



Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Office 303.357.7310
Fax 303.357.7315

March 27, 2020

West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street
Charleston, WV 25304

To Whom It May Concern:

Please find enclosed the Well Operator's Report of Well Work, Form WR-35 (including As-Drilled Survey Plat, Directional Survey and FracFocus report), Discharge Monitoring Report Form WR-34 and corresponding logs for the following wells off of the **Meredith Pad**:

- Horst Unit 2H-3H
- Sarahlene Unit 1H-2H
- Sterling Unit 1H-3H

If you have any questions, please feel free to contact me at (303)-357-7223.

Sincerely,

A handwritten signature in black ink, appearing to read "MGriffith", written over a light blue horizontal line.

Megan Griffith
Permitting Agent
Antero Resources Corporation

Enclosures

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47-095-02516 County Tyler District Centerville
Quad West Union 7.5' Pad Name Meredith Pad Field/Pool Name -----
Farm name Roy A. Meredith Well Number Horst Unit 2H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4355475m Easting 511214m
Landing Point of Curve Northing 4354697.83m Easting 510726.11m
Bottom Hole Northing 4352651m Easting 511410m

Elevation (ft) 1111' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine

Mud Type(s) and Additive(s)
Air - Foam & 4% KCL
Mud - Polymer

Date permit issued 1/22/2019 Date drilling commenced 10/7/2018 Date drilling ceased 2/10/2019
Date completion activities began 9/4/2019 Date completion activities ceased 10/9/2019
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 463', 683' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1521', 2109' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 63', 1239' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

Reviewed by:

API 47-095 - 02516 Farm name Roy A. Meredith Well number Horst Unit 2H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24"	20"	97'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	814'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2698'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	16320'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	7142'		4.7#, N-80		
Packer type and depth set		N/A					

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	204 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	670 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	915 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	735 sx (Lead) 1395 sx (Tail)	14.5 (Lead), 15.2 (Tail)	1.40 (Lead), 1.26 (Tail)		-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 16340' MD, 6546' TVD (BHL), 6546' (Deepest Point Drilled) Loggers TD (ft) 16340' MD

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 6500'

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____

Conductor - 0
Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface
Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface
Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED N/A

API 47- 095 - 02516 Farm name Roy A. Meredith Well number Horst Unit 2H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6466' (TOP)	TVD	7226' (TOP) MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 2800 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 11353 mcfpd Oil 112 bpd NGL --- bpd Water 241 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	

***PLEASE SEE ATTACHED EXHIBIT 3**

Please insert additional pages as applicable.

Drilling Contractor Patterson UTI Drilling Company LLC
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company KLX Energy Services
Address 3040 Post Oak Boulevard City Houston State TX Zip 77056

Cementing Company C&J Energy Services
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

Completed by Megan Griffith Telephone 303-357-7223
Signature  Title Permitting Agent Date 3.27.20

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	9/4/2019	16630.7	16164.2	60	Marcellus
2	9/4/2019	16429.1	15966.5733	60	Marcellus
3	9/5/2019	16227.5	15768.9467	60	Marcellus
4	9/5/2019	16025.9	15571.32	60	Marcellus
5	9/5/2019	15824.3	15373.6933	60	Marcellus
6	9/5/2019	15622.7	15176.0667	60	Marcellus
7	9/6/2019	15421.1	14978.44	60	Marcellus
8	9/6/2019	15219.5	14780.8133	60	Marcellus
9	9/6/2019	15017.9	14583.1867	60	Marcellus
10	9/7/2019	14816.3	14385.56	60	Marcellus
11	9/7/2019	14614.7	14187.9333	60	Marcellus
12	9/7/2019	14413.1	13990.3067	60	Marcellus
13	9/7/2019	14211.5	13792.68	60	Marcellus
14	9/8/2019	14009.9	13595.0533	60	Marcellus
15	9/8/2019	13808.3	13397.4267	60	Marcellus
16	9/8/2019	13606.7	13199.8	60	Marcellus
17	9/8/2019	13405.1	13002.1733	60	Marcellus
18	9/9/2019	13203.5	12804.5467	60	Marcellus
19	9/9/2019	13001.9	12606.92	60	Marcellus
20	9/9/2019	12800.3	12409.2933	60	Marcellus
21	9/9/2019	12598.7	12211.6667	60	Marcellus
22	9/10/2019	12397.1	12014.04	60	Marcellus
23	9/10/2019	12195.5	11816.4133	60	Marcellus
24	9/11/2019	11993.9	11618.7867	60	Marcellus
25	9/11/2019	11792.3	11421.16	60	Marcellus
26	9/11/2019	11590.7	11223.5333	60	Marcellus
27	9/12/2019	11389.1	11025.9067	60	Marcellus
28	9/13/2019	11187.5	10828.28	60	Marcellus
29	9/13/2019	10985.9	10630.6533	60	Marcellus
30	9/13/2019	10784.3	10433.0267	60	Marcellus
31	9/14/2019	10582.7	10235.4	60	Marcellus
32	9/14/2019	10381.1	10037.7733	60	Marcellus
33	9/14/2019	10179.5	9840.14667	60	Marcellus
34	9/15/2019	9977.9	9642.52	60	Marcellus
35	9/15/2019	9776.3	9444.89333	60	Marcellus
36	9/15/2019	9574.7	9247.26667	60	Marcellus
37	9/15/2019	9373.1	9049.64	60	Marcellus
38	9/16/2019	9171.5	8852.01333	60	Marcellus
39	9/17/2019	8969.9	8654.38667	60	Marcellus
40	9/17/2019	8768.3	8456.76	60	Marcellus
41	9/17/2019	8566.7	8259.13333	60	Marcellus
42	9/17/2019	8365.1	8061.50667	60	Marcellus
43	9/18/2019	8163.5	7863.88	60	Marcellus
44	9/18/2019	7961.9	7666.25333	60	Marcellus
45	9/18/2019	7760.3	7468.62667	60	Marcellus
46	9/18/2019	7558.7	7271	60	Marcellus

EXHIBIT 2

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/ other (units)
1	9/4/2019	63.01815	7780.437	7091	3938	168250	4676	N/A
2	9/4/2019	72.31678	7571.84	6152	4295	399350	8743	N/A
3	9/5/2019	74.64379	7884.997	6954	4092	399650	8590	N/A
4	9/5/2019	74.80634	7946.651	6030	4078	399100	8546	N/A
5	9/5/2019	73.31121	8009.586	6181	3537	399300	8699	N/A
6	9/5/2019	73.27276	7772.231	5756	3810	399500	8663	N/A
7	9/6/2019	72.08325	7813.479	6072	3770	399250	8704	N/A
8	9/6/2019	58.99076	8055.89	6405	3924	399900	9436	N/A
9	9/6/2019	73.5298	7938.857	6172	3820	399150	8706	N/A
10	9/7/2019	73.2508	7840.566	5263	3805	399550	8587	N/A
11	9/7/2019	76.47853	7971.246	6348	3746	399800	8654	N/A
12	9/7/2019	73.09157	7924.261	6273	3762	399900	8649	N/A
13	9/7/2019	74.39975	7835.101	6330	3839	399450	8690	N/A
14	9/8/2019	78.34769	7855.376	5082	4054	399250	8640	N/A
15	9/8/2019	76.29851	8049.9	6451	3806	399500	8655	N/A
16	9/8/2019	73.08356	7960.685	6645	3518	399600	8607	N/A
17	9/8/2019	76.19214	7951.593	6121	3804	399200	8504	N/A
18	9/9/2019	76.29141	7843.356	6163	3848	399300	8502.7	N/A
19	9/9/2019	79.97383	7978.619	6346	3853	399900	8599.8	N/A
20	9/9/2019	79.55561	7945.402	6172	3954	399500	8559.6	N/A
21	9/9/2019	75.90032	7768.403	6139	3745	399350	9997.1	N/A
22	9/10/2019	77.45126	7846.83	6857	3703	399200	8441.3	N/A
23	9/10/2019	78.67699	7989.502	6246	3574	399700	8559.1	N/A
24	9/11/2019	68.01434	7585.713	7254	3895	399500	10673.4	N/A
25	9/11/2019	72.35691	7847.46	6504	3772	399400	8581.1	N/A
26	9/11/2019	79.60608	7779.784	6808	3573	399500	8519.4	N/A
27	9/12/2019	82.01674	7737.542	6364	3656	399350	8396.8	N/A
28	9/13/2019	78.77721	7962.185	6773	3388	399600	8516.9	N/A
29	9/13/2019	81.96852	8081.547	7054	3526	399500	8558.2	N/A
30	9/13/2019	78.02322	7559.694	6490	3720	400000	8516.4	N/A
31	9/14/2019	79.83564	8190.913	6186	3439	399400	8389	N/A
32	9/14/2019	82.75635	8042.798	6234	3641	400200	8371.8	N/A
33	9/14/2019	84.1168	8245.54	6293	4186	399300	8558.9	N/A
34	9/15/2019	83.79743	8407.364	5850	4139	399650	8449	N/A
35	9/15/2019	82.10323	7996.19	6667	3755	399490	8359.1	N/A
36	9/15/2019	81.05021	7641.407	6324	3673	399240	8417.7	N/A
37	9/15/2019	85.75162	7923.817	5895	4238	399400	8409.3	N/A
38	9/16/2019	83.48393	7443.967	6222	4513	399950	8234.4	N/A
39	9/17/2019	85.40266	7680.198	6382	4060	399350	8310.3	N/A
40	9/17/2019	81.40469	7433.075	6219	3910	399700	8394.6	N/A
41	9/17/2019	81.91809	7320.196	6501	3759	400100	8400.2	N/A
42	9/17/2019	83.89165	7146.996	6366	4238	409250	8383.5	N/A
43	9/18/2019	85.3888	7617.754	6243	4485	398850	8227.7	N/A
44	9/18/2019	86.90958	7721.267	4659	3708	399600	8176.5	N/A
45	9/18/2019	86.59807	7394.763	6793	3849	399700	8318.5	N/A
46	9/18/2019	86.69954	7278.984	6744	4411	399400	8442.2	N/A
	AVG	77.8	7,829	6,296	3,853	17,756,680	383,571	TOTAL

EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Silty Sandstone	85	145	85	145
Sandstone	145	185	145	185
Silty sandstone tr coal	185	540	185	540
Shaly siltstone tr coal	540	655	540	655
Shaly siltstone	655	705	655	705
Silty Sandstone	705	985	705	985
Silty sandstone	985	1,035	985	1,035
Silty Sandstone	1,035	1,105	1,035	1,105
Siltstone	1,105	1,285	1,105	1,285
Siltstone tr coal	1,285	1,405	1,285	1,405
Sandstone tr coal	1,405	1,635	1,405	1,635
Shaly siltstone tr coal	1,635	1,725	1,635	1,725
Silty sandstone tr coal	1,725	1,981	1,725	2,017
Big Lime	1,996	2,878	1,992	2,995
Fifty Foot Sandstone	2,878	2,960	2,970	3,085
Gordon	2,960	3,112	3,060	3,254
Fifth Sandstone	3,112	3,265	3,229	3,427
Bayard	3,265	3,824	3,402	4,048
Speechley	3,824	4,111	4,023	4,365
Bailtown	4,111	4,656	4,340	4,974
Bradford	4,656	5,028	4,949	5,387
Benson	5,028	5,262	5,362	5,644
Alexander	5,262	6,317	5,619	6,854
Sycamore	6,094	6,292	6,669	6,829
Middlesex	6,292	6,402	6,829	7,032
Burkett	6,402	6,524	7,032	7,116
Tully	6,524	6,466	7,116	7,226
Marcellus	6,466	NA	7,226	NA

*Please note Antero determines formation tops based on mud logs that are only run on one well on a multi-well pad. The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Discharge Monitoring Report
Oil and Gas General Permit

Company Name: Antero Resources Corporation
API No: 47-095-02517 County: Tyler
District: Centerville Well No: Horst Unit 2H
Farm Name: Roy A. Meredith et al
Discharge Date/s From:(MMDDYY) 10/21/19 To: (MMDDYY) 11/20/19
Discharge Times. From: 0:00 To: 24:00
Total Volume to be Disposed from this facility (gallons): 719,859

Disposal Option(s) Utilized (write volumes in gallons):

- (1) Land Application: _____ (Include a topographical map of the Area.)
(2) UIC: 1,522 Permit No. 3416729731
(3) Offsite Disposal: _____ Site Location: _____
(4) Reuse: 718,337 Alternate Permit Number: _____
(5) Centralized Facility: _____ Permit No. _____
(6) Other method: _____ (Include an explanation)

Follow Instructions below to determine your treatment category:

Optional Pretreatment test: n/a Cl- mg/l n/a DO mg/l


1. Do you have permission to use expedited treatment from the Director or his representative?
(Y/N) n/a If yes, who? _____ and place a four (4) on line 7.
If not go to line 2
2. Was Frac Fluid or flowback put into the pit? (Y/N) n/a If yes, go to line 5. If not, go to line 3.
3. Do you have a chloride value pretreatment (see above)? (Y/N) n/a If yes, go to line 4
If not, go to line 5.
4. Is the Chloride level less than 5000 mg/l? (Y/N) n/a If yes, then enter a one (1) on line 7.
5. Do you have a pretreatment value for DO? (See above) (Y/N) n/a If yes, go to line 6
If not, enter a three (3) in line 7.
6. Is the DO level greater than 2.5 mg/l?(Y/N) n/a If yes, enter a two (2) on line 7. If not, enter a three (3) on line 7.
7. n/a is the category of your pit. Use the Appropriate section.
8. Comments on Pit condition: n/a No Pit on Site

Name of Principal Exec. Officer: Gretchen Kohler

Title of Officer: Senior Environmental and Regulatory Manager

Date Completed: 3/16/20

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.


Signature of a Principal Exec. Officer or Authorized agent.

Category 1
Sampling Results
API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	5	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl	5,000	_____	5,000	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

*** Al is only reported if the pH is above 9.0

Category 2
Sampling Results
API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	10	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____

** Include a description of your aeration technique.

Aeration Code: _____

*** Al is only reported if the pH is above 9.0

Category 3
Sampling Results
API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	20	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____ Date: _____

** Include a description of your aeration technique. Aeration Code: _____

*** Al is only reported if the pH is above 9.0.

Category 4
Sampling Results
API No: _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	1	_____	N/A	N/A	Days
Fe	Monitor	_____	Monitor	_____	mg/l
D.O.	Monitor	_____	Monitor	_____	mg/l
Settleable Sol.	Monitor	_____	Monitor	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Activated Carbon (0.175)		_____	N/A	N/A	lb/BI
Date Site Reclaimed	N/A	N/A			10 days from dis.
Disposal Area		_____	Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____ Date: _____

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/4/2019
Job End Date:	9/18/2019
State:	West Virginia
County:	Tyler
API Number:	47-095-02517-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Horst Unit 2H
Latitude:	39.34856400
Longitude:	-80.87001900
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,545
Total Base Water Volume (gal):	17,085,806
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Supplied by Operator	Base Fluid					
			Water	7732-18-5	100.00000	88.44544	
SaniFrac 8844	CWS	Biocide					
				Listed Below			

Sand (Proppant)	CWS	Propping Agent							
					Listed Below				
DWP-641	CWS	Friction Reducer							
					Listed Below				
DAP-902	CWS	Scale Inhibitor							
					Listed Below				
CalGel 4000	CWS	Gel Slurry							
					Listed Below				
Calbreak 5501	CWS	Breaker							
					Listed Below				
CI-9100G	CWS	Corrosion Inhibitor							
					Listed Below				
DAP-103	CWS	Iron Control							
					Listed Below				
Hydrochloric Acid	CWS	Clean Perforations							
					Listed Below				
Other Chemical (s)	Listed Above	See Trade Name (s) List							

					Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.								
					Crystalline silica (Quartz)	14808-60-7	100.00000	11.26320
					Illite	12173-60-3	1.00000	0.11263
					Hydrochloric acid	7647-01-0	37.00000	0.05866
					Polymer	26100-47-0	45.00000	0.02190
					Distillates (petroleum), hydrotreated light	64742-47-8	30.00000	0.01460
					Ilmenite	98072-94-7	0.10000	0.01126
					Biotite	1302-27-8	0.10000	0.01126
					Goethite	1310-14-1	0.10000	0.01126
					Apatite	64476-38-6	0.10000	0.01126
					Guar gum	9000-30-0	60.00000	0.00806
					Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.00806
					Polyethylene glycol mixture	25322-68-3	54.50000	0.00677
					Ammonium chloride	12125-02-9	11.00000	0.00535
					2,2-Dibromo-3-Nitripropionamide	10222-01-2	20.00000	0.00248
					Sorbitan monooleate	1338-43-8	4.00000	0.00195
					Polyethylene glycol monooleate	9004-96-0	3.00000	0.00146
					Sorbitol tetraoleate	61723-83-9	2.00000	0.00097
					Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00067
					Citric acid	77-92-9	60.00000	0.00051
					Sodium bromide	7647-15-6	4.00000	0.00050
					Amines, tallow alkyl, ethoxylated	61791-26-2	1.00000	0.00049
					Dibromoacetoneitrile	3252-43-5	3.00000	0.00037
					Ammonium Persulfate	7727-54-0	100.00000	0.00026

				Alkylloxypolyethyleneoxy ethanol	84133-50-6	0.50000	0.00024	
				Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00020	
				Vinylidene chloride-methyl acrylate copolymer	25038-72-6	20.00000	0.00005	
				Acrylamide	79-06-1	0.10000	0.00005	
				Ethylene Glycol	107-21-1	40.00000	0.00003	
				Diethylene glycol, monomethyl ether	34590-94-8	20.00000	0.00002	
				Cinnamaldehyde	104-55-2	10.00000	0.00001	
				Isopropyl alcohol	67-63-0	5.00000	0.00001	
				Ethoxylated Alcohols	68131-39-5	10.00000	0.00001	
				Tar bases, quinolone derivs, benzyl chloride- quaternized	72480-70-7	10.00000	0.00001	
				Formic acid	64-18-6	10.00000	0.00001	
				Glycol	57-55-6			Proprietary Additive Concentration
				Organic Acid Salts	9003-04-7			Proprietary Additive Concentration

* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%
*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

