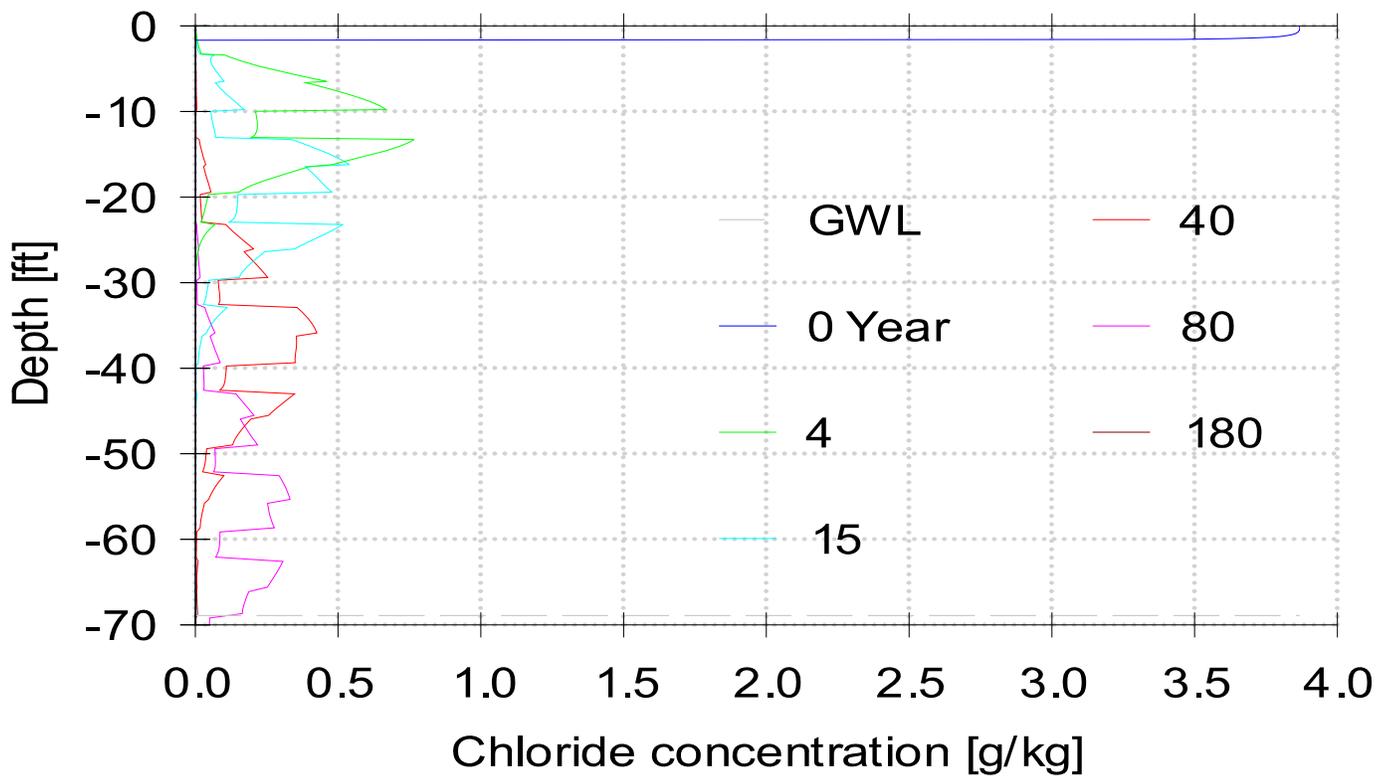
Chloride Load:: 3.5 [kg/m<sup>2</sup>]

Max. length of the spill in direction of GW flow:: 60 [ft]

Soil Profiles

Surface Layer: Medium Sand

Soil Profile: P7 - Sandy Clay (1) + Caliche (1) + Medium Sand (1)



Max Concentration 148.958 [mg/L] at time 124.332 Year

