

**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: 7H17011



NELAP/TCEQ # T104704516-16-7

Report Date: 08/25/17

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

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

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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S-1	7H17011-01	Water	08/17/17 07:48	08-17-2017 15:53
S-2	7H17011-02	Water	08/17/17 09:15	08-17-2017 15:53
S-3	7H17011-03	Water	08/17/17 09:23	08-17-2017 15:53
S-3A	7H17011-04	Water	08/17/17 09:36	08-17-2017 15:53
S-3B	7H17011-05	Water	08/17/17 09:42	08-17-2017 15:53
S-4	7H17011-06	Water	08/17/17 09:54	08-17-2017 15:53
S-4A	7H17011-07	Water	08/17/17 10:03	08-17-2017 15:53
S-4B	7H17011-08	Water	08/17/17 10:13	08-17-2017 15:53
S-4C	7H17011-09	Water	08/17/17 10:30	08-17-2017 15:53
S-5	7H17011-10	Water	08/17/17 09:21	08-17-2017 15:53
S-5A	7H17011-11	Water	08/17/17 09:45	08-17-2017 15:53
S-5B	7H17011-12	Water	08/17/17 10:58	08-17-2017 15:53
S-6	7H17011-13	Water	08/17/17 09:56	08-17-2017 15:53
S-6A	7H17011-14	Water	08/17/17 10:14	08-17-2017 15:53
S-6C	7H17011-15	Water	08/17/17 10:35	08-17-2017 15:53
DUP-1	7H17011-16	Water	08/17/17 12:00	08-17-2017 15:53
DUP-2	7H17011-17	Water	08/17/17 12:00	08-17-2017 15:53

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

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S-1
7H17011-01 (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	P7H2309	08/20/17	08/20/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/20/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/20/17	TX 1005	
Surrogate: 1-Chlorooctane		92.6 %	70-130		P7H2309	08/20/17	08/20/17	TX 1005	
Surrogate: o-Terphenyl		110 %	70-130		P7H2309	08/20/17	08/20/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/20/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	125	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	125	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.208	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	96.9	25.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	3220	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	8.01		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.10		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2860	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1910	50.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	617	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	58.9	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	6.11	2.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	98.6	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1780	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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S-2
7H17011-02 (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	P7H2309	08/20/17	08/20/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/20/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/20/17	TX 1005	
Surrogate: 1-Chlorooctane		69.3 %	70-130		P7H2309	08/20/17	08/20/17	TX 1005	S-GC
Surrogate: o-Terphenyl		77.4 %	70-130		P7H2309	08/20/17	08/20/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/20/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	121	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	121	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.238	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	115	25.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	3390	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.89		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.10		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2880	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1920	50.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	541	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	50.4	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	4.83	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	94.5	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1560	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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S-3

7H17011-03 (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	P7H2309	08/20/17	08/20/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/20/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/20/17	TX 1005	
Surrogate: 1-Chlorooctane		100 %	70-130		P7H2309	08/20/17	08/20/17	TX 1005	
Surrogate: o-Terphenyl		110 %	70-130		P7H2309	08/20/17	08/20/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/20/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	121	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	121	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.238	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	137	25.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	3410	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.90		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.10		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2720	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1910	50.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	540	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	50.1	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	4.36	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	94.4	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1550	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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S-3A
7H17011-04 (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	P7H2309	08/20/17	08/20/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/20/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/20/17	TX 1005	
Surrogate: 1-Chlorooctane		101 %	70-130		P7H2309	08/20/17	08/20/17	TX 1005	
Surrogate: o-Terphenyl		111 %	70-130		P7H2309	08/20/17	08/20/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/20/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	112	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	112	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.198	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	103	25.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	3440	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	8.05		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.20		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2800	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1810	50.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	650	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	55.2	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	4.38	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	102	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1850	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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Midland TX, 79701

Project: Assault SWD
Project Number: [none]
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S-3B

7H17011-05 (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	P7H2309	08/20/17	08/20/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/20/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/20/17	TX 1005	
Surrogate: 1-Chlorooctane		96.8 %	70-130		P7H2309	08/20/17	08/20/17	TX 1005	
Surrogate: o-Terphenyl		104 %	70-130		P7H2309	08/20/17	08/20/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/20/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	115	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	115	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.224	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	105	25.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	3420	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	8.03		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.10		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2980	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1880	50.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	645	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	55.2	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	4.26	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	101	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1840	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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Midland TX, 79701

Project: Assault SWD
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S-4
7H17011-06 (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	P7H2309	08/20/17	08/20/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/20/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/20/17	TX 1005	
Surrogate: 1-Chlorooctane		106 %	70-130		P7H2309	08/20/17	08/20/17	TX 1005	
Surrogate: o-Terphenyl		117 %	70-130		P7H2309	08/20/17	08/20/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/20/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	113	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	113	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.198	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	112	25.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	3360	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.77		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.10		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2770	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1900	50.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	529	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	45.3	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	3.73	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	83.8	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1510	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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

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

Fax: (432) 571-7832

S-4A

7H17011-07 (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	P7H2309	08/20/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		99.3 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		109 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	109	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	109	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.257	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	107	25.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	3330	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.82		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.10		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2800	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1890	50.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	531	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	45.0	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	4.04	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	83.8	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1510	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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

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

Fax: (432) 571-7832

S-4B

7H17011-08 (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	P7H2309	08/20/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		101 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		112 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	105	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	105	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.236	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	108	25.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	3410	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.85		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.10		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2780	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1900	50.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	487	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	41.1	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	2.90	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	75.6	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1380	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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S-4C

7H17011-09 (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	P7H2309	08/20/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		105 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		113 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	122	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	122	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.201	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	108	25.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	3200	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.90		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.30		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2760	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1910	50.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	637	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	53.8	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	5.60	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	99.9	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1810	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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S-5
7H17011-10 (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	P7H2309	08/20/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		95.1 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		104 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	110	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	110	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.204	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	129	25.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	3260	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.75		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.20		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2760	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1870	50.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	620	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	54.9	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	4.55	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	108	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1770	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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S-5A
7H17011-11 (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	P7H2309	08/20/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		105 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		112 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	102	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	102	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.239	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	109	25.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	3260	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.80		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	23.00		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2760	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1860	50.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	641	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	48.6	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	6.01	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	94.2	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1800	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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S-5B

7H17011-12 (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	P7H2309	08/20/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		97.4 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		108 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	98.0	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	98.0	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.215	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	105	25.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	3030	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.80		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	23.00		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2560	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1730	50.0	mg/L	50	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	492	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	38.8	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	3.05	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	74.9	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1390	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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S-6
7H17011-13 (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	P7H2309	08/20/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		103 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		110 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	92.0	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	92.0	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.196	0.0500	mg/L	1	P7H2120	08/21/17	08/22/17	EPA 300.0	
Chloride	99.0	12.5	mg/L	25	P7H2120	08/21/17	08/22/17	EPA 300.0	
Specific Conductance (EC)	2970	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.77		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.70		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2470	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1620	25.0	mg/L	25	P7H2120	08/21/17	08/22/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	484	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	37.0	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	3.02	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	73.1	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1360	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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S-6A
7H17011-14 (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	P7H2309	08/20/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		108 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		118 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	87.0	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	87.0	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	ND	0.0500	mg/L	1	P7H2215	08/22/17	08/24/17	EPA 300.0	
Chloride	91.4	25.0	mg/L	50	P7H2215	08/22/17	08/24/17	EPA 300.0	
Specific Conductance (EC)	3090	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.69		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.80		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2640	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1660	50.0	mg/L	50	P7H2215	08/22/17	08/24/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	638	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	34.8	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	1.94	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	75.4	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1740	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	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
7H17011-15 (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	P7H2309	08/20/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		102 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		115 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	89.0	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	89.0	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.229	0.0500	mg/L	1	P7H2215	08/22/17	08/24/17	EPA 300.0	
Chloride	75.0	12.5	mg/L	25	P7H2215	08/22/17	08/24/17	EPA 300.0	
Specific Conductance (EC)	2980	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.58		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.10		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2620	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1680	25.0	mg/L	25	P7H2215	08/22/17	08/24/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	659	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	33.8	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	3.82	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	69.4	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1780	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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Project Number: [none]
Project Manager: Christine Alderman

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DUP-1
7H17011-16 (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	P7H2309	08/20/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		103 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		111 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	103	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	103	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.232	0.0500	mg/L	1	P7H2215	08/22/17	08/24/17	EPA 300.0	
Chloride	96.6	25.0	mg/L	50	P7H2215	08/22/17	08/24/17	EPA 300.0	
Specific Conductance (EC)	3230	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.82		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.30		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2750	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1700	50.0	mg/L	50	P7H2215	08/22/17	08/24/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	567	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	48.7	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	1.30	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	88.5	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1620	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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Project Number: [none]
Project Manager: Christine Alderman

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DUP-2
7H17011-17 (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	P7H2309	08/20/17	08/21/17	TX 1005	
>C12-C28	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
>C28-C35	ND	2.50	mg/L	1	P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: 1-Chlorooctane		104 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Surrogate: o-Terphenyl		114 %	70-130		P7H2309	08/20/17	08/21/17	TX 1005	
Total Hydrocarbon nC6-nC35	ND	2.50	mg/L	1	[CALC]	08/20/17	08/21/17	[CALC]	

General Chemistry Parameters by EPA / Standard Methods

Total Alkalinity	91.0	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Carbonate Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bicarbonate Alkalinity	91.0	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Hydroxide Alkalinity	ND	10.0	mg/L	1	P7H2105	08/18/17	08/21/17	EPA 310.1M	
Bromide	0.277	0.0500	mg/L	1	P7H2215	08/22/17	08/24/17	EPA 300.0	
Chloride	92.8	12.5	mg/L	25	P7H2215	08/22/17	08/24/17	EPA 300.0	
Specific Conductance (EC)	2930	5.00	umhos/cm	1	P7H2501	08/18/17	08/25/17	EPA 120.1	
Dissolved Oxygen	6.00		mg/L	1	P7H2207	08/22/17	08/22/17	CHEMets	QAL1
pH	7.80		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Temperature	22.30		pH Units	1	P7H2109	08/21/17	08/21/17	EPA 150.1	
Total Dissolved Solids	2450	20.0	mg/L	1	P7H2112	08/21/17	08/21/17	EPA 160.1	
Sulfate	1560	25.0	mg/L	25	P7H2215	08/22/17	08/24/17	EPA 300.0	

Total Metals by EPA / Standard Methods

Calcium	535	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Magnesium	40.6	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Potassium	3.10	1.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Sodium	80.8	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2
Hardness	1500	5.00	mg/L	1	P7H2301	08/23/17	08/24/17	EPA 6010B	QAL2

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

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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 P7H2309 - TX 1005

Blank (P7H2309-BLK1)

Prepared & Analyzed: 08/20/17

C6-C12	ND	2.50	mg/L							
>C12-C28	ND	2.50	"							
>C28-C35	ND	2.50	"							
Surrogate: 1-Chlorooctane	9.08		"	9.38		96.8	70-130			
Surrogate: o-Terphenyl	4.88		"	4.69		104	70-130			

LCS (P7H2309-BS1)

Prepared & Analyzed: 08/20/17

C6-C12	71.5	2.50	mg/L	93.8		76.3	75-125			
>C12-C28	90.0	2.50	"	93.8		96.0	75-125			
Surrogate: 1-Chlorooctane	10.5		"	9.38		112	70-130			
Surrogate: o-Terphenyl	4.72		"	4.69		101	70-130			

LCS Dup (P7H2309-BSD1)

Prepared & Analyzed: 08/20/17

C6-C12	72.5	2.50	mg/L	93.8		77.4	75-125	1.46	20	
>C12-C28	92.1	2.50	"	93.8		98.2	75-125	2.25	20	
Surrogate: 1-Chlorooctane	10.8		"	9.38		116	70-130			
Surrogate: o-Terphenyl	4.19		"	4.69		89.3	70-130			

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

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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 P7H2105 - * DEFAULT PREP *****

Blank (P7H2105-BLK1)

Prepared: 08/18/17 Analyzed: 08/21/17

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

Blank (P7H2105-BLK2)

Prepared: 08/18/17 Analyzed: 08/21/17

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

Duplicate (P7H2105-DUP1)

Source: 7H17011-01

Prepared: 08/18/17 Analyzed: 08/21/17

Total Alkalinity	123	10.0	mg/L	125	1.61	20
Carbonate Alkalinity	ND	10.0	"	ND		20
Bicarbonate Alkalinity	123	10.0	"	125	1.61	20
Hydroxide Alkalinity	ND	10.0	"	ND		20

Duplicate (P7H2105-DUP2)

Source: 7H17012-04

Prepared: 08/18/17 Analyzed: 08/21/17

Total Alkalinity	107	10.0	mg/L	109	1.85	20
Carbonate Alkalinity	ND	10.0	"	ND		20
Bicarbonate Alkalinity	107	10.0	"	109	1.85	20
Hydroxide Alkalinity	ND	10.0	"	ND		20

Batch P7H2109 - * DEFAULT PREP *****

Duplicate (P7H2109-DUP1)

Source: 7H17011-01

Prepared & Analyzed: 08/21/17

pH	7.97	pH Units	8.01	0.501	20
Temperature	22.10	"	22.10	0.00	200

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

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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 P7H2109 - * DEFAULT PREP *****

Duplicate (P7H2109-DUP2)		Source: 7H17012-04			Prepared & Analyzed: 08/21/17					
pH	7.86		pH Units		7.85			0.127	20	
Temperature	22.10		"		22.20			0.451	200	

Batch P7H2112 - * DEFAULT PREP *****

Blank (P7H2112-BLK1)		Prepared & Analyzed: 08/21/17								
Total Dissolved Solids	ND	20.0	mg/L							

Blank (P7H2112-BLK2)		Prepared & Analyzed: 08/21/17								
Total Dissolved Solids	ND	20.0	mg/L							

Duplicate (P7H2112-DUP1)		Source: 7H17011-01			Prepared & Analyzed: 08/21/17					
Total Dissolved Solids	2840	20.0	mg/L		2860			0.702	20	

Duplicate (P7H2112-DUP2)		Source: 7H17012-04			Prepared & Analyzed: 08/21/17					
Total Dissolved Solids	1910	20.0	mg/L		1880			1.58	20	

Batch P7H2120 - * DEFAULT PREP *****

Blank (P7H2120-BLK1)		Prepared: 08/21/17 Analyzed: 08/22/17								
Sulfate	ND	1.00	mg/L							
Bromide	ND	0.0500	"							
Chloride	ND	0.500	"							

LCS (P7H2120-BS1)		Prepared: 08/21/17 Analyzed: 08/22/17								
Sulfate	44.6	1.00	mg/L	40.0	111	85-115				
Chloride	43.7	0.500	"	40.0	109	85-115				
Bromide	6.09	0.0500	"	5.00	122	80-120				

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

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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 P7H2120 - * DEFAULT PREP *****

LCS Dup (P7H2120-BSD1)

Prepared: 08/21/17 Analyzed: 08/22/17

Sulfate	44.8	1.00	mg/L	40.0		112	85-115	0.544	20	
Chloride	43.9	0.500	"	40.0		110	85-115	0.612	20	
Bromide	6.13	0.0500	"	5.00		123	80-120	0.655	20	

Duplicate (P7H2120-DUP1)

Source: 7H02002-01

Prepared: 08/21/17 Analyzed: 08/22/17

Sulfate	ND	1000	mg/L		521				20	
Chloride	65200	500	"		65200			0.0521	20	

Duplicate (P7H2120-DUP2)

Source: 7H17011-04

Prepared: 08/21/17 Analyzed: 08/22/17

Bromide	0.230	0.0500	mg/L		0.198			15.0	20	
Sulfate	1810	50.0	"		1810			0.0745	20	
Chloride	102	25.0	"		103			1.36	20	

Matrix Spike (P7H2120-MS1)

Source: 7H02002-01

Prepared: 08/21/17 Analyzed: 08/22/17

Sulfate	10800	1000	mg/L	10000	521	103	80-120			
Chloride	74800	500	"	10000	65200	96.3	80-120			

Batch P7H2207 - * DEFAULT PREP *****

Duplicate (P7H2207-DUP1)

Source: 7H17011-01

Prepared & Analyzed: 08/22/17

Dissolved Oxygen	6.00		mg/L		6.00			0.00	200	QAL1
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Batch P7H2215 - * DEFAULT PREP *****

Blank (P7H2215-BLK1)

Prepared: 08/22/17 Analyzed: 08/24/17

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

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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 P7H2215 - * DEFAULT PREP *****

LCS (P7H2215-BS1)

Prepared: 08/22/17 Analyzed: 08/24/17

Chloride	42.3	0.500	mg/L	40.0		106	85-115			
Bromide	5.76	0.0500	"	5.00		115	80-120			
Sulfate	43.1	1.00	"	40.0		108	85-115			

LCS Dup (P7H2215-BSD1)

Prepared: 08/22/17 Analyzed: 08/24/17

Chloride	42.3	0.500	mg/L	40.0		106	85-115	0.0709	20	
Bromide	5.76	0.0500	"	5.00		115	80-120	0.139	20	
Sulfate	43.0	1.00	"	40.0		108	85-115	0.225	20	

Duplicate (P7H2215-DUP1)

Source: 7H17011-14

Prepared: 08/22/17 Analyzed: 08/24/17

Bromide	0.223	0.0500	mg/L		ND				20	
Chloride	83.6	25.0	"		91.4			8.91	20	
Sulfate	1660	50.0	"		1660			0.172	20	

Duplicate (P7H2215-DUP2)

Source: 7H17012-07

Prepared: 08/22/17 Analyzed: 08/24/17

Sulfate	1840	50.0	mg/L		1840			0.180	20	
Bromide	ND	0.0500	"		ND				20	
Chloride	1720	25.0	"		1720			0.0320	20	

Matrix Spike (P7H2215-MS1)

Source: 7H17011-14

Prepared: 08/22/17 Analyzed: 08/24/17

Chloride	621	25.0	mg/L	500	91.4	106	80-120			
Sulfate	2180	50.0	"	500	1660	105	80-120			
Bromide	67.5	2.50	"	62.5	ND	108	75-125			

Batch P7H2501 - * DEFAULT PREP *****

Duplicate (P7H2501-DUP1)

Source: 7H17011-01

Prepared: 08/18/17 Analyzed: 08/25/17

Specific Conductance (EC)	3440	5.00	umhos/cm		3220			6.61	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

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 P7H2501 - * DEFAULT PREP *****

Duplicate (P7H2501-DUP2)

Source: 7H17012-01

Prepared: 08/18/17 Analyzed: 08/25/17

Specific Conductance (EC)	3280	5.00	umhos/cm		3240			1.23	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 P7H2301 - * DEFAULT PREP *****

Blank (P7H2301-BLK1)

Prepared: 08/23/17 Analyzed: 08/24/17

Calcium	ND	5.00	mg/L							QAL2
Magnesium	ND	5.00	"							QAL2
Potassium	ND	1.00	"							QAL2
Sodium	ND	5.00	"							QAL2
Hardness	ND	5.00	"							QAL2

LCS (P7H2301-BS1)

Prepared: 08/23/17 Analyzed: 08/24/17

Calcium	51.3	5.00	mg/L	50.0		103	80-120			QAL2
Magnesium	51.0	5.00	"	50.0		102	80-120			QAL2
Potassium	52.0	1.00	"	50.0		104	80-120			QAL2
Sodium	55.2	5.00	"	50.0		110	80-120			QAL2

LCS Dup (P7H2301-BSD1)

Prepared: 08/23/17 Analyzed: 08/24/17

Calcium	51.1	5.00	mg/L	50.0		102	80-120	0.445	20	QAL2
Magnesium	50.9	5.00	"	50.0		102	80-120	0.178	20	QAL2
Potassium	52.0	1.00	"	50.0		104	80-120	0.125	20	QAL2
Sodium	54.8	5.00	"	50.0		110	80-120	0.689	20	QAL2

Duplicate (P7H2301-DUP1)

Source: 7H17011-01

Prepared: 08/23/17 Analyzed: 08/24/17

Calcium	551	5.00	mg/L		617			11.5	20	QAL2
Magnesium	52.8	5.00	"		58.9			11.0	20	QAL2
Potassium	4.36	1.00	"		6.11			33.4	20	QAL2, R2
Sodium	88.3	5.00	"		98.6			11.0	20	QAL2, R2
Hardness	1590	5.00	"		1780			11.4	20	QAL2

Matrix Spike (P7H2301-MS1)

Source: 7H17011-01

Prepared: 08/23/17 Analyzed: 08/24/17

Calcium	606	5.00	mg/L	50.0	617	NR	75-125			QAL2, QM-07
Magnesium	108	5.00	"	50.0	58.9	98.1	75-125			QAL2
Potassium	59.9	1.00	"	50.0	6.11	108	75-125			QAL2
Sodium	147	5.00	"	50.0	98.6	96.1	75-125			QAL2

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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.

R2 The RPD exceeded the acceptance limit.

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.

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:

8/25/2017

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

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CHAIN OF CUSTODY RECORD

[illegible]