

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

API 47 - 085 - 10385 County Ritchie District Clay
Quad Pennsboro 7.5' Pad Name Lynn Camp Pad Field/Pool Name -----
Farm name Terry Lee Richards Well Number Riggs 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 4340537m Easting 504748m
Landing Point of Curve Northing 4340602.87m Easting 504733.65m
Bottom Hole Northing 4344997m Easting 502240m

Elevation (ft) 1149' 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

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Date permit issued 2/1/2019 Date drilling commenced 3/27/2019 Date drilling ceased 7/5/2019
Date completion activities began 1/11/2020 Date completion activities ceased 4/9/2020
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 222', 459' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1221', 1247' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 210', 784' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

Reviewed by:
Dmit
12-9-20

API 47- 085 - 10385 Farm name Terry Lee Richards Well number Riggs 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"	120'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	598'	New	54#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2564'	New	36#, H-40	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	22171'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6646'		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	244	0'	8 Hrs.
Surface	Class A	495 sx	15.6	1.19	402	0'	8 Hrs.
Coal							
Intermediate 1	Class A	890 sx	15.6	1.18	1047	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	798sx (Lead) 3519sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.53 (Lead), 1.83 (Tail)	2819	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 22166' MD, 6443' TVD (BHL), 6445' (Deepest Point Drilled) Loggers TD (ft) 22166' MD

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

Plug back procedure N/A

Kick off depth (ft) 5700'

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

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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- 085 - 10385 Farm name Terry Lee Richards Well number Riggs 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- 085 - 10385 Farm name Terry Lee Richards Well number Riggs Unit 2H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>6163' (TOP)</u>	<u>TVD</u>	<u>6881' (TOP)</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

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 9595 mcfpd Oil 149 bpd NGL --- bpd Water 682 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 Frontier Drilling LLC
Address 562 Spring Run Road City Pennsboro State WV Zip 26415

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Logging Company Nine Energy Services
Address 125 Museum Road City Washington State PA Zip 15301

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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 [Signature] Title Permitting Agent Date 6-20-20

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

API 47-085-10385 Farm Name Terry Lee Richards Well Number Riggs Unit 2H					
EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	1/5/2020	22039	21995	60	Marcellus
2	1/6/2020	21957.52412	21792.1447	60	Marcellus
3	1/6/2020	21756.66886	21591.2895	60	Marcellus
4	1/7/2020	21555.8136	21390.4342	60	Marcellus
5	1/7/2020	21354.95833	21189.5789	60	Marcellus
6	1/7/2020	21154.10307	20988.7237	60	Marcellus
7	1/8/2020	20953.24781	20787.8684	60	Marcellus
8	1/8/2020	20752.39254	20587.0132	60	Marcellus
9	1/8/2020	20551.53728	20386.1579	60	Marcellus
10	1/9/2020	20350.68202	20185.3026	60	Marcellus
11	1/9/2020	20149.82675	19984.4474	60	Marcellus
12	1/10/2020	19948.97149	19783.5921	60	Marcellus
13	1/10/2020	19748.11623	19582.7368	60	Marcellus
14	1/10/2020	19547.26096	19381.8816	60	Marcellus
15	1/11/2020	19346.4057	19181.0263	60	Marcellus
16	1/11/2020	19145.55044	18980.1711	60	Marcellus
17	1/12/2020	18944.69518	18779.3158	60	Marcellus
18	1/12/2020	18743.83991	18578.4605	60	Marcellus
19	1/12/2020	18542.98465	18377.6053	60	Marcellus
20	1/12/2020	18342.12939	18176.75	60	Marcellus
21	1/13/2020	18141.27412	17975.8947	60	Marcellus
22	1/13/2020	17940.41886	17775.0395	60	Marcellus
23	1/13/2020	17739.5636	17574.1842	60	Marcellus
24	1/14/2020	17538.70833	17373.3289	60	Marcellus
25	1/15/2020	17337.85307	17172.4737	60	Marcellus
26	1/15/2020	17136.99781	16971.6184	60	Marcellus
27	1/16/2020	16936.14254	16770.7632	60	Marcellus
28	1/16/2020	16735.28728	16569.9079	60	Marcellus
29	1/16/2020	16534.43202	16369.0526	60	Marcellus
30	1/17/2020	16333.57675	16168.1974	60	Marcellus
31	1/17/2020	16132.72149	15967.3421	60	Marcellus
32	1/17/2020	15931.86623	15766.4868	60	Marcellus
33	1/18/2020	15731.01096	15565.6316	60	Marcellus
34	1/18/2020	15530.1557	15364.7763	60	Marcellus
35	1/19/2020	15329.30044	15163.9211	60	Marcellus
36	1/19/2020	15128.44518	14963.0658	60	Marcellus
37	1/19/2020	14927.58991	14762.2105	60	Marcellus
38	1/19/2020	14726.73465	14561.3553	60	Marcellus
39	1/19/2020	14525.87939	14360.5	60	Marcellus
40	1/20/2020	14325.02412	14159.6447	60	Marcellus
41	1/20/2020	14124.16886	13958.7895	60	Marcellus
42	1/20/2020	13923.3136	13757.9342	60	Marcellus
43	1/21/2020	13722.45833	13557.0789	60	Marcellus
44	1/21/2020	13521.60307	13356.2237	60	Marcellus
45	1/21/2020	13320.74781	13155.3684	60	Marcellus
46	1/22/2020	13119.89254	12954.5132	60	Marcellus
47	1/22/2020	12919.03728	12753.6579	60	Marcellus
48	1/22/2020	12718.18202	12552.8026	60	Marcellus
49	1/22/2020	12517.32675	12351.9474	60	Marcellus
50	1/23/2020	12316.47149	12151.0921	60	Marcellus
51	1/23/2020	12115.61623	11950.2368	60	Marcellus
52	1/23/2020	11914.76096	11749.3816	60	Marcellus
53	1/24/2020	11713.9057	11548.5263	60	Marcellus
54	1/24/2020	11513.05044	11347.6711	60	Marcellus
55	1/24/2020	11312.19518	11146.8158	60	Marcellus
56	1/24/2020	11111.33991	10945.9605	60	Marcellus
57	1/24/2020	10910.48465	10745.1053	60	Marcellus
58	1/25/2020	10709.62939	10544.25	60	Marcellus
59	1/25/2020	10508.77412	10343.3947	60	Marcellus
60	1/25/2020	10307.91886	10142.5395	60	Marcellus
61	1/25/2020	10107.0636	9941.68421	60	Marcellus
62	1/26/2020	9906.208333	9740.82895	60	Marcellus
63	1/26/2020	9705.35307	9539.97368	60	Marcellus
64	1/26/2020	9504.497807	9339.11842	60	Marcellus
65	1/27/2020	9303.642544	9138.26316	60	Marcellus
66	1/27/2020	9102.787281	8937.40789	60	Marcellus
67	1/27/2020	8901.932018	8736.55263	60	Marcellus
68	1/28/2020	8701.076754	8535.69737	60	Marcellus
69	1/28/2020	8500.221491	8334.84211	60	Marcellus
70	1/28/2020	8299.366228	8133.98684	60	Marcellus
71	1/29/2020	8098.510965	7933.13158	60	Marcellus
72	1/29/2020	7897.655702	7732.27632	60	Marcellus
73	1/29/2020	7696.800439	7531.42105	60	Marcellus
74	1/30/2020	7495.945175	7330.56579	60	Marcellus
75	1/30/2020	7295.089912	7129.71053	60	Marcellus
76	1/30/2020	7094.234649	6928.85526	60	Marcellus
77	1/30/2020	6893.379386	6728	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 (bbbls)	Amount of Nitrogen/ other (units)
1	1/5/2020	71.82352	10004.33	7277	3646	163560	6417.166	N/A
2	1/6/2020	78.69925	9441.259	6153	3645	407880	7382.006	N/A
3	1/6/2020	83.61014	9925.148	5892	3042	405200	7560.94	N/A
4	1/7/2020	85.95043	9850.367	6018	3266	406180	7498.92	N/A
5	1/7/2020	84.15176	9746.767	5805	3627	408100	8945.42	N/A
6	1/7/2020	85.50369	9979.703	5838	3149	402800	7383.6	N/A
7	1/8/2020	78.56856	10427.96	5848	3497	404520	7552.59	N/A
8	1/8/2020	80.27568	9707.842	6436	3114	402020	7124.16	N/A
9	1/8/2020	75.48148	11064.93	6070	3435	406700	11530.23	N/A
10	1/9/2020	84.66156	10216.12	6000	3178	408720	7494.7	N/A
11	1/9/2020	77.32142	10374.17	6108	3263	405760	7469.466	N/A
12	1/10/2020	82.82555	10311.96	5907	3782	401820	7411.25	N/A
13	1/10/2020	82.82487	10045.08	5747	3279	405740	7400.71	N/A
14	1/10/2020	84.1213	10431.81	5622	3446	408120	7331.25	N/A
15	1/11/2020	83.02693	10867.68	5779	3175	408400	7703.17	N/A
16	1/11/2020	79.43073	9826.175	5395	3175	406660	7279.24	N/A
17	1/12/2020	82.02997	10352.18	6301	3671	408060	7463.08	N/A
18	1/12/2020	85.15889	10869.15	5997	3288	404160	7344.83	N/A
19	1/12/2020	85.59971	10386.34	6363	3513	404540	7255.94	N/A
20	1/12/2020	84.02474	10330.58	5824	3694	403340	7181.45	N/A
21	1/13/2020	83.78081	10197.43	6126	3765	404400	8542.52	N/A
22	1/13/2020	85.63479	10035.99	5402	3333	404880	7159.79	N/A
23	1/13/2020	84.85191	9626.007	5276	3611	405640	7955.75	N/A
24	1/14/2020	85.63513	9978.455	6107	3509	405280	7175.22	N/A
25	1/15/2020	81.50723	9013.271	6633	3787	397347	7119.89	N/A
26	1/15/2020	82.89718	9340.938	5512	3696	405000	7142.84	N/A
27	1/16/2020	79.74739	9038.237	6762	3906	404320	7168.94	N/A
28	1/16/2020	81.98555	9386.042	5960	3749	403280	7143.86	N/A
29	1/16/2020	83.14877	9384.03	5658	3435	403550	7200.2	N/A
30	1/17/2020	80.52091	8943.768	5938	3493	404300	7135.24	N/A
31	1/17/2020	83.75145	8871.911	6522	3459	403720	7058.54	N/A
32	1/17/2020	86.46421	8862.253	6114	3174	404840	7178.57	N/A
33	1/18/2020	84.48093	8926.102	6494	3132	403920	7059.79	N/A
34	1/18/2020	85.48376	8924.909	6629	3167	405100	7076.31	N/A
35	1/19/2020	84.36054	8893.86	6426	3391	405460	7412.51	N/A
36	1/19/2020	86.16074	9102.336	6268	3338	400840	7042.22	N/A
37	1/19/2020	85.4326	8882.218	6349	3314	405060	7182.35	N/A
38	1/19/2020	85.98801	8902.227	5710	3411	405280	7193.99	N/A
39	1/19/2020	85.99674	8746.561	4910	3439	407580	7125.36	N/A
40	1/20/2020	85.90915	8619.233	5667	3519	403560	7016	N/A
41	1/20/2020	86.5196	8815.296	5040	3270	403240	7620.23	N/A
42	1/20/2020	86.34063	8829.121	5501	3528	406080	6999.17	N/A
43	1/21/2020	84.17106	8734.879	5748	3594	403800	7782.05	N/A
44	1/21/2020	85.63604	8458.946	5981	3521	403200	6989.93	N/A
45	1/21/2020	85.83858	8667.731	6293	3522	405380	6974.37	N/A
46	1/22/2020	86.12885	8651.727	6526	3029	400860	7089.39	N/A
47	1/22/2020	85.48681	8679.658	4820	3328	407080	7154.74	N/A
48	1/22/2020	85.86599	8621.03	5235	3306	401120	7199.92	N/A
49	1/22/2020	84.33954	8687.728	7069	3310	404600	6982.3	N/A
50	1/23/2020	85.63843	8679.166	5705	3325	404960	6916.9	N/A
51	1/23/2020	85.90656	8116.731	6232	3480	403700	6912.57	N/A
52	1/23/2020	83.62461	8207.977	6181	3509	403340	6929.5	N/A
53	1/24/2020	84.39923	8069.9	5219	3363	406780	6970.91	N/A
54	1/24/2020	82.26474	8113.614	6777	3300	408175.84	7429.04	N/A
55	1/24/2020	85.93084	8593.813	6712	3049	406780	7004.31	N/A
56	1/24/2020	85.33302	8415.37	6331	3347	402220	7040.41	N/A
57	1/24/2020	85.79467	8361.908	6237	3293	409340	6966.52	N/A
58	1/25/2020	86.06252	8341.426	6420	3248	405180	7068.62	N/A
59	1/25/2020	86.59166	8335.989	6526	3278	404660	6894.99	N/A
60	1/25/2020	84.7199	8218.147	6168	3226	402920	6723.82	N/A
61	1/25/2020	85.11057	8295.293	6609	3217	409760	6763.73	N/A
62	1/26/2020	86.43599	8284.461	6187	3171	402440	6802.02	N/A
63	1/26/2020	84.94662	8131.439	6110	3199	396360	7818.63	N/A
64	1/26/2020	87.33849	8214.838	5730	3325	398960	6754.92	N/A
65	1/27/2020	86.47308	8200.261	5760	3248	399780	6755.76	N/A
66	1/27/2020	82.84988	7981.667	5880	3454	401660	7406.59	N/A
67	1/27/2020	84.79749	8076.62	6105	3225	400580	6797.24	N/A
68	1/28/2020	86.35737	8232.723	5583	3274	400680	6749.86	N/A
69	1/28/2020	85.74858	7798.104	6094	3513	406420	6728.45	N/A
70	1/28/2020	87.49337	7864.444	5726	3529	405620	6701.55	N/A
71	1/29/2020	86.87809	8292.31	5237	3222	405900	6834.98	N/A
72	1/29/2020	87.33172	8139.388	5685	3165	408480	6839.49	N/A
73	1/29/2020	85.25545	7566.407	5713	3362	405880	6738.87	N/A
74	1/30/2020	84.96026	7429.295	6090	3373	406420	6649.95	N/A
75	1/30/2020	86.82703	7916.692	6290	3217	404240	6710.73	N/A
76	1/30/2020	87.16277	7649.058	6391	3304	405440	6723.32	N/A
77	1/30/2020	86.68442	7699.88	6121	3154	406840	6701.05	N/A
	AVG=	83.1	9,674	5,997	3,434	16,358,877	305,440	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	From Surface	From Surface	From Surface	From Surface
Black/Gray Shale	85	145	145	85	85	145	145	145
Sandy Shale	145	655	655	145	145	655	655	655
Silty Sandstone	655	865	865	655	655	865	865	865
Silty Shale	865	1,085	1,085	865	865	1,085	1,085	1,085
Sandy Siltstone	1,085	1,175	1,175	1,085	1,085	1,175	1,175	1,175
Silty Shale	1,175	1,365	1,365	1,175	1,175	1,365	1,365	1,365
Sandstone	1,365	1,295	1,295	1,365	1,365	1,295	1,295	1,295
Sandstone	1,295	1,645	1,645	1,295	1,295	1,645	1,645	1,645
Shale	1,645	1,745	1,745	1,645	1,645	1,745	1,745	1,745
Sandstone	1,745	1,805	1,805	1,745	1,745	1,805	1,805	1,805
Silty Sandstone	1,805	1,795	1,795	1,805	1,805	1,795	1,795	1,795
Sandstone	1,795	1,835	1,835	1,795	1,795	1,835	1,835	1,835
Sandstone	1,835	1,838	1,838	1,835	1,835	1,854	1,854	1,854
Big Lime	1,853	2,585	2,585	1,829	1,829	2,587	2,587	2,587
Fifty Foot Sandstone	2,585	2,720	2,720	2,562	2,562	2,721	2,721	2,721
Gordon	2,720	3,213	3,213	2,696	2,696	3,216	3,216	3,216
Fifth Sandstone	3,213	3,297	3,297	3,191	3,191	3,299	3,299	3,299
Bayard	3,297	3,874	3,874	3,274	3,274	3,886	3,886	3,886
Speechley	3,874	4,244	4,244	3,861	3,861	4,265	4,265	4,265
Baltown	4,244	4,604	4,604	4,240	4,240	4,635	4,635	4,635
Bradford	4,604	4,878	4,878	4,610	4,610	4,917	4,917	4,917
Benson	4,878	5,127	5,127	4,892	4,892	5,172	5,172	5,172
Alexander	5,127	6,237	6,237	5,147	5,147	6,376	6,376	6,376
Sycamore	6,064	6,212	6,212	6,154	6,154	6,351	6,351	6,351
Middlesex	6,212	6,315	6,315	6,351	6,351	6,533	6,533	6,533
Burkett	6,315	6,345	6,345	6,533	6,533	6,612	6,612	6,612
Tully	6,345	6,363	6,363	6,612	6,612	6,681	6,681	6,681
Marcellus	6,363	NA	NA	6,681	6,681	NA	NA	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.

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ANTERO RESOURCES CORPORATION

Location: Ritchie County, WV
 Field: Ritchie
 Facility: Lynn Camp Pad
 Slot: Slot #07
 Well: Riggs Unit 2H
 Wellbore: Riggs Unit 2H PWB

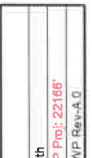


Plot reference wellpath is Riggs Unit 2H PWB Rev A.0
 True vertical depths are referenced to Patterson 342 (RKB)
 Measured depths are referenced to Patterson 342 (RKB)
 Patterson 342 (RKB) to Mean Sea Level: 1174 feet
 Mean Sea Level to Ground level (At Slot Slot #07): -1148 feet
 Coordinates are in feet referenced to Slot

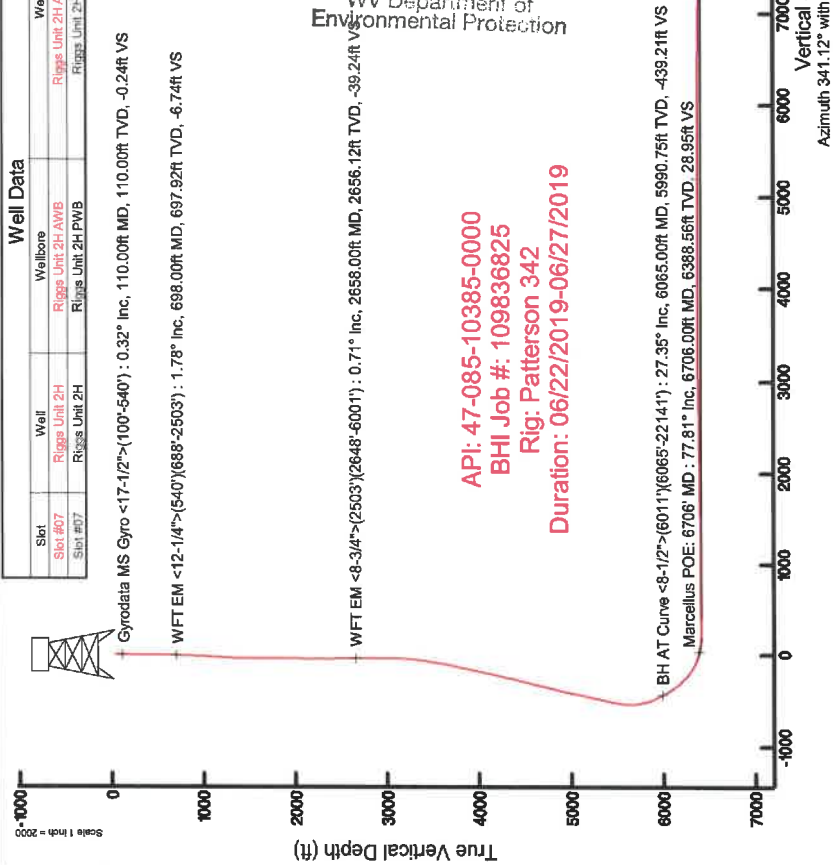
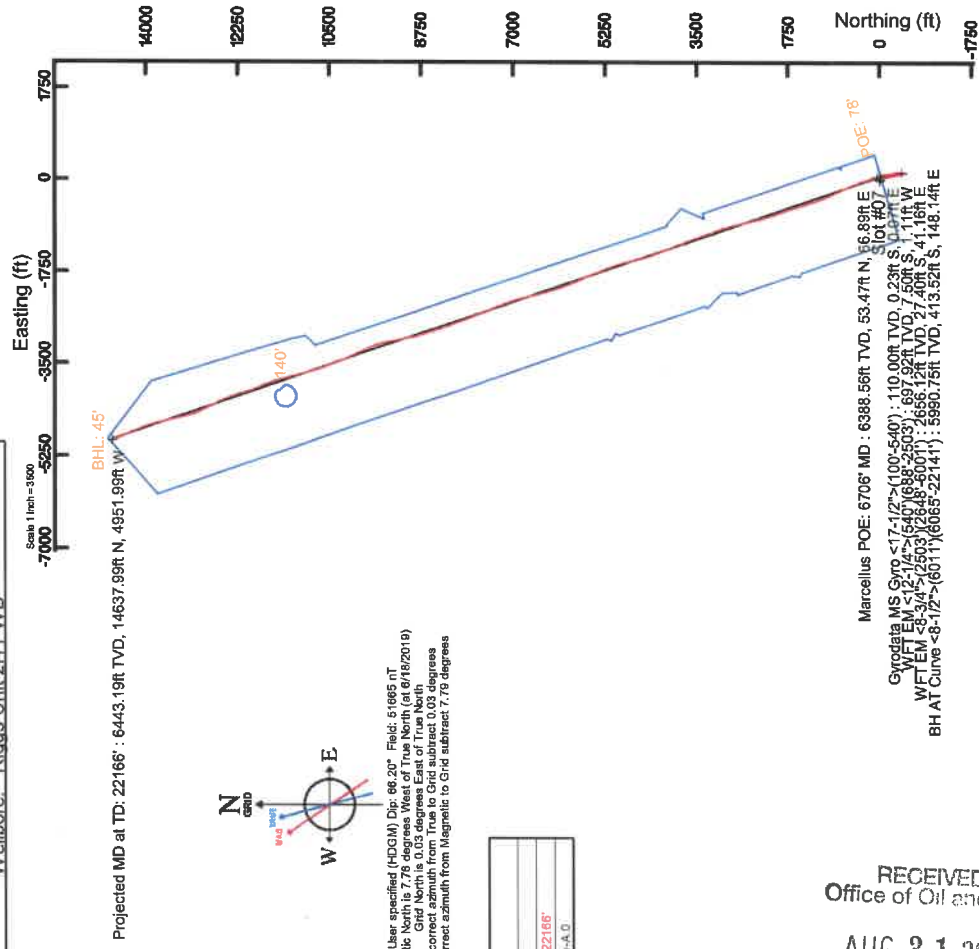
Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Lynn Camp Pad	1655924.222	39°12'50.070"N	80°59'42.910"W
Local N (ft)	Grid East (US ft)	Grid North (US ft)	Longitude
Slot #07	1655947.803	39°12'50.450"N	80°59'42.800"W
Patterson 342 (RKB) to Ground level (At Slot Slot #07)	25ft		
Mean Sea Level to Ground level (At Slot Slot #07)	-1148ft		
Patterson 342 (RKB) to Mean Sea Level	1174ft		

Well Profile Data						
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local E (ft)	Local N (ft)
TD On	6011.00	26.130	358.840	5942.63	-437.82	148.29
Prk. To Bottom	6085.00	28.470	359.840	6008.28	-403.88	148.20
Avoid No-Go	6108.81	30.000	359.000	6028.88	-392.35	148.08
End of 3D Arc	6374.03	48.904	349.789	6238.15	-226.32	129.80
POE	6679.19	79.389	341.118	6387.00	23.92	61.22
Landing PL	6845.81	90.000	341.118	6411.00	178.78	8.12
BHL	22132.06	90.000	341.118	14842.84	-4938.81	0.00

Slot	Well	Wellbore
Slot #07	Riggs Unit 2H	Riggs Unit 2H PWB
Slot #07	Riggs Unit 2H AMB	Riggs Unit 2H PWB Rev A.0



User specified (+DCM) Dip: 86.20° Field: 61665 nT
 Magnetic North is 7.76 degrees West of True North (at 06/16/2019)
 To correct azimuth from True to Grid subtract 0.03 degrees
 To correct azimuth from Magnetic to Grid subtract 7.79 degrees



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API: 47-085-10385-0000
 BHI Job #: 109836825
 Rig: Patterson 342
 Duration: 06/22/2019-06/27/2019

Projected MD at TD: 22166° : 6443.19ft TVD, 14637.99ft N, 4351.99ft W

Vertical Section (ft)
 Azimuth 341.12° with reference 0.00 N, 0.00 E

Scale 1 inch = 2000

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	1/5/2020
Job End Date:	1/30/2020
State:	West Virginia
County:	Ritchie
API Number:	47-085-10385-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Riggs Unit 2H
Latitude:	39.21401390
Longitude:	-80.94516660
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,540
Total Base Water Volume (gal):	24,747,187
Total Base Non Water Volume:	0

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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	86.67945	
CI-9100G	CWS	Corrosion Inhibitor					
				Listed Below			

DynaRate 6522	CWS	Friction Reducer							
					Listed Below				
Calbreak 5501	CWS	Breaker							
					Listed Below				
Sand (Proppant)	CWS	Propping Agent							
					Listed Below				
SaniFrac 8123	CWS	Microbiocide							
					Listed Below				
Hydrochloric Acid	CWS	Clean Perforations							
					Listed Below				
CalGel 4000	CWS	Gel Slurry							
					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	12.97641			
			Illite	12173-60-3	1.00000	0.12976			
			Hydrochloric acid	7647-01-0	37.00000	0.11072			
			Copolymer of 2-propanamide	69418-26-4	30.00000	0.01373			
			Ilmenite	98072-94-7	0.10000	0.01298			

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			Goethite	1310-14-1	0.10000	0.01298	
			Biotite	1302-27-8	0.10000	0.01298	
			Apatite	64476-38-6	0.10000	0.01298	
			Guar gum	9000-30-0	60.00000	0.01004	
			Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.01004	
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.00916	
			Ammonium chloride	12125-02-9	8.00000	0.00366	
			Glutaraldehyde	111-30-8	14.00000	0.00158	
			Oleic Acid	93-83-4	2.00000	0.00092	
			Diethanolamide	68953-58-2	5.00000	0.00084	
			Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite				
			Alkyl dimethyl benzyl ammonium chloride	68424-85-1	3.00000	0.00034	
			Ethanol	64-17-5	3.00000	0.00034	
			Didecyl dimethyl ammonium chloride	7173-51-5	3.00000	0.00034	
			Ammonium Persulfate	7727-54-0	100.00000	0.00031	
			Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00025	
			Ethylene Glycol	107-21-1	40.00000	0.00006	
			Vinylidene chloride-methyl acrylate copolymer	25038-72-6	20.00000	0.00006	
			Diethylene glycol, monomethyl ether	34590-94-8	20.00000	0.00003	
			Cinnamaldehyde	104-55-2	10.00000	0.00002	
			Formic acid	64-18-6	10.00000	0.00002	
			Tar bases, quinolone derivs, benzyl chloride-quaternized	72480-70-7	10.00000	0.00002	
			Ethoxylated Alcohols	68131-39-5	10.00000	0.00002	

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		Isopropyl alcohol	67-63-0	5.00000	0.00001
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* 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)

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LATITUDE 39°15'00"

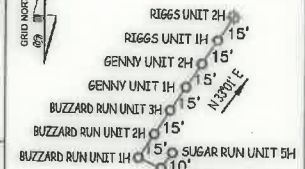
8,075'

1,214' TO BOTTOM HOLE
LATITUDE 39°17'30"

Antero Resources Corporation
Well No. Riggs Unit 2H

DOUGLAS R. ROWE
LICENSED
No. 2202
STATE OF
WEST VIRGINIA
PROFESSIONAL SURVEYOR

PAD LAYOUT



LONGITUDE 80°57'30"

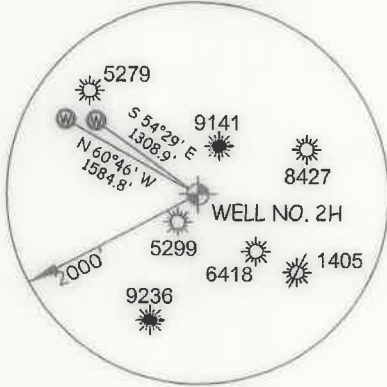
13,108'

LONGITUDE 80°55'00"

AS DRILLED DATA:
WELL 2H TOP HOLE INFORMATION:
N: 263,352ft E: 1,590,535ft
LAT: 39°12'50.45" LON: 80°56'42.60"
BOTTOM HOLE INFORMATION:
N: 278,070ft E: 1,585,829ft
LAT: 39°15'15.15" LON: 80°57'45.43"
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE 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: 4,340,537m E: 504,748m
BOTTOM HOLE INFORMATION:
N: 4,344,997m E: 503,240m

NOTE:
2 WATER WELLS WERE LOCATED WITHIN 2000' OF THE CENTER OF PAD



Clay District - Ritchie County

30-15	Joseph Wilson
30-16	Norma Hilvers
30-18	Harry Bruner
30-27	Joseph Wilson
30-41	Ray Taylor
31-17	E L F LLC
35-05	E L F LLC
35-12	E L F LLC
35-27	Kevin Headle
35-28	Brian Taylor
36-6.1	E L F LLC
36-14.1	Brian Taylor
36-25.1	EQ T Gatherings OPCO LLC
36-26	Meghan Clovis
36-27	James Elder
36-28	James Masters
2H BOTTOM HOLE	
39-09	Howard Hornish
40-02	Scott Williams
40-07	James Masters
40-08	Terry Lee Richards
40-09	Terry Lee Richards
40-14	Duane Riggs
40-18	Duane Riggs
40-05	MARY A. TUCKER ET AL LEASE
40-08	S. A. SMITH & C. BURKE MORRIS TRUST LEASE
40-09	LORETTA K. CLARK BARE ET AL LEASE
40-20	5" WHITE OAK @ FENCE CORNER

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 # 18-024WA
DRAWING # RIGGS2HAD
SCALE 1" = 2000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

LEGEND

- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Proposed Well Path
- Drilled Well Path

DOUGLAS R. ROWE P.S. 2202

DATE 06/04/20

OPERATOR'S WELL# RIGGS UNIT #2H

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 ANTERO RESOURCES CORPORATION.
- 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.

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
(IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
LOCATION: ELEVATION 1,149' AS BUILT WATERSHED NORTH FORK HUGHES RIVER QUADRANGLE PULLMAN 7.5' (SHL) PENNSBORO 7.5' (BHL) STATE COUNTY PERMIT
SURFACE OWNER TERRY LEE RICHARDS ACREAGE 60 ACRES +/- DISTRICT CLAY COUNTY RITCHIE
OIL & GAS ROYALTY OWNER LORETTA K. CLARK BARE ET AL; MILES H. LAMM ET UX; LAWRENCE E. DOTSON ET UX; LEASE ACREAGE 60 AC±; 44 AC±; 57 AC±;
DUANE RIGGS; ALMARINE HOUGE; HARRY J. TAYLOR; MARY HOLLAND ET VIR; GROVER C. TAYLOR ET AL; 42.5 AC±; 90 AC±; 155 AC±; 220 AC±; 577 AC±;
LENA R. CARR ET AL; DALE WEEKELY ET AL 163 AC±; 140 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 6,443' TVD 22,166' MD
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM
ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD
FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME

PERMIT

LATITUDE 39°15'00"

8,075'

1,214' TO BOTTOM HOLE

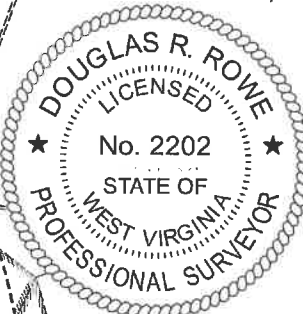
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13,108'

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Antero Resources Corporation
Well No. Riggs Unit 2H



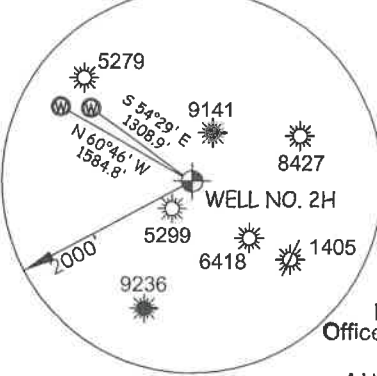
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STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

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

JOB # 18-024WA
DRAWING # RIGGS2HAD
SCALE 1" = 2000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS
STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

LEGEND
 - - - - - Surface Owner Boundary Lines +/-
 - - - - - Interior Surface Tracts +/-
 O - - - - - Proposed Well Path
 O - - - - - As Drilled Well Path

DOUGLAS R. ROWE P.S. 2202
DATE 06/04/20
OPERATOR'S WELL# RIGGS UNIT #2H

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WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___ 47 - 085 - 10385
 (IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X STATE COUNTY PERMIT
 LOCATION: ELEVATION 1,149' AS BUILT WATERSHED NORTH FORK HUGHES RIVER QUADRANGLE PULLMAN 7.5' (SHL) PENNSBORO 7.5' (BHL)
 SURFACE OWNER TERRY LEE RICHARDS ACREAGE 60 ACRES +/- DISTRICT CLAY COUNTY RITCHIE
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