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May 05, 2023

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

Work Order: **HS23041379**

Laboratory Results for: **Bernhardt 31-1**

Dear Jenifer Hakkarinen,

ALS Environmental received 1 sample(s) on Apr 21, 2023 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: JUMOKE.LAWAL
Tyler Monroe

Client: PDC Energy
Project: Bernhardt 31-1
Work Order: HS23041379

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23041379-01	Bernhardt 31-1	Water		19-Apr-2023 10:20	21-Apr-2023 10:25	☐

Client: PDC Energy **CASE NARRATIVE**
Project: Bernhardt 31-1
Work Order: HS23041379

GC Semivolatiles by Method RSK-175

Batch ID: R433810

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

GC Semivolatiles by Method SW8015M

Batch ID: 192876

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

GC Volatiles by Method SW8015

Batch ID: R433598

Sample ID: Bernhardt 31-1 (HS23041379-01)

• Surrogate failed outside of control limits high due to sample matrix interference. This was confirmed by sample reanalysis.

GCMS Volatiles by Method SW8260

Batch ID: R434013

Sample ID: Bernhardt 31-1 (HS23041379-01)

• Lowest practical dilution due to sample matrix and/or high concentration of non-target analyte(s).

Sample ID: VLCSDW-230501

• LCSD is outside recovery/RPD limits due to carryover from the previous sample.

Metals by Method E200.8

Batch ID: 193316

Sample ID: HS23041743-01MS

• MS and MSD are for an unrelated sample

Sample ID: HS23041837-01MS

• MS and MSD are for an unrelated sample

WetChemistry by Method E300

Batch ID: R434434

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

WetChemistry by Method SM2320B

Batch ID: R434307

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

WetChemistry by Method M2540C

Batch ID: R433646

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

Client: PDC Energy
Project: Bernhardt 31-1
Work Order: HS23041379

CASE NARRATIVE

WetChemistry by Method M2540C

Client: PDC Energy
Project: Bernhardt 31-1
Sample ID: Bernhardt 31-1
Collection Date: 19-Apr-2023 10:20

ANALYTICAL REPORT
WorkOrder:HS23041379
Lab ID:HS23041379-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: AKP
Benzene	**140**		**50**	**ug/L**	50	01-May-2023 18:55
Ethylbenzene	ND		50	ug/L	50	01-May-2023 18:55
m,p-Xylene	ND		100	ug/L	50	01-May-2023 18:55
o-Xylene	**80**		**50**	**ug/L**	50	01-May-2023 18:55
Toluene	ND		50	ug/L	50	01-May-2023 18:55
Xylenes, Total	**160**		**50**	**ug/L**	50	01-May-2023 18:55
Surr: 1,2-Dichloroethane-d4	*108*		*70-126*	*%REC*	*50*	*01-May-2023 18:55*
Surr: 4-Bromofluorobenzene	*105*		*77-113*	*%REC*	*50*	*01-May-2023 18:55*
Surr: Dibromofluoromethane	*109*		*77-123*	*%REC*	*50*	*01-May-2023 18:55*
Surr: Toluene-d8	*99.4*		*82-127*	*%REC*	*50*	*01-May-2023 18:55*
GASOLINE RANGE ORGANICS BY SW8015C		**Method:SW8015**				Analyst: PJM
Gasoline Range Organics	**135**		**25.0**	**mg/L**	500	25-Apr-2023 13:27
Surr: 4-Bromofluorobenzene	*169*	*S*	*70-123*	*%REC*	*500*	*25-Apr-2023 13:27*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**				Analyst: PPM
Ethane	**928**		**400**	**ug/L**	400	26-Apr-2023 12:49
Methane	**4,220**		**200**	**ug/L**	400	26-Apr-2023 12:49
Propane	**1,230**		**400**	**ug/L**	400	26-Apr-2023 12:49
TPH DRO/ORO BY SW8015C		**Method:SW8015M**		Prep:SW3511 / 24-Apr-2023		Analyst: PPM
TPH (Diesel Range)	**0.90**		**0.051**	**mg/L**	1	27-Apr-2023 12:00
Surr: 2-Fluorobiphenyl	*104*		*60-135*	*%REC*	*1*	*27-Apr-2023 12:00*
TOTAL METALS BY E200.8, REV 5.4, 1994		**Method:E200.8**		Prep:E200.8 / 03-May-2023		Analyst: JC
Calcium	**3.76**		**0.500**	**mg/L**	1	04-May-2023 12:25
Magnesium	**0.880**		**0.500**	**mg/L**	1	04-May-2023 12:25
Potassium	**2.26**		**0.500**	**mg/L**	1	04-May-2023 12:25
Sodium	**411**		**1.00**	**mg/L**	5	03-May-2023 21:13
ANIONS BY E300.0, REV 2.1, 1993		**Method:E300**				Analyst: TH
Chloride	**426**		**5.00**	**mg/L**	10	04-May-2023 18:55
Sulfate	ND		0.500	mg/L	1	04-May-2023 18:50
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**				Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**1,110**		**10.0**	**mg/L**	1	25-Apr-2023 15:00
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**				Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**243**		**5.00**	**mg/L**	1	03-May-2023 18:16
Alkalinity, Carbonate (As CaCO3)	**104**		**5.00**	**mg/L**	1	03-May-2023 18:16
Alkalinity, Total (As CaCO3)	**347**		**5.00**	**mg/L**	1	03-May-2023 18:16

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

Weight / Prep Log

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

Batch ID: 192876 **Start Date:** 24 Apr 2023 11:32 **End Date:** 25 Apr 2023 14:30
Method: SW3511 **Prep Code:** 3511_DRO

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23041379-01		32.12 (mL)	2 (mL)	0.06227	40 mL Amber

Batch ID: 193316 **Start Date:** 03 May 2023 10:00 **End Date:** 03 May 2023 17:00
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	
HS23041379-01		10 (mL)	10 (mL)	1	250 mL plastic, HNO3 to pH <2

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 192876 (0)	**Test Name :** TPH DRO/ORO BY SW8015C				**Matrix:** Water	
HS23041379-01	Bernhardt 31-1	19 Apr 2023 10:20		24 Apr 2023 11:32	27 Apr 2023 12:00	1
Batch ID: 193316 (0)	**Test Name :** TOTAL METALS BY E200.8, REV 5.4, 1994				**Matrix:** Water	
HS23041379-01	Bernhardt 31-1	19 Apr 2023 10:20		03 May 2023 10:00	04 May 2023 12:25	1
HS23041379-01	Bernhardt 31-1	19 Apr 2023 10:20		03 May 2023 10:00	03 May 2023 21:13	5
Batch ID: R433598 (0)	**Test Name :** GASOLINE RANGE ORGANICS BY SW8015C				**Matrix:** Water	
HS23041379-01	Bernhardt 31-1	19 Apr 2023 10:20			25 Apr 2023 13:27	500
Batch ID: R433646 (0)	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C-2011				**Matrix:** Water	
HS23041379-01	Bernhardt 31-1	19 Apr 2023 10:20			25 Apr 2023 15:00	1
Batch ID: R433810 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Water	
HS23041379-01	Bernhardt 31-1	19 Apr 2023 10:20			26 Apr 2023 12:49	400
Batch ID: R434013 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23041379-01	Bernhardt 31-1	19 Apr 2023 10:20			01 May 2023 18:55	50
Batch ID: R434307 (0)	**Test Name :** ALKALINITY BY SM 2320B-2011				**Matrix:** Water	
HS23041379-01	Bernhardt 31-1	19 Apr 2023 10:20			03 May 2023 18:16	1
Batch ID: R434434 (0)	**Test Name :** ANIONS BY E300.0, REV 2.1, 1993				**Matrix:** Water	
HS23041379-01	Bernhardt 31-1	19 Apr 2023 10:20			04 May 2023 18:55	10
HS23041379-01	Bernhardt 31-1	19 Apr 2023 10:20			04 May 2023 18:50	1

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

QC BATCH REPORT

Batch ID: 192876 (0) **Instrument: FID-16** **Method: TPH DRO/ORO BY SW8015C**

MBLK Sample ID: **MBLK-192876** Units: **mg/L** Analysis Date: **26-Apr-2023 14:33**
Client ID: Run ID: **FID-16_433859** SeqNo: **7267709** PrepDate: **24-Apr-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	ND	0.050								
Surr: 2-Fluorobiphenyl	*0.03911*	*0.0050*	*0.06*	*0*	*65.2*	*60 - 135*				

LCS Sample ID: **LCS-192876** Units: **mg/L** Analysis Date: **26-Apr-2023 13:05**
Client ID: Run ID: **FID-16_433859** SeqNo: **7267707** PrepDate: **24-Apr-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.5526	0.050	0.6	0	92.1	70 - 130				
Surr: 2-Fluorobiphenyl	*0.0561*	*0.0050*	*0.06*	*0*	*93.5*	*60 - 135*				

LCSD Sample ID: **LCSD-192876** Units: **mg/L** Analysis Date: **26-Apr-2023 14:04**
Client ID: Run ID: **FID-16_433859** SeqNo: **7267708** PrepDate: **24-Apr-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.5296	0.050	0.6	0	88.3	70 - 130	0.5526	4.25	20	
Surr: 2-Fluorobiphenyl	*0.05538*	*0.0050*	*0.06*	*0*	*92.3*	*60 - 135*	*0.0561*	*1.29*	*20*	

The following samples were analyzed in this batch: HS23041379-01

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

QC BATCH REPORT

Batch ID: R433810 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-230426** Units: **ug/L** Analysis Date: **26-Apr-2023 08:58**
Client ID: Run ID: **FID-4_433810** SeqNo: **7266740** 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-230426** Units: **ug/L** Analysis Date: **26-Apr-2023 09:29**
Client ID: Run ID: **FID-4_433810** SeqNo: **7266741** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	21.34	1.00	18.04	0	118	75 - 125				
Methane	9.669	0.500	9.647	0	100	75 - 125				
Propane	29.71	1.00	26.46	0	112	75 - 125				

LCSD Sample ID: **LCSD-230426** Units: **ug/L** Analysis Date: **26-Apr-2023 09:45**
Client ID: Run ID: **FID-4_433810** SeqNo: **7266742** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	18.65	1.00	18.04	0	103	75 - 125	21.34	13.5	30	
Methane	7.455	0.500	9.647	0	77.3	75 - 125	9.669	25.9	30	
Propane	28.62	1.00	26.46	0	108	75 - 125	29.71	3.76	30	

The following samples were analyzed in this batch: HS23041379-01

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

QC BATCH REPORT

Batch ID: R433598 (0) **Instrument:** FID-20 **Method:** GASOLINE RANGE ORGANICS BY SW8015C

MBLK Sample ID: **MBLK-230425** Units: **mg/L** Analysis Date: **25-Apr-2023 11:23**
Client ID: Run ID: **FID-20_433598** SeqNo: **7261412** 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	*0.1066*	*0.00500*	*0.1*	*0*	*107*	*70 - 121*				

LCS Sample ID: **LCS-230425** Units: **mg/L** Analysis Date: **25-Apr-2023 10:55**
Client ID: Run ID: **FID-20_433598** SeqNo: **7261410** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	1.194	0.0500	1	0	119	76 - 124				
Surr: 4-Bromofluorobenzene	*0.1056*	*0.00500*	*0.1*	*0*	*106*	*52 - 138*				

LCSD Sample ID: **LCSD-230425** Units: **mg/L** Analysis Date: **25-Apr-2023 11:09**
Client ID: Run ID: **FID-20_433598** SeqNo: **7261411** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	1.198	0.0500	1	0	120	76 - 124	1.194	0.339	20	
Surr: 4-Bromofluorobenzene	*0.1052*	*0.00500*	*0.1*	*0*	*105*	*52 - 138*	*0.1056*	*0.399*	*20*	

The following samples were analyzed in this batch: HS23041379-01

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

QC BATCH REPORT

Batch ID: 193316 (0) **Instrument: ICPMS06** **Method: TOTAL METALS BY E200.8, REV 5.4, 1994**

MBLK Sample ID: **MBLK-193316** Units: **ug/L** Analysis Date: **03-May-2023 20:42**
Client ID: Run ID: **ICPMS06_434214** SeqNo: **7277986** PrepDate: **03-May-2023** 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-193316** Units: **ug/L** Analysis Date: **03-May-2023 20:44**
Client ID: Run ID: **ICPMS06_434214** SeqNo: **7277987** PrepDate: **03-May-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	5174	500	5000	0	103	85 - 115				
Magnesium	5159	500	5000	0	103	85 - 115				
Potassium	5135	500	5000	0	103	85 - 115				
Sodium	5107	200	5000	0	102	85 - 115				

MS Sample ID: **HS23041837-01MS** Units: **ug/L** Analysis Date: **03-May-2023 20:54**
Client ID: Run ID: **ICPMS06_434214** SeqNo: **7277992** PrepDate: **03-May-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	139300	500	5000	131600	153	70 - 130				SO
Magnesium	14590	500	5000	9615	99.5	70 - 130				
Potassium	7610	500	5000	2749	97.2	70 - 130				
Sodium	73610	200	5000	68250	107	70 - 130				O

MS Sample ID: **HS23041743-01MS** Units: **ug/L** Analysis Date: **03-May-2023 20:48**
Client ID: Run ID: **ICPMS06_434214** SeqNo: **7277989** PrepDate: **03-May-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	52390	500	5000	43000	188	70 - 130				SO
Magnesium	12630	500	5000	6471	123	70 - 130				
Sodium	529500	200	5000	482300	945	70 - 130				SEO

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

QC BATCH REPORT

Batch ID: 193316 (0) **Instrument: ICPMS06** **Method: TOTAL METALS BY E200.8, REV 5.4, 1994**

MS Sample ID: **HS23041743-01MS** Units: **ug/L** Analysis Date: **04-May-2023 11:51**
Client ID: Run ID: **ICPMS06_434216** SeqNo: **7278820** PrepDate: **03-May-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Potassium	19650	500	5000	15760	77.9	70 - 130				

MSD Sample ID: **HS23041837-01MSD** Units: **ug/L** Analysis Date: **03-May-2023 20:55**
Client ID: Run ID: **ICPMS06_434214** SeqNo: **7277993** PrepDate: **03-May-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	138100	500	5000	131600	130	70 - 130	139300	0.855	20	O
Magnesium	14510	500	5000	9615	97.8	70 - 130	14590	0.574	20	
Potassium	7623	500	5000	2749	97.5	70 - 130	7610	0.171	20	
Sodium	73600	200	5000	68250	107	70 - 130	73610	0.0137	20	O

MSD Sample ID: **HS23041743-01MSD** Units: **ug/L** Analysis Date: **03-May-2023 20:50**
Client ID: Run ID: **ICPMS06_434214** SeqNo: **7277990** PrepDate: **03-May-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	46460	500	5000	43000	69.2	70 - 130	52390	12	20	SO
Magnesium	11400	500	5000	6471	98.5	70 - 130	12630	10.3	20	
Potassium	20570	500	5000	15760	96.2	70 - 130	22860	10.5	20	
Sodium	480900	200	5000	482300	-27.9	70 - 130	529500	9.63	20	SEO

The following samples were analyzed in this batch: HS23041379-01

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

QC BATCH REPORT

Batch ID: R434013 (0) **Instrument: VOA4** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-230501** Units: **ug/L** Analysis Date: **01-May-2023 10:33**
Client ID: Run ID: **VOA4_434013** SeqNo: **7271255** 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	*56.37*	*1.0*	*50*	*0*	*113*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*51.05*	*1.0*	*50*	*0*	*102*	*77 - 113*				
Surr: Dibromofluoromethane	*56.24*	*1.0*	*50*	*0*	*112*	*73 - 126*				
Surr: Toluene-d8	*51.88*	*1.0*	*50*	*0*	*104*	*81 - 120*				

LCS Sample ID: **VLCSW-230501** Units: **ug/L** Analysis Date: **01-May-2023 09:48**
Client ID: Run ID: **VOA4_434013** SeqNo: **7271254** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.13	1.0	20	0	95.6	74 - 120				
Ethylbenzene	19.48	1.0	20	0	97.4	77 - 117				
m,p-Xylene	38.25	2.0	40	0	95.6	77 - 122				
o-Xylene	18.38	1.0	20	0	91.9	75 - 119				
Toluene	19.18	1.0	20	0	95.9	77 - 118				
Xylenes, Total	56.63	1.0	60	0	94.4	75 - 122				
Surr: 1,2-Dichloroethane-d4	*55.76*	*1.0*	*50*	*0*	*112*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.32*	*1.0*	*50*	*0*	*96.6*	*77 - 113*				
Surr: Dibromofluoromethane	*52.43*	*1.0*	*50*	*0*	*105*	*73 - 126*				
Surr: Toluene-d8	*52.06*	*1.0*	*50*	*0*	*104*	*81 - 120*				

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

QC BATCH REPORT

Batch ID: R434013 (0) **Instrument: VOA4** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCSD Sample ID: **VLCSDW-230501** Units: **ug/L** Analysis Date: **01-May-2023 20:26**
Client ID: Run ID: **VOA4_434013** SeqNo: **7272924** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	16.03	1.0	20	0	80.1	74 - 120	19.13	17.6	20	
Ethylbenzene	16.61	1.0	20	0	83.1	77 - 117	19.48	15.9	20	
m,p-Xylene	31.53	2.0	40	0	78.8	77 - 122	38.25	19.3	20	
o-Xylene	16.05	1.0	20	0	80.2	75 - 119	18.38	13.5	20	
Toluene	15.95	1.0	20	0	79.7	77 - 118	19.18	18.4	20	
Xylenes, Total	47.57	1.0	60	0	79.3	75 - 122	56.63	17.4	20	
Surr: 1,2-Dichloroethane-d4	*42.19*	*1.0*	*50*	*0*	*84.4*	*70 - 123*	*55.76*	*27.7*	*20*	R
Surr: 4-Bromofluorobenzene	*50.23*	*1.0*	*50*	*0*	*100*	*77 - 113*	*48.32*	*3.87*	*20*	
Surr: Dibromofluoromethane	*41.4*	*1.0*	*50*	*0*	*82.8*	*73 - 126*	*52.43*	*23.5*	*20*	R
Surr: Toluene-d8	*49.43*	*1.0*	*50*	*0*	*98.9*	*81 - 120*	*52.06*	*5.2*	*20*	

MS Sample ID: **HS23041654-04MS** Units: **ug/L** Analysis Date: **01-May-2023 13:36**
Client ID: Run ID: **VOA4_434013** SeqNo: **7271259** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	18.68	1.0	20	0.6889	90.0	70 - 127				
Ethylbenzene	22.77	1.0	20	5.941	84.1	70 - 124				
m,p-Xylene	39.3	2.0	40	5.183	85.3	70 - 130				
o-Xylene	16.56	1.0	20	0	82.8	70 - 124				
Toluene	17.27	1.0	20	0	86.3	70 - 123				
Xylenes, Total	55.86	1.0	60	5.183	84.5	70 - 130				
Surr: 1,2-Dichloroethane-d4	*53.47*	*1.0*	*50*	*0*	*107*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*49.71*	*1.0*	*50*	*0*	*99.4*	*77 - 113*				
Surr: Dibromofluoromethane	*50.63*	*1.0*	*50*	*0*	*101*	*77 - 123*				
Surr: Toluene-d8	*50*	*1.0*	*50*	*0*	*100*	*82 - 127*				

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

QC BATCH REPORT

Batch ID: R434013 (0) **Instrument: VOA4** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS23041654-04MSD** Units: **ug/L** Analysis Date: **01-May-2023 13:59**
Client ID: Run ID: **VOA4_434013** SeqNo: **7271260** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Benzene	17.99	1.0	20	0.6889	86.5	70 - 127	18.68	3.77	20	
Ethylbenzene	22.87	1.0	20	5.941	84.6	70 - 124	22.77	0.441	20	
m,p-Xylene	38.77	2.0	40	5.183	84.0	70 - 130	39.3	1.36	20	
o-Xylene	16.32	1.0	20	0	81.6	70 - 124	16.56	1.46	20	
Toluene	16.78	1.0	20	0	83.9	70 - 123	17.27	2.87	20	
Xylenes, Total	55.09	1.0	60	5.183	83.2	70 - 130	55.86	1.39	20	
Surr: 1,2-Dichloroethane-d4	*54.53*	*1.0*	*50*	*0*	*109*	*70 - 126*	*53.47*	*1.97*	*20*	
Surr: 4-Bromofluorobenzene	*49.56*	*1.0*	*50*	*0*	*99.1*	*77 - 113*	*49.71*	*0.302*	*20*	
Surr: Dibromofluoromethane	*51.55*	*1.0*	*50*	*0*	*103*	*77 - 123*	*50.63*	*1.81*	*20*	
Surr: Toluene-d8	*51.29*	*1.0*	*50*	*0*	*103*	*82 - 127*	*50*	*2.55*	*20*	

The following samples were analyzed in this batch: HS23041379-01

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

QC BATCH REPORT

Batch ID: R433646 (0) **Instrument:** Balance1 **Method:** TOTAL DISSOLVED SOLIDS BY SM2540C-2011

MBLK Sample ID: **WBLK-04252023** Units: **mg/L** Analysis Date: **25-Apr-2023 15:00**
Client ID: Run ID: **Balance1_433646** SeqNo: **7262713** 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: **LCS-042523** Units: **mg/L** Analysis Date: **25-Apr-2023 15:00**
Client ID: Run ID: **Balance1_433646** SeqNo: **7262712** 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)	1092	10.0	1000	0	109	85 - 115				

DUP Sample ID: **HS23041348-07DUP** Units: **mg/L** Analysis Date:
Client ID: Run ID: **Balance1_433646** SeqNo: **7262705** 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)	1328	10.0					1324	0.302	20	

DUP Sample ID: **HS23041348-01DUP** Units: **mg/L** Analysis Date: **25-Apr-2023 15:00**
Client ID: Run ID: **Balance1_433646** SeqNo: **7262698** 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)	768	10.0					764	0.522	20	

The following samples were analyzed in this batch: HS23041379-01

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

QC BATCH REPORT

Batch ID: R434307 (0) **Instrument: Skalar 03** **Method: ALKALINITY BY SM 2320B-2011**

MBLK Sample ID: **MBLK-05032023** Units: **mg/L** Analysis Date: **03-May-2023 15:35**
Client ID: Run ID: **Skalar 03_434307** SeqNo: **7278363** 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: **LCS-05032023** Units: **mg/L** Analysis Date: **03-May-2023 15:40**
Client ID: Run ID: **Skalar 03_434307** SeqNo: **7278364** 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)	934.2	5.00	1000	0	93.4	85 - 115				
Alkalinity, Total (As CaCO3)	938.7	5.00	1000	0	93.9	85 - 115				

LCSD Sample ID: **LCSD-05032023** Units: **mg/L** Analysis Date: **03-May-2023 15:47**
Client ID: Run ID: **Skalar 03_434307** SeqNo: **7278365** 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)	933	5.00	1000	0	93.3	85 - 115	934.2	0.129	20	
Alkalinity, Total (As CaCO3)	938.8	5.00	1000	0	93.9	85 - 115	938.7	0.0107	20	

DUP Sample ID: **HS23041191-01DUP** Units: **mg/L** Analysis Date: **03-May-2023 17:06**
Client ID: Run ID: **Skalar 03_434307** SeqNo: **7278378** 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)	709.3	5.00					718.1	1.23	20	
Alkalinity, Carbonate (As CaCO3)	ND	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	709.3	5.00					718.1	1.23	20	

DUP Sample ID: **HS23041115-01DUP** Units: **mg/L** Analysis Date: **03-May-2023 15:57**
Client ID: Run ID: **Skalar 03_434307** SeqNo: **7278367** 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)	40.2	5.00					40.6	0.99	20	
Alkalinity, Carbonate (As CaCO3)	ND	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	40.2	5.00					40.6	0.99	20	

The following samples were analyzed in this batch: HS23041379-01

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

QC BATCH REPORT

Batch ID: R434434 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY E300.0, REV 2.1, 1993**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **04-May-2023 15:30**
Client ID: Run ID: **ICS-Integrion_434434** SeqNo: **7281283** 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-May-2023 15:36**
Client ID: Run ID: **ICS-Integrion_434434** SeqNo: **7281284** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	21.26	0.500	20	0	106	90 - 110				
Sulfate	18.96	0.500	20	0	94.8	90 - 110				

MS Sample ID: **HS23050252-01MS** Units: **mg/L** Analysis Date: **04-May-2023 15:48**
Client ID: Run ID: **ICS-Integrion_434434** SeqNo: **7281286** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	35.31	0.500	10	25.69	96.2	80 - 120				
Sulfate	109.3	0.500	10	98.62	106	80 - 120				EO

MS Sample ID: **HS23041420-02MS** Units: **mg/L** Analysis Date: **04-May-2023 17:04**
Client ID: Run ID: **ICS-Integrion_434434** SeqNo: **7281297** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	4177	50.0	1000	3236	94.1	80 - 120				
Sulfate	1765	50.0	1000	903.7	86.2	80 - 120				

MSD Sample ID: **HS23050252-01MSD** Units: **mg/L** Analysis Date: **04-May-2023 15:54**
Client ID: Run ID: **ICS-Integrion_434434** SeqNo: **7281287** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	35.19	0.500	10	25.69	95.0	80 - 120	35.31	0.346	20	
Sulfate	108.7	0.500	10	98.62	100	80 - 120	109.3	0.561	20	EO

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: HS23041379

QC BATCH REPORT

Batch ID: R434434 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY E300.0, REV 2.1, 1993**

MSD Sample ID: **HS23041420-02MSD** Units: **mg/L** Analysis Date: **04-May-2023 17:10**
Client ID: Run ID: **ICS-Integrion_434434** SeqNo: **7281298** PrepDate: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	4168	50.0	1000	3236	93.2	80 - 120	4177	0.211	20	
Sulfate	1764	50.0	1000	903.7	86.0	80 - 120	1765	0.0895	20	

The following samples were analyzed in this batch: HS23041379-01

Client: PDC Energy
Project: Bernhardt 31-1
WorkOrder: **HS23041379**

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
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
Louisiana	03087, 2022-2023	30-Jun-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2023	31-Dec-2023
Oklahoma	2022-141	31-Aug-2023
Utah	TX026932022-13	31-Jul-2023

Sample Receipt Checklist

Work Order ID: HS23041379 **Date/Time Received:** 21-Apr-2023 10:25

Client Name: PDC Energy 80203 **Received by:** Malcolm Burleson

Completed By: /S/ Corey Grandits 21-Apr-2023 17:56 **Reviewed by:** /S/ Tyler Monroe 24-Apr-2023 11:22

eSignature Date/Time eSignature Date/Time

Matrices: W 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 ☐	
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):	2.9UC/2.4C	IR31
Cooler(s)/Kit(s):	49898	
Date/Time sample(s) sent to storage:	4/21/23	

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:

HS23041379
PDC Energy
Bernhardt 31-1

ALS Environmental
965 E 11th St
Loveland, CO 80537
PH: 970-305-1648

Chain-of-Custody

WORKORDER #

		SAMPLER	Jeff Braden	DATE	4/19/2023
PROJECT NAME	Bernhardt 31-1	FACILITY ID	123-31267	TURNAROUND	Standard
PROJECT No.	09C2073371	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 ST, Suite 3000	ADDRESS	1775 Sherman Street, Suite 3000		
CITY / STATE / ZIP	Denver, CO 80203	CITY / STATE / ZIP	Denver, Colorado		
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		

PAGE 1 of 1
DISPOSAL: By Lab (circled) 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 (EPA200.7/208)	Total Anions - see comments (EPA 300.0)	Total Dissolved Solids (SM2540C)
	Bernhardt 31-1	W	4/19/2023	1020	11	1,2	II	X	X	X	X	X	X	X

Cooler # 49898

*Time Zone: MST
For metals or anions, please detail analytes below.

Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter

IR31 2.9UC / 2.5C

Comments: **Cations/Anions:**
Calcium, Chloride, Magnesium, Potassium, Sodium, Sulfate
Samples analyzed per
COGCC Bradenhead Sampling Program

QC PACKAGE (check below)	
X	LEVEL II (Standard QC)
	LEVEL III (Std QC + forms)
	LEVEL IV (Std QC + forms + raw data)

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY	[signature]	Jeff Braden	4/20/2023	1230
RECEIVED BY	[signature]	Tyler Monroe	4/20/23	1230
RELINQUISHED BY	[signature]	Tyler Monroe	4/20/23	1600
RECEIVED BY	[signature]	MB	04212023	1025
RELINQUISHED BY				
RECEIVED BY				

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

49898 APR 2 1 2023

ORIGIN ID:GXYA (970) 305-1648
AMY KEPHART
ALS
965 E 11TH ST

LOVELAND, CO 80537
UNITED STATES US

SHIP DATE: 20APR23
ACTWGT: 33.20 LB
CAD: 0487862/CAFE3621
DIMS: 16x13x13 IN

BILL THIRD PARTY

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

49898

REF: PDC

FedEx Express

TRK# 0201 6182 5243 8006

FRI – 21 APR 10:30A
PRIORITY OVERNIGHT

NA SGRA

77099
TX-US IAH

Part # 167077-4334 MTN1 EXP 06/22