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 #: 47-095-02078

Farm name: Moore, Forest and Brenda Operator Well No.: Thorkildson Unit 1H

LOCATION: Elevation: 749' Quadrangle: Center Point 7.5

District: McElroy County: Tyler
Latitude: 9,006' Feet South of 39 Deg. 25 Min. 00 Sec.
Longitude 7,547' 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#	350'	350'	486 Cu. Ft. Class A
Inspector: Joe Taylor	9 5/8" 36#	2,501'	2,501'	1018 Cu. Ft. Class A
Date Permit Issued: 1/11/2013	5 1/2" 20#	13,058'	13,058'	3183 Cu. Ft. Class H
Date Well Work Commenced: 2/3/2013				
Date Well Work Completed: 7/2/2013	2 3/8" 4.7#	6845'		
Verbal Plugging: N/A				
Date Permission granted on: N/A		Top	Bottom	
Rotary ☑ Cable ☐ Rig ☐	Cement Plug	372'	1104'	392 Cu Ft. Class A
Total Vertical Depth (ft): 6660' TVD				
Total Measured Depth (ft): 13,058' MD				
Fresh Water Depth (ft.): 275'				
Salt Water Depth (ft.): 1299'				
Is coal being mined in area (N/Y)? N				
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) 6575' (TOP)
Gas: Initial open flow ---- MCF/d Oil: Initial open flow ---- Bbl/d
Final open flow 7,183 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

95-02078

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 pad (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: 6,943'- 13,002' (1,512 Holes)

Frac'd w/ 10,500 gals 15% HCL Acid, 155,618 bbls Slick Water carrying 804,015# 100 mesh

2,875,405 40/70 sand and 1,514,055# 20/40 sand.

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

Formations Encountered: Surface:	Top Depth	/ Bottom Depth
Gantz Sand	est2678'	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'	6345'
Middlesex	6346'	6485'
Burkett	6486'	6514'
Tully	6515'	6574'
Marcellus	6575'	6660' TVD

04/04/2014

95-02078

ANTERO RESOURCES

Antero Resources
Thorkildson Unit 1H
Tyler County WV
Northing: 14306205.13
Easting: 1713812.23
As Drilled

WELL DETAILS: Thorkildson Unit 1H

Ground Level: 749.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	14306205.13	1713812.23	39° 23' 45.407 N	80° 44' 24.728 W	

To convert Magnetic North to Grid, Subtract 8.64°
To convert True North to Grid, Subtract 0.16°

Azimuths to Grid North
True North: -0.17°
Magnetic North: -8.64°

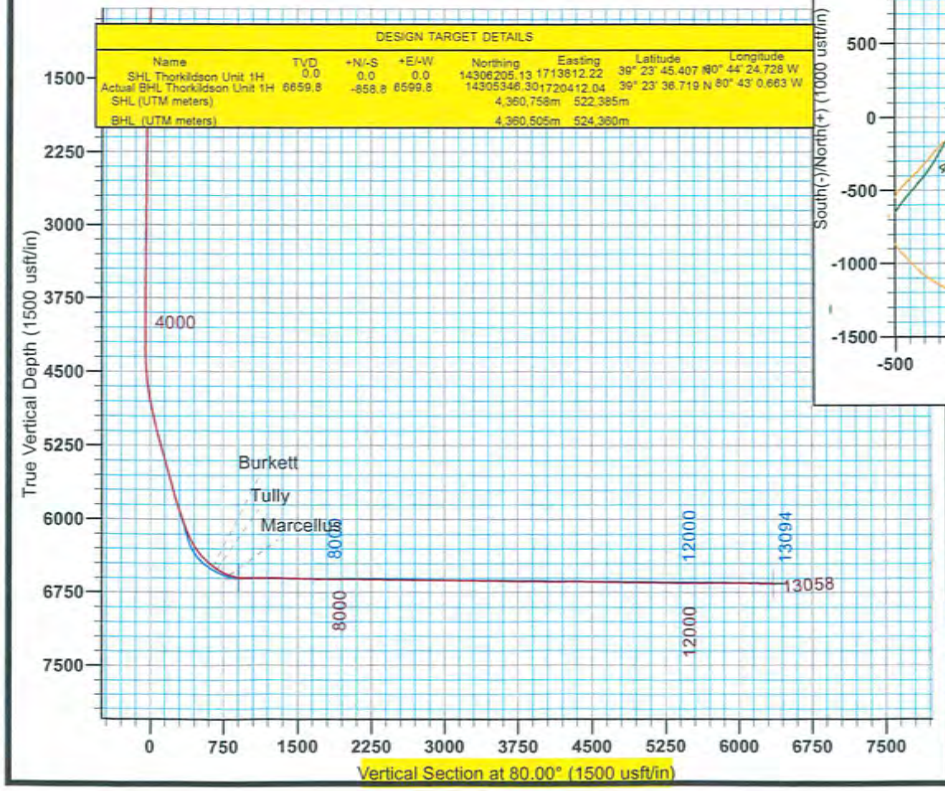
Magnetic Field
Strength: 52513.3snT
Dip Angle: 67.02°
Date: 2/4/2013
Model: IGRF2010

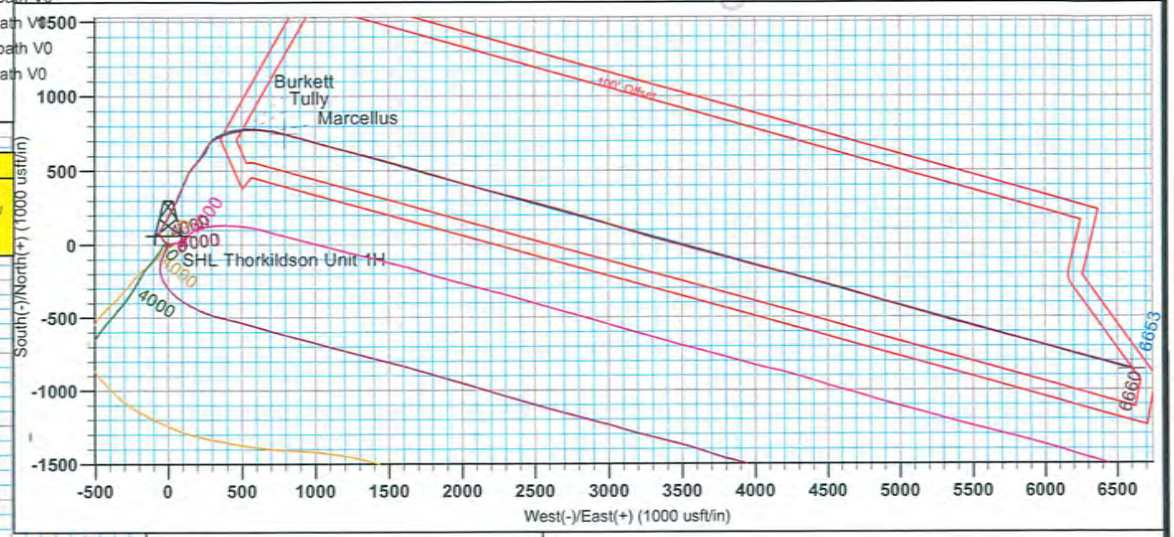
LEGEND

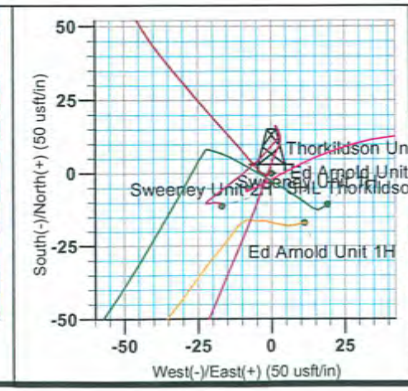
- Thorkildson Unit 1H, Original Wellpath, Plan 5 V0
- Ed Arnold Unit 1H, Original Wellpath, Original Wellpath V0
- Sweeney Unit 2H, Original Wellpath, Original Wellpath V0
- Ed Arnold Unit 2H, Original Wellpath, Original Wellpath V0
- Sweeney Unit 1H, Original Wellpath, Original Wellpath V0
- As Drilled

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
SHL Thorkildson Unit 1H	0.0	0.0	0.0	14306205.13	1713812.22	39° 23' 45.407 N	80° 44' 24.728 W
Actual BHL Thorkildson Unit 1H	6659.8	-858.8	6599.8	14305346.30	1720412.04	39° 23' 36.719 N	80° 43' 0.663 W
SHL (UTM meters)				4,360,758m	522,385m		
BHL (UTM meters)				4,360,505m	524,360m		







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

Genie Lightfoot 14:32, September 09 2013

Scientific Drilling
421 South Eagle Lane
Oklahoma City, OK

Scientific Drilling

95-02078

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	6/27/2013
Job End Date:	7/2/2013
State:	West Virginia
County:	Tyler
API Number:	47-095-02078-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Thorkildson Unit 1H
Longitude:	-80.74020280
Latitude:	39.39594720
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	6,660
Total Base Water Volume (gal):	6,535,998
Total Base Non Water Volume:	258,659

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Interstate 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	91.06141	
Sand	U.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	8.67590	
LGC-15	U.S. Well Services, LLC	Gelling Agents					
			Guar Gum	9000-30-0	50.00000	0.03757	
			Petroleum Distillates	64742-47-8	60.00000	0.03558	
			Suspending agent (solid)	14808-60-7	3.00000	0.00575	
			Surfactant	68439-51-0	3.00000	0.00225	
WFRA-405	U.S. Well Services, LLC	Friction Reducer					
			Water	7732-18-5	40.00000	0.02603	
			Anionic Polyacrylamide	Proprietary	40.00000	0.02603	
			Petroleum Distillates	64742-47-8	40.00000	0.02095	
			Crystalline Salt	12125-02-9	5.00000	0.00325	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00325	
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.50000	0.06394	

95-02078

			Hydrogen Chloride	7641-01-1	18.00000	0.01527	
SI-1000	U.S. Well Services, LLC	Scale Inhibitor					
			Anionic Copolymer	Proprietary		0.00458	
			Ethylene Glycol	107-21-1	20.00000	0.00414	
			Water	7732-18-5	30.00000	0.00345	
K-BAC 1020	U.S. Well Services, LLC	Anti-Bacterial Agent					
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	20.00000	0.00572	
			Deionized Water	7732-18-5	28.00000	0.00327	
AP One	U.S. Well Services, LLC	Gel Breakers					
			Ammonium Persulfate	7727-54-0	100.00000	0.00126	
AI-300	U.S. Well Services, LLC	Acid Corrosion Inhibitor					
			Ethylene Glycol	107-21-1	40.00000	0.00017	
			Cinnamaldehyde	104-55-2	15.00000	0.00005	
			N,N-Dimethylformamide	68-12-2	20.00000	0.00005	
			2-Butoxyethanol	111-76-2	15.00000	0.00004	
			Tar bases, quinoline derivs, benzyl chloride-quaternized	72480-70-7	15.00000	0.00004	
			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	0.00001	
			1-Octanol	111-87-5	3.00000	0.00001	
			Isopropyl Alcohol	67-63-0	2.50000	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)