Environmental & Safety Solutions, Inc.

Electronic Correspondence

January 16, 2015:

Mr. Mike Bratcher
State of New Mexico
Oil Conservation Division
811 S. 1st Street
Artesia, NM 88210
mike.bratcher@state.nm.us

Re: Corrective Action Plan
Memorial Production Operating, Diverse Federal Battery
Legal: Unit D, Sec 24, T26S R29E – NW1/4-NW1/4, Eddy County, NM
Latitude/Longitude: 32.032475/ -103.94377
RP Number: Pending
Etech Proj. Number: 416-5774-000

Dear Mike:

Etech Environmental & Safety Solutions, Inc. (Etech) is pleased to submit the following corrective action plan on the aforementioned site for your review and approval.

Background
On December 22nd, 2014, a release was discovered and reported from the Diverse Federal Battery. The apparent cause was vandals opening valves on the unloading lines of the oil tanks. Approximately 170 barrels of oil was released. An assessment of the site was conducted on December 24, 2014 by Etech. The assessment determined the release had migrated west-northwest following a shallow drainage for approximately 900 linear feet and had varying widths. The overall impacted area was estimated to be approximately 22,000 square feet of surface area.

An initial sampling was conducted of the impacted area. Samples were collected from the first 6 inch interval in 5 locations of the impacted area. Note: All of the samples were collected from low areas to present a "worse case" basis. The samples were sent for laboratory analyses for TPH, BTEX and Chlorides. The results of analyses determined the upper intervals of the release area were heavily saturated with oil and ranged from 36,000 – 74,000 mg/kg. Chlorides ranges from non-detect to 37.5 mg/kg.

In addition, during the assessment, an archeologist accompanied the assessment team to inspect for the presence or potential for cultural resources. The inspection determined the area to be clear. Copies of the assessment sheet showing the impact area and corresponding analytical results, the archeologist report, and the initial C-141 is attached.

Scope of Work
After discussion with Mr. Mike Bratcher of the NMOCD and James Amos of the BLM, the corrective action for this site is a two-fold approach of reusing the soil via construction material and remediation via biological degradation. Depth to groundwater in the area is greater than 100 feet. Therefore, the corrective action goals for this project will be 1,000 mg/kg of TPH. The levels of chlorides found from the assessment are below action levels for this project. The particulars for remediation will involve the actions summarized as follows:

1. Placement of a one-call for utility location.

2. Excavation of the grossly impacted soils and blending the soil with clean caliche from a nearby pit until the TPH levels are lowered to less than 5,000 mg/kg. The blended soil will be used to construct containments at the battery site.
3. Excavation of the remaining impacted soils to a level of 1,000 mg/kg. The soils will be staged up to an area next to the battery and spread out to a uniform average thickness of 1 foot. A biological amendment will be added and blended into the soil. The soil will be routinely tilled at least monthly until the TPH levels are less than 1,000 mg/kg.
4. Once the screening determines the remediation objectives have been reached, confirmation samples will be collected from the bottom of the excavation to confirm that remediation goals have been reached. If the excavation depth is greater than 2 feet vertical, side wall samples will be collected as well.
5. If the results of analysis determine that the TPH levels are above regulatory threshold levels, additional excavation will be performed until the remediation objectives are met. It should be noted that there may be circumstances that arise where additional excavation is not practical. This includes reaching the limits of excavation with TPH that are close to objective levels, safety issues such as the close proximity of equipment, or other site specific issues. In this event, you will be contacted to discuss the issue at hand and determine any alternative course of action that could be employed or if the site can be backfilled.
6. Backfilling of the excavated area(s) will be achieved by placing clean fill similar to the existing material from the site to within 1 foot of the surface. The last foot will be backfilled with top soil of similar configuration to the surrounding area and contoured to match the existing grade.
7. Where pad areas or interior areas of tank batteries are excavated, they will be backfilled to within 6 inches of surface then backfilled to grade with compacted caliche. Any firewalls or containment berms removed during remediation will be reinstalled.
8. The site will be seeded with a 50/50 mixture of BLM #2 and #4 seed. Seeding will take place when the seasonal conditions are conducive to maximizing the potential for seed germination. Actual seeding will be accomplished by broadcast or drilling; whichever is the most practical for the site.

Notifications and Special Conditions

1. The OCD and BLM will be notified prior to the commencement of on-site operations.
2. The OCD and BLM will be notified prior to each sampling event to allow the opportunity to witness the sampling events. Splits will be made available if requested.
3. Prior to seeding, the OCD and BLM will be notified when the site is closed for final inspection.
4. A final report documenting the closure of the site will be submitted along with a final C-141.

Thank you for your assistance on this matter. Should you have any questions, require additional information, or have any additional stipulations for this site, please me at (432) 563-2200 (office) or via email at fred@etechenv.com.

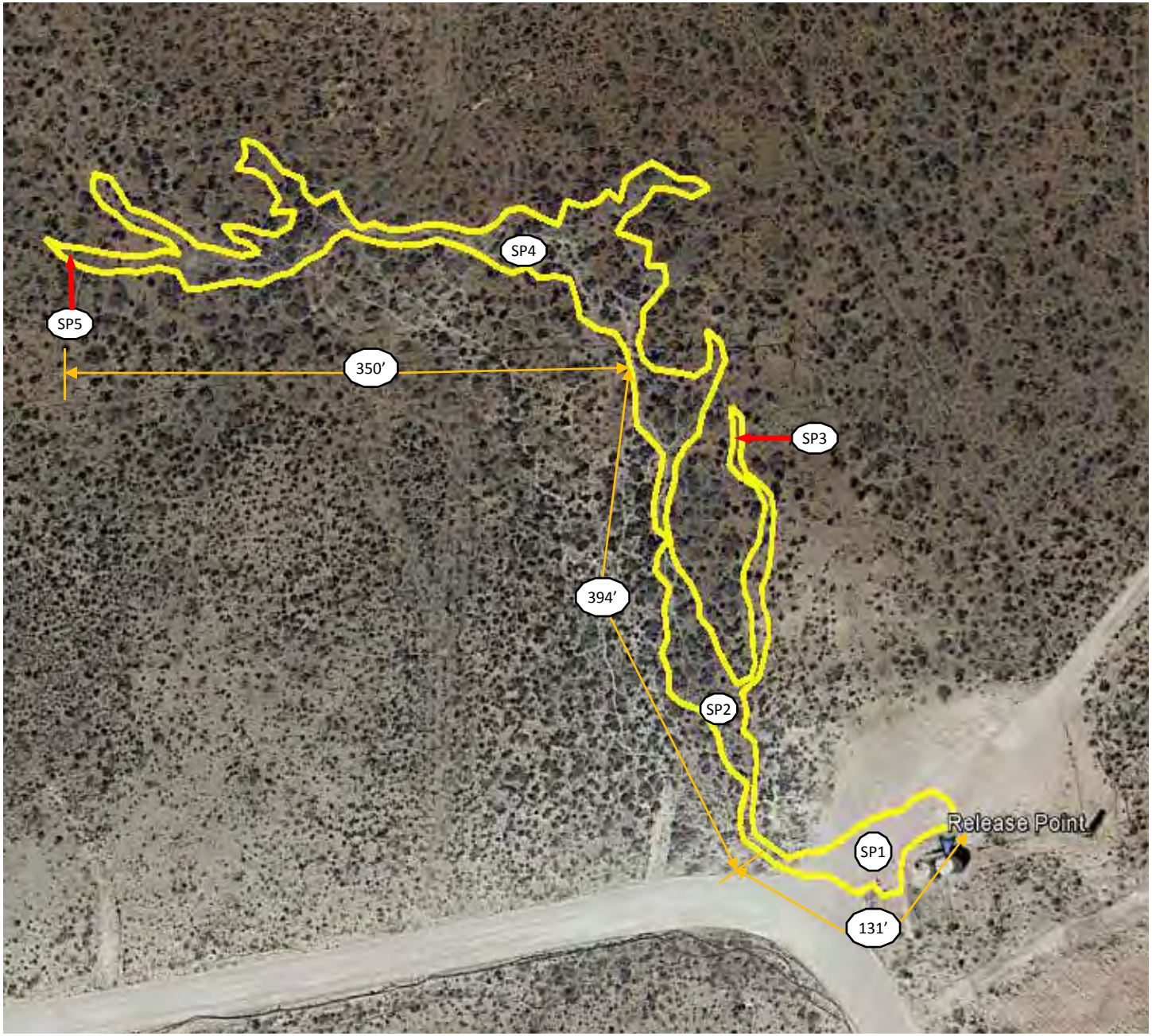
Respectfully:

Fred Holmes
Environmental Professional

cc: Jim Amos, BLM Carlsbad District Office
Jeff Robertson, BLM Carlsbad District Office
Toby Nivens, Memorial Operating
Chris Gafford, Memorial Operating

eTECH Environmental & Safety Solutions, Inc.

Delineation & Assessment Report ©	Lease Name:	Diverse Battery	Proj No.:	418-5774-000
	Date Assessed:	December 24, 2014		

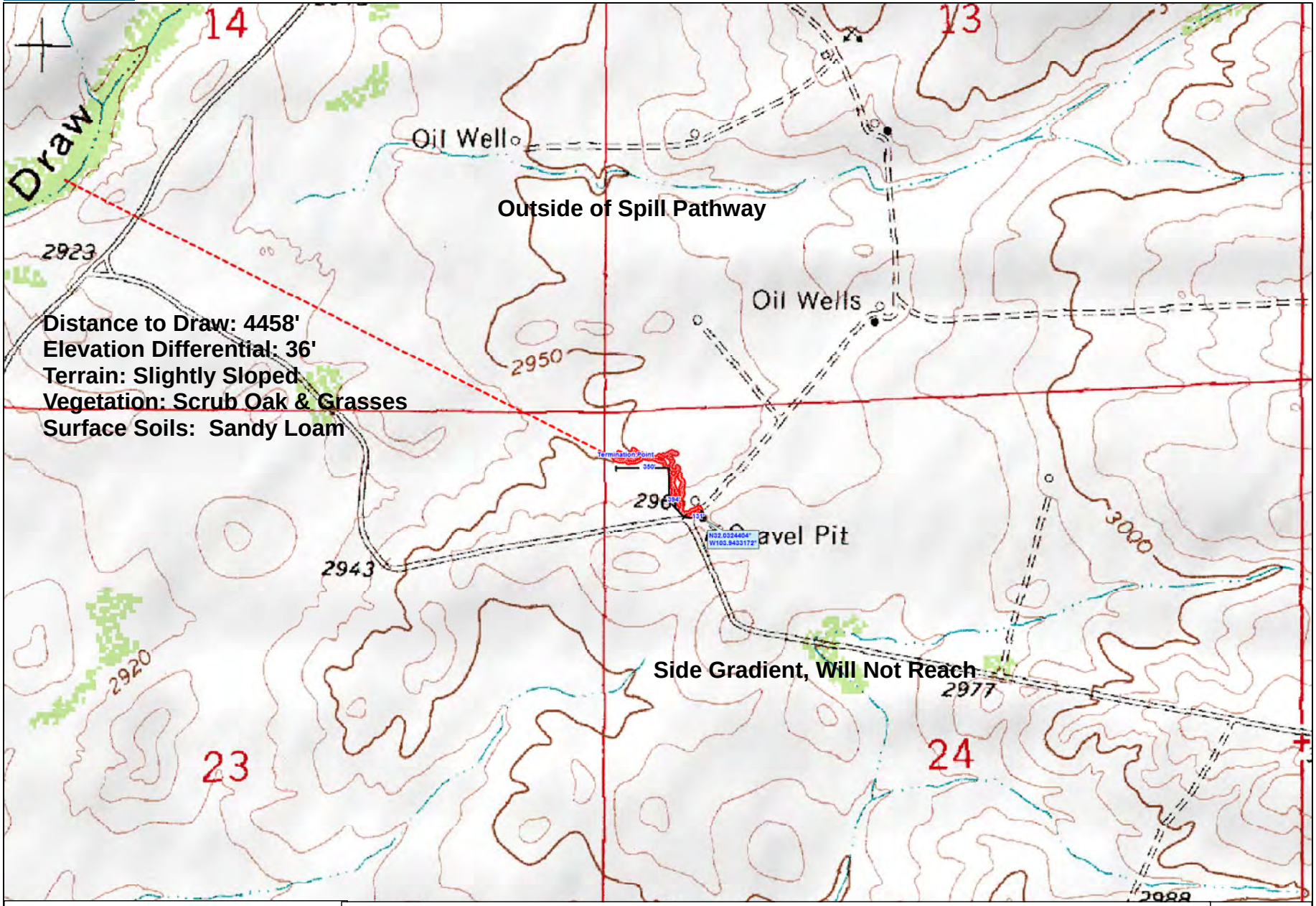


Assessment Results

Sample I.D.	Depth (ft.)	Cl (mg/kg)	TPH (mg/kg)	
SP1	0-6"	37.5	36400	
SP2	0-6"	4.10	42800	
SP3	0-6"	ND	47600	
SP4	0-6"	ND	73100	
SP5	0-6"	ND	39200	

BTEX Results (mg/kg)

Sample I.D	B	T	E	X
SP1	1.41	20.1	12.9	74.3
SP2	10.4	73.5	40.1	191.5
SP3	11.3	74.3	38.8	178.1
SP4	22.9	103	50.4	219.2
SP5	3.63	53	30.7	143.2



Scale 1:12,000

0 400 800 1200 1600 2000 ft

1" = 1,000.0 ft Data Zoom 15-0

Memorial Resource Development
Diverse Federal Tank Battery Release Map - Receptor View

MN (7.3° E)

PERMIAN BASIN
ENVIRONMENTAL LAB, LP
10014 SCR 1213
Midland, TX 79706

PBELAB

Analytical Report

Prepared for:

Kit Prichard
E Tech Environmental & Safety Solutions, Inc.
12800 W Hwy 80 E
Odessa, TX 79765

Project: Memorial - Diverse Federal Battery
Project Number: 416-5774-000
Location: Eddy County, New Mexico

Lab Order Number: 4L30005

NELAP/TCEQ # T104704156-13-3

Report Date: 01/06/15

E Tech Environmental & Safety Solutions, Inc.
12800 W Hwy 80 E
Odessa TX, 79765

Project: Memorial - Diverse Federal Battery
Project Number: 416-5774-000
Project Manager: Kit Prichard

Fax: (432) 563-2213

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SP1 0-6"	4L30005-01	Soil	12/24/14 12:00	12-30-2014 09:05
SP2 0-6"	4L30005-02	Soil	12/24/14 12:10	12-30-2014 09:05
SP3 0-6"	4L30005-03	Soil	12/24/14 12:20	12-30-2014 09:05
SP4 0-6"	4L30005-04	Soil	12/24/14 12:30	12-30-2014 09:05
SP5 0-6"	4L30005-05	Soil	12/24/14 12:40	12-30-2014 09:05

The results for Toluene in sampleSP4 have been analyzed at multiple dilutions and are slightly over calibration limits the results are flagged as estimated, but they should be fairly representative of the Toluene in the sample.

E Tech Environmental & Safety Solutions, Inc.
12800 W Hwy 80 E
Odessa TX, 79765

Project: Memorial - Diverse Federal Battery
Project Number: 416-5774-000
Project Manager: Kit Prichard

Fax: (432) 563-2213

SP1 0-6"

4L30005-01 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	**1.41**	0.206	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Toluene	**20.1**	0.412	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Ethylbenzene	**12.9**	0.206	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Xylene (p/m)	**50.5**	0.412	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Xylene (o)	**23.8**	0.206	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*81.4 %*	*75-125*		*P5A0601*	*01/05/15*	*01/05/15*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*85.5 %*	*75-125*		*P5A0601*	*01/05/15*	*01/05/15*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**37.5**	1.03	mg/kg dry	1	P4L3009	12/30/14	12/30/14	EPA 300.0	
% Moisture	**3.0**	0.1	%	1	P4L3101	12/30/14	12/31/14	% calculation	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	**7970**	129	mg/kg dry	5	P5A0201	12/30/14	12/30/14	TPH 8015M	
>C12-C28	**25300**	129	mg/kg dry	5	P5A0201	12/30/14	12/30/14	TPH 8015M	
>C28-C35	**3120**	129	mg/kg dry	5	P5A0201	12/30/14	12/30/14	TPH 8015M	
Surrogate: 1-Chlorooctane		*84.0 %*	*70-130*		*P5A0201*	*12/30/14*	*12/30/14*	*TPH 8015M*	
Surrogate: o-Terphenyl		*95.2 %*	*70-130*		*P5A0201*	*12/30/14*	*12/30/14*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**36400**	129	mg/kg dry	5	[CALC]	12/30/14	12/30/14	calc	

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Odessa TX, 79765	Project Manager: Kit Prichard	

SP2 0-6"

4L30005-02 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	**10.4**	0.208	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Toluene	**73.5**	0.417	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Ethylbenzene	**40.1**	0.208	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Xylene (p/m)	**135**	0.417	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Xylene (o)	**56.5**	0.208	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*79.8 %*	*75-125*		*P5A0601*	*01/05/15*	*01/05/15*	*EPA 8021B*	
Surrogate: 1,4-Difluorobenzene		*134 %*	*75-125*		*P5A0601*	*01/05/15*	*01/05/15*	*EPA 8021B*	*S-GC*
General Chemistry Parameters by EPA / Standard Methods									
Chloride	**4.10**	1.04	mg/kg dry	1	P4L3009	12/30/14	12/30/14	EPA 300.0	
% Moisture	**4.0**	0.1	%	1	P4L3101	12/30/14	12/31/14	% calculation	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	**15200**	130	mg/kg dry	5	P5A0201	12/30/14	12/30/14	TPH 8015M	
>C12-C28	**24800**	130	mg/kg dry	5	P5A0201	12/30/14	12/30/14	TPH 8015M	
>C28-C35	**2820**	130	mg/kg dry	5	P5A0201	12/30/14	12/30/14	TPH 8015M	
Surrogate: 1-Chlorooctane		*112 %*	*70-130*		*P5A0201*	*12/30/14*	*12/30/14*	*TPH 8015M*	
Surrogate: o-Terphenyl		*116 %*	*70-130*		*P5A0201*	*12/30/14*	*12/30/14*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**42800**	130	mg/kg dry	5	[CALC]	12/30/14	12/30/14	calc	

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SP3 0-6"

4L30005-03 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	**11.3**	0.211	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Toluene	**74.3**	0.421	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Ethylbenzene	**38.8**	0.211	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Xylene (p/m)	**126**	0.421	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Xylene (o)	**52.1**	0.211	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		*134 %*	*75-125*		*P5A0601*	*01/05/15*	*01/05/15*	*EPA 8021B*	*S-04*
Surrogate: 4-Bromofluorobenzene		*71.0 %*	*75-125*		*P5A0601*	*01/05/15*	*01/05/15*	*EPA 8021B*	*S-04*
General Chemistry Parameters by EPA / Standard Methods									
Chloride	ND	1.05	mg/kg dry	1	P4L3009	12/30/14	12/30/14	EPA 300.0	
% Moisture	**5.0**	0.1	%	1	P4L3101	12/30/14	12/31/14	% calculation	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	**16000**	263	mg/kg dry	10	P5A0201	12/30/14	01/05/15	TPH 8015M	
>C12-C28	**28200**	263	mg/kg dry	10	P5A0201	12/30/14	01/05/15	TPH 8015M	
>C28-C35	**3410**	263	mg/kg dry	10	P5A0201	12/30/14	01/05/15	TPH 8015M	
Surrogate: 1-Chlorooctane		*119 %*	*70-130*		*P5A0201*	*12/30/14*	*01/05/15*	*TPH 8015M*	
Surrogate: o-Terphenyl		*82.4 %*	*70-130*		*P5A0201*	*12/30/14*	*01/05/15*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**47600**	263	mg/kg dry	10	[CALC]	12/30/14	01/05/15	calc	

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Odessa TX, 79765	Project Manager: Kit Prichard	

SP4 0-6"

4L30005-04 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	**22.9**	0.213	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Toluene	**103**	0.426	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	E
Ethylbenzene	**50.4**	0.213	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Xylene (p/m)	**156**	0.426	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Xylene (o)	**63.2**	0.213	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		*114 %*	*75-125*		*P5A0601*	*01/05/15*	*01/05/15*	*EPA 8021B*	
Surrogate: 4-Bromofluorobenzene		*62.0 %*	*75-125*		*P5A0601*	*01/05/15*	*01/05/15*	*EPA 8021B*	*S-GC*
General Chemistry Parameters by EPA / Standard Methods									
Chloride	ND	1.06	mg/kg dry	1	P4L3009	12/30/14	12/30/14	EPA 300.0	
% Moisture	**6.0**	0.1	%	1	P4L3101	12/30/14	12/31/14	% calculation	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	**24900**	266	mg/kg dry	10	P5A0201	12/30/14	01/05/15	TPH 8015M	
>C12-C28	**41700**	266	mg/kg dry	10	P5A0201	12/30/14	01/05/15	TPH 8015M	
>C28-C35	**6470**	266	mg/kg dry	10	P5A0201	12/30/14	01/05/15	TPH 8015M	
Surrogate: 1-Chlorooctane		*128 %*	*70-130*		*P5A0201*	*12/30/14*	*01/05/15*	*TPH 8015M*	
Surrogate: o-Terphenyl		*122 %*	*70-130*		*P5A0201*	*12/30/14*	*01/05/15*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**73100**	266	mg/kg dry	10	[CALC]	12/30/14	01/05/15	calc	

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12800 W Hwy 80 E	Project Number: 416-5774-000	
Odessa TX, 79765	Project Manager: Kit Prichard	

SP5 0-6"

4L30005-05 (Soil)

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Organics by GC									
Benzene	**3.63**	0.213	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Toluene	**53.0**	0.426	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Ethylbenzene	**30.7**	0.213	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Xylene (p/m)	**101**	0.426	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Xylene (o)	**42.2**	0.213	mg/kg dry	200	P5A0601	01/05/15	01/05/15	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		*70.7 %*	*75-125*		*P5A0601*	*01/05/15*	*01/05/15*	*EPA 8021B*	*S-GC*
Surrogate: 1,4-Difluorobenzene		*124 %*	*75-125*		*P5A0601*	*01/05/15*	*01/05/15*	*EPA 8021B*	
General Chemistry Parameters by EPA / Standard Methods									
Chloride	ND	1.06	mg/kg dry	1	P4L3009	12/30/14	12/30/14	EPA 300.0	
% Moisture	**6.0**	0.1	%	1	P4L3101	12/30/14	12/31/14	% calculation	
Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M									
C6-C12	**12700**	133	mg/kg dry	5	P5A0201	12/30/14	12/30/14	TPH 8015M	
>C12-C28	**23500**	133	mg/kg dry	5	P5A0201	12/30/14	12/30/14	TPH 8015M	
>C28-C35	**3040**	133	mg/kg dry	5	P5A0201	12/30/14	12/30/14	TPH 8015M	
Surrogate: 1-Chlorooctane		*102 %*	*70-130*		*P5A0201*	*12/30/14*	*12/30/14*	*TPH 8015M*	
Surrogate: o-Terphenyl		*113 %*	*70-130*		*P5A0201*	*12/30/14*	*12/30/14*	*TPH 8015M*	
Total Petroleum Hydrocarbon C6-C35	**39200**	133	mg/kg dry	5	[CALC]	12/30/14	12/30/14	calc	

E Tech Environmental & Safety Solutions, Inc.
12800 W Hwy 80 E
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Project: Memorial - Diverse Federal Battery
Project Number: 416-5774-000
Project Manager: Kit Prichard

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Organics by GC - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P5A0601 - General Preparation (GC)										
Blank (P5A0601-BLK1)				Prepared & Analyzed: 01/05/15						
Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00200	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
Surrogate: 4-Bromofluorobenzene	*30.5*		*ug/kg*	*50.0*		*60.9*	*75-125*			*S-GC*
Surrogate: 1,4-Difluorobenzene	*59.7*		*"*	*50.0*		*119*	*75-125*			
LCS (P5A0601-BS1)				Prepared & Analyzed: 01/05/15						
Benzene	0.0842	0.00100	mg/kg wet	0.100		84.2	70-130			
Toluene	0.0976	0.00200	"	0.100		97.6	70-130			
Ethylbenzene	0.104	0.00100	"	0.100		104	70-130			
Xylene (p/m)	0.219	0.00200	"	0.200		110	70-130			
Xylene (o)	0.109	0.00100	"	0.100		109	70-130			
Surrogate: 1,4-Difluorobenzene	*67.3*		*ug/kg*	*50.0*		*135*	*75-125*			*S-GC*
Surrogate: 4-Bromofluorobenzene	*50.1*		*"*	*50.0*		*100*	*75-125*			
LCS Dup (P5A0601-BSD1)				Prepared & Analyzed: 01/05/15						
Benzene	0.0923	0.00100	mg/kg wet	0.100		92.3	70-130	9.20	20	
Toluene	0.0991	0.00200	"	0.100		99.1	70-130	1.49	20	
Ethylbenzene	0.101	0.00100	"	0.100		101	70-130	2.52	20	
Xylene (p/m)	0.209	0.00200	"	0.200		104	70-130	4.84	20	
Xylene (o)	0.103	0.00100	"	0.100		103	70-130	5.42	20	
Surrogate: 4-Bromofluorobenzene	*44.4*		*ug/kg*	*50.0*		*88.9*	*75-125*			
Surrogate: 1,4-Difluorobenzene	*67.6*		*"*	*50.0*		*135*	*75-125*			*S-GC*
Duplicate (P5A0601-DUP1)		**Source: 4L30005-05**		Prepared & Analyzed: 01/05/15						
Benzene	3.67	0.213	mg/kg dry		3.63			1.05	20	
Toluene	54.2	0.426	"		53.0			2.19	20	
Ethylbenzene	31.6	0.213	"		30.7			2.80	20	
Xylene (p/m)	103	0.426	"		101			1.75	20	
Xylene (o)	43.8	0.213	"		42.2			3.76	20	
Surrogate: 4-Bromofluorobenzene	*34.7*		*ug/kg*	*50.0*		*69.4*	*75-125*			*S-04*
Surrogate: 1,4-Difluorobenzene	*63.1*		*"*	*50.0*		*126*	*75-125*			*S-04*

E Tech Environmental & Safety Solutions, Inc.
12800 W Hwy 80 E
Odessa TX, 79765

Project: Memorial - Diverse Federal Battery
Project Number: 416-5774-000
Project Manager: Kit Prichard

Fax: (432) 563-2213

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P4L3009 - * DEFAULT PREP *** **										
Blank (P4L3009-BLK1)				Prepared & Analyzed: 12/30/14						
Chloride	ND	1.00	mg/kg wet							
LCS (P4L3009-BS1)				Prepared & Analyzed: 12/30/14						
Chloride	99.8	1.00	mg/kg wet	100		99.8	80-120			
LCS Dup (P4L3009-BSD1)				Prepared & Analyzed: 12/30/14						
Chloride	97.4	1.00	mg/kg wet	100		97.4	80-120	2.40	20	
Duplicate (P4L3009-DUP1)		**Source: 4L29004-21**		Prepared & Analyzed: 12/30/14						
Chloride	9980	27.2	mg/kg dry		9990			0.123	20	
Duplicate (P4L3009-DUP2)		**Source: 4L29003-07**		Prepared & Analyzed: 12/30/14						
Chloride	3060	11.1	mg/kg dry		3080			0.543	20	
Matrix Spike (P4L3009-MS1)		**Source: 4L29004-21**		Prepared & Analyzed: 12/30/14						
Chloride	9960	27.2	mg/kg dry	54.3	9990	NR	80-120			QM-4X
Batch P4L3101 - * DEFAULT PREP *** **										
Blank (P4L3101-BLK1)				Prepared: 12/30/14 Analyzed: 12/31/14						
% Moisture	ND	0.1	%							
Duplicate (P4L3101-DUP1)		**Source: 4L30001-01**		Prepared: 12/30/14 Analyzed: 12/31/14						
% Moisture	6.0	0.1	%		6.0			0.00	20	

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12800 W Hwy 80 E
Odessa TX, 79765

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Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control

Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P5A0201 - TX 1005										
Blank (P5A0201-BLK1)				Prepared & Analyzed: 12/30/14						
C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	*105*		*"*	*100*		*105*	*70-130*			
Surrogate: o-Terphenyl	*56.1*		*"*	*50.0*		*112*	*70-130*			
LCS (P5A0201-BS1)				Prepared & Analyzed: 12/30/14						
C6-C12	945	25.0	mg/kg wet	1000		94.5	75-125			
>C12-C28	1060	25.0	"	1000		106	75-125			
Surrogate: 1-Chlorooctane	*113*		*"*	*100*		*113*	*70-130*			
Surrogate: o-Terphenyl	*48.3*		*"*	*50.0*		*96.6*	*70-130*			
LCS Dup (P5A0201-BSD1)				Prepared & Analyzed: 12/30/14						
C6-C12	952	25.0	mg/kg wet	1000		95.2	75-125	0.756	20	
>C12-C28	1080	25.0	"	1000		108	75-125	1.80	20	
Surrogate: 1-Chlorooctane	*116*		*"*	*100*		*116*	*70-130*			
Surrogate: o-Terphenyl	*48.8*		*"*	*50.0*		*97.6*	*70-130*			

E Tech Environmental & Safety Solutions, Inc.	Project: Memorial - Diverse Federal Battery	Fax: (432) 563-2213
12800 W Hwy 80 E	Project Number: 416-5774-000	
Odessa TX, 79765	Project Manager: Kit Prichard	

Notes and Definitions

S-GC	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QM-4X	The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate (CLP E-flag).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By: Brent Barron Date: 1/6/2015

Brent Barron, Laboratory Director/Technical Director

E Tech Environmental & Safety Solutions, Inc.	Project: Memorial - Diverse Federal Battery	Fax: (432) 563-2213
12800 W Hwy 80 E	Project Number: 416-5774-000	
Odessa TX, 79765	Project Manager: Kit Prichard	

Etech Environmental and Safety Solutions, Inc.

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Kit Prichard
Company Name: Etech Environmental & Safety Solutions, Inc.
Company Address: PO Box 8469
City/State/Zip: Midland, Texas 79708
Telephone No: 432-563-2200
Fax No: 432-563-2213
Sampler Signature: [signature]
e-mail: kit@etechenv.com

Project Name: Memorial - Diverse Federal Battery
Project #: 416-5774-000
Project Loc: Eddy County, New Mexico
PO #:
Report Format: ☐ Standard ☐ TRRP ☐ NPDES

(lab use only)
ORDER #: 4L30005

LAB # (lab use only)	FIELD CODE	Sample Depth	Date Sampled	Time Sampled	No. of Containers	Ice	HNO_3	HCl	H_2SO_4	NaOH	$Na_2S_2O_3$	None	Other (Specify)	Matrix (DW=Drinking Water SL=Sludge; GW = Groundwater S=Soil/Solid; NP=Non-Potable Specify Other)	TPH: 418.1 (8015M) 1005 1006	Cations (Ca, Mg, Na, K)	Anions (Cl, SO4, CO3, HCO3)	SAR / ESP / CEC	Metals: As Ag Ba Cd Cr Pb Hg Se (TCLP: ☐ / TOTAL: ✓)	Volatiles	Semivolatiles	BTEX 8021B/5030	RCI	N.O.R.M.	TDS, Bromide	Chlorides	PAH		RUSH TAT (Pre-Schedule) 24, 48, 72 hrs	Standard TAT
-01	SP1	0-6"	12/24/2014	1200	1	✓								S	✓							✓				✓			✓	
-02	SP2	0-6"	12/24/2014	1210	1	✓								S	✓							✓				✓			✓	
-03	SP3	0-6"	12/24/2014	1220	1	✓								S	✓							✓				✓			✓	
-04	SP4	0-6"	12/24/2014	1230	1	✓								S	✓							✓				✓			✓	
-05	SP5	0-6"	12/24/2014	1240	1	✓								S	✓							✓				✓			✓	

Special Instructions:

Relinquished by:	Date	Time	Received by:	Date	Time
Kit Prichard	12/29/14	1700			
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by Lab: [signature]	12/30/14	9:05

Laboratory Comments:

Sample Containers Intact?	(Y)	N
VOCs Free of Headspace?	(Y)	N
Labels on container(s)	(Y)	N
Custody seals on container(s)	(Y)	N
Custody seals on cooler(s)	(Y)	N
Sample Hand Delivered by Sampler/Client Rep. ?	(Y)	N
by Courier? UPS DHL FedEx Lone Star		

Temperature Upon Receipt: 3.5 °C NCF

NMCRIS No.: 132388

NMCRIS INVESTIGATION ABSTRACT FORM (NIAF)

1. NMCRIS Activity No.:	2a. Lead Agency:	2b. Other Agency(ies):	3. Lead Agency Report No.:
132388	US Bureau of Land Management Carlsbad Field Office		

4. Title of Report:

A Class III Archaeological Survey for Memorial Resource Development Corporation's Tank Battery Release Clean-up

Author(s)

Hill, Rebecca L. and Joshua W. Broxson

5. Type of Report

☑ Negative

☐ Positive

6. Investigation Type

☐ Research Design ☑ Archaeological Survey/Inventory ☐ Architectural Survey/Inventory ☐ Test Excavation ☐ Excavation
☐ Collections/Non-Field Study ☐ Compliance Decision Based on Previous Inventory ☐ Overview/Lit Review ☐ Monitoring
☐ Ethnographic Study ☐ Site/Property Specific Visit ☐ Historic Structures Report ☐ Other

7. Description of Undertaking (what does the project entail?):

A pedestrian cultural resources survey was conducted on 24 Dec 2014 for Memorial Resource Development Corporation's Tank Battery Release Clean-up. The oil release lies in Eddy County, NM, on federal lands managed by the Bureau of Land Management Carlsbad Field Office (BLM/CFO) in Section 24 (NW¼NW¼) of T26S R29E. The released oil extends downhill from an existing battery pad north for approximately 400 ft. before turning west and continuing downhill for an additional 400 ft. The release area measures 22,602.92 sq. ft. or 0.51 acres. The clean-up area of potential effect measures 76,393.23 sq. ft. or 1.75 acres. The survey was conducted using 15 m (50 ft.) parallel transects covering the release area and 100 ft. beyond the release area. The survey extended into Section 23 of T26S R29E on federal lands managed by the BLM/CFO. The survey did not extend south of the existing tank battery or lease road. The survey area measures 233,162.73 sq. ft. or 5.35 acres. No cultural resources were recorded or updated during the survey. The clean-up is recommended for approval.

[ ] Continuation

8. Dates of Investigation: from: 24-Dec-2014 to: 24-Dec-2014

9. Report Date: 26-Dec-2014

10. Performing Agency/Consultant: Boone Arch Services of NM, LLC

Principal Investigator: Rebecca L. Hill

Field Supervisor: Rebecca L. Hill

Field Personnel Names: Rebecca L. Hill
Hans W. Schmid III

Historian / Other:

11. Performing Agency/Consultant Report No.:

BASNM 12-14-137

12. Applicable Cultural Resource Permit No(s):

BLM Permit No.: 190-2920-14-T

NMCRIS No.: 132388

13. Client/Customer (project proponent):

Memorial Resource Development Corporation

Contact: Chris Gafford

Address: 400E Loop 250 N, Suite 115, Midland, TX 79705 **Phone:** 432-218-8642

14. Client/Customer Project No.:

15. Land Ownership Status (must be indicated on project map):

Land Owner (By Agency)	Acres Surveyed	Acres in APE
US Bureau of Land Management Carlsbad Field Office	5.35	1.75
TOTALS	5.35	1.75

16. Records Search(es):

Date(s) of HPD/ARMS File Review: 23 Dec 2014	Name of Reviewer(s): R. Hill	
Date(s) of Other Agency File Review: 23 Dec 2014	Name of Reviewer(s): R. Hill	Agency: BLM/ CFO

17. Survey Data:

a. Source Graphics [ ] NAD 27 [x] NAD 83 Note: NAD 83 is the NMCRIS standard.

☑ USGS 7.5' (1:24,000) topo map ☐ Other topo map, Scale:

☑ GPS Unit Accuracy ☑ <1.0m ☐ 1-10m ☐ 10-100m ☐ >100m ☐ Aerial Photo(s)

Other Source Graphic(s):

b. USGS 7.5' Topographic Map Name	USGS Quad Code
Ross Ranch, NM	32103-A8

c. County(ies): EDDY

d. Nearest City or Town: Malaga, NM

e. Legal Description:

Township (N/S)	Range (E/W)	Section
26S	29E	24
26S	29E	23

Projected legal description? [ ] Yes [x] No [ ] Unplatted

f. Other Description (e.g. well pad footages, mile markers, plats, land grant name, etc.):

[ ] Continuation

18. Survey Field Methods:

NMCRIS No.: 132388

Intensity: ☑ 100% coverage ☐ <100% coverage

Configuration: ☑ block survey units ☐ linear survey units (l x w):

☐ other survey units (specify):

Scope: ☑ non-selective (all sites/properties recorded) ☐ selective/thematic (selected sites/properties recorded)

Coverage Method: ☑ systematic pedestrian coverage

☐ other method (describe):

Survey Interval (m): 15 **Crew Size:** 2 **Fieldwork Dates:** from: 24-Dec-2014 to: 24-Dec-2014

Survey Person Hours: 3.00 **Recording Person Hours:** 0.00 **Total Hours:** 3.00

Additional Narrative:

The release area lies within ¼ mile of one previously recorded archaeological site: LA 128879. The release is at a distance sufficient to avoid impacting this site. For a detailed description of the site, see Table 1 on page 5.

[ ] Continuation

19. Environmental Setting (NRCS soil designation; vegetative community; elevation; etc.):

According to the Natural Resources Conservation Service' online database, the release area soils consist of Pajarito-Dune land complex. Pajarito soils are designated as "loamy" and typically support black grama, dropseed, and bluestem grasslands with an even distribution of shinnery oak and sand sage. The current vegetative community consists of mesquite, soapweed yucca, creosote, prickly pear, and desert grasses. The release area is located on a northwest facing hillslope approximately 1 mile southeast of Brushy Draw and 2.5 miles northwest of Tucker Draw. The Pecos River lies approximately 2.85 miles to the west. The elevation ranges from 2,940 ft. to 2,960 ft. above mean sea level.

[ ] Continuation

20.a. Percent Ground Visibility: 80% **b. Condition of Survey Area (grazed, bladed, undistributed, etc.):**

The survey area extends north from an existing tank battery pad and lease road. An existing well pad lies and access road lie approximately 150 ft. west of the survey area. Aside from the release itself, the survey area includes disturbance from a reclaimed well pad extending north of the existing tank battery.

[ ] Continuation

21. CULTURAL RESOURCE FINDINGS ☐ **Yes, see next report section** ☑ **No, discuss why:**

No cultural resources were recorded or updated during the survey. It is unclear why aboriginal peoples did not inhabit the area.

[ ] Continuation

22. Attachments (check all appropriate boxes):

[x] USGS 7.5 Topographic Map with sites, isolates, and survey area clearly drawn (required)

[x] Copy of NMCRIS Map Check (required)

[ ] LA Site Forms - new sites (with sketch map & topographic map) if applicable

[ ] LA Site Forms (update) - previously recorded & un-relocated sites (first 2 pages minimum)

[ ] Historic Cultural Property Inventory Forms, if applicable

[ ] List and Description of Isolates, if applicable

[ ] List and Description of Collections, if applicable

23. Other Attachments:

[x] Photographs and Log

[x] Other Attachments (Describe): BLM Map

NMCRIS No.: 132388

24. I certify the information provided above is correct and accurate and meets all applicable agency standards.

Principal Investigator/Qualified Supervisor: Printed Name: Rebecca L. Hill

Signature: Rebecca Hill Date: 26 Dec 2014 Title: Principal Investigator

25. Reviewing Agency	26. SHPO
Reviewer's Name/Date:	Reviewer's Name/Date:
Accepted [ ] Rejected [ ]	HPD Log #:
	Date sent to ARMS:

CULTURAL RESOURCE FINDINGS

[fill in appropriate section(s)]

SURVEY RESULTS:

Archaeological Sites discovered and registered: 0

Archaeological Sites discovered and NOT registered: 0

Previously recorded archaeological sites revisited (site update form required): 0

Previously recorded archaeological sites not relocated (site update form required): 0

TOTAL ARCHAEOLOGICAL SITES (visited & recorded): 0

Total isolates recorded: 0 ☑ Non-selective isolate recording?

HCPI properties discovered and registered: 0

HCPI properties discovered and NOT registered: 0

Previously recorded HCPI properties revisited: 0

Previously recorded HCPI properties not relocated: 0

TOTAL HCPI PROPERTIES (visited & recorded, including acequias): 0

MANAGEMENT SUMMARY:

No cultural resources were recorded or updated during survey for the tank battery release clean-up. The clean-up is recommended for approval. If any cultural resources are encountered during the clean-up process, work should be halted and archaeologists with BLM/CFO should be notified immediately.

[ ] Continuation

IF REPORT IS NEGATIVE, YOU ARE DONE AT THIS POINT.

SURVEY LA/HCPI NUMBER LOG

Sites/Properties Discovered:

LA/HCPI No.	Field/Agency No.	Eligible? (Y/N/U, applicable criteria)

NMCRIS No.: 132388

Previously recorded revisited sites/HCPI properties:

LA/HCPI No. **Field/Agency No.** **Eligible? (Y/N/U, applicable criteria)**

MONITORING LA NUMBER LOG (site form required)

Sites Discovered (site form required):

LA No. **Field/Agency No.**

Previously recorded sites (site update form required):

LA No. **Field/Agency No.**

Areas outside known nearby site boundaries monitored? **[ ] Yes** **[ ] No, Explain why:**

TESTING & EXCAVATION LA NUMBER LOG (site form required)

Tested LA number(s)

Excavated LA number(s)

Table 1. Previously Recorded Archaeological Sites within ¼ Mile.

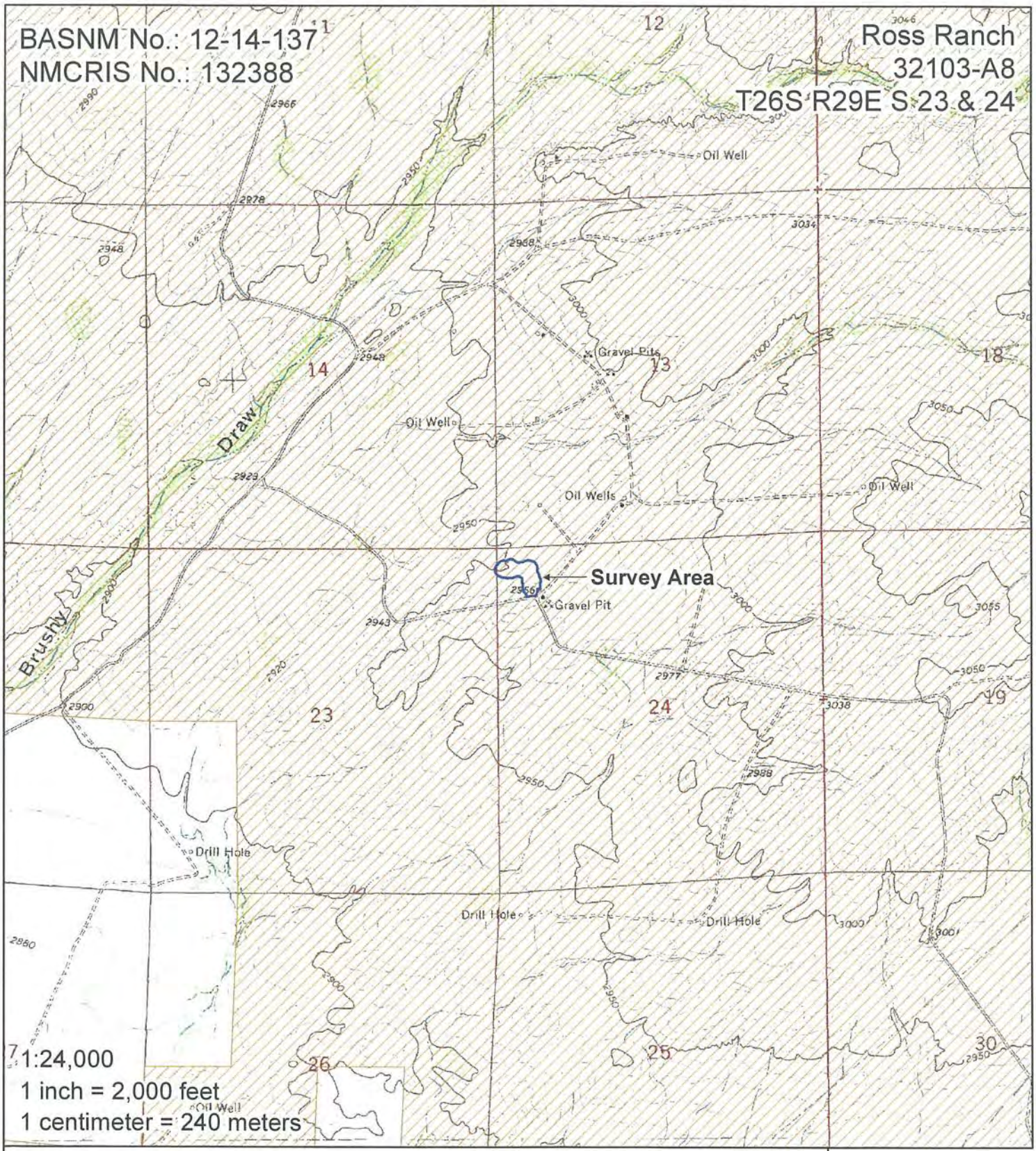
LA No.	Cultural/Temporal Affiliation	Eligibility
128879	Unknown Aboriginal (9500 BC – 1880 AD)	Eligible, D

Photographs.

Figure 1. Oil Release.

Figure 2. Oil Release.

Memorial Resource Development Corporation
Tank Battery Release Clean-up

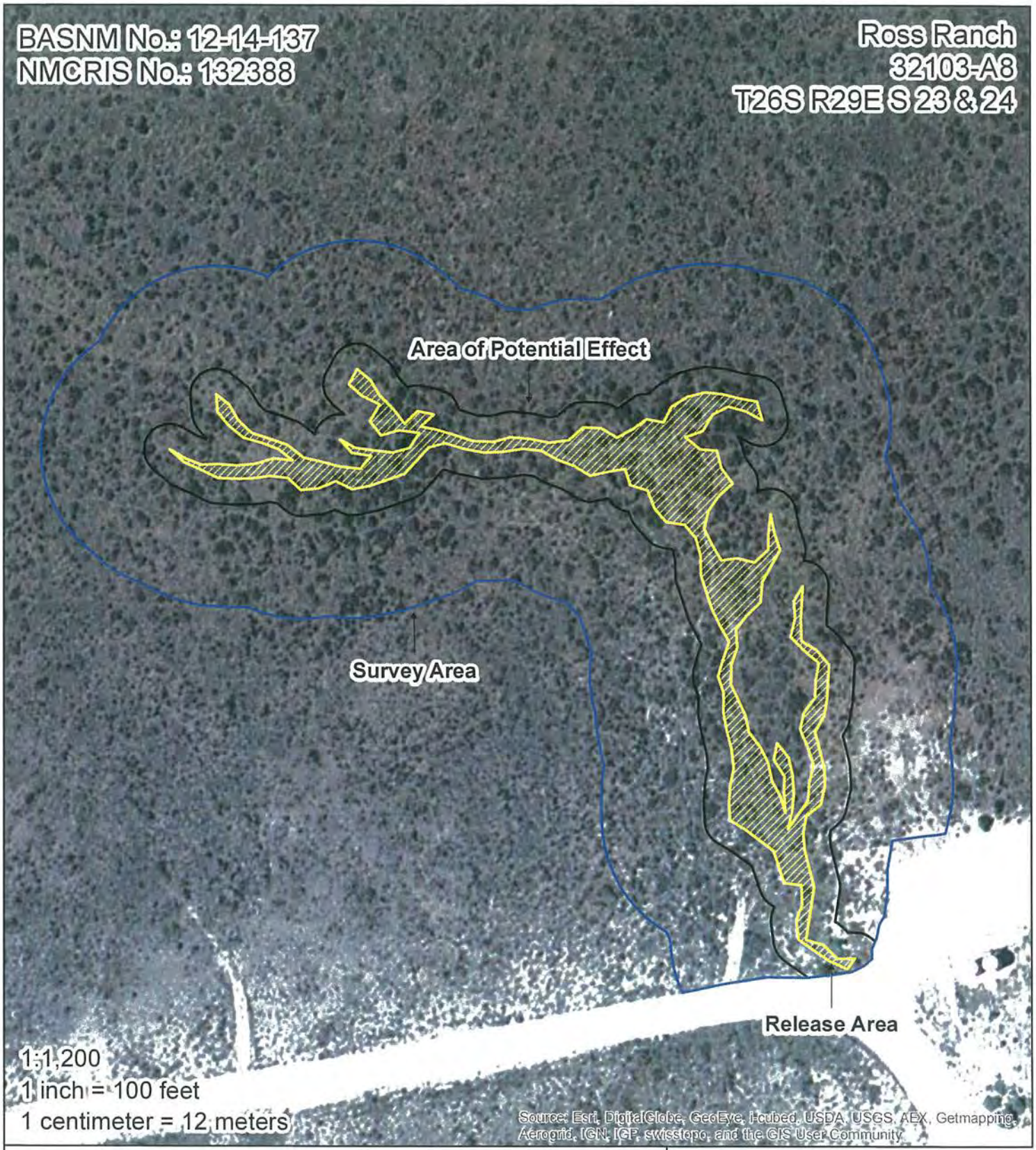


Legend

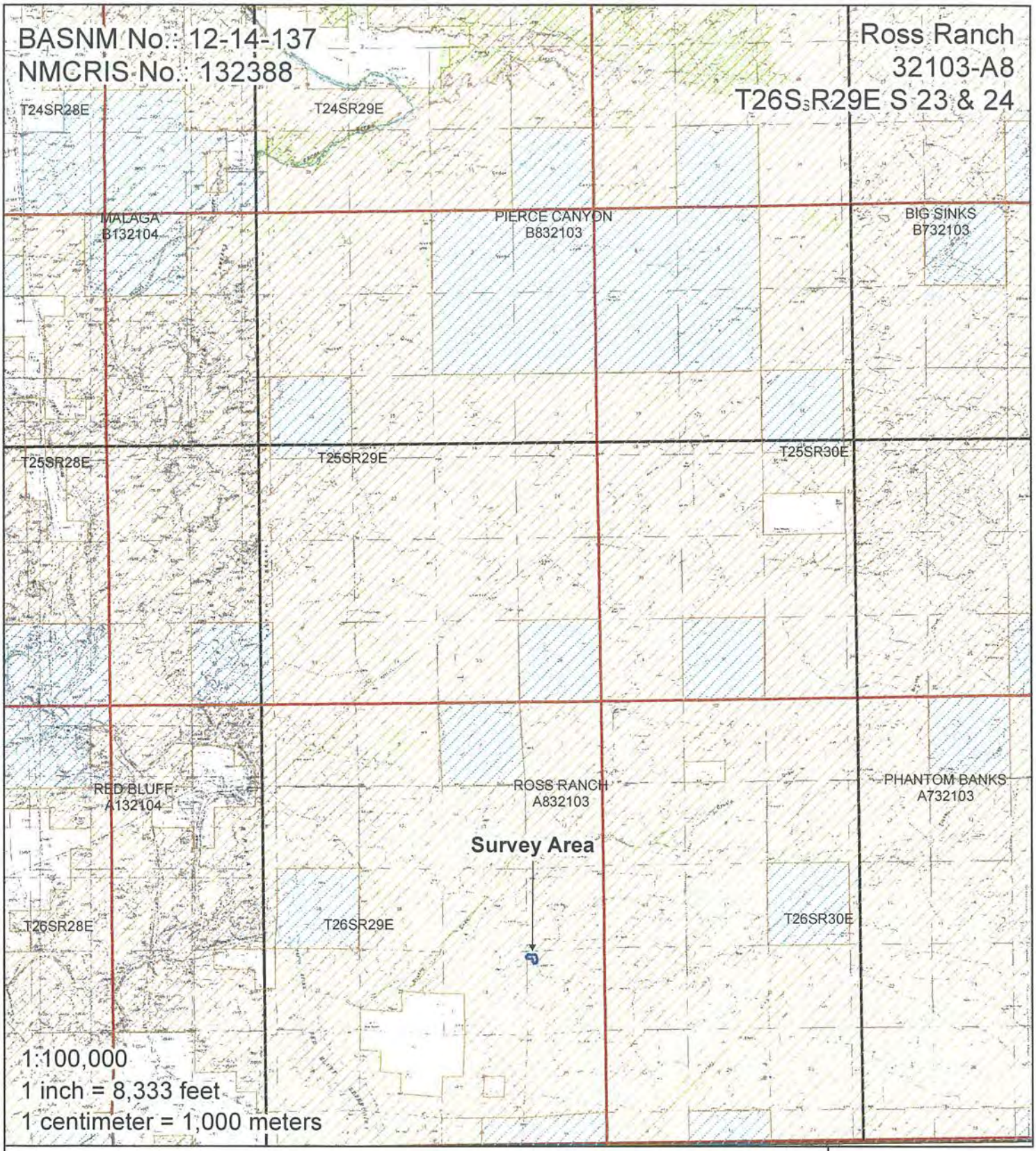
- Survey Area
- BLM
- DOE
- BOI
- Private
- NM State Game and Fish
- BOR
- Forest Service
- NPS
- NM State Trust Land
- NM State Park

N W E S

Memorial Resource Development Corporation
Tank Battery Release Clean-up



Memorial Resource Development Corporation
Tank Battery Release Clean-up



District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, 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 October 10, 2003

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

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: Memorial Production Operating LLC	Contact: Heather Dolphin
Address: 1301 McKinney St, Suite 2100, Houston, TX 77010	Telephone No.: 832-797-1334
Facility Name: Diverse Federal Battery	Facility Type: Production

Surface Owner: BLM	Mineral Owner:	API No.: N/A

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
D	24	26S	29E		NW1/4		NW1/4	Eddy

Latitude: 32.032475 **Longitude:** -103.943377

NATURE OF RELEASE

Type of Release: Oil	Volume of Release: 170	Volume Recovered: 1
Source of Release: Tanks	Date and Hour of Occurrence: 12/21/14	Date and Hour of Discovery: 12/22/14
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Jeff Robertson & Jim Amos	
By Whom? Heater Dolphin Sr. Regulatory Specialist	Date and Hour 12/22/14	
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.*: As a transport truck drive drove across the Diverse Federal Battery location, he noticed there was oil all over the ground and found that the valves to the oil tanks has been opened. The initial thought was the release was caused by cattle in the area. However, after further investigation, it appears that this was an act of vandalism. There were a total of 3 valves opened and footprints leading away from the valves that were not from any personnel that work or access the site.

Describe Area Affected and Cleanup Action Taken.*: The release migrated west northwest off of the site following a shallow drainage. Estimated length is approximately 900 linear feet. Corrective action plan to follow after the completion of the assessment.

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:	OIL CONSERVATION DIVISION
Printed Name: Heather Dolphin	Approved by District Supervisor:
Title: Sr. Regulatory Specialist	Approval Date: / Expiration Date:
E-mail Address: heather.dolphin@memorial.com	Conditions of Approval: / Attached ☐
Date: 01/05/2014 Phone: 832-797-1334	

* Attach Additional Sheets If Necessary