Souder, Miller & Associates ♦ 201 S. Halagueno ♦ Carlsbad, NM 88221
(575) 689-7040

December 30, 2015

NMOCD District II
Attn. Heather Patterson
1301 W Grand Ave
Artesia, NM 88210

SUBJECT: FINAL CLOSURE REPORT FOR INCIDENT 2RP-3354 COPPERHEAD 31 FEDERAL COM #2H, API# 30-015-39791 EDDY COUNTY, NEW MEXICO

Dear Ms. Patterson:

On behalf of COG Operating (COG), Souder Miller & Associates (SMA) is pleased to submit the attached Final Closure Report summarizing the soil remediation activities performed for the produced water release at the Copperhead 31 Federal Com #2H in Eddy County, New Mexico. The purpose of the closure report is to obtain approval from the New Mexico Oil Conservation Division for remediation of the release that occurred on September 26, 2015.

At the request of COG, SMA assessed, delineated and remediated soil affected by production water release associated with the Copperhead 31 Federal Com #2H well location. The release was initially reported to NMOCD by COG Operating on October 10, 2015 and was a result of a poly flowline leak. The table below summarizes information regarding the produced water release. Results of the assessment and delineation follow in the attached report.

Table 1: Release information and Site Ranking

Name	Copperhead 31 Federal Oil				
Location	Incident Number	API Number	Section, Township, Range		
	2RP-3354	30-015-39791	LOT 6 SW/NE (UL G)	Section 31	T 26S, R 29E NMPM
Estimated Date of Release	Discovered September 26, 2015				
Date Reported to NMOCD	October 10, 2015				
Reported by	Amanda Trujillo, COG Operating LLC				
Land Owner	Federal				
Reported To	NM Oil Conservation Division (NMOCD)				
Source of Release	Poly flowline leak				
Released Material	Produced Water				
Released Volume	40 bbls Produced Water				
Recovered Volume	10 bbls Produced Water				
Net Release	30 bbls Produced Water				
Nearest Waterway	Pecos River is over 2 miles east of the location.				

Depth to Groundwater	Estimated to be 76 feet
Nearest Domestic Water Source	Greater than 1000ft
NMOCD Ranking	10
SMA Response Dates	Initial: November 2, 2015 Mitigation Activities: December 14, 2015
Subcontractors	TCS
Disposal Facility	Lea Land, LLC
Estimated Yd^3 Contaminated Soil Excavated and Disposed	1180

A copy of the C-141 Initial is located in Appendix B. For questions or comments pertaining to the release or the attached Work Plan, please feel free to contact either of us.

Submitted by:

SOUDER, MILLER & ASSOCIATES

J. Austin Weyant

Austin Weyant
Project Scientist

Reviewed by:

Cynthia Gray, CHMM
Senior Scientist

Souder, Miller & Associates ♦ 201 S. Halagueno ♦ Carlsbad, NM 88221
(575) 689-7040

SOIL REMEDIATION FINAL CLOSURE FOR INCIDENT 2RP-3354

COG OPERATING LLC

COPPERHEAD 31 FEDERAL COM #2H
API# 30-015-39791
LOT 6 UL G SECTION 31, T26S, R29E, NMPM
EDDY COUNTY, NM

Prepared for:
COG Operating LLC
2407 Pecos Ave
Artesia, NM 88210

Prepared by:
Souder, Miller & Associates
201 S. Halagueno
Carlsbad, NM 88221
575-689-7040

December 30, 2015
SMA Reference
5B23978 BG10

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1.0 Introduction

On behalf of COG Operating LLC (COG), SMA has prepared this report that describes the assessment, initial delineation and mitigation of a release associated with the Copperhead 31 Federal Com #2H release site. The site is located in Section 31, T 26S, R 29 E NMPM, Eddy County, New Mexico, on federal land administered by BLM. Please note Section 31 is an odd section right on the Texas-New Mexico state line. Figure 1 shows the vicinity and location of the site.

2.0 Site Ranking and Land Jurisdiction

The release site is located approximately 2 miles (> 1,000 feet) east of Pecos River, in an area administered by BLM with an elevation of approximately 2,900 feet above sea level. SMA searched the New Mexico State Engineer's Office online water well database for water wells in the vicinity of the release. No well is located within a 1000 foot radius of the site. After evaluation of the site using aerial photography and topographic maps, depth to groundwater is estimated greater than 50 feet below ground surface (bgs) but less than 100 feet bgs. Figure 2 depicts the site details and sample locations. The physical location of this release is within the jurisdiction of NMOCD.

This release location has been assigned a NMOCD ranking of 10 under "Guidelines Remediation" which requires a soil remediation standard of 10 parts per million (ppm) benzene, 50 ppm combined benzene, toluene, ethyl-benzene, and total xylenes (BTEX), and 1000 ppm total petroleum hydrocarbons (TPH). Table 1 illustrates site ranking rationale.

3.0 Assessment and Initial Results

On November 2, 2015, after receiving 811 clearance, SMA field personnel assessed the release area onsite with an auger, a Photo Ionization Detector (PID), and a mobile chlorides titration kit. The affected area was found to be 175 feet long and 50 feet wide. Delineation samples were taken to depths of three feet bgs. Using field screening, samples at one foot bgs were found to exhibit elevated levels of chloride. Sample locations are noted on Figure 2 "Site Details and Sample Location Map". For additional information on the initial soil results and site assessment, please refer to the NMOCD approved work plan (Soil Remediation Work Plan for Incident 2RP-3354.) All samples were collected and processed according to NMOCD soil sampling procedures. The samples were sent under chain-of-custody protocols to Hall Environmental Analysis Laboratory for analysis for Benzene and Total BTEX using EPA Method 8021B, DRO and GRO by EPA Method 8015D, and total Chlorides using EPA Method 300.

4.0 Soil Remediation Summary

SMA began the excavation of affected soils, with approval from area utilities owners via 811 and NMOCD. SMA continuously guided the excavation activities by collecting composite soil samples for field screening with a mobile titration unit (EPA 4500) and a calibrated PID. Excavation depth was to approximately four feet bgs in the spill area. Samples were taken in the sidewalls to ensure contaminated soils have been removed to the horizontal extent. Closure samples were collected at the final depth of excavation. Within the excavation an in-situ cap will be placed at the final depth of excavation 4 feet bgs. The construction of the in-situ cap (Figure #3) has been designed to prevent both capillary and leaching movement of the brine affected soils. Starting at the bottom of the excavation approximately four feet below ground surface the affected soils were compacted

within the excavation with buckets and tires of equipment. Then a .40mil plastic liner was installed to serve as an intrusion barrier between the affected soils and the caliche cap above the plastic liner. The caliche cap placed above the liner is two feet of compacted contaminant-free caliche from off site. Above the caliche cap 250 bales of wheat straw were added to form a capillary break between the caliche cap and top soil. This barrier will help prevent capillary rise and formation of deep root systems into the caliche cap itself. A two foot minimum of clean topsoil from off site was then placed on top of the wheat straw capillary break. The intrusion barrier and capillary break on both sides of the caliche cap will effectively break the communication of precipitation through the compacted cap. After excavation, installation of the in-situ caliche cap and backfilling of topsoil the area was contoured to match the adjacent landscape to prevent ponding and pooling on the excavated area. Approximately 1180 cubic yards of contaminated soil was removed and was transported to for proper disposal at Texas permitted R360 Red Bluff facility in Texas. The excavation backfilled with clean material from SRO COG pit to bring the contours to surface grade the top soil was amended with hay to improve bulk density and vegetation growth.

5.0 Conclusions and Recommendations

NMOCD "Guidelines for Remediation of Leaks, Spills, and Releases" have established the following action levels for contaminants of concern with a site ranking of 10: 10 ppm (mg/kg) Benzene, 50 ppm total BTEX, and 1000 ppm TPH. The release consisted of produced and associated petroleum found during the initial assessment and delineation.

All closure confirmation samples were taken as discrete samples to ensure that the contaminated soil was removed.

Soil sample location are illustrated in Figure 2. A summary of the laboratory analyses is included in Table 2. Laboratory reports are included in Appendix A.

6.0 Closure and Limitations

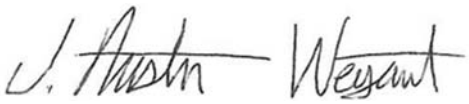
Closure standards have been achieved for the produced water release 2RP-3354 on the Copperhead 31 Fed Com #2H well pad. The closure samples laboratory analysis results are all below the targeted remediation standards of a site ranking of 10: 10 ppm (mg/kg) Benzene, 50 ppm total BTEX, and 1000 ppm TPH.

The scope of our services consisted of the performance of a preliminary spill assessment, verification of release stabilization, regulatory liaison, and preparation of a Remediation Work Plan and a Closure Report. All work has been performed in accordance with generally accepted professional environmental consulting practices for oil and gas releases in the Permian Basin in New Mexico.

If there are any questions regarding this report, please contact either Austin Weyant at 575-689-7040 or Cindy Gray at 505-325-7535.

Submitted by:

SOUDER, MILLER & ASSOCIATES



Austin Weyant
Project Scientist

Reviewed by:

Cynthia Gray, CHMM
Senior Scientist

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Figure 1: Vicinity Map
Figure 2: Site Details and Sample Locations Map
Figure 3: In-situ Cap and Bio barrier Design

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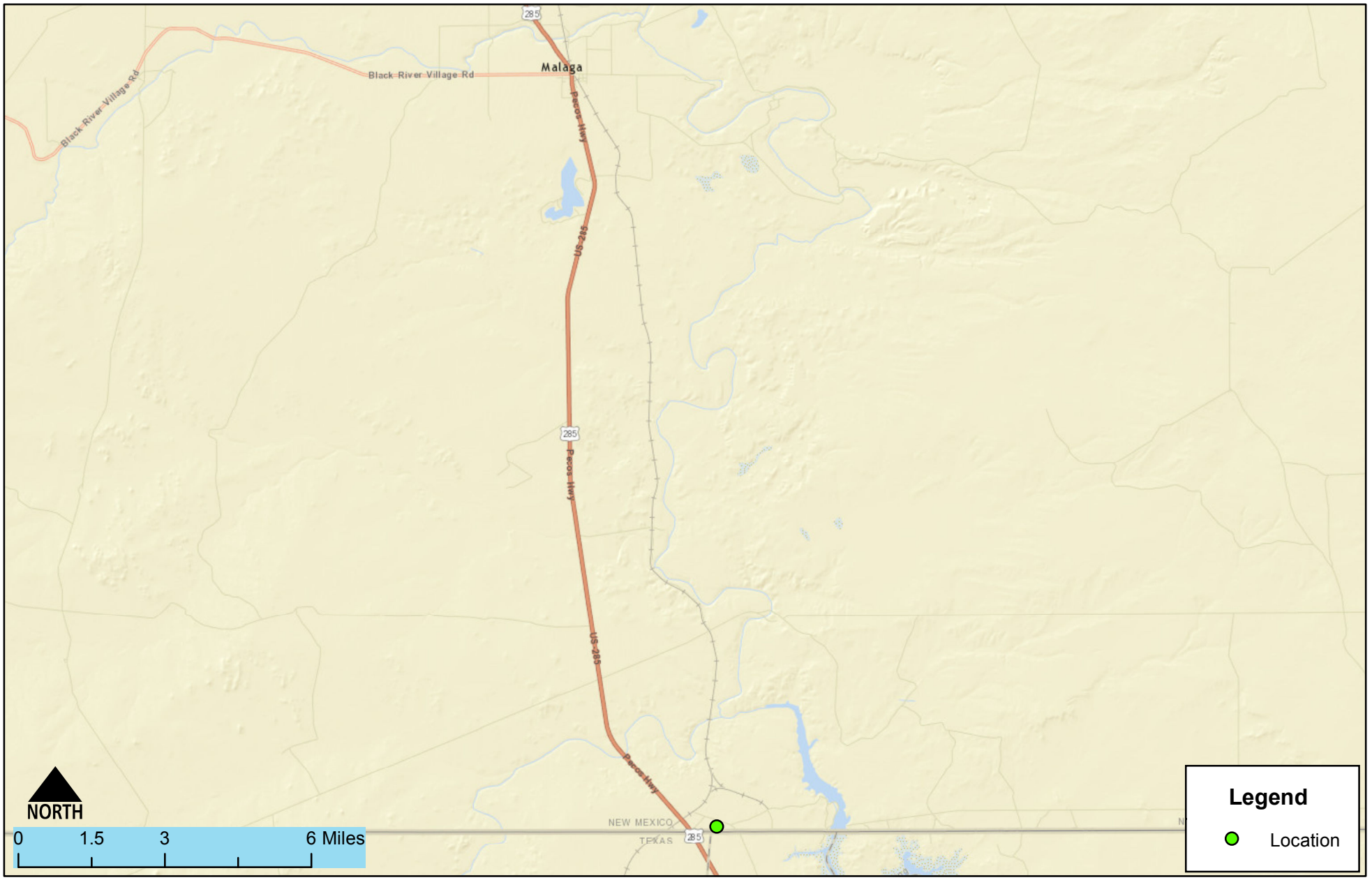
Table 2: Summary of Laboratory Analyses

Appendices:

Appendix A: Laboratory Analytical Reports
Appendix B: Form C141 Final
Appendix C: API Amigo Summary

FIGURE 1

VICINITY MAP



Vicinity Map
COG- Copperhead 31 Fed Com 2H
Malaga, New Mexico

Figure 1

Document: C:\Users\lcm\Documents\GIS DATA\MAPS\Figure 1Copperhead 31 Fed Com 2H.mxd

Date Saved: 11/17/2015

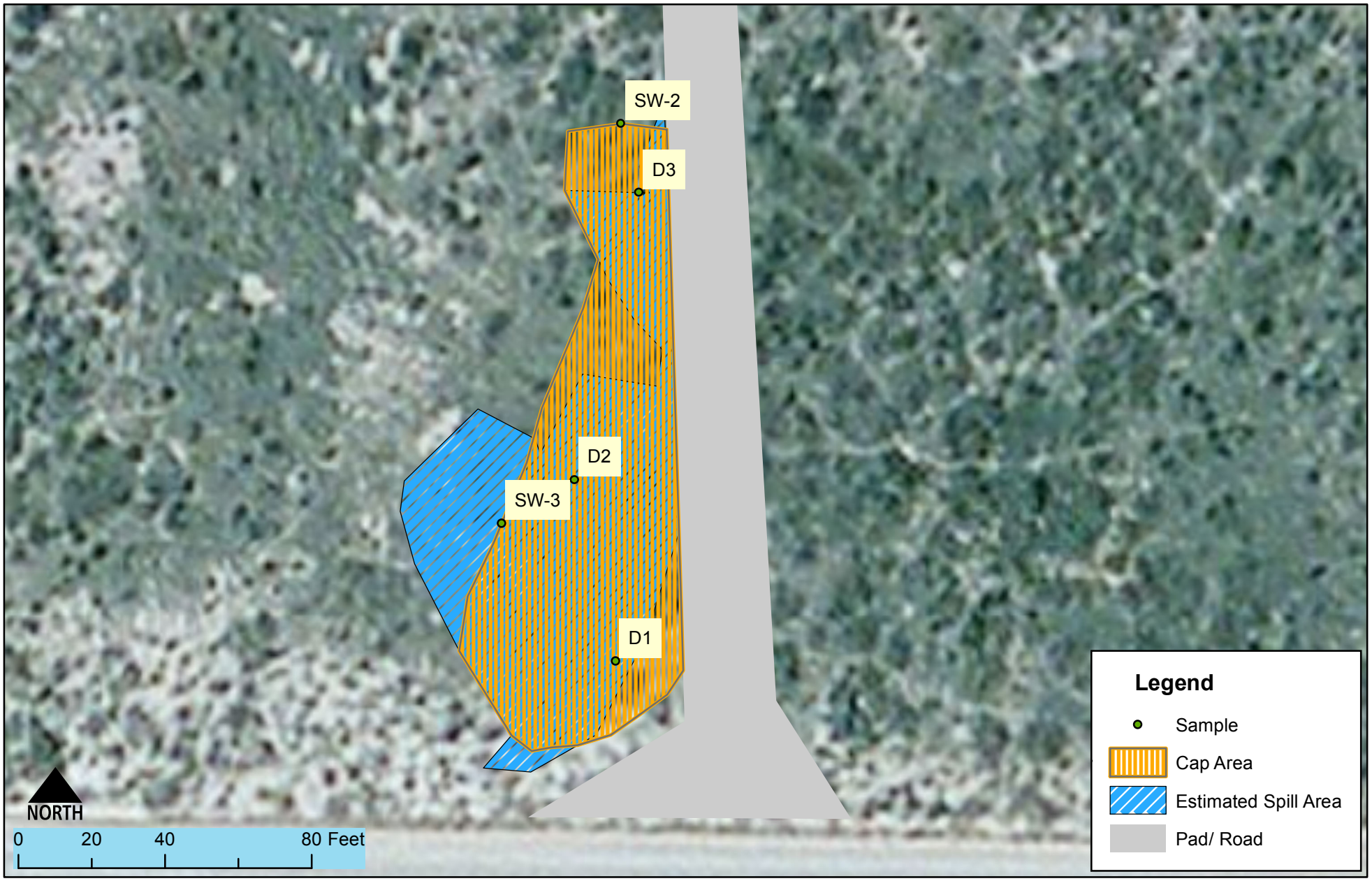
Revisions
By: Date: Descr:
By: Date: Descr:

Drawn Lucas Middleton
Checked
Approved

SMA
201 South Halaguena Street
Carlsbad, New Mexico 88221
(575) 689.7040
www.soudermiller.com
Serving the Southwest & Rocky Mountains

FIGURE 2

SITE DETAILS AND SAMPLE LOCATIONS MAP



Site Detail and Sample Locations
COG-Copperhead 31 Fed Com 2H
Malaga, New Mexico

Figure 2

Document: C:\Users\lcm\Documents\GIS DATA\MAPS\Figure 2 Copperhead 31 Fed Com 2H.mxd

Date Saved: 1/8/2016

Revisions
By: Date: Descr:
By: Date: Descr:

Drawn Lucas Middleton
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Approved

SMA
201 South Halaguena Street
Carlsbad, New Mexico 88221
(575) 689.7040
www.soudermiller.com
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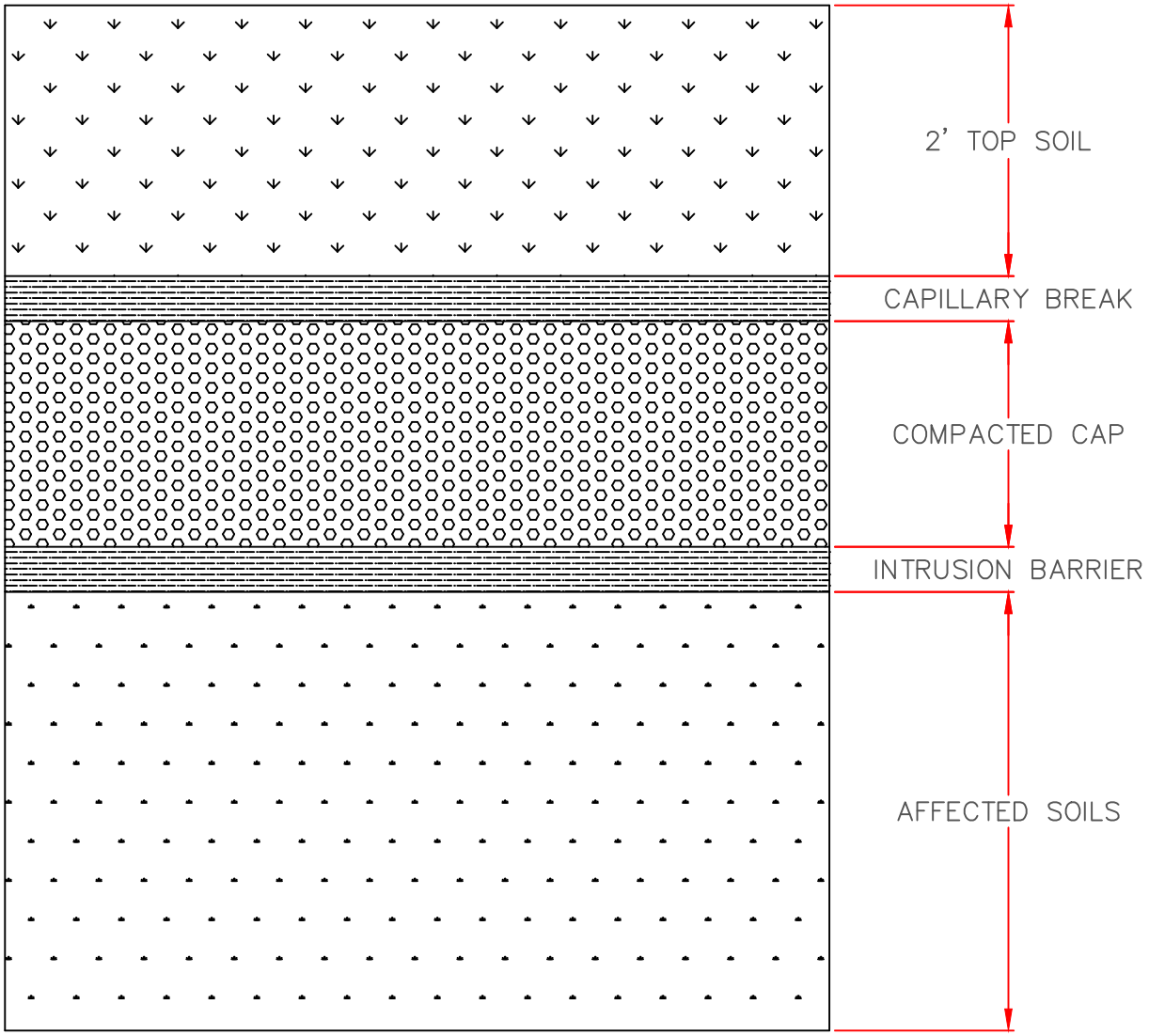
FIGURE 3

IN-SITU CAP AND BIO BARRIER DESIGN



SMA
Engineering
Environmental
Surveying

Souder, Miller & Associates
201 S. Halaqueno Street
Carlsbad, NM 88220
Phone (575) 689-7040
www.soudermiller.com
Serving the Southwest & Rocky Mountains

COG

IN-SITU CAP
AND BIOBARRIER DESIGN
COG-Copperhead 31 Fed Com #2H

Designed	Drawn	Checked
LM	GJF	KT

Date: December 2015
Scale: Horiz: NA Vert: NA
Project No: 5B23978
Figure 3

C:\Users\lcm\Documents\CAp design\COG cap.dwg, LCM, 12/2/2015 12:25 PM

TABLE 1

RELEASE INFORMATION AND SITE RANKING

Table 1: Release information and Site Ranking					
Name	Copperhead 31 Federal Oil				
Location	Incident Number	API Number	Section, Township, Range		
	2RP-3354	30-015-39791	N/S (UL G)	Section 31	T 26S, R 29E NMPM
Estimated Date of Release	September 26, 2015				
Date Reported to NMOCD	October 10, 2015				
Reported by	Amanda Trujillo, COG Operating LLC				
Land Owner	Federal				
Reported To	NM Oil Conservation Division (NMOCD)				
Source of Release	Poly flowline leak				
Released Material	Produced Water				
Released Volume	40 bbls Produced Water				
Recovered Volume	10 bbls Produced Water				
Net Release	30 bbl Produced Water				
Nearest Waterway	Pecos River is over 2 miles east of the location.				
Depth to Groundwater	Estimated to be 76				
Nearest Domestic Water Source	Greater than 1000ft				
NMOCD Ranking	10				
SMA Response Dates	Initial: November 2, 2015 Mitigation Activities: December 14, 2015				
Subcontractors	TCS				
Disposal Facility	Lea Land, LLC				
Estimated Yd^3 Contaminated Soil Excavated and Disposed	1180				

TABLE 2

SUMMARY OF LABORATORY ANALYSES

Table 2: Summary of Laboratory Analyses

Analytical Report- 1512A56	Sample Number on Figure 2 Map	Sample Date	Depth	BTEX ppm	Benzene mg/Kg	GRO mg/Kg	DRO mg/Kg	Cl- mg/Kg
1512A56-001	D1-12	12/16/2015	12'	N/A	N/A	N/A	N/A	150
1512A56-002	D1-5	12/16/2015	5'	BDL	BDL	N/A	N/A	BDL
1512A56-003	D2-11.5	12/16/2015	11.5'	N/A	N/A	N/A	N/A	3,000
1512A56-004	D2-8	12/16/2015	8'	N/A	N/A	N/A	N/A	75
1512A56-005	D3-4	12/16/2015	4'	N/A	N/A	N/A	N/A	8,400
1512A56-006	D3-12	12/16/2015	12'	BDL	BDL	N/A	N/A	BDL
1512A56-007	SW-3	12/16/2015	2'	N/A	N/A	N/A	N/A	180
1512A56-008	SW-2	12/16/2015	2'	N/A	N/A	N/A	N/A	77

APPENDIX A

LABORATORY ANALYTICAL REPORTS

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

January 06, 2016

Austin Weyant

Souder, Miller & Associates
201 S Halagueno
Carlsbad, NM 88221
TEL: (575) 689-7040
FAX

RE: Copperhead 31 2H OrderNo.: 1512A56

Dear Austin Weyant:

Hall Environmental Analysis Laboratory received 8 sample(s) on 12/22/2015 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report
Lab Order **1512A56**
Date Reported: **1/6/2016**

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: D1-12
Project: Copperhead 31 2H
Collection Date: 12/16/2015 1:20:00 PM
Lab ID: 1512A56-001
Matrix: SOIL
Received Date: 12/22/2015 9:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	150	30		mg/Kg	20	12/30/2015 4:02:48 PM	22982

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Detection Limit

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: D1-5
Project: Copperhead 31 2H
Collection Date: 12/16/2015 1:20:00 PM
Lab ID: 1512A56-002
Matrix: SOIL
Received Date: 12/22/2015 9:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	ND	30		mg/Kg	20	12/29/2015 3:15:26 PM	22982
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.047		mg/Kg	1	12/24/2015 11:22:33 PM	22945
Toluene	ND	0.047		mg/Kg	1	12/24/2015 11:22:33 PM	22945
Ethylbenzene	ND	0.047		mg/Kg	1	12/24/2015 11:22:33 PM	22945
Xylenes, Total	ND	0.094		mg/Kg	1	12/24/2015 11:22:33 PM	22945
Surr: 4-Bromofluorobenzene	99.8	80-120		%REC	1	12/24/2015 11:22:33 PM	22945

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: D2-11.5
Project: Copperhead 31 2H
Collection Date: 12/16/2015 1:20:00 PM
Lab ID: 1512A56-003
Matrix: SOIL
Received Date: 12/22/2015 9:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	3000	150		mg/Kg	100	12/30/2015 4:15:12 PM	22982

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: D2-8
Project: Copperhead 31 2H
Collection Date: 12/16/2015 1:20:00 PM
Lab ID: 1512A56-004 **Matrix:** SOIL **Received Date:** 12/22/2015 9:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	75	30		mg/Kg	20	12/29/2015 3:40:16 PM	22982

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: D3-4
Project: Copperhead 31 2H
Collection Date: 12/16/2015 1:20:00 PM
Lab ID: 1512A56-005 **Matrix:** SOIL **Received Date:** 12/22/2015 9:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	8400	750		mg/Kg	500	12/31/2015 8:57:16 PM	23002

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: D3-12
Project: Copperhead 31 2H
Collection Date: 12/16/2015 1:20:00 PM
Lab ID: 1512A56-006
Matrix: SOIL
Received Date: 12/22/2015 9:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	ND	30		mg/Kg	20	12/30/2015 10:52:35 AM	23002
EPA METHOD 8021B: VOLATILES						Analyst: **NSB**	
Benzene	ND	0.047		mg/Kg	1	12/24/2015 11:46:49 PM	22945
Toluene	ND	0.047		mg/Kg	1	12/24/2015 11:46:49 PM	22945
Ethylbenzene	ND	0.047		mg/Kg	1	12/24/2015 11:46:49 PM	22945
Xylenes, Total	ND	0.094		mg/Kg	1	12/24/2015 11:46:49 PM	22945
Surr: 4-Bromofluorobenzene	100	80-120		%REC	1	12/24/2015 11:46:49 PM	22945

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: SW-3
Project: Copperhead 31 2H
Collection Date: 12/16/2015 1:20:00 PM
Lab ID: 1512A56-007
Matrix: SOIL
Received Date: 12/22/2015 9:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	180	30		mg/Kg	20	12/30/2015 11:04:59 AM	23002

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Souder, Miller & Associates
Client Sample ID: SW-2
Project: Copperhead 31 2H
Collection Date: 12/16/2015 1:20:00 PM
Lab ID: 1512A56-008 **Matrix:** SOIL **Received Date:** 12/22/2015 9:25:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst: **LGT**	
Chloride	77	30		mg/Kg	20	12/30/2015 11:17:24 AM	23002

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1512A56**

06-Jan-16

Client: Souder, Miller & Associates

Project: Copperhead 31 2H

Sample ID	**MB-22982**	SampType:	**MBLK**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**22982**	RunNo:	**31150**					
Prep Date:	**12/28/2015**	Analysis Date:	**12/29/2015**	SeqNo:	**953465**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-22982**	SampType:	**LCS**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**22982**	RunNo:	**31150**					
Prep Date:	**12/28/2015**	Analysis Date:	**12/29/2015**	SeqNo:	**953466**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.3	90	110			

Sample ID	**MB-23002**	SampType:	**MBLK**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**23002**	RunNo:	**31168**					
Prep Date:	**12/29/2015**	Analysis Date:	**12/30/2015**	SeqNo:	**954140**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-23002**	SampType:	**LCS**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**23002**	RunNo:	**31168**					
Prep Date:	**12/29/2015**	Analysis Date:	**12/30/2015**	SeqNo:	**954141**	Units:	**mg/Kg**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	92.4	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1512A56**

06-Jan-16

Client: Souder, Miller & Associates

Project: Copperhead 31 2H

Sample ID	**MB-22945**	SampType:	**MBLK**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**PBS**	Batch ID:	**22945**	RunNo:	**31062**					
Prep Date:	**12/23/2015**	Analysis Date:	**12/24/2015**	SeqNo:	**950286**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.1		1.000		108	80	120			

Sample ID	**LCS-22945**	SampType:	**LCS**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**LCSS**	Batch ID:	**22945**	RunNo:	**31062**					
Prep Date:	**12/23/2015**	Analysis Date:	**12/24/2015**	SeqNo:	**950305**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.0	0.050	1.000	0	102	80	120			
Toluene	1.0	0.050	1.000	0	102	80	120			
Ethylbenzene	1.0	0.050	1.000	0	101	80	120			
Xylenes, Total	3.1	0.10	3.000	0	103	80	120			
Surr: 4-Bromofluorobenzene	1.2		1.000		124	80	120			S

Sample ID	**1512A12-001AMS**	SampType:	**MS**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**BatchQC**	Batch ID:	**22945**	RunNo:	**31062**					
Prep Date:	**12/23/2015**	Analysis Date:	**12/24/2015**	SeqNo:	**950311**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.99	0.047	0.9381	0	105	69.6	136			
Toluene	1.1	0.047	0.9381	0	113	76.2	134			
Ethylbenzene	1.1	0.047	0.9381	0	116	75.8	137			
Xylenes, Total	3.3	0.094	2.814	0	119	78.9	133			
Surr: 4-Bromofluorobenzene	1.2		0.9381		123	80	120			S

Sample ID	**1512A12-001AMSD**	SampType:	**MSD**	TestCode:	**EPA Method 8021B: Volatiles**					
Client ID:	**BatchQC**	Batch ID:	**22945**	RunNo:	**31062**					
Prep Date:	**12/23/2015**	Analysis Date:	**12/24/2015**	SeqNo:	**950312**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.95	0.047	0.9390	0	101	69.6	136	3.44	20	
Toluene	1.0	0.047	0.9390	0	110	76.2	134	2.32	20	
Ethylbenzene	1.1	0.047	0.9390	0	113	75.8	137	2.87	20	
Xylenes, Total	3.2	0.094	2.817	0	115	78.9	133	3.08	20	
Surr: 4-Bromofluorobenzene	1.1		0.9390		120	80	120	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix		

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: SMA-CARLSBAD Work Order Number: 1512A56 RcptNo: 1

Received by/date: JA 12/22/15

Logged By: Ashley Gallegos 12/22/2015 9:25:00 AM

Completed By: Ashley Gallegos 12/23/2015 9:00:40 AM

Reviewed By: IO 12/23/15

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☐	No ☐	No VOA Vials ☑
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.3	Good	Yes			

Chain-of-Custody Record

Client: SMA

Mailing Address: 201 S HALAGUENO

Phone #: 684-7040

email or Fax#:

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☑ Standard ☐ Rush

Project Name: COPPERHEAD 31 2H

Project #:

Project Manager: AUSTIN WEYANT

Sampler: LCM

On Ice: ☒ Yes ☐ No

Sample Temperature: 4.3

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1518456	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO3,NO2,PO4,SO4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)					Air Bubbles (Y or N)
12/16	1:20	SOIL	D1-12	4oz		-001								X								
12/16			D1-5	4oz		-002	X	X						X								
			D2-11.5			-003								X								
			D2-8			-004								X								
			D3-4			-005								X								
			D3-12			-006	X	X						X								
			SW-3			-007								X								
			SW-2			-008								X								

Date:	Time:	Relinquished by:	Received by:	Date	Time
			[signature]	12/22/15	0925
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

APPENDIX B

FORM C141 FINAL

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

Name of Company: COG Operating LLC	Contact: Robert McNeill
Address: 600 West Illinois Avenue, Midland TX 79701	Telephone No. 432-230-0077
Facility Name: Copperhead 31 Federal Com #2H	Facility Type: Well

Surface Owner: Federal	Mineral Owner:	API No. 30-015-39791

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
G	31	26S	29E	480	South	2140	East	Eddy

Latitude 32.0014229 **Longitude** -104.0222015

NATURE OF RELEASE

Type of Release: Produced Water	Volume of Release: 40 bbls PW	Volume Recovered: 10 bbls PW
Source of Release: Flowline	Date and Hour of Occurrence: 9/26/2015 5:00 pm	Date and Hour of Discovery: 9/26/2015 5:00 pm
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher – NMOCD / Jim Amos – BLM	
By Whom? Lupe Carrasco	Date and Hour: Sunday, September 27, 2015 9:30 AM	
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.*
This release was caused by a poly flowline leak. A vacuum truck was dispatched to recover all standing fluid.

Describe Area Affected and Cleanup Action Taken.*

This release impacted the nearby pasture approximately 80' x 80'. This release was addressed per the approved work plan and under the guidance of NMOCD and the BLM.

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: A Trujillo	OIL CONSERVATION DIVISION	
Printed Name: Amanda Trujillo	Approved by Environmental Specialist:	
Title: Senior Environmental Coordinator	Approval Date:	Expiration Date:
E-mail Address: atrujillo@concho.com	Conditions of Approval:	Attached ☐
Date: December 29, 2015 Phone: 575-748-6940		

* Attach Additional Sheets If Necessary

APPENDIX C

API AMIGO SUMMARY

AMIGO

New File | Browse... | Save | Quick Start | Manual | AMIGO

Units

○ Metric (m) ◉ English (inches)

Climate

Arid Hot (NM/W.Texas, Hobbs)

Input for a Distant Well

Distance to Well	1000	[ft]
Source Width	3.28	[ft]
Longitudinal Dispersivity	10	[-]
Transverse Dispersivity	1	[-]

Groundwater Characterictics

Background Cl Concentration in Aquifer	cGW =	550	[mg/L]
Aquifer porosity	n =	0.3	[-]
Groundwater Table Depth	D =	80	[ft]
Aquifer Thickness	H =	50	[ft]
Slope of Water Table	i =	0.05	[-]
Hydraulic Conductivity	Ks =	3.28	[ft/d]
Groundwater Flux	Q =	8.2	[ft2/d]

Source Characteristics

Chloride Load: M = 16 [kg/m2]

Max. length of the spill in direction of GW flow: L = 20 [ft]

Plant Uptake Trigger

◉ 1% Input Concentration
○ 10% Input Concentration

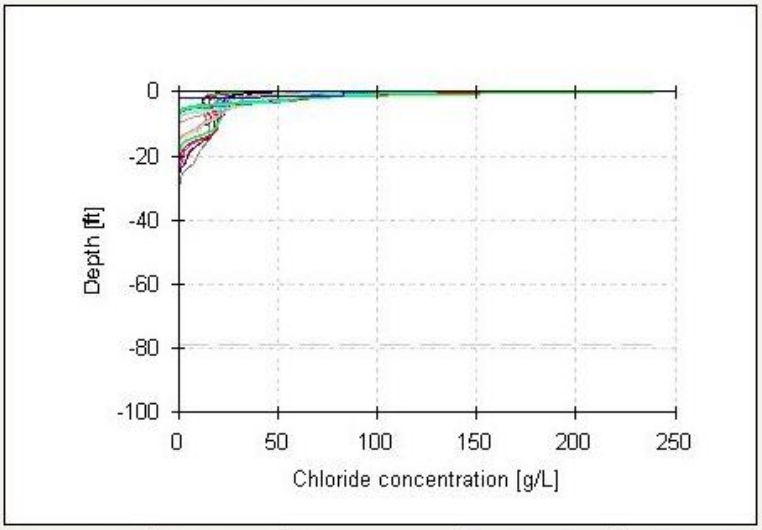
Soil Profiles

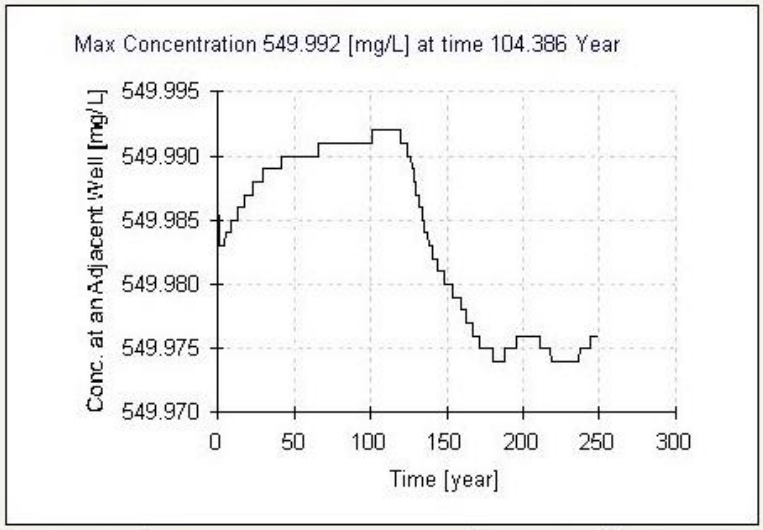
Surface Layer: Loam

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

Output Charts

Quantity 1: Chloride concentration [g/L] | Quantity 2: Conc. at an Adjacent Well [mg/L]





Reduce | Display All | ☐ Legend | Export | Export All

Refresh | ☐ Auto-Refresh | Export | Export All