10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

September 15, 2022

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

Work Order: **HS22081729**

Laboratory Results for: **Werning 1-2B**

Dear Jenifer Hakkarinen,

ALS Environmental received 1 sample(s) on Aug 31, 2022 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL
Bernadette A. Fini
Project Manager

Client: PDC Energy
Project: Werning 1-2B
Work Order: HS22081729

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22081729-01	Werning 1-2B	Water		29-Aug-2022 12:50	31-Aug-2022 09:15	☐

Client: PDC Energy **CASE NARRATIVE**
Project: Werning 1-2B
Work Order: HS22081729

GC Semivolatiles by Method RSK-175

Batch ID: R416366

Sample ID: HS22081267-02MS

- MS and MSD are for an unrelated sample

GC Semivolatiles by Method SW8015M

Batch ID: 183075

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

GC Volatiles by Method SW8015

Batch ID: R416438

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

GCMS Volatiles by Method SW8260

Batch ID: R416697,R416740

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

Metals by Method E200.8

Batch ID: 183476

Sample ID: HS22081666-02MSD

- MSD is for an unrelated sample (Calcium)

WetChemistry by Method SM2320B

Batch ID: R416816

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

WetChemistry by Method E300

Batch ID: R416696

Sample ID: HS22090185-01MS

- MS and MSD are for an unrelated sample

Sample ID: HS22090249-01MS

- MS and MSD are for an unrelated sample

WetChemistry by Method M2540C

Batch ID: R416543

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

Client: PDC Energy
Project: Werning 1-2B
Sample ID: Werning 1-2B
Collection Date: 29-Aug-2022 12:50

ANALYTICAL REPORT
WorkOrder:HS22081729
Lab ID:HS22081729-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**				Analyst: AKP
Benzene	**270**		**10**	**ug/L**	10	08-Sep-2022 12:29
Ethylbenzene	**10**		**1.0**	**ug/L**	1	08-Sep-2022 06:41
m,p-Xylene	**130**		**2.0**	**ug/L**	1	08-Sep-2022 06:41
o-Xylene	**25**		**1.0**	**ug/L**	1	08-Sep-2022 06:41
Toluene	**440**		**10**	**ug/L**	10	08-Sep-2022 12:29
Xylenes, Total	**160**		**1.0**	**ug/L**	1	08-Sep-2022 06:41
Surr: 1,2-Dichloroethane-d4	*121*		*70-126*	*%REC*	*1*	*08-Sep-2022 06:41*
Surr: 1,2-Dichloroethane-d4	*103*		*70-126*	*%REC*	*10*	*08-Sep-2022 12:29*
Surr: 4-Bromofluorobenzene	*102*		*77-113*	*%REC*	*1*	*08-Sep-2022 06:41*
Surr: 4-Bromofluorobenzene	*100*		*77-113*	*%REC*	*10*	*08-Sep-2022 12:29*
Surr: Dibromofluoromethane	*107*		*77-123*	*%REC*	*1*	*08-Sep-2022 06:41*
Surr: Dibromofluoromethane	*102*		*77-123*	*%REC*	*10*	*08-Sep-2022 12:29*
Surr: Toluene-d8	*100*		*82-127*	*%REC*	*1*	*08-Sep-2022 06:41*
Surr: Toluene-d8	*103*		*82-127*	*%REC*	*10*	*08-Sep-2022 12:29*
GASOLINE RANGE ORGANICS BY SW8015C		**Method:SW8015**				Analyst: FT
Gasoline Range Organics	**3.30**		**0.0500**	**mg/L**	1	02-Sep-2022 12:43
Surr: 4-Bromofluorobenzene	*110*		*70-123*	*%REC*	*1*	*02-Sep-2022 12:43*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**				Analyst: PPM
Ethane	**5,180**		**500**	**ug/L**	500	01-Sep-2022 14:23
Methane	**10,600**		**250**	**ug/L**	500	01-Sep-2022 14:23
Propane	**3,690**		**500**	**ug/L**	500	01-Sep-2022 14:23
TPH DRO/ORO BY SW8015C		**Method:SW8015M**		Prep:SW3511 / 31-Aug-2022		Analyst: PPM
DRO (>C10 - C28)	**0.055**		**0.051**	**mg/L**	1	07-Sep-2022 16:44
Surr: 2-Fluorobiphenyl	*94.6*		*60-135*	*%REC*	*1*	*07-Sep-2022 16:44*
TOTAL METALS BY E200.8, REV 5.4, 1994		**Method:E200.8**		Prep:E200.8 / 13-Sep-2022		Analyst: YP
Calcium	**6.37**		**2.50**	**mg/L**	5	15-Sep-2022 01:30
Magnesium	**1.37**		**0.500**	**mg/L**	1	15-Sep-2022 15:01
Potassium	**2.53**		**0.500**	**mg/L**	1	15-Sep-2022 15:01
Sodium	**596**		**1.00**	**mg/L**	5	15-Sep-2022 01:30
ANIONS BY E300.0, REV 2.1, 1993		**Method:E300**				Analyst: TH
Chloride	**695**		**10.0**	**mg/L**	20	07-Sep-2022 17:51
Sulfate	**1.12**		**0.500**	**mg/L**	1	07-Sep-2022 17:46
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**				Analyst: CWG
Total Dissolved Solids (Residue, Filterable)	**1,640**		**10.0**	**mg/L**	1	02-Sep-2022 12:24

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

Client: PDC Energy
Project: Werning 1-2B
Sample ID: Werning 1-2B
Collection Date: 29-Aug-2022 12:50

ANALYTICAL REPORT
WorkOrder:HS22081729
Lab ID:HS22081729-01
Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**				Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**462**		**5.00**	**mg/L**	1	09-Sep-2022 11:42
Alkalinity, Carbonate (As CaCO3)	**49.5**		**5.00**	**mg/L**	1	09-Sep-2022 11:42
Alkalinity, Total (As CaCO3)	**511**		**5.00**	**mg/L**	1	09-Sep-2022 11:42

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

Weight / Prep Log

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

Batch ID: 183075 **Start Date:** 31 Aug 2022 09:13 **End Date:** 01 Sep 2022 16:00
Method: SW3511 **Prep Code:** 3511_DRO

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS22081729-01		32.32 (mL)	2 (mL)	0.06188	40 mL Amber

Batch ID: 183476 **Start Date:** 13 Sep 2022 09:30 **End Date:** 13 Sep 2022 13:30
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	
HS22081729-01		10 (mL)	10 (mL)	1	250 mL plastic, HNO3 to pH <2

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 183075 (0)	**Test Name :** TPH DRO/ORO BY SW8015C				**Matrix:** Water	
HS22081729-01	Werning 1-2B	29 Aug 2022 12:50		31 Aug 2022 09:13	07 Sep 2022 16:44	1
Batch ID: 183476 (0)	**Test Name :** TOTAL METALS BY E200.8, REV 5.4, 1994				**Matrix:** Water	
HS22081729-01	Werning 1-2B	29 Aug 2022 12:50		13 Sep 2022 09:30	15 Sep 2022 15:01	1
HS22081729-01	Werning 1-2B	29 Aug 2022 12:50		13 Sep 2022 09:30	15 Sep 2022 01:30	5
Batch ID: R416366 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Water	
HS22081729-01	Werning 1-2B	29 Aug 2022 12:50			01 Sep 2022 14:23	500
Batch ID: R416438 (0)	**Test Name :** GASOLINE RANGE ORGANICS BY SW8015C				**Matrix:** Water	
HS22081729-01	Werning 1-2B	29 Aug 2022 12:50			02 Sep 2022 12:43	1
Batch ID: R416543 (0)	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C-2011				**Matrix:** Water	
HS22081729-01	Werning 1-2B	29 Aug 2022 12:50			02 Sep 2022 12:24	1
Batch ID: R416696 (0)	**Test Name :** ANIONS BY E300.0, REV 2.1, 1993				**Matrix:** Water	
HS22081729-01	Werning 1-2B	29 Aug 2022 12:50			07 Sep 2022 17:51	20
HS22081729-01	Werning 1-2B	29 Aug 2022 12:50			07 Sep 2022 17:46	1
Batch ID: R416697 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS22081729-01	Werning 1-2B	29 Aug 2022 12:50			08 Sep 2022 06:41	1
Batch ID: R416740 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS22081729-01	Werning 1-2B	29 Aug 2022 12:50			08 Sep 2022 12:29	10
Batch ID: R416816 (0)	**Test Name :** ALKALINITY BY SM 2320B-2011				**Matrix:** Water	
HS22081729-01	Werning 1-2B	29 Aug 2022 12:50			09 Sep 2022 11:42	1

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: 183075 (0) **Instrument: FID-16** **Method: TPH DRO/ORO BY SW8015C**

MBLK Sample ID: **MBLK-183075** Units: **mg/L** Analysis Date: **01-Sep-2022 19:30**
Client ID: Run ID: **FID-16_416524** SeqNo: **6834866** PrepDate: **31-Aug-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (>C10 - C28)	ND	0.050								
Surr: 2-Fluorobiphenyl	*0.03792*	*0.0050*	*0.06*	*0*	*63.2*	*60 - 135*				

LCS Sample ID: **LCS-183075** Units: **mg/L** Analysis Date: **01-Sep-2022 19:59**
Client ID: Run ID: **FID-16_416524** SeqNo: **6834867** PrepDate: **31-Aug-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (>C10 - C28)	0.5229	0.050	0.6	0	87.1	70 - 130				
Surr: 2-Fluorobiphenyl	*0.03699*	*0.0050*	*0.06*	*0*	*61.6*	*60 - 135*				

LCSD Sample ID: **LCSD-183075** Units: **mg/L** Analysis Date: **01-Sep-2022 20:29**
Client ID: Run ID: **FID-16_416524** SeqNo: **6834868** PrepDate: **31-Aug-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (>C10 - C28)	0.4602	0.050	0.6	0	76.7	70 - 130	0.5229	12.7	20	
Surr: 2-Fluorobiphenyl	*0.03652*	*0.0050*	*0.06*	*0*	*60.9*	*60 - 135*	*0.03699*	*1.27*	*20*	

The following samples were analyzed in this batch: HS22081729-01

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: R416366 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-220901** Units: **ug/L** Analysis Date: **01-Sep-2022 09:00**
Client ID: Run ID: **FID-4_416366** SeqNo: **6830915** 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-220901** Units: **ug/L** Analysis Date: **01-Sep-2022 09:24**
Client ID: Run ID: **FID-4_416366** SeqNo: **6830916** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	18.83	1.00	18.04	0	104	75 - 125				
Methane	8.649	0.500	9.647	0	89.7	75 - 125				
Propane	30.78	1.00	26.46	0	116	75 - 125				

MS Sample ID: **HS22081267-02MS** Units: **ug/L** Analysis Date: **01-Sep-2022 10:43**
Client ID: Run ID: **FID-4_416366** SeqNo: **6830920** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	22.76	1.00	18.04	0	126	75 - 125				S
Methane	1869	0.500	9.647	1838	320	75 - 125				SEO
Propane	28.16	1.00	26.46	0	106	75 - 125				

MSD Sample ID: **HS22081267-02MSD** Units: **ug/L** Analysis Date: **01-Sep-2022 10:57**
Client ID: Run ID: **FID-4_416366** SeqNo: **6830921** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	22.41	1.00	18.04	0	124	75 - 125	22.76	1.54	30	
Methane	1863	0.500	9.647	1838	258	75 - 125	1869	0.318	30	SEO
Propane	28.22	1.00	26.46	0	107	75 - 125	28.16	0.211	30	

The following samples were analyzed in this batch: HS22081729-01

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: R416438 (0) **Instrument:** FID-20 **Method:** GASOLINE RANGE ORGANICS BY SW8015C

MBLK Sample ID: **MBLK-2200902** Units: **mg/L** Analysis Date: **02-Sep-2022 09:48**
Client ID: Run ID: **FID-20_416438** SeqNo: **6832490** 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	*0.1074*	*0.00500*	*0.1*	*0*	*107*	*70 - 121*				

LCS Sample ID: **LCS-220902** Units: **mg/L** Analysis Date: **02-Sep-2022 09:16**
Client ID: Run ID: **FID-20_416438** SeqNo: **6832488** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.8371	0.0500	1	0	83.7	76 - 124				
Surr: 4-Bromofluorobenzene	*0.09048*	*0.00500*	*0.1*	*0*	*90.5*	*52 - 138*				

LCSD Sample ID: **LCSD-220902** Units: **mg/L** Analysis Date: **02-Sep-2022 09:32**
Client ID: Run ID: **FID-20_416438** SeqNo: **6832489** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.7874	0.0500	1	0	78.7	76 - 124	0.8371	6.12	20	
Surr: 4-Bromofluorobenzene	*0.0808*	*0.00500*	*0.1*	*0*	*80.8*	*52 - 138*	*0.09048*	*11.3*	*20*	

The following samples were analyzed in this batch: HS22081729-01

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: 183476 (0) **Instrument: ICPMS07** **Method: TOTAL METALS BY E200.8, REV 5.4, 1994**

MBLK Sample ID: **MBLK-183476** Units: **ug/L** Analysis Date: **15-Sep-2022 14:57**
Client ID: Run ID: **ICPMS07_417250** SeqNo: **6851806** PrepDate: **13-Sep-2022** DF: **1**

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

LCS Sample ID: **LCS-183476** Units: **ug/L** Analysis Date: **15-Sep-2022 00:40**
Client ID: Run ID: **ICPMS07_417112** SeqNo: **6850484** PrepDate: **13-Sep-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	4881	500	5000	0	97.6	85 - 115				
Magnesium	5153	500	5000	0	103	85 - 115				
Potassium	5085	500	5000	0	102	85 - 115				
Sodium	4976	200	5000	0	99.5	85 - 115				

MS Sample ID: **HS22081666-02MS** Units: **ug/L** Analysis Date: **15-Sep-2022 00:49**
Client ID: Run ID: **ICPMS07_417112** SeqNo: **6850489** PrepDate: **13-Sep-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	92550	500	5000	86680	117	70 - 130				O
Magnesium	42600	500	5000	36720	118	70 - 130				O
Potassium	9135	500	5000	4022	102	70 - 130				
Sodium	60610	200	5000	54350	125	70 - 130				O

MS Sample ID: **HS22081666-01MS** Units: **ug/L** Analysis Date: **15-Sep-2022 00:44**
Client ID: Run ID: **ICPMS07_417112** SeqNo: **6850486** PrepDate: **13-Sep-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	89920	500	5000	85690	84.6	70 - 130				O
Magnesium	40810	500	5000	36460	87.0	70 - 130				O
Potassium	8791	500	5000	4001	95.8	70 - 130				
Sodium	58410	200	5000	53980	88.6	70 - 130				O

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: 183476 (0) **Instrument: ICPMS07** **Method: TOTAL METALS BY E200.8, REV 5.4, 1994**

MSD Sample ID: **HS22081666-02MSD** Units: **ug/L** Analysis Date: **15-Sep-2022 00:51**
Client ID: Run ID: **ICPMS07_417112** SeqNo: **6850490** PrepDate: **13-Sep-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	89840	500	5000	86680	63.3	70 - 130	92550	2.96	20	SO
Magnesium	41080	500	5000	36720	87.3	70 - 130	42600	3.62	20	O
Potassium	8852	500	5000	4022	96.6	70 - 130	9135	3.15	20	
Sodium	58440	200	5000	54350	81.8	70 - 130	60610	3.65	20	O

MSD Sample ID: **HS22081666-01MSD** Units: **ug/L** Analysis Date: **15-Sep-2022 00:45**
Client ID: Run ID: **ICPMS07_417112** SeqNo: **6850487** PrepDate: **13-Sep-2022** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	90090	500	5000	85690	87.9	70 - 130	89920	0.187	20	O
Magnesium	41510	500	5000	36460	101	70 - 130	40810	1.7	20	O
Potassium	9001	500	5000	4001	100	70 - 130	8791	2.36	20	
Sodium	59190	200	5000	53980	104	70 - 130	58410	1.33	20	O

The following samples were analyzed in this batch: HS22081729-01

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: R416697 (0) **Instrument: VOA4** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-220907** Units: **ug/L** Analysis Date: **07-Sep-2022 23:28**
Client ID: Run ID: **VOA4_416697** SeqNo: **6838679** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylbenzene	ND	1.0								
m,p-Xylene	ND	2.0								
o-Xylene	ND	1.0								
Xylenes, Total	ND	1.0								
Surr: 1,2-Dichloroethane-d4	*54.63*	*1.0*	*50*	*0*	*109*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.29*	*1.0*	*50*	*0*	*96.6*	*77 - 113*				
Surr: Dibromofluoromethane	*49.29*	*1.0*	*50*	*0*	*98.6*	*73 - 126*				
Surr: Toluene-d8	*50.78*	*1.0*	*50*	*0*	*102*	*81 - 120*				

LCS Sample ID: **VLCSW-220907** Units: **ug/L** Analysis Date: **07-Sep-2022 22:45**
Client ID: Run ID: **VOA4_416697** SeqNo: **6838678** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylbenzene	19.41	1.0	20	0	97.0	77 - 117				
m,p-Xylene	40.91	2.0	40	0	102	77 - 122				
o-Xylene	20.05	1.0	20	0	100	75 - 119				
Xylenes, Total	60.96	1.0	60	0	102	75 - 122				
Surr: 1,2-Dichloroethane-d4	*54.76*	*1.0*	*50*	*0*	*110*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*49.48*	*1.0*	*50*	*0*	*99.0*	*77 - 113*				
Surr: Dibromofluoromethane	*53.04*	*1.0*	*50*	*0*	*106*	*73 - 126*				
Surr: Toluene-d8	*49.27*	*1.0*	*50*	*0*	*98.5*	*81 - 120*				

MS Sample ID: **HS22090107-05MS** Units: **ug/L** Analysis Date: **08-Sep-2022 07:03**
Client ID: Run ID: **VOA4_416697** SeqNo: **6838700** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylbenzene	18.31	1.0	20	0	91.6	70 - 124				
m,p-Xylene	36.49	2.0	40	0	91.2	70 - 130				
o-Xylene	17.77	1.0	20	0	88.8	70 - 124				
Xylenes, Total	54.26	1.0	60	0	90.4	70 - 130				
Surr: 1,2-Dichloroethane-d4	*56.98*	*1.0*	*50*	*0*	*114*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*51.89*	*1.0*	*50*	*0*	*104*	*77 - 113*				
Surr: Dibromofluoromethane	*54.74*	*1.0*	*50*	*0*	*109*	*77 - 123*				
Surr: Toluene-d8	*51.21*	*1.0*	*50*	*0*	*102*	*82 - 127*				

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: R416697 (0) **Instrument: VOA4** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS22090107-05MSD** Units: **ug/L** Analysis Date: **08-Sep-2022 07:25**
Client ID: Run ID: **VOA4_416697** SeqNo: **6838701** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethylbenzene	19.57	1.0	20	0	97.8	70 - 124	18.31	6.62	20	
m,p-Xylene	39.97	2.0	40	0	99.9	70 - 130	36.49	9.1	20	
o-Xylene	19.28	1.0	20	0	96.4	70 - 124	17.77	8.15	20	
Xylenes, Total	59.24	1.0	60	0	98.7	70 - 130	54.26	8.79	20	
Surr: 1,2-Dichloroethane-d4	*61.53*	*1.0*	*50*	*0*	*123*	*70 - 126*	*56.98*	*7.67*	*20*	
Surr: 4-Bromofluorobenzene	*53.06*	*1.0*	*50*	*0*	*106*	*77 - 113*	*51.89*	*2.22*	*20*	
Surr: Dibromofluoromethane	*59.69*	*1.0*	*50*	*0*	*119*	*77 - 123*	*54.74*	*8.65*	*20*	
Surr: Toluene-d8	*50.65*	*1.0*	*50*	*0*	*101*	*82 - 127*	*51.21*	*1.12*	*20*	

The following samples were analyzed in this batch: HS22081729-01

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: R416740 (0) **Instrument: VOA7** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-220908** Units: **ug/L** Analysis Date: **08-Sep-2022 09:50**
Client ID: Run ID: **VOA7_416740** SeqNo: **6839561** 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								
Toluene	ND	1.0								
Surr: 1,2-Dichloroethane-d4	*51.79*	*1.0*	*50*	*0*	*104*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*49.82*	*1.0*	*50*	*0*	*99.6*	*77 - 113*				
Surr: Dibromofluoromethane	*51.21*	*1.0*	*50*	*0*	*102*	*73 - 126*				
Surr: Toluene-d8	*51.68*	*1.0*	*50*	*0*	*103*	*81 - 120*				

LCS Sample ID: **VLCSW-220908** Units: **ug/L** Analysis Date: **08-Sep-2022 09:11**
Client ID: Run ID: **VOA7_416740** SeqNo: **6839559** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.24	1.0	20	0	96.2	74 - 120				
Toluene	19.68	1.0	20	0	98.4	77 - 118				
Surr: 1,2-Dichloroethane-d4	*52.61*	*1.0*	*50*	*0*	*105*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*50.7*	*1.0*	*50*	*0*	*101*	*77 - 113*				
Surr: Dibromofluoromethane	*50.61*	*1.0*	*50*	*0*	*101*	*73 - 126*				
Surr: Toluene-d8	*51.79*	*1.0*	*50*	*0*	*104*	*81 - 120*				

MS Sample ID: **HS22090277-01MS** Units: **ug/L** Analysis Date: **08-Sep-2022 17:17**
Client ID: Run ID: **VOA7_416740** SeqNo: **6840676** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.36	1.0	20	0	96.8	70 - 127				
Toluene	19.46	1.0	20	0	97.3	70 - 123				
Surr: 1,2-Dichloroethane-d4	*52.86*	*1.0*	*50*	*0*	*106*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*51.19*	*1.0*	*50*	*0*	*102*	*77 - 113*				
Surr: Dibromofluoromethane	*51.28*	*1.0*	*50*	*0*	*103*	*77 - 123*				
Surr: Toluene-d8	*51.74*	*1.0*	*50*	*0*	*103*	*82 - 127*				

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: R416740 (0) **Instrument: VOA7** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS22090277-01MSD** Units: **ug/L** Analysis Date: **08-Sep-2022 17:37**
Client ID: Run ID: **VOA7_416740** SeqNo: **6840677** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	18.43	1.0	20	0	92.2	70 - 127	19.36	4.9	20	
Toluene	18.97	1.0	20	0	94.9	70 - 123	19.46	2.52	20	
Surr: 1,2-Dichloroethane-d4	*52.37*	*1.0*	*50*	*0*	*105*	*70 - 126*	*52.86*	*0.93*	*20*	
Surr: 4-Bromofluorobenzene	*51.15*	*1.0*	*50*	*0*	*102*	*77 - 113*	*51.19*	*0.0816*	*20*	
Surr: Dibromofluoromethane	*50.76*	*1.0*	*50*	*0*	*102*	*77 - 123*	*51.28*	*1.03*	*20*	
Surr: Toluene-d8	*52.03*	*1.0*	*50*	*0*	*104*	*82 - 127*	*51.74*	*0.566*	*20*	

The following samples were analyzed in this batch: HS22081729-01

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: R416543 (0) **Instrument:** Balance1 **Method:** TOTAL DISSOLVED SOLIDS BY SM2540C-2011

MBLK Sample ID: **WBLK-090222** Units: **mg/L** Analysis Date: **02-Sep-2022 12:24**
Client ID: Run ID: **Balance1_416543** SeqNo: **6835199** 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-090222** Units: **mg/L** Analysis Date: **02-Sep-2022 12:24**
Client ID: Run ID: **Balance1_416543** SeqNo: **6835200** 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)	1062	10.0	1000	0	106	85 - 115				

DUP Sample ID: **HS22090039-01DUP** Units: **mg/L** Analysis Date: **02-Sep-2022 12:24**
Client ID: Run ID: **Balance1_416543** SeqNo: **6835198** 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)	180	10.0					184	2.2	5	

The following samples were analyzed in this batch: HS22081729-01

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: R416696 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY E300.0, REV 2.1, 1993**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **07-Sep-2022 14:15**
Client ID: Run ID: **ICS-Integrion_416696** SeqNo: **6838635** 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: **07-Sep-2022 14:20**
Client ID: Run ID: **ICS-Integrion_416696** SeqNo: **6838636** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20	0.500	20	0	100	90 - 110				
Sulfate	20.41	0.500	20	0	102	90 - 110				

MS Sample ID: **HS22090249-01MS** Units: **mg/L** Analysis Date: **07-Sep-2022 14:31**
Client ID: Run ID: **ICS-Integrion_416696** SeqNo: **6838638** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	36.62	0.500	10	27.08	95.4	80 - 120				
Sulfate	1192	0.500	10	1216	-242	80 - 120				SEO

MS Sample ID: **HS22090185-01MS** Units: **mg/L** Analysis Date: **07-Sep-2022 16:06**
Client ID: Run ID: **ICS-Integrion_416696** SeqNo: **6838654** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	588.1	5.00	100	513.4	74.7	80 - 120				SO
Sulfate	890.8	5.00	100	830.4	60.4	80 - 120				SO

MSD Sample ID: **HS22090249-01MSD** Units: **mg/L** Analysis Date: **07-Sep-2022 14:36**
Client ID: Run ID: **ICS-Integrion_416696** SeqNo: **6838639** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	36.45	0.500	10	27.08	93.8	80 - 120	36.62	0.446	20	
Sulfate	1185	0.500	10	1216	-308	80 - 120	1192	0.559	20	SEO

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: R416696 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY E300.0, REV 2.1, 1993**

MSD Sample ID: **HS22090185-01MSD** Units: **mg/L** Analysis Date: **07-Sep-2022 16:11**
Client ID: Run ID: **ICS-Integrion_416696** SeqNo: **6838655** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	588.5	5.00	100	513.4	75.1	80 - 120	588.1	0.0663	20	SO
Sulfate	891.4	5.00	100	830.4	61.0	80 - 120	890.8	0.064	20	SO

The following samples were analyzed in this batch: HS22081729-01

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: HS22081729

QC BATCH REPORT

Batch ID: R416816 (0) **Instrument: ManTech01** **Method: ALKALINITY BY SM 2320B-2011**

MBLK Sample ID: **WBLKW1-220909** Units: **mg/L** Analysis Date: **09-Sep-2022 10:50**
Client ID: Run ID: **ManTech01_416816** SeqNo: **6841442** 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: **LCS1-220909** Units: **mg/L** Analysis Date: **09-Sep-2022 10:58**
Client ID: Run ID: **ManTech01_416816** SeqNo: **6841443** 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)	962.4	5.00	1000	0	96.2	85 - 115				
Alkalinity, Total (As CaCO3)	996.4	5.00	1000	0	99.6	85 - 115				

LCSD Sample ID: **LCSD1-220909** Units: **mg/L** Analysis Date: **09-Sep-2022 11:07**
Client ID: Run ID: **ManTech01_416816** SeqNo: **6841444** 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)	958.9	5.00	1000	0	95.9	85 - 115	962.4	0.366	20	
Alkalinity, Total (As CaCO3)	993.6	5.00	1000	0	99.4	85 - 115	996.4	0.283	20	

DUP Sample ID: **HS22090335-02DUP** Units: **mg/L** Analysis Date: **09-Sep-2022 11:20**
Client ID: Run ID: **ManTech01_416816** SeqNo: **6841446** 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)	124	5.00					124.2	0.161	20	
Alkalinity, Carbonate (As CaCO3)	ND	5.00					0	0	20	
Alkalinity, Total (As CaCO3)	124	5.00					124.2	0.161	20	

The following samples were analyzed in this batch: HS22081729-01

Client: PDC Energy
Project: Werning 1-2B
WorkOrder: **HS22081729**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

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

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

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

Sample Receipt Checklist

Work Order ID: HS22081729 **Date/Time Received:** 31-Aug-2022 09:15

Client Name: PDC Energy 80203 **Received by:** Corey Grandits

Completed By:	/S/ Corey Grandits	31-Aug-2022 17:42	**Reviewed by:**	/S/ Kori Bagsby	01-Sep-2022 09:24
	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):	3.9uc/3.7c	IR31
Cooler(s)/Kit(s):	Red	
Date/Time sample(s) sent to storage:	8/31/2022	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

ALS Environmental

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

Chain-of-Custody

Form 202r8

PROJECT NAME	Wernig 1-2B	SAMPLER	Jeff Braden	DATE	8/29/22
PROJECT No.	09A2073093	FACILITY ID	123-26399	TURNAROUND	Standard
	PDCE Bradenhead Sampling	EDD FORMAT	COGCC EDD, LTE		
COMPANY NAME	PDC Energy	PURCHASE ORDER	N/A		
SEND REPORT TO	Jenifer Hakkarinen	BILL TO COMPANY	PDC Energy		
ADDRESS	1775 Sherman Street, Suite 3000	INVOICE ATTN TO	Jenifer Hakkarinen		
CITY / STATE / ZIP	Denver, Colorado 80203	ADDRESS	1775 Sherman Street, Suite 3000		
PHONE	303.860.5815	CITY / STATE / ZIP	Denver, Colorado 80203		
FAX		PHONE	303.860.5815		
E-MAIL	jenifer.hakkarinen@pdce.com jessica.johannsen@pdce.com jbraden@ensolum.com	FAX			
		E-MAIL	jenifer.hakkarinen@pdce.com		

WORKORDER #	
PAGE	1 of 1
DISPOSAL	By Lab or Return to Client

HS2081729
PDC Energy
Wernig 1-2B

Lab ID	Field ID	Matrix	Sample Date	Sample Time	# Bottles	Pres.	QC	Dissolved Methane, Ethane, Propane	BTEX & TPH GRO	TPH DRO	Alkalinity, Carbonate, Bicarbonate, Total	Total Cations - see comments	Total Anions - see comments	Total Dissolved Solids								
								RSK 175	SW8260_25	SW8015M	SM2320B	EPA200.7/200.8	EPA 300.0	SM2540C								
	Wernig 1-2B	W	8/29/22	12:50	11	12	-	X	X	X	X	X	X	X								

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

For metals or anions, please detail analytes below.

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

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

	SIGNATURE	PRINTED NAME	DATE	TIME
RELINQUISHED BY		Jeff Braden	8/29/22	1455
RECEIVED BY		Karen Crave	8-29-22	1455
RELINQUISHED BY		Karen Crave	8-29-22	1530
RECEIVED BY		COREY S	8/31/22	0915
RELINQUISHED BY				
RECEIVED BY