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WR-35  
Rev. 8/23/13

WV GEOLOGICAL SURVEY  
MORGANTOWN, WV

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

API 47-033-05654 County Harrison District Union  
Quad West Milford Pad Name Bennett Pad Field/Pool Name \_\_\_\_\_  
Farm name Bennett, Robert & Patricia Well Number Brutus 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 4,339,514.648m Easting 545,384.858m  
Landing Point of Curve Northing 4,339,737.92m Easting 544,967.16m  
Bottom Hole Northing 4,341,443.475m Easting 544,423.297m

Elevation (ft) 1,235' 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 09/25/2012 Date drilling commenced 05/23/2013 Date drilling ceased 09/08/2013  
Date completion activities began 2/26/2014 Date completion activities ceased 04/27/2014  
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 121' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1574', 1576' Void(s) encountered (Y/N) depths None  
Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths None  
Is coal being mined in area (Y/N) No

Reviewed by: \_\_\_\_\_

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API 47-033 - 05654 Farm name Bennett, Robert & Patricia Well number Brutus 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	30"	20"	40'	New	94#; J-55	N/A	Yes
Surface	17 1/2"	13 3/8"	549'	New	48#; J-55	N/A	Yes
Coal							
Intermediate 1	12 1/4"	9 5/8"	2,541'	New	36#; J-55	N/A	Yes
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	13,985'	New	20#; P-110	N/A	Yes
Tubing		2 3/8"	7,310'		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 <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	100 sx	15.6	1.18	109	0'	8 Hrs.
Surface	Class A	669 sx	15.6	1.18	381	0'	8 Hrs.
Coal							
Intermediate 1	Class A	932 sx	15.6	1.18	796	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	943 sx (Lead); 1,154 sx (Tail)	13.5 (Lead); 15.2 (Tail)	1.44 (Lead); 1.8 (Tail)	2,737	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 13,988' MD, 7,033' TVD (BHL); 7,040' TVD (Deepest Point Drilled)      Loggers TD (ft) 13,940'  
 Deepest formation penetrated Marcellus      Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 6,450'

\*\*This is a subsequent well. Antero only runs wireline logs on one well on a multi-well pad (Bennett Unit 1H, API #47-033-05680). Please reference the wireline logs submitted with Form WR-35 for the Bennett 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

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 \_\_\_\_\_



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API 47- 033 - 05654 Farm name Bennett, Robert & Patricia Well number Brutus Unit 2H

PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6,926' (top) TVD	7,451' (top) MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 3,600 psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST \_\_\_\_\_ hrs

OPEN FLOW Gas 8,269 mcfpd Oil \_\_\_\_\_ bpd NGL \_\_\_\_\_ bpd Water 234 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
	0		0		

**\* 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 Rush Wellsite Services  
Address 600 alpha Drive City Canonsburg State PA Zip 15317

Cementing Company Baker Hughes  
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Stimulating Company Allied Oil & Gas Services  
Address 1036 East Main Street City Bridgeport State WV Zip 26330

Please insert additional pages as applicable.

Completed by Megan Darling Telephone 303-357-7230  
Signature Megan C. Darling Title Permitting Agent Date 06/05/2015

API 47-033-05654 Farm Name Bennett, Robert & Patricia Well Number Brutus Unit 2H

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	26-Feb-14	13,746	13,934	60	Marcellus
2	7-Apr-14	13,523	13,711	60	Marcellus
3	8-Apr-14	13,299	13,487	60	Marcellus
4	8-Apr-14	13,076	13,264	60	Marcellus
5	9-Apr-14	12,853	13,041	60	Marcellus
6	9-Apr-14	12,630	12,818	60	Marcellus
7	9-Apr-14	12,406	12,594	60	Marcellus
8	9-Apr-14	12,183	12,371	60	Marcellus
9	10-Apr-14	11,960	12,148	60	Marcellus
10	10-Apr-14	11,737	11,925	60	Marcellus
11	11-Apr-14	11,513	11,701	60	Marcellus
12	11-Apr-14	11,290	11,478	60	Marcellus
13	11-Apr-14	11,067	11,255	60	Marcellus
14	12-Apr-14	10,844	11,032	60	Marcellus
15	12-Apr-14	10,620	10,808	60	Marcellus
16	12-Apr-14	10,397	10,585	60	Marcellus
17	13-Apr-14	10,174	10,362	60	Marcellus
18	13-Apr-14	9,951	10,139	60	Marcellus
19	13-Apr-14	9,727	9,915	60	Marcellus
20	13-Apr-14	9,504	9,692	60	Marcellus
21	14-Apr-14	9,281	9,469	60	Marcellus
22	14-Apr-14	9,057	9,246	60	Marcellus
23	15-Apr-14	8,834	9,022	60	Marcellus
24	15-Apr-14	8,611	8,799	60	Marcellus
25	15-Apr-14	8,388	8,576	60	Marcellus
26	15-Apr-14	8,164	8,353	60	Marcellus
27	16-Apr-14	7,941	8,129	60	Marcellus
28	16-Apr-14	7,718	7,906	60	Marcellus
29	16-Apr-14	7,495	7,683	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	7-Apr-14	77.6	6,942	-	4,848	266,353	6,965	N/A
2	7-Apr-14	63.0	7,196	5,782	5,169	197,218	7,347	N/A
3	8-Apr-14	78.8	7,806	5,546	4,428	264,017	7,096	N/A
4	8-Apr-14	78.5	7,424	5,594	4,527	264,488	6,773	N/A
5	9-Apr-14	79.6	7,525	5,481	4,928	265,968	6,741	N/A
6	9-Apr-14	81.6	7,335	5,236	5,177	263,168	6,734	N/A
7	9-Apr-14	77.1	7,185	5,550	4,668	251,686	6,631	N/A
8	9-Apr-14	78.0	7,113	5,355	4,579	261,954	6,747	N/A
9	10-Apr-14	83.3	7,332	5,439	4,826	262,941	6,667	N/A
10	10-Apr-14	78.5	7,811	5,485	4,791	262,687	6,718	N/A
11	11-Apr-14	78.9	7,482	5,648	4,901	263,632	6,653	N/A
12	11-Apr-14	77.6	7,692	5,881	4,319	263,945	6,738	N/A
13	11-Apr-14	79.0	7,172	5,340	4,370	264,443	6,682	N/A
14	12-Apr-14	79.6	7,181	5,220	4,806	261,492	6,563	N/A
15	12-Apr-14	79.5	6,918	5,458	4,918	261,757	6,579	N/A
16	12-Apr-14	79.0	7,234	5,845	4,237	263,596	6,595	N/A
17	13-Apr-14	78.0	7,208	5,800	4,348	265,081	6,650	N/A
18	13-Apr-14	80.3	6,809	5,769	4,549	264,009	6,538	N/A
19	13-Apr-14	78.0	7,232	5,633	4,882	263,212	6,599	N/A
20	13-Apr-14	78.3	6,930	5,693	4,741	265,645	6,598	N/A
21	14-Apr-14	76.0	6,774	5,294	4,956	260,693	6,069	N/A
22	14-Apr-14	77.0	6,767	5,692	4,534	257,713	6,594	N/A
23	15-Apr-14	79.0	6,700	5,620	4,520	264,437	6,405	N/A
24	15-Apr-14	87.0	6,730	5,245	4,602	263,855	6,409	N/A
25	15-Apr-14	78.0	6,632	5,656	4,377	262,018	6,498	N/A
26	15-Apr-14	75.1	6,990	5,509	4,577	210,418	6,796	N/A
27	16-Apr-14	78.3	6,900	5,725	4,670	252,679	6,220	N/A
28	16-Apr-14	79.7	6,670	6,286	4,484	263,715	6,343	N/A
29	16-Apr-14	78.0	6,595	6,237	4,532	286,787	6,724	N/A
	<b>AVG=</b>	<b>78.4</b>	<b>7,113</b>	<b>5,608</b>	<b>4,664</b>	<b>7,519,607</b>	<b>192,672</b>	<b>TOTAL</b>

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## EXHIBIT 3

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Fresh Water	121'	N/A	121'	N/A
Sandstone	Est. 24	420	Est. 24	420
Trace coal	Est. 420	425	Est. 420	425
Sandstone	Est. 425	476	Est. 425	476
Shale	Est. 476	816	Est. 476	816
Sandstone	Est. 816	866	Est. 816	866
Shale	Est. 866	1,006	Est. 866	1,006
Sandstone	Est. 1006	1,616	Est. 1006	1,616
Limestone	Est. 1616	1,624	Est. 1616	1,624
Big Lime	1,624	1,712	1,624	1,712
Big Injun	1,712	2,021	1,712	2,021
Gantz Sand	2,021	2,107	2,021	2,107
Fifty Foot Sandstone	2,107	2,245	2,107	2,245
Gordon	2,245	2,509	2,245	2,509
Fifth Sandstone	2,509	2,555	2,509	2,555
Bayard	2,555	2,943	2,555	2,943
Warren	2,943	3,209	2,943	3,209
Speechley	3,209	3,447	3,209	3,448
Baltown	3,447	3,963	3,448	3,965
Bradford	3,963	4,538	3,965	4,542
Benson	4,538	4,732	4,542	4,739
Alexander	4,732	4,900	4,739	4,912
Elk	4,900	6,266	4,912	6,404
Sycamore	6,266	6,526	6,404	6,708
Middlesex	6,526	6,709	6,708	6,975
Burkett	6,709	6,738	6,975	7,025
Tully	6,738	6,926	7,025	7,451
Marcellus	6,926	NA	7,451	NA

\*Please note Antero determines shallow formation tops based on mud and/or wireline 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.

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MORGANTOWN, WV

# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	4/7/2014
Job End Date:	4/16/2014
State:	West Virginia
County:	Harrison
API Number:	47-033-05654-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Brutus Unit 2H
Longitude:	-80.47455300
Latitude:	39.20362200
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	7,040
Total Base Water Volume (gal):	8,383,494
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	Operator	Carrier	Water				
Sand, White, 40/70	Baker Hughes	Proppant	Crystalline Silica (Quartz)	14808-60-7	100.00000	89.77875	
Sand, White, 20/40	Baker Hughes	Proppant	Crystalline Silica (Quartz)	14808-60-7	100.00000	5.90741	
Sand, White, 100 mesh	Baker Hughes	Proppant	Crystalline Silica (Quartz)	14808-60-7	100.00000	3.05433	
HCl, 10.1 - 15%	Baker Hughes	Acidizing	Water	7732-18-5	85.00000	0.19366	SmartCare Product
			Hydrochloric Acid	7647-01-0	15.00000	0.03413	SmartCare Product
GW-3LDF	Baker Hughes	Gelling Agent	Mineral Oil	8042-47-5	70.00000	0.06432	SmartCare Product
			Guar Gum	9000-30-0	60.00000	0.05513	SmartCare Product
			Paraffinic Petroleum Distillate	64742-55-8	30.00000	0.02756	SmartCare Product
			Petroleum Distillates	64742-47-8	30.00000	0.02756	SmartCare Product
			sotridecanol, ethoxylated	9043-30-5	5.00000	0.00458	SmartCare Product
			Crystalline Silica: Quartz	14808-60-7	5.00000	0.00458	SmartCare Product
			1-butoxy-2-propanol	5131-66-8	5.00000	0.00458	SmartCare Product

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FRW-18	Baker Hughes	Friction Reducer	Hydrotreated Light Distillate	64742-47-8	30.00000	0.01769	SmartCare Product
Scaletrol 720	Baker Hughes	Scale Inhibitor	Ethylene Glycol	107-21-1	45.00000	0.00712	SmartCare Product
			Calcium Chloride	10043-52-4	5.00000	0.00079	SmartCare Product
Alpha 1427	Baker Hughes	Biocide	Glutaraldehyde	111-30-8	30.00000	0.00424	SmartCare Product
			Didecyl Dimethyl Ammonium Chloride	7173-51-5	10.00000	0.00141	SmartCare Product
			Quaternary Ammonium Compound	68424-85-1	5.00000	0.00071	SmartCare Product
Ferrotrol 300L	Baker Hughes	Iron Control	Ethanol	64-17-5	5.00000	0.00071	SmartCare Product
CI-14	Baker Hughes	Corrosion Inhibitor	Citric Acid	77-92-9	60.00000	0.00097	SmartCare Product
			Methanol	67-56-1	100.00000	0.00034	SmartCare Product
			Polyoxyalkylenes	Trade Secret	30.00000	0.00010	SmartCare Product
			Fatty Acids	Trade Secret	10.00000	0.00003	SmartCare Product
			Olefin	Trade Secret	5.00000	0.00002	SmartCare Product
Enzyme G-NE	Baker Hughes	Breaker	Propargyl Alcohol	107-19-7	5.00000	0.00002	SmartCare Product
			Contains non-hazardous ingredients which are listed in the non-MSDS section of the report	NA			SmartCare Product
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.							
		Other Chemicals	Water	7732-18-5		0.05253	
			Poly (acrylamide-co-acrylic acid) partial sodium salt	Trade Secret		0.01769	
			2-Propenoic, Polymer with Sodium Phosphinate, Sodium Salt	71050-62-9		0.00317	
			Ammonium Chloride	12125-02-9		0.00177	
			Alcohols, C12-16, ethoxylated	Trade Secret		0.00118	
			Oleamide DEA	93-83-4		0.00118	
			Hemicellulase Enzyme Concentrate	9025-56-3		0.00062	
			Sorbitan Monooleate	Trade Secret		0.00029	
			Polyoxyethylene Sorbitan Monooleate	9005-65-6		0.00029	
			Potassium Chloride	7447-40-7		0.00016	
			Sodium Chloride	7647-14-5		0.00016	
			2-butoxy-1-propanol	Trade Secret		0.00009	
			Modified Thiourea Polymer	68527-49-1		0.00002	
			Formaldehyde	50-00-0		0.00000	
			Hydrochloric Acid	7647-01-0		0.00000	

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\* 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)

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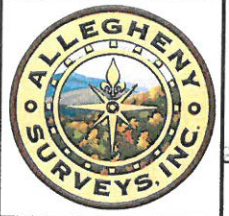
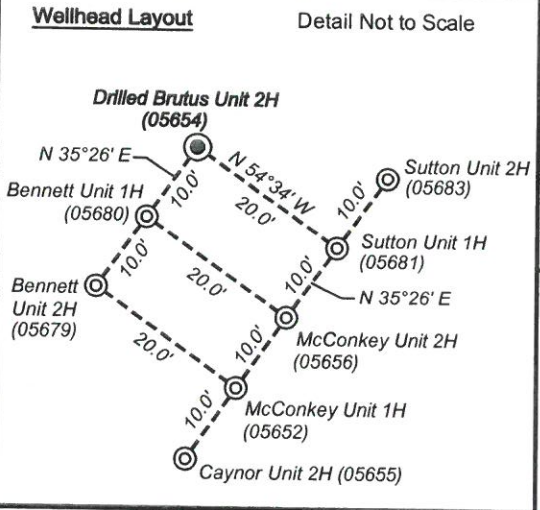
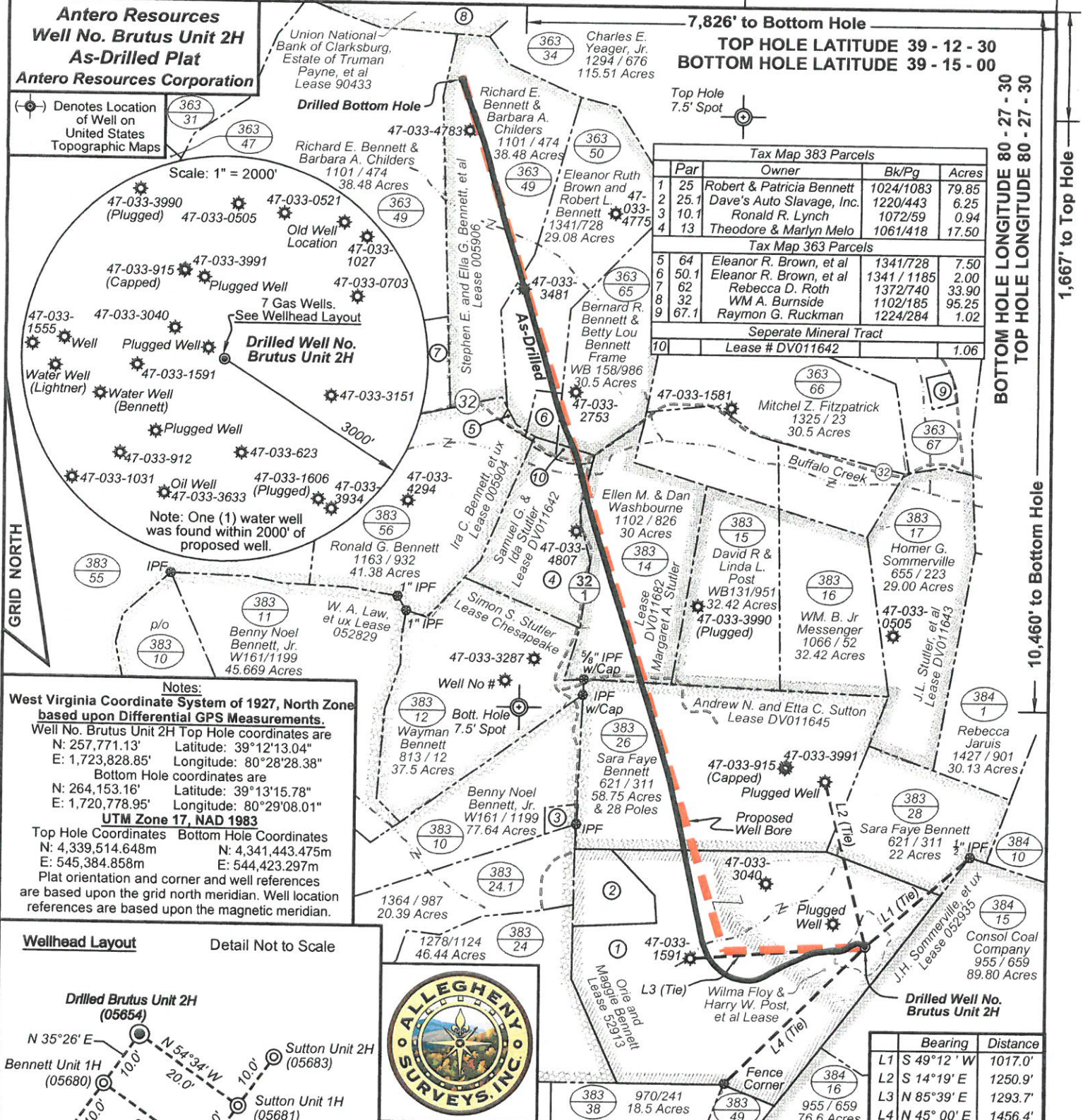
4,614' to Top Hole

7,826' to Bottom Hole  
TOP HOLE LATITUDE 39 - 12 - 30  
BOTTOM HOLE LATITUDE 39 - 15 - 00

BOTTOM HOLE LONGITUDE 80 - 27 - 30  
TOP HOLE LONGITUDE 80 - 27 - 30

10,460' to Bottom Hole

1,667' to Top Hole



Top Hole coordinates verified by survey grade GPS. As-drilled data and information was provided by Antero Resources Corporation. Allegheny Surveys, Inc. (ASI) is not certifying the data and information provided. ASI is not responsible for any errors or inaccuracies with the data and information that has been provided.

Bearing	Distance
L1 S 49°12' W	1017.0'
L2 S 14°19' E	1250.9'
L3 N 85°39' E	1293.7'
L4 N 45° 00' E	1456.4'

**LEGEND**

- Proposed gas well
- Found corner, as noted
- County Route
- Creek or Drain
- Existing Road
- Surface Boundary (approx.)
- Interior surface tracts (approx.)

FILE NO: 280-36-U-11  
DRAWING NO: 280-11 Drilled Brutus 2H  
SCALE: 1" = 1000'  
MINIMUM DEGREE OF ACCURACY: Submeter  
PROVEN SOURCE OF ELEVATION: CORS Glenville, WV

**STATE OF WEST VIRGINIA**  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**OIL AND GAS DIVISION**

DATE: February 9 2015  
OPERATOR'S WELL NO. Brutus Unit 2H  
API WELL NO  
47 - 033 - 05654  
STATE COUNTY PERMIT

WELL TYPE:  OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  
(IF GAS) PRODUCTION:  STORAGE  DEEP  SHALLOW  
LOCATION: ELEVATION: 1235' WATERSHED: Middle West Fork River QUADRANGLE: West Milford  
DISTRICT: Union COUNTY: Harrison  
SURFACE OWNER: Robert & Patricia Bennett ACREAGE: 26.08 80; 101.3  
ROYALTY OWNER: Wilma Floy Post, et al; Orie & Maggie Bennett; Margaret A. Stutler LEASE NO: 52913; DV011645; 005906 ACREAGE: 26; 59.5; 30; 19  
PROPOSED WORK:  DRILL  CONVERT  DRILL DEEPER  FRACTURE OR STIMULATE  PLUG OFF OLD FORMATION  
 PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) As-Drilled  
 PLUG AND ABANDON  CLEAN OUT AND REPLUG TARGET FORMATION: Marcellus Shale DEPTH: TVD 7,033' MD 13,988'

WELL OPERATOR: Antero Resources Corporation DESIGNATED AGENT: Dianna Stamper - CT Corporation System  
ADDRESS: 1615 Wynkoop Street ADDRESS: 5400 D Big Tyler Road  
Denver, CO 80202 Charleston, WV 25313