



Wednesday, August 31, 2022

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

Re: ALS Workorder: 2208347  
Project Name: Volt 21N BH  
Project Number:

Dear Mr. Trehus:

Two water samples were received from PDC Energy, on 8/12/2022. The samples were scheduled for the following analyses:

Dissolved Gasses

GC/MS Volatiles

Inorganics

Metals

Total Extractable Petroleum Hydrocarbons (Diesel)

Total Volatile Petroleum Hydrocarbons (Gasoline)

TDS - Subcontracted to ALS MI


The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental  
Katie M. O'Brien  
Project Manager

	<h1>Accreditations</h1>	Effective June 7, 2022
		ALS   Environmental – Fort Collins

**Accreditations:** ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
Arizona	AZ0828
California (CA)	2926
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
Oklahoma	1301
Louisiana	197538
Maryland (MD)	285
PJLA (DoD ELAP/ISO 170250)	95377
PJLA (DOE-AP/ISO 17025)	95377
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO010992018-1
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	TN02976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280
Virginia	460305

**40 CFR Part 136:** All analyses for Clean Water Act samples are analyzed using the 40 CFR Part 136 specified method and include all the QC requirements.



## 2208347

### **GC/MS Volatiles:**

The sample was analyzed using GC/MS following the current revision of SOP 525 based on SW-846 Method 8260C.

All acceptance criteria were met.

### **Dissolved Gasses:**

The sample was prepared and analyzed according to method RSK-175 procedures and the current revision of SOP 449.

All acceptance criteria were met.

### **DRO:**

The sample was analyzed following the current revision of SOP 406 generally based on SW-846 Methods 8000C and 8015D. TEPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C10 to C28.

A surrogate recovery could not be reported for sample -1 due to the dilution of the sample.

All acceptance criteria were met.

### **GRO:**

The sample was analyzed following the current revision of SOP 425 generally based on SW-846 Methods 8000C and 8015D. TVPH is a multicomponent mixture and is quantitated by summing the entire carbon range, rather than individual peaks. The carbon range integrated in this test extends from C6 to C10.

All acceptance criteria were met.

### **Metals:**

The samples were analyzed following Methods for the Determination of Metals in Environmental Samples – Supplement 1 procedures. Analysis by Trace ICP followed method 200.7 and the current revision of SOP 834.



Sample 2208347-2 was to be analyzed for dissolved metals. The sample was filtered through a 0.45 micron filter and preserved with nitric acid to a pH less than two prior to analysis.

All acceptance criteria were met.

**Inorganics:**

The sample was analyzed following EMSL and Standard Method procedures for the current revisions of the following SOPs and methods:

<u>Analyte</u>	<u>Method</u>	<u>SOP #</u>
Alkalinity	SM2320B	1106
Bicarbonate	SM2320B	1106
Carbonate	SM2320B	1106
Chloride	300.0 Revision 2.1	1113
Sulfate	300.0 Revision 2.1	1113

All acceptance criteria were met.

# ALS -- Fort Collins

## Sample Number(s) Cross-Reference Table

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**OrderNum:** 2208347

**Client Name:** PDC Energy

**Client Project Name:** Volt 21N BH

**Client Project Number:**

**Client PO Number:**

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Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
V-21N A	2208347-1		WATER	10-Aug-22	16:10
V-21N B	2208347-2		WATER	10-Aug-22	16:10



2225 Commerce Drive, Fort Collins, Colorado 80524  
 IF: (800) 443-1511 PH: (970) 490-1511 FX: (970) 490-1522

## Chain-of-Custody

Form 20218

[illegible]

6 of 26



**ALS Environmental - Fort Collins**  
**CONDITION OF SAMPLE UPON RECEIPT FORM**

Client: PDC Workorder No: 2208347  
 Project Manager: KMO Initials: CXT Date: 8/12/2022

	N/A	YES	NO
1. Are airbills / shipping documents present and/or removable?	X		
Tracking number:			
2. Are custody seals on shipping containers intact?	X		
3. Are custody seals on sample containers intact?	X		
4. Is there a COC (chain-of-custody) present?		X	
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		X	
6. Are short-hold samples present?			X
7. Are all samples within holding times for the requested analyses?		X	
8. Were all sample containers received intact? (not broken or leaking)		X	
9. Is there sufficient sample for the requested analyses?		X	
10. Are samples in proper containers for requested analyses? (form 250, <i>Sample Handling Guidelines</i> )		X	
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		X	
12. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)		X	
13. Were the samples shipped on ice?		X	
14. Were cooler temperatures measured at 0.1-6.0°C?	IR gun used*: #6		RAD ONLY
Cooler #: <u>1</u> Temperature (°C): <u>1.1</u> # of custody seals on cooler: <u>0</u> External µR/hr reading: <u>NA</u> Background µR/hr reading: <u>11</u> Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? NA (If no, see Form 008.)			

\* Please provide details here for NO responses to boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

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Were unpreserved bottles pH checked? NA All client bottle ID's vs ALS lab ID's double-checked by: CT

If applicable, was the client contacted? YES / NO / NA Contact: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Project Manager Signature / Date: Margaret G. Brown 8/12/22

## ALS -- Fort Collins

## SAMPLE SUMMARY REPORT

Client: PDC Energy  
 Project: Volt 21N BH  
 Sample ID: V-21N A  
 Legal Location:  
 Collection Date: 8/10/2022 16:10

Date: 31-Aug-22  
 Work Order: 2208347  
 Lab ID: 2208347-1  
 Matrix: WATER  
 Percent Moisture:

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Alkalinity as Calcium Carbonate</b>			<b>SM2320B</b>		Prep Date: 8/22/2022	PrepBy: AOW
BICARBONATE AS CaCO3	150		20	MG/L	1	8/22/2022
CARBONATE AS CaCO3	160		20	MG/L	1	8/22/2022
TOTAL ALKALINITY AS CaCO3	310		20	MG/L	1	8/22/2022
<b>Diesel Range Organics</b>			<b>SW8015M</b>		Prep Date: 8/22/2022	PrepBy: JRS
Diesel Range Organics	6600		94	MG/L	50	8/24/2022 09:04
Surr: O-TERPHENYL		X	69-120	%REC	50	8/24/2022 09:04
<b>Dissolved Gasses</b>			<b>RSK175</b>		Prep Date: 8/19/2022	PrepBy: JRS
METHANE	1900		2	UG/L	1	8/22/2022 13:22
ETHANE	670		4	UG/L	1	8/22/2022 13:22
PROPANE	400		6	UG/L	1	8/22/2022 13:22
<b>Gasoline Range Organics</b>			<b>SW8015</b>		Prep Date: 8/24/2022	PrepBy: JRS
GASOLINE RANGE ORGANICS	160		10	MG/L	100	8/30/2022 12:57
Surr: 2,3,4-TRIFLUOROTOLUENE	117		80-120	%REC	100	8/30/2022 12:57
<b>GC/MS Volatiles</b>			<b>SW8260_25</b>		Prep Date: 8/22/2022	PrepBy: TWK
BENZENE	250		50	UG/L	50	8/22/2022 18:55
TOLUENE	1700		50	UG/L	50	8/22/2022 18:55
ETHYLBENZENE	140		50	UG/L	50	8/22/2022 18:55
M+P-XYLENE	1300		50	UG/L	50	8/22/2022 18:55
O-XYLENE	370		50	UG/L	50	8/22/2022 18:55
TOTAL XYLENES	1700		1	UG/L	1	8/22/2022 18:55
Surr: 4-BROMOFLUOROBENZENE	108		80-120	%REC	50	8/22/2022 18:55
Surr: DIBROMOFLUOROMETHANE	97		80-120	%REC	50	8/22/2022 18:55
Surr: TOLUENE-D8	102		80-120	%REC	50	8/22/2022 18:55
<b>Ion Chromatography</b>			<b>EPA300.0</b>		Prep Date: 8/13/2022	PrepBy: AOW
CHLORIDE	2800		40	MG/L	200	8/13/2022 16:14
SULFATE	930		200	MG/L	200	8/13/2022 16:14
<b>Total Recoverable Metals by 200.7</b>			<b>EPA200.7</b>		Prep Date: 8/19/2022	PrepBy: ETC
CALCIUM	2000		100	MG/L	10	8/23/2022 16:24
POTASSIUM	220		100	MG/L	10	8/23/2022 16:24
MAGNESIUM	ND		100	MG/L	10	8/23/2022 16:24
SODIUM	320		100	MG/L	10	8/23/2022 16:24



**Client:** PDC Energy  
**Project:** Volt 21N BH  
**Sample ID:** V-21N B  
**Legal Location:**  
**Collection Date:** 8/10/2022 16:10

**Date:** 31-Aug-22  
**Work Order:** 2208347  
**Lab ID:** 2208347-2  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>Dissolved Metals by 200.7</b>			<b>EPA200.7</b>		Prep Date: 8/19/2022	PrepBy:ETC
<b>CALCIUM</b>	1900		100	MG/L	10	8/23/2022 16:25
<b>POTASSIUM</b>	220		100	MG/L	10	8/23/2022 16:25
<b>MAGNESIUM</b>	ND		100	MG/L	10	8/23/2022 16:25
<b>SODIUM</b>	300		100	MG/L	10	8/23/2022 16:25

**Client:** PDC Energy  
**Project:** Volt 21N BH  
**Sample ID:** V-21N B  
**Legal Location:**  
**Collection Date:** 8/10/2022 16:10

**Date:** 31-Aug-22  
**Work Order:** 2208347  
**Lab ID:** 2208347-2  
**Matrix:** WATER  
**Percent Moisture:**

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
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### Explanation of Qualifiers

#### Radiochemistry:

- "Report Limit" is the MDC  
 U or ND - Result is less than the sample specific MDC.  
 Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.  
 Y2 - Chemical Yield outside default limits.  
 W - DER is greater than Warning Limit of 1.42  
 \* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.  
 # - Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.  
 G - Sample density differs by more than 15% of LCS density.  
 D - DER is greater than Control Limit  
 M - Requested MDC not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.  
 L - LCS Recovery below lower control limit.  
 H - LCS Recovery above upper control limit.  
 P - LCS, Matrix Spike Recovery within control limits.  
 N - Matrix Spike Recovery outside control limits  
 NC - Not Calculated for duplicate results less than 5 times MDC  
 B - Analyte concentration greater than MDC.  
 B3 - Analyte concentration greater than MDC but less than Requested MDC.

#### Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).  
 U or ND - Indicates that the compound was analyzed for but not detected.  
 E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.  
 M - Duplicate injection precision was not met.  
 N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.  
 Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.  
 \* - Duplicate analysis (relative percent difference) not within control limits.  
 S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

#### Organics:

U or ND - Indicates that the compound was analyzed for but not detected.  
 B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.  
 E - Analyte concentration exceeds the upper level of the calibration range.  
 J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).  
 A - A tentatively identified compound is a suspected aldol-condensation product.  
 X - The analyte was diluted below an accurate quantitation level.  
 \* - The spike recovery is equal to or outside the control criteria used.  
 + - The relative percent difference (RPD) equals or exceeds the control criteria.  
 G - A pattern resembling gasoline was detected in this sample.  
 D - A pattern resembling diesel was detected in this sample.  
 M - A pattern resembling motor oil was detected in this sample.  
 C - A pattern resembling crude oil was detected in this sample.  
 4 - A pattern resembling JP-4 was detected in this sample.  
 5 - A pattern resembling JP-5 was detected in this sample.  
 H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.  
 L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.  
 Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:  
 - gasoline  
 - JP-8  
 - diesel  
 - mineral spirits  
 - motor oil  
 - Stoddard solvent  
 - bunker C

## ALS -- Fort Collins

Client: PDC Energy  
Work Order: 2208347  
Project: Volt 21N BH

Date: 8/31/2022 3:02:0

## QC BATCH REPORT

Batch ID: **HC220819-91-1** Instrument ID: **MEE-1** Method: **RSK175**

**LCS** Sample ID: **HC220819-91** Units: **UG/L** Analysis Date: **8/22/2022 12:26**

Client ID: Run ID: **HC220825-91A** Prep Date: **8/19/2022** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
METHANE	133	2	142		94	76-125				25	
ETHANE	249	4	267		93	70-120				25	
PROPANE	364	6	391		93	72-120				25	

**LCSD** Sample ID: **HC220819-91** Units: **UG/L** Analysis Date: **8/22/2022 15:48**

Client ID: Run ID: **HC220825-91A** Prep Date: **8/19/2022** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
METHANE	119	2	142		83	76-125		133	12	25	
ETHANE	223	4	267		84	70-120		249	11	25	
PROPANE	324	6	391		83	72-120		364	11	25	

**MB** Sample ID: **HC220819-91** Units: **UG/L** Analysis Date: **8/22/2022 12:30**

Client ID: Run ID: **HC220825-91A** Prep Date: **8/19/2022** DF: **1**

Analyte	Result	ReportLimit	Qual
METHANE	ND	2	
ETHANE	ND	4	
PROPANE	ND	6	

The following samples were analyzed in this batch: 2208347-1

Client: PDC Energy  
Work Order: 2208347  
Project: Volt 21N BH

## QC BATCH REPORT

Batch ID: **HC220822-81-1** Instrument ID: **FUELS-1** Method: **SW8015M**

**LCS** Sample ID: **HC220822-81** Units: **MG/L** Analysis Date: **8/24/2022 07:18**

Client ID: Run ID: **HC220830-81A** Prep Date: **8/22/2022** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
Diesel Range Organics	9.57	1.07	8.33		115	53-120				20	
Surr: O-TERPHENYL	1.96		1.67		118	69-120					

**LCSD** Sample ID: **HC220822-81** Units: **MG/L** Analysis Date: **8/24/2022 07:40**

Client ID: Run ID: **HC220830-81A** Prep Date: **8/22/2022** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
Diesel Range Organics	9.77	1.07	8.33		117	53-120		9.57	2	20	
Surr: O-TERPHENYL	1.93		1.67		116	69-120			2		

**MB** Sample ID: **HC220822-81** Units: **MG/L** Analysis Date: **8/24/2022 06:58**

Client ID: Run ID: **HC220830-81A** Prep Date: **8/22/2022** DF: **1**

Analyte	Result	ReportLimit									Qual
Diesel Range Organics	ND	1.1									
Surr: O-TERPHENYL	1.91				115	69-120					

The following samples were analyzed in this batch:

2208347-1

Client: PDC Energy  
Work Order: 2208347  
Project: Volt 21N BH

## QC BATCH REPORT

Batch ID: **HC220824-61-1** Instrument ID: **FUELS-1** Method: **SW8015**

<b>LCS</b>		Sample ID: <b>HC220824-61</b>				Units: <b>MG/L</b>		Analysis Date: <b>8/29/2022 12:52</b>				
Client ID:		Run ID: <b>HC220831-61A</b>				Prep Date: <b>8/24/2022</b>			DF: <b>1</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual	
GASOLINE RANGE ORGANICS	0.469	0.1	0.5		94	80-120				20		
Surr: 2,3,4-TRIFLUOROTOLUENE	0.113		0.1		113	80-120						

<b>LCSD</b>		Sample ID: <b>HC220824-61</b>				Units: <b>MG/L</b>		Analysis Date: <b>8/29/2022 13:07</b>				
Client ID:		Run ID: <b>HC220831-61A</b>				Prep Date: <b>8/24/2022</b>			DF: <b>1</b>			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual	
GASOLINE RANGE ORGANICS	0.478	0.1	0.5		96	80-120		0.469	2	20		
Surr: 2,3,4-TRIFLUOROTOLUENE	0.113		0.1		113	80-120			0			

MB		Sample ID: <b>HC220824-61</b>				Units: <b>MG/L</b>		Analysis Date: <b>8/29/2022 13:38</b>			
Client ID:		Run ID: <b>HC220831-61A</b>				Prep Date: <b>8/24/2022</b>			DF: <b>1</b>		
Analyte		Result	ReportLimit		Qual						
GASOLINE RANGE ORGANICS		ND	0.1								
Surr: 2,3,4-TRIFLUOROTOLUENE		0.112			112	80-120					

The following samples were analyzed in this batch:

2208347-1

Client: PDC Energy  
Work Order: 2208347  
Project: Volt 21N BH

## QC BATCH REPORT

Batch ID: **IP220819-1-2** Instrument ID: **ICP5900** Method: **EPA200.7**

**LCS** Sample ID: **IP220819-1** Units: **MG/L** Analysis Date: **8/23/2022 16:20**

Client ID: Run ID: **IT220823-2A6** Prep Date: **8/19/2022** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
CALCIUM	39.6	1	40		99	85-115				20	
MAGNESIUM	38.7	1	40		97	85-115				20	
POTASSIUM	34.7	1	40		87	85-115				20	
SODIUM	35	1	40		88	85-115				20	

**LCSD** Sample ID: **IP220819-1** Units: **MG/L** Analysis Date: **8/23/2022 16:21**

Client ID: Run ID: **IT220823-2A6** Prep Date: **8/19/2022** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
CALCIUM	39.6	1	40		99	85-115		39.6	0	20	
MAGNESIUM	38.9	1	40		97	85-115		38.7	0	20	
POTASSIUM	35.5	1	40		89	85-115		34.7	2	20	
SODIUM	35.7	1	40		89	85-115		35	2	20	

**MB** Sample ID: **IP220819-1** Units: **MG/L** Analysis Date: **8/23/2022 16:16**

Client ID: Run ID: **IT220823-2A6** Prep Date: **8/19/2022** DF: **1**

Analyte	Result	ReportLimit	Qual
CALCIUM	ND	1	
MAGNESIUM	ND	1	
POTASSIUM	ND	1	
SODIUM	ND	1	

The following samples were analyzed in this batch:

2208347-1

Client: PDC Energy  
Work Order: 2208347  
Project: Volt 21N BH

## QC BATCH REPORT

Batch ID: IP220819-1-3 Instrument ID: ICP5900 Method: EPA200.7

LCS	Sample ID: IP220819-1				Units: MG/L		Analysis Date: 8/23/2022 16:20				
Client ID:		Run ID: IT220823-2A6				Prep Date: 8/19/2022			DF: 1		
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
CALCIUM	39.6	1	40		99	85-115				20	
MAGNESIUM	38.7	1	40		97	85-115				20	
POTASSIUM	34.7	1	40		87	85-115				20	
SODIUM	35	1	40		88	85-115				20	

LCSD		Sample ID: IP220819-1				Units: MG/L		Analysis Date: 8/23/2022 16:21			
Client ID:		Run ID: IT220823-2A6				Prep Date: 8/19/2022		DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
CALCIUM	39.6	1	40		99	85-115		39.6	0	20	
MAGNESIUM	38.9	1	40		97	85-115		38.7	0	20	
POTASSIUM	35.5	1	40		89	85-115		34.7	2	20	
SODIUM	35.7	1	40		89	85-115		35	2	20	

MB		Sample ID: <b>FP220815-1</b>		Units: <b>MG/L</b>		Analysis Date: <b>8/23/2022 16:19</b>	
Client ID:		Run ID: <b>IT220823-2A6</b>		Prep Date: <b>8/19/2022</b>		DF: <b>1</b>	
Analyte		Result	ReportLimit	Qual			
CALCIUM		ND	1				
MAGNESIUM		ND	1				
POTASSIUM		ND	1				
SODIUM		ND	1				

The following samples were analyzed in this batch:

2208347-2

Client: PDC Energy  
Work Order: 2208347  
Project: Volt 21N BH

## QC BATCH REPORT

Batch ID: VL220822-3-2 Instrument ID: HPV3 Method: SW8260\_25

LCS		Sample ID: VL220822-3			Units: %REC		Analysis Date: 8/22/2022 15:43				
Client ID:		Run ID: VL220822-3A			Prep Date: 8/22/2022			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	24.9		25		100	80-120					
Surr: DIBROMOFLUOROMETHANE	25.7		25		103	80-120					
Surr: TOLUENE-D8	24.4		25		98	80-120					
BENZENE	10.1	1	10		101	80-120				20	
TOLUENE	10.2	1	10		102	80-120				20	
ETHYLBENZENE	10.1	1	10		101	80-120				20	
M+P-XYLENE	20	1	20		100	80-120				20	
O-XYLENE	10.2	1	10		102	80-120				20	

LCSD		Sample ID: VL220822-3			Units: %REC			Analysis Date: 8/22/2022 16:07			
Client ID:		Run ID: VL220822-3A			Prep Date: 8/22/2022			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
Surr: 4-BROMOFLUOROBENZENE	25.2		25		101	80-120			1		
Surr: DIBROMOFLUOROMETHANE	25.6		25		103	80-120			0		
Surr: TOLUENE-D8	24.8		25		99	80-120			1		
BENZENE	10.9	1	10		109	80-120		10.1	7	20	
TOLUENE	10.8	1	10		108	80-120		10.2	6	20	
ETHYLBENZENE	10.8	1	10		108	80-120		10.1	6	20	
M+P-XYLENE	21.6	1	20		108	80-120		20	8	20	
O-XYLENE	10.7	1	10		107	80-120		10.2	5	20	

MB		Sample ID: VL220822-3		Units: %REC		Analysis Date: 8/22/2022 17:21	
Client ID:		Run ID: VL220822-3A		Prep Date: 8/22/2022		DF: 1	
Analyte		Result	ReportLimit			Qual	
Surr: 4-BROMOFLUOROBENZENE		25.3		101	80-120		
Surr: DIBROMOFLUOROMETHANE		25.4		102	80-120		
Surr: TOLUENE-D8		24.5		98	80-120		
BENZENE		ND	1				
TOLUENE		ND	1				
ETHYLBENZENE		ND	1				
M+P-XYLENE		ND	1				
O-XYLENE		ND	1				
TOTAL XYLENES		ND	1				

The following samples were analyzed in this batch:

2208347-1



**Client:** PDC Energy  
**Work Order:** 2208347  
**Project:** Volt 21N BH

## QC BATCH REPORT

Batch ID: **AK220822-1-1** Instrument ID: **NONE** Method: **SM2320B**

**LCS** Sample ID: **AK220822-1** Units: **MG/L** Analysis Date: **8/22/2022**

Client ID: Run ID: **AK220822-1A1** Prep Date: **8/22/2022** DF: **1**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
TOTAL ALKALINITY AS CaCO3	100	5	100		100	85-115				15	

**MB** Sample ID: **AK220822-1** Units: **MG/L** Analysis Date: **8/22/2022**

Client ID: Run ID: **AK220822-1A1** Prep Date: **8/22/2022** DF: **1**

Analyte	Result	ReportLimit	Qual
BICARBONATE AS CaCO3	ND	5	
CARBONATE AS CaCO3	ND	5	
TOTAL ALKALINITY AS CaCO3	ND	5	

The following samples were analyzed in this batch:

2208347-1

Client: PDC Energy  
Work Order: 2208347  
Project: Volt 21N BH

## QC BATCH REPORT

Batch ID: IC220813-1-1 Instrument ID: IC3 Method: EPA300.0

LCS	Sample ID: IC220813-1				Units: MG/L		Analysis Date: 8/13/2022 13:18				
Client ID:	Run ID: IC220813-1A1				Prep Date: 8/13/2022			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
CHLORIDE	9.85	0.2	10		99	90-110				15	
SULFATE	47.5	1	50		95	90-110				15	

LCSD	Sample ID: IC220813-1				Units: MG/L		Analysis Date: 8/13/2022 14:31				
Client ID:	Run ID: IC220813-1A1				Prep Date: 8/13/2022			DF: 1			
Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	RPD Ref Value	RPD	RPD Limit	Qual
CHLORIDE	9.75	0.2	10		97	90-110		9.85	1	15	
SULFATE	47.8	1	50		96	90-110		47.5	1	15	

MB		Sample ID: IC220813-1		Units: MG/L		Analysis Date: 8/13/2022 13:24	
Client ID:		Run ID: IC220813-1A1		Prep Date: 8/13/2022		DF: 1	
Analyte		Result	ReportLimit	Qual			
CHLORIDE		ND	0.2				
SULFATE		ND	1				

The following samples were analyzed in this batch:

2208347-1



20-Aug-2022

Katie O'Brien  
ALS Environmental  
225 Commerce Dr  
Ft. Collins, CO 80524

Re: **2208347**

Work Order: **22081447**

Dear Katie,

ALS Environmental received 1 sample on 13-Aug-2022 10:15 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 8.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA  
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Jodi Blouw

Jodi Blouw

## Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

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**Client:** ALS Environmental  
**Project:** 2208347  
**Work Order:** 22081447

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**Work Order Sample Summary**

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<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
22081447-01	V-21N A	Water		8/10/2022 16:10	8/13/2022 10:15	<input type="checkbox"/>

---

**Client:** ALS Environmental  
**Project:** 2208347  
**WorkOrder:** 22081447

## **QUALIFIERS, ACRONYMS, UNITS**

<b><u>Qualifier</u></b>	<b><u>Description</u></b>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Analyte accreditation is not offered
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
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<b><u>Acronym</u></b>	<b><u>Description</u></b>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<b><u>Units Reported</u></b>	<b><u>Description</u></b>
mg/L	Milligrams per Liter

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**Client:** ALS Environmental  
**Project:** 2208347  
**Work Order:** 22081447

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**Case Narrative**

Samples for the above noted Work Order were received on 08/13/2022. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

Wet Chemistry:

No deviations or anomalies were noted.

# ALS Group USA, Corp

Date: 20-Aug-22

CLIENT: ALS Environmental  
Project: 2208347

Work Order: 22081447

Lab ID: 22081447-01A

Collection Date: 8/10/2022 4:10:00 PM

Client Sample ID: V-21N A

Matrix: WATER

Analyses	Result	Report Limit	MDL	Qual	Units	Dilution Factor	Date Analyzed
<b>TOTAL DISSOLVED SOLIDS</b>			<b>A2540 C-15</b>				Analyst: <b>LAD</b>
Total Dissolved Solids	28,000	1,500	1,100		mg/L	1	8/18/2022 01:23 PM

**Qualifiers:** U - Analyzed for but Not Detected  
J - Analyte detected below quantitation limits  
B - Analyte detected in the associated Method Blank  
\* - Value exceeds Maximum Contaminant Level

S - Spike Recovery outside accepted recovery limits  
P - Dual Column results RPD > 40%  
E - Value above quantitation range  
H - Analyzed outside of Hold Time

AR Page 1 of 1

Client: ALS Environmental

Work Order: 22081447

Project: 2208347

## QC BATCH REPORT

Batch ID: 201481

Instrument ID TDS

Method: A2540 C-15

<b>MBLK</b>		Sample ID: <b>MBLK-201481-201481</b>				Units: <b>mg/L</b>		Analysis Date: <b>8/18/2022 01:23 PM</b>			
Client ID:		Run ID: <b>TDS_220818B</b>				SeqNo: <b>8719513</b>		Prep Date: <b>8/16/2022</b>		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids	U	22	30								

<b>LCS</b>		Sample ID: <b>LCS-201481-201481</b>				Units: <b>mg/L</b>		Analysis Date: <b>8/18/2022 01:23 PM</b>			
Client ID:		Run ID: <b>TDS_220818B</b>				SeqNo: <b>8719512</b>		Prep Date: <b>8/16/2022</b>		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids	502	22	30	495	0	101	85-109	0			

<b>DUP</b>		Sample ID: <b>22081451-04A DUP</b>				Units: <b>mg/L</b>		Analysis Date: <b>8/18/2022 01:23 PM</b>			
Client ID:		Run ID: <b>TDS_220818B</b>				SeqNo: <b>8719507</b>		Prep Date: <b>8/16/2022</b>		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids	1413	74	100	0	0	0	0-0	1387	1.9	10	

<b>DUP</b>		Sample ID: <b>22081451-05A DUP</b>				Units: <b>mg/L</b>		Analysis Date: <b>8/18/2022 01:23 PM</b>			
Client ID:		Run ID: <b>TDS_220818B</b>				SeqNo: <b>8719509</b>		Prep Date: <b>8/16/2022</b>		DF: <b>1</b>	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids	526.7	37	50	0	0	0	0-0	523.3	0.635	10	

The following samples were analyzed in this batch:

22081447-01A

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





Sample Receipt Checklist

Client Name: **ALS - FORT COLLINS**

Date/Time Received: **13-Aug-22 10:15**

Work Order: **22081447**

Received by: **LYS**

Checklist completed by Lydia Sweet 15-Aug-22  
eSignature Date

Reviewed by: Jodi Blum 16-Aug-22  
eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>2.9/3.9c</u>		<u>IR3</u>
Cooler(s)/Kit(s):	<u></u>		
Date/Time sample(s) sent to storage:	<u>8/15/2022 1:11:29 PM</u>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:	<u>-</u>		

Login Notes:

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Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction: