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February 09, 2023

Max Trehus
PDC Energy
4000 Burlington Ave.
Evans, CO 80620

Work Order: **HS23011370**

Laboratory Results for: **B-Farm LD 18-036HN**

Dear Max Trehus ,

ALS Environmental received 2 sample(s) on Jan 26, 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: B-Farm LD 18-036HN
Work Order: HS23011370

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23011370-01	18-036HN A	Water		23-Jan-2023 16:25	26-Jan-2023 10:15	☐
HS23011370-02	18-036HN B	Water		23-Jan-2023 16:25	26-Jan-2023 10:15	☐

Client: PDC Energy **CASE NARRATIVE**
Project: B-Farm LD 18-036HN
Work Order: HS23011370

GC Semivolatiles by Method RSK-175

Batch ID: R427455

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

GC Semivolatiles by Method SW8015M

Batch ID: 189054

Sample ID: 18-036HN A (HS23011370-01)

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

GC Volatiles by Method SW8015

Batch ID: R426992

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

GCMS Volatiles by Method SW8260

Batch ID: R427395

Sample ID: 18-036HN A (HS23011370-01)

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

Sample ID: HS23020150-06MS

• MS/MSD was performed on an unrelated sample.

Metals by Method E200.8

Batch ID: 189495

Sample ID: 18-036HN B (HS23011370-02)

• Sample ran at a 5X dilution due to high concentration of Potassium.

Sample ID: 18-036HN B (HS23011370-02MS)

• The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Calcium, Potassium, Sodium.

Batch ID: 189481

Sample ID: HS23020073-01MS

• MS and MSD are for an unrelated sample

WetChemistry by Method E300

Batch ID: R427520

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

Client: PDC Energy **CASE NARRATIVE**
Project: B-Farm LD 18-036HN
Work Order: HS23011370

WetChemistry by Method SM2320B

Batch ID: R427404

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

WetChemistry by Method M2540C

Batch ID: R426945

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

Client: PDC Energy
Project: B-Farm LD 18-036HN
Sample ID: 18-036HN A
Collection Date: 23-Jan-2023 16:25

ANALYTICAL REPORT
WorkOrder:HS23011370
Lab ID:HS23011370-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene	U		100	500	ug/L	500	06-Feb-2023 11:53
Ethylbenzene	U		150	500	ug/L	500	06-Feb-2023 11:53
m,p-Xylene	U		250	1000	ug/L	500	06-Feb-2023 11:53
o-Xylene	U		150	500	ug/L	500	06-Feb-2023 11:53
Toluene	U		100	500	ug/L	500	06-Feb-2023 11:53
Xylenes, Total	U		150	500	ug/L	500	06-Feb-2023 11:53
Surr: 1,2-Dichloroethane-d4	*102*			*70-126*	*%REC*	*500*	*06-Feb-2023 11:53*
Surr: 4-Bromofluorobenzene	*97.9*			*77-113*	*%REC*	*500*	*06-Feb-2023 11:53*
Surr: Dibromofluoromethane	*108*			*77-123*	*%REC*	*500*	*06-Feb-2023 11:53*
Surr: Toluene-d8	*96.7*			*82-127*	*%REC*	*500*	*06-Feb-2023 11:53*
GASOLINE RANGE ORGANICS BY SW8015C		**Method:SW8015**					Analyst: FT
Gasoline Range Organics	**8,450**		**5.00**	**25.0**	**mg/L**	500	31-Jan-2023 14:51
Surr: 4-Bromofluorobenzene	*115*			*70-123*	*%REC*	*500*	*31-Jan-2023 14:51*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**					Analyst: PPM
Ethane	**31.8**		**0.144**	**1.00**	**ug/L**	1	06-Feb-2023 11:42
Methane	**1,270**		**10.7**	**50.0**	**ug/L**	100	06-Feb-2023 12:09
Propane	**13.3**		**1.00**	**1.00**	**ug/L**	1	06-Feb-2023 11:42
TPH DRO/ORO BY SW8015C		**Method:SW8015M**			Prep:SW3511 / 30-Jan-2023		Analyst: PPM
TPH (Diesel Range)	**47**		**2.0**	**5.0**	**mg/L**	100	31-Jan-2023 14:48
Surr: 2-Fluorobiphenyl	*0*	*JS*		*60-135*	*%REC*	*100*	*31-Jan-2023 14:48*
TOTAL METALS BY E200.8, REV 5.4, 1994		**Method:E200.8**			Prep:E200.8 / 08-Feb-2023		Analyst: JC
Calcium	**217**		**1.80**	**50.0**	**mg/L**	100	09-Feb-2023 12:03
Magnesium	**0.185**	J	**0.00780**	**0.500**	**mg/L**	1	08-Feb-2023 19:35
Potassium	**2,560**		**3.30**	**50.0**	**mg/L**	100	09-Feb-2023 12:03
Sodium	**1,090**		**2.10**	**20.0**	**mg/L**	100	09-Feb-2023 12:03
ANIONS BY E300.0, REV 2.1, 1993		**Method:E300**					Analyst: TH
Chloride	**1,050**		**10.0**	**25.0**	**mg/L**	50	06-Feb-2023 15:35
Sulfate	**474**		**10.0**	**25.0**	**mg/L**	50	06-Feb-2023 15:35
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**11,500**		**5.00**	**10.0**	**mg/L**	1	30-Jan-2023 10:30
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	U		50.0	50.0	mg/L	10	06-Feb-2023 14:06
Alkalinity, Carbonate (As CaCO3)	**1,480**		**50.0**	**50.0**	**mg/L**	10	06-Feb-2023 14:06
Alkalinity, Total (As CaCO3)	**15,200**		**50.0**	**50.0**	**mg/L**	10	06-Feb-2023 14:06

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

Client: PDC Energy
Project: B-Farm LD 18-036HN
Sample ID: 18-036HN B
Collection Date: 23-Jan-2023 16:25

ANALYTICAL REPORT
WorkOrder:HS23011370
Lab ID:HS23011370-02
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
DISSOLVED METALS BY E200.8, REV 5.4, 1994	**Method:E200.8 (dissolved)**				Prep:E200.8 / 08-Feb-2023		Analyst: JC
Calcium	**120**		**0.360**	**10.0**	**mg/L**	20	09-Feb-2023 14:34
Magnesium	U		0.0390	2.50	mg/L	5	09-Feb-2023 14:48
Potassium	**2,530**		**0.660**	**10.0**	**mg/L**	20	09-Feb-2023 14:34
Sodium	**1,080**		**0.420**	**4.00**	**mg/L**	20	09-Feb-2023 14:34

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

Weight / Prep Log

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

Batch ID: 189054 **Start Date:** 30 Jan 2023 12:00 **End Date:** 31 Jan 2023 12:00
Method: SW3511 **Prep Code:** 3511_DRO

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23011370-01		33.1 (mL)	2 (mL)	0.06042	40 mL Amber

Batch ID: 189090 **Start Date:** 30 Jan 2023 18:30 **End Date:** 30 Jan 2023 19:00
Method: SAMPLE FILTRATION - 0.45 MICRON FILTER **Prep Code:** FILTRATION

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23011370-02		100 (mL)	100 (mL)	1	250 mL plastic, Neat

Batch ID: 189481 **Start Date:** 08 Feb 2023 10:00 **End Date:** 08 Feb 2023 14:00
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	
HS23011370-01		10 (mL)	10 (mL)	1	250 mL plastic, HNO3 to pH <2

Batch ID: 189495 **Start Date:** 08 Feb 2023 13:30 **End Date:** 08 Feb 2023 17:30
Method: DISSOLVED METALS DIGESTION BY E200.8,REV 5.4,1994 **Prep Code:** 200.8_DISSPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23011370-02		10 (mL)	10 (mL)	1	250 mL plastic, Neat

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 189054 (0)	**Test Name :** TPH DRO/ORO BY SW8015C				**Matrix:** Water	
HS23011370-01	18-036HN A	23 Jan 2023 16:25		30 Jan 2023 08:52	31 Jan 2023 14:48	100
Batch ID: 189481 (0)	**Test Name :** TOTAL METALS BY E200.8, REV 5.4, 1994				**Matrix:** Water	
HS23011370-01	18-036HN A	23 Jan 2023 16:25		08 Feb 2023 10:00	09 Feb 2023 12:03	100
HS23011370-01	18-036HN A	23 Jan 2023 16:25		08 Feb 2023 10:00	08 Feb 2023 19:35	1
Batch ID: 189495 (0)	**Test Name :** DISSOLVED METALS BY E200.8, REV 5.4, 1994				**Matrix:** Water	
HS23011370-02	18-036HN B	23 Jan 2023 16:25		08 Feb 2023 13:30	09 Feb 2023 14:48	5
HS23011370-02	18-036HN B	23 Jan 2023 16:25		08 Feb 2023 13:30	09 Feb 2023 14:34	20
Batch ID: R426945 (0)	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C-2011				**Matrix:** Water	
HS23011370-01	18-036HN A	23 Jan 2023 16:25			30 Jan 2023 10:30	1
Batch ID: R426992 (0)	**Test Name :** GASOLINE RANGE ORGANICS BY SW8015C				**Matrix:** Water	
HS23011370-01	18-036HN A	23 Jan 2023 16:25			31 Jan 2023 14:51	500
Batch ID: R427395 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23011370-01	18-036HN A	23 Jan 2023 16:25			06 Feb 2023 11:53	500
Batch ID: R427404 (0)	**Test Name :** ALKALINITY BY SM 2320B-2011				**Matrix:** Water	
HS23011370-01	18-036HN A	23 Jan 2023 16:25			06 Feb 2023 14:06	10
Batch ID: R427455 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Water	
HS23011370-01	18-036HN A	23 Jan 2023 16:25			06 Feb 2023 12:09	100
HS23011370-01	18-036HN A	23 Jan 2023 16:25			06 Feb 2023 11:42	1
Batch ID: R427520 (0)	**Test Name :** ANIONS BY E300.0, REV 2.1, 1993				**Matrix:** Water	
HS23011370-01	18-036HN A	23 Jan 2023 16:25			06 Feb 2023 16:38	1
HS23011370-01	18-036HN A	23 Jan 2023 16:25			06 Feb 2023 15:35	50

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

QC BATCH REPORT

Batch ID: 189054 (0) **Instrument: FID-16** **Method: TPH DRO/ORO BY SW8015C**

MBLK Sample ID: **MBLK-189054** Units: **mg/L** Analysis Date: **31-Jan-2023 12:21**
Client ID: Run ID: **FID-16_427140** SeqNo: **7103813** PrepDate: **30-Jan-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	U	0.050								
Surr: 2-Fluorobiphenyl	*0.05034*	*0.0050*	*0.06*	*0*	*83.9*	*60 - 135*				

LCS Sample ID: **LCS-189054** Units: **mg/L** Analysis Date: **31-Jan-2023 12:51**
Client ID: Run ID: **FID-16_427140** SeqNo: **7103814** PrepDate: **30-Jan-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.6747	0.050	0.6	0	112	70 - 130				
Surr: 2-Fluorobiphenyl	*0.06061*	*0.0050*	*0.06*	*0*	*101*	*60 - 135*				

LCSD Sample ID: **LCSD-189054** Units: **mg/L** Analysis Date: **31-Jan-2023 13:20**
Client ID: Run ID: **FID-16_427140** SeqNo: **7103815** PrepDate: **30-Jan-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.7049	0.050	0.6	0	117	70 - 130	0.6747	4.38	20	
Surr: 2-Fluorobiphenyl	*0.0592*	*0.0050*	*0.06*	*0*	*98.7*	*60 - 135*	*0.06061*	*2.35*	*20*	

The following samples were analyzed in this batch: HS23011370-01

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

QC BATCH REPORT

Batch ID: R427455 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-230206** Units: **ug/L** Analysis Date: **06-Feb-2023 10:28**
Client ID: Run ID: **FID-4_427455** SeqNo: **7111767** PrepDate: DF: **1**

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

LCS Sample ID: **LCS-230206** Units: **ug/L** Analysis Date: **06-Feb-2023 10:42**
Client ID: Run ID: **FID-4_427455** SeqNo: **7111768** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	19.88	1.00	18.04	0	110	75 - 125				
Methane	9.13	0.500	9.647	0	94.6	75 - 125				
Propane	32.08	1.00	26.46	0	121	75 - 125				

LCSD Sample ID: **LCSD-230206** Units: **ug/L** Analysis Date: **06-Feb-2023 10:57**
Client ID: Run ID: **FID-4_427455** SeqNo: **7111769** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	19.51	1.00	18.04	0	108	75 - 125	19.88	1.88	30	
Methane	8.903	0.500	9.647	0	92.3	75 - 125	9.13	2.53	30	
Propane	32.05	1.00	26.46	0	121	75 - 125	32.08	0.0869	30	

The following samples were analyzed in this batch: HS23011370-01

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

QC BATCH REPORT

Batch ID: R426992 (0) **Instrument:** FID-20 **Method:** GASOLINE RANGE ORGANICS BY SW8015C

MBLK Sample ID: **MBLK-230131** Units: **mg/L** Analysis Date: **31-Jan-2023 10:18**
Client ID: Run ID: **FID-20_426992** SeqNo: **7099823** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	U	0.0500								
Surr: 4-Bromofluorobenzene	*0.09492*	*0.00500*	*0.1*	*0*	*94.9*	*70 - 121*				

LCS Sample ID: **LCS-230131** Units: **mg/L** Analysis Date: **31-Jan-2023 09:37**
Client ID: Run ID: **FID-20_426992** SeqNo: **7099821** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	1.07	0.0500	1	0	107	76 - 124				
Surr: 4-Bromofluorobenzene	*0.0833*	*0.00500*	*0.1*	*0*	*83.3*	*52 - 138*				

LCSD Sample ID: **LCSD-230131** Units: **mg/L** Analysis Date: **31-Jan-2023 09:50**
Client ID: Run ID: **FID-20_426992** SeqNo: **7099822** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	1.19	0.0500	1	0	119	76 - 124	1.07	10.7	20	
Surr: 4-Bromofluorobenzene	*0.08796*	*0.00500*	*0.1*	*0*	*88.0*	*52 - 138*	*0.0833*	*5.44*	*20*	

The following samples were analyzed in this batch: HS23011370-01

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

QC BATCH REPORT

Batch ID: 189481 (0) **Instrument: ICPMS06** **Method: TOTAL METALS BY E200.8, REV 5.4, 1994**

MBLK Sample ID: **MBLK-189481** Units: **ug/L** Analysis Date: **08-Feb-2023 18:20**
Client ID: Run ID: **ICPMS06_427569** SeqNo: **7115158** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	U	500								
Magnesium	14.92	500								J
Potassium	U	500								
Sodium	193.4	200								J

LCS Sample ID: **LCS-189481** Units: **ug/L** Analysis Date: **08-Feb-2023 18:22**
Client ID: Run ID: **ICPMS06_427569** SeqNo: **7115159** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	5128	500	5000	0	103	85 - 115				
Magnesium	5215	500	5000	0	104	85 - 115				
Potassium	5278	500	5000	0	106	85 - 115				
Sodium	5183	200	5000	0	104	85 - 115				

MS Sample ID: **HS23020073-01MS** Units: **ug/L** Analysis Date: **08-Feb-2023 18:32**
Client ID: Run ID: **ICPMS06_427569** SeqNo: **7115164** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	269700	500	5000	261300	168	70 - 130				SEO
Magnesium	32410	500	5000	26890	110	70 - 130				O
Potassium	38720	500	5000	33270	109	70 - 130				O
Sodium	299700	200	5000	288900	215	70 - 130				SEO

MS Sample ID: **HS23011528-01MS** Units: **ug/L** Analysis Date: **08-Feb-2023 18:26**
Client ID: Run ID: **ICPMS06_427569** SeqNo: **7115161** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	5191	500	5000	130.2	101	70 - 130				
Magnesium	5159	500	5000	30.51	103	70 - 130				
Potassium	5158	500	5000	0	103	70 - 130				
Sodium	6433	200	5000	1478	99.1	70 - 130				

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

QC BATCH REPORT

Batch ID: 189481 (0) **Instrument: ICPMS06** **Method: TOTAL METALS BY E200.8, REV 5.4, 1994**

MSD Sample ID: **HS23020073-01MSD** Units: **ug/L** Analysis Date: **08-Feb-2023 18:34**
Client ID: Run ID: **ICPMS06_427569** SeqNo: **7115165** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	264800	500	5000	261300	70.1	70 - 130	269700	1.83	20	EO
Magnesium	31800	500	5000	26890	98.3	70 - 130	32410	1.88	20	O
Potassium	37720	500	5000	33270	89.1	70 - 130	38720	2.6	20	O
Sodium	295700	200	5000	288900	135	70 - 130	299700	1.35	20	SEO

MSD Sample ID: **HS23011528-01MSD** Units: **ug/L** Analysis Date: **08-Feb-2023 18:28**
Client ID: Run ID: **ICPMS06_427569** SeqNo: **7115162** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	5215	500	5000	130.2	102	70 - 130	5191	0.453	20	
Magnesium	5246	500	5000	30.51	104	70 - 130	5159	1.67	20	
Potassium	5178	500	5000	0	104	70 - 130	5158	0.391	20	
Sodium	6420	200	5000	1478	98.8	70 - 130	6433	0.203	20	

The following samples were analyzed in this batch: HS23011370-01

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

QC BATCH REPORT

Batch ID: 189495 (0) **Instrument: ICPMS06** **Method: DISSOLVED METALS BY E200.8, REV 5.4, 1994 (DISSOLVED)**

MBLK Sample ID: **MBLKF1-189495** Units: **ug/L** Analysis Date: **09-Feb-2023 14:00**
Client ID: Run ID: **ICPMS06_427673** SeqNo: **7116737** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	U	500								
Magnesium	14.37	500								J
Potassium	U	500								
Sodium	U	200								

MBLK Sample ID: **MBLK-189495** Units: **ug/L** Analysis Date: **09-Feb-2023 13:58**
Client ID: Run ID: **ICPMS06_427673** SeqNo: **7116736** PrepDate: **08-Feb-2023** DF: **1**

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

LCS Sample ID: **LCS-189495** Units: **ug/L** Analysis Date: **09-Feb-2023 14:02**
Client ID: Run ID: **ICPMS06_427673** SeqNo: **7116738** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	5161	500	5000	0	103	85 - 115				
Magnesium	5455	500	5000	0	109	85 - 115				
Potassium	5214	500	5000	0	104	85 - 115				
Sodium	5436	200	5000	0	109	85 - 115				

MS Sample ID: **HS23011370-02MS** Units: **ug/L** Analysis Date: **09-Feb-2023 14:36**
Client ID: **18-036HN B** Run ID: **ICPMS06_427673** SeqNo: **7116743** PrepDate: **08-Feb-2023** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	142300	10000	5000	120100	443	85 - 115				SO
Potassium	2890000	10000	5000	2527000	7260	85 - 115				SO
Sodium	1237000	4000	5000	1084000	3060	85 - 115				SO

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

QC BATCH REPORT

Batch ID: 189495 (0) **Instrument:** ICPMS06 **Method:** DISSOLVED METALS BY E200.8, REV 5.4, 1994 (DISSOLVED)

MS Sample ID: **HS23011370-02MS** Units: **ug/L** Analysis Date: **09-Feb-2023 14:50**
Client ID: **18-036HN B** Run ID: **ICPMS06_427673** SeqNo: **7116753** PrepDate: **08-Feb-2023** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	5446	2500	5000	29.75	108	85 - 115				

MSD Sample ID: **HS23011370-02MSD** Units: **ug/L** Analysis Date: **09-Feb-2023 14:38**
Client ID: **18-036HN B** Run ID: **ICPMS06_427673** SeqNo: **7116744** PrepDate: **08-Feb-2023** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	141500	10000	5000	120100	428	85 - 115	142300	0.539	20	SO
Potassium	2894000	10000	5000	2527000	7340	85 - 115	2890000	0.146	20	SO
Sodium	1216000	4000	5000	1084000	2640	85 - 115	1237000	1.74	20	SO

MSD Sample ID: **HS23011370-02MSD** Units: **ug/L** Analysis Date: **09-Feb-2023 14:52**
Client ID: **18-036HN B** Run ID: **ICPMS06_427673** SeqNo: **7116754** PrepDate: **08-Feb-2023** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	5459	2500	5000	29.75	109	85 - 115	5446	0.241	20	

The following samples were analyzed in this batch: HS23011370-02

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

QC BATCH REPORT

Batch ID: R427395 (0) **Instrument: VOA11** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-230206** Units: **ug/L** Analysis Date: **06-Feb-2023 10:21**
Client ID: Run ID: **VOA11_427395** SeqNo: **7110224** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	1.0								
Ethylbenzene	U	1.0								
m,p-Xylene	U	2.0								
o-Xylene	U	1.0								
Toluene	U	1.0								
Xylenes, Total	U	1.0								
Surr: 1,2-Dichloroethane-d4	*49.92*	*1.0*	*50*	*0*	*99.8*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*50.08*	*1.0*	*50*	*0*	*100*	*77 - 113*				
Surr: Dibromofluoromethane	*52.32*	*1.0*	*50*	*0*	*105*	*73 - 126*				
Surr: Toluene-d8	*48.33*	*1.0*	*50*	*0*	*96.7*	*81 - 120*				

LCS Sample ID: **VLCSW-230206** Units: **ug/L** Analysis Date: **06-Feb-2023 09:39**
Client ID: Run ID: **VOA11_427395** SeqNo: **7110223** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.02	1.0	20	0	105	74 - 120				
Ethylbenzene	21.21	1.0	20	0	106	77 - 117				
m,p-Xylene	41.65	2.0	40	0	104	77 - 122				
o-Xylene	20.74	1.0	20	0	104	75 - 119				
Toluene	20.95	1.0	20	0	105	77 - 118				
Xylenes, Total	62.39	1.0	60	0	104	75 - 122				
Surr: 1,2-Dichloroethane-d4	*45*	*1.0*	*50*	*0*	*90.0*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*47.8*	*1.0*	*50*	*0*	*95.6*	*77 - 113*				
Surr: Dibromofluoromethane	*48.85*	*1.0*	*50*	*0*	*97.7*	*73 - 126*				
Surr: Toluene-d8	*49.43*	*1.0*	*50*	*0*	*98.9*	*81 - 120*				

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

QC BATCH REPORT

Batch ID: R427395 (0) **Instrument: VOA11** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS23020150-06MS** Units: **ug/L** Analysis Date: **06-Feb-2023 12:37**
Client ID: Run ID: **VOA11_427395** SeqNo: **7110228** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.87	1.0	20	0	104	70 - 127				
Ethylbenzene	22.33	1.0	20	0	112	70 - 124				
m,p-Xylene	64.83	2.0	40	0	162	70 - 130				S
o-Xylene	24.89	1.0	20	0	124	70 - 124				S
Toluene	26.95	1.0	20	0	135	70 - 123				S
Xylenes, Total	89.72	1.0	60	0	150	70 - 130				S
Surr: 1,2-Dichloroethane-d4	*44.42*	*1.0*	*50*	*0*	*88.8*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*48.25*	*1.0*	*50*	*0*	*96.5*	*77 - 113*				
Surr: Dibromofluoromethane	*48.16*	*1.0*	*50*	*0*	*96.3*	*77 - 123*				
Surr: Toluene-d8	*50.21*	*1.0*	*50*	*0*	*100*	*82 - 127*				

MSD Sample ID: **HS23020150-06MSD** Units: **ug/L** Analysis Date: **06-Feb-2023 12:58**
Client ID: Run ID: **VOA11_427395** SeqNo: **7110229** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.42	1.0	20	0	102	70 - 127	20.87	2.18	20	
Ethylbenzene	22.21	1.0	20	0	111	70 - 124	22.33	0.507	20	
m,p-Xylene	88.04	2.0	40	0	220	70 - 130	64.83	30.4	20	SR
o-Xylene	35.09	1.0	20	0	175	70 - 124	24.89	34	20	SR
Toluene	30.99	1.0	20	0	155	70 - 123	26.95	13.9	20	S
Xylenes, Total	123.1	1.0	60	0	205	70 - 130	89.72	31.4	20	SR
Surr: 1,2-Dichloroethane-d4	*43.64*	*1.0*	*50*	*0*	*87.3*	*70 - 126*	*44.42*	*1.78*	*20*	
Surr: 4-Bromofluorobenzene	*47.02*	*1.0*	*50*	*0*	*94.0*	*77 - 113*	*48.25*	*2.6*	*20*	
Surr: Dibromofluoromethane	*48.6*	*1.0*	*50*	*0*	*97.2*	*77 - 123*	*48.16*	*0.9*	*20*	
Surr: Toluene-d8	*48.52*	*1.0*	*50*	*0*	*97.0*	*82 - 127*	*50.21*	*3.44*	*20*	

The following samples were analyzed in this batch: HS23011370-01

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

QC BATCH REPORT

Batch ID: R426945 (0) **Instrument:** Balance1 **Method:** TOTAL DISSOLVED SOLIDS BY SM2540C-2011

MBLK	Sample ID:	**WBLK-01302023**			Units: **mg/L**		Analysis Date: **30-Jan-2023 10:30**				
Client ID:			Run ID: **Balance1_426945**		SeqNo: **7098733**		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)		U	10.0								
LCS	Sample ID:	**LCS-01302023**			Units: **mg/L**		Analysis Date: **30-Jan-2023 10:30**				
Client ID:			Run ID: **Balance1_426945**		SeqNo: **7098732**		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)		1136	10.0	1000	0	114	85 - 115				
DUP	Sample ID:	**HS23011208-10DUP**			Units: **mg/L**		Analysis Date: **30-Jan-2023 10:30**				
Client ID:			Run ID: **Balance1_426945**		SeqNo: **7098723**		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)		16	10.0					16	0	5	
DUP	Sample ID:	**HS23011208-02DUP**			Units: **mg/L**		Analysis Date: **30-Jan-2023 10:30**				
Client ID:			Run ID: **Balance1_426945**		SeqNo: **7098714**		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)		U	10.0					-2	0	5	

The following samples were analyzed in this batch: HS23011370-01

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

QC BATCH REPORT

Batch ID: R427404 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM 2320B-2011**

MBLK Sample ID: **WBLKW1-020623** Units: **mg/L** Analysis Date: **06-Feb-2023 12:58**
Client ID: Run ID: **ManTech01_427404** SeqNo: **7110371** 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)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								
Alkalinity, Hydroxide (As CaCO3)	U	5.00								
Alkalinity, Total (As CaCO3)	U	5.00								

LCS Sample ID: **LCS1-020623** Units: **mg/L** Analysis Date: **06-Feb-2023 13:07**
Client ID: Run ID: **ManTech01_427404** SeqNo: **7110372** 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)	1014	5.00	1000	0	101	85 - 115				
Alkalinity, Total (As CaCO3)	1024	5.00	1000	0	102	85 - 115				

LCSD Sample ID: **LCSD1-020623** Units: **mg/L** Analysis Date: **06-Feb-2023 13:16**
Client ID: Run ID: **ManTech01_427404** SeqNo: **7110373** 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)	1019	5.00	1000	0	102	85 - 115	1014	0.45	20	
Alkalinity, Total (As CaCO3)	1029	5.00	1000	0	103	85 - 115	1024	0.504	20	

DUP Sample ID: **HS23011208-09DUP** Units: **mg/L** Analysis Date: **06-Feb-2023 13:33**
Client ID: Run ID: **ManTech01_427404** SeqNo: **7110376** 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)	164.6	5.00					163.6	0.646	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Hydroxide (As CaCO3)	U	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	164.6	5.00					163.6	0.646	20	

The following samples were analyzed in this batch: HS23011370-01

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: HS23011370

QC BATCH REPORT

Batch ID: R427520 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY E300.0, REV 2.1, 1993**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **06-Feb-2023 13:39**
Client ID: Run ID: **ICS-Integrion_427520** SeqNo: **7113061** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.500								
Fluoride	U	0.100								
Sulfate	U	0.500								

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **06-Feb-2023 13:51**
Client ID: Run ID: **ICS-Integrion_427520** SeqNo: **7113062** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.42	0.500	20	0	102	90 - 110				
Fluoride	4.256	0.100	4	0	106	90 - 110				
Sulfate	21.35	0.500	20	0	107	90 - 110				

MS Sample ID: **HS23011367-03MS** Units: **mg/L** Analysis Date: **06-Feb-2023 14:55**
Client ID: Run ID: **ICS-Integrion_427520** SeqNo: **7113070** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	10.54	0.500	10	0.22	103	80 - 120				
Fluoride	2.177	0.100	2	0.0208	108	80 - 120				
Sulfate	11.64	0.500	10	0.5773	111	80 - 120				

MSD Sample ID: **HS23011367-03MSD** Units: **mg/L** Analysis Date: **06-Feb-2023 15:00**
Client ID: Run ID: **ICS-Integrion_427520** SeqNo: **7113071** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	10.54	0.500	10	0.22	103	80 - 120	10.54	0.0474	20	
Fluoride	2.131	0.100	2	0.0208	106	80 - 120	2.177	2.14	20	
Sulfate	11.61	0.500	10	0.5773	110	80 - 120	11.64	0.27	20	

The following samples were analyzed in this batch: HS23011370-01

Client: PDC Energy
Project: B-Farm LD 18-036HN
WorkOrder: **HS23011370**

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
Date	
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	624-2023	31-Dec-2023
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: HS23011370 **Date/Time Received:** **26-Jan-2023 10:15**

Client Name: PDC Energy 80620 **Received by:** **Corey Grandits**

Completed By:	/S/ Corey Grandits	27-Jan-2023 09:35	**Reviewed by:**	/S/ Tyler Monroe	30-Jan-2023 17:14
	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):	3.0UC/2.5C	IR31
Cooler(s)/Kit(s):	Lg Blue	
Date/Time sample(s) sent to storage:	1/27/2023	

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:

Chain of Custody Form

ALS Environmental

Page ____ of ____

HS23011370

PDC Energy

B-Farm LD 18-036HN

ALS Project Manager:

Customer Information		Project Information			
Purchase Order		Project Name	B-Farm LD 18-036HN	A	Dissolved Gases (Methane, Ethane, Propane)
Work Order		Project Number		B	BTEX 8260
Company Name	PDC Energy	Bill To Company	PDC Energy	C	DRO 8015
Send Report To	Max Trehus	Invoice Attn.	Max Trehus	D	GRO 8015
Address	4000 Burlington Ave	Address	1775 Sherman St #3000	E	Anions (Cl,SO4), Alk (T, CO3, HCO3), TDS
				F	Dissolved Ca, Mg, K, Na - need to lab filter
City/State/Zip	Evans, CO 80620	City/State/Zip	Denver, CO 80203	G	Total Ca, Mg, K, Na
Phone	720-762-3569	Phone	303-860-5800	H	
Fax		Fax		I	
e-Mail Address	max.trehus@pdce.com Jenifer.Hakkarinen@pdce.com jessica.johannsen@pdce.com	e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	18-036HN A	1/23/2023	16:25	W	8	2	X										
2	18-036HN A			W	1	2		X									
3	18-036HN A			W	1	2			X								
4	18-036HN A			W	1	2				X							
5	18-036HN A			W	8	1					X						
6	18-036HN B			W	8	1						X					
7	18-036HN A			W	2	1							X				
8																	
9																	
10																	

Sampler(s): Please Print & Sign: Max Trehus

Shipment Method:

Required Turnaround Time: ☑ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other ____

Results Due Date:

Relinquished by:	Date: 1/25/23	Time: 1015	Received by:	Notes: Facility ID: 452911	
Relinquished by:	Date: 1/25/23	Time: 1500	Received by (Laboratory): 107676 1-26-23 1015	Cooler Temp.	QC Package: (Check Box Below)
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):	3.0°	X Level II: Standard QC ☐ TRRP-Checklist ☐ Level III: Std QC + Raw Data ☐ TRRP Level IV ☐ Level IV: SW846 CLP-Like ☐ Other: ____

Preservative Key: 1-HCL 2-HNO3 3-H2SO4 4-NaOH 5-Na2S2O3 6-NaHSO4 7-Other 8-4 degrees C 9-5035

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

LG Bmc JAN 2 6 2023
JAN 2 6 2023