

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

API 47-085-10338 County Ritchie District Clay
Quad Pennsboro 7.5' Pad Name Hichman Pad Field/Pool Name ----
Farm name Radall Bond et al Well Number Centerville 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 4354367m Easting 509973m
Landing Point of Curve Northing 4354232m Easting 509863m
Bottom Hole Northing 4350767m Easting 511024m

Elevation (ft) 1250' 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 1/17/2018 Date drilling commenced 1/31/2018 Date drilling ceased 7/15/2018
Date completion activities began 2/3/2018 Date completion activities ceased 3/24/2019
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 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:

API 47-085 - 10338 Farm name Radall Bond et al Well number Centerville 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"	95'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	465.9'	New	54.5#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2567.8'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	19144'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6822.1'		4.7#, L-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	241	0'	8 Hrs.
Surface	Class A	421 sx	15.6	1.20	505	0'	8 Hrs.
Coal							
Intermediate 1	Class A	887 sx	15.6	1.20	1064	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	690 sx (Lead) 2320 sx (Tail)	14 (Lead), 15.2 (Tail)	1.45 (Lead), 1.83(Tail)	5246	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 19164' MD, 6693' TVD (BHL), 6693' (Deepest Point Drilled) Loggers TD (ft) 19164' MD

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

Plug back procedure N/A

Kick off depth (ft) 6000'

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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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>6590' (TOP)</u>	<u>TVD</u>	<u>6883' (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 3000 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 11806.40 mcfpd Oil 123.7 bpd NGL --- bpd Water 832.47 bpd GAS MEASURED BY Estimated Orifice Pilot

<u>LITHOLOGY/ FORMATION</u>	<u>TOP</u>		<u>BOTTOM</u>		<u>DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H₂S, ETC)</u>
	<u>DEPTH IN FT NAME TVD</u>	<u>DEPTH IN FT TVD</u>	<u>DEPTH IN FT MD</u>	<u>DEPTH IN FT MD</u>	

***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

Logging Company Allied Horizontal Wireline Services
Address 381 Colonial Manor Rd City North Huntington State PA Zip 15642

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

Stimulating Company CalFrac Well Services
Address 171 17th Street, Wuite 1445 City Denver State CO Zip 80202

Please insert additional pages as applicable.

Completed by Karin Cox Telephone 303-357-6820
Signature  Title Permitting Agent Date 6/7/2019

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	2/3/2019	18985.5	19040.6	60	Marcellus
2	2/4/2019	18784.53	18954.005	60	Marcellus
3	2/4/2019	18583.56	18753.035	60	Marcellus
4	2/4/2019	18382.59	18552.065	60	Marcellus
5	2/5/2019	18181.62	18351.095	60	Marcellus
6	2/5/2019	17980.65	18150.125	60	Marcellus
7	2/5/2019	17779.68	17949.155	60	Marcellus
8	2/6/2019	17578.71	17748.185	60	Marcellus
9	2/6/2019	17377.74	17547.215	60	Marcellus
10	2/6/2019	17176.77	17346.245	60	Marcellus
11	2/6/2019	16975.8	17145.275	60	Marcellus
12	2/7/2019	16774.83	16944.305	60	Marcellus
13	2/7/2019	16573.86	16743.335	60	Marcellus
14	2/7/2019	16372.89	16542.365	60	Marcellus
15	2/8/2019	16171.92	16341.395	60	Marcellus
16	2/8/2019	15970.95	16140.425	60	Marcellus
17	2/8/2019	15769.98	15939.455	60	Marcellus
18	2/9/2019	15569.01	15738.485	60	Marcellus
19	2/9/2019	15368.04	15537.515	60	Marcellus
20	2/10/2019	15167.07	15336.545	60	Marcellus
21	2/10/2019	14966.1	15135.575	60	Marcellus
22	2/10/2019	14765.13	14934.605	60	Marcellus
23	2/10/2019	14564.16	14733.635	60	Marcellus
24	2/11/2019	14363.19	14532.665	60	Marcellus
25	2/11/2019	14162.22	14331.695	60	Marcellus
26	2/12/2019	13961.25	14130.725	60	Marcellus
27	2/12/2019	13760.28	13929.755	60	Marcellus
28	2/13/2019	13559.31	13728.785	60	Marcellus
29	2/13/2019	13358.34	13527.815	60	Marcellus
30	2/14/2019	13157.37	13326.845	60	Marcellus
31	2/14/2019	12956.4	13125.875	60	Marcellus
32	2/15/2019	12755.43	12924.905	60	Marcellus
33	2/15/2019	12554.46	12723.935	60	Marcellus
34	2/16/2019	12353.49	12522.965	60	Marcellus
35	2/16/2019	12152.52	12321.995	60	Marcellus
36	2/17/2019	11951.55	12121.025	60	Marcellus
37	2/17/2019	11750.58	11920.055	60	Marcellus
38	2/17/2019	11549.61	11719.085	60	Marcellus
39	2/18/2019	11348.64	11518.115	60	Marcellus
40	2/18/2019	11147.67	11317.145	60	Marcellus
41	2/19/2019	10946.7	11116.175	60	Marcellus
42	2/19/2019	10745.73	10915.205	60	Marcellus
43	2/19/2019	10544.76	10714.235	60	Marcellus
44	2/20/2019	10343.79	10513.265	60	Marcellus
45	2/20/2019	10142.82	10312.295	60	Marcellus
46	2/20/2019	9941.85	10111.325	60	Marcellus
47	2/20/2019	9740.88	9910.355	60	Marcellus
48	2/21/2019	9539.91	9709.385	60	Marcellus
49	2/21/2019	9338.94	9508.415	60	Marcellus
50	2/21/2019	9137.97	9307.445	60	Marcellus
51	2/22/2019	8937	9106.475	60	Marcellus
52	2/22/2019	8736.03	8905.505	60	Marcellus
53	2/22/2019	8535.06	8704.535	60	Marcellus
54	2/23/2019	8334.09	8503.565	60	Marcellus
55	2/23/2019	8133.12	8302.595	60	Marcellus
56	2/23/2019	7932.15	8101.625	60	Marcellus
57	2/24/2019	7731.18	7900.655	60	Marcellus
58	2/24/2019	7530.21	7699.685	60	Marcellus
59	2/25/2019	7329.24	7498.715	60	Marcellus
60	2/25/2019	7128.27	7297.745	60	Marcellus
61	2/26/2019	6927.3	7096.775	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	2/3/2019	59.24129	8101.725	7674	4012	151250	7964.701	N/A
2	2/4/2019	71.15957	8351.323	6293	4200	401100	8316.43	N/A
3	2/4/2019	71.64954	8340.19	5897	4032	402250	8584.82	N/A
4	2/4/2019	73.04764	8261.375	5750	3807	401800	8416.82	N/A
5	2/5/2019	75.25543	8458.394	5506	4156	403600	8581.03	N/A
6	2/5/2019	73.62125	8303.489	5476	3689	400600	8559.64	N/A
7	2/5/2019	71.94261	8323.585	9288	3820	401900	8469.41	N/A
8	2/6/2019	67.5034	8313.847	9311	3813	389800	8338.57	N/A
9	2/6/2019	73.88692	8209.447	4560	4240	400900	8292.7	N/A
10	2/6/2019	71.4864	8350.086	9022	3982	401850	8339.11	N/A
11	2/6/2019	76.7845	8339.096	6374	4215	402300	8390.52	N/A
12	2/7/2019	69.29568	8460.987	6195	4861	404850	9435.29	N/A
13	2/7/2019	69.36323	8255.488	5956	4615	402750	8571.53	N/A
14	2/7/2019	63.27517	8185.216	6152	3723	401300	8394.46	N/A
15	2/8/2019	70.72434	8071.415	5869	3779	401300	8352.55	N/A
16	2/8/2019	71.59077	8359.291	6248	4536	402250	8771.7	N/A
17	2/8/2019	79.87703	8324.218	5207	4080	402300	8347.08	N/A
18	2/9/2019	72.93173	8286.096	6127	4043	402450	8692.35	N/A
19	2/9/2019	77.80923	8261.194	5063	4169	403400	8274.47	N/A
20	2/10/2019	75.57262	8206.606	6186	3775	403200	8287.78	N/A
21	2/10/2019	79.12323	8085.435	6150	4756	402900	8497.73	N/A
22	2/10/2019	77.82297	8140.53	5940	3900	403900	8438.58	N/A
23	2/10/2019	77.89842	8206.028	6225	3418	401900	8280.48	N/A
24	2/11/2019	77.75005	8090.807	6313	4088	402900	8395.15	N/A
25	2/11/2019	80.28738	7917.194	5509	4918	401400	8305.81	N/A
26	2/12/2019	75.56522	8011.13	5912	3768	403300	8271.53	N/A
27	2/12/2019	76.64191	7834.503	4753	4149	403200	8317.97	N/A
28	2/13/2019	81.82625	8176.355	5988	3660	403750	8221.3	N/A
29	2/13/2019	78.74744	8302.21	6271	3997	402800	8364.99	N/A
30	2/14/2019	76.72274	7858.662	5187	4207	303980	8266.23	N/A
31	2/14/2019	76.89666	8043.236	4639	4217	285340	8234.94	N/A
32	2/15/2019	82.42898	8112.097	4220	3637	335200	8495.19	N/A
33	2/15/2019	77.21005	7978.628	6062	3492	403000	8204.37	N/A
34	2/16/2019	78.94837	7792.471	5642	3903	400000	8378.87	N/A
35	2/16/2019	78.97276	7861.262	5515	3712	402350	8282.68	N/A
36	2/17/2019	76.15585	7771.04	4634	4265	400500	8267.15	N/A
37	2/17/2019	71.08872	7571.324	6564	3904	402650	8359.46	N/A
38	2/17/2019	75.7616	7828.595	5909	3659	401550	8290.34	N/A
39	2/18/2019	73.82286	7694.516	4853	3538	402850	8134.78	N/A
40	2/18/2019	76.28539	8018.339	6490	3509	403200	8266.43	N/A
41	2/19/2019	74.3746	8005.104	6723	3449	399650	8277.81	N/A
42	2/19/2019	78.20704	7843.994	6648	3681	402850	8301.74	N/A
43	2/19/2019	70.61284	7732.531	5754	4225	400800	8218.32	N/A
44	2/20/2019	72.95038	7602.906	6275	4208	401350	8225.56	N/A
45	2/20/2019	76.09411	7421.778	5249	5058	402650	8183.63	N/A
46	2/20/2019	79.39125	7912.027	5244	3787	400550	8252.39	N/A
47	2/20/2019	84.25098	7841.333	4041	3927	400800	8216.18	N/A
48	2/21/2019	81.06539	7663.742	5910	3675	402000	8198.74	N/A
49	2/21/2019	79.11399	7557.978	6488	3592	402350	8179.02	N/A
50	2/21/2019	80.24779	7670.875	5351	3848	399800	8119.41	N/A
51	2/22/2019	80.741	7416.366	5851	3689	402200	8264.15	N/A
52	2/22/2019	82.28684	7603.469	6636	4263	402300	8074.09	N/A
53	2/22/2019	86.27403	7760.761	5000	4807	402050	8168.8	N/A
54	2/23/2019	75.05296	7199.302	6211	3193	401600	8142.1	N/A
55	2/23/2019	75.08689	7245.917	5804	3341	401900	8027.16	N/A
56	2/23/2019	72.24065	7038.553	5831	4014	401500	8142.77	N/A
57	2/24/2019	82.4743	7111.5	7129	4002	402250	8136.94	N/A
58	2/24/2019	82.44074	7004.402	4928	3612	402560	8290.81	N/A
59	2/25/2019	74.66255	6769.981	5805	3869	402050	8326.06	N/A
60	2/25/2019	79.23053	7278.66	6651	3856	401600	8169.65	N/A
61	2/26/2019	79.86951	6921.158	5440	3777	401400	8123.88	N/A
AVG=		76	7,896	5,966	3,969	23,982,030	507,694	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
No Data collected	0	445	0	445
Silty Shale	est 445	505	est 445	505
Shaly Siltstone	est 505	685	est 505	685
Sandy Siltstone	est 685	765	est 685	765
Silty Sandstone	est 765	845	est 765	845
Sandy Siltstone	est 845	905	est 845	905
Shaly Sandstone	est 905	945	est 905	945
Sandy Shale	est 945	1,085	est 945	1,085
Shaly sandstone tr coal	est 1,085	1,145	est 1,085	1,145
Shaly Sandstone	est 1,145	1,265	est 1,145	1,265
Silty Shale with intermittend SS	est 1,265	1,625	est 1,265	1,625
Sandstone	est 1,625	1,785	est 1,625	1,785
Sandy Shale	est 1,785	2,097	est 1,785	2,098
Big Lime	2,097	2,966	2,098	2,969
Fifty Foot Sandstone	2,966	3,067	2,969	3,071
Gordon	3,067	3,233	3,071	3,239
Fifth Sandstone	3,233	3,434	3,239	3,442
Bayard	3,434	3,962	3,442	3,981
Speechley	3,962	4,205	3,981	4,227
Balltown	4,205	4,759	4,227	4,789
Bradford	4,759	5,108	4,789	5,145
Benson	5,108	5,357	5,145	5,399
Alexander	5,357	6,292	5,399	6,371
Sycamore	6,292	6,417	6,371	6,533
Middlesex	6,417	6,526	6,533	6,716
Burkett	6,526	6,559	6,716	6,792
Tully	6,559	6,590	6,792	6,883
Marcellus	6,590	NA	6,883	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.



ANTERO RESOURCES CORPORATION

Location: Ritchie County, WV
 Field: Ritchie
 Facility: Hichman Pad
 Slot: Slot #04
 Well: Centerville Unit 2H
 Wellbore: Centerville_Unit_2H_PWB

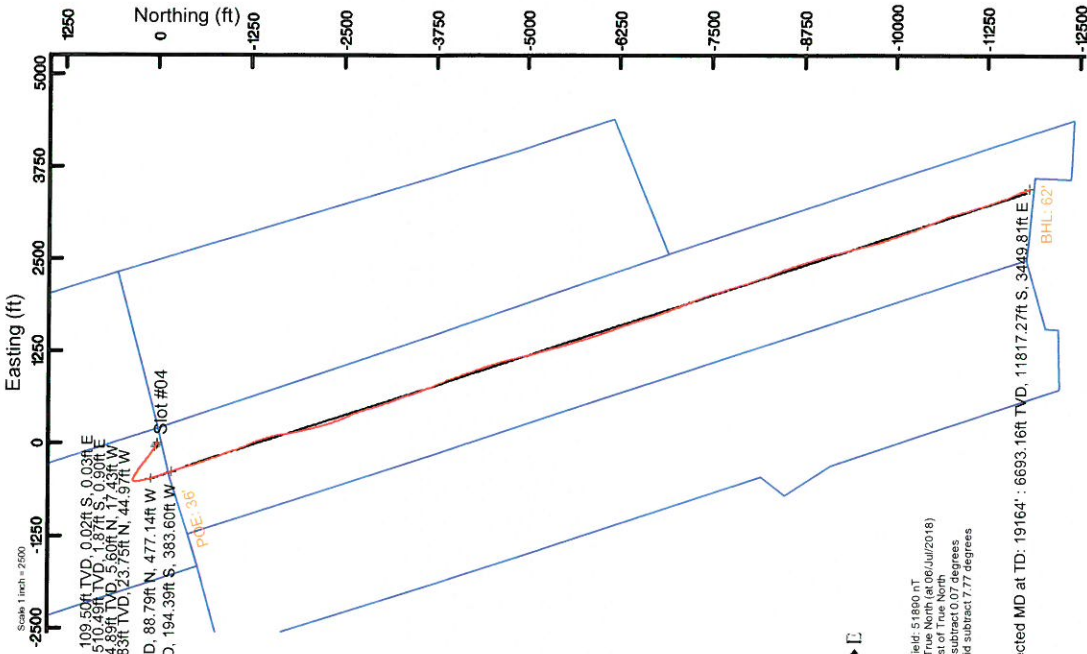


API: 47-085-10338-0000

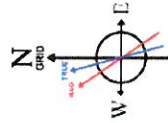
BHI Job #: 9263334

Rig: Frontier 22

Duration: 07/08/2018-07/12/2018



Gyrodatta MS Gyro <17-1/2> (100-445): 109.50ft TVD, 0.02ft S, 0.03ft E
 Gyrodatta MS Gyro <12-1/4> (445)501:770: 510.50ft TVD, 2.06ft VS
 WFT EM <-8-3/4> (2488)(2593-6471): 2600.83ft TVD, 36.49ft VS
 Marcellus POE: 6907 MD: 6613.99ft TVD, 194.39ft S, 383.60ft W
 BHI AT Curve <-8-1/2> (6480.50)(6559-19135): 6442.22ft TVD, 88.79ft N, 477.14ft W
 Projected MD at TD: 19164: 6693.16ft TVD, 11817.27ft S, 3449.81ft E



User specified Dip: 66.49° Field: 51800 nT
 Magnetic North is 0.07 degrees East of True North (July 2018)
 Grid North is 0.07 degrees East of True North
 To correct azimuth from True to Grid subtract 0.07 degrees
 To correct azimuth from Magnetic to Grid subtract 7.77 degrees

Pict reference wellpath is Centerville_Unit_2H_PWB_Rev-A.0		Grid System: NAD27 UTM Zone 17 North, US feet	
True vertical depths are referenced to Frontier 22 (RKB)		North Reference: Grid north	
Measured depths are referenced to Frontier 22 (RKB)		Scale: True distance	
Frontier 22 (RKB) to Mean Sea Level: 1274.5 feet		Depths are in feet	
Mean Sea Level to Ground level (At Slot: Slot #04): -1250 feet		Created by: dbeason on 2018-08-02	
Coordinates are in feet referenced to Slot		Database: WA_MPL_EasternUS_Defn	

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Hichman Pad	1673097.617	1428267.289	80°53'03.890"W
Slot	Local N (ft)	Grid East (US ft)	Latitude
Slot #04	-29.35	1673089.801	39°20'18.930"N
Frontier 22 (RKB) to Ground level (At Slot: Slot #04)	24.5 ft		80°53'03.990"W
Mean Sea Level to Ground level (At Slot: Slot #04)	-1250ft		
Frontier 22 (RKB) to Mean Sea Level	1274.5ft		

Gyrodatta MS Gyro <17-1/2> (100-445): 0.04° Inc, 109.50ft MD, 109.50ft TVD, 0.02ft VS

Gyrodatta MS Gyro <12-1/4> (445)501:770: 0.30° Inc, 510.50ft MD, 510.49ft TVD, 2.06ft VS

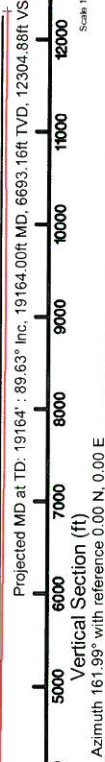
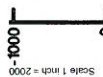
WFT EM <-12-1/4> (770)(886-2488): 5.00° Inc, 895.50ft MD, 894.89ft TVD, -10.72ft VS

WFT EM <-8-3/4> (2488)(2593-6471): 1.64° Inc, 2602.50ft MD, 2600.83ft TVD, -36.49ft VS

Well Data			
Slot	Well	Wellbore	Wellpath
Slot #04	Centerville Unit 2H	Centerville Unit 2H AWB	Centerville_Unit_2H_AWP_Proj_19164
Slot #04	Centerville Unit 2H	Centerville Unit 2H PWB	Centerville_Unit_2H_PWB_Rev-A.0

Well Profile Data							
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	DLS (7100ft)	VS (ft)
Tie On	6480.50	39.170	166.100	6393.47	139.12	-490.33	4.52
Proj. To Bottom	6578.50	46.380	164.950	6455.36	74.73	-473.66	7.40
POE	6923.82	76.000	160.000	6620.00	-209.90	-381.81	8.66
Landing Pt.	7113.02	90.000	160.000	6643.00	-385.93	-317.74	7.40
On Azimuth	7551.31	90.000	161.986	6643.00	-800.30	-175.01	0.45
BHL	19099.00	90.000	161.986	6643.00	-11773.34	3393.42	0.00
							12245.67

BHI AT Curve <-8-1/2> (6480.50)(6559-19135): 43.89° Inc, 6559.00ft MD, 6442.22ft TVD, -231.96ft VS
 Marcellus POE: 6907 MD: 6613.99ft TVD, 194.39ft S, 383.60ft W



Projected MD at TD: 19164: 89.63° Inc, 19164.00ft MD, 6693.16ft TVD, 12304.86ft VS
 Azimuth 161.99° with reference 0.00 N, 0.00 E

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	2/3/2019
Job End Date:	2/26/2019
State:	West Virginia
County:	Ritchie
API Number:	47-085-10338-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Centerville Unit 2H
Latitude:	39.33859200
Longitude:	-80.88444200
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,693
Total Base Water Volume (gal):	22,029,992
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	88.00468	
DAP-902	CWS	Scale Inhibitor					
				Listed Below			

				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	11.61952
				Calcite	471-34-1	1.00000	0.08080
				Hydrochloric acid	7647-01-0	37.00000	0.05520
				Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.04608
				Guar gum	9000-30-0	60.00000	0.04608
				Illite	12173-60-3	1.00000	0.03536
				Polymer	26100-47-0	45.00000	0.02680
				Distillates (petroleum), hydrotreated light	64742-47-8	30.00000	0.01786
				Goethite	1310-14-1	0.10000	0.01162
				Biotite	1302-27-8	0.10000	0.01162
				Apatite	64476-38-6	0.10000	0.01162
				Ammonium chloride	12125-02-9	11.00000	0.00655
				Polyethylene glycol mixture	25322-68-3	54.50000	0.00586
				Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00384
				Ilmenite	98072-94-7	0.10000	0.00354
				Sorbitan monooleate	1338-43-8	4.00000	0.00238
				2,2-Dibromo-3-Nitriopropionamide	10222-01-2	20.00000	0.00215
				Polyethylene glycol monooleate	9004-96-0	3.00000	0.00179
				Ammonium Persulfate	7727-54-0	100.00000	0.00171
				Sorbitol tetraoleate	61723-83-9	2.00000	0.00119
				Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00115
				Amines, tallow alkyl, ethoxylated	61791-26-2	1.00000	0.00060

					77-92-9	60.00000	0.00050	
					7647-15-6	4.00000	0.00043	
					25038-72-6	20.00000	0.00034	
					3252-43-5	3.00000	0.00032	
					84133-50-6	0.50000	0.00030	
					79-06-1	0.10000	0.00006	
					107-21-1	40.00000	0.00003	
					34590-94-8	20.00000	0.00002	
					104-55-2	10.00000	0.00001	
					64-18-6	10.00000	0.00001	
					67-63-0	5.00000	0.00001	
					72480-70-7	10.00000	0.00001	
					68131-39-5	10.00000	0.00001	
					57-55-6			Proprietary Additive Concentration
					9003-04-7			Proprietary Additive Concentration

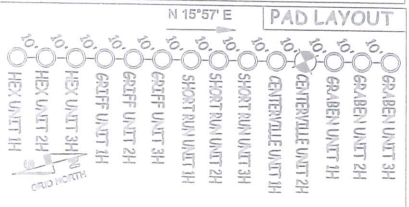
* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water
** Information is based on the maximum potential for concentration and thus the total may be over 100%
*** If you are calculating a percentage of total ingredients do not add the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

LATITUDE 39°22'30" 2,670'
 11,027' TO BOTTOM HOLE
 LATITUDE 39°20'00"

Antero Resources Corporation
 Well No. Centerville Unit 2H

NOTES:
 WELL 2H TOP HOLE INFORMATION:
 N: 308,449ft E: 1,608,438ft
 LAT: 39°20'18.93" LON: 80°53'03.99"
 BOTTOM HOLE INFORMATION:
 N: 296,577ft E: 1,611,690ft
 LAT: 39°18'22.09" LON: 80°52'20.29"
 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: 4,354,367m E: 509,973m
 BOTTOM HOLE INFORMATION:
 N: 4,350,767m E: 511,024m



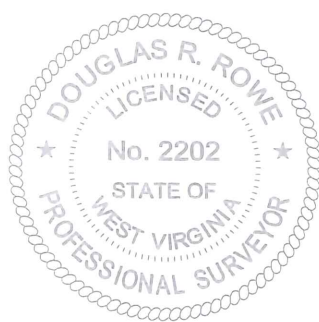
Clay District - Ritchie County			
9-20	Robert Langmeyer	312/911	129.32 AC
9-32	WVA Christian Youth Camp	178/198	87.75 AC
9-32.2	WVA Christian Youth Camp	178/198	30.25 AC
9-33	William Hart	313/273	98.79 AC
15-03	Karl Hochman	238/698	184.19 AC
15-3.1	WVA Christian Youth Camp	178/198	30 AC
15-11	Ronald Brasley Et Al	346/654	31 AC
Centerville District - Tyler County			
17-07	Roger Scott	85/223	20 AC
17-7.2	Roger Scott	207/043	30 AC
17-7.3	Roger Scott	211/621	30.88 AC
17-7.3	Randall Bond		32.16 AC
17-08	Eleanor Fowler	279/079	116 AC
19-01	Edwin Highway	W982/02	41 AC
19-02	James Ash Et Al		41.6 AC
20-1.3	Edward Getrell	W824/391	93.75 AC
20-02	Richard Foley	260/372	113 AC
20-05	Hertie Licot	348/334	85.1 AC
20-10.1	Eugene Walton	266/197	77.5 AC
20-11	Arnold Ambrose	313/532	61.85 AC
20-11.1	Robert Deak	333/537	2 AC
20-12	Phyllis Sheppard	264/427	85.25 AC
20-13	Robert Deak		100 AC
20-14	Nellie McCullough	368/517	9.93 AC
20-16	Anita Kern	122/397	59.25 AC
20-17	Nellie McCullough	368/517	18 AC
20-18	Ronald Williams	229/265	15 AC
20-19	William Stensbraker	356/508	29.31 AC
20-20	Edmond Garner	280/692	30.56 AC
21-01	Gary McCullough	269/446	84.42 AC
21-02	Edmund Garner	321/715	39.25 AC
20-22	Thadford Haldren Trust	321/715	30 AC
20-23	Thadford Haldren Trust	321/715	39.62 AC
20-24	Thadford Haldren Trust	301/131	41 AC
20-25	Coastal Forest Resources Co	280/692	62.5 AC
20-26	Edmond Garner	299/561	92.42 AC
21-01	Gary McCullough	264/659	43 AC
21-02	Arthur Colman	214/392	100.94 AC
21-04	Hammett Land & Minerals LLC	532/838	138.16 AC
Central District - Doddridge County			
3-13	Jeffrey James	348/712	35 AC
3-14	Jeff James	215/483	35 AC
3-15	Jeffrey James	329/680	209.85 AC
6-01	William Cottrill	239/479	69.25 AC
6-02	Edmond Rice	161/857	69.13 AC

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.

- NOTICE
1. 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.
 2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, ETC.
 3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
 4. 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.
 5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.



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 # 17-009WA
 DRAWING # CENTERVILLE2HAD
 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 +/-
 - - - - - Proposed Well Path
 - - - - - As Drilled Well Path
 DOUGLAS R. ROWE P.S. 2202
 DATE 06/03/19
 OPERATOR'S WELL# CENTERVILLE UNIT 2H

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___ 47 - 085 - 10338
 (IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X STATE COUNTY PERMIT
 LOCATION: ELEVATION 1,250' AS BUILT WATERSHED NORTH FORK HUGHES RIVER
 QUADRANGLE PENNSBORO 7.5' DISTRICT CLAY COUNTY RITCHIE
 SURFACE OWNER RADALL BOND ET AL ACREAGE 32.16 ACRES +/-
 OIL & GAS ROYALTY OWNER MARTHA J. DAVIS ET VIR; VERA LANGON; MRS. DORSEY P. CHRISLIP; LELIA WASHBURN ET AL; LEASE ACREAGE 70 AC±; 98.79 AC±; 87.75 AC±; 150 AC±; THE HEIRS OF S.T. DARNELL AND JOHN C. WILSON; DONALD F. HANES ET UX; RICHARD W. HANES; MRS. ALBERT MARSH ET AL; 113 AC±; 41 AC±; 39.63 AC±; 30 AC±; PHYLLIS SHEPARD TRUST; J.W. MCCULLOUGH ET AL; LOVIE E. GARNER; JANICE M. HASSIG; RALPHA A. ASH ET AL; CLYDE B. FERREBEE ET UX; 86.25 AC±; 99.5 AC±; 19 AC±; 53 AC±; 30 AC±; 105 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 6,693' TVD 19,164' 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

9,906' TO BOTTOM HOLE — LONGITUDE 80°50'00"
 13,261'
 LONGITUDE 80°52'30"