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 #: 47-095-02079

Farm name: Moore, Forest and Brenda Operator Well No.: Thorkildson Unit 2H

LOCATION: Elevation: 749' Quadrangle: Center Point 7.5'

District: McElroy County: Tyler
Latitude: 8,998' Feet South of 39 Deg. 25 Min. 00 Sec.
Longitude 7,542' Feet West of 80 Deg. 42 Min. 30 Sec.

Company: Antero Resources Corporation

Address: 1625 17th Street	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
Denver, CO 80202	20" 94#	43'	43'	41 Cu. Ft. Class A
Agent: CT Corporation System	13 3/8" 48#	351'	351'	488 Cu. Ft. Class A
Inspector: Joe Taylor	9 5/8" 36#	2,606'	2,606'	1061 Cu. Ft. Class A
Date Permit Issued: 12/28/2012	5 1/2" 20#	12,564'	12,564'	3015 Cu. Ft. Class H
Date Well Work Commenced: 2/3/2013				
Date Well Work Completed: 7/8/2013	2 3/8" 4.7#	7,012'		
Verbal Plugging: N/A				
Date Permission granted on: N/A				
Rotary ☑ Cable ☐ Rig ☐				
Total Vertical Depth (ft): 6676' TVD				
Total Measured Depth (ft): 12,564' MD				
Fresh Water Depth (ft.): 275'				
Salt Water Depth (ft.): 1940'				
Is coal being mined in area (N/Y)? No				
Coal Depths (ft.): 672', 747'				
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) 6580' (TOP)
Gas: Initial open flow ---- MCF/d Oil: Initial open flow ---- Bbl/d
Final open flow 7,854 MCF/d Final open flow ---- Bbl/d
Time of open flow between initial and final tests ---- Hours
Static rock Pressure 3550 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

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.

Kaitlin Buck
Signature

12/10/2013
Date

04/04/2014

95-02079

Were core samples taken? Yes_____ No X Were cuttings caught during drilling? Yes_____ No X

Were Electrical, Mechanical or Geophysical logs recorded on this well? If yes, please list Yes, CBL.

This is a subsequent well. Antero only runs wireline logs on the first well on a multi-well ped (Ed Arnold Unit 1H 47-095-02038). Please reference the wireline logs submitted with Form WR-35 for Ed Arnold Unit 1H.

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: 7,163'- 12,508' (1,656 Holes)

Frac'd w/ 12,000 gals 15% HCL Acid, 143,687 bbls Slick Water carrying 692,930# 100 mesh

2,141,545# 40/70 sand and 1,217,135# 20/40 sand.

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

Formations Encountered: Surface:	Top Depth	/ Bottom Depth
Gantz Sand	est 2678'	2803'
Fifty Foot Sand	est 2804'	2918'
Gordon	est 2919'	3122'
Fifth Sandstone	est 3123'	3153'
Bayard	est 3154'	3526'
Warren	est 3527'	3903'
Speechley	est 3904'	4183'
Balltown	est 4184'	4381'
Bradford	est 4382'	4836'
Benson	est 4837'	5090'
Alexander	est 5091'	5283'
Elk	est 5284'	5901'
Rhinestreet	est 5902'	6184'
Sycamore	est 6185'	6352'
Middlesex	6353'	6491'
Burkett	6492'	6520'
Tully	6521'	6579'
Marcellus	6580'	6676' TVD

04/04/2014

95-02079

ANTERO RESOURCES

Antero Resources
Thorkildson Unit 2H
Tyler County WV
Northing: 14306211.27
Easting: 1713821.12
As Drilled

LEGEND

- Thorkildson Unit 1H, Original Wellpath, As Drilled V0
- Ed Arnold Unit 1H, Original Wellpath, Original Wellpath V0
- Sweeney Unit 2H, Original Wellpath, Original Wellpath V0
- Thorkildson Unit 2H, Original Wellpath, Plan 5 V0
- Ed Arnold Unit 2H, Original Wellpath, Original Wellpath V0
- Sweeney Unit 1H, Original Wellpath, Original Wellpath V0
- As Drilled

G T M

To convert Magnetic North to Grid, Subtract 8.65°
To convert True North to Grid, Subtract 0.16°

Azimuths to Grid North
True North: -0.17°
Magnetic North: -8.65°

Magnetic Field
Strength: 52481.8snT
Dip Angle: 66.99°
Date: 5/9/2013
Model: IGRF2010

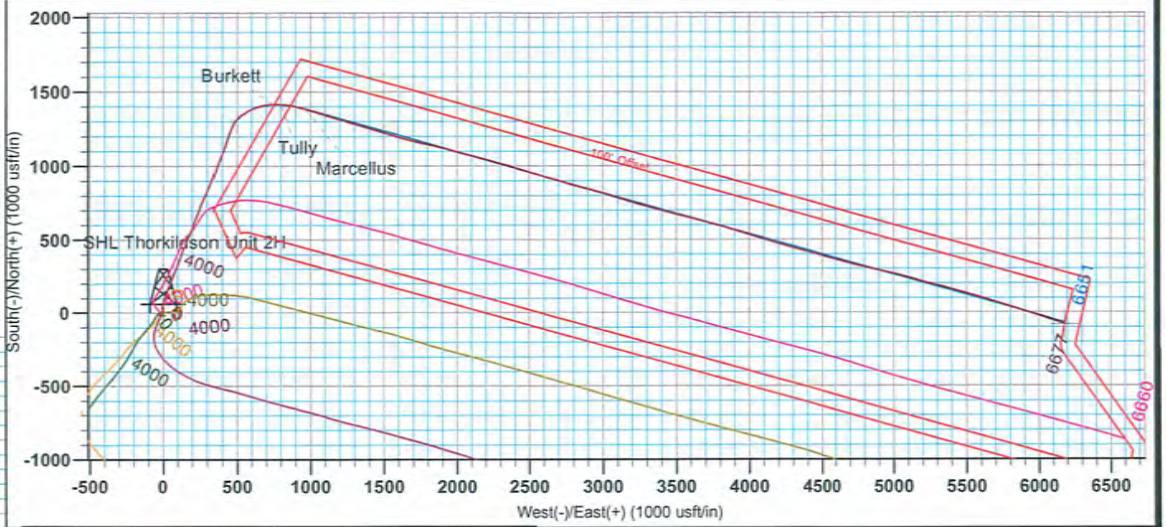
WELL DETAILS: Thorkildson Unit 2H

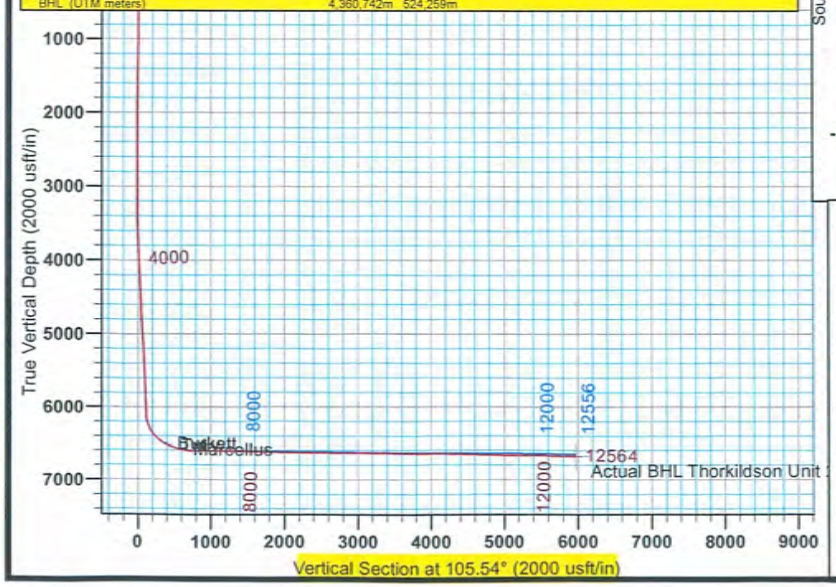
Ground Level: 749.0

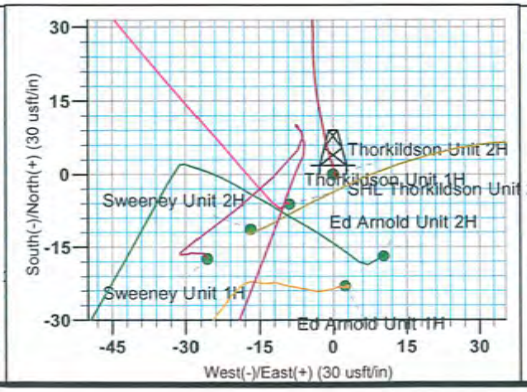
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	14306211.27	1713821.12	39° 23' 45.467 N	80° 44' 24.615 W	

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL Thorkildson Unit 2H	0.0	0.0	0.0	14306211.27	1713821.12	39° 23' 45.467 N	80° 44' 24.615 W
Actual BHL Thorkildson Unit 2H	6276.6	-83.1	6179.0	14306128.13	1720000.18	39° 23' 44.462 N	80° 43' 5.880 W
SHL (UTM meters)				4,360,760m	522,388m		
BHL (UTM meters)				4,360,742m	524,259m		







SITE DETAILS: Ed Arnold Pad
Ed Arnold Pad McElroy District

Site Centre Northing: 14306188.32
Easting: 1713823.50

Positional Uncertainty: 2.0
Convergence: 0.16
Local North: Grid

PROJECT DETAILS: Tyler County WV

Geodetic System: Universal Transverse Mercator (US Survey Feet)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: Zone 17N (84 W to 78 W)

System Datum: Mean Sea Level

FORMATION TOP DETAILS
No formation data is available

Deanna Jacobs 15:05, September 09 2013

Scientific Drilling
421 South Eagle Lane
Oklahoma City, OK

Scientific Drilling

95-02079

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	7/3/2013
Job End Date:	7/8/2013
State:	West Virginia
County:	Tyler
API Number:	47-095-02079-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Thorkildson Unit 2H
Longitude:	-80.74017220
Latitude:	39.39596110
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,676
Total Base Water Volume (gal):	6,034,812
Total Base Non Water Volume:	200,334

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Oil & Gas

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	92.46613	
Sand	U.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	7.25984	
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.50000	0.08036	
			Hydrogen Chloride	7641-01-1	18.00000	0.01920	
WFRA-405	U.S. Well Services, LLC	Friction Reducer					
			Water	7732-18-5	40.00000	0.02574	
			Anionic Polyacrylamide	Proprietary	40.00000	0.02574	
			Petroleum Distillates	64742-47-8	40.00000	0.02072	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00322	
			Crystalline Salt	12125-02-9	5.00000	0.00322	
LGC-15	U.S. Well Services, LLC	Gelling Agents					
			Guar Gum	9000-30-0	50.00000	0.03410	
			Petroleum Distillates	64742-47-8	60.00000	0.03230	
			Suspending agent (solid)	14808-60-7	3.00000	0.00522	

95-02079

			Surfactant	68439-51-0	3.00000	0.00205	
SI-1000	U.S. Well Services, LLC	Scale Inhibitor					
			Anionic Copolymer	Proprietary		0.00455	
			Ethylene Glycol	107-21-1	20.00000	0.00411	
			Water	7732-18-5	30.00000	0.00343	
K-BAC 1020	U.S. Well Services, LLC	Anti-Bacterial Agent					
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	20.00000	0.00545	
			Deionized Water	7732-18-5	28.00000	0.00311	
AP One	U.S. Well Services, LLC	Gel Breakers					
			Ammonium Persulfate	7727-54-0	100.00000	0.00104	
AI-300	U.S. Well Services, LLC	Acid Corrosion Inhibitor					
			Ethylene Glycol	107-21-1	40.00000	0.00021	
			N,N-Dimethylformamide	68-12-2	20.00000	0.00007	
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	15.00000	0.00006	
			Cinnamaldehyde	104-55-2	15.00000	0.00006	
			2-Butoxyethanol	111-76-2	15.00000	0.00005	
			Poly(oxy-1,2-ethanediyl), alpha-(4-nolylphenyl)-omega-hydroxy, branched	127087-87-0	5.00000	0.00002	
			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	

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)