



---

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

July 12, 2023

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

Work Order: **HS23061733**

Laboratory Results for: **Werning 2-3**

Dear Jenifer Hakkarinen,

ALS Environmental received 1 sample(s) on Jun 24, 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: Werning 2-3  
Work Order: HS23061733

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23061733-01	Werning 2-3	Water		22-Jun-2023 10:30	24-Jun-2023 09:05	<input type="checkbox"/>

**Client:** PDC Energy  
**Project:** Werning 2-3  
**Work Order:** HS23061733

**CASE NARRATIVE**

---

**GC Semivolatiles by Method RSK-175****Batch ID: R439932**

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

---

**GC Semivolatiles by Method SW8015M****Batch ID: 196878**

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

---

**GC Volatiles by Method SW8015****Batch ID: R440336**

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

---

**GCMS Volatiles by Method SW8260****Batch ID: R440144****Sample ID: Werning 2-3 (HS23061733-01)**

- Lowest possible dilution due to sample matrix.

---

**Metals by Method E200.8****Batch ID: 197352****Sample ID: HS23061561-01MS**

- MS and MSD are for an unrelated sample

**Sample ID: Werning 2-3 (HS23061733-01MS)**

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

---

**WetChemistry by Method E300****Batch ID: R440960****Sample ID: HS23061706-02MS**

- MS and MSD are for an unrelated sample

**Sample ID: Werning 2-3 (HS23061733-01)**

- The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Sulfate)

---

**WetChemistry by Method SM2320B****Batch ID: R440544**

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

**Client:** PDC Energy  
**Project:** Werning 2-3  
**Work Order:** HS23061733

**CASE NARRATIVE**

---

**WetChemistry by Method M2540C**

**Batch ID: R440206**

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

Client: PDC Energy  
 Project: Werning 2-3  
 Sample ID: Werning 2-3  
 Collection Date: 22-Jun-2023 10:30

**ANALYTICAL REPORT**

WorkOrder:HS23061733  
 Lab ID:HS23061733-01  
 Matrix:Water

ANALYSES	RESULT	QUAL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
<b>LOW LEVEL VOLATILES BY SW8260C</b>		<b>Method:SW8260</b>		Analyst: FT		
Benzene	ND		500	ug/L	500	29-Jun-2023 05:10
Ethylbenzene	ND		500	ug/L	500	29-Jun-2023 05:10
m,p-Xylene	ND		1000	ug/L	500	29-Jun-2023 05:10
o-Xylene	ND		500	ug/L	500	29-Jun-2023 05:10
Toluene	ND		500	ug/L	500	29-Jun-2023 05:10
Xylenes, Total	ND		500	ug/L	500	29-Jun-2023 05:10
Surr: 1,2-Dichloroethane-d4	98.1		70-126	%REC	500	29-Jun-2023 05:10
Surr: 4-Bromofluorobenzene	92.5		77-113	%REC	500	29-Jun-2023 05:10
Surr: Dibromofluoromethane	96.3		77-123	%REC	500	29-Jun-2023 05:10
Surr: Toluene-d8	98.7		82-127	%REC	500	29-Jun-2023 05:10
<b>GASOLINE RANGE ORGANICS BY SW8015C</b>		<b>Method:SW8015</b>		Analyst: PJM		
Gasoline Range Organics	116		25.0	mg/L	500	30-Jun-2023 13:33
Surr: 4-Bromofluorobenzene	103		70-123	%REC	500	30-Jun-2023 13:33
<b>DISSOLVED GASES BY RSK-175</b>		<b>Method:RSK-175</b>		Analyst: SAM		
Ethane	529		10.0	ug/L	10	26-Jun-2023 16:58
Methane	10,200		250	ug/L	500	26-Jun-2023 16:35
Propane	223		10.0	ug/L	10	26-Jun-2023 16:58
<b>TPH DRO/ORO BY SW8015C</b>		<b>Method:SW8015M</b>		Prep:SW3511 / 26-Jun-2023 Analyst: SAM		
TPH (Diesel Range)	0.12		0.052	mg/L	1	30-Jun-2023 20:39
Surr: 2-Fluorobiphenyl	73.8		60-135	%REC	1	30-Jun-2023 20:39
<b>TOTAL METALS BY E200.8, REV 5.4, 1994</b>		<b>Method:E200.8</b>		Prep:E200.8 / 10-Jul-2023 Analyst: JHD		
Calcium	70.1		2.50	mg/L	5	11-Jul-2023 20:59
Magnesium	11.0		2.50	mg/L	5	11-Jul-2023 20:59
Potassium	8.11		2.50	mg/L	5	11-Jul-2023 20:59
Sodium	2,280		20.0	mg/L	100	12-Jul-2023 15:47
<b>ANIONS BY E300.0, REV 2.1, 1993</b>		<b>Method:E300</b>		Analyst: TH		
Chloride	2,230		50.0	mg/L	100	10-Jul-2023 16:12
Sulfate	ND		2.50	mg/L	5	10-Jul-2023 16:06
<b>TOTAL DISSOLVED SOLIDS BY SM2540C -2011</b>		<b>Method:M2540C</b>		Analyst: DC		
Total Dissolved Solids (Residue, Filterable)	2,800		10.0	mg/L	1	28-Jun-2023 13:51
<b>ALKALINITY BY SM 2320B-2011</b>		<b>Method:SM2320B</b>		Analyst: DW		
Alkalinity, Bicarbonate (As CaCO3)	353		5.00	mg/L	1	05-Jul-2023 12:58
Alkalinity, Carbonate (As CaCO3)	ND		5.00	mg/L	1	05-Jul-2023 12:58
Alkalinity, Total (As CaCO3)	353		5.00	mg/L	1	05-Jul-2023 12:58

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

Weight / Prep Log

Client: PDC Energy  
Project: Werning 2-3  
WorkOrder: HS23061733

Batch ID: 196878	Start Date: 26 Jun 2023 14:23	End Date: 26 Jun 2023 14:23
Method: SW3511		Prep Code: 3511_DRO

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23061733-01		31.72 (mL)	2 (mL)	0.06305	40 mL Amber

Batch ID: 197352	Start Date: 10 Jul 2023 16:30	End Date: 10 Jul 2023 16:30
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	
HS23061733-01		10 (mL)	10 (mL)	1	250 mL plastic, HNO3 to pH <2

**Client:** PDC Energy  
**Project:** Werning 2-3  
**WorkOrder:** HS23061733

**DATES REPORT**

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
<b>Batch ID:</b> 196878 ( 0 )		<b>Test Name :</b> TPH DRO/ORO BY SW8015C			<b>Matrix:</b> Water	
HS23061733-01	Werning 2-3	22 Jun 2023 10:30		26 Jun 2023 14:23	30 Jun 2023 20:39	1
<b>Batch ID:</b> 197352 ( 0 )		<b>Test Name :</b> TOTAL METALS BY E200.8, REV 5.4, 1994			<b>Matrix:</b> Water	
HS23061733-01	Werning 2-3	22 Jun 2023 10:30		10 Jul 2023 16:30	12 Jul 2023 15:47	100
HS23061733-01	Werning 2-3	22 Jun 2023 10:30		10 Jul 2023 16:30	11 Jul 2023 20:59	5
<b>Batch ID:</b> R439932 ( 0 )		<b>Test Name :</b> DISSOLVED GASES BY RSK-175			<b>Matrix:</b> Water	
HS23061733-01	Werning 2-3	22 Jun 2023 10:30			26 Jun 2023 16:58	10
HS23061733-01	Werning 2-3	22 Jun 2023 10:30			26 Jun 2023 16:35	500
<b>Batch ID:</b> R440144 ( 0 )		<b>Test Name :</b> LOW LEVEL VOLATILES BY SW8260C			<b>Matrix:</b> Water	
HS23061733-01	Werning 2-3	22 Jun 2023 10:30			29 Jun 2023 05:10	500
<b>Batch ID:</b> R440206 ( 0 )		<b>Test Name :</b> TOTAL DISSOLVED SOLIDS BY SM2540C-2011			<b>Matrix:</b> Water	
HS23061733-01	Werning 2-3	22 Jun 2023 10:30			28 Jun 2023 13:51	1
<b>Batch ID:</b> R440336 ( 0 )		<b>Test Name :</b> GASOLINE RANGE ORGANICS BY SW8015C			<b>Matrix:</b> Water	
HS23061733-01	Werning 2-3	22 Jun 2023 10:30			30 Jun 2023 13:33	500
<b>Batch ID:</b> R440544 ( 0 )		<b>Test Name :</b> ALKALINITY BY SM 2320B-2011			<b>Matrix:</b> Water	
HS23061733-01	Werning 2-3	22 Jun 2023 10:30			05 Jul 2023 12:58	1
<b>Batch ID:</b> R440960 ( 0 )		<b>Test Name :</b> ANIONS BY E300.0, REV 2.1, 1993			<b>Matrix:</b> Water	
HS23061733-01	Werning 2-3	22 Jun 2023 10:30			10 Jul 2023 16:12	100
HS23061733-01	Werning 2-3	22 Jun 2023 10:30			10 Jul 2023 16:06	5

**Client:** PDC Energy  
**Project:** Werning 2-3  
**WorkOrder:** HS23061733

**QC BATCH REPORT**

Batch ID: 196878 ( 0 )		Instrument: FID-16		Method: TPH DRO/ORO BY SW8015C						
<b>MBLK</b>	Sample ID: <b>MBLK-196878</b>	Units: <b>mg/L</b>		Analysis Date: <b>30-Jun-2023 15:42</b>						
Client ID:	Run ID: <b>FID-16_440417</b>		SeqNo: <b>7398371</b>		PrepDate: <b>26-Jun-2023</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	ND	0.050								
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.04142</i>	<i>0.0050</i>	<i>0.06</i>	<i>0</i>	<i>69.0</i>	<i>60 - 135</i>				
<b>LCS</b>	Sample ID: <b>LCS-196878</b>	Units: <b>mg/L</b>		Analysis Date: <b>28-Jun-2023 06:55</b>						
Client ID:	Run ID: <b>FID-16_440417</b>		SeqNo: <b>7398378</b>		PrepDate: <b>26-Jun-2023</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.6017	0.050	0.6	0	100	70 - 130				
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.05153</i>	<i>0.0050</i>	<i>0.06</i>	<i>0</i>	<i>85.9</i>	<i>60 - 135</i>				
<b>LCSD</b>	Sample ID: <b>LCSD-196878</b>	Units: <b>mg/L</b>		Analysis Date: <b>28-Jun-2023 07:24</b>						
Client ID:	Run ID: <b>FID-16_440417</b>		SeqNo: <b>7398379</b>		PrepDate: <b>26-Jun-2023</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH (Diesel Range)	0.6166	0.050	0.6	0	103	70 - 130	0.6017	2.44	20	
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.05579</i>	<i>0.0050</i>	<i>0.06</i>	<i>0</i>	<i>93.0</i>	<i>60 - 135</i>	<i>0.05153</i>	<i>7.94</i>	<i>20</i>	
The following samples were analyzed in this batch: HS23061733-01										



Client: PDC Energy  
 Project: Werning 2-3  
 WorkOrder: HS23061733

## QC BATCH REPORT

Batch ID: R439932 ( 0 )		Instrument: FID-4		Method: DISSOLVED GASES BY RSK-175					
<b>MBLK</b>	Sample ID: <b>MBLK-230626</b>	Units: <b>ug/L</b>		Analysis Date: <b>26-Jun-2023 09:17</b>					
Client ID:	Run ID: <b>FID-4_439932</b>	SeqNo: <b>7386386</b>		PrepDate:		DF: <b>1</b>			
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							

  

<b>LCS</b>	Sample ID: <b>LCS-230626</b>	Units: <b>ug/L</b>		Analysis Date: <b>26-Jun-2023 09:44</b>					
Client ID:	Run ID: <b>FID-4_439932</b>	SeqNo: <b>7386387</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Ethane	18.17	1.00	18.04	0	101	75 - 125			
Methane	8.664	0.500	9.647	0	89.8	75 - 125			
Propane	30.66	1.00	26.46	0	116	75 - 125			

  

<b>LCSD</b>	Sample ID: <b>LCSD-230626</b>	Units: <b>ug/L</b>		Analysis Date: <b>26-Jun-2023 10:02</b>					
Client ID:	Run ID: <b>FID-4_439932</b>	SeqNo: <b>7386388</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Ethane	19	1.00	18.04	0	105	75 - 125	18.17	4.45	30
Methane	8.322	0.500	9.647	0	86.3	75 - 125	8.664	4.02	30
Propane	30.41	1.00	26.46	0	115	75 - 125	30.66	0.841	30

The following samples were analyzed in this batch: HS23061733-01

Client: PDC Energy  
 Project: Werning 2-3  
 WorkOrder: HS23061733

## QC BATCH REPORT

Batch ID: R440336 ( 0 )		Instrument: FID-20		Method: GASOLINE RANGE ORGANICS BY SW8015C						
<b>MBLK</b>	Sample ID: <b>MBLK-230630</b>	Units: <b>mg/L</b>		Analysis Date: <b>30-Jun-2023 10:23</b>						
Client ID:	Run ID: <b>FID-20_440336</b>		SeqNo: <b>7396035</b>		PrepDate:		DF: <b>1</b>			
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	0.08358	0.00500	0.1	0	83.6	70 - 121				

  

<b>LCS</b>	Sample ID: <b>LCS-230630</b>	Units: <b>mg/L</b>		Analysis Date: <b>30-Jun-2023 09:56</b>						
Client ID:	Run ID: <b>FID-20_440336</b>		SeqNo: <b>7396033</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.8944	0.0500	1	0	89.4	76 - 124				
Surr: 4-Bromofluorobenzene	0.08201	0.00500	0.1	0	82.0	52 - 138				

  

<b>LCSD</b>	Sample ID: <b>LCSD-230630</b>	Units: <b>mg/L</b>		Analysis Date: <b>30-Jun-2023 10:09</b>						
Client ID:	Run ID: <b>FID-20_440336</b>		SeqNo: <b>7396034</b>		PrepDate:		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Gasoline Range Organics	0.9149	0.0500	1	0	91.5	76 - 124	0.8944	2.26	20	
Surr: 4-Bromofluorobenzene	0.08186	0.00500	0.1	0	81.9	52 - 138	0.08201	0.179	20	

The following samples were analyzed in this batch: HS23061733-01

**Client:** PDC Energy  
**Project:** Werning 2-3  
**WorkOrder:** HS23061733

**QC BATCH REPORT**

Batch ID: 197352 ( 0 )		Instrument: ICPMS06		Method: TOTAL METALS BY E200.8, REV 5.4, 1994					
<b>MBLK</b>	Sample ID: <b>MBLK-197352</b>	Units: <b>ug/L</b>		Analysis Date: <b>11-Jul-2023 20:27</b>					
Client ID:	Run ID: <b>ICPMS06_441004</b>	SeqNo: <b>7420192</b>		PrepDate: <b>10-Jul-2023</b>		DF: <b>1</b>			
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							

<b>LCS</b>	Sample ID: <b>LCS-197352</b>	Units: <b>ug/L</b>		Analysis Date: <b>11-Jul-2023 20:29</b>					
Client ID:	Run ID: <b>ICPMS06_441004</b>	SeqNo: <b>7420193</b>		PrepDate: <b>10-Jul-2023</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

Calcium	4445	500	5000	0	88.9	85 - 115			
Magnesium	4757	500	5000	0	95.1	85 - 115			
Potassium	4612	500	5000	0	92.2	85 - 115			
Sodium	4825	200	5000	0	96.5	85 - 115			

<b>MS</b>	Sample ID: <b>HS23061733-01MS</b>	Units: <b>ug/L</b>		Analysis Date: <b>11-Jul-2023 21:01</b>					
Client ID: <b>Werning 2-3</b>	Run ID: <b>ICPMS06_441004</b>	SeqNo: <b>7420266</b>		PrepDate: <b>10-Jul-2023</b>		DF: <b>5</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Calcium	73100	2500	5000	70110	59.9	70 - 130			SO
Magnesium	15410	2500	5000	10960	89.0	70 - 130			
Potassium	12570	2500	5000	8111	89.2	70 - 130			
Sodium	2145000	1000	5000	2152000	-140	70 - 130			SEO

<b>MS</b>	Sample ID: <b>HS23061561-01MS</b>	Units: <b>ug/L</b>		Analysis Date: <b>11-Jul-2023 20:33</b>					
Client ID:	Run ID: <b>ICPMS06_441004</b>	SeqNo: <b>7420195</b>		PrepDate: <b>10-Jul-2023</b>		DF: <b>1</b>			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Calcium	133700	500	5000	138500	-95.1	70 - 130			SO
Magnesium	52290	500	5000	49920	47.2	70 - 130			SO
Potassium	16790	500	5000	12870	78.3	70 - 130			
Sodium	1591000	200	5000	1694000	-2070	70 - 130			SEO

**Client:** PDC Energy  
**Project:** Werning 2-3  
**WorkOrder:** HS23061733

**QC BATCH REPORT**

Batch ID: 197352 ( 0 )		Instrument: ICPMS06		Method: TOTAL METALS BY E200.8, REV 5.4, 1994						
<b>MSD</b>		Sample ID: <b>HS23061733-01MSD</b>		Units: <b>ug/L</b>		Analysis Date: <b>11-Jul-2023 21:03</b>				
Client ID: <b>Werning 2-3</b>		Run ID: <b>ICPMS06_441004</b>		SeqNo: <b>7420267</b>		PrepDate: <b>10-Jul-2023</b>		DF: <b>5</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	70650	2500	5000	70110	10.9	70 - 130	73100	3.41	20	SO
Magnesium	14700	2500	5000	10960	74.9	70 - 130	15410	4.71	20	
Potassium	11930	2500	5000	8111	76.4	70 - 130	12570	5.25	20	
Sodium	1997000	1000	5000	2152000	-3080	70 - 130	2145000	7.11	20	SEO
<b>MSD</b>		Sample ID: <b>HS23061561-01MSD</b>		Units: <b>ug/L</b>		Analysis Date: <b>11-Jul-2023 20:37</b>				
Client ID:		Run ID: <b>ICPMS06_441004</b>		SeqNo: <b>7420197</b>		PrepDate: <b>10-Jul-2023</b>		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Calcium	135200	500	5000	138500	-66.7	70 - 130	133700	1.06	20	SO
Magnesium	52860	500	5000	49920	58.7	70 - 130	52290	1.09	20	SO
Potassium	17230	500	5000	12870	87.1	70 - 130	16790	2.58	20	
Sodium	1621000	200	5000	1694000	-1480	70 - 130	1591000	1.85	20	SEO
The following samples were analyzed in this batch: HS23061733-01										

Client: PDC Energy  
 Project: Werning 2-3  
 WorkOrder: HS23061733

## QC BATCH REPORT

Batch ID: R440144 ( 0 )		Instrument: VOA7		Method: LOW LEVEL VOLATILES BY SW8260C					
<b>MBLK</b>	Sample ID: VBLKW-230628	Units: ug/L		Analysis Date: 28-Jun-2023 21:39					
Client ID:	Run ID: VOA7_440144	SeqNo: 7391696		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	ND	1.0							
Ethylbenzene	ND	1.0							
m,p-Xylene	ND	2.0							
o-Xylene	ND	1.0							
Toluene	ND	1.0							
Xylenes, Total	ND	1.0							
Surr: 1,2-Dichloroethane-d4	48.6	1.0	50	0	97.2	70 - 123			
Surr: 4-Bromofluorobenzene	45.87	1.0	50	0	91.7	77 - 113			
Surr: Dibromofluoromethane	48.65	1.0	50	0	97.3	73 - 126			
Surr: Toluene-d8	49.45	1.0	50	0	98.9	81 - 120			

  

<b>LCS</b>	Sample ID: VLCSW-230628	Units: ug/L		Analysis Date: 28-Jun-2023 20:56					
Client ID:	Run ID: VOA7_440144	SeqNo: 7391695		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	18.08	1.0	20	0	90.4	74 - 120			
Ethylbenzene	18.38	1.0	20	0	91.9	77 - 117			
m,p-Xylene	36.17	2.0	40	0	90.4	77 - 122			
o-Xylene	18.23	1.0	20	0	91.2	75 - 119			
Toluene	18.23	1.0	20	0	91.2	77 - 118			
Xylenes, Total	54.4	1.0	60	0	90.7	75 - 122			
Surr: 1,2-Dichloroethane-d4	49.31	1.0	50	0	98.6	70 - 123			
Surr: 4-Bromofluorobenzene	47.58	1.0	50	0	95.2	77 - 113			
Surr: Dibromofluoromethane	48.68	1.0	50	0	97.4	73 - 126			
Surr: Toluene-d8	49.3	1.0	50	0	98.6	81 - 120			

**Client:** PDC Energy  
**Project:** Werning 2-3  
**WorkOrder:** HS23061733

**QC BATCH REPORT**

Batch ID: R440144 ( 0 )		Instrument: VOA7		Method: LOW LEVEL VOLATILES BY SW8260C					
<b>MS</b>		Sample ID: HS23061923-06MS		Units: ug/L		Analysis Date: 28-Jun-2023 23:48			
Client ID:		Run ID: VOA7_440144		SeqNo: 7391702		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	16.9	1.0	20	0	84.5	70 - 127			
Ethylbenzene	16.74	1.0	20	0	83.7	70 - 124			
m,p-Xylene	33.1	2.0	40	0	82.7	70 - 130			
o-Xylene	16.22	1.0	20	0	81.1	70 - 124			
Toluene	16.73	1.0	20	0	83.7	70 - 123			
Xylenes, Total	49.32	1.0	60	0	82.2	70 - 130			
Surr: 1,2-Dichloroethane-d4	49.93	1.0	50	0	99.9	70 - 126			
Surr: 4-Bromofluorobenzene	47.31	1.0	50	0	94.6	77 - 113			
Surr: Dibromofluoromethane	49.49	1.0	50	0	99.0	77 - 123			
Surr: Toluene-d8	49.8	1.0	50	0	99.6	82 - 127			

  

<b>MSD</b>		Sample ID: HS23061923-06MSD		Units: ug/L		Analysis Date: 29-Jun-2023 00:09			
Client ID:		Run ID: VOA7_440144		SeqNo: 7391703		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Benzene	17.24	1.0	20	0	86.2	70 - 127	16.9	1.99	20
Ethylbenzene	17.12	1.0	20	0	85.6	70 - 124	16.74	2.26	20
m,p-Xylene	33.84	2.0	40	0	84.6	70 - 130	33.1	2.23	20
o-Xylene	16.62	1.0	20	0	83.1	70 - 124	16.22	2.43	20
Toluene	17.13	1.0	20	0	85.7	70 - 123	16.73	2.37	20
Xylenes, Total	50.47	1.0	60	0	84.1	70 - 130	49.32	2.3	20
Surr: 1,2-Dichloroethane-d4	49.54	1.0	50	0	99.1	70 - 126	49.93	0.79	20
Surr: 4-Bromofluorobenzene	47.1	1.0	50	0	94.2	77 - 113	47.31	0.444	20
Surr: Dibromofluoromethane	50.21	1.0	50	0	100	77 - 123	49.49	1.44	20
Surr: Toluene-d8	49.47	1.0	50	0	98.9	82 - 127	49.8	0.651	20

The following samples were analyzed in this batch: HS23061733-01

Client: PDC Energy  
 Project: Werning 2-3  
 WorkOrder: HS23061733

## QC BATCH REPORT

Batch ID: R440206 ( 0 )		Instrument: Balance1		Method: TOTAL DISSOLVED SOLIDS BY SM2540C-2011						
MBLK	Sample ID: WBLK-06282023	Units: mg/L		Analysis Date: 28-Jun-2023 13:51						
Client ID:	Run ID: Balance1_440206	SeqNo: 7392994		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-06282023	Units: mg/L		Analysis Date: 28-Jun-2023 13:51						
Client ID:	Run ID: Balance1_440206	SeqNo: 7392995		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)		1066	10.0	1000	0	107	85 - 115			
DUP	Sample ID: HS23061744-04DUP	Units: mg/L		Analysis Date: 28-Jun-2023 13:51						
Client ID:	Run ID: Balance1_440206	SeqNo: 7392986		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)		1124	10.0				1124	0	20	
DUP	Sample ID: HS23061744-02DUP	Units: mg/L		Analysis Date: 28-Jun-2023 13:51						
Client ID:	Run ID: Balance1_440206	SeqNo: 7392983		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)		12	10.0				14	15.4	20	
The following samples were analyzed in this batch:		HS23061733-01								

Client: PDC Energy  
 Project: Werning 2-3  
 WorkOrder: HS23061733

## QC BATCH REPORT

Batch ID: R440544 ( 0 )		Instrument: Skalar 03		Method: ALKALINITY BY SM 2320B-2011					
<b>MBLK</b>	Sample ID: MBLK-07052023	Units: mg/L		Analysis Date: 05-Jul-2023 11:42					
Client ID:	Run ID: Skalar 03_440544	SeqNo: 7401629		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							

  

<b>LCS</b>	Sample ID: LCS-07052023	Units: mg/L		Analysis Date: 05-Jul-2023 11:48					
Client ID:	Run ID: Skalar 03_440544	SeqNo: 7401630		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)	918.4	5.00	1000	0	91.8	85 - 115			
Alkalinity, Total (As CaCO3)	925.6	5.00	1000	0	92.6	85 - 115			

  

<b>LCSD</b>	Sample ID: LCSD-07052023	Units: mg/L		Analysis Date: 05-Jul-2023 11:55					
Client ID:	Run ID: Skalar 03_440544	SeqNo: 7401631		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)	916.8	5.00	1000	0	91.7	85 - 115	918.4	0.174	20
Alkalinity, Total (As CaCO3)	925.3	5.00	1000	0	92.5	85 - 115	925.6	0.0324	20

  

<b>DUP</b>	Sample ID: HS23061591-02DUP	Units: mg/L		Analysis Date: 05-Jul-2023 12:14					
Client ID:	Run ID: Skalar 03_440544	SeqNo: 7401634		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)	996.7	5.00					984.2	1.26	20
Alkalinity, Carbonate (As CaCO3)	ND	5.00					0	0	20
Alkalinity, Total (As CaCO3)	996.7	5.00					984.2	1.26	20

The following samples were analyzed in this batch: HS23061733-01



**Client:** PDC Energy  
**Project:** Werning 2-3  
**WorkOrder:** HS23061733

**QC BATCH REPORT**

Batch ID: R440960 ( 0 )		Instrument: ICS-Integrion		Method: ANIONS BY E300.0, REV 2.1, 1993						
<b>MBLK</b>	Sample ID: MBLK	Units: mg/L		Analysis Date: 10-Jul-2023 14:16						
Client ID:	Run ID: ICS-Integrion_440960		SeqNo: 7418018		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								

  

<b>LCS</b>	Sample ID: LCS	Units: mg/L		Analysis Date: 10-Jul-2023 14:27						
Client ID:	Run ID: ICS-Integrion_440960		SeqNo: 7418019		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.35	0.500	20	0	102	90 - 110				
Sulfate	19.89	0.500	20	0	99.5	90 - 110				

  

<b>MS</b>	Sample ID: HS23061706-02MS	Units: mg/L		Analysis Date: 10-Jul-2023 14:39						
Client ID:	Run ID: ICS-Integrion_440960		SeqNo: 7418021		PrepDate:		DF: 10			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	426.5	5.00	100	358.9	67.7	80 - 120				S
Sulfate	187.9	5.00	100	107.4	80.4	80 - 120				

  

<b>MSD</b>	Sample ID: HS23061706-02MSD	Units: mg/L		Analysis Date: 10-Jul-2023 14:45						
Client ID:	Run ID: ICS-Integrion_440960		SeqNo: 7418022		PrepDate:		DF: 10			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	409.7	5.00	100	358.9	50.8	80 - 120	426.5	4.02	20	S
Sulfate	179.7	5.00	100	107.4	72.3	80 - 120	187.9	4.42	20	S

The following samples were analyzed in this batch: HS23061733-01

**Client:** PDC Energy  
**Project:** Werning 2-3  
**WorkOrder:** HS23061733

**QUALIFIERS,  
ACRONYMS, UNITS**

<b>Qualifier</b>	<b>Description</b>
*	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

<b>Acronym</b>	<b>Description</b>
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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

<b>Unit Reported</b>	<b>Description</b>
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; 2022-2023	31-Jul-2023
Louisiana	03087-2023	30-Jun-2024
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2023-2024	30-Apr-2024
Oklahoma	2022-141	31-Aug-2023
Texas	T104704231-23-31	30-Apr-2024
Utah	TX026932022-13	31-Jul-2023

## Sample Receipt Checklist

Work Order ID: HS23061733

Date/Time Received: **24-Jun-2023 09:05**

Client Name: PDC Energy 80203

Received by: **Corey Grandits**Completed By: /S/ Paresh M. Giga

26-Jun-2023 13:10

eSignature

Date/Time

Reviewed by: /S/ Tyler Monroe

27-Jun-2023 11:39

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):

2.9C/2.8C U/C

IR31

Cooler(s)/Kit(s):

48223

Date/Time sample(s) sent to storage:

6/24/23 12:00

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**965 E 11th St  
Loveland, CO 80537  
PH: 970-305-1648**Chain-of-Custody**

WORKORDER #

<b>SAMPLER</b>		Jeff Braden		<b>DATE</b>		6/22/23		<b>PAGE</b>		1 of 1												
<b>PROJECT NAME</b>		Werning 2-3		<b>FACILITY ID</b>		123-18672		<b>TURNAROUND</b>		Standard												
<b>PROJECT No.</b>		09C2073451		<b>EDD FORMAT</b>		COGCC EDD, LTE		<b>DISPOSAL</b>		By Lab or Return to Client												
<b>PDCE Bradenhead Sampling</b>		<b>PURCHASE ORDER</b>		N/A																		
<b>COMPANY NAME</b>		PDC Energy		<b>BILL TO COMPANY</b>		PDC Energy																
<b>SEND REPORT TO</b>		Jenifer Hakkarinen		<b>INVOICE ATTN TO</b>		Jenifer Hakkarinen																
<b>ADDRESS</b>		1775 Sherman ST, Suite 3000		<b>ADDRESS</b>		1775 Sherman Street, Suite 3000																
<b>CITY / STATE / ZIP</b>		Denver, CO 80203		<b>CITY / STATE / ZIP</b>		Denver, Colorado																
<b>PHONE</b>		303-860-5815		<b>PHONE</b>		303.860.5815																
<b>FAX</b>				<b>FAX</b>																		
<b>E-MAIL</b>		jenifer.hakkarinen@pdce.com jessica.johannsen@pdce.com jbraden@ensolum.com		<b>E-MAIL</b>		jenifer.hakkarinen@pdce.com																
<b>Lab ID</b>	<b>Field ID</b>	<b>Matrix</b>	<b>Sample Date</b>	<b>Sample Time</b>	<b># Bottles</b>	<b>Pres.</b>	<b>QC</b>	<b>RSK 175</b>	<b>SW6260_25</b>	<b>SW6015M</b>	<b>SM2320B</b>	<b>EPA200.7/208</b>	<b>EPA 300.0</b>	<b>SM2640C</b>	<b>Total Cations - see comments</b>	<b>Total Anions - see comments</b>	<b>Total Dissolved Solids</b>	<b>Dissoved Methane, Ethane, Propane</b>	<b>BTEX &amp; TPH GRO</b>	<b>TPH DRO</b>	<b>Alkalinity, Carbonate, Bicarbonate, Total</b>	
	Werning 2-3	W	6/22/23	1030	11	1,2	II	X	X	X	X	X	X	X								
<b>*Time Zone: MST</b>		<b>Matrix: O = oil S = soil NS = non-soil solid W = water L = liquid E = extract F = filter</b>																				
<b>For metals or anions, please detail analytes below.</b>																						
<b>Comments:</b>	<b>Cations/Anions:</b>	<b>QC PACKAGE (check below)</b>																				
Calcium, Chloride, Magnesium, Potassium, Sodium, Sulfate Samples analyzed per COGCC Bradenhead Sampling Program  2.90		<input checked="" type="checkbox"/>	LEVEL II (Standard QC)																			
		<input type="checkbox"/>	LEVEL III (Std QC + forms)																			
		<input type="checkbox"/>	LEVEL IV (Std QC + forms + raw data)																			
		<input type="checkbox"/>																				
<b>Preservative Key:</b>		1-HCl 2-HNO3 3-H2SO4 4-NaOH 5-NaHSO4 7-Other 8-4 degrees C 9-5035																				
<b>RELINQUISHED BY</b>		SIGNATURE		PRINTED NAME		DATE		TIME														
				Jeff Braden		6/23/23		1200														
<b>RECEIVED BY</b>				Tyler Monroe		6/23/23		1200														
<b>RELINQUISHED BY</b>				Tyler Monroe		6/23/23		1600														
<b>RECEIVED BY</b>				Tyler Monroe		6-24-23		0905														
<b>RELINQUISHED BY</b>																						
<b>RECEIVED BY</b>																						

PDC Energy  
Werning 2-3  
HS23061733

