

**PERMIAN BASIN
ENVIRONMENTAL LAB, LP
1400 Rankin Hwy
Midland, TX 79701**



Analytical Report

Prepared for:

Christine Alderman
Cimarex
600 N. Marinfeld, Ste. 600
Midland, TX 79701

Project: Assault SWD

Project Number: [none]

Location:

Lab Order Number: 7H13001



NELAP/TCEQ # T104704516-16-7

Report Date: 08/16/17

Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S-1	7H13001-01	Water	08/13/17 08:00	08-13-2017 15:24
S-2	7H13001-02	Water	08/13/17 15:24	08-13-2017 15:24
S-3	7H13001-03	Water	08/13/17 09:20	08-13-2017 15:24
S-3A	7H13001-04	Water	08/13/17 09:33	08-13-2017 15:24
S-3B	7H13001-05	Water	08/13/17 09:41	08-13-2017 15:24
S-4	7H13001-06	Water	08/13/17 09:55	08-13-2017 15:24
S-4A	7H13001-07	Water	08/13/17 10:05	08-13-2017 15:24
S-4B	7H13001-08	Water	08/13/17 10:15	08-13-2017 15:24
S-4C	7H13001-09	Water	08/13/17 10:35	08-13-2017 15:24
S-5	7H13001-10	Water	08/13/17 09:23	08-13-2017 15:24
S-5A	7H13001-11	Water	08/13/17 09:46	08-13-2017 15:24
S-5B	7H13001-12	Water	08/13/17 12:36	08-13-2017 15:24
S-6	7H13001-13	Water	08/13/17 09:54	08-13-2017 15:24
S-6A	7H13001-14	Water	08/13/17 10:22	08-13-2017 15:24
S-6C	7H13001-15	Water	08/13/17 11:50	08-13-2017 15:24
DUP-1	7H13001-16	Water	08/13/17 12:00	08-13-2017 15:24
DUP-2	7H13001-17	Water	08/13/17 12:00	08-13-2017 15:24

Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
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Fax: (432) 571-7832

S-1
7H13001-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1406	08/14/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1406	08/14/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1406	08/14/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		126 %	70-130		P7H1406	08/14/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		140 %	70-130		P7H1406	08/14/17	08/15/17	TX 1005	S-GC
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/14/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	120	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	120	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	0.237	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	81.0	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2970	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	7.87		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.40		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2810	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1700	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	639	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Magnesium	53.2	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Potassium	4.53	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	J
Sodium	104	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Hardness	1810	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	

Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

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Fax: (432) 571-7832

S-2
7H13001-02 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1406	08/14/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1406	08/14/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1406	08/14/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		123 %	70-130		P7H1406	08/14/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		139 %	70-130		P7H1406	08/14/17	08/15/17	TX 1005	S-GC
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/14/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	100	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	100	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	68.7	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2900	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	7.84		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.10		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2810	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1650	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	676	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Magnesium	39.6	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Potassium	6.21	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Sodium	67.3	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Hardness	1850	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	

Cimarex
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S-3
7H13001-03 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1406	08/14/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1406	08/14/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1406	08/14/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		128 %	70-130		P7H1406	08/14/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		143 %	70-130		P7H1406	08/14/17	08/15/17	TX 1005	S-GC
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/14/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	120	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	120	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	0.231	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	61.6	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2850	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	7.85		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.00		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2860	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1650	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	698	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Magnesium	42.6	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Potassium	5.82	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Sodium	73.5	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Hardness	1920	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	

Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

S-3A

7H13001-04 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1406	08/14/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1406	08/14/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1406	08/14/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		119 %	70-130		P7H1406	08/14/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		135 %	70-130		P7H1406	08/14/17	08/15/17	TX 1005	S-GC
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/14/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	110	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	110	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	0.251	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	71.5	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2990	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	8.01		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.40		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2830	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1660	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	660	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Magnesium	45.2	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Potassium	6.54	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Sodium	81.9	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Hardness	1830	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	

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600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
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S-3B

7H13001-05 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		89.2 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		102 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	127	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	127	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	0.248	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	72.0	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2910	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	7.96		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.00		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2840	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1640	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	506	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Magnesium	35.0	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Potassium	4.03	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	J
Sodium	65.0	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Hardness	1410	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	

Cimarex
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Midland TX, 79701

Project: Assault SWD
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Fax: (432) 571-7832

S-4
7H13001-06 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		88.8 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		100 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	115	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	115	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	85.4	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	3000	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	7.92		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.10		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2990	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1640	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	609	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Magnesium	45.1	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Potassium	6.27	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Sodium	86.7	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Hardness	1710	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	

Cimarex
600 N. Marinfeld, Ste. 600
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Project Manager: Christine Alderman

Fax: (432) 571-7832

S-4A

7H13001-07 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		81.6 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		93.4 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	122	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	122	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	88.0	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2980	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	7.95		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.00		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2930	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1670	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	584	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Magnesium	44.8	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Potassium	6.21	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Sodium	87.2	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Hardness	1640	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	

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Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

S-4B

7H13001-08 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		85.7 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		98.0 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	107	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	107	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	91.3	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	3030	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	8.06		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.00		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2930	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1680	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	595	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Magnesium	44.7	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Potassium	4.17	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	J
Sodium	89.8	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Hardness	1670	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	

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Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

S-4C

7H13001-09 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		79.2 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		91.3 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	105	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	105	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	91.2	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	3030	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	8.01		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.00		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2900	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1690	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	560	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Magnesium	41.0	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Potassium	4.02	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	J
Sodium	84.0	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Hardness	1570	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	

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600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

S-5
7H13001-10 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		80.0 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		93.4 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	85.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	85.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	88.5	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2930	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	7.85		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	22.90		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2880	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1630	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	613	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Magnesium	40.3	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Potassium	6.63	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Sodium	83.3	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Hardness	1700	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	

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Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

S-5A
7H13001-11 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		78.9 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		89.6 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	65.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	65.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	0.225	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	51.6	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2800	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	7.96		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	22.80		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2620	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1370	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	546	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Magnesium	19.0	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Potassium	5.20	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Sodium	37.8	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Hardness	1440	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	

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Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

S-5B
7H13001-12 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		78.6 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		92.7 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	70.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	70.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	0.228	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	39.8	0.500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2630	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	7.86		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	22.90		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2570	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1280	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	542	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Magnesium	19.8	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Potassium	5.96	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Sodium	38.7	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	
Hardness	1430	5.00	mg/L	1	P7H1405	08/14/17	08/14/17	EPA 6010B	

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600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

S-6
7H13001-13 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		70.1 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		81.5 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	70.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	70.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	43.6	0.500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2680	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	7.91		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.00		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2650	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1390	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	599	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Magnesium	22.4	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Potassium	5.98	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Sodium	43.9	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Hardness	1590	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2

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600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

S-6A

7H13001-14 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: 1-Chlorooctane		74.4 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Surrogate: o-Terphenyl		85.7 %	70-130		P7H1512	08/15/17	08/15/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/15/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	67.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	67.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	54.8	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2700	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	7.83		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.40		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2620	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1410	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	523	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Magnesium	19.5	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Potassium	5.31	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Sodium	37.7	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Hardness	1380	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2

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Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

S-6C
7H13001-15 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		71.6 %	70-130		P7H1512	08/15/17	08/16/17	TX 1005	
Surrogate: o-Terphenyl		81.5 %	70-130		P7H1512	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	82.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	82.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	73.9	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2800	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	8.10		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.40		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2720	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1420	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	608	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Magnesium	33.4	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Potassium	6.51	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Sodium	65.6	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Hardness	1660	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2

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Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

DUP-1
7H13001-16 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		65.1 %	70-130		P7H1512	08/15/17	08/16/17	TX 1005	S-GC
Surrogate: o-Terphenyl		75.8 %	70-130		P7H1512	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	110	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	110	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	97.9	12.5	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	3020	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	8.02		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.10		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2890	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1560	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	597	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Magnesium	41.7	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Potassium	5.51	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Sodium	83.9	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Hardness	1660	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2

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Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

DUP-2
7H13001-17 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Permian Basin Environmental Lab, L.P.

Organics by GC

C6-C12	ND	2.50	mg/L	1	P7H1512	08/15/17	08/16/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H1512	08/15/17	08/16/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H1512	08/15/17	08/16/17	TX 1005	
Surrogate: 1-Chlorooctane		68.3 %	70-130		P7H1512	08/15/17	08/16/17	TX 1005	S-GC
Surrogate: o-Terphenyl		79.3 %	70-130		P7H1512	08/15/17	08/16/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/15/17	08/16/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	72.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bicarbonate Alkalinity	72.0	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H1413	08/14/17	08/14/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Chloride	39.6	0.500	mg/L	1	P7H1408	08/14/17	08/15/17	EPA 300.0	
Specific Conductance (EC)	2630	5.00	umhos/cm	1	P7H1501	08/15/17	08/15/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H1415	08/14/17	08/14/17	CHEMets	QAL1
pH	7.88		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Temperature	23.10		pH Units	1	P7H1414	08/14/17	08/14/17	EPA 150.1	
Total Dissolved Solids	2590	20.0	mg/L	1	P7H1416	08/14/17	08/14/17	EPA 160.1	
Sulfate	1370	25.0	mg/L	25	P7H1408	08/14/17	08/15/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	581	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Magnesium	19.8	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Potassium	5.52	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Sodium	37.9	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2
Hardness	1530	5.00	mg/L	1	P7H1412	08/14/17	08/16/17	EPA 6010B	QAL2

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Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

Organics by GC - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1406 - TX 1005

Blank (P7H1406-BLK1)

Prepared & Analyzed: 08/14/17

C6-C12	ND	2.50	mg/L							
>C12-C28	ND	2.50	"							
>C28-C35	ND	2.50	"							
Surrogate: 1-Chlorooctane	11.3		"	9.38		120	70-130			
Surrogate: o-Terphenyl	6.08		"	4.69		130	70-130			

LCS (P7H1406-BS1)

Prepared & Analyzed: 08/14/17

C6-C12	72.0	2.50	mg/L	93.8		76.8	75-125			
>C12-C28	71.0	2.50	"	93.8		75.8	75-125			
Surrogate: 1-Chlorooctane	11.0		"	9.38		118	70-130			
Surrogate: o-Terphenyl	5.48		"	4.69		117	70-130			

LCS Dup (P7H1406-BSD1)

Prepared & Analyzed: 08/14/17

C6-C12	71.9	2.50	mg/L	93.8		76.6	75-125	0.180	20	
>C12-C28	71.3	2.50	"	93.8		76.1	75-125	0.370	20	
Surrogate: 1-Chlorooctane	11.0		"	9.38		117	70-130			
Surrogate: o-Terphenyl	5.49		"	4.69		117	70-130			

Batch P7H1512 - TX 1005

Blank (P7H1512-BLK1)

Prepared & Analyzed: 08/15/17

C6-C12	ND	2.50	mg/L							
>C12-C28	ND	2.50	"							
>C28-C35	ND	2.50	"							
Surrogate: 1-Chlorooctane	9.70		"	9.38		104	70-130			
Surrogate: o-Terphenyl	5.41		"	4.69		115	70-130			

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Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

Organics by GC - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1512 - TX 1005

LCS (P7H1512-BS1)

Prepared & Analyzed: 08/15/17

C6-C12	81.8	2.50	mg/L	93.8		87.3	75-125			
>C12-C28	70.4	2.50	"	93.8		75.1	75-125			
Surrogate: 1-Chlorooctane	8.15		"	9.38		86.9	70-130			
Surrogate: o-Terphenyl	3.96		"	4.69		84.4	70-130			

LCS Dup (P7H1512-BSD1)

Prepared & Analyzed: 08/15/17

C6-C12	75.8	2.50	mg/L	93.8		80.8	75-125	7.67	20	
>C12-C28	82.8	2.50	"	93.8		88.3	75-125	16.1	20	
Surrogate: 1-Chlorooctane	9.71		"	9.38		104	70-130			
Surrogate: o-Terphenyl	5.01		"	4.69		107	70-130			

Duplicate (P7H1512-DUP1)

Source: 7H15006-03

Prepared: 08/15/17 Analyzed: 08/16/17

C6-C12	7.60	2.50	mg/L		7.53			0.917	20	
>C12-C28	ND	2.50	"		1.10				20	
Surrogate: 1-Chlorooctane	10.7		"	9.38		114	70-130			
Surrogate: o-Terphenyl	5.70		"	4.69		122	70-130			

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Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1408 - * DEFAULT PREP *****

Blank (P7H1408-BLK1)

Prepared: 08/14/17 Analyzed: 08/15/17

Bromide	ND	0.0500	mg/L							
Chloride	ND	0.500	"							
Sulfate	ND	1.00	"							

LCS (P7H1408-BS1)

Prepared: 08/14/17 Analyzed: 08/15/17

Bromide	5.93	0.0500	mg/L	5.00		119	80-120			
Chloride	42.8	0.500	"	40.0		107	85-115			
Sulfate	38.9	1.00	"	40.0		97.1	85-115			

LCS Dup (P7H1408-BSD1)

Prepared: 08/14/17 Analyzed: 08/15/17

Sulfate	38.9	1.00	mg/L	40.0		97.3	85-115	0.139	20	
Bromide	5.98	0.0500	"	5.00		120	80-120	0.772	20	
Chloride	43.4	0.500	"	40.0		108	85-115	1.35	20	

Duplicate (P7H1408-DUP1)

Source: 7H13001-01

Prepared: 08/14/17 Analyzed: 08/15/17

Bromide	ND	0.0500	mg/L		0.237				20	
Chloride	80.9	12.5	"		81.0			0.0618	20	
Sulfate	1700	25.0	"		1700			0.137	20	

Duplicate (P7H1408-DUP2)

Source: 7H13001-11

Prepared: 08/14/17 Analyzed: 08/15/17

Bromide	ND	0.0500	mg/L		0.225				20	
Chloride	52.4	12.5	"		51.6			1.59	20	
Sulfate	1400	25.0	"		1370			1.62	20	

Matrix Spike (P7H1408-MS1)

Source: 7H13001-01

Prepared: 08/14/17 Analyzed: 08/15/17

Bromide	49.4	1.25	mg/L	50.0	ND	98.8	75-125			
Chloride	458	12.5	"	400	81.0	94.3	80-120			
Sulfate	2070	25.0	"	400	1700	93.8	80-120			

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Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1413 - * DEFAULT PREP *****

Blank (P7H1413-BLK1)

Prepared & Analyzed: 08/14/17

Total Alkalinity	ND	10.0	mg/L
Carbonate Alkalinity	ND	10.0	"
Bicarbonate Alkalinity	ND	10.0	"
Hydroxide Alkalinity	ND	10.0	"

Blank (P7H1413-BLK2)

Prepared & Analyzed: 08/14/17

Total Alkalinity	ND	10.0	mg/L
Carbonate Alkalinity	ND	10.0	"
Bicarbonate Alkalinity	ND	10.0	"
Hydroxide Alkalinity	ND	10.0	"

Duplicate (P7H1413-DUP1)

Source: 7H13001-01

Prepared & Analyzed: 08/14/17

Total Alkalinity	125	10.0	mg/L	120	4.08	20
Carbonate Alkalinity	ND	10.0	"	ND		20
Bicarbonate Alkalinity	125	10.0	"	120	4.08	20
Hydroxide Alkalinity	ND	10.0	"	ND		20

Duplicate (P7H1413-DUP2)

Source: 7H13002-04

Prepared & Analyzed: 08/14/17

Total Alkalinity	77.0	10.0	mg/L	80.0	3.82	20
Carbonate Alkalinity	ND	10.0	"	ND		20
Bicarbonate Alkalinity	77.0	10.0	"	80.0	3.82	20
Hydroxide Alkalinity	ND	10.0	"	ND		20

Batch P7H1414 - * DEFAULT PREP *****

Duplicate (P7H1414-DUP1)

Source: 7H13001-01

Prepared & Analyzed: 08/14/17

pH	7.85	pH Units	7.87	0.254	20
Temperature	23.40	"	23.40	0.00	200

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Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1414 - * DEFAULT PREP *****

Duplicate (P7H1414-DUP2)	Source: 7H13002-04		Prepared & Analyzed: 08/14/17							
pH	8.00		pH Units		8.04			0.499	20	
Temperature	23.00		"		23.00			0.00	200	

Batch P7H1415 - * DEFAULT PREP *****

Duplicate (P7H1415-DUP1)	Source: 7H13002-11		Prepared & Analyzed: 08/14/17							
Dissolved Oxygen	6.00		mg/L		6.00			0.00	200	QAL1

Batch P7H1416 - * DEFAULT PREP *****

Blank (P7H1416-BLK1)			Prepared & Analyzed: 08/14/17							
Total Dissolved Solids	ND	20.0	mg/L							

Blank (P7H1416-BLK2)			Prepared & Analyzed: 08/14/17							
Total Dissolved Solids	ND	20.0	mg/L							

Duplicate (P7H1416-DUP1)	Source: 7H13001-01		Prepared & Analyzed: 08/14/17							
Total Dissolved Solids	2950	20.0	mg/L		2810			4.86	20	

Duplicate (P7H1416-DUP2)	Source: 7H13002-04		Prepared & Analyzed: 08/14/17							
Total Dissolved Solids	5960	20.0	mg/L		6010			0.835	20	

Batch P7H1501 - * DEFAULT PREP *****

Duplicate (P7H1501-DUP1)	Source: 7H13001-01		Prepared & Analyzed: 08/15/17							
Specific Conductance (EC)	2990	5.00	umhos/cm		2970			0.671	20	

Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1501 - * DEFAULT PREP *****

Duplicate (P7H1501-DUP2)

Source: 7H13002-01

Prepared & Analyzed: 08/15/17

Specific Conductance (EC)	2980	5.00	umhos/cm		2920			2.03	20	
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Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

Total Metals by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1405 - * DEFAULT PREP *****

Blank (P7H1405-BLK1)

Prepared & Analyzed: 08/14/17

Calcium	0.0295	5.00	mg/L							J
Magnesium	ND	5.00	"							
Potassium	0.0202	5.00	"							J
Sodium	0.230	5.00	"							J
Hardness	ND	5.00	"							

LCS (P7H1405-BS1)

Prepared & Analyzed: 08/14/17

Calcium	51.9	5.00	mg/L	50.0		104	80-120			
Magnesium	51.5	5.00	"	50.0		103	80-120			
Potassium	56.9	5.00	"	50.0		114	80-120			
Sodium	57.7	5.00	"	50.0		115	80-120			

Duplicate (P7H1405-DUP1)

Source: 7H12004-06

Prepared & Analyzed: 08/14/17

Calcium	432	5.00	mg/L		455			5.20	20	
Magnesium	161	5.00	"		173			7.16	20	
Potassium	21.8	5.00	"		23.0			5.44	20	
Sodium	573	5.00	"		617			7.31	20	
Hardness	1740	5.00	"		1850			5.95	20	

Matrix Spike (P7H1405-MS1)

Source: 7H12004-06

Prepared & Analyzed: 08/14/17

Calcium	451	5.00	mg/L	50.0	455	NR	75-125			QM-07
Magnesium	204	5.00	"	50.0	173	61.8	75-125			QM-07
Potassium	78.7	5.00	"	50.0	23.0	111	75-125			
Sodium	574	5.00	"	50.0	617	NR	75-125			QM-07

Batch P7H1412 - * DEFAULT PREP *****

Blank (P7H1412-BLK1)

Prepared: 08/14/17 Analyzed: 08/16/17

Calcium	0.311	5.00	mg/L							QAL2, J
Magnesium	ND	5.00	"							QAL2
Potassium	ND	5.00	"							QAL2
Sodium	0.262	5.00	"							QAL2, J
Hardness	ND	5.00	"							QAL2

Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

Total Metals by EPA / Standard Methods - Quality Control
Permian Basin Environmental Lab, L.P.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P7H1412 - * DEFAULT PREP *****

LCS (P7H1412-BS1)

Prepared: 08/14/17 Analyzed: 08/16/17

Calcium	52.7	5.00	mg/L	50.0		105	80-120			QAL2
Magnesium	51.4	5.00	"	50.0		103	80-120			QAL2
Potassium	55.2	5.00	"	50.0		110	80-120			QAL2
Sodium	57.5	5.00	"	50.0		115	80-120			QAL2

Duplicate (P7H1412-DUP1)

Source: 7H13001-13

Prepared: 08/14/17 Analyzed: 08/16/17

Calcium	695	5.00	mg/L		599			14.9	20	QAL2
Magnesium	24.8	5.00	"		22.4			10.2	20	QAL2
Potassium	6.75	5.00	"		5.98			12.2	20	QAL2
Sodium	49.1	5.00	"		43.9			11.2	20	QAL2
Hardness	1840	5.00	"		1590			14.6	20	QAL2

Matrix Spike (P7H1412-MS1)

Source: 7H13001-13

Prepared: 08/14/17 Analyzed: 08/16/17

Calcium	678	5.00	mg/L	50.0	599	159	75-125			QAL2, QM-07
Magnesium	80.3	5.00	"	50.0	22.4	116	75-125			QAL2
Potassium	70.8	5.00	"	50.0	5.98	130	75-125			QAL2, QM-07
Sodium	107	5.00	"	50.0	43.9	126	75-125			QAL2, QM-07

Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
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Project Manager: Christine Alderman

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Notes and Definitions

S-GC Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

QAL2 Certification in process for this analyte.

QAL1 The Laboratory is not NELAC Certified for this analyte or analysis.

J Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

LCS Laboratory Control Spike

MS Matrix Spike

Dup Duplicate

Report Approved By:



Date:

8/16/2017

Brent Barron, Laboratory Director/Technical Director

Cimarex
600 N. Marinfeld, Ste. 600
Midland TX, 79701

Project: Assault SWD
Project Number: [none]
Project Manager: Christine Alderman

Fax: (432) 571-7832

This material is intended only for the use of the individual (s) or entity to whom it is addressed, and may contain information that is privileged and confidential.

If you have received this material in error, please notify us immediately at 432-686-7235.



CHAIN OF CUSTODY RECORD

7H13001 000140

Facility Name Cimarex Energy		Analytical Laboratory Name PBE Labs		Today's Date 8/13/17											
Address 600 N Mainfield St		Address 432-853-7059		Page 1											
City Midland TX		City Christine Alderman		Of 2											
State TX		Zip 79701		Analysis/Analyses											
Sample Group Identifier Assault SWD		Carrier Waybill Number 432-853-7059													
Special Instructions 24 hr TAT															
Station Name or Sample ID	Sample Date	Time 24 hrs	Matrix	Sample Top Btm	Size	Containers Type No.	Y	Filtered N	Preservative	Comments					
S-1	8/13/17	08:00	W			3			COOL		Oil/Grease	TPH	St. H ₂ O And	Arion/Petrol	
S-2	8/13/17	09:13													
S-3	8/13/17	09:20													
S-3A	8/13/17	09:33													
S-3B	8/13/17	09:41													
S-4	8/13/17	09:55													
S-4A	8/13/17	10:05													
S-4B	8/13/17	10:15													
S-4C	8/13/17	10:35													
S-5	8/13/17	01:23													
S-5A	8/13/17	01:46													
S-5B	8/13/17	12:36													
S-6	8/13/17	01:54													

Notes:

Potential Hazardous Characteristics
☐ Non-Haz ☐ RCRA D001, 283, or 4 ☐ RCRA Listed ☐ Radioactive ☐ Unknown

Sample Disposal
☐ Disposal by Lab ☐ Return to Client ☐ Hold pending further instructions

1. Relinquished by **Kimberly M. Wilcox** Date **8/13/17** Time **12:50**

2. Received by **Christine Alderman** Date **8/13/17** Time **15:24**

3. Relinquished by **Christine Alderman** Date **8/13/17** Time **15:24**

4. Received by **Christine Alderman** Date **8/13/17** Time **15:24**

5. Relinquished by **Christine Alderman** Date **8/13/17** Time **15:24**

6. Received by **Christine Alderman** Date **8/13/17** Time **15:24**

Comments
Send invoice to ESH Department

Original - Send to lab with sample

Yellow - Return to ESH

Pink - Remain in book

2.0 NCF-1

Version 1: 4/21/2015

Facility Name		Analytical Laboratory Name		Today's Date	
Address		City		Page	
State		Zip		Of	
1. Reinquished by		2. Received by		Date	
3. Reinquished by		4. Received by		Date	
5. Reinquished by		6. Received by		Date	
Comments		Samples released by or H.P. name		Date	
Comments		Send invoice to ESH Department		Time	

Original – Send to lab with sample

Yellow – Return to FSH

Pink – Remain in book

2.0 VCF