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November 04, 2022

Jenifer Hakkarinen
PDC Energy
1775 Sherman Street
Suite 3000
Denver, CO 80203

Work Order: **HS22101187**

Laboratory Results for: **Loeffler-UP 3-11 - API 123-13807**

Dear Jenifer Hakkarinen,

ALS Environmental received 1 sample(s) on Oct 21, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

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

Sincerely,

Generated By: DAYNA.FISHER
Tyler Monroe

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
Work Order: HS22101187

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22101187-01	Loeffler-Up 3-11	Water		19-Oct-2022 14:20	21-Oct-2022 09:25	☐

Client: PDC Energy **CASE NARRATIVE**
Project: Loeffler-UP 3-11 - API 123-13807
Work Order: HS22101187

GC Semivolatiles by Method RSK-175

Batch ID: R420291

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GC Semivolatiles by Method SW8015M

Batch ID: 185217

Sample ID: Loeffler-Up 3-11 (HS22101187-01)

• The surrogate recoveries could not be determined due to dilution below the calibration range.

GC Volatiles by Method SW8015

Batch ID: R420467

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R420680

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method E200.8

Batch ID: 185598

Sample ID: HS22101022-01MS

• MS and MSD are for an unrelated sample

Sample ID: HS22101300-01MS

• MS and MSD are for an unrelated sample

Wet Chemistry by Method E300

Batch ID: R421029

Sample ID: HS22110266-02MS

• MS and MSD are for an unrelated sample

WetChemistry by Method SM2320B

Batch ID: R420440

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method M2540C

Batch ID: R420423

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
Sample ID: Loeffler-Up 3-11
Collection Date: 19-Oct-2022 14:20

ANALYTICAL REPORT
WorkOrder:HS22101187
Lab ID:HS22101187-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: AKP
Benzene	**140**		**1.0**	**ug/L**	1	31-Oct-2022 18:03
Ethylbenzene	**28**		**1.0**	**ug/L**	1	31-Oct-2022 18:03
m,p-Xylene	**240**		**2.0**	**ug/L**	1	31-Oct-2022 18:03
o-Xylene	**74**		**1.0**	**ug/L**	1	31-Oct-2022 18:03
Toluene	**69**		**1.0**	**ug/L**	1	31-Oct-2022 18:03
Xylenes, Total	**310**		**1.0**	**ug/L**	1	31-Oct-2022 18:03
Surr: 1,2-Dichloroethane-d4	*100.0*		*70-126*	*%REC*	*1*	*31-Oct-2022 18:03*
Surr: 4-Bromofluorobenzene	*97.8*		*77-113*	*%REC*	*1*	*31-Oct-2022 18:03*
Surr: Dibromofluoromethane	*101*		*77-123*	*%REC*	*1*	*31-Oct-2022 18:03*
Surr: Toluene-d8	*100*		*82-127*	*%REC*	*1*	*31-Oct-2022 18:03*
GASOLINE RANGE ORGANICS BY SW8015C		**Method:SW8015**				Analyst: FT
Gasoline Range Organics	**2.09**		**0.500**	**mg/L**	10	27-Oct-2022 17:47
Surr: 4-Bromofluorobenzene	*120*		*70-123*	*%REC*	*10*	*27-Oct-2022 17:47*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**				Analyst: PPM
Ethane	**2,150**		**200**	**ug/L**	200	25-Oct-2022 13:13
Methane	**3,580**		**100**	**ug/L**	200	25-Oct-2022 13:13
Propane	**1,730**		**200**	**ug/L**	200	25-Oct-2022 13:13
TPH DRO/ORO BY SW8015C		**Method:SW8015M**		Prep:SW3511 / 24-Oct-2022		Analyst: PPM
DRO (>C10 - C28)	**19**		**5.1**	**mg/L**	100	25-Oct-2022 15:51
Surr: 2-Fluorobiphenyl	*0*	*JS*	*60-135*	*%REC*	*100*	*25-Oct-2022 15:51*
TOTAL METALS BY E200.8, REV 5.4, 1994		**Method:E200.8**		Prep:E200.8 / 02-Nov-2022		Analyst: JHD
Calcium	**1.64**		**0.500**	**mg/L**	1	03-Nov-2022 11:49
Magnesium	ND		0.500	mg/L	1	03-Nov-2022 11:49
Potassium	**21.8**		**0.500**	**mg/L**	1	03-Nov-2022 11:49
Sodium	**365**		**1.00**	**mg/L**	5	02-Nov-2022 14:08
ANIONS BY E300.0, REV 2.1, 1993		**Method:E300**				Analyst: TH
Chloride	**330**		**5.00**	**mg/L**	10	04-Nov-2022 12:29
Sulfate	**0.708**		**0.500**	**mg/L**	1	04-Nov-2022 12:50
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**				Analyst: CWG
Total Dissolved Solids (Residue, Filterable)	**918**		**10.0**	**mg/L**	1	26-Oct-2022 16:38
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**				Analyst: TH
Alkalinity, Bicarbonate (As CaCO3)	**381**		**50.0**	**mg/L**	10	28-Oct-2022 04:51
Alkalinity, Carbonate (As CaCO3)	**265**		**50.0**	**mg/L**	10	28-Oct-2022 04:51
Alkalinity, Total (As CaCO3)	**646**		**50.0**	**mg/L**	10	28-Oct-2022 04:51

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

Weight / Prep Log

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: HS22101187

Batch ID: 185217 **Start Date:** 24 Oct 2022 11:00 **End Date:** 25 Oct 2022 01:00
Method: SW3511 **Prep Code:** 3511_DRO

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22101187-01		32.6 (mL)	2 (mL)	0.06135	40 mL Amber

Batch ID: 185598 **Start Date:** 02 Nov 2022 08:00 **End Date:** 02 Nov 2022 12:00
Method: TOTAL METALS PREP BY E200.8, REV 5.4, 1994 **Prep Code:** 200.8PR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22101187-01		10 (mL)	10 (mL)	1	250 mL plastic, HNO3 to pH <2

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: HS22101187

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 185217 (0)	**Test Name :** TPH DRO/ORO BY SW8015C				**Matrix:** Water	
HS22101187-01	Loeffler-Up 3-11	19 Oct 2022 14:20		24 Oct 2022 11:00	25 Oct 2022 15:51	100
Batch ID: 185598 (0)	**Test Name :** TOTAL METALS BY E200.8, REV 5.4, 1994				**Matrix:** Water	
HS22101187-01	Loeffler-Up 3-11	19 Oct 2022 14:20		02 Nov 2022 08:00	03 Nov 2022 11:49	1
HS22101187-01	Loeffler-Up 3-11	19 Oct 2022 14:20		02 Nov 2022 08:00	02 Nov 2022 14:08	5
Batch ID: R420291 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Water	
HS22101187-01	Loeffler-Up 3-11	19 Oct 2022 14:20			25 Oct 2022 13:13	200
Batch ID: R420423 (0)	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C-2011				**Matrix:** Water	
HS22101187-01	Loeffler-Up 3-11	19 Oct 2022 14:20			26 Oct 2022 16:38	1
Batch ID: R420440 (0)	**Test Name :** ALKALINITY BY SM 2320B-2011				**Matrix:** Water	
HS22101187-01	Loeffler-Up 3-11	19 Oct 2022 14:20			28 Oct 2022 04:51	10
Batch ID: R420467 (0)	**Test Name :** GASOLINE RANGE ORGANICS BY SW8015C				**Matrix:** Water	
HS22101187-01	Loeffler-Up 3-11	19 Oct 2022 14:20			27 Oct 2022 17:47	10
Batch ID: R420680 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS22101187-01	Loeffler-Up 3-11	19 Oct 2022 14:20			31 Oct 2022 18:03	1
Batch ID: R421029 (0)	**Test Name :** ANIONS BY E300.0, REV 2.1, 1993				**Matrix:** Water	
HS22101187-01	Loeffler-Up 3-11	19 Oct 2022 14:20			04 Nov 2022 12:50	1
HS22101187-01	Loeffler-Up 3-11	19 Oct 2022 14:20			04 Nov 2022 12:29	10

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: HS22101187

QC BATCH REPORT

Batch ID: 185217 (0) **Instrument: FID-16** **Method: TPH DRO/ORO BY SW8015C**

MBLK Sample ID: **MBLK-185217** Units: **mg/L** Analysis Date: **25-Oct-2022 17:19**
Client ID: Run ID: **FID-16_420396** SeqNo: **6945478** PrepDate: **24-Oct-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (>C10 - C28)	ND	0.050								
Surr: 2-Fluorobiphenyl	*0.06118*	*0.0050*	*0.06*	*0*	*102*	*60 - 135*				

LCS Sample ID: **LCS-185217** Units: **mg/L** Analysis Date: **25-Oct-2022 17:48**
Client ID: Run ID: **FID-16_420396** SeqNo: **6945479** PrepDate: **24-Oct-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (>C10 - C28)	0.5561	0.050	0.6	0	92.7	70 - 130				
Surr: 2-Fluorobiphenyl	*0.06794*	*0.0050*	*0.06*	*0*	*113*	*60 - 135*				

MS Sample ID: **HS22101079-05MS** Units: **mg/L** Analysis Date: **25-Oct-2022 20:44**
Client ID: Run ID: **FID-16_420396** SeqNo: **6945485** PrepDate: **24-Oct-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (>C10 - C28)	0.5667	0.051	0.6109	0	92.8	70 - 130				
Surr: 2-Fluorobiphenyl	*0.07423*	*0.0051*	*0.06109*	*0*	*122*	*60 - 135*				

MSD Sample ID: **HS22101079-05MSD** Units: **mg/L** Analysis Date: **25-Oct-2022 21:13**
Client ID: Run ID: **FID-16_420396** SeqNo: **6945504** PrepDate: **24-Oct-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (>C10 - C28)	0.5351	0.051	0.6111	0	87.6	70 - 130	0.5667	5.73	20	
Surr: 2-Fluorobiphenyl	*0.07146*	*0.0051*	*0.06111*	*0*	*117*	*60 - 135*	*0.07423*	*3.81*	*20*	

The following samples were analyzed in this batch: HS22101187-01

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: HS22101187

QC BATCH REPORT

Batch ID: R420291 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-221025** Units: **ug/L** Analysis Date: **25-Oct-2022 08:47**
Client ID: Run ID: **FID-4_420291** SeqNo: **6943366** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	ND	1.00								
Methane	ND	0.500								
Propane	ND	1.00								

LCS Sample ID: **LCS-221025** Units: **ug/L** Analysis Date: **25-Oct-2022 09:00**
Client ID: Run ID: **FID-4_420291** SeqNo: **6943367** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	20.08	1.00	18.04	0	111	75 - 125				
Methane	10.08	0.500	9.647	0	104	75 - 125				
Propane	30.83	1.00	26.46	0	117	75 - 125				

LCSD Sample ID: **LCSD-221025** Units: **ug/L** Analysis Date: **25-Oct-2022 09:15**
Client ID: Run ID: **FID-4_420291** SeqNo: **6943368** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	20.4	1.00	18.04	0	113	75 - 125	20.08	1.57	30	
Methane	9.276	0.500	9.647	0	96.2	75 - 125	10.08	8.27	30	
Propane	31.71	1.00	26.46	0	120	75 - 125	30.83	2.83	30	

The following samples were analyzed in this batch: HS22101187-01

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: HS22101187

QC BATCH REPORT

Batch ID: R420467 (0) **Instrument:** FID-20 **Method:** GASOLINE RANGE ORGANICS BY SW8015C

MBLK Sample ID: **MBLK-221027** Units: **mg/L** Analysis Date: **27-Oct-2022 13:53**
Client ID: Run ID: **FID-20_420467** SeqNo: **6947385** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	ND	0.0500								
Surr: 4-Bromofluorobenzene	*0.119*	*0.00500*	*0.1*	*0*	*119*	*70 - 121*				

LCS Sample ID: **LCS-221027** Units: **mg/L** Analysis Date: **27-Oct-2022 13:07**
Client ID: Run ID: **FID-20_420467** SeqNo: **6947383** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.9466	0.0500	1	0	94.7	76 - 124				
Surr: 4-Bromofluorobenzene	*0.1066*	*0.00500*	*0.1*	*0*	*107*	*52 - 138*				

LCSD Sample ID: **LCSD-221027** Units: **mg/L** Analysis Date: **27-Oct-2022 13:22**
Client ID: Run ID: **FID-20_420467** SeqNo: **6947384** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.893	0.0500	1	0	89.3	76 - 124	0.9466	5.82	20	
Surr: 4-Bromofluorobenzene	*0.1069*	*0.00500*	*0.1*	*0*	*107*	*52 - 138*	*0.1066*	*0.288*	*20*	

The following samples were analyzed in this batch: HS22101187-01

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: HS22101187

QC BATCH REPORT

Batch ID: 185598 (0) **Instrument: ICPMS07** **Method: TOTAL METALS BY E200.8, REV 5.4, 1994**

MBLK Sample ID: **MBLK-185598** Units: **ug/L** Analysis Date: **02-Nov-2022 13:46**
Client ID: Run ID: **ICPMS07_420822** SeqNo: **6956543** PrepDate: **02-Nov-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	ND	500								
Magnesium	ND	500								
Potassium	ND	500								
Sodium	ND	200								

LCS Sample ID: **LCS-185598** Units: **ug/L** Analysis Date: **02-Nov-2022 13:48**
Client ID: Run ID: **ICPMS07_420822** SeqNo: **6956544** PrepDate: **02-Nov-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	5452	500	5000	0	109	85 - 115				
Potassium	5707	500	5000	0	114	85 - 115				
Sodium	5657	200	5000	0	113	85 - 115				

LCS Sample ID: **LCS-185598** Units: **ug/L** Analysis Date: **03-Nov-2022 11:43**
Client ID: Run ID: **ICPMS07_420935** SeqNo: **6958951** PrepDate: **02-Nov-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	5584	500	5000	0	112	85 - 115				

MS Sample ID: **HS22101300-01MS** Units: **ug/L** Analysis Date: **02-Nov-2022 15:00**
Client ID: Run ID: **ICPMS07_420822** SeqNo: **6956563** PrepDate: **02-Nov-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	51380	500	5000	46490	97.8	70 - 130				O
Magnesium	11210	500	5000	5860	107	70 - 130				
Potassium	135200	500	5000	134800	7.02	70 - 130				SO
Sodium	321700	200	5000	329200	-150	70 - 130				SEO

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: HS22101187

QC BATCH REPORT

Batch ID: 185598 (0) **Instrument: ICPMS07** **Method: TOTAL METALS BY E200.8, REV 5.4, 1994**

MS Sample ID: **HS22101022-01MS** Units: **ug/L** Analysis Date: **03-Nov-2022 11:45**
Client ID: Run ID: **ICPMS07_420935** SeqNo: **6958952** PrepDate: **02-Nov-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	94920	500	5000	106700	-236	70 - 130				SO
Magnesium	37960	500	5000	37660	6.14	70 - 130				SO
Potassium	7998	500	5000	3534	89.3	70 - 130				
Sodium	60440	200	5000	64040	-71.9	70 - 130				SO

MSD Sample ID: **HS22101300-01MSD** Units: **ug/L** Analysis Date: **02-Nov-2022 15:02**
Client ID: Run ID: **ICPMS07_420822** SeqNo: **6956564** PrepDate: **02-Nov-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	50500	500	5000	46490	80.2	70 - 130	51380	1.72	20	O
Magnesium	11200	500	5000	5860	107	70 - 130	11210	0.0886	20	
Potassium	134700	500	5000	134800	-3.00	70 - 130	135200	0.371	20	SO
Sodium	321700	200	5000	329200	-149	70 - 130	321700	0.0197	20	SEO

MSD Sample ID: **HS22101022-01MSD** Units: **ug/L** Analysis Date: **02-Nov-2022 14:02**
Client ID: Run ID: **ICPMS07_420822** SeqNo: **6956549** PrepDate: **02-Nov-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	101000	500	5000	106700	-114	70 - 130	94920	6.21	20	SO
Magnesium	39020	500	5000	37660	27.2	70 - 130	37960	2.73	20	SO
Potassium	8121	500	5000	3534	91.7	70 - 130	7998	1.53	20	
Sodium	62610	200	5000	64040	-28.6	70 - 130	60440	3.52	20	SO

The following samples were analyzed in this batch: HS22101187-01

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: HS22101187

QC BATCH REPORT

Batch ID: R420680 (0) **Instrument: VOA4** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-221031** Units: **ug/L** Analysis Date: **31-Oct-2022 13:24**
Client ID: Run ID: **VOA4_420680** SeqNo: **6952608** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	ND	1.0								
Ethylbenzene	ND	1.0								
m,p-Xylene	ND	2.0								
o-Xylene	ND	1.0								
Toluene	ND	1.0								
Xylenes, Total	ND	1.0								
Surr: 1,2-Dichloroethane-d4	*51.19*	*1.0*	*50*	*0*	*102*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.9*	*1.0*	*50*	*0*	*97.8*	*77 - 113*				
Surr: Dibromofluoromethane	*51.41*	*1.0*	*50*	*0*	*103*	*73 - 126*				
Surr: Toluene-d8	*50.84*	*1.0*	*50*	*0*	*102*	*81 - 120*				

LCS Sample ID: **VLCSW-221031** Units: **ug/L** Analysis Date: **31-Oct-2022 12:41**
Client ID: Run ID: **VOA4_420680** SeqNo: **6952606** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	18.78	1.0	20	0	93.9	74 - 120				
Ethylbenzene	17.79	1.0	20	0	89.0	77 - 117				
m,p-Xylene	32.33	2.0	40	0	80.8	77 - 122				
o-Xylene	17.98	1.0	20	0	89.9	75 - 119				
Toluene	18.52	1.0	20	0	92.6	77 - 118				
Xylenes, Total	50.31	1.0	60	0	83.8	75 - 122				
Surr: 1,2-Dichloroethane-d4	*52.15*	*1.0*	*50*	*0*	*104*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*49.93*	*1.0*	*50*	*0*	*99.9*	*77 - 113*				
Surr: Dibromofluoromethane	*52.32*	*1.0*	*50*	*0*	*105*	*73 - 126*				
Surr: Toluene-d8	*50.19*	*1.0*	*50*	*0*	*100*	*81 - 120*				

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: HS22101187

QC BATCH REPORT

Batch ID: R420680 (0) **Instrument: VOA4** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS22101047-01MS** Units: **ug/L** Analysis Date: **31-Oct-2022 20:57**
Client ID: Run ID: **VOA4_420680** SeqNo: **6952629** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Benzene	23.87	1.0	20	0	119	70 - 127				
Ethylbenzene	22.71	1.0	20	0	114	70 - 124				
m,p-Xylene	41.3	2.0	40	0	103	70 - 130				
o-Xylene	22.92	1.0	20	0	115	70 - 124				
Toluene	22.29	1.0	20	0	111	70 - 123				
Xylenes, Total	64.22	1.0	60	0	107	70 - 130				
Surr: 1,2-Dichloroethane-d4	*50.36*	*1.0*	*50*	*0*	*101*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*49.03*	*1.0*	*50*	*0*	*98.1*	*77 - 113*				
Surr: Dibromofluoromethane	*50.11*	*1.0*	*50*	*0*	*100*	*77 - 123*				
Surr: Toluene-d8	*50.61*	*1.0*	*50*	*0*	*101*	*82 - 127*				

MSD Sample ID: **HS22101047-01MSD** Units: **ug/L** Analysis Date: **31-Oct-2022 21:39**
Client ID: Run ID: **VOA4_420680** SeqNo: **6952630** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Benzene	23.45	1.0	20	0	117	70 - 127	23.87	1.76	20	
Ethylbenzene	23.32	1.0	20	0	117	70 - 124	22.71	2.63	20	
m,p-Xylene	40.71	2.0	40	0	102	70 - 130	41.3	1.44	20	
o-Xylene	23	1.0	20	0	115	70 - 124	22.92	0.345	20	
Toluene	22.66	1.0	20	0	113	70 - 123	22.29	1.66	20	
Xylenes, Total	63.71	1.0	60	0	106	70 - 130	64.22	0.799	20	
Surr: 1,2-Dichloroethane-d4	*51.09*	*1.0*	*50*	*0*	*102*	*70 - 126*	*50.36*	*1.42*	*20*	
Surr: 4-Bromofluorobenzene	*49.59*	*1.0*	*50*	*0*	*99.2*	*77 - 113*	*49.03*	*1.14*	*20*	
Surr: Dibromofluoromethane	*50.98*	*1.0*	*50*	*0*	*102*	*77 - 123*	*50.11*	*1.72*	*20*	
Surr: Toluene-d8	*50.23*	*1.0*	*50*	*0*	*100*	*82 - 127*	*50.61*	*0.77*	*20*	

The following samples were analyzed in this batch: HS22101187-01

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: HS22101187

QC BATCH REPORT

Batch ID: R420423 (0) **Instrument:** Balance1 **Method:** TOTAL DISSOLVED SOLIDS BY SM2540C-2011

MBLK Sample ID: **WBLK-102622** Units: **mg/L** Analysis Date: **26-Oct-2022 16:38**
Client ID: Run ID: **Balance1_420423** SeqNo: **6946135** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	ND	10.0								

LCS Sample ID: **WLCS-102622** Units: **mg/L** Analysis Date: **26-Oct-2022 16:38**
Client ID: Run ID: **Balance1_420423** SeqNo: **6946136** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1072	10.0	1000	0	107	85 - 115				

DUP Sample ID: **HS22101243-12DUP** Units: **mg/L** Analysis Date: **26-Oct-2022 16:38**
Client ID: Run ID: **Balance1_420423** SeqNo: **6946131** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	128	10.0					132	3.08	5	

DUP Sample ID: **HS22100987-01DUP** Units: **mg/L** Analysis Date: **26-Oct-2022 16:38**
Client ID: Run ID: **Balance1_420423** SeqNo: **6946112** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1408	10.0					1410	0.142	5	

The following samples were analyzed in this batch: HS22101187-01

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: HS22101187

QC BATCH REPORT

Batch ID: R420440 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM 2320B-2011**

MBLK Sample ID: **MBLK3-102722** Units: **mg/L** Analysis Date: **28-Oct-2022 02:49**
Client ID: Run ID: **ManTech01_420440** SeqNo: **6946667** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	ND	5.00								
Alkalinity, Carbonate (As CaCO3)	ND	5.00								
Alkalinity, Total (As CaCO3)	ND	5.00								

LCS Sample ID: **LCS3-102722** Units: **mg/L** Analysis Date: **28-Oct-2022 01:53**
Client ID: Run ID: **ManTech01_420440** SeqNo: **6946661** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	985.1	5.00	1000	0	98.5	85 - 115				
Alkalinity, Total (As CaCO3)	1007	5.00	1000	0	101	85 - 115				

LCSD Sample ID: **LCSD3-102722** Units: **mg/L** Analysis Date: **28-Oct-2022 02:03**
Client ID: Run ID: **ManTech01_420440** SeqNo: **6946662** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1020	5.00	1000	0	102	85 - 115	985.1	3.49	20	
Alkalinity, Total (As CaCO3)	1028	5.00	1000	0	103	85 - 115	1007	2.04	20	

DUP Sample ID: **HS22101159-09DUP** Units: **mg/L** Analysis Date: **28-Oct-2022 02:18**
Client ID: Run ID: **ManTech01_420440** SeqNo: **6946664** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	829.3	5.00					826.4	0.349	20	
Alkalinity, Carbonate (As CaCO3)	ND	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	829.3	5.00					826.4	0.349	20	

The following samples were analyzed in this batch: HS22101187-01

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: HS22101187

QC BATCH REPORT

Batch ID: R421029 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY E300.0, REV 2.1, 1993**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **04-Nov-2022 11:20**
Client ID: Run ID: **ICS-Integrion_421029** SeqNo: **6961710** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	ND	0.500								
Sulfate	ND	0.500								

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **04-Nov-2022 11:25**
Client ID: Run ID: **ICS-Integrion_421029** SeqNo: **6961711** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20	0.500	20	0	100.0	90 - 110				
Sulfate	20.37	0.500	20	0	102	90 - 110				

MS Sample ID: **HS22110266-02MS** Units: **mg/L** Analysis Date: **04-Nov-2022 10:32**
Client ID: Run ID: **ICS-Integrion_421029** SeqNo: **6961704** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	384.3	0.500	10	379.9	44.4	80 - 120				SEO
Sulfate	69.13	0.500	10	59.69	94.4	80 - 120				O

MSD Sample ID: **HS22110266-02MSD** Units: **mg/L** Analysis Date: **04-Nov-2022 10:37**
Client ID: Run ID: **ICS-Integrion_421029** SeqNo: **6961705** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	383.2	0.500	10	379.9	33.0	80 - 120	384.3	0.298	20	SEO
Sulfate	69.47	0.500	10	59.69	97.8	80 - 120	69.13	0.495	20	O

The following samples were analyzed in this batch: HS22101187-01

Client: PDC Energy
Project: Loeffler-UP 3-11 - API 123-13807
WorkOrder: **HS22101187**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not 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 detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
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/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	22-041-0	27-Mar-2023
California	2919 2022-2023	30-Apr-2023
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-36	30-Jun-2023
Illinois	2000322022-9	09-May-2023
Kansas	E-10352; 2022-2023	31-Jul-2023
Kentucky	123043, 2022-2023	30-Apr-2023
Louisiana	03087, 2022-2023	30-Jun-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2022	31-Dec-2022
North Dakota	R-193 2022-2023	30-Apr-2023
Oklahoma	2022-141	31-Aug-2023
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932022-13	31-Jul-2023

Sample Receipt Checklist

Work Order ID: HS22101187 **Date/Time Received:** **21-Oct-2022 09:25**

Client Name: PDC Energy 80203 **Received by:** **Paresh M. Giga**

Completed By:	/S/ Nelson D. Dusara	22-Oct-2022 10:05	**Reviewed by:**	/S/ Tyler Monroe	24-Oct-2022 12:17
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **WATER** 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 ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:n/a
Samplers name present on COC?	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 ☐	
Temperature(s)/Thermometer(s):	1.7/1.5 C UC/C	IR 31	
Cooler(s)/Kit(s):	BLUE		
Date/Time sample(s) sent to storage:	OCT/21/2022 11:30		
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:

Corrective Action:

ALS Environmental

225 Commerce Drive, Fort Collins, Colorado 80524
TF: (800) 443-1511 PH: (970) 490-1511 FX: (970) 490-1522

Chain-of-Custody

Form 202r8

WORKORDER #	

		SAMPLER	Jeff Braden
PROJECT NAME	Loeffler-UP 3-11	FACILITY ID	123-13807
PROJECT No.	09A2073127	EDD FORMAT	COGCC EDD, LTE
	PDCE Bradenhead Sampling	PURCHASE ORDER	N/A
COMPANY NAME	PDC Energy	BILL TO COMPANY	PDC Energy
SEND REPORT TO	Jenifer Hakkarinen	INVOICE ATTN TO	Jenifer Hakkarinen
ADDRESS	1775 Sherman Street, Suite 3000	ADDRESS	1775 Sherman Street, Suite 3000
CITY / STATE / ZIP	Denver, Colorado 80203	CITY / STATE / ZIP	Denver, Colorado 80203
PHONE	303.860.5815	PHONE	303.860.5815
FAX		FAX	
E-MAIL	jenifer.hakkarinen@pdce.com jessica.johannsen@pdce.com jbraden@ensolum.com	E-MAIL	jenifer.hakkarinen@pdce.com

DATE	10/19/22	PAGE	1 of 1
TURNAROUND	Standard	DISPOSAL	By Lab or Return to Client

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	Dissolved Methane, Ethane, Propane RSK 175	BTEX & TPH GRO SW8260_25	TPH DRO SW8015M	Alkalinity, Carbonate, Bicarbonate, Total SM2320B	Total Cations - see comments EPA200.7/200.8	Total Anions - see comments EPA 300.0	Total Dissolved Solids SM2540C
	Loeffler-UP 3-11	W	10/19/22	1420	11	1,2	-	X	X	X	X	X	X	X

Rise 17°
4.51
Circled

HS22101187
PDC Energy
Loeffler-UP 3-11

*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:	Cations/Anions:	QC PACKAGE (check below)
Calcium, Chloride, Magnesium, Potassium, Sodium, Sulfate		LEVEL II (Standard QC)
		LEVEL III (Std QC + forms)
Samples analyzed per		LEVEL IV (Std QC + forms + raw data)
COGCC Bradenhead Sampling Program		

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	[signature]	Jeff Braden	10/20/22	1030
RECEIVED BY	[signature]	Amy Keenan	10/20/22	1030
RELINQUISHED BY	[signature]	Amy Keenan	10/20/22	1620
RECEIVED BY	[signature]	[illegible]	10/21/22	0825
RELINQUISHED BY				
RECEIVED BY				

Blue

OCT 2 1 2022

ORIGIN ID:FTCA (970) 490-1511
SAMPLE CONTROL
ALS HOUSTON
225 COMMERCE DRIVE

FORT COLLINS, CO 80524
UNITED STATES US

SHIP DATE: 20OCT22
ACTWGT: 44.40 LB
CAD: 0730254/CAFE3616
DIMS: 24x14x13 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
10450 STANCLIFF RD.
SUITE 210
HOUSTON TX 77099

Blue

(281) 530-6666
REF: 6710-ENV-FC-LB-00

577CJ/ACSF/A32B

FedEx Express

J22202203280lv

TRK# 0201 5066 7517 6622

FRI - 21 OCT 10:30A
PRIORITY OVERNIGHT

XA SGRA

77099
TX-US IAH

Part # 167077-434 rev TW EXP 06/22