

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

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WV GEOLOGICAL SURVEY
MORGANTOWN, WV

API 47 - 017 - 06275 County Doddridge District Central
Quad West Union 7.5' Pad Name McGill Field/Pool Name ---
Farm name Brown, Mary F. Well Number Mash Unit 2H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop City Denver State CO Zip 80203

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4347266m Easting 513047m
Landing Point of Curve Northing 4347068.86m Easting 513009.30m
Bottom Hole Northing 4344312m Easting 514334m

Elevation (ft) 1166' 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 6/28/2013 Date drilling commenced 8/17/2013 Date drilling ceased 10/2/2013
Date completion activities began 11/16/2013 Date completion activities ceased 2/9/2014
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 225' Open mine(s) (Y/N) depths No
Salt water depth(s) ft 1865' Void(s) encountered (Y/N) depths No
Coal depth(s) ft 1240', 1300' Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

Reviewed by: _____

Greenwood (89) 6-6

API 47-017 - 06275 Farm name Brown, Mary F. Well number Mash 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"	40'	New	106.5# J-55	N/A	Y
Surface	17- 1/2"	13- 3/8"	376'	New	48# H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2,551'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5-1/2"	17,146'	New	20# P-110	N/A	Y
Tubing		2-3/8"	6801'		4.7# N-80	N/A	
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	200 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	438 sx	15.6	1.18	261	0'	8 Hrs.
Coal							
Intermediate 1	Class A	938 sx	15.6	1.18	799	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	904 sx (Lead), 1656 sx (Tail)	Lead 13.5, 15.2 Tail	1.44 Lead, 1.8 Tail	3458	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 17,158' MD, 6757' TVD (BHL), 6769' TVD (Deepest point drilled) Loggers TD (ft) 17,114' MD

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

Plug back procedure N/A

Kick off depth (ft) 6030'

** This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Nero Unit 1H API #47-017-06211). Please reference the wireline logs submitted with Form WR-35 for the Nero Unit 1H. A Cement Bond Log has been included with this submittal.

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

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WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED Radioactive + Chemical

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PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6691' (TOP) TVD	6888' (TOP) MD

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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 3600 psi DURATION OF TEST --- hrs

OPEN FLOW Gas 11153 mcfpd Oil 64 bpd NGL --- bpd Water 239 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	
	0		0		
*PLEASE SEE ATTACHED EXHIBIT 3					

Please insert additional pages as applicable.

Drilling Contractor Patterson Drilling - UTI Drilling Company, LLC
Address 207 Carolton Drive City Eight Four State PA Zip 15330

Logging Company Rush Wellsite Services
Address 600 Alpha Drive City Canonsburg State PA Zip 15317

Cementing Company Allied Oil & Gas Services, LLC
Address 1036 East Main St. City Bridgeport State WV Zip 26330

Stimulating Company U.S. Well Services
Address 533 Industrial Park Drive City Jane Lew State WV Zip 26378

Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233
Signature Kara Quackenbush Title Permit Representative Date 1/9/2015

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	16-Nov-13	16,920	17,089	60	Marcellus
2	19-Dec-13	16,720	16,888	60	Marcellus
3	19-Dec-13	16,519	16,688	60	Marcellus
4	19-Dec-13	16,319	16,488	60	Marcellus
5	21-Dec-13	16,119	16,288	60	Marcellus
6	21-Dec-13	15,919	16,087	60	Marcellus
7	21-Dec-13	15,718	15,887	60	Marcellus
8	21-Dec-13	15,518	15,687	60	Marcellus
9	22-Dec-13	15,318	15,487	60	Marcellus
10	22-Dec-13	15,118	15,287	60	Marcellus
11	22-Dec-13	14,917	15,086	60	Marcellus
12	23-Dec-13	14,717	14,886	60	Marcellus
13	23-Dec-13	14,517	14,686	60	Marcellus
14	23-Dec-13	14,317	14,486	60	Marcellus
15	24-Dec-13	14,116	14,285	60	Marcellus
16	24-Dec-13	13,916	1,408	60	Marcellus
17	26-Dec-13	13,716	13,885	60	Marcellus
18	26-Dec-13	13,516	13,685	60	Marcellus
19	27-Dec-13	13,315	13,484	60	Marcellus
20	27-Dec-13	13,115	13,284	60	Marcellus
21	27-Dec-13	12,915	13,084	60	Marcellus
22	27-Dec-13	12,715	12,884	60	Marcellus
23	28-Dec-13	12,514	12,683	60	Marcellus
24	28-Dec-13	12,314	12,483	60	Marcellus
25	28-Dec-13	12,114	12,283	60	Marcellus
26	29-Dec-13	11,914	12,083	60	Marcellus
27	29-Dec-13	11,713	11,882	60	Marcellus
28	29-Dec-13	11,513	11,682	60	Marcellus
29	29-Dec-13	11,313	11,482	60	Marcellus
30	30-Dec-13	11,131	11,282	60	Marcellus
31	30-Dec-13	10,913	11,081	60	Marcellus
32	30-Dec-13	10,712	10,881	60	Marcellus
33	31-Dec-13	10,512	10,681	60	Marcellus
34	31-Dec-13	10,312	10,481	60	Marcellus
35	31-Dec-13	10,112	10,280	60	Marcellus
36	1-Jan-14	9,911	10,080	60	Marcellus
37	1-Jan-14	9,711	9,880	60	Marcellus
38	2-Jan-14	9,511	9,680	60	Marcellus
39	2-Jan-14	9,311	9,479	60	Marcellus
40	2-Jan-14	9,110	9,279	60	Marcellus
41	2-Jan-14	8,910	9,079	60	Marcellus
42	3-Jan-14	8,710	8,879	60	Marcellus
43	3-Jan-14	8,510	8,678	60	Marcellus
44	4-Jan-14	8,309	8,478	60	Marcellus
45	4-Jan-14	8,109	8,278	60	Marcellus
46	4-Jan-14	7,909	8,078	60	Marcellus
47	4-Jan-14	7,709	7,877	60	Marcellus
48	5-Jan-14	7,508	7,677	60	Marcellus
49	5-Jan-14	7,308	7,477	60	Marcellus
50	5-Jan-14	7,108	7,277	60	Marcellus
51	5-Jan-14	6,908	7,077	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	19-Dec-13	69.9	7,686	N/A	4,979	174,020	6,519	N/A
2	19-Dec-13	72.3	7,621	6,177	4,287	211,670	6,164	N/A
3	20-Dec-13	70.2	7,635	6,674	4,579	203,620	6,275	N/A
4	20-Dec-13	69.7	7,586	6,629	4,962	142,680	6,411	N/A
5	21-Dec-13	75.2	7,393	6,005	4,045	206,460	6,029	N/A
6	21-Dec-13	72.3	7,425	5,403	3,801	124,850	5,931	N/A
7	21-Dec-13	68.9	7,683	6,318	4,921	134,870	6,427	N/A
8	22-Dec-13	76.9	7,389	5,956	4,865	196,640	5,944	N/A
9	22-Dec-13	68.2	7,534	5,909	3,509	131,200	6,286	N/A
10	22-Dec-13	76.3	7,690	6,107	4,850	174,150	5,943	N/A
11	23-Dec-13	70.1	7,777	5,746	4,906	129,940	6,217	N/A
12	23-Dec-13	64.0	7,432	5,839	3,787	87,100	6,185	N/A
13	23-Dec-13	75.6	7,159	5,850	4,596	114,600	6,397	N/A
14	23-Dec-13	70.5	7,644	5,725	5,039	139,160	6,401	N/A
15	24-Dec-13	73.1	7,408	5,131	4,650	169,170	6,316	N/A
16	26-Dec-13	63.9	6,763	5,304	4,108	72,820	6,438	N/A
17	26-Dec-13	73.7	7,612	5,249	5,590	165,275	6,347	N/A
18	27-Dec-13	71.8	7,402	5,444	3,984	170,450	5,625	N/A
19	27-Dec-13	70.5	7,313	2,362	4,136	97,560	6,416	N/A
20	27-Dec-13	70.0	7,264	5,193	5,294	178,400	6,258	N/A
21	27-Dec-13	73.0	7,388	5,149	5,404	223,790	6,134	N/A
22	28-Dec-13	73.0	7,042	5,523	4,808	225,550	6,095	N/A
23	28-Dec-13	73.6	7,124	5,406	4,690	227,260	5,957	N/A
24	28-Dec-13	75.4	7,174	5,494	5,100	226,680	5,914	N/A
25	29-Dec-13	73.5	7,296	5,316	5,152	230,002	6,019	N/A
26	29-Dec-13	72.5	7,036	5,313	4,626	232,120	5,971	N/A
27	29-Dec-13	74.3	7,217	5,305	4,894	226,320	5,867	N/A
28	29-Dec-13	72.3	7,016	5,165	4,958	228,350	5,912	N/A
29	30-Dec-13	71.4	6,995	5,393	5,373	153,970	6,143	N/A
30	30-Dec-13	78.2	7,170	5,757	5,380	229,950	5,796	N/A
31	30-Dec-13	77.9	7,213	5,455	4,829	251,160	5,809	N/A
32	30-Dec-13	80.4	7,075	5,524	4,433	242,620	5,817	N/A
33	31-Dec-13	79.3	7,104	5,334	4,889	227,400	5,786	N/A
34	31-Dec-13	77.1	7,124	5,350	5,202	221,860	5,646	N/A
35	31-Dec-13	79.9	6,987	5,198	5,093	226,020	5,747	N/A
36	1-Jan-14	72.6	6,963	5,859	5,157	206,400	6,315	N/A
37	2-Jan-14	79.2	7,142	5,556	5,550	207,810	5,554	N/A
38	2-Jan-14	78.6	7,007	5,590	4,201	227,000	5,676	N/A
39	2-Jan-14	78.3	6,932	5,491	5,222	227,760	5,661	N/A
40	2-Jan-14	79.2	9,615	5,318	6,052	227,400	5,652	N/A
41	3-Jan-14	79.3	7,064	5,302	5,224	228,950	5,615	N/A
42	3-Jan-14	80.2	6,800	5,119	5,612	222,240	5,651	N/A
43	4-Jan-14	79.0	6,893	5,473	4,784	226,920	5,634	N/A
44	4-Jan-14	78.9	6,826	5,493	4,569	227,760	5,676	N/A
45	4-Jan-14	78.9	6,729	5,345	5,419	228,670	5,629	N/A
46	4-Jan-14	79.8	6,918	5,251	5,591	230,270	5,590	N/A
47	5-Jan-14	79.2	6,885	5,374	5,061	224,650	5,562	N/A
48	5-Jan-14	78.0	6,787	5,194	5,389	224,555	5,545	N/A
49	5-Jan-14	78.6	6,614	5,394	5,305	230,620	5,552	N/A
50	5-Jan-14	79.4	6,910	5,152	5,309	225,580	5,503	N/A
51	5-Jan-14	79.0	6,501	149	5,736	226,770	5,515	N/A
AVG=		75	7,235	5,375	4,900	9,991,042	303,472	TOTAL

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EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)	ROCK TYPE	FLUID PRODUCED
Undifferentiated Pennsylvanian Sedimentary Sequence	0'	2123'	0'	2122'	Sandstone/Shale/Siltstone	
Big Lime	est. 2124'	2229'	est. 2123'	2238'	Limestone	
Big Injun	est. 2230'	2625'	est. 2239'	2634'	Sandstone	
Gantz Sand	est. 2626'	2777'	est. 2635'	2786'	Sandstone	
Fifty Foot Sandstone	est. 2778'	2866'	est. 2787'	2866'	Sandstone	
Gordon	est. 2867'	3182'	est. 2876'	3191'	Sandstone	
Fifth Sandstone	est. 3183'	3214'	est. 3192'	3223'	Sandstone	
Bayard	est. 3215'	3955'	est. 3224'	3964'	Sandstone	
Speechley	est. 3956'	4240'	est. 3965'	4249'	Sandstone	
Baltown	est. 4241'	4691'	est. 4250'	4700'	Sandstone	
Bradford	est. 4692'	5109'	est. 4701'	5118'	Sandstone	
Benson	est. 5110'	5396'	est. 5119'	5402'	Sandstone	
Alexander	est. 5397'	5546'	est. 5403'	5402'	Sandstone	
Elk	est. 5547'	6038'	est. 5552'	6047'	Sandstone	
Rhinestreet	est. 6039'	6343'	est. 6048'	6359'	Sandstone	
Sycamore	6344'	6511'	6360'	6560'	Sandstone	
Middlesex	6512'	6628'	6561'	6738'	Shale	
Burkett	6629'	6628'	6739'	6797'	Shale	Gas
Tully	6658'	6657'	6798'	6865'	Limestone	N/A
Hamilton	6684'	6683'	6866'	6867'	Shale	N/A
Marcellus	6691'	6769'	6888'	13337'	Shale	Gas

*Please note Antero determines formation tops based on wireline logs that are only run on one well on a multi-well pad (Please referenece Nero Unit 1H #47-017-06211). The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.

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