

WR-35
Rev (9-11)

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

DATE: 8/12/2013
API #: 47-017-06164

Farm name: Mutschelknaus, Clarence Operator Well No.: Ruth Unit 1H

LOCATION: Elevation: 1050' Quadrangle: Big Isaac

District: Greenbrier County: Doddridge
Latitude: 7.514 Feet South of 39 Deg. 15 Min. 00 Sec.
Longitude 1.829' Feet West of 80 Deg. 32 Min. 30 Sec.

Company: Antero Resources Corporation

Address:	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
1625 17th Street Denver, CO 80202	20" 94#	40'	40'	38 Cu. Ft Class A
Agent: CT Corporation System	13 3/8" 54#	397'	397'	552 Cu. Ft Class A
Inspector: Douglas Newlon	9 5/8" 36#	2,540'	2,540'	1034 Cu. Ft Class A
Date Permit Issued: 1/15/2013	5 1/2" 20#	14,265'	14,265'	3503 Cu. Ft Class H
Date Well Work Commenced: 2/7/2013				
Date Well Work Completed: 7/15/2013	2 3/8" 4.7#	7,542'		
Verbal Plugging: N/A				
Date Permission granted on: N/A				
Rotary <input checked="" type="checkbox"/> Cable <input type="checkbox"/> Rig <input type="checkbox"/>				
Total Vertical Depth (ft): 7,168' TVD (Deepest Point Drilled)				
Total Measured Depth (ft): 14,265' MD, 7103' TVD (BHL)				
Fresh Water Depth (ft.): 135'				
Salt Water Depth (ft.): 1,489'				
Is coal being mined in area (N/Y)? No				
Coal Depths (ft.): 740', 820', 1,760'				
Void(s) encountered (N/Y) Depth(s) None				

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)

Producing formation Marcellus Pay zone depth (ft) 7132' (TOP)

Gas: Initial open flow ---- MCF/d Oil: Initial open flow ---- Bbl/d

Final open flow 2,767 MCF/d Final open flow ---- Bbl/d

Time of open flow between initial and final tests ---- Hours

Static rock Pressure 3600 psig (surface pressure) after ---- Hours

Second producing formation _____ Pay zone depth (ft) _____

Gas: Initial open flow _____ MCF/d Oil: Initial open flow _____ Bbl/d

Final open flow _____ MCF/d Final open flow _____ Bbl/d

Time of open flow between initial and final tests _____ Hours

Static rock Pressure _____ psig (surface pressure) after _____ Hours

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I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

Karen Buck
Signature

12/11/2013
Date

04/04/2014

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Were core samples taken? Yes _____ No

Were cuttings caught during drilling? Yes No _____

Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list Yes, CBL, Photo Density/ Compensated Neutron, Dual Laterolog/ Gamma Ray

NOTE: IN THE AREA BELOW PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF THE TOPS AND BOTTOMS OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE FROM SURFACE TO TOTAL DEPTH.

Perforated Intervals, Fracturing, or Stimulating:

Perforations: 7,585'- 14,210' (3,096 Holes)

Frac'd w/ 22,000 gals 15% HCL Acid, 198,420 bbls Slick Water carrying 496,610# 100 mesh, 3,517,080# 40/70 sand and 1,858,810# 20/40 sand.

Plug Back Details Including Plug Type and Depth(s): N/A

Formations Encountered:	Top Depth	/	Bottom Depth
Surface:			
Big Lime	1990'		2104'
Big Injun	2105'		2454'
Gantz Sand	2455'		2573'
Fifty Foot Sandstone	2574'		2662'
Gordon	2663'		2831'
Fifth Sandstone	2832'		2875'
Bayard	2876'		3553'
Speechley	3554'		3879'
Balltown	3880'		4380'
Bradford	4381'		4966'
Benson	4967'		5279'
Alexander	5280'		5435'
Elk	5436'		6065'
Rhinestreet	6066'		6583'
Sycamore	6584'		6812'
Middlesex	6813'		6956'
Burkett	6957'		6982'
Tully	6983'		7079'
Hamilton	7080'		7131'
Marcellus	7132'		7168' TVD

Handwritten notes and stamps, including "ELECTRICAL LOGS" and "CBL LOGS".

04/04/2014

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Hydraulic Fracturing Fluid Product Component Information Disclosure



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 1500 Greenbrier Parkway
 Charleston, WV 25304

Job Start Date:	7/6/2013
Job End Date:	7/15/2013
State:	West Virginia
County:	Doddridge
API Number:	47-017-06164-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Ruth Unit 1H
Longitude:	-80.56812220
Latitude:	39.24473610
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	7,168
Total Base Water Volume (gal):	8,333,640
Total Base Non Water Volume:	300,578

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	Base Fluid					
			Water	7732-18-5	100.00000	91.90934	
Sand	U.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	7.76572	
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.50000	0.10605	
			Hydrogen Chloride	7641-01-1	18.00000	0.02533	
WFRA-405	U.S. Well Services, LLC	Friction Reducer					
			Water	7732-18-5	40.00000	0.02987	
			Anionic Polyacrylamide	Proprietary	40.00000	0.02987	
			Petroleum Distillates	64742-47-8	40.00000	0.02405	
			Crystalline Salt	12125-02-9	5.00000	0.00373	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00373	
LGC-15	U.S. Well Services, LLC	Gelling Agents					
			Guar Gum	9000-30-0	50.00000	0.03573	
			Petroleum Distillates	64742-47-8	60.00000	0.03384	
			Suspending agent (solid)	14808-60-7	3.00000	0.00546	

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			Surfactant	68439-51-0	3.00000	0.00214
SI-1000	U.S. Well Services, LLC	Scale Inhibitor				
			Anionic Copolymer	Proprietary		0.00510
			Ethylene Glycol	107-21-1	20.00000	0.00461
			Water	7732-18-5	30.00000	0.00385
K-BAC 1020	U.S. Well Services, LLC	Anti-Bacterial Agent				
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	20.00000	0.00656
			Deionized Water	7732-18-5	28.00000	0.00375
AI-300	U.S. Well Services, LLC	Acid Corrosion Inhibitor				
			Ethylene Glycol	107-21-1	40.00000	0.00028
			N,N-Dimethylformamide	68-12-2	20.00000	0.00009
			Cinnamaldehyde	104-55-2	15.00000	0.00008
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	15.00000	0.00007
			2-Butoxyethanol	111-76-2	15.00000	0.00007
			Poly(oxy-1,2-ethanediyl), alpha-(4-nolylphenyl)-omega-hydroxy, branched	127087-87-0	5.00000	0.00003
			1-Decanol	112-30-1	5.00000	0.00002
			Isopropyl Alcohol	67-63-0	2.50000	0.00001
			1-Octanol	111-87-5	3.00000	0.00001
AP One	U.S. Well Services, LLC	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00061

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)