22-Dec-2017

Jake Janicek
Caerus Oil and Gas LLC
143 Diamond Ave.
Parachute, CO 81635

Re: **F23 Tank Spill** Work Order: **1712923**

Dear Jake,

ALS Environmental received 1 sample on 14-Dec-2017 10:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 21.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Chad Whelton

Chad Whelton
Project Manager

Certificate No: MN 998501

ADDRESS 3352 128th Ave Holland, Michigan 49424 | PHONE (616) 399-6070 | FAX (616) 399-6185
ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

ALS Group, USA

Date: 22-Dec-17

Client: Caerus Oil and Gas LLC
Project: F23 Tank Spill
Work Order: **1712923**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1712923-01	20171213-F23-Tank Spill POR	Soil		12/13/2017 09:00	12/14/2017 10:00	☐

ALS Group, USA

Date: 22-Dec-17

Client: Caerus Oil and Gas LLC
Project: F23 Tank Spill
Work Order: 1712923

Case Narrative

Batch 112019, Method CR6_7196_S, Sample 1712923-01A MS/MSD: The MS/MSD recovery was below the lower control limit. The corresponding result in the parent sample may be biased low.

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter
mmhos/cm @25°C	Millimhos-Centimeter at 25 Degrees Celcius
none	

ALS Group, USA

Date: *22-Dec-17*

Client: Caerus Oil and Gas LLC
Project: F23 Tank Spill
Sample ID: 20171213-F23-Tank Spill POR
Collection Date: 12/13/2017 09:00 AM

Work Order: 1712923
Lab ID: 1712923-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID		Method: **SW8015C**			Prep: SW3546 / 12/15/17		Analyst: **MEB**
DRO (C10-C28)	**340**		**6.1**	**11**	**mg/Kg-dry**	1	12/15/2017 21:19
Surr: 4-Terphenyl-d14	*123*			*34-130*	*%REC*	1	12/15/2017 21:19
GASOLINE RANGE ORGANICS BY GC-FID		Method: **SW8015D**			Prep: SW5035 / 12/15/17		Analyst: **KB**
GRO (C6-C10)	**460**		**3.7**	**8.9**	**mg/Kg-dry**	1	12/18/2017 18:29
Surr: Toluene-d8	*98.1*			*71-123*	*%REC*	1	12/18/2017 18:29
MERCURY BY CVAA		Method: **SW7471B**			Prep: SW7471 / 12/20/17		Analyst: **RSH**
Mercury	**0.059**		**0.0027**	**0.027**	**mg/Kg-dry**	1	12/20/2017 14:16
METALS ANALYSIS BY ICP		Method: **SW846 6010C**			Prep: SW3050B / 12/15/17		Analyst: **HBA**
Arsenic	**19**		**0.14**	**0.52**	**mg/Kg-dry**	1	12/20/2017 19:52
Barium	**3,900**		**0.21**	**0.52**	**mg/Kg-dry**	1	12/20/2017 19:52
Cadmium	**0.62**	J	**0.050**	**1.0**	**mg/Kg-dry**	1	12/20/2017 19:52
Chromium	**23**		**0.029**	**0.52**	**mg/Kg-dry**	1	12/20/2017 19:52
Copper	**27**		**0.23**	**1.0**	**mg/Kg-dry**	1	12/20/2017 19:52
Lead	**15**		**0.11**	**0.52**	**mg/Kg-dry**	1	12/20/2017 19:52
Nickel	**16**		**0.21**	**0.52**	**mg/Kg-dry**	1	12/20/2017 19:52
Selenium	**3.1**		**0.29**	**1.0**	**mg/Kg-dry**	1	12/20/2017 19:52
Silver	U		0.065	0.52	mg/Kg-dry	1	12/20/2017 19:52
Zinc	**370**		**0.084**	**1.0**	**mg/Kg-dry**	1	12/20/2017 19:52
SOLUBLE CATIONS FOR SAR		Method: **SW6020A**			Prep: USDA Method 20B / 12/19/17		Analyst: **JF**
Calcium	**200**		**0.86**	**5.0**	**mg/L**	10	12/19/2017 12:03
Magnesium	**15**		**0.068**	**2.0**	**mg/L**	10	12/19/2017 12:03
Sodium	**4,300**		**3.4**	**20**	**mg/L**	100	12/19/2017 12:13
SODIUM ADSORPTION RATIO		Method: **USDA H60 METHOD 2**			Prep: USDA Method 20B / 12/19/17		Analyst: **RH**
Sodium Adsorption Ratio	**77**		**0.010**	**0.010**	**none**	1	12/19/2017
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW846 8270D**			Prep: SW3546 / 12/15/17		Analyst: **RM**
Acenaphthene	U		6.3	89	µg/Kg-dry	1	12/15/2017 21:18
Anthracene	U		3.2	89	µg/Kg-dry	1	12/15/2017 21:18
Benzo(a)anthracene	U		5.5	89	µg/Kg-dry	1	12/15/2017 21:18
Benzo(a)pyrene	U		2.2	89	µg/Kg-dry	1	12/15/2017 21:18
Benzo(b)fluoranthene	U		3.4	89	µg/Kg-dry	1	12/15/2017 21:18
Benzo(k)fluoranthene	U		4.6	89	µg/Kg-dry	1	12/15/2017 21:18
Chrysene	U		3.4	89	µg/Kg-dry	1	12/15/2017 21:18
Dibenzo(a,h)anthracene	U		2.9	89	µg/Kg-dry	1	12/15/2017 21:18
Fluoranthene	U		2.6	89	µg/Kg-dry	1	12/15/2017 21:18

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: *22-Dec-17*

Client: Caerus Oil and Gas LLC
Project: F23 Tank Spill
Sample ID: 20171213-F23-Tank Spill POR
Collection Date: 12/13/2017 09:00 AM

Work Order: 1712923
Lab ID: 1712923-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Fluorene	U		2.9	89	µg/Kg-dry	1	12/15/2017 21:18
Indeno(1,2,3-cd)pyrene	U		2.7	89	µg/Kg-dry	1	12/15/2017 21:18
Naphthalene	**1,100**		**17**	**89**	**µg/Kg-dry**	1	12/15/2017 21:18
Pyrene	U		3.2	89	µg/Kg-dry	1	12/15/2017 21:18
Surr: 2-Fluorobiphenyl	*92.7*			*20-140*	*%REC*	1	12/15/2017 21:18
Surr: 4-Terphenyl-d14	*133*			*22-172*	*%REC*	1	12/15/2017 21:18
Surr: Nitrobenzene-d5	*137*			*28-140*	*%REC*	1	12/15/2017 21:18
VOLATILE ORGANIC COMPOUNDS		Method:	**SW8260B**		Prep: SW5035 / 12/15/17		Analyst: **BG**
Benzene	**3.6**		**0.091**	**0.53**	**mg/Kg-dry**	10	12/20/2017 04:20
Ethylbenzene	**2.0**		**0.11**	**0.53**	**mg/Kg-dry**	10	12/20/2017 04:20
m,p-Xylene	**28**		**0.25**	**1.1**	**mg/Kg-dry**	10	12/20/2017 04:20
o-Xylene	**4.5**		**0.21**	**0.53**	**mg/Kg-dry**	10	12/20/2017 04:20
Toluene	**20**		**0.15**	**0.53**	**mg/Kg-dry**	10	12/20/2017 04:20
Xylenes, Total	**33**		**0.46**	**1.6**	**mg/Kg-dry**	10	12/20/2017 04:20
Surr: 1,2-Dichloroethane-d4	*104*			*70-130*	*%REC*	10	12/20/2017 04:20
Surr: 4-Bromofluorobenzene	*99.0*			*70-130*	*%REC*	10	12/20/2017 04:20
Surr: Dibromofluoromethane	*104*			*70-130*	*%REC*	10	12/20/2017 04:20
Surr: Toluene-d8	*97.6*			*70-130*	*%REC*	10	12/20/2017 04:20
ELECTRICAL CONDUCTIVITY (SAR)		Method:	**USDA H60 METHOD 2**		Prep: USDA Method 20B / 12/19/17		Analyst: **JB**
Electrical Conductivity @ Saturation	**21**		**0.011**	**0.10**	**mmhos/cm @25°**	20	12/19/2017 16:40
CHROMIUM, TRIVALENT		Method:	**CALCULATION**				Analyst: **JB**
Chromium, Trivalent	**22**		**0.43**	**1.4**	**mg/Kg-dry**	1	12/22/2017 08:10
CHROMIUM, HEXAVALENT		Method:	**SW7196A**		Prep: SW3060A / 12/18/17		Analyst: **RP**
Chromium, Hexavalent	**0.69**	J	**0.40**	**1.3**	**mg/Kg-dry**	1	12/19/2017 15:45
MOISTURE		Method:	**SW3550C**				Analyst: **BTG**
Moisture	**28**		**0.025**	**0.050**	**% of sample**	1	12/18/2017 17:45

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 22-Dec-17

Client: Caerus Oil and Gas LLC

Work Order: 1712923

Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **111906** Instrument ID **GC8** Method: **SW8015C**

MBLK Sample ID: **DBLKS1-111906-111906** Units: **mg/Kg** Analysis Date: **12/15/2017 04:58 PM**

Client ID: Run ID: **GC8_171215B** SeqNo: **4814983** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	U	5.0								
Surr: 4-Terphenyl-d14	*3.95*	0	*3.33*	0	*119*	*34-130*	0			

LCS Sample ID: **DLCSS1-111906-111906** Units: **mg/Kg** Analysis Date: **12/15/2017 05:27 PM**

Client ID: Run ID: **GC8_171215B** SeqNo: **4814984** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	268.6	5.0	333	0	80.7	65-122	0			
Surr: 4-Terphenyl-d14	*3.917*	0	*3.33*	0	*118*	*34-130*	0			

MS Sample ID: **1712920-01A MS** Units: **mg/Kg** Analysis Date: **12/15/2017 05:56 PM**

Client ID: Run ID: **GC8_171215B** SeqNo: **4814985** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	2593	4.8	322.9	3004	-127	65-122	0			SEO
Surr: 4-Terphenyl-d14	*9.682*	0	*3.229*	0	*300*	*34-130*	0			*S*

MSD Sample ID: **1712920-01A MSD** Units: **mg/Kg** Analysis Date: **12/15/2017 06:25 PM**

Client ID: Run ID: **GC8_171215B** SeqNo: **4814986** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	3683	5.0	330.9	3004	205	65-122	2593	34.7	30	SREO
Surr: 4-Terphenyl-d14	*15.62*	0	*3.309*	0	*472*	*34-130*	9.682	*46.9*	*30*	*SR*

The following samples were analyzed in this batch: 1712923-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1712923
Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **111909** Instrument ID **GC10** Method: **SW8015D**

MBLK Sample ID: **MBLK-111909-111909** Units: **µg/Kg-dry** Analysis Date: **12/18/2017 04:12 PM**
Client ID: Run ID: **GC10_171218A** SeqNo: **4817143** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	U	5,000								
Surr: Toluene-d8	*4576*	0	*5000*	0	*91.5*	*71-123*	0			

LCS Sample ID: **LCS-111909-111909** Units: **µg/Kg-dry** Analysis Date: **12/18/2017 03:20 PM**
Client ID: Run ID: **GC10_171218A** SeqNo: **4817142** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	463800	5,000	500000	0	92.8	71-123	0			
Surr: Toluene-d8	*4866*	0	*5000*	0	*97.3*	*71-123*	0			

MS Sample ID: **1712963-02A MS** Units: **µg/Kg-dry** Analysis Date: **12/19/2017 03:08 A**
Client ID: Run ID: **GC10_171218A** SeqNo: **4817161** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	622800	6,400	636400	0	97.9	71-123	0			
Surr: Toluene-d8	*6348*	0	*6364*	0	*99.8*	*71-123*	0			

MSD Sample ID: **1712963-02A MSD** Units: **µg/Kg-dry** Analysis Date: **12/19/2017 03:34 A**
Client ID: Run ID: **GC10_171218A** SeqNo: **4817162** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	660500	6,400	636400	0	104	71-123	622800	5.88	30	
Surr: Toluene-d8	*6483*	0	*6364*	0	*102*	*71-123*	6348	*2.1*	*30*	

The following samples were analyzed in this batch: 1712923-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1712923
Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **112112** Instrument ID **HG1** Method: **SW7471B**

MBLK Sample ID: **MBLK-112112-112112** Units: **mg/Kg** Analysis Date: **12/20/2017 01:53 PM**
Client ID: Run ID: **HG1_171220A** SeqNo: **4821250** Prep Date: **12/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.020								

LCS Sample ID: **LCS-112112-112112** Units: **mg/Kg** Analysis Date: **12/20/2017 01:56 PM**
Client ID: Run ID: **HG1_171220A** SeqNo: **4821251** Prep Date: **12/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1808	0.020	0.1665	0	109	80-120	0			

MS Sample ID: **1712914-01AMS** Units: **mg/Kg** Analysis Date: **12/20/2017 02:06 PM**
Client ID: Run ID: **HG1_171220A** SeqNo: **4821255** Prep Date: **12/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1415	0.017	0.1386	0.01176	93.6	75-125	0			

MSD Sample ID: **1712914-01AMSD** Units: **mg/Kg** Analysis Date: **12/20/2017 02:08 PM**
Client ID: Run ID: **HG1_171220A** SeqNo: **4821256** Prep Date: **12/20/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1559	0.017	0.1409	0.01176	102	75-125	0.1415	9.68	35	

The following samples were analyzed in this batch: 1712923-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1712923
Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **111907** Instrument ID **ICP2** Method: **SW846 6010C**

MBLK Sample ID: **MBLK-111907-111907** Units: **mg/Kg** Analysis Date: **12/18/2017 09:56 A**
Client ID: Run ID: **ICP2_171218A** SeqNo: **4815267** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.25								
Barium	U	0.25								
Cadmium	U	0.50								
Chromium	0.04085	0.25								J
Copper	U	0.50								
Lead	U	0.25								
Nickel	U	0.25								
Selenium	U	0.50								
Silver	U	0.25								
Zinc	U	0.50								

LCS Sample ID: **LCS-111907-111907** Units: **mg/Kg** Analysis Date: **12/18/2017 10:02 A**
Client ID: Run ID: **ICP2_171218A** SeqNo: **4815268** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	5.106	0.25	5	0	102	80-120	0			
Barium	4.717	0.25	5	0	94.3	80-120	0			
Cadmium	5.107	0.50	5	0	102	80-120	0			
Chromium	5.147	0.25	5	0	103	80-120	0			
Copper	4.998	0.50	5	0	100	80-120	0			
Lead	5.321	0.25	5	0	106	80-120	0			
Nickel	5.13	0.25	5	0	103	80-120	0			
Selenium	4.614	0.50	5	0	92.3	80-120	0			
Silver	4.901	0.25	5	0	98	80-120	0			
Zinc	5.282	0.50	5	0	106	80-120	0			

MS Sample ID: **1712981-03AMS** Units: **mg/Kg** Analysis Date: **12/19/2017 10:38 A**
Client ID: Run ID: **ICP2_171219A** SeqNo: **4818425** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	13.88	0.35	7.013	6.543	105	75-125	0			
Barium	78.43	0.35	7.013	62.24	231	75-125	0			SO
Cadmium	7.57	0.70	7.013	0.2118	105	75-125	0			
Chromium	20.59	0.35	7.013	11.93	123	75-125	0			
Copper	18.21	0.70	7.013	14.39	54.5	75-125	0			S
Lead	23	0.35	7.013	15.96	100	75-125	0			
Nickel	21.14	0.35	7.013	12.48	123	75-125	0			
Selenium	7.769	0.70	7.013	1.403	90.8	75-125	0			
Silver	6.634	0.35	7.013	-0.2735	98.5	75-125	0			
Zinc	66.03	0.70	7.013	48.76	246	75-125	0			SO

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1712923
Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **111907** Instrument ID **ICP2** Method: **SW846 6010C**

MSD Sample ID: **1712981-03AMSD** Units: **mg/Kg** Analysis Date: **12/19/2017 10:43 A**

Client ID: Run ID: **ICP2_171219A** SeqNo: **4818426** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	15.97	0.35	7.032	6.543	134	75-125	13.88	14	20	S
Barium	79.1	0.35	7.032	62.24	240	75-125	78.43	0.847	20	SO
Cadmium	7.88	0.70	7.032	0.2118	109	75-125	7.57	4.02	20	
Chromium	21.21	0.35	7.032	11.93	132	75-125	20.59	2.99	20	S
Copper	22.55	0.70	7.032	14.39	116	75-125	18.21	21.3	20	R
Lead	27.56	0.35	7.032	15.96	165	75-125	23	18	20	S
Nickel	21.1	0.35	7.032	12.48	123	75-125	21.14	0.197	20	
Selenium	8.185	0.70	7.032	1.403	96.4	75-125	7.769	5.21	20	
Silver	6.702	0.35	7.032	-0.2735	99.2	75-125	6.634	1.02	20	
Zinc	109.7	0.70	7.032	48.76	866	75-125	66.03	49.7	20	SRO

The following samples were analyzed in this batch: 1712923-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1712923
Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **112032** Instrument ID **ICPMS3** Method: **SW6020A**

DUP Sample ID: **1712982-03ADUP** Units: **mg/L** Analysis Date: **12/19/2017 12:27 PM**
Client ID: Run ID: **ICPMS3_171219A** SeqNo: **4818532** Prep Date: **12/19/2017** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	885.4	5.0	0	0	0	0-0	814.2	8.39		
Magnesium	157.3	2.0	0	0	0	0-0	141.5	10.6		

DUP Sample ID: **1712982-03ADUP** Units: **mg/L** Analysis Date: **12/19/2017 12:42 PM**
Client ID: Run ID: **ICPMS3_171219A** SeqNo: **4818541** Prep Date: **12/19/2017** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	2030	20	0	0	0	0-0	1900	6.64		

The following samples were analyzed in this batch: 1712923-01A

Batch ID: **112032** Instrument ID **SAR** Method: **USDA H60 Metho**

DUP Sample ID: **1712982-03ADUP** Units: **none** Analysis Date: **12/19/2017**
Client ID: Run ID: **SAR_171219A** SeqNo: **4819134** Prep Date: **12/19/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium Adsorption Ratio	16.52	0.010	0	0	0		16.38	0.855	50	

The following samples were analyzed in this batch: 1712923-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1712923
Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **111905** Instrument ID **SVMS6** Method: **SW846 8270D**

MBLK Sample ID: **SBLKS1-111905-111905** Units: **µg/Kg** Analysis Date: **12/15/2017 07:29 PM**
Client ID: Run ID: **SVMS6_171215A** SeqNo: **4815947** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	U	42								
Anthracene	U	42								
Benzo(a)anthracene	U	42								
Benzo(a)pyrene	U	42								
Benzo(b)fluoranthene	U	42								
Benzo(k)fluoranthene	U	42								
Chrysene	U	42								
Dibenzo(a,h)anthracene	U	42								
Fluoranthene	U	42								
Fluorene	U	42								
Indeno(1,2,3-cd)pyrene	U	42								
Naphthalene	U	42								
Pyrene	U	42								
Surr: 2-Fluorobiphenyl	*3087*	0	*3333*	0	*92.6*	*20-140*	0			
Surr: 4-Terphenyl-d14	*4262*	0	*3333*	0	*128*	*22-172*	0			
Surr: Nitrobenzene-d5	*4562*	0	*3333*	0	*137*	*28-140*	0			

LCS Sample ID: **SLCSS1-111905-111905** Units: **µg/Kg** Analysis Date: **12/15/2017 07:43 PM**
Client ID: Run ID: **SVMS6_171215A** SeqNo: **4815948** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	1094	42	1333	0	82.1	40-140	0			
Anthracene	1168	42	1333	0	87.7	40-140	0			
Benzo(a)anthracene	1447	42	1333	0	109	40-140	0			
Benzo(a)pyrene	1554	42	1333	0	117	40-140	0			
Benzo(b)fluoranthene	1425	42	1333	0	107	40-140	0			
Benzo(k)fluoranthene	1104	42	1333	0	82.9	40-140	0			
Chrysene	1045	42	1333	0	78.4	40-140	0			
Dibenzo(a,h)anthracene	1190	42	1333	0	89.3	40-140	0			
Fluoranthene	1148	42	1333	0	86.2	40-140	0			
Fluorene	1301	42	1333	0	97.6	40-140	0			
Indeno(1,2,3-cd)pyrene	1243	42	1333	0	93.3	40-140	0			
Naphthalene	1098	42	1333	0	82.4	40-140	0			
Pyrene	1218	42	1333	0	91.4	40-140	0			
Surr: 2-Fluorobiphenyl	*2820*	0	*3333*	0	*84.6*	*20-140*	0			
Surr: 4-Terphenyl-d14	*3735*	0	*3333*	0	*112*	*22-172*	0			
Surr: Nitrobenzene-d5	*4620*	0	*3333*	0	*139*	*28-140*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1712923
Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **111905** Instrument ID **SVMS6** Method: **SW846 8270D**

MS Sample ID: **1712757-02B MS** Units: **µg/Kg** Analysis Date: **12/15/2017 07:56 PM**
Client ID: Run ID: **SVMS6_171215A** SeqNo: **4815949** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	1058	40	1293	0	81.8	40-140	0			
Anthracene	1195	40	1293	0	92.4	40-140	0			
Benzo(a)anthracene	1375	40	1293	0	106	40-140	0			
Benzo(a)pyrene	1381	40	1293	0	107	40-140	0			
Benzo(b)fluoranthene	1242	40	1293	0	96.1	40-140	0			
Benzo(k)fluoranthene	1030	40	1293	0	79.6	40-140	0			
Chrysene	1016	40	1293	0	78.6	40-140	0			
Dibenzo(a,h)anthracene	1305	40	1293	0	101	40-140	0			
Fluoranthene	1116	40	1293	0	86.3	40-140	0			
Fluorene	1258	40	1293	0	97.3	40-140	0			
Indeno(1,2,3-cd)pyrene	1303	40	1293	0	101	40-140	0			
Naphthalene	1064	40	1293	0	82.3	40-140	0			
Pyrene	1161	40	1293	0	89.8	40-140	0			
Surr: 2-Fluorobiphenyl	*2883*	0	*3233*	0	*89.2*	*20-140*	0			
Surr: 4-Terphenyl-d14	*3454*	0	*3233*	0	*107*	*22-172*	0			
Surr: Nitrobenzene-d5	*3795*	0	*3233*	0	*117*	*28-140*	0			

MSD Sample ID: **1712757-02B MSD** Units: **µg/Kg** Analysis Date: **12/15/2017 08:10 PM**
Client ID: Run ID: **SVMS6_171215A** SeqNo: **4815950** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Acenaphthene	1036	41	1296	0	80	40-140	1058	2.08	30	
Anthracene	1145	41	1296	0	88.4	40-140	1195	4.26	30	
Benzo(a)anthracene	1339	41	1296	0	103	40-140	1375	2.65	30	
Benzo(a)pyrene	1350	41	1296	0	104	40-140	1381	2.27	30	
Benzo(b)fluoranthene	1194	41	1296	0	92.1	40-140	1242	4	30	
Benzo(k)fluoranthene	985.5	41	1296	0	76	40-140	1030	4.38	30	
Chrysene	985.5	41	1296	0	76.1	40-140	1016	3.09	30	
Dibenzo(a,h)anthracene	1195	41	1296	0	92.2	40-140	1305	8.75	30	
Fluoranthene	1075	41	1296	0	83	40-140	1116	3.69	30	
Fluorene	1223	41	1296	0	94.4	40-140	1258	2.87	30	
Indeno(1,2,3-cd)pyrene	1227	41	1296	0	94.7	40-140	1303	6.03	30	
Naphthalene	1080	41	1296	0	83.3	40-140	1064	1.46	30	
Pyrene	1127	41	1296	0	86.9	40-140	1161	2.98	30	
Surr: 2-Fluorobiphenyl	*2828*	0	*3240*	0	*87.3*	*20-140*	2883	*1.91*	*0*	
Surr: 4-Terphenyl-d14	*3393*	0	*3240*	0	*105*	*22-172*	3454	*1.81*	*0*	
Surr: Nitrobenzene-d5	*3514*	0	*3240*	0	*108*	*28-140*	3795	*7.69*	*0*	

The following samples were analyzed in this batch: 1712923-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1712923
Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **111908** Instrument ID **VMS8** Method: **SW8260B**

MBLK Sample ID: **MBLK-111908-111908** Units: **µg/Kg-dry** Analysis Date: **12/15/2017 03:24 PM**
Client ID: Run ID: **VMS8_171215A** SeqNo: **4814893** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	30	0	0	0	0-0	0			
Ethylbenzene	U	30	0	0	0	0-0	0			
m,p-Xylene	U	60	0	0	0	0-0	0			
o-Xylene	U	30	0	0	0	0-0	0			
Toluene	U	30	0	0	0	0-0	0			
Xylenes, Total	U	90	0	0	0	0-0	0			
Surr: 1,2-Dichloroethane-d4	*933.5*	0	*1000*	0	*93.4*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*889.5*	0	*1000*	0	*89*	*70-130*	0			
Surr: Dibromofluoromethane	*947*	0	*1000*	0	*94.7*	*70-130*	0			
Surr: Toluene-d8	*951*	0	*1000*	0	*95.1*	*70-130*	0			

LCS Sample ID: **LCS-111908-111908** Units: **µg/Kg-dry** Analysis Date: **12/15/2017 02:37 PM**
Client ID: Run ID: **VMS8_171215A** SeqNo: **4814892** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	908	30	1000	0	90.8	75-125	0			
Ethylbenzene	996	30	1000	0	99.6	75-125	0			
m,p-Xylene	1830	60	2000	0	91.5	80-125	0			
o-Xylene	1006	30	1000	0	101	75-125	0			
Toluene	960.5	30	1000	0	96	70-125	0			
Xylenes, Total	2836	90	3000	0	94.6	75-125	0			
Surr: 1,2-Dichloroethane-d4	*860*	0	*1000*	0	*86*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1056*	0	*1000*	0	*106*	*70-130*	0			
Surr: Dibromofluoromethane	*892*	0	*1000*	0	*89.2*	*70-130*	0			
Surr: Toluene-d8	*1018*	0	*1000*	0	*102*	*70-130*	0			

MS Sample ID: **1712963-02A MS** Units: **µg/Kg-dry** Analysis Date: **12/19/2017 04:01 A**
Client ID: Run ID: **VMS10_171218B** SeqNo: **4818019** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1404	38	1273	0	110	75-125	0			
Ethylbenzene	1387	38	1273	0	109	75-125	0			
m,p-Xylene	2790	76	2545	0	110	80-125	0			
o-Xylene	1408	38	1273	0	111	75-125	0			
Toluene	1353	38	1273	0	106	70-125	0			
Xylenes, Total	4199	110	3818	0	110	75-125	0			
Surr: 1,2-Dichloroethane-d4	*1295*	0	*1273*	0	*102*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1360*	0	*1273*	0	*107*	*70-130*	0			
Surr: Dibromofluoromethane	*1229*	0	*1273*	0	*96.6*	*70-130*	0			
Surr: Toluene-d8	*1296*	0	*1273*	0	*102*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1712923
Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **111908** Instrument ID **VMS8** Method: **SW8260B**

MSD Sample ID: **1712963-02A MSD** Units: **µg/Kg-dry** Analysis Date: **12/19/2017 04:17 A**

Client ID: Run ID: **VMS10_171218B** SeqNo: **4818020** Prep Date: **12/15/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	1378	38	1273	0	108	75-125	1404	1.88	30	
Ethylbenzene	1326	38	1273	0	104	75-125	1387	4.55	30	
m,p-Xylene	2625	76	2545	0	103	80-125	2790	6.11	30	
o-Xylene	1371	38	1273	0	108	75-125	1408	2.66	30	
Toluene	1308	38	1273	0	103	70-125	1353	3.4	30	
Xylenes, Total	3996	110	3818	0	105	75-125	4199	4.94	30	
Surr: 1,2-Dichloroethane-d4	*1322*	0	*1273*	0	*104*	*70-130*	1295	*2.09*	*30*	
Surr: 4-Bromofluorobenzene	*1357*	0	*1273*	0	*107*	*70-130*	1360	*0.187*	*30*	
Surr: Dibromofluoromethane	*1236*	0	*1273*	0	*97.1*	*70-130*	1229	*0.516*	*30*	
Surr: Toluene-d8	*1284*	0	*1273*	0	*101*	*70-130*	1296	*0.987*	*30*	

The following samples were analyzed in this batch: 1712923-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1712923
Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **112019** Instrument ID **WETCHEM** Method: **SW7196A**

MBLK Sample ID: **MBLK-112019-112019** Units: **mg/Kg** Analysis Date: **12/19/2017 03:45 PM**
Client ID: Run ID: **WETCHEM_171219F** SeqNo: **4819176** Prep Date: **12/18/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	U	0.99								

LCS Sample ID: **LCS-112019-112019** Units: **mg/Kg** Analysis Date: **12/19/2017 03:45 PM**
Client ID: Run ID: **WETCHEM_171219F** SeqNo: **4819177** Prep Date: **12/18/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	5.314	0.98	4.902	0	108	80-120	0			

MS Sample ID: **1712923-01A MS** Units: **mg/Kg** Analysis Date: **12/19/2017 03:45 PM**
Client ID: **20171213-F23-Tank Spill POR** Run ID: **WETCHEM_171219F** SeqNo: **4819184** Prep Date: **12/18/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	3.951	0.97	4.854	0.4953	71.2	75-125	0			S

MS Sample ID: **1712923-01A MSI** Units: **mg/Kg** Analysis Date: **12/19/2017 03:45 PM**
Client ID: **20171213-F23-Tank Spill POR** Run ID: **WETCHEM_171219F** SeqNo: **4819186** Prep Date: **12/18/2017** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	1483	95	1609	0.4953	92.2	75-125	0			

MSD Sample ID: **1712923-01A MSD** Units: **mg/Kg** Analysis Date: **12/19/2017 03:45 PM**
Client ID: **20171213-F23-Tank Spill POR** Run ID: **WETCHEM_171219F** SeqNo: **4819185** Prep Date: **12/18/2017** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	3.683	0.96	4.808	0.4953	66.3	75-125	3.951	7.04	20	S

The following samples were analyzed in this batch: 1712923-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1712923
Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **112032** Instrument ID **WETCHEM** Method: **USDA H60 Metho**

DUP Sample ID: **1712982-03A DUP** Units: **mmhos/cm @25°** Analysis Date: **12/19/2017 04:40 PM**

Client ID: Run ID: **WETCHEM_171219J** SeqNo: **4819303** Prep Date: **12/19/2017** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Electrical Conductivity @ Saturation	16.66	0.10	0	0	0		14.4	14.6	50	

The following samples were analyzed in this batch: 1712923-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Caerus Oil and Gas LLC
Work Order: 1712923
Project: F23 Tank Spill

QC BATCH REPORT

Batch ID: **R226768** Instrument ID **MOIST** Method: **SW3550C**

MBLK	Sample ID: **WBLKS-R226768**				Units: **% of sample**			Analysis Date: **12/18/2017 05:45 PM**		
Client ID:	Run ID: **MOIST_171218D**				SeqNo: **4817886**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	U	0.050								

LCS	Sample ID: **LCS-R226768**				Units: **% of sample**			Analysis Date: **12/18/2017 05:45 PM**		
Client ID:	Run ID: **MOIST_171218D**				SeqNo: **4817885**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP	Sample ID: **1712756-03B DUP**				Units: **% of sample**			Analysis Date: **12/18/2017 05:45 PM**		
Client ID:	Run ID: **MOIST_171218D**				SeqNo: **4817866**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	15.79	0.050	0	0	0	0-0	14.85	6.14	10	

DUP	Sample ID: **1712756-09B DUP**				Units: **% of sample**			Analysis Date: **12/18/2017 05:45 PM**		
Client ID:	Run ID: **MOIST_171218D**				SeqNo: **4817873**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	18.7	0.050	0	0	0	0-0	19.05	1.85	10	

The following samples were analyzed in this batch: 1712923-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Laboratory Group

Chain-of-Custody

Form 202r6

WORKORDER #	1712923				
SAMPLER	Blair K Rollins	DATE	12/13/17	PAGE	1 of 1
PROJECT NAME	F23 Tank Spill	SITE ID		TURNAROUND	STD	DISPOSAL	By Lab or Return to Client
PROJECT No.		EDD FORMAT					
		PURCHASE ORDER					
COMPANY NAME	Caerus Piceance, LLC	BILL TO COMPANY	Caerus Piceance, LLC				
SEND REPORT TO	Jake Janicek	INVOICE ATTN TO	Jake Janicek				
ADDRESS	143 Diamond Ave	ADDRESS	143 Diamond Ave				
CITY / STATE / ZIP	Parachute Co 81635	CITY / STATE / ZIP	Parachute CO 81635				
PHONE	970-285-9608	PHONE	970-285-9608				
FAX		FAX					
E-MAIL	jjanicek@caerusoilandgas.com	E-MAIL	jjanicek@caerusoilandgas.com				

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	TPH/GRO/DRO	BTEX	Table 910 PAH's	EC	PH	SAR	Benzene	Table 910 Metals
	20171213-F23-TankSpillPOR	S	12/13/17	0900	3			X	X	X	X	X	X		X

*Time Zone (Circle): EST CST MST PST Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

For metals or anions, please detail analytes below.

Comments:	QC PACKAGE (check below)	
3.0°C	X	LEVEL II (Standard QC)
SR2		LEVEL III (Std QC + forms)
		LEVEL IV (Std QC + forms + raw data)

Preservative Key: 1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY		Blair Rollins	12/13/17	1500
RECEIVED BY			12-13-17	1500
RELINQUISHED BY			12-13-17	1810
RECEIVED BY		Keith Wiersema	12/14/17	1000
RELINQUISHED BY				
RECEIVED BY				

ALS Group, USA

Sample Receipt Checklist

Client Name: **CAERUS** Date/Time Received: **14-Dec-17 10:00**

Work Order: **1712923** Received by: **KRW**

Checklist completed by Keith Wierenga (eSignature) 14-Dec-17 (Date) Reviewed by: Chad Whelton (eSignature) 15-Dec-17 (Date)

Matrices: Soil

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0/3.0 C	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	12/14/2017 3:14:20 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction: