



November 18, 2015

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

SUBJECT: SOIL REMEDIATION WORK PLAN FOR INCIDENT 2RP-3354 COPPERHEAD 31 FEDERAL COM #2H, EDDY COUNTY, NEW MEXICO

Dear Ms. Patterson:

On behalf of COG Operating (COG), Souder Miller & Associates (SMA) is pleased to submit the attached Work Plan summarizing the soil remediation planned for the release site located on the Copperhead 31 Federal Com #2H in Eddy County, New Mexico. The purpose of the work plan 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 and delineated the 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 incident. The table below summarizes information regarding the 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	N/S (Unit G)	Section 31
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 and 0 bbls Oil				
Recovered Volume	10 bbls Produced Water and 0 bbls Oil				
Net Release	30 bbl Produced Water and bbl Oil				
Nearest Waterway	Pecos River is over 2 miles east of the location.				

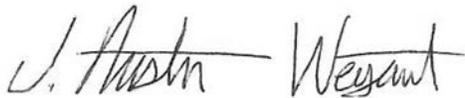


Depth to Groundwater	Estimated to be 76
Nearest Domestic Water Source	Greater than 1000ft
NMOCD Ranking	10
SMA Response Dates	Initial: November 2, 2015 Mitigation Activities: Unknown
Subcontractors	TCS
Disposal Facility	Lea Land, LLC
Estimated Yd ³ Contaminated Soil Excavated and Disposed	800

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



Austin Weyant
Project Scientist

Reviewed by:



Cynthia Gray, CHMM
Senior Scientist



SOIL REMEDIATION WORK PLAN FOR INCIDENT 2RP-3354

COG OPERATING LLC

COPPERHEAD 31 FEDERAL COM #2H
API# 30-015-39791
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

November 18, 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 and initial delineation 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 land owned by the Bureau of Land Management (BLM). Figure 1 illustrates 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. After evaluation of the site using aerial photography and topographic maps, depth to groundwater is estimated to be less than 100 feet but greater than 50 feet below ground surface (bgs). Figure 1 depicts the site vicinity and Figure 2 depicts the site details and sample locations.

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. Figure 1 depicts the site vicinity and Figure 2 shows the site itself. The physical location of this release is within the jurisdiction of NMOCD.

This release location has been assigned a NMOCD ranking of 10 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 2nd, 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. 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 300.0.

4.0 Soil Remediation Work Plan

SMA will begin the excavation of affected soils, with approval from area utilities owners via 811 and NMOCD. SMA will continuously guide the excavation activities by collecting composite soil samples for field screening with a mobile titration unit (EPA 4500) and a calibrated PID. Excavation will occur to approximately three ft. bsg in the spill area. Samples will be taken in the sidewalls to ensure contaminated soils have been removed in the horizontal extent. Final samples will be collected at final depth of excavation, where an in-situ cap will be placed within the excavation. 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 from three ft. below surface grade the affected soils will be compacted and amended with clay a plastic liner will be

added as a capillary break between the affected soils and the proposed caliche cap. The caliche cap will consist of two feet of contaminant-free material placed, and compacted. Then, plastic liner will be added above the caliche cap to form an intrusion barrier. This barrier will prevent leaching and formation of deep root systems into the cap itself. Topsoil will then be placed on top of the cap. The plastic liner on both sides of the caliche cap will effectively break the communication of precipitation through the compacted cap. After excavation, installation of in-situ cap and backfill occurs topsoil will be added as over burden to help with contouring of the area. A berm will be installed on the western area of the spill on surface close to the point of release. Approximately 800 cubic yards of contaminated soil will be removed and replaced with clean backfill material to bring the contours to surface grade the top soil will be amended with hay to improve bulk density and vegetation growth. The contaminated soil will be transported to Lea Land, near Carlsbad, NM.

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.

After the soil remediation work plan is approved by NMOCD, SMA will begin soil remediation activities on site.

Soil contaminant concentrations found during the initial delineation are illustrated in Figure 2. A summary of the laboratory analyses is included in Table 2. Laboratory reports are included in Appendix A.

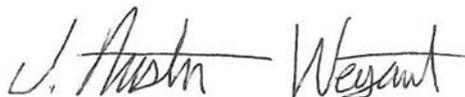
6.0 Closure and Limitations

The scope of our services consisted of the performance of a preliminary spill assessment, verification of release stabilization, regulatory liaison, and preparation of this Remediation Work Plan. 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

Figures:

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

Tables:

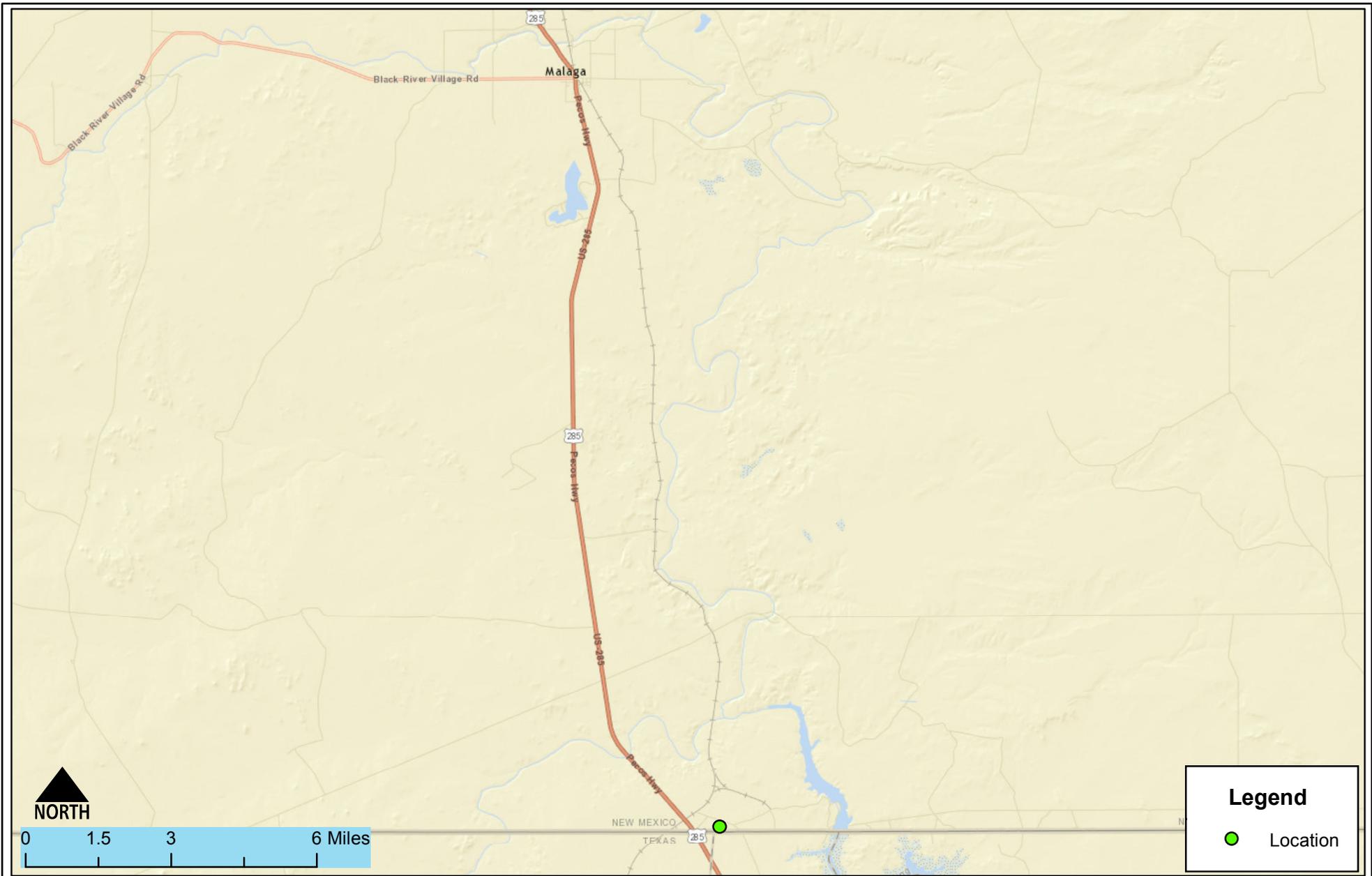
- Table 1: Release Information and Site Ranking
- Table 2: Summary of Laboratory Analyses

Appendices:

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

FIGURE 1

VICINITY MAP



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

Figure 1

Date Saved:
 11/17/2015

By: _____	Date: _____	Revisions	Descr: _____
By: _____	Date: _____		Descr: _____
Copyright 2015 Souder, Miller & Associates - All Rights Reserved			

Drawn	<u>Lucas Middleton</u>
Checked	_____
Approved	_____



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 Carlsbad, New Mexico 88221
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FIGURE 2

SITE DETAILS AND SAMPLE LOCATIONS MAP



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

Figure 2

Date Saved: 11/18/2015	By: _____	Date: _____	Revisions	Descr: _____
	By: _____	Date: _____		Descr: _____
Copyright 2015 Souder, Miller & Associates - All Rights Reserved				

Drawn	<u>Lucas Middleton</u>
Checked	_____
Approved	_____



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FIGURE 3

IN-SITU CAP AND BIO BARRIER DESIGN

TABLE 1

RELEASE INFORMATION AND SITE RANKING

Depth to Groundwater	NMOCD Numeric Rank for this Site	Source for Ranking	Notes
< 50 BGS = 20		USGS Topo Maps; Google Earth Elevation Difference from the site and the bobcat draw wash to the west	Bobcat Draw is 0.28 miles to the north of the location. ; Site elevation is approximately 7 feet below Bobcat Draw
50' to 99' = 10	10		
>100' = 0			
Ranking Criteria for Horizontal Distance to Nearest Surface Water	NMOCD Numeric Rank for this Site	Source for Ranking	Notes
< 200' = 20		USGS Topo Maps; Google Earth ; PRCC Mapping Tool	Pecos River is located approximately 1.4 miles to the east release
200' - 1000' = 10			
>1000' = 0	0		
Ranking Criteria for Horizontal Distance to a Water Well or Water Source	NMOCD Numeric Rank for this Site	Source for Ranking	Notes
<1000' from a water source? <200' from a private domestic water source? YES OR NO to BOTH. YES = 20, NO = 0	0	NM State Engineer Water Well Database	nearest well 2,000ft north of - Easting 627552.22, Northing 3549364.79
Total Site Ranking			
	10		
Soil Remediation Standards	0 to 9	10 to 19	>19
Benzene	10 PPM	10 PPM	10 PPM
BTEX	50 PPM	50 PPM	50 PPM
TPH	5000 PPM	1000 PPM	100 PPM





New Mexico Office of the State Engineer

Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-Code	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 02894	C	ED	2	2	3	12	26S	28E	590458	3547061*		6341	240		
C 01354 X-3	C	ED	2	1	3	23	26S	29E	598323	3543837		6600	170		
C 02038	C	ED	3	2	4	26	26S	29E	599204	3541992*		6915	200		
C 02924	C	ED	1	3	2	11	26S	28E	589032	3547451*		7248			
C 03507 POD1	C	ED	1	3	3	05	26S	29E	593064	3548313		7336	140	78	62
C 03508 POD1	C	ED	1	3	3	05	26S	29E	593063	3548361		7383	140	75	65

Average Depth to Water: **76 feet**
 Minimum Depth: **75 feet**
 Maximum Depth: **78 feet**

Record Count: 6

Basin/County Search:

Basin: Carlsbad **County:** Eddy **Subbasin:** Carlsbad

UTMNAD83 Radius Search (in meters):

Easting (X): 592358.85 **Northing (Y):** 3541011 **Radius:** 10000

*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

TABLE 2

SUMMARY OF LABORATORY ANALYSES

Table 2: Summary of Laboratory Analyses

Analytical Report-1511280	Sample Number on Figure 2 Map	Sample Date	Depth	BTEX ppm	Benzene mg/Kg	GRO mg/Kg	DRO mg/Kg	Cl- mg/Kg
1511280-001	L1	11/2/2015	6"	BDL	BDL	BDL	12	2,600
1511280-002	L1	11/2/2015	3'	N/A	N/A	N/A	N/A	15,000
1511280-003	L2	11/2/2015	1'	BDL	BDL	BDL	BDL	14,000
1511280-004	L2	11/2/2015	2.5'	N/A	N/A	N/A	N/A	15,000
1511280-005	L3	11/2/2015	1'	BDL	BDL	BDL	91	12,000
1511280-006	L4	11/2/2015	6"	N/A	N/A	N/A	N/A	1,100
1511280-007	L4	11/2/2015	3'	N/A	N/A	N/A	N/A	9,200
1511280-008	L5	11/2/2015	6"	N/A	N/A	N/A	N/A	5,000
1511280-009	L5	11/2/2015	3'	N/A	N/A	N/A	N/A	8,900
1511280-010	L6	11/2/2015	6"	N/A	N/A	N/A	N/A	4,900
1511280-011	L6	11/2/2015	2.5'	N/A	N/A	N/A	N/A	5,600
1511280-012	B6 2	11/2/2015	6"	N/A	N/A	N/A	N/A	BDL
1511280-013	B6 1	11/2/2015	6"	N/A	N/A	N/A	N/A	BDL

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

November 12, 2015

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

RE: Copperhead 31 Fed Oil

OrderNo.: 1511280

Dear Austin Weyant:

Hall Environmental Analysis Laboratory received 13 sample(s) on 11/4/2015 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,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written in a cursive style.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1511280

Date Reported: 11/12/2015

CLIENT: Souder, Miller & Associates

Client Sample ID: L1 6"

Project: Copperhead 31 Fed Oil

Collection Date: 11/2/2015 2:33:00 PM

Lab ID: 1511280-001

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	2600	75		mg/Kg	50	11/11/2015 2:21:46 PM	22269
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: KJH
Diesel Range Organics (DRO)	12	10		mg/Kg	1	11/10/2015 11:17:16 AM	22220
Surr: DNOP	111	70-130		%REC	1	11/10/2015 11:17:16 AM	22220
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	5.0		mg/Kg	1	11/10/2015 9:52:15 PM	22241
Surr: BFB	86.2	75.4-113		%REC	1	11/10/2015 9:52:15 PM	22241
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	0.099		mg/Kg	1	11/10/2015 9:52:15 PM	22241
Benzene	ND	0.050		mg/Kg	1	11/10/2015 9:52:15 PM	22241
Toluene	ND	0.050		mg/Kg	1	11/10/2015 9:52:15 PM	22241
Ethylbenzene	ND	0.050		mg/Kg	1	11/10/2015 9:52:15 PM	22241
Xylenes, Total	ND	0.099		mg/Kg	1	11/10/2015 9:52:15 PM	22241
Surr: 4-Bromofluorobenzene	108	80-120		%REC	1	11/10/2015 9:52:15 PM	22241

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.

Analytical Report

Lab Order **1511280**

Date Reported: **11/12/2015**

CLIENT: Souder, Miller & Associates

Client Sample ID: L1 3'

Project: Copperhead 31 Fed Oil

Collection Date: 11/3/2015 1:10:00 PM

Lab ID: 1511280-002

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	15000	750		mg/Kg	500	11/11/2015 1:44:32 PM	22248

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.

Analytical Report

Lab Order 1511280

Date Reported: 11/12/2015

CLIENT: Souder, Miller & Associates

Client Sample ID: L2 1'

Project: Copperhead 31 Fed Oil

Collection Date: 11/2/2015 2:35:00 PM

Lab ID: 1511280-003

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	14000	750		mg/Kg	500	11/11/2015 2:34:11 PM	22269
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: KJH
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	11/10/2015 12:38:45 PM	22220
Surr: DNOP	108	70-130		%REC	1	11/10/2015 12:38:45 PM	22220
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	11/10/2015 10:15:28 PM	22241
Surr: BFB	86.6	75.4-113		%REC	1	11/10/2015 10:15:28 PM	22241
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	0.097		mg/Kg	1	11/10/2015 10:15:28 PM	22241
Benzene	ND	0.048		mg/Kg	1	11/10/2015 10:15:28 PM	22241
Toluene	ND	0.048		mg/Kg	1	11/10/2015 10:15:28 PM	22241
Ethylbenzene	ND	0.048		mg/Kg	1	11/10/2015 10:15:28 PM	22241
Xylenes, Total	ND	0.097		mg/Kg	1	11/10/2015 10:15:28 PM	22241
Surr: 4-Bromofluorobenzene	109	80-120		%REC	1	11/10/2015 10:15:28 PM	22241

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.

Analytical Report

Lab Order **1511280**

Date Reported: **11/12/2015**

CLIENT: Souder, Miller & Associates

Client Sample ID: L2 2.5'

Project: Copperhead 31 Fed Oil

Collection Date: 11/3/2015 1:13:00 PM

Lab ID: 1511280-004

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	15000	750		mg/Kg	500	11/11/2015 1:56:57 PM	22248

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.

Analytical Report

Lab Order 1511280

Date Reported: 11/12/2015

CLIENT: Souder, Miller & Associates

Client Sample ID: L3 1'

Project: Copperhead 31 Fed Oil

Collection Date: 11/2/2015 2:15:00 PM

Lab ID: 1511280-005

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	12000	750		mg/Kg	500	11/11/2015 2:46:35 PM	22269
EPA METHOD 8015M/D: DIESEL RANGE ORGANICS							Analyst: KJH
Diesel Range Organics (DRO)	91	9.8		mg/Kg	1	11/10/2015 1:05:42 PM	22220
Surr: DNOP	104	70-130		%REC	1	11/10/2015 1:05:42 PM	22220
EPA METHOD 8015D: GASOLINE RANGE							Analyst: NSB
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	11/10/2015 10:38:46 PM	22241
Surr: BFB	86.9	75.4-113		%REC	1	11/10/2015 10:38:46 PM	22241
EPA METHOD 8021B: VOLATILES							Analyst: NSB
Methyl tert-butyl ether (MTBE)	ND	0.095		mg/Kg	1	11/10/2015 10:38:46 PM	22241
Benzene	ND	0.048		mg/Kg	1	11/10/2015 10:38:46 PM	22241
Toluene	ND	0.048		mg/Kg	1	11/10/2015 10:38:46 PM	22241
Ethylbenzene	ND	0.048		mg/Kg	1	11/10/2015 10:38:46 PM	22241
Xylenes, Total	ND	0.095		mg/Kg	1	11/10/2015 10:38:46 PM	22241
Surr: 4-Bromofluorobenzene	109	80-120		%REC	1	11/10/2015 10:38:46 PM	22241

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.

Analytical Report

Lab Order **1511280**

Date Reported: **11/12/2015**

CLIENT: Souder, Miller & Associates

Client Sample ID: L4 6"

Project: Copperhead 31 Fed Oil

Collection Date: 11/2/2015 2:40:00 PM

Lab ID: 1511280-006

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	1100	30		mg/Kg	20	11/9/2015 3:49:59 PM	22248

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.

Analytical Report

Lab Order **1511280**

Date Reported: **11/12/2015**

CLIENT: Souder, Miller & Associates

Client Sample ID: L4 3'

Project: Copperhead 31 Fed Oil

Collection Date: 11/3/2015 1:21:00 PM

Lab ID: 1511280-007

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	9200	300		mg/Kg	200	11/11/2015 12:54:54 PM	22248

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.

Analytical Report

Lab Order **1511280**

Date Reported: **11/12/2015**

CLIENT: Souder, Miller & Associates

Client Sample ID: L5 6"

Project: Copperhead 31 Fed Oil

Collection Date: 11/2/2015 2:42:00 PM

Lab ID: 1511280-008

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	5000	300		mg/Kg	200	11/11/2015 1:07:19 PM	22248

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.

Analytical Report

Lab Order 1511280

Date Reported: 11/12/2015

CLIENT: Souder, Miller & Associates

Client Sample ID: L5 3'

Project: Copperhead 31 Fed Oil

Collection Date: 11/3/2015 1:26:00 PM

Lab ID: 1511280-009

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	8900	300		mg/Kg	200	11/11/2015 1:19:44 PM	22248

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.

Analytical Report

Lab Order **1511280**

Date Reported: **11/12/2015**

CLIENT: Souder, Miller & Associates

Client Sample ID: L6 6"

Project: Copperhead 31 Fed Oil

Collection Date: 11/2/2015 2:44:00 PM

Lab ID: 1511280-010

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	4900	300		mg/Kg	200	11/11/2015 1:32:08 PM	22248

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.

Analytical Report

Lab Order 1511280

Date Reported: 11/12/2015

CLIENT: Souder, Miller & Associates

Client Sample ID: L6 2.5'

Project: Copperhead 31 Fed Oil

Collection Date: 11/3/2015 1:30:00 PM

Lab ID: 1511280-011

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	5600	300		mg/Kg	200	11/11/2015 2:09:22 PM	22248

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.

Analytical Report

Lab Order 1511280

Date Reported: 11/12/2015

CLIENT: Souder, Miller & Associates

Client Sample ID: B6 2 6"

Project: Copperhead 31 Fed Oil

Collection Date: 11/2/2015 2:30:00 PM

Lab ID: 1511280-012

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	ND	30		mg/Kg	20	11/10/2015 12:10:28 PM	22269

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.

Analytical Report

Lab Order **1511280**

Date Reported: **11/12/2015**

CLIENT: Souder, Miller & Associates

Client Sample ID: B6 1 6"

Project: Copperhead 31 Fed Oil

Collection Date: 11/2/2015 2:27:00 PM

Lab ID: 1511280-013

Matrix: SOIL

Received Date: 11/4/2015 12:15:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS							Analyst: LGT
Chloride	ND	30		mg/Kg	20	11/10/2015 1:12:32 PM	22269

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#: 1511280

12-Nov-15

Client: Souder, Miller & Associates

Project: Copperhead 31 Fed Oil

Sample ID	MB-22248	SampType:	MBLK	TestCode:	EPA Method 300.0: Anions					
Client ID:	PBS	Batch ID:	22248	RunNo:	30129					
Prep Date:	11/9/2015	Analysis Date:	11/9/2015	SeqNo:	917812	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	LCS-22248	SampType:	LCS	TestCode:	EPA Method 300.0: Anions					
Client ID:	LCSS	Batch ID:	22248	RunNo:	30129					
Prep Date:	11/9/2015	Analysis Date:	11/9/2015	SeqNo:	917821	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	90.7	90	110			

Sample ID	MB-22269	SampType:	MBLK	TestCode:	EPA Method 300.0: Anions					
Client ID:	PBS	Batch ID:	22269	RunNo:	30148					
Prep Date:	11/10/2015	Analysis Date:	11/10/2015	SeqNo:	918734	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	LCS-22269	SampType:	LCS	TestCode:	EPA Method 300.0: Anions					
Client ID:	LCSS	Batch ID:	22269	RunNo:	30148					
Prep Date:	11/10/2015	Analysis Date:	11/10/2015	SeqNo:	918735	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.7	90	110			

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1511280

12-Nov-15

Client: Souder, Miller & Associates

Project: Copperhead 31 Fed Oil

Sample ID MB-22220	SampType: MBLK		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: PBS	Batch ID: 22220		RunNo: 30124							
Prep Date: 11/6/2015	Analysis Date: 11/10/2015		SeqNo: 917919		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	12		10.00		117	70	130			

Sample ID LCS-22220	SampType: LCS		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: LCSS	Batch ID: 22220		RunNo: 30124							
Prep Date: 11/6/2015	Analysis Date: 11/10/2015		SeqNo: 917920		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	63	10	50.00	0	126	57.4	139			
Surr: DNOP	7.4		5.000		147	70	130			S

Sample ID 1511280-001AMS	SampType: MS		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: L1 6"	Batch ID: 22220		RunNo: 30124							
Prep Date: 11/6/2015	Analysis Date: 11/10/2015		SeqNo: 917998		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	9.8	49.12	12.43	72.2	31.2	162			
Surr: DNOP	5.3		4.912		109	70	130			

Sample ID 1511280-001AMSD	SampType: MSD		TestCode: EPA Method 8015M/D: Diesel Range Organics							
Client ID: L1 6"	Batch ID: 22220		RunNo: 30124							
Prep Date: 11/6/2015	Analysis Date: 11/10/2015		SeqNo: 917999		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	44	9.5	47.30	12.43	65.8	31.2	162	9.53	31.7	
Surr: DNOP	4.8		4.730		102	70	130	0	0	

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1511280

12-Nov-15

Client: Souder, Miller & Associates

Project: Copperhead 31 Fed Oil

Sample ID MB-22241	SampType: MBLK		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: PBS	Batch ID: 22241		RunNo: 30136							
Prep Date: 11/9/2015	Analysis Date: 11/10/2015		SeqNo: 918420		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	860		1000		85.6	75.4	113			

Sample ID LCS-22241	SampType: LCS		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: LCSS	Batch ID: 22241		RunNo: 30136							
Prep Date: 11/9/2015	Analysis Date: 11/10/2015		SeqNo: 918421		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	101	79.6	122			
Surr: BFB	930		1000		92.7	75.4	113			

Sample ID 1511280-001AMS	SampType: MS		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: L1 6"	Batch ID: 22241		RunNo: 30136							
Prep Date: 11/9/2015	Analysis Date: 11/10/2015		SeqNo: 918425		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	24.83	0	109	62.5	151			
Surr: BFB	950		993.0		96.1	75.4	113			

Sample ID 1511280-001AMSD	SampType: MSD		TestCode: EPA Method 8015D: Gasoline Range							
Client ID: L1 6"	Batch ID: 22241		RunNo: 30136							
Prep Date: 11/9/2015	Analysis Date: 11/10/2015		SeqNo: 918426		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	27	5.0	24.80	0	107	62.5	151	1.76	22.1	
Surr: BFB	940		992.1		94.6	75.4	113	0	0	

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1511280

12-Nov-15

Client: Souder, Miller & Associates

Project: Copperhead 31 Fed Oil

Sample ID MB-22241	SampType: MBLK		TestCode: EPA Method 8021B: Volatiles							
Client ID: PBS	Batch ID: 22241		RunNo: 30136							
Prep Date: 11/9/2015	Analysis Date: 11/10/2015		SeqNo: 918501		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	0.10								
Benzene	ND	0.050								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 4-Bromofluorobenzene	1.1		1.000		109	80	120			

Sample ID LCS-22241	SampType: LCS		TestCode: EPA Method 8021B: Volatiles							
Client ID: LCSS	Batch ID: 22241		RunNo: 30136							
Prep Date: 11/9/2015	Analysis Date: 11/10/2015		SeqNo: 918502		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	0.93	0.10	1.000	0	93.2	67.2	121			
Benzene	0.99	0.050	1.000	0	99.0	80	120			
Toluene	0.98	0.050	1.000	0	98.1	80	120			
Ethylbenzene	1.0	0.050	1.000	0	101	80	120			
Xylenes, Total	3.0	0.10	3.000	0	101	80	120			
Surr: 4-Bromofluorobenzene	1.2		1.000		115	80	120			

Sample ID 1511280-003AMS	SampType: MS		TestCode: EPA Method 8021B: Volatiles							
Client ID: L2 1'	Batch ID: 22241		RunNo: 30136							
Prep Date: 11/9/2015	Analysis Date: 11/10/2015		SeqNo: 918528		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	1.1	0.097	0.9690	0	111	53.6	133			
Benzene	1.0	0.048	0.9690	0	104	69.6	136			
Toluene	0.99	0.048	0.9690	0.01530	101	76.2	134			
Ethylbenzene	1.0	0.048	0.9690	0	106	75.8	137			
Xylenes, Total	3.1	0.097	2.907	0.02161	106	78.9	133			
Surr: 4-Bromofluorobenzene	1.1		0.9690		116	80	120			

Sample ID 1511280-003AMSD	SampType: MSD		TestCode: EPA Method 8021B: Volatiles							
Client ID: L2 1'	Batch ID: 22241		RunNo: 30136							
Prep Date: 11/9/2015	Analysis Date: 11/10/2015		SeqNo: 918529		Units: mg/Kg					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	0.99	0.097	0.9681	0	102	53.6	133	8.94	20	
Benzene	1.1	0.048	0.9681	0	109	69.6	136	5.05	20	
Toluene	1.1	0.048	0.9681	0.01530	108	76.2	134	6.81	20	
Ethylbenzene	1.1	0.048	0.9681	0	112	75.8	137	5.59	20	

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1511280

12-Nov-15

Client: Souder, Miller & Associates

Project: Copperhead 31 Fed Oil

Sample ID	1511280-003AMSD	SampType:	MSD	TestCode:	EPA Method 8021B: Volatiles					
Client ID:	L2 1'	Batch ID:	22241	RunNo:	30136					
Prep Date:	11/9/2015	Analysis Date:	11/10/2015	SeqNo:	918529	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Xylenes, Total	3.3	0.097	2.904	0.02161	112	78.9	133	5.24	20	
Surr: 4-Bromofluorobenzene	1.1		0.9681		113	80	120	0	0	

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

Sample Log-In Check List

Client Name: SMA-CARLSBAD

Work Order Number: 1511280

RcptNo: 1

Received by/date: *AT* *11/04/15*
 Logged By: Lindsay Mangin 11/4/2015 12:15:00 PM
 Completed By: Lindsay Mangin 11/6/2015 1:07:27 PM
 Reviewed By: *KS* *11/07/15*

Lindsay Mangin
Lindsay Mangin

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? Client

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	5.4	Good	Not Present			

Chain-of-Custody Record

Client: SOMA

Billing Address: Carlsbad

Phone #:

Fax #:

A/QC Package:

Standard Level 4 (Full Validation)

Accreditation:

NELAP Other

EDD (Type):

Turn-Around Time:

Standard Rush

Project Name:

Copperhead 31 Fed Oil

Project #:

Project Manager:

Austin Weigant

Sampler: Lisa Gaston

On Ice: Yes No

Sample Temperature: 5.4

Date Time Matrix Sample Request ID

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
12/15	1433	Soil	L26"	4oz Seal 71	None	1511280
12/15	1310		L23'			-001
12/15	1435		L21'			-002
12/15	1313		L2 2.5'			-003
12/15	1415		L3 1'			-004
12/15	1440		L4 6"			-005
12/15	1321		L4 3'			-006
12/15	1442		L5 6"			-007
12/15	1326		L5 3'			-008
12/15	1444		L6 6"			-009
12/15	1330		L6 2.5'			-010
12/15	1430		B6 2 6"			-011
12/15	1215					-012

Relinquished by:

Lisa Gaston

Received by:

Austin Weigant

Date

11/10/15

Time

1215

Received by:

Date

Time

Remarks: Send MRO via email only. Do not include in report.
Send a copy of report to Lisa.gaston@soandermiller.com



www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Analysis Request

<input checked="" type="checkbox"/> BTEX + MTBE + TMB's (8021)	<input type="checkbox"/>
<input checked="" type="checkbox"/> BTEX + MTBE + TPH (Gas only)	<input type="checkbox"/>
TPH 8015B (GRO / DRO / MRO)	<input type="checkbox"/>
TPH (Method 418.1)	<input type="checkbox"/>
EDB (Method 504.1)	<input type="checkbox"/>
PAH's (8310 or 8270 SIMS)	<input type="checkbox"/>
RCRA 8 Metals	<input type="checkbox"/>
Anions (F ⁻ , NO ₃ ⁻ , NO ₂ ⁻ , PO ₄ ⁻ , SO ₄ ⁻)	<input checked="" type="checkbox"/>
8081 Pesticides / 8082 PCB's	<input type="checkbox"/>
8260B (VOA)	<input type="checkbox"/>
8270 (Semi-VOA)	<input type="checkbox"/>
Air Bubbles (Y or N)	<input type="checkbox"/>

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.

Chain-of-Custody Record

Client: SMA

Standard Rush

Project Name:

Copperhead 31 Fed 0-7

Billing Address: Carlsbad

Project #:

Phone #:

Fax #:

QC Package:

Standard Level 4 (Full Validation)

Creditation:

NELAP Other

EDD (Type)

Sampler: Lisa

On Ice: Yes No

Sample Temperature: 5.4

Date Time Matrix Sample Request ID

2/15/127

Soil

BGI 6"

Container Type and #

4oz. Seal

Preservative Type

None

HEAL No.

1511280

-013

BTEX + MTBE + TMBs (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)

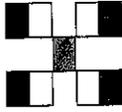
8081 Pesticides / 8082 PCBs

8260B (VOA)

8270 (Semi-VOA)

Air Bubbles (Y or N)

Analysis Request



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

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

Received by: *[Signature]* Date: 11/04/15

Relinquished by: *[Signature]* Date: 12/15

Received by: *[Signature]* Date: 11/04/15

Remarks:

APPENDIX B

FORM C141 INITIAL

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

NAB1529955581

OPERATOR

Initial Report Final Report

Name of Company: COG Operating LLC 217965	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? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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'. Concho will have the spill site sampled to delineate any possible contamination from the release and we will present a remediation work plan to the NMOCD for approval prior to any significant remediation work.

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: <i>A Trujillo</i>	OIL CONSERVATION DIVISION	
Printed Name: Amanda Trujillo	Approved by Environmental Specialist: <i>[Signature]</i>	
Title: Senior Environmental Coordinator	Approval Date: 10/26/15	Expiration Date: N/A
E-mail Address: atrujillo@concho.com	Conditions of Approval: Remediation per O.C.D. Rules & Guidelines	
Date: October 10, 2015 Phone: 575-748-6940	SUBMIT REMEDIATION PROPOSAL NO. <input type="checkbox"/> Attached <input type="checkbox"/>	

LATER THAN: 11/26/15

NM OIL CONSERVATION
ARTESIA DISTRICT
OCT 26 2015
RECEIVED

2RP-3354

* Attach Additional Sheets If Necessary

Patterson, Heather, EMNRD

From: Amanda Trujillo Davis <ATrujillo@concho.com>
Sent: Monday, October 26, 2015 8:29 AM
To: Patterson, Heather, EMNRD; Bratcher, Mike, EMNRD; James_Amos@blm.gov; Shelly Tucker
Subject: (C-141 Initial) Copperhead 31 Federal Com #2H Battery (30-015-39791)
Attachments: 9-26-2015 Copperhead 31 Federal Com #2H (FL) Initial.pdf

Mr. Bratcher,

Attached is a C-141 Initial for your consideration. Please feel to contact me if you have any additional questions or concerns.

Thank you,

Amanda Trujillo Davis

Senior Environmental Coordinator
COG Operating LLC
Cell: 505.350.1336
Office: 575.748.6930
atrujillo@concho.com

2407 Pecos Ave.
Artesia , NM 88210



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From: Lupe Carrasco
Sent: Sunday, September 27, 2015 9:30 AM
To: NMOCD; Patterson, Heather, EMNRD; James Amos; stucker@blm.gov
Subject: RE: (Notification) Copperhead 31 Federal Com #2H Battery (30-015-39791)

Mr. Bratcher,

COG Operating LLC is reporting a release on the Copperhead 31 Federal Com #2H (30-015-39791)

Section 31, Township 26S Range 29E

The release occurred at 5:00 pm on 9/26/2015.

Released : 40 bbls Produced Water

Recovered: 10 bbls Produced Water

The release was due to a failed flowline. The area is being evaluated and a C-141 will be submitted. If you have any additional questions please feel free to contact me.

Thanks!

Lupe Carrasco

Environmental Coordinator

Concho Resources

Cell: 575-725-0787

Office: 575-748-6933

gcarrasco@concho.com

2208 W. Main St.

Artesia, NM. 88210

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----- Original message -----

From: Lupe Carrasco <GCarrasco@concho.com>

Date: 09/27/2015 9:23 AM (GMT-07:00)

To: NMOCD <mike.bratcher@state.nm.us>, "Patterson, Heather, EMNRD" <Heather.Patterson@state.nm.us>, James Amos <jamos@blm.gov>, stucker@blm.gov

Subject: (Notification) Copperhead 31 Federal Com #2H Battery (30-015-39791)

Lupe Carrasco

Environmental Coordinator

Concho Resources

Cell: 575-725-0787

Office: 575-748-6933

gcarrasco@concho.com

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Patterson, Heather, EMNRD

From: Lupe Carrasco <GCarrasco@concho.com>
Sent: Sunday, September 27, 2015 9:30 AM
To: Bratcher, Mike, EMNRD; Patterson, Heather, EMNRD; James Amos; stucker@blm.gov
Subject: RE: (Notification) Copperhead 31 Federal Com #2H Battery (30-015-39791)

Mr. Bratcher,

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Date: 09/27/2015 9:23 AM (GMT-07:00)
To: NMOCD <mike.bratcher@state.nm.us>, "Patterson, Heather, EMNRD" <Heather.Patterson@state.nm.us>, James Amos <jamos@blm.gov>, stucker@blm.gov

Subject: (Notification) Copperhead 31 Federal Com #2H Battery (30-015-39791)

Lupe Carrasco

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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 [ft]

Source Width [ft]

Longitudinal Dispersivity [-]

Transverse Dispersivity [-]

Groundwater Characteristics

Background Cl Concentration in Aquifer cGW = [mg/L]

Aquifer porosity n = [-]

Groundwater Table Depth D = [ft]

Aquifer Thickness H = [ft]

Slope of Water Table i = [-]

Hydraulic Conductivity Ks = [ft/d]

Groundwater Flux Q = [ft²/d]

Source Characteristics

Chloride Load: Max. length of the spill in direction of GW flow:

M = [kg/m²] L = [ft]

Plant Uptake Trigger

1% Input Concentration

10% Input Concentration

Soil Profiles

Surface Layer ▾

Soil Profile ▾

Output Charts

Quantity 1: ▾ Quantity 2: ▾

Depth [ft] vs Chloride concentration [g/L]

The plot shows depth on the y-axis (0 to -100 ft) and chloride concentration on the x-axis (0 to 250 g/L). Multiple colored lines represent concentration profiles at different depths, showing a sharp increase in concentration near the surface (0 ft) that levels off at approximately 50 g/L below 20 ft depth.

Max Concentration 549.992 [mg/L] at time 104.386 Year

Conc. at an Adjacent Well [mg/L] vs Time [year]

The plot shows concentration on the y-axis (549.970 to 549.995 mg/L) and time on the x-axis (0 to 300 years). The concentration starts at approximately 549.975 mg/L, rises to a peak of 549.992 mg/L at 104.386 years, and then gradually declines back towards the initial concentration.

Reduce Display All Legend Export Export All Refresh Auto-Refresh Export Export All