

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

API 47 - 095 - 02348 County Tyler District Meade
Quad Pennsboro 7.5' Pad Name Terry Snider Pad Field/Pool Name -----
Farm name Terry L. Snider Well Number Edwards 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 4357633m Easting 503098m
Landing Point of Curve Northing 4357761.74m Easting 502802.60m
Bottom Hole Northing 4360068m Easting 501898m

Elevation (ft) 1146.5' 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 5/6/2016 Date drilling commenced 5/10/2016 Date drilling ceased 10/12/2016
Date completion activities began 10/2/2017 Date completion activities ceased N/A
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

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

Freshwater depth(s) ft N/A Open mine(s) (Y/N) depths No
Salt water depth(s) ft N/A Void(s) encountered (Y/N) depths No
Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

Reviewed

Reviewed by:

geb
9/12/2018

API 47- 095 - 02348 Farm name Terry L. Snider Well number Edwards Unit 2H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade w/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24"	20"	65'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	501'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2521'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	15611'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6527'		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	60 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	603 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	990 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	n/a sx (Lead) n/a sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.44 (Lead), 1.87 (Tail)	3774	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 15611' MD, 6419' TVD (BHL), 6418' (Deepest Point Drilled) Loggers TD (ft) 15611' MD

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

Plug back procedure N/A

Kick off depth (ft) 5922'

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

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API 47-095 - 02348 Farm name Terry L. Snider Well number Edwards Unit 2H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
*PLEASE SEE ATTACHED EXHIBIT 1					

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
*PLEASE SEE ATTACHED EXHIBIT 2								

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API 47- 095 - 02348 Farm name Terry L. Snider Well number Edwards Unit 2H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6406' (TOP)	TVD	6673' (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 5067 mcfpd Oil 50 bpd NGL --- bpd Water 328 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	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 Kodiak Services Int'l
Address 2219 Sawdust Road, Unit 1604-1605 City The Woodlands State TX Zip 77380

Cementing Company BJ Services
Address 1036 East Main Street City Bridgeport State WV Zip 26330

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 8/20/2018

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

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API 47-095-02348 Farm Name Terry L. Snider Well Number Edwards Unit 2H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	10/26/2017	15339	15509	60	Marcellus
2	10/27/2017	15138	15308	60	Marcellus
3	10/28/2017	14937	15107	60	Marcellus
4	10/29/2017	14736	14906	60	Marcellus
5	10/30/2017	14535	14705	60	Marcellus
6	10/31/2017	14334	14504	60	Marcellus
7	10/31/2017	14133	14302	60	Marcellus
8	11/1/2017	13932	14101	60	Marcellus
9	11/3/2017	13731	13900	60	Marcellus
10	11/5/2017	13530	13699	60	Marcellus
11	11/5/2017	13329	13498	60	Marcellus
12	11/5/2017	13127	13297	60	Marcellus
13	11/6/2017	12926	13096	60	Marcellus
14	11/6/2017	12725	12895	60	Marcellus
15	11/7/2017	12524	12694	60	Marcellus
16	11/7/2017	12323	12493	60	Marcellus
17	11/8/2017	12122	12292	60	Marcellus
18	11/8/2017	11921	12090	60	Marcellus
19	11/9/2017	11720	11889	60	Marcellus
20	11/10/2017	11519	11688	60	Marcellus
21	11/10/2017	11318	11487	60	Marcellus
22	11/11/2017	11117	11286	60	Marcellus
23	11/11/2017	10915	11085	60	Marcellus
24	11/12/2017	10714	10884	60	Marcellus
25	11/12/2017	10513	10683	60	Marcellus
26	11/13/2017	10312	10482	60	Marcellus
27	11/13/2017	10111	10281	60	Marcellus
28	11/14/2017	9910	10080	60	Marcellus
29	11/15/2017	9709	9878	60	Marcellus
30	11/15/2017	9508	9677	60	Marcellus
31	11/15/2017	9307	9476	60	Marcellus
32	11/16/2017	9106	9275	60	Marcellus
33	11/16/2017	8905	9074	60	Marcellus
34	11/17/2017	8703	8873	60	Marcellus
35	11/17/2017	8502	8672	60	Marcellus
36	11/18/2017	8301	8471	60	Marcellus
37	11/18/2017	8100	8270	60	Marcellus
38	11/19/2017	7899	8069	60	Marcellus
39	11/19/2017	7698	7868	60	Marcellus
40	11/20/2017	7497	7666	60	Marcellus
41	11/20/2017	7296	7465	60	Marcellus
42	11/21/2017	7095	7264	60	Marcellus
43	11/22/2017	6894	7063	60	Marcellus
44	11/22/2017	6693	6862	60	Marcellus

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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	10/26/2017	76.4	7272		2617	9889	11077	N/A
2	10/27/2017	72.7	7149	6312	2708	16169	10241	N/A
3	10/28/2017	77.6	7506	6617	3012	17135	10027	N/A
4	10/29/2017	76.3	7636	5873	2989	16498	12497	N/A
5	10/30/2017	73	7196	6112	2901	16209	10216	N/A
6	10/31/2017	77.2	7340	6302	3463	17105	9969	N/A
7	10/31/2017	68.7	7285	5847	3311	16443	10455	N/A
8	11/1/2017	51	7889	5695		13584	16998	N/A
9	11/3/2017	70.9	7578	5264	3099	15941	12836	N/A
10	11/5/2017	68.8	7421	5250	3825	16496	10839	N/A
11	11/5/2017	69.8	7090	4968	3164	15222	11577	N/A
12	11/5/2017	77.7	7156	5017	3392	15565	10392	N/A
13	11/6/2017	75.7	7162	4996	3197	15355	10667	N/A
14	11/6/2017	75.7	7075	4965	3416	15456	9792	N/A
15	11/7/2017	74.6	6727	5154	3472	15353	11706	N/A
16	11/7/2017	77.3	6946	5066	3410	15422	10422	N/A
17	11/8/2017	77.9	7099	5248	3693	16040	10311	N/A
18	11/8/2017	76.1	6797	4991	3599	15387	11233	N/A
19	11/9/2017	78.9	7141	5051	4138	16330	10706	N/A
20	11/10/2017	76.3	7038	5076	3436	15550	11206	N/A
21	11/10/2017	75.2	7074	4749	3375	15198	12108	N/A
22	11/11/2017	77.3	6453	4973	3365	14791	10496	N/A
23	11/11/2017	76.4	6646	4902	3197	14745	11357	N/A
24	11/12/2017	77	6803	4794	3351	14948	12139	N/A
25	11/12/2017	78.3	6807	4979	3672	15458	10783	N/A
26	11/13/2017	76.8	6746	5246	3381	15373	10866	N/A
27	11/13/2017	74	6948	4997	3109	15054	10531	N/A
28	11/14/2017	73.7	7411	4950	3208	15569	11859	N/A
29	11/15/2017	70.2	7288	4950	3109	15347	13585	N/A
30	11/15/2017	6970	6970	5142	3038	15150	10731	N/A
31	11/15/2017	74.6	7047	5559	3623	16229	12707	N/A
32	11/16/2017	78.6	6837	5366	3192	15395	10482	N/A
33	11/16/2017	76.7	6601	5413	3204	15218	10672	N/A
34	11/17/2017	71.8	6795	5342	3164	15301	11396	N/A
35	11/17/2017	72.6	6562	5352	3178	15092	11212	N/A
36	11/18/2017	75.2	6694	6117	3191	16002	10361	N/A
37	11/18/2017	77.6	6392	5223	3202	14817	10386	N/A
38	11/19/2017	76.2	6556	5102	5066	16724	11313	N/A
39	11/19/2017	75.8	6332	5156	3233	14721	10399	N/A
40	11/20/2017	77	6541	5578	3689	15808	10462	N/A
41	11/20/2017	76.1	6364	5406	3449	15219	10169	N/A
42	11/21/2017	75	6296	5454	3012	14762	10350	N/A
43	11/22/2017	72.8	6247	5065	3006	14318	10581	N/A
44	11/22/2017	75.1	6079	6141	2951	15171	10104	N/A
	AVG=	231.3	6,932	5,343	3,321	677,559	488,216	TOTAL

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EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Sandstone	0	N/A	0	N/A
Silty Sandstone	260	N/A	260	N/A
Shale w/trace Coal	560	N/A	560	N/A
Silty Sandstone	740	N/A	740	N/A
Limey Shale	880	N/A	880	N/A
Silty Shale w/trace Coal	1,080	N/A	1,080	N/A
Silty Sandstone	1,240	N/A	1,240	N/A
Silty Shale w/trace Coal	1,380	N/A	1,380	N/A
Silty Sandstone	1,520	N/A	1,520	N/A
Sandstone w/trace Coal	1,600	N/A	1,600	N/A
Silty Sandstone	1,680	N/A	1,680	N/A
Shale w/trace Coal	1,740	N/A	1,740	N/A
Silty Sandstone	1,840	N/A	1,840	N/A
Big Lime	2,008	N/A	2,009	N/A
Big Injun	2,154	N/A	2,155	N/A
Gantz Sand	2,564	N/A	2,565	N/A
Fifty Foot Sandstone	2,827	N/A	2,828	N/A
Gordon	2,927	N/A	2,928	N/A
Fifth Sandstone	3,177	N/A	3,180	N/A
Bayard	3,230	N/A	3,234	N/A
Warren	3,667	N/A	3,679	N/A
Speechley	4,027	N/A	4,051	N/A
Balltown	4,303	N/A	4,336	N/A
Bradford	4,685	N/A	4,735	N/A
Benson	5,072	N/A	5,141	N/A
Alexander	5,285	N/A	5,362	N/A
Rhinestreet	5,842	N/A	5,935	N/A
Sycamore	6,185	N/A	6,304	N/A
Middlesex	6,281	N/A	6,433	N/A
Burkett	6,374	N/A	6,594	N/A
Tully	6,398	N/A	6,651	N/A
Marcellus	6,406	N/A	6,673	N/A

*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.

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Environmental Protection

LATITUDE 39°22'30" 1,661'

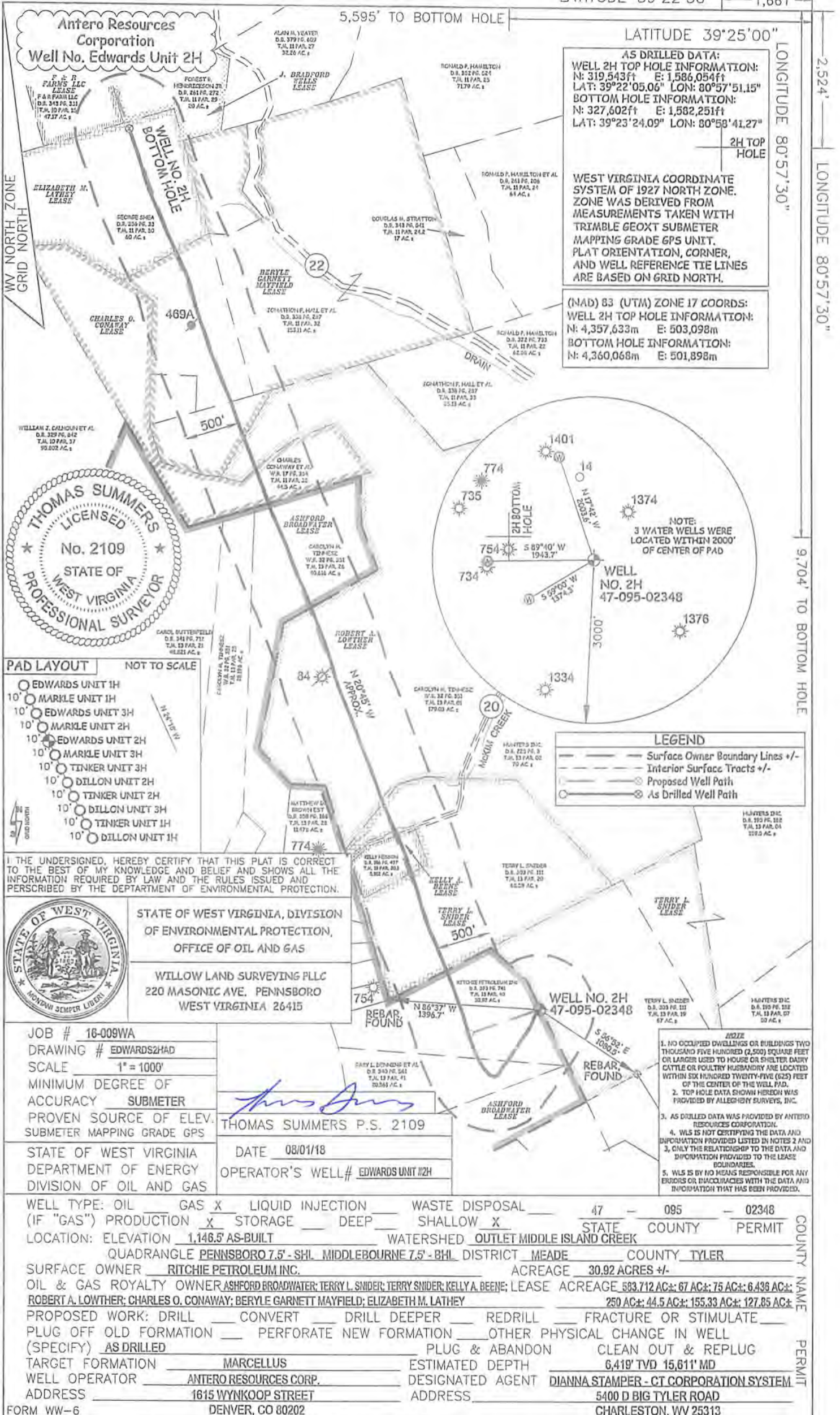
LATITUDE 39°25'00"

2,524'

LONGITUDE 80°57'30"

9,704' TO BOTTOM HOLE

5,595' TO BOTTOM HOLE



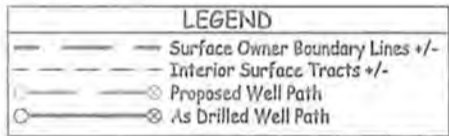
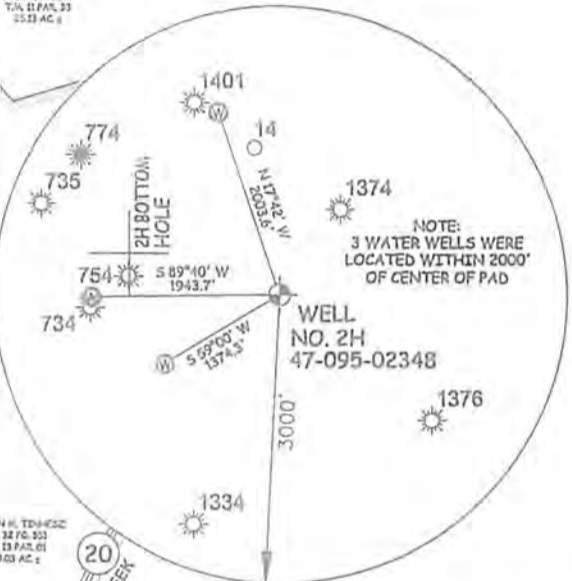
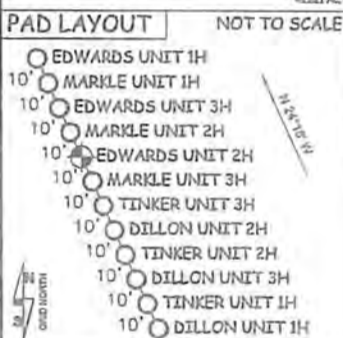
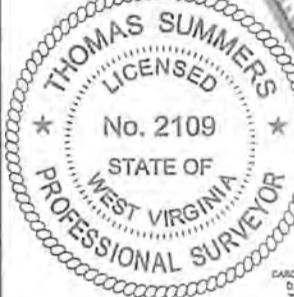
Antero Resources Corporation
Well No. Edwards Unit 2H

AS DRILLED DATA:
WELL 2H TOP HOLE INFORMATION:
N: 319,543ft E: 1,586,054ft
LAT: 39°22'05.06" LON: 80°57'51.15"
BOTTOM HOLE INFORMATION:
N: 327,602ft E: 1,582,251ft
LAT: 39°23'24.09" LON: 80°58'41.27"

WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE.
SYSTEM WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 2H TOP HOLE INFORMATION:
N: 4,357,633m E: 503,098m
BOTTOM HOLE INFORMATION:
N: 4,360,068m E: 501,898m

WV NORTH ZONE GRID NORTH



I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC
220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

JOB # 16-009WA
DRAWING # EDWARDS2HAD
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

Thomas Summers
THOMAS SUMMERS P.S. 2109

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

DATE 08/01/18
OPERATOR'S WELL# EDWARDS UNIT #2H

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL 47 - 095 - 02348
(IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
LOCATION: ELEVATION 1,146.5' AS-BUILT STATE COUNTY PERMIT
QUADRANGLE PENNSBORO 7.5' - SHI. MIDDLEBOURNE 7.5' - BHI. DISTRICT MEADE COUNTY TYLER
SURFACE OWNER RITCHIE PETROLEUM INC. ACREAGE 30.92 ACRES +/-
OIL & GAS ROYALTY OWNER ASHFORD BROADWATER; TERRY L. SNIDER; TERRY SNIDER; KELLY A. BEENE; LEASE ACREAGE 583.712 AC±; 67 AC±; 75 AC±; 6.436 AC±; ROBERT A. LOWTHER; CHARLES O. CONAWAY; BERYLE GARNETT MAYFIELD; ELIZABETH M. LATHEY 250 AC±; 44.5 AC±; 155.33 AC±; 127.85 AC±
PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,419' TVD 15,611' MD
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

NOTE

- NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
- TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.
- AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
- WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.
- WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

COUNTY NAME PERMIT

FORM WW-6
 ADDRESS 1615 WYNKOOP STREET DENVER, CO 80202
 WELL OPERATOR ANTERO RESOURCES CORP.
 TARGET FORMATION MARCELLUS
 (SPECIFY) AS DRILLED
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL
 SURFACE OWNER RITCHEE PETROLEUM INC.
 COUNTY NAME ACRES 30.92 ACRES +/-
 COUNTY TYLER
 STATE COUNTY PERMIT
 WASTE DISPOSAL 47 095 02348

WELL TYPE: OIL
 GAS X LIQUID INJECTION
 DIVISION OF OIL AND GAS
 DEPARTMENT OF ENERGY
 STATE OF WEST VIRGINIA
 DATE 08/01/18
 OPERATOR'S WELL # EDWARDS UNIT #2H
 JOB # 16-009WA
 DRAWING # EDWARDS2HAD
 SCALE 1" = 1000'
 MINIMUM DEGREE OF
 ACCURACY
 PROVEN SOURCE OF ELEV.
 SUBMETER
 THOMAS SUMMERS P.S. 2109
 DATE 08/01/18

WILLOW LAND SURVEYS PLLC
 220 MASONIC AVE. PENNSBORO
 WEST VIRGINIA 26415
 OFFICE OF ENVIRONMENTAL PROTECTION,
 STATE OF WEST VIRGINIA, DIVISION
 OF ENVIRONMENTAL PROTECTION,
 OFFICE OF OIL AND GAS
 TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE
 INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND
 DESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION,
 I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN IS CORRECT

NOTE:
 1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO
 THOUSAND FIVE HUNDRED (2,500) SQUARE FEET
 OR LARGER USED TO HOUSE OR SHEDDER DAIRY
 CATTLE OR POLICITY HUSBANDRY ARE LOCATED
 WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET
 OF THE CENTER OF THE WELL PAD.
 2. TOP HOLE DATA SHOWN HEREON WAS
 PROVIDED BY ALTECHN SURVEYS, INC.
 3. AS DRILLED DATA WAS PROVIDED BY ANTERO
 RESOURCES CORPORATION.
 4. WLS IS NOT CERTIFIED THE DATA AND
 INFORMATION PROVIDED LISTED IN NOTES 2 AND
 3, ONLY THE RELATIONSHIP TO THE DATA AND
 INFORMATION PROVIDED TO THE LEASE.
 5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY
 ERRORS OR OMISSIONS WITH THE DATA AND
 INFORMATION THAT HAS BEEN PROVIDED.



LATITUDE 39.22'30" LONGITUDE 80°57'30" LONGITUDE 80°57'30" LONGITUDE 80°57'30"

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	10/27/2017
Job End Date:	11/22/2017
State:	West Virginia
County:	Tyler
API Number:	47-095-02348-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Edwards Unit 2H
Latitude:	39.36807222
Longitude:	-80.95143056
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,457
Total Base Water Volume (gal):	20,979,199
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
Fresh Water	Operator	Base Fluid					
			Water	7732-18-5	100.00000	88.26049	Density = 8.340
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.16038	

SP BREAKER	Halliburton	Breaker					
				Listed Below			
MC MX 2-2822	Halliburton	Scale Inhibitor					
				Listed Below			
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor					
				Listed Below			
MC S-2510T	Halliburton	Scale Inhibitor					
				Listed Below			
SAND-PREMIUM WHITE-30/50, BULK	Halliburton	Proppant					
				Listed Below			
SAND-COMMON WHITE - 100 MESH, BULK	Halliburton	Proppant					
				Listed Below			
MURIATIC ACID	Halliburton	Solvent					
				Listed Below			
SAND-PREMIUM WHITE-40/70, BULK	Halliburton	Proppant					
				Listed Below			

FR-76	Halliburton	Friction Reducer					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
MC B-8614	Halliburton	Biocide					
				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	11.51225	
			Guar gum	9000-30-0	100.00000	0.02660	
			Inorganic salt	Proprietary	30.00000	0.02218	
			Acrylamide acrylate copolymer	Proprietary	30.00000	0.02218	Denise Tuck, Halliburton, 3000 N. Sam Houston Pkwy E., Houston, TX 77032, 281-871-6226
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.02218	
			Hydrochloric acid	7647-01-0	15.00000	0.01350	
			Ethylene Glycol	107-21-1	60.00000	0.00832	
			Methanol	67-56-1	60.00000	0.00417	
			Amines, polyethylenepoly-, ethoxylated, phosphonomethylated, sodium salts	70900-16-2	30.00000	0.00394	
			Glutaraldehyde	111-30-8	30.00000	0.00261	
			Neutralized Polyacrylic Emulsion	Proprietary	10.00000	0.00139	
			Sodium persulfate	7775-27-1	100.00000	0.00068	
			Sodium chloride	7647-14-5	5.00000	0.00066	

			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00044	
			Ethoxylated alcohols	Proprietary	30.00000	0.00011	
			Fatty acids, tall oil	Proprietary	30.00000	0.00011	
			Modified thiourea polymer	Proprietary	30.00000	0.00011	
			Ethanol	64-17-5	1.00000	0.00009	
			Olefins	Proprietary	5.00000	0.00004	
			Propargyl alcohol	107-19-7	10.00000	0.00004	
			Formaldehyde	50-00-0	0.09000	0.00001	
			Phosphoric acid	7664-38-2	0.10000	0.00001	
			Sodium sulfate	7757-82-6	0.10000	0.00000	

* 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)