

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

API 47 - 017 - 06845 County Doddridge District West Union
 Quad West Union 7.5' Pad Name Strickling Pad Field/Pool Name ----
 Farm name John Paul Strickling, et al Well Number Smithers Unit 1H
 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 4353671m Easting 518646m
 Landing Point of Curve Northing 4353513.21m Easting 518028.77m
 Bottom Hole Northing 4356453m Easting 516843m

Elevation (ft) 1065' 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 7/13/2017 Date drilling commenced 9/5/2017 Date drilling ceased 3/23/2018
 Date completion activities began 6/30/2018 Date completion activities ceased 10/20/2018
 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 None Identified Open mine(s) (Y/N) depths No
 Salt water depth(s) ft None Identified 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 by:

WR-35
Rev. 8/23/13

API 47-017 - 06845 Farm name John Paul Strickling, et al Well number Smithers Unit 1H

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"	95'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	363'	New	54.5#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2649'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	17959'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	7074'		4.7#, P-110		
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	284 sx	15.6	1.18	335	0'	8 Hrs.
Surface	Class A	320 sx	15.6	1.2	384	0'	8 Hrs.
Coal							
Intermediate 1	Class A	920 sx	15.6	1.18	1086	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	744 sx (Lead) 1702sx (Tail)	14(Lead), 15.2 (Tail)	1.56 (Lead), 1.83 (Tail)	4275	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 17959' MD, 6665' TVD (BHL), 6714' (Deepest Point Drilled) Loggers TD (ft) 17959' MD

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

Plug back procedure N/A

Kick off depth (ft) 6356'

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

WR-35
Rev. 8/23/13

API 47-017 - 06845 Farm name John Paul Strickling, et al Well number Smithers Unit 1H

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								

Please insert additional pages as applicable.

WR-35
Rev. 8/23/13

API 47- 017 - 06845 Farm name John Paul Strickling, et al Well number Smithers Unit 1H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6645' (TOP)	TVD	7185' (TOP) MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3600 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas Oil NGL Water GAS MEASURED BY
11197 mcfpd 162 bpd --- bpd 559 bpd 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.

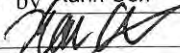
Drilling Contractor Frontier Drilling LLC
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company Nine Energy Service
Address 125 Museum Rd City Washington State PA Zip 15301

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

Stimulating Company US Well Services
Address 533 Industrial Park Road City Lane Jew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Karin Cox Telephone 303-357-6820
Signature  Title Permitting Agent Date 2/1/2019

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

API 47-017-06845 Farm Name John Paul Strickling, et al Well Number Smithers Unit 1H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	6/30/2018	17606.04	17777.59	48	Marcellus
2	7/1/2018	17402.58	17574.13	48	Marcellus
3	7/1/2018	17199.12	17370.67	48	Marcellus
4	7/2/2018	16995.66	17167.21	48	Marcellus
5	7/2/2018	16792.2	16963.75	48	Marcellus
6	7/3/2018	16588.74	16760.29	48	Marcellus
7	7/3/2018	16385.28	16556.83	48	Marcellus
8	7/3/2018	16181.82	16353.37	48	Marcellus
9	7/4/2018	15978.36	16149.91	48	Marcellus
10	7/4/2018	15774.9	15946.45	48	Marcellus
11	7/5/2018	15571.44	15742.99	48	Marcellus
12	7/5/2018	15367.98	15539.53	48	Marcellus
13	7/6/2018	15164.52	15336.07	48	Marcellus
14	7/6/2018	14961.06	15132.61	48	Marcellus
15	7/6/2018	14757.6	14929.15	48	Marcellus
16	7/7/2018	14554.14	14725.69	48	Marcellus
17	7/7/2018	14350.68	14522.23	48	Marcellus
18	7/7/2018	14147.22	14318.77	48	Marcellus
19	7/8/2018	13943.76	14115.31	48	Marcellus
20	7/9/2018	13740.3	13911.85	48	Marcellus
21	7/9/2018	13536.84	13708.39	48	Marcellus
22	7/10/2018	13333.38	13504.93	48	Marcellus
23	7/11/2018	13129.92	13301.47	48	Marcellus
24	7/11/2018	12926.46	13098.01	48	Marcellus
25	7/12/2018	12723	12894.55	48	Marcellus
26	7/12/2018	12519.54	12691.09	48	Marcellus
27	7/13/2018	12316.08	12487.63	48	Marcellus
28	7/13/2018	12112.62	12284.17	48	Marcellus
29	7/13/2018	11909.16	12080.71	48	Marcellus
30	7/13/2018	11705.7	11877.25	48	Marcellus
31	7/14/2018	11502.24	11673.79	48	Marcellus
32	7/14/2018	11298.78	11470.33	48	Marcellus
33	7/14/2018	11095.32	11266.87	48	Marcellus
34	7/15/2018	10891.86	11063.41	48	Marcellus
35	7/15/2018	10688.4	10859.95	48	Marcellus
36	7/15/2018	10484.94	10656.49	48	Marcellus
37	7/15/2018	10281.48	10453.03	48	Marcellus
38	7/16/2018	10078.02	10249.57	48	Marcellus
39	7/16/2018	9874.56	10046.11	48	Marcellus
40	7/16/2018	9671.1	9842.65	48	Marcellus
41	7/17/2018	9467.64	9639.19	48	Marcellus
42	7/17/2018	9264.18	9435.73	48	Marcellus
43	7/17/2018	9060.72	9232.27	48	Marcellus
44	7/17/2018	8857.26	9028.81	48	Marcellus
45	7/18/2018	8653.8	8825.35	48	Marcellus
46	7/18/2018	8450.34	8621.89	48	Marcellus
47	7/18/2018	8246.88	8418.43	48	Marcellus
48	7/18/2018	8043.42	8214.97	48	Marcellus
49	7/19/2018	7839.96	8011.51	48	Marcellus
50	7/19/2018	7636.5	7808.05	48	Marcellus
51	7/19/2018	7433.04	7604.59	48	Marcellus
52	7/19/2018	7229.58	7401.13	48	Marcellus

API 47-017-06845 Farm Name John Paul Strickling, et al Well Number Smithers Unit 1H								
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	6/30/2018	64.9	7536.7	5661	4511	403000	8552	N/A
2	7/1/2018	73.3	7814.2	5645	4722	406450	8162	N/A
3	7/1/2018	73.6458	8029.817	5634	4404	414100	8142	N/A
4	7/2/2018	72.2	7904.4	5447	4303	405860	7913	N/A
5	7/2/2018	71.8087	8028.104	6053	4685	406130	7946	N/A
6	7/3/2018	69.945	7769.583	5723	4316	405400	7807	N/A
7	7/3/2018	72.2	7946.5	4404	4946	404800	7926	N/A
8	7/3/2018	74.7	7877.4	4624	4931	407000	8009	N/A
9	7/4/2018	76.2883	7788.289	5336	4013	406540	9542	N/A
10	7/4/2018	72.3	7890.8	5862	4262	406720	7833	N/A
11	7/5/2018	71.2993	7814.79	5538	4100	404660	7863	N/A
12	7/5/2018	78.5	8284.1	5784	4606	406700	7938	N/A
13	7/6/2018	75.2316	7788.866	5662	4051	405000	7865	N/A
14	7/6/2018	72.4	7984	5967	4288	402500	7791	N/A
15	7/6/2018	75.3512	7788.199	5787	4037	405800	7811	N/A
16	7/7/2018	77.9365	7887.424	5629	4229	407170	7797	N/A
17	7/7/2018	78.1073	7998.156	6053	4627	407940	7901	N/A
18	7/7/2018	74.8301	7572.892	5593	4054	406300	7771	N/A
19	7/8/2018	77.0728	7798.439	5878	4865	406750	7770	N/A
20	7/9/2018	78.2432	7715.123	5236	4317	406150	8925	N/A
21	7/9/2018	78.6606	7705.639	5572	4124	405500	7765	N/A
22	7/10/2018	76.5	7773.8	5714	4051	406100	7781	N/A
23	7/11/2018	78.7435	7840.773	5578	4525	406150	7798	N/A
24	7/11/2018	78.9	7741	5370	4580	405100	8665	N/A
25	7/12/2018	77.1796	7818.699	6034	4888	412100	7775	N/A
26	7/12/2018	73.9864	7775.228	5701	4789	392300	7520	N/A
27	7/13/2018	78.9981	7651.502	5547	4186	405950	8239	N/A
28	7/13/2018	78.7623	7548.771	5980	4680	406700	7838	N/A
29	7/13/2018	78.4672	7498.264	5583	5047	403400	7868	N/A
30	7/13/2018	75.7165	7496.306	5808	3821	405150	8429	N/A
31	7/14/2018	78.4546	7623.042	5824	4056	406750	7706	N/A
32	7/14/2018	77.5015	7753.967	5307	4241	384700	7740	N/A
33	7/14/2018	77.0339	7469.259	5747	4761	406400	7715	N/A
34	7/15/2018	78.4803	7900.971	5700	3987	405550	7650	N/A
35	7/15/2018	79.6659	7470.653	6060	3929	403300	7835	N/A
36	7/15/2018	77.1786	7403.065	5688	4224	405000	8686	N/A
37	7/15/2018	78.8734	7740.44	6041	3814	406880	7633	N/A
38	7/16/2018	79.2094	7648.821	5918	4915	406550	7698	N/A
39	7/16/2018	78.3241	7487.218	5402	3980	408500	7687	N/A
40	7/16/2018	78.9676	7729.813	6276	4848	406520	7642	N/A
41	7/17/2018	78.887	7757.487	6262	5133	406250	7600	N/A
42	7/17/2018	79.4838	7245.345	5864	4149	407200	7780	N/A
43	7/17/2018	79.1863	7160.49	6203	4018	406600	7764	N/A
44	7/17/2018	80.1613	7249.941	5942	4106	407160	7594	N/A
45	7/18/2018	78.788	7734.806	6349	4751	406960	7527	N/A
46	7/18/2018	78.3089	7357.881	5894	4987	405800	7683	N/A
47	7/18/2018	77.7847	7381.926	6090	4178	405000	7648	N/A
48	7/18/2018	79.2	7586.2	5938	4730	408230	7493	N/A
49	7/19/2018	79.3	7617.7	6228	4240	405290	7469	N/A
50	7/19/2018	77.6979	7450.268	6568	3958	406300	7574	N/A
51	7/19/2018	79.4656	7544.499	6291	3974	406200	7547	N/A
52	7/19/2018	79.2	7256.6	6729	4765	407310	7516	N/A
	AVG=	77	7,685	5,783	4,398	21,091,870	410,129	TOTAL

API 47-017-06845 Farm Name John Paul Strickling, et al Well Number Smithers Unit 1H				
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	187	0	187
Sandstone tr coal	est 187	267	est 187	267
Sandy shale	est 267	807	est 267	807
Calcareous Shale	est 807	1,187	est 807	1,187
Shale tr coal	est 1187	1,207	est 1187	1,207
Sandy Shale	est 1207	1,527	est 1207	1,527
Sandstone	est 1527	1,567	est 1527	1,567
Silty shale	est 1567	1,667	est 1567	1,667
Sandstone	est 1667	1,787	est 1667	1,787
Sandy shale	est 1787	1,924	est 1787	1,963
Big Lime	1,924	2,528	1,963	2,607
Fifty Foot Sandstone	2,528	2,719	2,607	2,808
Gordon	2,719	2,926	2,808	3,028
Fifth Sandstone	2,926	2,988	3,028	3,094
Bayard	2,988	3,777	3,094	3,937
Speechley	3,777	4,086	3,937	4,267
Balltown	4,086	4,572	4,267	4,785
Bradford	4,572	5,005	4,785	5,245
Benson	5,005	5,274	5,245	5,532
Alexander	5,274	6,264	5,532	6,590
Sycamore	6,264	6,437	6,590	6,803
Middlesex	6,437	6,571	6,803	7,013
Burkett	6,571	6,599	7,013	7,071
Tully	6,599	6,645	7,071	7,185
Marcellus	6,645	N/A	7,185	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.

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	7/1/2018
Job End Date:	7/19/2018
State:	West Virginia
County:	Doddridge
API Number:	47-017-06845-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Smithers 1H
Latitude:	39.33217500
Longitude:	-80.78382500
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,781
Total Base Water Volume (gal):	17,915,034
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

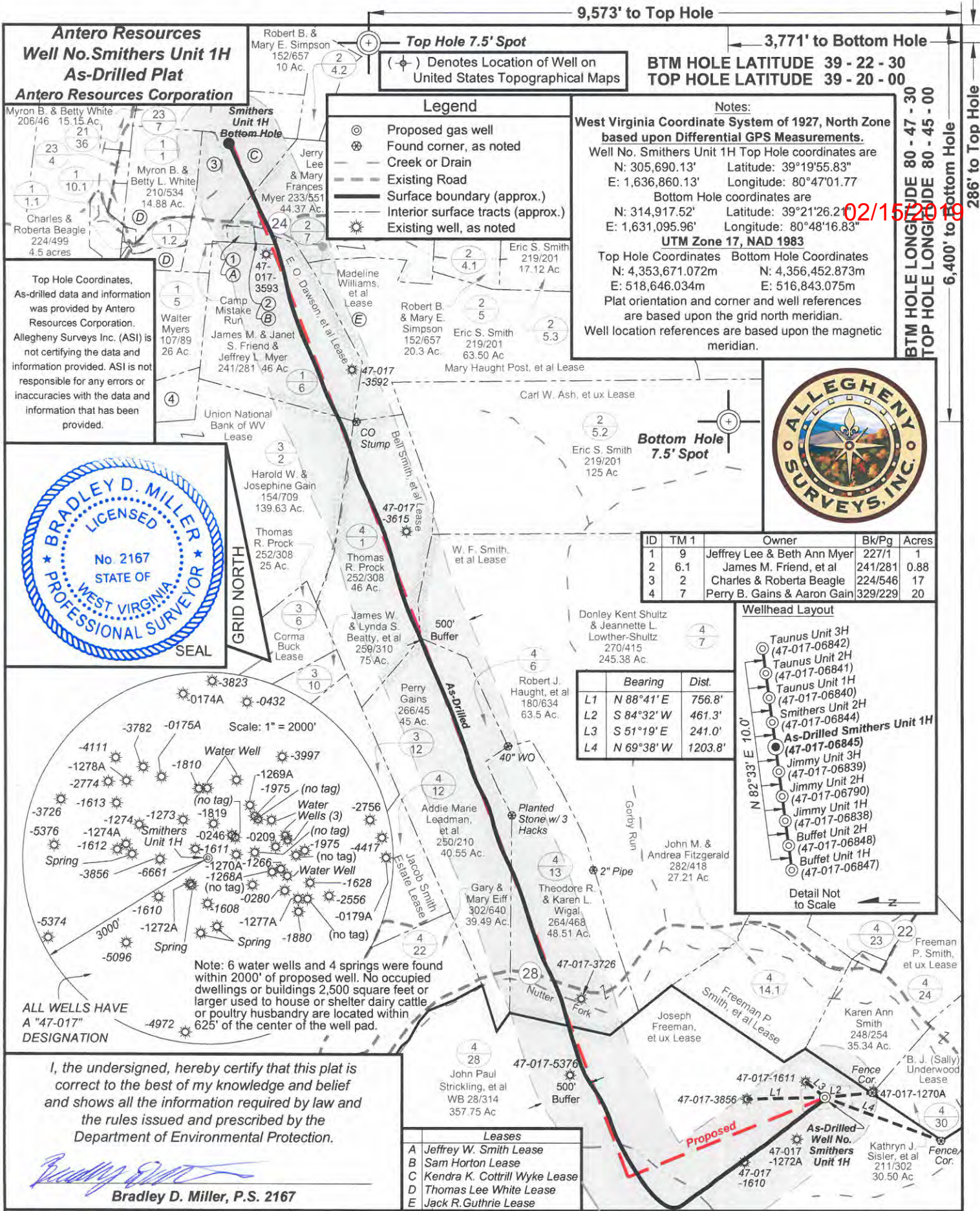
Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Antero Resources	Carrier/Base Fluid	Water	7732-18-5	100.00000	87.45292	
Sand	U.S. Well Services, LLC	Proppant					
HCL Acid (12.6%-17.5%)	U.S. Well Services, LLC	Bulk Acid	Crystalline Silica, quartz	14808-60-7	100.00000	12.34542	
WFRA-405	U.S. Well Services, LLC	Friction Reducer	Water Hydrogen Chloride	7732-18-5 7647-01-0	87.40000 17.50000	0.12147 0.02824	
LGC-15	U.S. Well Services, LLC	Gelling Agents	2-Propenoic acid, polymer with propenamide Hydrated light distillate (petroleum)	29003-06-9 84742-47-8	30.00000 30.00000	0.01609 0.01295	
			Guar Gum	8000-30-0	50.00000	0.00705	
			Petroleum Distillates	84742-47-8	60.00000	0.00667	
			Suspending agent (solid)	14808-60-7	3.00000	0.00108	
			Surfactant	88439-51-0	3.00000	0.00042	

Bioclear 2000	U.S. Well Services, LLC	Anti-Bacterial Agent							
			2,2-dibromo-3-nitropropionamide	10222-01-2	20.00000	0.00389			
SI-1200s	U.S. Well Services, LLC	Scale Inhibitor	Deionized Water	7732-18-5	28.00000	0.00222			
AP One	U.S. Well Services, LLC	Gel Breakers	Proprietary Scale Inhibitor	Proprietary	10.00000	0.00128			
AI-303	U.S. Well Services, LLC	Acid Corrosion Inhibitors	Ammonium Persulfate	7727-54-0	100.00000	0.00021			
			Ethylene glycol	107-21-1	40.00000	0.00004			
			Formic acid	64-18-6	20.00000	0.00001			
			Cinnamaldehyde	104-55-2	20.00000	0.00001			
			Butyl cellosolve	111-76-2	20.00000	0.00001			
			Polyether	60828-78-6	10.00000	0.00001			
			Acetophenone, thiourea, formaldehyde polymer	68527-49-1	5.00000	0.00000			

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

* Total Water Volume sources may include fresh water, produced water, and/or recycled water
 ** Information is based on the maximum potential for concentration and thus the total may be over 100%

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)



FILE NO: 44-30-WU-14
 DRAWING NO: Smithers 1H As-Drilled Plat
 SCALE: 1" = 1200'
 MINIMUM DEGREE OF ACCURACY: Submeter
 PROVEN SOURCE OF ELEVATION: WVDOT, Harrisville, WV

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION OIL AND GAS DIVISION

DATE: December 27 2018
 OPERATOR'S WELL NO. Smithers Unit 1H
 API WELL NO. 47 - 017 - 06845
 STATE COUNTY PERMIT

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF GAS) PRODUCTION: STORAGE DEEP SHALLOW

LOCATION: ELEVATION: As-Drilled - 1065' WATERSHED: Headwaters Middle Island Creek QUADRANGLE: West Union
 DISTRICT: West Union COUNTY: Doddridge
 SURFACE OWNER: John Paul Strickling, et al Madeline Williams, et al; E. O. Dawson, et al ACREAGE: 357.75 22.5; 0.88; 50
 ROYALTY OWNER: Bell Smith, et al; Joseph Freeman, et ux; W. F. Smith, et al LEASE NO: ACREAGE: 23; 45; 79; 368; 600

PROPOSED WORK: DRILL CONVERT DRILL DEEPER FRACTURE OR STIMULATE PLUG OFF OLD FORMATION
 PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Drilled 6,665' TVD
 PLUG AND ABANDON CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale ESTIMATED DEPTH: 17,959' MD

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System
 ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road
 Denver, CO 80202 Charleston, WV 25313