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October 16, 2023

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

Work Order: **HS23091909**

Laboratory Results for: **Brown 23P-221**

Dear Jenifer Hakkarinen,

ALS Environmental received 1 sample(s) on Sep 30, 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: DAYNA.FISHER
Tyler Monroe

Client: PDC Energy
Project: Brown 23P-221
Work Order: HS23091909

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23091909-01	Brown 23P-221	Water		29-Sep-2023 13:30	30-Sep-2023 08:45	☐

Client: PDC Energy **CASE NARRATIVE**
Project: Brown 23P-221
Work Order: HS23091909

GC Semivolatiles by Method RSK-175

Batch ID: R448573

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

GC Semivolatiles by Method SW8015M

Batch ID: 201337

Sample ID: Brown 23P-221 (HS23091909-01)

• Surrogate recoveries were outside of the control limits due to matrix interference.

GC Volatiles by Method SW8015

Batch ID: R447956

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

GCMS Volatiles by Method SW8260

Batch ID: R448073

Sample ID: Brown 23P-221 (HS23091909-01)

• Lowest possible dilution due to sample matrix.

Metals by Method E200.8

Batch ID: 201737

Sample ID: Brown 23P-221 (HS23091909-01)

• Sample ran at 5x due to high concentration of Sodium.

Sample ID: HS23100052-02MS

• MS and MSD are for an unrelated sample

WetChemistry by Method E300

Batch ID: R449091

Sample ID: HS23100570-02MS, HS23100851-02MS, HS23100055-14MS

• MSD is for an unrelated sample (Sulfate)

WetChemistry by Method SM2320B

Batch ID: R448663

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

WetChemistry by Method M2540C

Batch ID: R448337

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

Client: PDC Energy
Project: Brown 23P-221
Sample ID: Brown 23P-221
Collection Date: 29-Sep-2023 13:30

ANALYTICAL REPORT
WorkOrder:HS23091909
Lab ID:HS23091909-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: KDN
Benzene	**1,500**		**500**	**ug/L**	500	04-Oct-2023 04:04
Ethylbenzene	ND		500	ug/L	500	04-Oct-2023 04:04
m,p-Xylene	ND		1000	ug/L	500	04-Oct-2023 04:04
o-Xylene	ND		500	ug/L	500	04-Oct-2023 04:04
Toluene	**3,200**		**500**	**ug/L**	500	04-Oct-2023 04:04
Xylenes, Total	ND		500	ug/L	500	04-Oct-2023 04:04
Surr: 1,2-Dichloroethane-d4	*111*		*70-126*	*%REC*	*500*	*04-Oct-2023 04:04*
Surr: 4-Bromofluorobenzene	*97.4*		*77-113*	*%REC*	*500*	*04-Oct-2023 04:04*
Surr: Dibromofluoromethane	*109*		*77-123*	*%REC*	*500*	*04-Oct-2023 04:04*
Surr: Toluene-d8	*96.4*		*82-127*	*%REC*	*500*	*04-Oct-2023 04:04*
GASOLINE RANGE ORGANICS BY SW8015C		**Method:SW8015**				Analyst: TS
Gasoline Range Organics	**12.9**		**0.0500**	**mg/L**	1	02-Oct-2023 19:04
Surr: 4-Bromofluorobenzene	*96.1*		*70-123*	*%REC*	*1*	*02-Oct-2023 19:04*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**				Analyst: SAM
Ethane	**2,600**		**200**	**ug/L**	200	06-Oct-2023 13:10
Methane	**5,190**		**100**	**ug/L**	200	06-Oct-2023 13:10
Propane	**1,850**		**200**	**ug/L**	200	06-Oct-2023 13:10
TPH DRO/ORO BY SW8015C		**Method:SW8015M**		Prep:SW3511 / 03-Oct-2023		Analyst: SAM
TPH (Diesel Range)	**7.7**		**0.50**	**mg/L**	10	03-Oct-2023 18:51
Surr: 2-Fluorobiphenyl	*213*	*S*	*60-135*	*%REC*	*10*	*03-Oct-2023 18:51*
TOTAL METALS BY E200.8, REV 5.4, 1994		**Method:E200.8**		Prep:E200.8 / 11-Oct-2023		Analyst: MSC
Calcium	**15.9**		**2.50**	**mg/L**	5	13-Oct-2023 14:42
Magnesium	ND		2.50	mg/L	5	13-Oct-2023 14:42
Potassium	**640**		**2.50**	**mg/L**	5	13-Oct-2023 14:42
Sodium	**2,870**		**100**	**mg/L**	500	13-Oct-2023 14:58
ANIONS BY E300.0, REV 2.1, 1993		**Method:E300**				Analyst: TH
Chloride	**2,240**		**50.0**	**mg/L**	100	13-Oct-2023 16:29
Sulfate	**1,280**		**50.0**	**mg/L**	100	13-Oct-2023 16:29
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**				Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**7,870**		**10.0**	**mg/L**	1	05-Oct-2023 11:30
ALKALINITY BY -2011		**Method:SM2320B**				Analyst: DW
Alkalinity, Bicarbonate (As CaCO3)	ND		5.00	mg/L	1	10-Oct-2023 20:18
Alkalinity, Carbonate (As CaCO3)	**822**		**5.00**	**mg/L**	1	10-Oct-2023 20:18
Alkalinity, Total (As CaCO3)	**2,390**		**5.00**	**mg/L**	1	10-Oct-2023 20:18

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

Weight / Prep Log

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

Batch ID: 201337 **Start Date:** 03 Oct 2023 08:00 **End Date:** 03 Oct 2023 08:00
Method: SW3511 **Prep Code:** 3511_DRO

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23091909-01		32.82 (mL)	2 (mL)	0.06094	40 mL Amber

Batch ID: 201737 **Start Date:** 11 Oct 2023 09:00 **End Date:** 11 Oct 2023 09:00
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	
HS23091909-01		10 (mL)	10 (mL)	1	250 mL plastic, HNO3 to pH <2

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 201337 (0)	**Test Name :** TPH DRO/ORO BY SW8015C				**Matrix:** Water	
HS23091909-01	Brown 23P-221	29 Sep 2023 13:30		03 Oct 2023 08:00	03 Oct 2023 18:51	10
Batch ID: 201737 (0)	**Test Name :** TOTAL METALS BY E200.8, REV 5.4, 1994				**Matrix:** Water	
HS23091909-01	Brown 23P-221	29 Sep 2023 13:30		11 Oct 2023 09:00	13 Oct 2023 14:58	500
HS23091909-01	Brown 23P-221	29 Sep 2023 13:30		11 Oct 2023 09:00	13 Oct 2023 14:42	5
Batch ID: R447956 (0)	**Test Name :** GASOLINE RANGE ORGANICS BY SW8015C				**Matrix:** Water	
HS23091909-01	Brown 23P-221	29 Sep 2023 13:30			02 Oct 2023 19:04	1
Batch ID: R448073 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23091909-01	Brown 23P-221	29 Sep 2023 13:30			04 Oct 2023 04:04	500
Batch ID: R448337 (0)	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C-2011				**Matrix:** Water	
HS23091909-01	Brown 23P-221	29 Sep 2023 13:30			05 Oct 2023 11:30	1
Batch ID: R448573 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Water	
HS23091909-01	Brown 23P-221	29 Sep 2023 13:30			06 Oct 2023 13:10	200
Batch ID: R448663 (0)	**Test Name :** ALKALINITY BY -2011				**Matrix:** Water	
HS23091909-01	Brown 23P-221	29 Sep 2023 13:30			10 Oct 2023 20:18	1
Batch ID: R449091 (0)	**Test Name :** ANIONS BY E300.0, REV 2.1, 1993				**Matrix:** Water	
HS23091909-01	Brown 23P-221	29 Sep 2023 13:30			13 Oct 2023 16:29	100

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

QC BATCH REPORT

Batch ID: 201337 (0) **Instrument: FID-16** **Method: TPH DRO/ORO BY SW8015C**

MBLK Sample ID: **MBLK-201337** Units: **mg/L** Analysis Date: **03-Oct-2023 14:26**
Client ID: Run ID: **FID-16_448159** SeqNo: **7584893** PrepDate: **03-Oct-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	*0.05638*	*0.0050*	*0.06*	*0*	*94.0*	*60 - 135*				

LCS Sample ID: **LCS-201337** Units: **mg/L** Analysis Date: **03-Oct-2023 14:55**
Client ID: Run ID: **FID-16_448159** SeqNo: **7584894** PrepDate: **03-Oct-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.4932	0.050	0.6	0	82.2	70 - 130				
Surr: 2-Fluorobiphenyl	*0.06192*	*0.0050*	*0.06*	*0*	*103*	*60 - 135*				

LCSD Sample ID: **LCSD-201337** Units: **mg/L** Analysis Date: **03-Oct-2023 15:25**
Client ID: Run ID: **FID-16_448159** SeqNo: **7584895** PrepDate: **03-Oct-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.5182	0.050	0.6	0	86.4	70 - 130	0.4932	4.93	20	
Surr: 2-Fluorobiphenyl	*0.0715*	*0.0050*	*0.06*	*0*	*119*	*60 - 135*	*0.06192*	*14.4*	*20*	

The following samples were analyzed in this batch: HS23091909-01

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

QC BATCH REPORT

Batch ID: R448573 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-231006** Units: **ug/L** Analysis Date: **06-Oct-2023 06:55**
Client ID: Run ID: **FID-4_448573** SeqNo: **7596235** 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-231006** Units: **ug/L** Analysis Date: **06-Oct-2023 07:18**
Client ID: Run ID: **FID-4_448573** SeqNo: **7596236** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	19.58	1.00	18.04	0	109	75 - 125				
Methane	8.198	0.500	9.647	0	85.0	75 - 125				
Propane	31.34	1.00	26.46	0	118	75 - 125				

LCSD Sample ID: **LCSD-231006** Units: **ug/L** Analysis Date: **06-Oct-2023 07:39**
Client ID: Run ID: **FID-4_448573** SeqNo: **7596237** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	18.77	1.00	18.04	0	104	75 - 125	19.58	4.2	30	
Methane	7.714	0.500	9.647	0	80.0	75 - 125	8.198	6.08	30	
Propane	30.85	1.00	26.46	0	117	75 - 125	31.34	1.58	30	

The following samples were analyzed in this batch: HS23091909-01

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

QC BATCH REPORT

Batch ID: R447956 (0) **Instrument:** FID-20 **Method:** GASOLINE RANGE ORGANICS BY SW8015C

MBLK Sample ID: **MBLK-231002** Units: **mg/L** Analysis Date: **02-Oct-2023 13:37**
Client ID: Run ID: **FID-20_447956** SeqNo: **7580497** 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	*0.08002*	*0.00500*	*0.1*	*0*	*80.0*	*70 - 121*				

LCS Sample ID: **LCS-231002** Units: **mg/L** Analysis Date: **02-Oct-2023 13:10**
Client ID: Run ID: **FID-20_447956** SeqNo: **7580495** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.8976	0.0500	1	0	89.8	76 - 124				
Surr: 4-Bromofluorobenzene	*0.0975*	*0.00500*	*0.1*	*0*	*97.5*	*52 - 138*				

LCSD Sample ID: **LCSD-231002** Units: **mg/L** Analysis Date: **02-Oct-2023 13:23**
Client ID: Run ID: **FID-20_447956** SeqNo: **7580496** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.7746	0.0500	1	0	77.5	76 - 124	0.8976	14.7	20	
Surr: 4-Bromofluorobenzene	*0.08582*	*0.00500*	*0.1*	*0*	*85.8*	*52 - 138*	*0.0975*	*12.7*	*20*	

The following samples were analyzed in this batch: HS23091909-01

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

QC BATCH REPORT

Batch ID: 201737 (0) **Instrument: ICPMS07** **Method: TOTAL METALS BY E200.8, REV 5.4, 1994**

MBLK Sample ID: **MBLK-201737** Units: **ug/L** Analysis Date: **13-Oct-2023 11:54**
Client ID: Run ID: **ICPMS07_449010** SeqNo: **7606805** PrepDate: **11-Oct-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-201737** Units: **ug/L** Analysis Date: **12-Oct-2023 17:45**
Client ID: Run ID: **ICPMS07_448848** SeqNo: **7604860** PrepDate: **11-Oct-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	5005	500	5000	0	100	85 - 115				
Magnesium	5261	500	5000	0	105	85 - 115				
Potassium	5273	500	5000	0	105	85 - 115				
Sodium	5152	200	5000	0	103	85 - 115				

MS Sample ID: **HS23100428-01MS** Units: **ug/L** Analysis Date: **13-Oct-2023 15:21**
Client ID: Run ID: **ICPMS07_449010** SeqNo: **7608107** PrepDate: **11-Oct-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	42630	500	5000	35090	151	70 - 130				SO
Magnesium	9671	500	5000	4317	107	70 - 130				
Potassium	38040	500	5000	31020	140	70 - 130				SO
Sodium	429900	200	5000	396100	675	70 - 130				SEO

MS Sample ID: **HS23100052-02MS** Units: **ug/L** Analysis Date: **13-Oct-2023 15:14**
Client ID: Run ID: **ICPMS07_449010** SeqNo: **7608104** PrepDate: **11-Oct-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	99840	500	5000	88640	224	70 - 130				SO
Magnesium	12360	500	5000	7222	103	70 - 130				
Potassium	7946	500	5000	2965	99.6	70 - 130				
Sodium	55750	200	5000	47710	161	70 - 130				SO

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

QC BATCH REPORT

Batch ID: 201737 (0) **Instrument: ICPMS07** **Method: TOTAL METALS BY E200.8, REV 5.4, 1994**

MSD Sample ID: **HS23100428-01MSD** Units: **ug/L** Analysis Date: **13-Oct-2023 15:23**
Client ID: Run ID: **ICPMS07_449010** SeqNo: **7608108** PrepDate: **11-Oct-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	40640	500	5000	35090	111	70 - 130	42630	4.8	20	O
Magnesium	9455	500	5000	4317	103	70 - 130	9671	2.26	20	
Potassium	36580	500	5000	31020	111	70 - 130	38040	3.92	20	O
Sodium	413300	200	5000	396100	343	70 - 130	429900	3.94	20	SEO

MSD Sample ID: **HS23100052-02MSD** Units: **ug/L** Analysis Date: **13-Oct-2023 15:16**
Client ID: Run ID: **ICPMS07_449010** SeqNo: **7608105** PrepDate: **11-Oct-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	103500	500	5000	88640	298	70 - 130	99840	3.64	20	SO
Magnesium	12170	500	5000	7222	98.9	70 - 130	12360	1.59	20	
Potassium	7531	500	5000	2965	91.3	70 - 130	7946	5.35	20	
Sodium	57470	200	5000	47710	195	70 - 130	55750	3.03	20	SO

The following samples were analyzed in this batch: HS23091909-01

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

QC BATCH REPORT

Batch ID: R448073 (0) **Instrument: VOA10** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-231003** Units: **ug/L** Analysis Date: **03-Oct-2023 22:49**
Client ID: Run ID: **VOA10_448073** SeqNo: **7583470** 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	3.0								
Surr: 1,2-Dichloroethane-d4	*53.74*	*1.0*	*50*	*0*	*107*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.81*	*1.0*	*50*	*0*	*97.6*	*77 - 113*				
Surr: Dibromofluoromethane	*52.76*	*1.0*	*50*	*0*	*106*	*73 - 126*				
Surr: Toluene-d8	*47.19*	*1.0*	*50*	*0*	*94.4*	*81 - 120*				

LCS Sample ID: **VLCSW-231003** Units: **ug/L** Analysis Date: **03-Oct-2023 22:07**
Client ID: Run ID: **VOA10_448073** SeqNo: **7583469** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.13	1.0	20	0	106	74 - 120				
Ethylbenzene	20.77	1.0	20	0	104	77 - 117				
m,p-Xylene	44.67	2.0	40	0	112	77 - 122				
o-Xylene	21.49	1.0	20	0	107	75 - 119				
Toluene	19.08	1.0	20	0	95.4	77 - 118				
Xylenes, Total	66.16	3.0	60	0	110	75 - 122				
Surr: 1,2-Dichloroethane-d4	*54.28*	*1.0*	*50*	*0*	*109*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*51.14*	*1.0*	*50*	*0*	*102*	*77 - 113*				
Surr: Dibromofluoromethane	*52.94*	*1.0*	*50*	*0*	*106*	*73 - 126*				
Surr: Toluene-d8	*47.72*	*1.0*	*50*	*0*	*95.4*	*81 - 120*				

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

QC BATCH REPORT

Batch ID: R448073 (0) **Instrument: VOA10** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS23091679-01MS** Units: **ug/L** Analysis Date: **04-Oct-2023 00:34**
Client ID: Run ID: **VOA10_448073** SeqNo: **7583475** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	170.5	10	200	0	85.3	70 - 127				
Ethylbenzene	157.5	10	200	0	78.8	70 - 124				
m,p-Xylene	342	20	400	0	85.5	70 - 130				
o-Xylene	171.5	10	200	0	85.7	70 - 124				
Toluene	161	10	200	0	80.5	70 - 123				
Xylenes, Total	513.4	30	600	0	85.6	70 - 130				
Surr: 1,2-Dichloroethane-d4	*539*	*10*	*500*	*0*	*108*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*529*	*10*	*500*	*0*	*106*	*77 - 113*				
Surr: Dibromofluoromethane	*515.9*	*10*	*500*	*0*	*103*	*77 - 123*				
Surr: Toluene-d8	*476.5*	*10*	*500*	*0*	*95.3*	*82 - 127*				

MSD Sample ID: **HS23091679-01MSD** Units: **ug/L** Analysis Date: **04-Oct-2023 00:55**
Client ID: Run ID: **VOA10_448073** SeqNo: **7583476** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	167.6	10	200	0	83.8	70 - 127	170.5	1.71	20	
Ethylbenzene	168.4	10	200	0	84.2	70 - 124	157.5	6.66	20	
m,p-Xylene	344.7	20	400	0	86.2	70 - 130	342	0.803	20	
o-Xylene	168.3	10	200	0	84.2	70 - 124	171.5	1.86	20	
Toluene	160.8	10	200	0	80.4	70 - 123	161	0.114	20	
Xylenes, Total	513	30	600	0	85.5	70 - 130	513.4	0.0788	20	
Surr: 1,2-Dichloroethane-d4	*531.4*	*10*	*500*	*0*	*106*	*70 - 126*	*539*	*1.41*	*20*	
Surr: 4-Bromofluorobenzene	*540.2*	*10*	*500*	*0*	*108*	*77 - 113*	*529*	*2.09*	*20*	
Surr: Dibromofluoromethane	*522.5*	*10*	*500*	*0*	*104*	*77 - 123*	*515.9*	*1.26*	*20*	
Surr: Toluene-d8	*485.6*	*10*	*500*	*0*	*97.1*	*82 - 127*	*476.5*	*1.89*	*20*	

The following samples were analyzed in this batch: HS23091909-01

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

QC BATCH REPORT

Batch ID: R448337 (0) **Instrument:** Balance1 **Method:** TOTAL DISSOLVED SOLIDS BY SM2540C-2011

MBLK Sample ID: **WMBLK-10052023** Units: **mg/L** Analysis Date: **05-Oct-2023 11:30**
Client ID: Run ID: **Balance1_448337** SeqNo: **7590008** 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-10052023** Units: **mg/L** Analysis Date: **05-Oct-2023 11:30**
Client ID: Run ID: **Balance1_448337** SeqNo: **7590007** 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)	1054	10.0	1000	0	105	85 - 115				

DUP Sample ID: **HS23091910-01DUP** Units: **mg/L** Analysis Date: **05-Oct-2023 11:30**
Client ID: Run ID: **Balance1_448337** SeqNo: **7590001** 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)	608	10.0					608	0	20	

DUP Sample ID: **HS23091898-07DUP** Units: **mg/L** Analysis Date: **05-Oct-2023 11:30**
Client ID: Run ID: **Balance1_448337** SeqNo: **7589991** 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)	2400	10.0					2404	0.167	20	

The following samples were analyzed in this batch: HS23091909-01

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

QC BATCH REPORT

Batch ID: R448663 (0) **Instrument: Skalar 03** **Method: ALKALINITY BY -2011**

MBLK Sample ID: **MBLK-10102023** Units: **mg/L** Analysis Date: **10-Oct-2023 18:58**
Client ID: Run ID: **Skalar 03_448663** SeqNo: **7598696** 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-10102023** Units: **mg/L** Analysis Date: **10-Oct-2023 19:04**
Client ID: Run ID: **Skalar 03_448663** SeqNo: **7598697** 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)	906.4	5.00	1000	0	90.6	85 - 115				
Alkalinity, Total (As CaCO3)	942.7	5.00	1000	0	94.3	85 - 115				

LCSD Sample ID: **LCSD-10102023** Units: **mg/L** Analysis Date: **10-Oct-2023 19:10**
Client ID: Run ID: **Skalar 03_448663** SeqNo: **7598698** 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)	896.8	5.00	1000	0	89.7	85 - 115	906.4	1.06	20	
Alkalinity, Total (As CaCO3)	936.3	5.00	1000	0	93.6	85 - 115	942.7	0.681	20	

DUP Sample ID: **HS23100120-01DUP** Units: **mg/L** Analysis Date: **10-Oct-2023 19:35**
Client ID: Run ID: **Skalar 03_448663** SeqNo: **7598702** 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)	188.7	5.00					187	0.905	20	
Alkalinity, Carbonate (As CaCO3)	117.2	5.00					115.2	1.72	20	
Alkalinity, Total (As CaCO3)	305.9	5.00					302.2	1.22	20	

The following samples were analyzed in this batch: HS23091909-01

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

QC BATCH REPORT

Batch ID: R449091 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY E300.0, REV 2.1, 1993**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **13-Oct-2023 13:30**
Client ID: Run ID: **ICS-Integrion_449091** SeqNo: **7608353** 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: **13-Oct-2023 13:36**
Client ID: Run ID: **ICS-Integrion_449091** SeqNo: **7608354** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.63	0.500	20	0	103	90 - 110				
Sulfate	18.72	0.500	20	0	93.6	90 - 110				

MS Sample ID: **HS23100851-02MS** Units: **mg/L** Analysis Date: **13-Oct-2023 15:55**
Client ID: Run ID: **ICS-Integrion_449091** SeqNo: **7608373** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	43.33	0.500	10	34.05	92.8	80 - 120				
Sulfate	131.5	0.500	10	121.5	99.7	80 - 120				EO

MS Sample ID: **HS23100849-04MS** Units: **mg/L** Analysis Date: **13-Oct-2023 14:57**
Client ID: Run ID: **ICS-Integrion_449091** SeqNo: **7608366** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	42.7	0.500	10	33.97	87.3	80 - 120				
Sulfate	126.6	0.500	10	116.8	97.3	80 - 120				EO

MS Sample ID: **HS23100570-02MS** Units: **mg/L** Analysis Date: **13-Oct-2023 17:15**
Client ID: Run ID: **ICS-Integrion_449091** SeqNo: **7608385** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	2200	25.0	500	1677	105	80 - 120				
Sulfate	2981	25.0	500	2370	122	80 - 120				SO

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: HS23091909

QC BATCH REPORT

Batch ID: R449091 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY E300.0, REV 2.1, 1993**

MS Sample ID: **HS23100055-14MS** Units: **mg/L** Analysis Date: **13-Oct-2023 13:47**
Client ID: Run ID: **ICS-Integrion_449091** SeqNo: **7608356** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	458.5	5.00	100	394.1	64.4	80 - 120				S
Sulfate	398.2	5.00	100	298.4	99.8	80 - 120				

MSD Sample ID: **HS23100851-02MSD** Units: **mg/L** Analysis Date: **13-Oct-2023 16:00**
Client ID: Run ID: **ICS-Integrion_449091** SeqNo: **7608374** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	42.5	0.500	10	34.05	84.5	80 - 120	43.33	1.94	20	
Sulfate	128	0.500	10	121.5	64.3	80 - 120	131.5	2.73	20	SEO

MSD Sample ID: **HS23100849-04MSD** Units: **mg/L** Analysis Date: **13-Oct-2023 15:02**
Client ID: Run ID: **ICS-Integrion_449091** SeqNo: **7608367** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	42.56	0.500	10	33.97	86.0	80 - 120	42.7	0.31	20	
Sulfate	126.3	0.500	10	116.8	94.7	80 - 120	126.6	0.2	20	EO

MSD Sample ID: **HS23100570-02MSD** Units: **mg/L** Analysis Date: **13-Oct-2023 17:21**
Client ID: Run ID: **ICS-Integrion_449091** SeqNo: **7608386** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	2191	25.0	500	1677	103	80 - 120	2200	0.408	20	
Sulfate	2914	25.0	500	2370	109	80 - 120	2981	2.29	20	O

MSD Sample ID: **HS23100055-14MSD** Units: **mg/L** Analysis Date: **13-Oct-2023 13:53**
Client ID: Run ID: **ICS-Integrion_449091** SeqNo: **7608357** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	457.9	5.00	100	394.1	63.8	80 - 120	458.5	0.135	20	S
Sulfate	395.4	5.00	100	298.4	97.0	80 - 120	398.2	0.71	20	

The following samples were analyzed in this batch: HS23091909-01

Client: PDC Energy
Project: Brown 23P-221
WorkOrder: **HS23091909**

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	88-00356	27-Mar-2024
California	2919; 2024	30-Apr-2024
Dept of Defense	L23-358	31-May-2025
Florida	E87611-38	30-Jun-2024
Illinois	2000322023-11	30-Jun-2024
Kansas	E-10352 2023-2024	31-Jul-2024
Louisiana	03087 2023-2024	30-Jun-2024
Maryland	343; 2023-2024	30-Jun-2024
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2023-2024	30-Apr-2024
Oklahoma	2023-140	31-Aug-2024
Texas	T104704231-23-31	30-Apr-2024
Utah	TX026932023-14	31-Jul-2024

Sample Receipt Checklist

Work Order ID: HS23091909 **Date/Time Received:** **30-Sep-2023 08:45**

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

Completed By:	/S/ Paresh M. Giga	30-Sep-2023 14:13	**Reviewed by:**	/S/ Tyler Monroe	03-Oct-2023 12:51
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **Water** Carrier name: **FedEx Priority Overnight**

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:none
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):	2.1C/2.0C U/C	IR31
Cooler(s)/Kit(s):	Blue	
Date/Time sample(s) sent to storage:	9/30/23 14:30	

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: Metals pH >2 (14).
Preserved with 1ml HNO3 (Lot 322143103).
9/30/23 @ 14:05. Fianl pH (1)

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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

Chain-of-Custody

WORKORDER #

PAGE 1 of 1

DISPOSAL By Lab or Return to Client

SAMPLER	Jeff Braden	DATE	
PROJECT NAME	Brown 23P-221	FACILITY ID	123-42657
PROJECT No.	09C2073502	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

TURNAROUND: Standard

HS2309190 9

PDC Energy
Brown 23P-221

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	RSK 175 (Dissolved Methane, Ethane, Propane)	SW8260_25 (BTEX & TPH GRO)	SW8015M (TPH DRO)	SM2320B (Alkalinity, Carbonate, Bicarbonate, Total)	EPA200.7/208 (Total Cations - see comments)	EPA 300.0 (Total Anions - see comments)	SM2540C (Total Dissolved Solids)
	Brown 23P-221	W	9/29/23	1330	11	1,2	II	X	X	X	X	X	X	X

*Time Zone: MST

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:

Calcium, Chloride, Magnesium, Potassium, Sodium, Sulfate
Samples analyzed per
COGCC Bradenhead Sampling Program

Blue 2.10 #31 Clr - 0.10.

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

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

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY		Jeff Braden	9/29/23	1535
RECEIVED BY	Karen Craven	Karen Craven	9-29-23	1535
RELINQUISHED BY	Karen Craven	Karen Craven	9-29-23	1600
RECEIVED BY		P. Craven	9/30/23	08:45
RELINQUISHED BY				
RECEIVED BY