

1R - 425-103

# WORKPLANS

Date:

5-31-13

Rice Environmental Consulting & Safety

P.O. Box 2948, Hobbs, NM 88241  
Phone 575.393.2967

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RETURN RECEIPT NO. 7007 2560 0003 0320 5563

2013 JUN -5 P 2: 10

**May 31<sup>st</sup>, 2013**

**Mr. Edward Hansen**

New Mexico Energy, Minerals, & Natural Resources  
Oil Conservation Division, Environmental Bureau  
1220 S. St. Francis Drive  
Santa Fe, New Mexico 87505

**RE: Investigation and Characterization Plan (ICP) Report and Corrective  
Action Plan (CAP)  
Rice Operating Company – Vacuum SWD System  
Vacuum C-36 EOL (1R425-103): UL/C sec. 36 T17S R34E**

Mr. Hansen:

RICE Operating Company (ROC) has retained Rice Environmental Consulting and Safety (RECS) to address potential environmental concerns at the above-referenced site in the abandoned Vacuum Salt Water Disposal (SWD) system. ROC is the service provider (agent) for the Vacuum SWD System and has no ownership of any portion of the pipeline, well, or facility. The system is owned by a consortium of oil producers, System Parties, who provide all operating capital on a percentage ownership/usage basis.

**Background and Previous Work**

The site is located approximately 0.8 miles southwest of Buckeye, New Mexico in Unit C, Section 36, T17S, R34E as shown on the Site Location Map (Figure 1). NM OSE records indicate that groundwater will likely be encountered at a depth of approximately 107 +/- feet.

In 2010, ROC initiated work on the former Vacuum C-36 EOL junction box. A backhoe was used to collect soil samples at regular intervals creating a 5 x 3 x 4-ft deep excavation. The backhoe was unable to excavate the site deeper than 4 ft below ground surface (bgs) due to extremely compacted subsoil material. The excavated soil was properly disposed of at a NMOCD approved facility, and clean, imported soil was used to backfill the excavation to ground surface. On October 11<sup>th</sup>, 2010, the site was seeded with a blend of native vegetation.

To further investigate the depth of chloride contamination at the site, a soil bore was initiated on July 25<sup>th</sup>, 2011 at the source of the former junction box. Soil samples were field tested for chlorides and hydrocarbons to a depth of 12 ft bgs. Laboratory analysis of the 12 ft sample resulted in a chloride concentration of 1,880 mg/kg and a gasoline range

organics (GRO) and diesel range organics (DRO) concentration of non-detect. The bore hole was plugged in total with bentonite to the ground surface.

NMOCD was notified of potential groundwater impact on April 10<sup>th</sup>, 2012, and a junction box disclosure report was submitted to NMOCD with all the 2011 junction box closures and disclosures.

On February 20<sup>th</sup>, 2013, ROC submitted an Investigation and Characterization Plan (ICP) to NMOCD which was approved on March 4<sup>th</sup>, 2013. As part of the ICP, RECS personnel were on site April 8<sup>th</sup> and 9<sup>th</sup>, 2013 to install soil bores. A total of five soil bores (SB-2 through SB-6) were advanced and four surface samples were taken at this site (Figure 2). As the bores were advanced, samples were taken at regular intervals and field tested for chlorides and hydrocarbons. Representative samples from each bore were taken to a commercial laboratory for analysis of chlorides and TPH (Appendix A). SB-2 returned laboratory chloride results of 1,740 mg/kg at 15 ft bgs, which decreased to 48 mg/kg at 30 ft bgs. In SB-3, laboratory chloride readings returned results of 2,600 mg/kg at 5 ft bgs, which decreased to 64 mg/kg at 30 ft bgs. In SB-4, laboratory chloride reading returned results of 4,040 mg/kg at the surface, which decreased to 1,040 mg/kg at 10 ft bgs and 64 mg/kg at 25 ft bgs. In SB-5, laboratory chloride readings returned a result of 1,920 mg/kg at 10 ft bgs, which decreased to 96 mg/kg at 30 ft bgs. In SB-6, laboratory chloride readings returned a result of 1,730 mg/kg at 20 ft bgs, which decreased to 48 mg/kg at 35 ft bgs. GRO and DRO readings in all bores at all depths were non-detect.

Two surface samples were taken outside SB-3, west, and two outside of SB-4, south. These samples were field tested for chlorides and hydrocarbons and returned high chloride readings and very low hydrocarbon readings.

### **Corrective Action Plan**

The site surrounds the base of an old heater-treater which indicates the presence of an old tank battery at the site. A series of historical photos were created of the site and from the photos, particularly the 1978 historical photo, it is evident that the C-36 junction box sat inside a tank battery (Appendix B). There are also numerous non-ROC steel lines located south of the site, and a non-ROC poly line located west of the site. This suggests that the elevated chloride concentrations observed in the surface samples were contributed from past operations of the non-ROC facility and not the former junction box.

From the analysis of the soil bore data, residual chlorides and TPH at the site have not affected groundwater. In order to protect groundwater from residual soil chlorides, RECS recommends that ROC install a 20-mil reinforced poly liner at the site with dimensions of 30 ft x 39 ft at a depth of 3.5 ft bgs (Figure 2). The junction box investigation, conducted in 2010, showed an extremely hard rock layer to be located at approximately 4 ft bgs. Lithology description of the soil samples collected while drilling soil bores also showed a caliche/sandstone layer beginning at a depth of approximately 4 ft bgs. The liner will inhibit the downward migration of residual constituents to

groundwater. The soils placed above the liner will have a laboratory chloride reading no greater than 500 mg/kg and a field PID measurement below 100 ppm. Excavated soil will be evaluated for use as backfill and any soil requiring disposal will be properly disposed of at a NMOCD approved facility. The soils over and surrounding the site will then be prepared with soil amendments as necessary and seeded with a native vegetative mix. Vegetation above the liner will also provide a natural infiltration barrier for the site since plants capture water through their roots thereby reducing the volume of water moving through the vadose zone to groundwater.

Once the CAP work is completed by installing the 20-mil reinforced poly liner and seeding the site, ROC will submit a written report that will include a request for 'remediation termination' of the regulatory file.

RECS appreciates the opportunity to work with you on this project. Please call Hack Conder at (575) 393-9174 or me if you have any questions or wish to discuss the site.

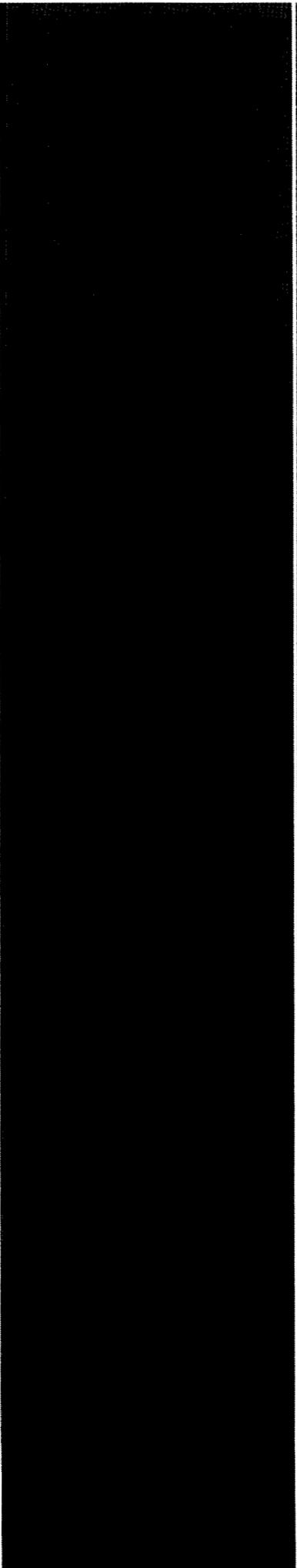
Sincerely,



Lara Weinheimer  
Project Scientist  
RECS  
(575) 441-0431

Attachments:

- Figure 1 – Site Location Map
- Figure 2 – Soil Bore Installation Map and Proposed Liner
- Appendix A – Soil Bore Installation Documentation
- Appendix B – Historical Aerial Photos



# Figures

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 2948, Hobbs, NM 88241  
Phone 575.393.2967

# Site Location Map



## Vacuum C-36 EOL

Legals: UL/ C, Section 36,  
T17S, R34E  
Lea County, NM

NMOCD Case #: 1R425-103

## Figure 1



0 295 590 1:180  
Feet

Drawing date: 2-8-13

# Soil Bore Installation and Proposed Liner

SB-1					
Depth	Cl-	PID	LAB	Cl-	GRO DRO
1'	121	1.2			
2'	266	1.7			
3'	296	3.8			
4'	1282	10			
5'	1181	5.9			
6'	1244	5.4			
7'	677	2.7			
8'	1795	1.8			
9'	1253	3.8			
10'	947	2.8			
11'	1016	1.8			
12'	1651	0.9	1880	<10	<10

SB-3					
Depth	Cl-	PID	Lab	Cl-	DRO GRO
SS	1846	1.2			
5'	1907	2.5	2600	<10.0	<10.0
10'	1772	2.5			
15'	1302	1.5			
20'	926	1.1			
25'	317	1.1			
30'	147	1.0	64.0	<10.0	<10.0

SB-5					
Depth	Cl-	PID	Lab	Cl-	GRO DRO
SS	248	0.3			
5'	339	1.3			
10'	1650	1.7	1920	<10.0	<10.0
15'	1460	1.9			
20'	706	1.5			
25'	310	1.2			
30'	168	1.6	96.0	<10.0	<10.0

SB-2					
Depth	Cl-	PID	LAB	Cl-	GRO DRO
SS	1002	1.4			
5'	233	1.6			
10'	1177	4.3			
15'	1718	5.2	1740	<10.0	<10.0
20'	1285	3.8			
25'	494	1.3			
30'	149	1.2	48.0	<10.0	<10.0

SB-4					
Depth	Cl-	PID	Lab	Cl-	GRO DRO
SS	3949	1.0	4040	<10.0	<10.0
5'	476	1.5			
10'	762	2.5	1040	<10.0	<10.0
15'	677	2.6			
20'	410	1.8			
25'	154	2.3	64.0	<10.0	<10.0

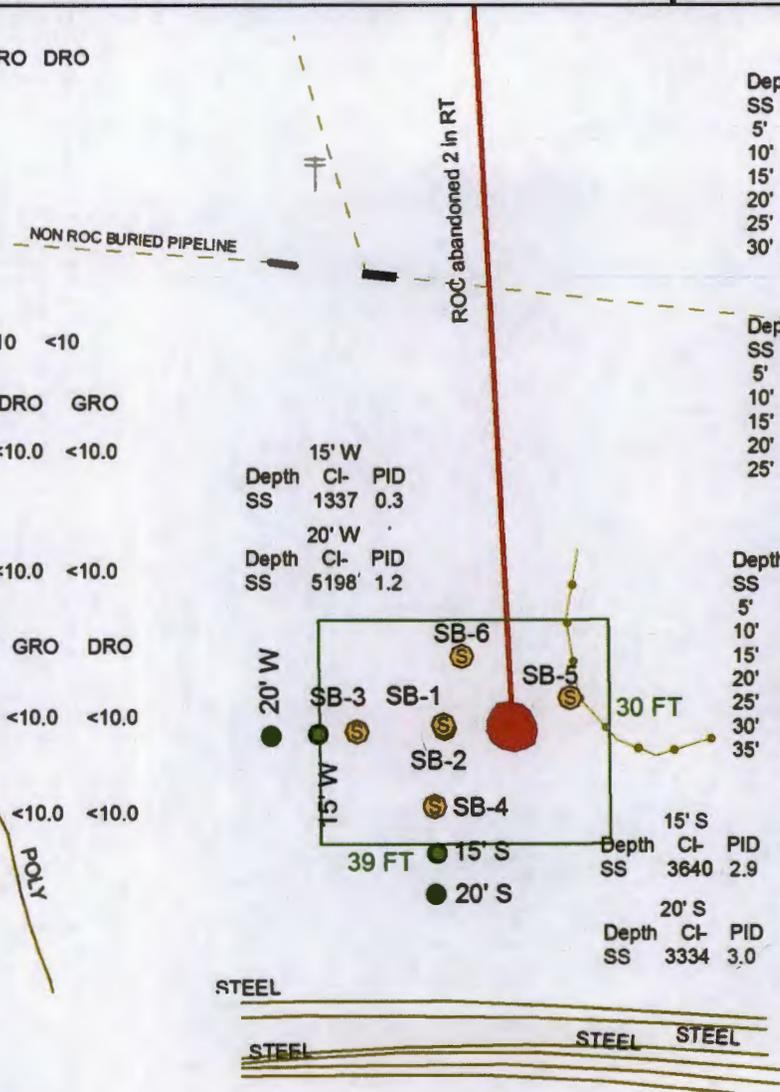
SB-6					
Depth	Cl-	PID	Lab	Cl-	GRO DRO
SS	205	0.4			
5'	760	2			
10'	1350	1.7			
15'	1438	1.8			
20'	1619	2	1730	<10.0	<10.0
25'	1098	1.9			
30'	288	1.9			
35'	149	1.8	48.0	<10.0	<10.0

15' W		
Depth	Cl-	PID
SS	1337	0.3

20' W		
Depth	Cl-	PID
SS	5198	1.2

15' S		
Depth	Cl-	PID
SS	3640	2.9

20' S		
Depth	Cl-	PID
SS	3334	3.0



## Legend

- ELECTRIC POLE
- VACUUM SOIL BORES
- VACUUM REMOVED BOX
- VACUUM MARKER PLATES
- BURIED PIPELINE
- RISER
- RISER PIPE NOT CONNECTED
- LINEFINDER HIT
- SURFACE LINES
- PROPOSED 20-MIL POLY LINER AT 3.5 FT
- VACUUM ABANDONED LINE
- TREATER BASE
- SURFACE SAMPLE

DGW: 107'

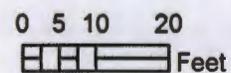


## Vacuum C-36 EOL

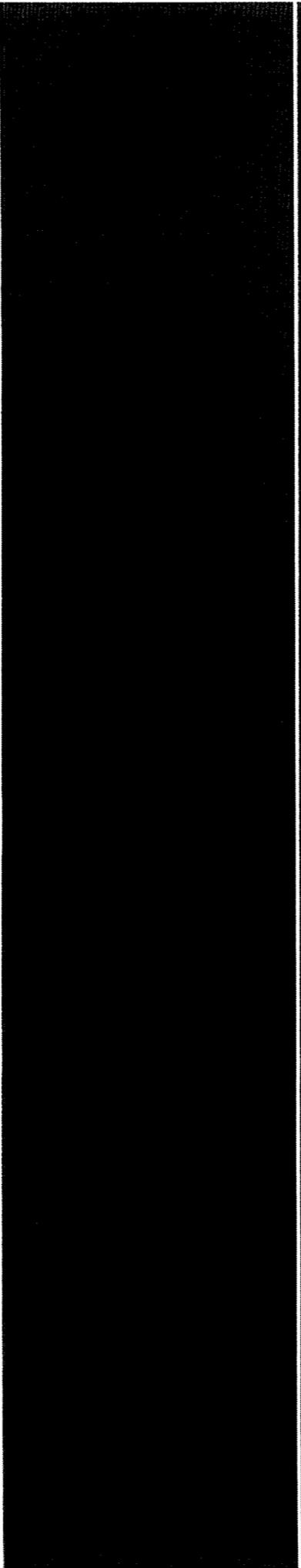
Legals: UL/ C, Section 36,  
T17S, R34E  
Lea County, NM

NMOCD Case #: 1R425-103

## Figure 2



Drawing date: 5-17-13  
Drawn by: LS

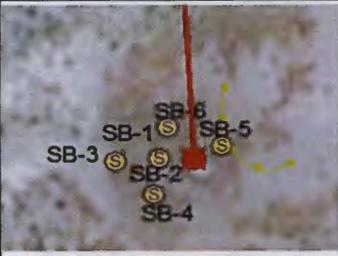


# Appendix A

Soil Bore Installation Documentation

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 2948 Hobbs, NM 88241  
Phone 575.393.2967

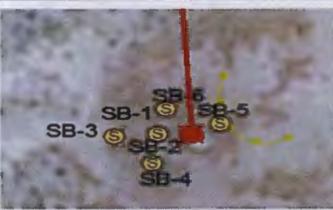


<b>Logger:</b>	Kyle Norman		
<b>Driller:</b>	Harrison & Cooper, Inc.		
<b>Drilling Method:</b>	Air rotary		
<b>Start Date:</b>	4/9/2013		
<b>End Date:</b>	4/9/2013		

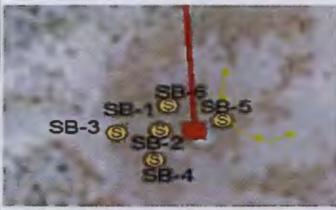
<b>Project Name:</b>	Vacuum C-36 EOL	<b>Well ID:</b>	SB-3
<b>Project Consultant:</b> RECS		<b>Location:</b> UL/C, Sec. 36, T17S, R34E	
<b>Comments:</b> SB-3 is located 21 ft west of the former junction box site. All samples were from cuttings.		<b>Lat:</b> 32°47'47.378"N	<b>County:</b> Lea
<b>DRAFTED BY:</b> L. Peña		<b>Long:</b> 103°31'0.341"W	<b>State:</b> NM
TD = 40 ft		GW = 107 ft	

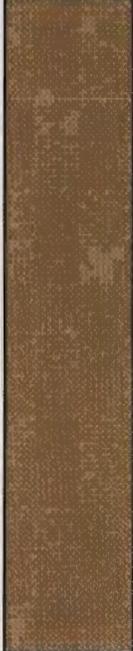
Depth	Field	LAB		PID	Description	Lithology	Well Construction
	Cl <sup>-</sup> (mg/kg)	Cl <sup>-</sup> (mg/kg)	TPH (mg/kg)				
SS	1,846			1.2	6" Brown Sand		
5 ft	1,907	2,600	GRO <10 DRO <10	2.5	Caliche/Sandstone		
10 ft	1,772			2.5			
15 ft	1,302			1.5			
20 ft	926			1.1	Caliche		bentonite seal
25 ft	317			1.1			
30 ft	147	64	GRO <10 DRO <10	1.0			



<b>Logger:</b>	Kyle Norman		
<b>Driller:</b>	Harrison & Cooper, Inc.		
<b>Drilling Method:</b>	Air Rotary		
<b>Start Date:</b>	4/9/2013		
<b>End Date:</b>	4/9/2013		
<b>Project Name:</b> Vacuum C-36 EOL		<b>Well ID:</b> SB-5	
<b>Project Consultant:</b> RECS		<b>Location:</b> UL/C, Sec. 36, T17S, R34E	
Comments: SB-5 is located 10 ft east of the former junction box. All samples were from cuttings.		<b>Lat:</b> 32°47'47.415"N	
DRAFTED BY: L. Peña		<b>County:</b> Lea	
TD = 30 ft		<b>State:</b> NM	
GW = 107 ft		<b>Long:</b> 103°30'59.998"W	

Depth	Field	LAB		PID (ppm)	Description	Lithology	Well Construction
	Cl <sup>-</sup> (mg/kg)	Cl <sup>-</sup> (mg/kg)	TPH (mg/kg)				
SS	248			0.3	6" Top Soil		
5 ft	339			1.3	Caliche/Sandstone		
10 ft	1,650	1,920	GRO <10 DRO <10	1.7	Caliche		
15 ft	1,460			1.9	Tan Sand		bentonite seal
20 ft	706			1.5			
25 ft	310			1.2			
30 ft	168	96	GRO <10 DRO <10	1.6			

<b>Logger:</b>	Kyle Norman		
<b>Driller:</b>	Harrison & Cooper, Inc.		
<b>Drilling Method:</b>	Air Rotary		
<b>Start Date:</b>	4/9/2013		
<b>End Date:</b>	4/9/2013		
<b>Project Name:</b> Vacuum C-36 EOL		<b>Well ID:</b> SB-6	
<b>Project Consultant:</b> RECS		<b>Location:</b> UL/C, Sec. 36, T17S, R34E	
Comments: SB-6 is located 10 ft north of the former junction box. All samples were from cuttings.		<b>Lat:</b> 32°47'47.479"N	
DRAFTED BY: L. Peña		<b>County:</b> Lea	
TD = 35 ft		<b>State:</b> NM	
GW = 107 ft		<b>Long:</b> 103°31'0.169"W	

Depth	Field	LAB		PID (ppm)	Description	Lithology	Well Construction
	CI (mg/kg)	CI (mg/kg)	TPH (mg/kg)				
SS	205			0.4	6" Top Soil		
5 ft	760			2.0	Caliche/Sand Stone		
10 ft	1,350			1.7	Caliche		
15 ft	1,438			1.8	Tan Sand		
20 ft	1,619	1,730	GRO <10 DRO <10	2.0			
25 ft	1,098			1.9			
30 ft	288			1.9			
35 ft	149	48	GRO <10 DRO <10	1.8			



April 11, 2013

Hack Conder  
Rice Operating Company  
112 W. Taylor  
Hobbs, NM 88240

RE: VACUUM C-36 EOL (17/34)

Enclosed are the results of analyses for samples received by the laboratory on 04/08/13 14:05.

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 black ink that reads "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene  
Lab Director/Quality Manager

**Analytical Results For:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	04/08/2013	Sampling Date:	04/08/2013
Reported:	04/11/2013	Sampling Type:	Soil
Project Name:	VACUUM C-36 EOL (17/34)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 2 @ 15' (H300835-01)**

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>1740</b>	16.0	04/10/2013	ND	448	112	400	0.00		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	04/10/2013	ND	211	105	200	4.47		
DRO >C10-C28	<10.0	10.0	04/10/2013	ND	208	104	200	4.21		
Surrogate: 1-Chlorooctane	94.6 %	65.2-140								
Surrogate: 1-Chlorooctadecane	114 %	63.6-154								

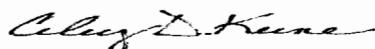
**Sample ID: SB 2 @ 30' (H300835-02)**

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>48.0</b>	16.0	04/10/2013	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	04/10/2013	ND	211	105	200	4.47		
DRO >C10-C28	<10.0	10.0	04/10/2013	ND	208	104	200	4.21		
Surrogate: 1-Chlorooctane	92.7 %	65.2-140								
Surrogate: 1-Chlorooctadecane	112 %	63.6-154								

Cardinal Laboratories

\*=Accredited Analyte

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 client for 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 thirty (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 the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

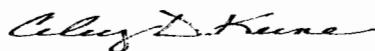
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received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

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Cardinal Laboratories

\*=Accredited Analyte

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 client for 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 thirty (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 the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



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Celey D. Keene, Lab Director/Quality Manager



April 12, 2013

Hack Conder  
Rice Operating Company  
112 W. Taylor  
Hobbs, NM 88240

RE: VACUUM C-36 EOL (17/34)

Enclosed are the results of analyses for samples received by the laboratory on 04/09/13 16:15.

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:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	04/09/2013	Sampling Date:	04/09/2013
Reported:	04/12/2013	Sampling Type:	Soil
Project Name:	VACUUM C-36 EOL (17/34)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 3 @ 5' (H300849-01)**

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>2600</b>	16.0	04/11/2013	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	04/11/2013	ND	214	107	200	1.94		
DRO >C10-C28	<10.0	10.0	04/11/2013	ND	210	105	200	3.26		
Surrogate: 1-Chlorooctane	83.0 %	65.2-140								
Surrogate: 1-Chlorooctadecane	103 %	63.6-154								

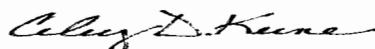
**Sample ID: SB 3 @ 30' (H300849-02)**

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>64.0</b>	16.0	04/11/2013	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	04/11/2013	ND	214	107	200	1.94		
DRO >C10-C28	<10.0	10.0	04/11/2013	ND	210	105	200	3.26		
Surrogate: 1-Chlorooctane	81.2 %	65.2-140								
Surrogate: 1-Chlorooctadecane	101 %	63.6-154								

Cardinal Laboratories

\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	04/09/2013	Sampling Date:	04/09/2013
Reported:	04/12/2013	Sampling Type:	Soil
Project Name:	VACUUM C-36 EOL (17/34)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 4 @ SURFACE (H300849-03)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: DW						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>4040</b>	16.0	04/11/2013	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	04/11/2013	ND	214	107	200	1.94		
DRO >C10-C28	<10.0	10.0	04/11/2013	ND	210	105	200	3.26		

Surrogate: 1-Chlorooctane 76.6 % 65.2-140

Surrogate: 1-Chlorooctadecane 102 % 63.6-154

**Sample ID: SB 4 @ 10' (H300849-04)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: DW						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>1040</b>	16.0	04/11/2013	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	04/11/2013	ND	214	107	200	1.94		
DRO >C10-C28	<10.0	10.0	04/11/2013	ND	210	105	200	3.26		

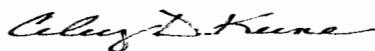
Surrogate: 1-Chlorooctane 75.9 % 65.2-140

Surrogate: 1-Chlorooctadecane 97.8 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	04/09/2013	Sampling Date:	04/09/2013
Reported:	04/12/2013	Sampling Type:	Soil
Project Name:	VACUUM C-36 EOL (17/34)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 4 @ 25' (H300849-05)**

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>64.0</b>	16.0	04/11/2013	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	04/11/2013	ND	214	107	200	1.94		
DRO >C10-C28	<10.0	10.0	04/11/2013	ND	210	105	200	3.26		
<i>Surrogate: 1-Chlorooctane</i>		<i>79.0 %</i>	<i>65.2-140</i>							
<i>Surrogate: 1-Chlorooctadecane</i>		<i>104 %</i>	<i>63.6-154</i>							

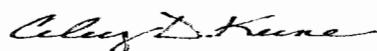
**Sample ID: SB 5 @ 10' (H300849-06)**

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>1920</b>	16.0	04/11/2013	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	04/11/2013	ND	214	107	200	1.94		
DRO >C10-C28	<10.0	10.0	04/11/2013	ND	210	105	200	3.26		
<i>Surrogate: 1-Chlorooctane</i>		<i>82.7 %</i>	<i>65.2-140</i>							
<i>Surrogate: 1-Chlorooctadecane</i>		<i>106 %</i>	<i>63.6-154</i>							

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	04/09/2013	Sampling Date:	04/09/2013
Reported:	04/12/2013	Sampling Type:	Soil
Project Name:	VACUUM C-36 EOL (17/34)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SB 5 @ 30' (H300849-07)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: DW						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>96.0</b>	16.0	04/11/2013	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	04/11/2013	ND	214	107	200	1.94		
DRO >C10-C28	<10.0	10.0	04/11/2013	ND	210	105	200	3.26		
<i>Surrogate: 1-Chlorooctane</i>		<i>82.4 %</i>	<i>65.2-140</i>							
<i>Surrogate: 1-Chlorooctadecane</i>		<i>107 %</i>	<i>63.6-154</i>							

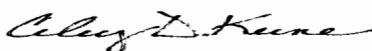
**Sample ID: SB 6 @ 20' (H300849-08)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: DW						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>1730</b>	16.0	04/11/2013	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	04/11/2013	ND	214	107	200	1.94		
DRO >C10-C28	<10.0	10.0	04/11/2013	ND	210	105	200	3.26		
<i>Surrogate: 1-Chlorooctane</i>		<i>79.9 %</i>	<i>65.2-140</i>							
<i>Surrogate: 1-Chlorooctadecane</i>		<i>104 %</i>	<i>63.6-154</i>							

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**Analytical Results For:**

 Rice Operating Company  
 Hack Conder  
 112 W. Taylor  
 Hobbs NM, 88240  
 Fax To: (575) 397-1471

Received:	04/09/2013	Sampling Date:	04/09/2013
Reported:	04/12/2013	Sampling Type:	Soil
Project Name:	VACUUM C-36 EOL (17/34)	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

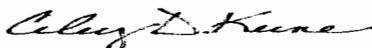
**Sample ID: SB 6 @ 35' (H300849-09)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: DW						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>48.0</b>	16.0	04/11/2013	ND	432	108	400	3.77		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	04/11/2013	ND	214	107	200	1.94		
DRO >C10-C28	<10.0	10.0	04/11/2013	ND	210	105	200	3.26		
Surrogate: 1-Chlorooctane	76.9 %	65.2-140								
Surrogate: 1-Chlorooctadecane	99.9 %	63.6-154								

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

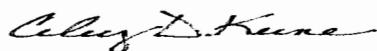
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received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

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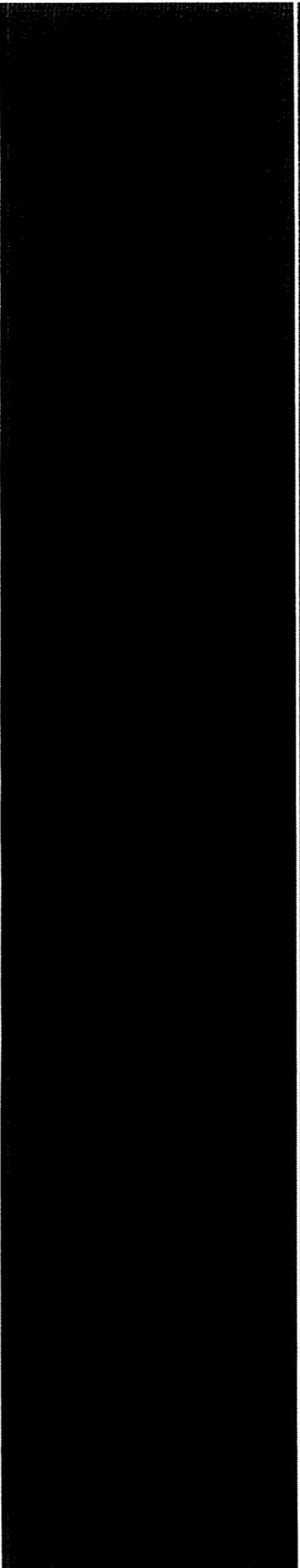
PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (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 the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



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Celey D. Keene, Lab Director/Quality Manager



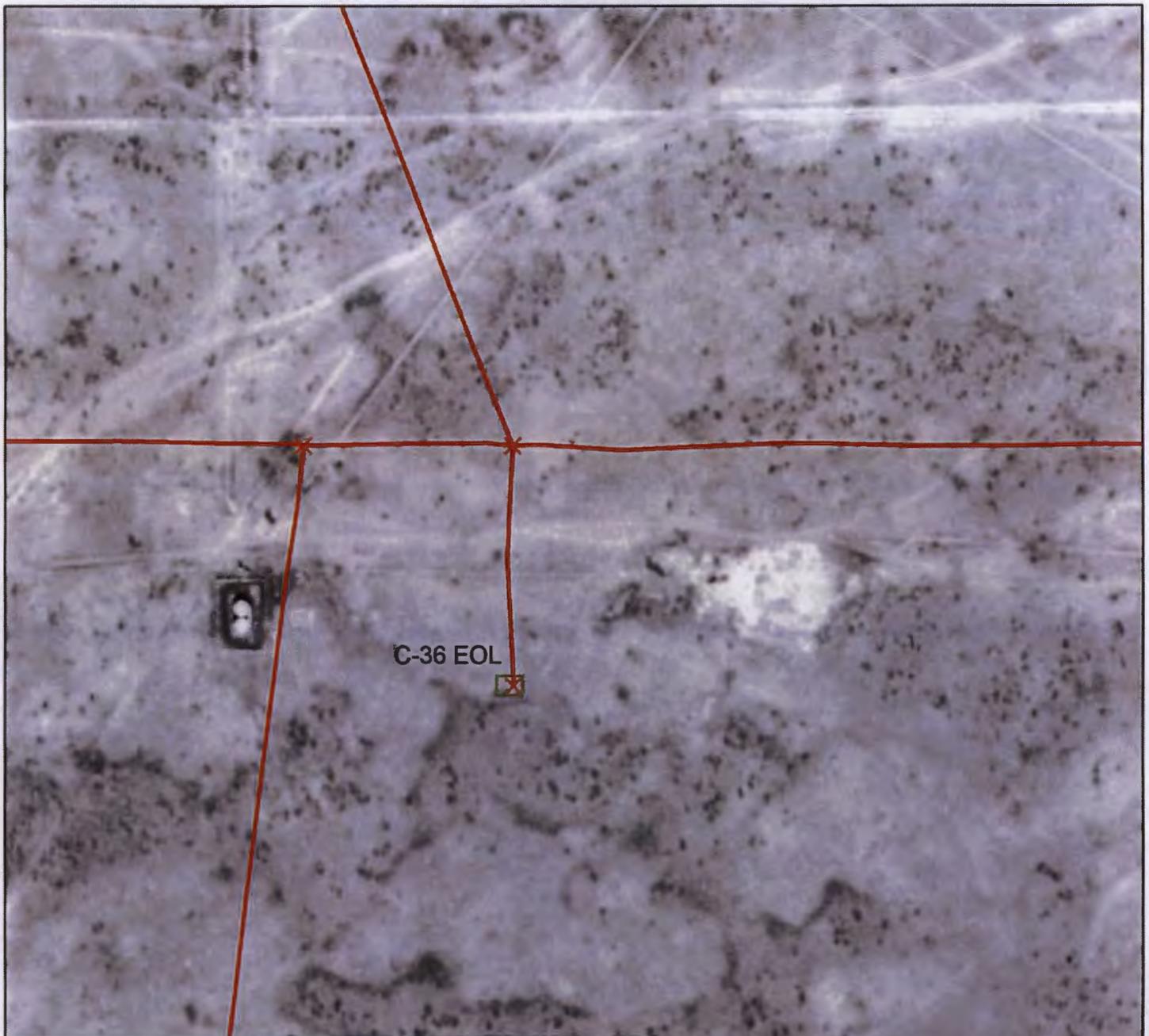


# Appendix B

Historical Aerial Photos

**RICE Environmental Consulting and Safety (RECS)**  
P.O. Box 2948 Hobbs, NM 88241  
Phone 575.393.2967

1949



**Legend**

-  ROC REMOVED BOXES
-  ROC ABANDONED LINES
-  PROPOSED 30' x 39' 20-MIL POLY LINER AT 3.5 FT

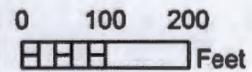
DGW = 107 ft



**Vacuum C-36 EOL**

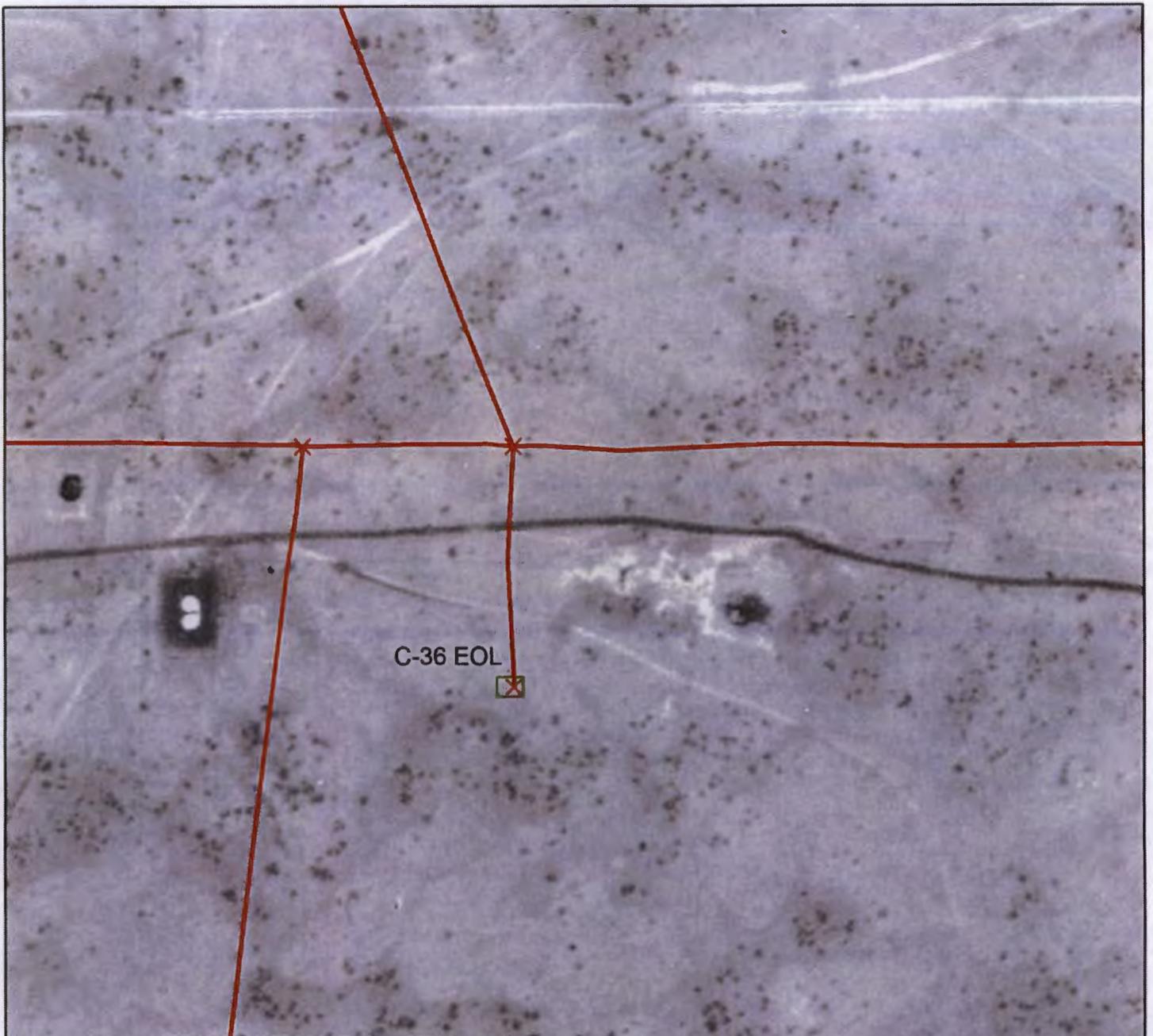
Legals: UL/ C, Section 36,  
T17S, R34E  
Lea County, NM

NMOCD Case #: 1R425-103



Drawing date: 5/22/2013  
Drafted by: L. Weinheimer

1955



**Legend**

-  ROC REMOVED BOXES
-  ROC ABANDONED LINES
-  PROPOSED 30' x 39' 20-MIL POLY LINER AT 3.5 FT

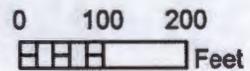
DGW = 107 ft



**Vacuum C-36 EOL**

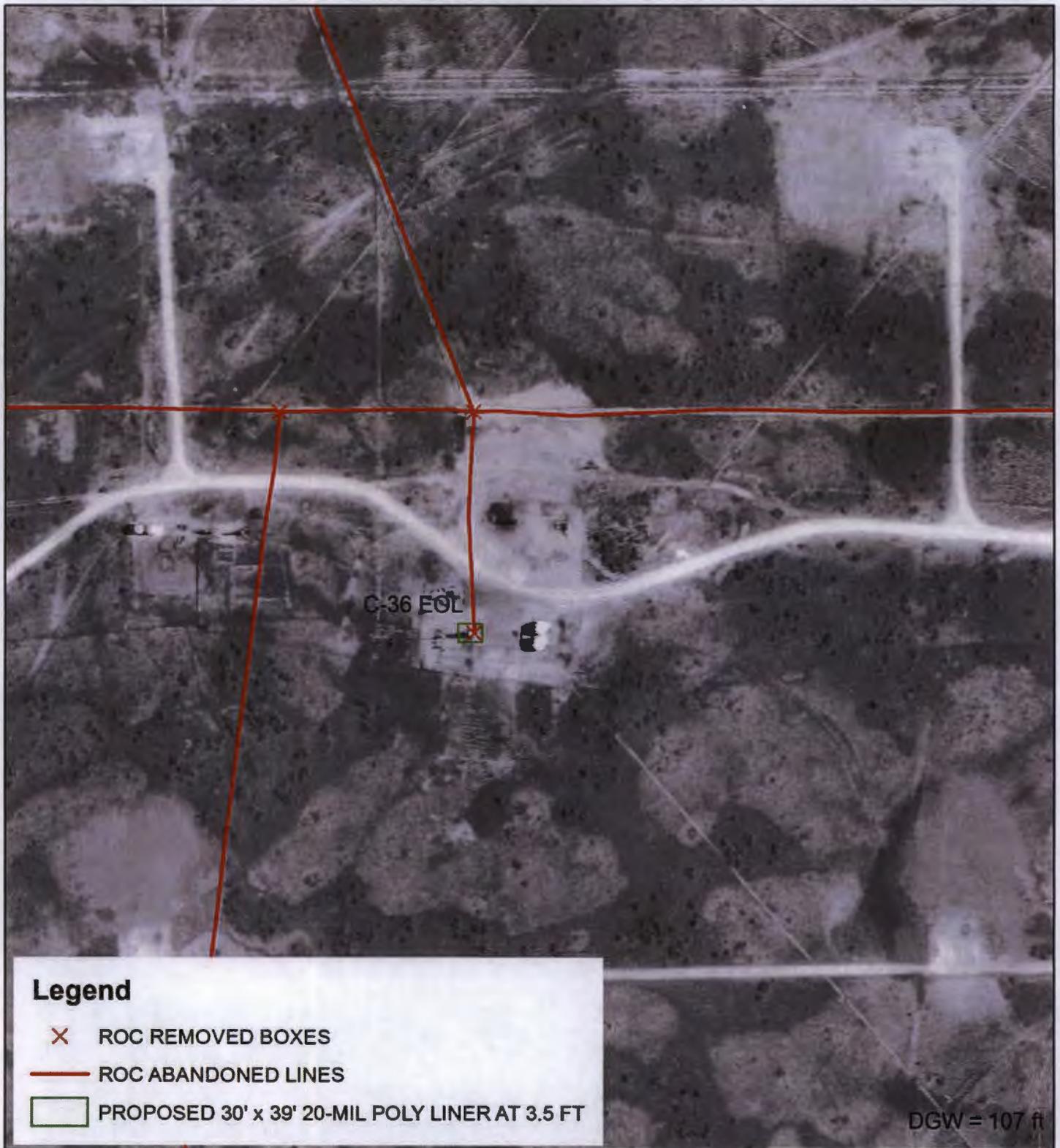
Legals: UL/ C, Section 36,  
T17S, R34E  
Lea County, NM

NMOCD Case #: 1R425-103



Drawing date: 5/22/2013  
Drafted by: L. Weinheimer

1978



**Legend**

-  ROC REMOVED BOXES
-  ROC ABANDONED LINES
-  PROPOSED 30' x 39' 20-MIL POLY LINER AT 3.5 FT

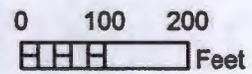
DGW = 107 ft



**Vacuum C-36 EOL**

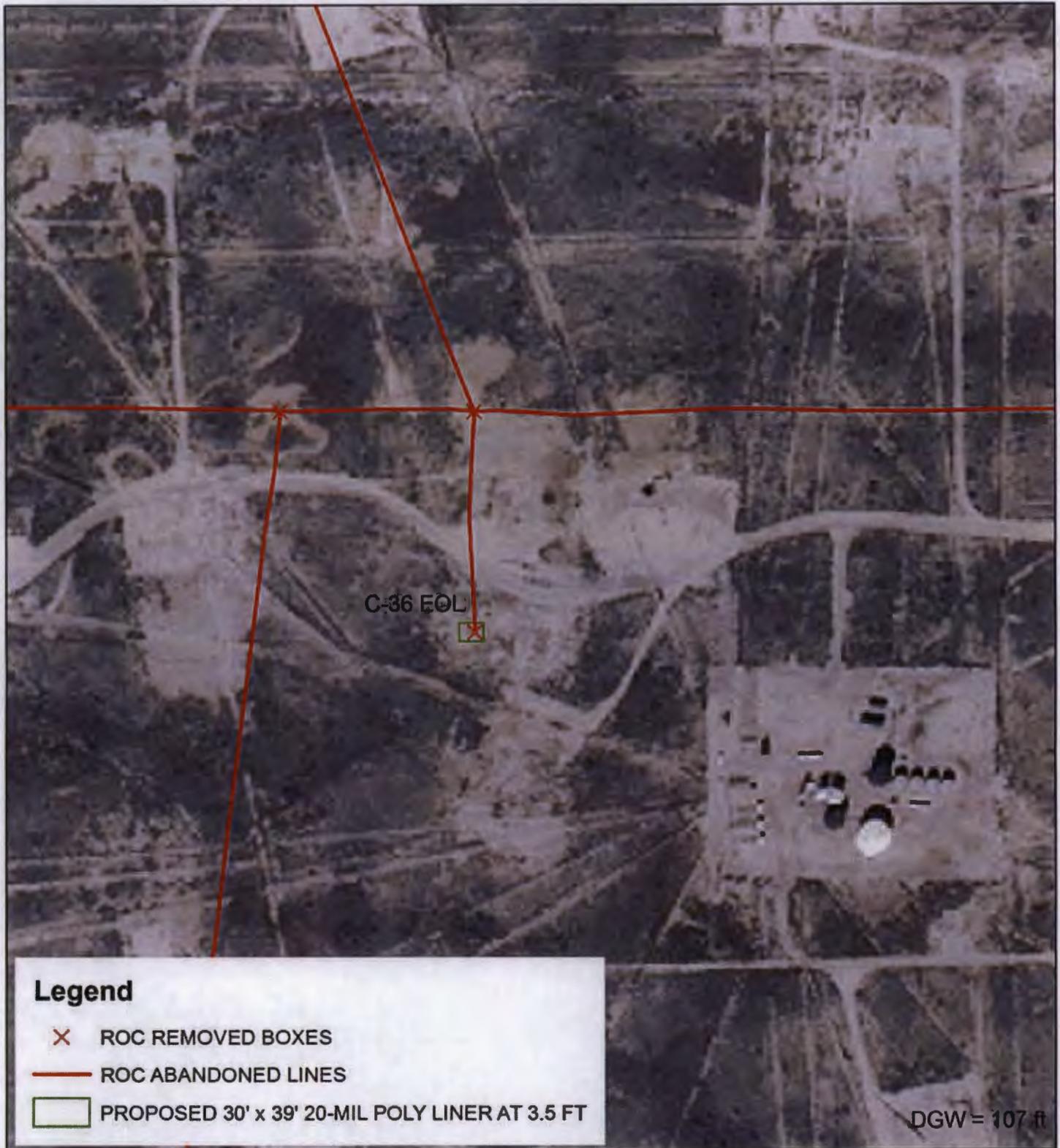
Legals: UL/ C, Section 36,  
T17S, R34E  
Lea County, NM

NMOCD Case #: 1R425-103



Drawing date: 5/22/2013  
Drafted by: L. Weinheimer

2004



**Legend**

-  ROC REMOVED BOXES
-  ROC ABANDONED LINES
-  PROPOSED 30' x 39' 20-MIL POLY LINER AT 3.5 FT

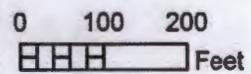
DGW = 107 ft



**Vacuum C-36 EOL**

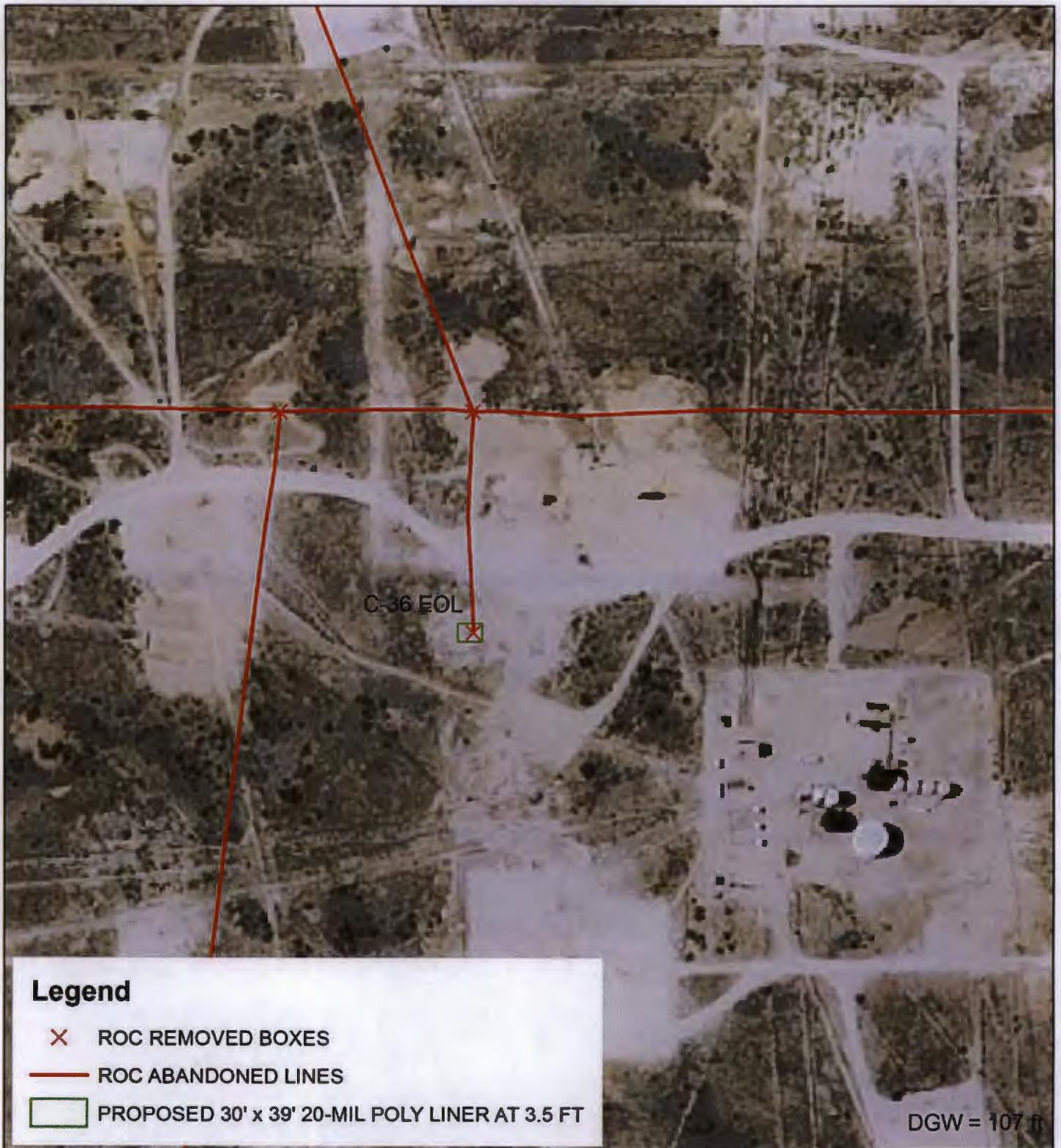
Legals: UL/ C, Section 36,  
T17S, R34E  
Lea County, NM

NMOCD Case #: 1R425-103



Drawing date: 5/22/2013  
Drafted by: L. Weinheimer

2009



**Legend**

-  ROC REMOVED BOXES
-  ROC ABANDONED LINES
-  PROPOSED 30' x 39' 20-MIL POLY LINER AT 3.5 FT

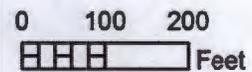
DGW = 107 ft



**Vacuum C-36 EOL**

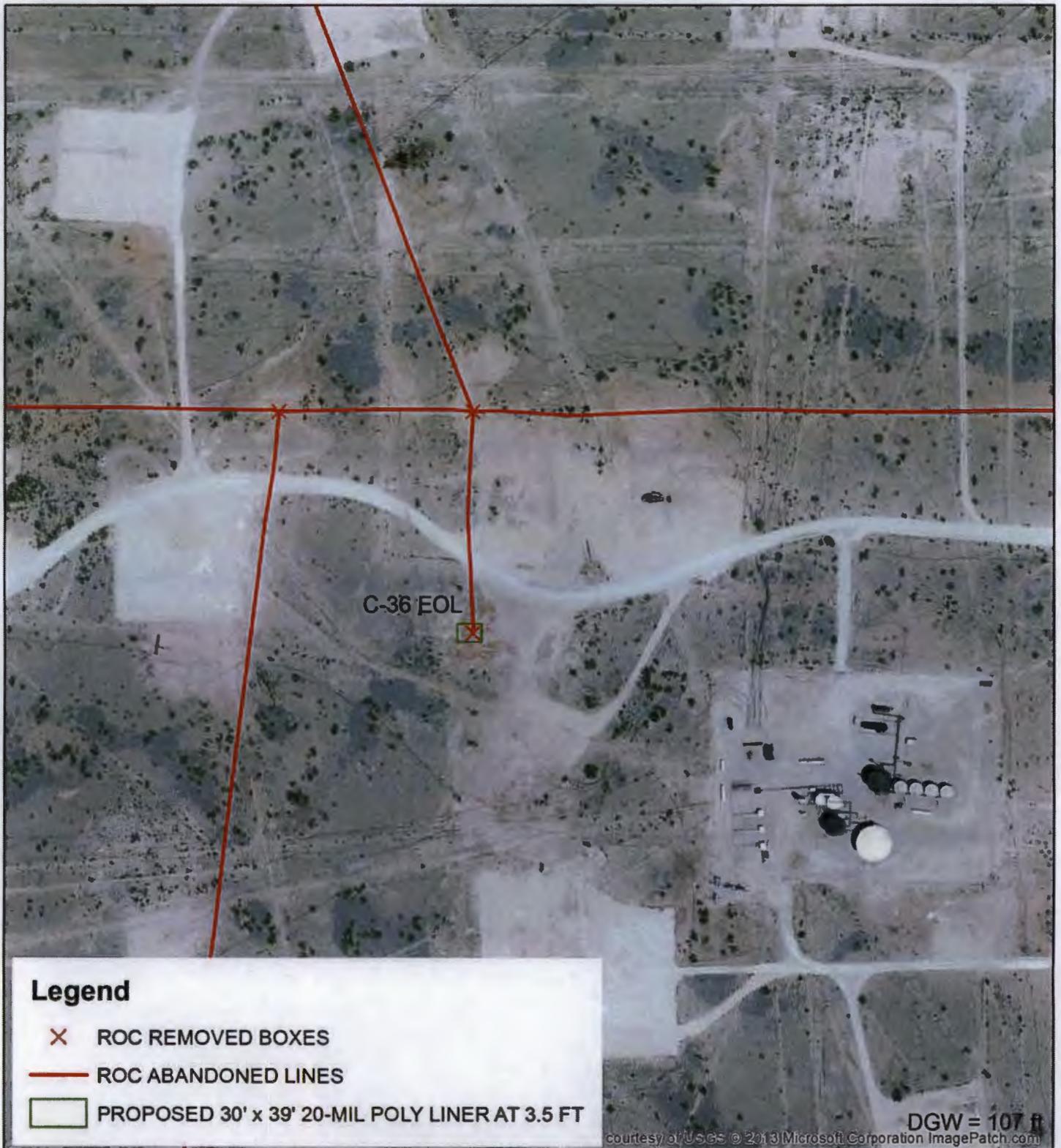
Legals: UL/ C, Section 36,  
T17S, R34E  
Lea County, NM

NMOCD Case #: 1R425-103



Drawing date: 5/22/2013  
Drafted by: L. Weinheimer

2013



**Legend**

-  ROC REMOVED BOXES
-  ROC ABANDONED LINES
-  PROPOSED 30' x 39' 20-MIL POLY LINER AT 3.5 FT

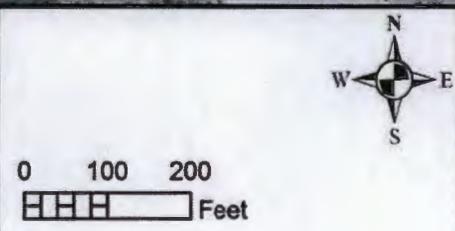
DGW = 107 ft  
courtesy of USGS © 2013 Microsoft Corporation ImagePatch.com



**Vacuum C-36 EOL**

Legals: UL/ C, Section 36,  
T17S, R34E  
Lea County, NM

NMOCD Case #: 1R425-103



Drawing date: 5/22/2013  
Drafted by: L. Weinheimer