Basin Environmental Service Technologies
Effective Solutions

RECEIVED
By OCD Dr Oberding at 10:38 am, Sep 16, 2016

PO Box 2948 | Hobbs, NM 88241 | Phone 575.393.2967

September 15, 2016

APPROVED
By OCD Dr Oberding at 10:49 am, Sep 16, 2016

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

RE: **CAP Report and Termination Request**
Rice Operating Company – EME SWD System
EME L-20 AD (1R-~~1159~~): UL/L, Sec. 20, T19S, R37E

Dr. Oberding: 1R-3652

RICE Operating Company (ROC) has retained Basin Environmental Service Technologies (Basin) to address potential environmental concerns at the above-referenced site in the EME Salt Water Disposal (SWD) system.

ROC is the service provider (agent) for the EME 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 1.6 miles northwest of Monument, New Mexico at UL/L, Sec. 20, T19S, R37E as shown on the Geographical Location Map (Figure 1) and Area Map (Figure 2). NM OSE records indicate that groundwater will likely be encountered at a depth of approximately 31 feet below ground surface (bgs); however, non-ROC monitor wells in the area indicate that groundwater will be encountered at a depth of approximately 23 feet bgs (Figure 3).

On February 7th, 2007, ROC discovered an accidental discharge due to a cracked 6-inch AC line. Approximately 60 barrels of produced water were released and 30 barrels were recovered. An initial C-141 was submitted to NMOCD on February 8th, 2007 and approved on February 15th, 2007.

Personnel were on site to begin soil delineation of the accidental discharge, with samples being collected at regular intervals and field tested for chlorides and hydrocarbons. A 5-point composite of the surface resulted in a chloride concentration of 1,125 mg/Kg and a PID reading

of 0.3 mg/Kg. The edge of the leak area was hand augered and resulted in low chloride concentrations throughout.

Verticals were installed at the site and samples were collected in regular intervals and field tested for chlorides and hydrocarbons. Representative samples from each vertical were taken to a commercial laboratory for analysis. Vertical 1 resulted in a chloride concentration of 112 mg/kg at 7 ft bgs. Vertical 2 resulted in a chloride concentration of 320 mg/Kg at 7 ft bgs. Vertical 3 resulted in a chloride concentration of 832 mg/Kg at 5 ft bgs. Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) were below detectable limits throughout.

To further delineate the site, two soil bores were installed on May 21st, 2015. As the bores were advanced, soil 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. Laboratory analysis of SB-1 returned chloride concentrations of 9,460 at the surface and decreased to 208 mg/Kg at 9 ft bgs. SB-2 returned chloride concentrations of 32 mg/kg at the surface and below detectable limits at 6 ft bgs. GRO and DRO analysis returned values of non-detect in throughout. The bore holes were plugged in total with bentonite to the ground surface.

A Corrective Action Plan (CAP) was submitted to the NMOCD on September 10th, 2015 and was approved on September 15th, 2015. The plan proposed installing a 20-mil reinforced poly liner at 5-4 ft bgs. The liner would cover the leak area measuring approximately 2,380 ft^2. The soils placed above the liner would have a laboratory chloride reading no greater than 500 mg/Kg and a field PID measurement below 100 ppm. Excavated soils would be evaluated for use as backfill and any soils that do not meet requirements will be properly disposed of at a NMOCD approved facility. The soils over and surrounding the site would then be prepared with soil amendments as necessary and seeded with a native vegetative mix.

To determine if the residual chloride in the vadose zone pose a threat to groundwater quality, Basin ran the U.S. Environmental Protection Agency Exposure Assessment Multimedia Model (MULTIMED Version 1.5, 2005). The model output concluded that the peak concentration of chloride in groundwater contributed by the vadose zone soils would be approximately 99 mg/L in 90 years with the installation of the 20-mil reinforced liner.

CAP Report

On October 7, 2015, field personnel were on site to begin liner installation CAP work. The leak area (2,380 ft^2) was excavated to a depth of 5 ft bgs. The bottom of the excavation was padded with 6 inches of imported soil and a 20-mil reinforced liner was installed and properly seated at a depth of 4.5 ft bgs. The top of the liner was padded with imported soil and the excavation was backfilled to ground surface. Approximately 588 yards of excavated soil were properly disposed of at a NMOCD approved facility. A composite sample of the imported top soil and imported blow was analyzed by a commercial laboratory resulting in a concentration below detectable limit in each sample. On November 18th, 2015, the backfilled site was seeded

with a blend of native vegetation. Vegetation was beginning to recover in July 2016; however, the site was seeded again on July 21st, 2016. Documentation of this work is included in Appendix A.

ROC acknowledges they have met the requirements as approved by NMOCD in the CAP, and the newly installed 20-mil reinforced liner will prohibit the migration of any residual chloride. 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. As such, ROC request termination of the regulatory file or similar closure status.

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

Sincerely,

Edward J. Hansen

Edward J. Hansen
Senior Hydrologist
BEST

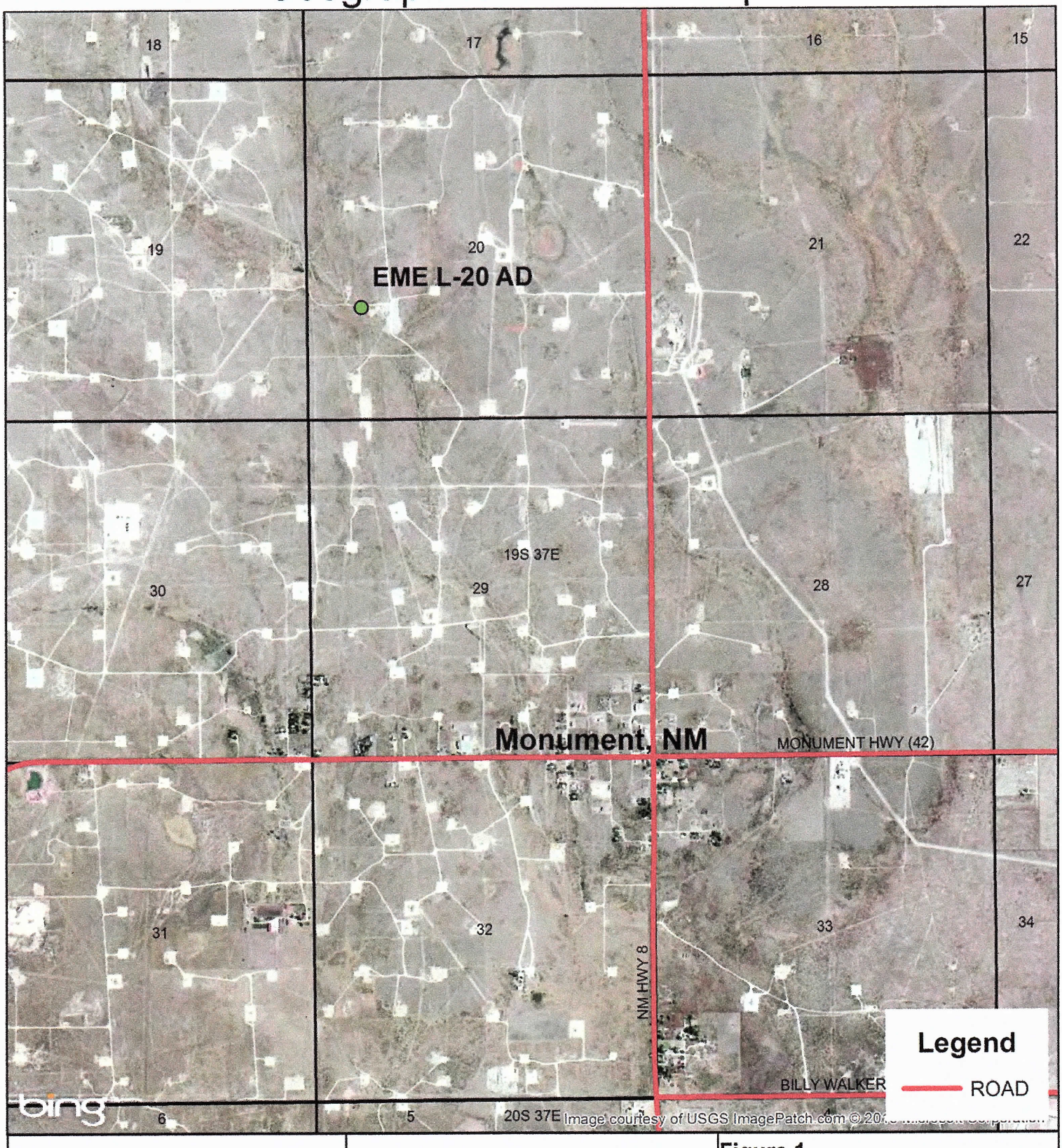
Attachments:

Figure 1 – Geographical Location Map
Figure 2 – Area Map
Figure 3 – Surrounding Monitor Well Locations
Figure 4 – Installed Liner
Appendix A – Liner Installation Documentation
Appendix B – Final C-141

Figures

Basin Environmental Service Technologies
P.O. Box 2948, Hobbs, NM 88241
Phone 575.393.2967

Geographical Location Map



Basin Environmental Service Technologies
Effective Solutions

EME L-20 AD

NMOCD Case #: 1RP-1159

UL L SECTION 20
T-19-S R-37-E
LEA COUNTY, NM

Figure 1
Landowner: Jimmie T. Cooper
DGW: 23 ft

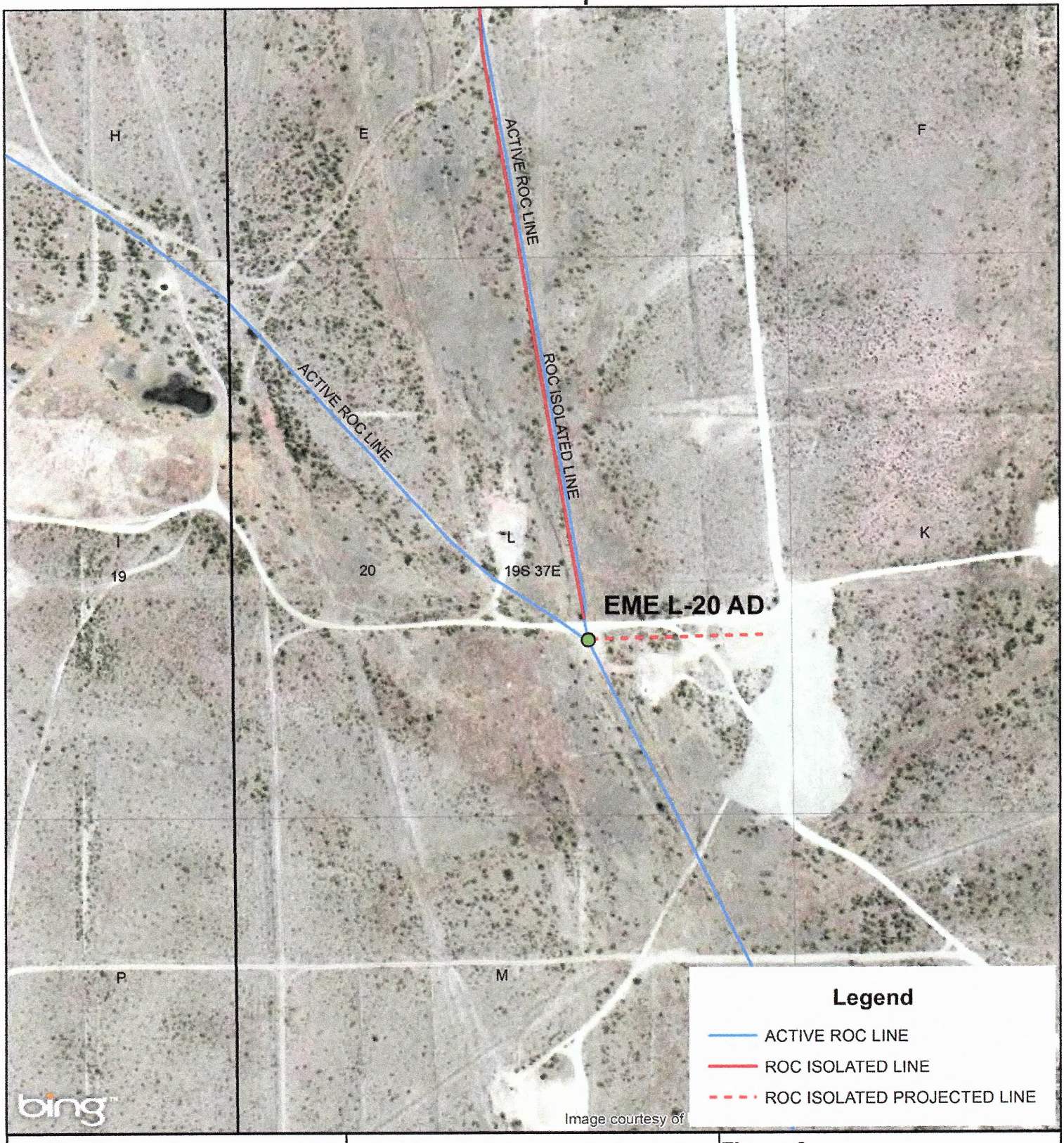
GPS: 32.642727, -103.279111

0 1,000 2,000
Feet

N
W E
S

Drawing date: 4/15/2015
Drafted by: L. Flores

Area Map



Basin Environmental Service Technologies
Effective Solutions

EME L-20 AD

NMOCD Case #: 1RP-1159

UL L SECTION 20
T-19-S R-37-E
LEA COUNTY, NM

Figure 2
Landowner: Jimmie T. Cooper
DGW: 23 ft
GPS: 32.642727, -103.279111

0 250 500 Feet

N W E S

Drawing date: 4/15/2015
Drafted by: L. Flores

Non - ROC Monitor Wells

Basin Environmental Effective Solutions Service Technologies

EME L-20 AD

NMOCD Case #: 1RP-1159

UL L SECTION 20
T-19-S R-37-E
LEA COUNTY, NM

Figure 3
Landowner: Jimmie T. Cooper
DGW: 23 ft

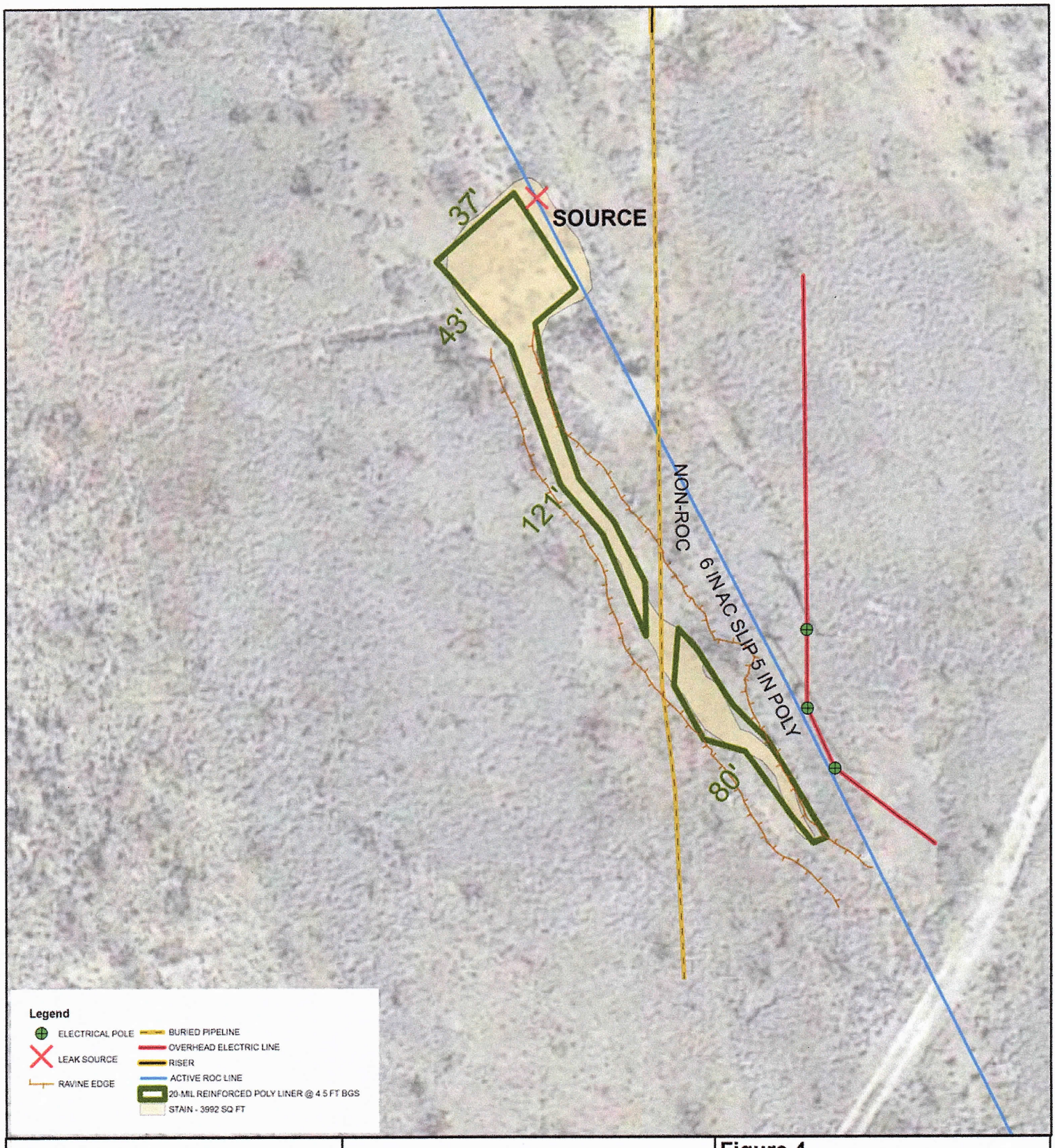
GPS: 32.642727, -103.279111

0 50 100
Feet

GPS date: 5/12/15
Drawing date: 5/13/15
Drafted by: T. Grieco

N
W E
S

Installed Liner



Basin Environmental Service Technologies
Effective Solutions

EME L-20 AD

NMOCD Case #: 1RP-1159

UL L SECTION 20
T-19-S R-37-E
LEA COUNTY, NM

Figure 4
Landowner: Jimmie T. Cooper
DGW: 23 ft

GPS: 32.642727, -103.279111

0 25 50
Feet

GPS date: 7/8/15
Drawing date: 9/8/16
Drafted by: T. Grieco

N W E S

Appendix A

Basin Environmental Service Technologies
P.O. Box 2948, Hobbs, NM 88241
Phone 575.393.2967

EME L-20 AD (1RP-1159)
Unit L, Sec. 20, T19S, R37E

Site prior, facing south 3/18/2008


Excavating the north half of the site, facing northwest 11/2/2015


Excavating the south half of the site, facing southeast 11/2/2015

Exporting excavated soil, facing south 11/2/2015


Installing a 20-mil, reinforced liner above a 6 inch pad of blow sand, facing south 11/5/2015

Seaming the liner, facing east 11/5/2015

EME L-20 AD (1RP-1159)
Unit L, Sec. 20, T19S, R37E

Padding above the liner with imported blow sand, facing northwest 11/5/2015

20-mil, reinforced liner installed in the south half of the site, facing south 11/9/2015

Backfilling with imported top soil, facing northwest 11/9/2015

Spreading amendments, facing northeast 11/18/2015

Seeding the site, facing southwest 11/18/2015

Site complete with vegetation beginning to establish, facing south 7/21/2016

CARDINAL Laboratories

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

November 16, 2015

KATIE JONES

Rice Operating Company

112 W. Taylor

Hobbs, NM 88240

RE: EME L-20 AD

Enclosed are the results of analyses for samples received by the laboratory on 11/13/15 15:50.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. 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.

Cardinal Laboratories is accreditated 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

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

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

Received:	11/13/2015	Sampling Date:	11/13/2015
Reported:	11/16/2015	Sampling Type:	Soil
Project Name:	EME L-20 AD	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NONE GIVEN		

Sample ID: IMPORTED TOP SOIL (H503013-01)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	11/16/2015	ND	416	104	400	3.92	

Sample ID: IMPORTED BLOW SAND (H503013-02)

Chloride, SM4500Cl-B **mg/kg** **Analyzed By: AP**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	11/16/2015	ND	416	104	400	3.92	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

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

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

CARDINAL LABORATORIES
101 East Marland, Hobbs, NM 88240 2111 Beechwood, Abilene, TX 79603
(505) 393-2326 FAX (505) 393-2476 (325) 673-7001 FAX (325)673-7020

Company Name: RICE Operating
Project Manager: Katie Jones
Address: 112 W. Taylor
City: Hobbs State: NM Zip: 88240
Phone #: Fax #:
Project #: Project Owner:
Project Name:
Project Location: EME L-20 AD (195376)
Sampler Name: Karanja Lewis

BILL TO
P.O. #:
Company:
Attn:
Address:
City:
State: Zip:
Phone #:
Fax #:

ANALYSIS REQUEST

Lab I.D.	Sample I.D.	GRAB OR (G)COMP	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER	PRESERV: ACID/BASE	ICE / COOL	OTHER	SAMPLING: DATE	TIME	Chlorides	TPH 8015 M	BTEX	Texas TPH	Complete Cations/Anions	TDS
H50303																				
1	Imported Top Soil	G	1			✓					✓		11-13-15	1:33	✓					
2	Imported Blow Sand	G	1			✓					✓		11-13-15	1:35	✓					

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.

Relinquished By: Karanja Lewis
Date: 11-13-15 Time: 3:50
Received By: Jodi Henson

Relinquished By:
Date: Time:
Received By:

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

Sample Condition: Cool: Yes / No; Intact: Yes / No
CHECKED BY: (Initials)

Phone Result: ☐ Yes ☑ No Add'l Phone #:
Fax Result: ☐ Yes ☑ No Add'l Fax #:
REMARKS:

email: ~~hconder@riceswd.com~~, kjones@riceswd.com; ~~jflores@rice-ecs.com~~; ~~lweinheimer@rice-ecs.com~~; knorman@rice-ecs.com; jkamplain@rice-ecs.com; ~~cedwards@rice-ecs.com~~, ~~cursanic@rice-ecs.com~~
Environmental Tech Klewis @rice-ecs.com

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476

3.2°C

#54

419.W. Cain
Hobbs, NM 88240

Basin Environmental Effective Solutions Service Technologies

Phone: (575) 393-2967
Fax: (575) 393-0293

VEGETATION FORM

1. General Information

Site name:	EME L-20 AD					
U/L	Section	Township	Range	County	Latitude	Longitude
L	20	19-S	37-E	Lea	N32*38.544	W103*16.713
Contact Name:	Jacob Kamplain					
Email:	JKamplain@basinenv.com					
Site size:	5,000		Square feet:			

2. Soils **Do not rip caliche subsoils; caliche rocks brought to the surface by ripping shall be removed.*

Salvaged from site		Bioremediated		Imported	X	Blended		Depth (in)	
Texture:	Sand		Describe soil & subsoil:		Sand and Caliche				
Soil prep methods:	Rip		Depth (in)		Disc	X	Depth (in)	3	Rollerpack
Date completed:	11/16/2015								

3. Bioremediation

Fertilizer		Hay		Other	
Type:				Describe:	
Lbs/acre:				15 Bags ROC Amendments	

4. Seeding **Attach seed bag tags to this form. Seed bag tags shall contain the site name and S-T-R.*

Custom Seed Mix	X	Prescribed Mix		Seed Mix Name:	5 lbs. Blue Grama & 5 lbs. Boyd seed mix	Date:	11/18/2015
Broadcast	Drill seeder			Method:	Dew drop drill seeder		
Soil conditions during seed:	Dry	X	Damp		Wet		
Observations:	The seed was tilled into the soil.						

5. Certification I hereby certify that the information in this form and attachments is true and complete to the best of my knowledge and belief.

Name:	Jose Flores	Title:	Field Tech	Date:	11/18/2015
Signature:	Jose Flores				

419 W. Cain
Hobbs, NM 88240

Basin Environmental Service Technologies
Effective Solutions

Phone: (575) 393-2967
Fax: (575) 393-0293

VEGETATION FORM

1. General Information

Site name: EME L-20 AD						
U/L	Section	Township	Range	County	Latitude	Longitude
L	20	19-S	37-E	Lea	N32*38 544	W103*16 713
Contact Name: Kyle Norman						
Email: knorman@basineny.com						
Site size: 5,000			Square feet:			

2. Soils **Do not rip caliche subsoils; caliche rocks brought to the surface by ripping shall be removed.*

Salvaged from site		Bioremediated		Imported	X	Blended		Depth (in)			
Texture:	Sand			Describe soil & subsoil		Sand and Caliche					
Soil prep methods:	Rip		Depth (in)		Disc	X	Depth (in)	3	Rollerpack		
Date completed:	11/16/2015										

3. Bioremediation

Fertilizer		Hay		Other	
Type:				Describe	
Lbs/acre:					

4. Seeding **Attach seed bag tags to this form. Seed bag tags shall contain the site name and S-T-R.*

Custom Seed Mix	X	Prescribed Mix		Seed Mix Name:	5 lbs Blue Grama & 5 lbs Triticale			Date:	7/21/2016		
Broadcast	Drill seeder				Method	Dew drop drill seeder					
Soil conditions during seed:	Dry	X	Damp		Wet						
Observations:	The seed was tilled into the soil.										

5. Certification I hereby certify that the information in this form and attachments is true and complete to the best of my knowledge and belief.

Name: Jose Flores	Title: Field Tech	Date:	7/21/2016	
Signature:	Jose Flores			

Appendix B

Basin Environmental Service Technologies
P.O. Box 2948, Hobbs, NM 88241
Phone 575.393.2967

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 8, 2011

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☐ Initial Report ☒ Final Report (1RP-1159)

Name of Company Rice Operating Company	Contact Katie Jones Davis
Address 122 W Taylor, Hobbs, NM	Telephone No. 575-393-9174
Facility Name EME L-20 AD	Facility Type Salt Water Gathering System

Surface Owner: Jimmie T. Cooper	Mineral Owner	API No. 30-025-12800

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
L	20	19S	37E		FSL		FWL	Lea

Latitude 32°38.552 N **Longitude** 103°16.720 W

NATURE OF RELEASE

Type of Release Produced Water	Volume of Release 60 bbls	Volume Recovered 30 bbls
Source of Release Broken 6" AC Pipeline	Date and Hour of Occurrence Unknown	Date and Hour of Discovery 2/7/07 10:00 am
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Pat Caperton	
By Whom? Tony Grieco	Date and Hour 2/7/07 1:30 pm	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*
Cracked 6" AC line. Line has been permanently repaired

Describe Area Affected and Cleanup Action Taken.*
Area consisted of pasture and pipeline right-of-way. A water truck was called to the location and removed approx. 30 barrels of standing water. Site was delineated with three hand auger points, three verticals, and two soil bores. A CAP was submitted to NMOCD on Sept 10, 2015 and was approved on Sept 15, 2015. A 2,380 ft2 20-mil reinforced poly liner was installed at 4.5 ft bgs. The site was backfilled with imported soil and seeded with a blend of native vegetation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:

Printed Name: Katie Jones Davis

Title: Environmental Project Manager

E-mail Address: kjones@riceswd.com

Date: 9/8/2016 Phone: 575-393-9174

OIL CONSERVATION DIVISION

Approved by Environmental Specialist: PhD

Approval Date: 09/16/2016 Expiration Date: ///

Conditions of Approval: /// Attached ☐

* Attach Additional Sheets If Necessary