

Reviewed
Jul 6 7/6/18

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

API 47-017-06532 County Doddridge District West Union
Quad West Union 7.5' Pad Name Yvonne Pad Field/Pool Name -----
Farm name Yvonne Foster Well Number Brocade 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 4355525m Easting 519879m
Landing Point of Curve Northing 4355785.61m Easting 520260.73m
Bottom Hole Northing 4358239m Easting 519293m

Elevation (ft) 1229' 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 Brine
Production hole Air Mud Fresh Water Brine

Mud Type(s) and Additive(s)
Air - Foam & 4% KCL

Mud - Polymer

RECEIVED
Office of Oil and Gas
JUL 06 2018

WV Department of
Environmental Protection

Date permit issued 9/3/2014 Date drilling commenced 6/29/2016 Date drilling ceased 12/1/2016
Date completion activities began 10/12/2017 Date completion activities ceased 2/19/2018
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 1400' Void(s) encountered (Y/N) depths No
Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths No
Is coal being mined in area (Y/N) No

Reviewed by:

07/20/2018

API 47-017 - 06532 Farm name Yvonne Foster Well number Brocade Unit 2H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade w/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	24"	20"	53'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	588'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2522'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	16304'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	7252'		4.7#, N-80		
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	102 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	700 sx	15.6	1.19	833	0'	8 Hrs.
Coal							
Intermediate 1	Class A	1010 sx	15.6	1.18	1192	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	950 sx (Lead) 1212 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.44 (Lead), 1.87 (Tail)	3634	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 16304' MD, 6941' TVD (BHL), 6955' (Deepest Point Drilled) Loggers TD (ft) 16304' MD
 Deepest formation penetrated Marcellus Plug back to (ft) N/A
 Plug back procedure N/A

Kick off depth (ft) 6501'

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

RECEIVED
Office of Oil and Gas

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

JUL 06 2018

WV Department of
Environment & Protection

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 N/A

API 47- 017 - 06532 Farm name Yvonne Foster Well number Brocade Unit 2H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6894' (TOP)	TVD	7267' (TOP) MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3550 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 12683.40 mcfpd Oil 81.54 bpd NGL --- bpd Water 12.07 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	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	

***PLEASE SEE ATTACHED EXHIBIT 3**

Please insert additional pages as applicable.


Drilling Contractor Patterson - UTI Drilling Company LLC
Address 207 Carlton Drive City Eighty Four State PA Zip 15330

Logging Company Kodiak Services Int'l
Address 2219 Sawdust Road, Unit 1604-1605 City The Woodlands State TX Zip 77380
JUL 06 2018

Cementing Company BJ Services
Address 1036 East Main Street City Bridgeport State WV Zip 26330

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

Please insert additional pages as applicable.

Completed by Karin Cox Telephone 303-357-6820
Signature  Title Permitting Agent Date 7/3/2018

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

07/20/2018

API 47-017-06532 Farm Name Yvonne Foster Well Number Brocade Unit 2H

EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	10/12/2017	16034	16201	48	Marcellus
2	11/25/2017	15836	16003	48	Marcellus
3	11/25/2017	15638	15805	48	Marcellus
4	11/26/2017	15439	15607	48	Marcellus
5	11/26/2017	15241	15408	48	Marcellus
6	11/26/2017	15043	15210	48	Marcellus
7	11/27/2017	14845	15012	48	Marcellus
8	11/27/2017	14646	14814	48	Marcellus
9	11/27/2017	14448	14615	48	Marcellus
10	11/28/2017	14250	14417	48	Marcellus
11	11/28/2017	14052	14219	48	Marcellus
12	11/28/2017	13854	14021	48	Marcellus
13	11/29/2017	13655	13822	48	Marcellus
14	11/29/2017	13457	13624	48	Marcellus
15	11/29/2017	13259	13426	48	Marcellus
16	11/30/2017	13061	13228	48	Marcellus
17	11/30/2017	12862	13030	48	Marcellus
18	11/30/2017	12664	12831	48	Marcellus
19	12/1/2017	12466	12633	48	Marcellus
20	12/1/2017	12268	12435	48	Marcellus
21	12/1/2017	12069	12237	48	Marcellus
22	12/2/2017	11871	12038	48	Marcellus
23	12/2/2017	11673	11840	48	Marcellus
24	12/3/2017	11475	11642	48	Marcellus
25	12/3/2017	11277	11444	48	Marcellus
26	12/3/2017	11078	11246	48	Marcellus
27	12/4/2017	10880	11047	48	Marcellus
28	12/4/2017	10682	10849	48	Marcellus
29	12/4/2017	10484	10651	48	Marcellus
30	12/5/2017	10285	10453	48	Marcellus
31	12/5/2017	10087	10254	48	Marcellus
32	12/5/2017	9889	10056	48	Marcellus
33	12/6/2017	9691	9858	48	Marcellus
34	12/6/2017	9493	9660	48	Marcellus
35	12/7/2017	9294	9461	48	Marcellus
36	12/7/2017	9096	9263	48	Marcellus
37	12/7/2017	8898	9065	48	Marcellus
38	12/8/2017	8700	8867	48	Marcellus
39	12/8/2017	8501	8669	48	Marcellus
40	12/8/2017	8303	8470	48	Marcellus
41	12/9/2017	8105	8272	48	Marcellus
42	12/9/2017	7907	8074	48	Marcellus
43	12/10/2017	7708	7876	48	Marcellus
44	12/10/2017	7510	7677	48	Marcellus
45	12/10/2017	7312	7479	48	Marcellus

RECEIVED
Office of Oil and Gas
JUL 06 2018

WV Department of Environmental Protection

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	10/12/2017	68.2325	8159.425	0	5011	412,300	14246	N/A
2	11/25/2017	73.5942	8154.693	5537	5367	412,450	8953	N/A
3	11/25/2017	70.2509	8001.008	6289	4732	413,240	9221	N/A
4	11/26/2017	71.0369	7795.56	5976	5131	412,060	8697	N/A
5	11/26/2017	68.9964	7961.384	5717	4884	412,650	8753	N/A
6	11/26/2017	71.109	7802.937	6192	4940	416,500	8703	N/A
7	11/27/2017	70.6028	7705.841	6304	5397	413,445	8633	N/A
8	11/27/2017	73.8596	7749.997	5643	4445	410,200	8626	N/A
9	11/27/2017	73.0294	7601.311	6256	5129	411,470	8611.048	N/A
10	11/28/2017	70.7234	7226.336	6180	5150	412,510	10413	N/A
11	11/28/2017	72.6231	7471.58	5867	4548	410,960	8567	N/A
12	11/28/2017	69.3059	7230.559	5403	3893	413,530	8751.381	N/A
13	11/29/2017	70.8246	7375.076	5726	5163	411,380	8765.333	N/A
14	11/29/2017	71.4865	7582.21	5176	4573	410,190	10788	N/A
15	11/29/2017	71.0474	7523.973	5851	5159	411,410	8561.762	N/A
16	11/30/2017	68.3836	7559.808	5670	4358	415,050	9595.286	N/A
17	11/30/2017	73.5753	7449.066	5747	4853	412,240	8642	N/A
18	11/30/2017	74.5495	7538.862	5658	4522	411,120	8536.143	N/A
19	12/1/2017	74.2101	7481.999	5570	5085	413,020	8537.095	N/A
20	12/1/2017	74.6	7486	5693	5000	401,200	8547	N/A
21	12/1/2017	72.186	7332.684	5547	5707	412,190	10611.86	N/A
22	12/2/2017	72.8469	6995.454	5450	4734	413,570	8594.429	N/A
23	12/2/2017	70.8115	7152.93	5495	4230	412,350	8786.667	N/A
24	12/3/2017	68.5533	6986.412	5492	5360	412,180	8531.929	N/A
25	12/3/2017	68.4126	6822.392	5539	4998	410,535	8436.286	N/A
26	12/3/2017	72.6438	7487.303	5354	5260	412,570	11081.14	N/A
27	12/4/2017	70	6964	5465	4826	412,239	9534.762	N/A
28	12/4/2017	72.3	6954	6038	4553	389,100	8649.214	N/A
29	12/4/2017	71.9838	7000.256	5297	3867	412,300	9112	N/A
30	12/5/2017	76.1	7017	5676	4818	412,250	8589	N/A
31	12/5/2017	70.7	7050	5579	3761	412,550	8379.333	N/A
32	12/5/2017	73.9406	7358.69	5487	3890	412,500	8444	N/A
33	12/6/2017	69.1	6783	5271	3835	413,150	8733.905	N/A
34	12/6/2017	70.8	6829	5387	4031	411,300	8392.19	N/A
35	12/7/2017	73.3	6802	5430	4291	412,960	8513.952	N/A
36	12/7/2017	70.8	6874	5426	4881	412,600	8428.429	N/A
37	12/7/2017	70.5533	7039.586	5563	4705	411,550	8314	N/A
38	12/8/2017	64.6503	7620.206	5824	4668	399,400	9082	N/A
39	12/8/2017	70.5	7296	5627	5433	411,380	8415.881	N/A
40	12/8/2017	69.4132	7350.822	5633	5131	412,010	10936.81	N/A
41	12/9/2017	70.3	7223	5560	4941	411,831	8368.333	N/A
42	12/9/2017	68.9136	7048.928	5534	3750	410,290	8401	N/A
43	12/10/2017	70.2	7156	5522	4573	412,140	8318.69	N/A
44	12/10/2017	69.6	6651.0	5203	4230	412,590	8331.976	N/A
45	12/10/2017	69.3519	6895.674	6060	3882	411,880	8199	N/A
AVG=		71.1	7,323	5,528	4,707	18,504,340	405,334	TOTAL

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	225'	N/A	225'	N/A
Siltstone/Sandstone	0	147	0	87
Silty shale	est. 147	205	est. 87	227
Sandstone/Siltstone/Shale	est. 205	327	est. 227	347
Silty shale	est. 327	447	est. 347	565
Siltstone	est. 447	547	est. 565	607
Silty shale	est. 547	607	est. 607	1,127
Shale	est. 607	687	est. 1127	1,387
Silty sandstone	est. 687	727	est. 1387	1,507
Silty shale	est. 727	767	est. 1507	1,727
Sandstone tr coal	est. 767	787	est. 1727	1,767
Sandy shale	est. 787	907	est. 1767	1,807
Silty shale	est. 907	1,147	est. 1807	1,847
Silty sandstone	est. 1147	2,154	est. 1847	2,189
Big Lime	2,154	2,831	2,189	2,892
Fifty Foot Sandstone	2,831	2,911	2,892	2,975
Gordon	2,911	3,222	2,975	3,299
Fifth Sandstone	3,222	3,240	3,299	3,318
Bayard	3,240	4,017	3,318	4,124
Speechley	4,017	4,283	4,124	4,400
Balltown	4,283	4,776	4,400	4,915
Bradford	4,776	5,213	4,915	5,370
Benson	5,213	5,474	5,370	5,645
Alexander	5,474	6,511	5,645	6,722
Sycamore	6,511	6,680	6,722	6,913
Middlesex	6,680	6,815	6,913	7,105
Burkett	6,815	6,845	7,105	7,158
Tully	6,845	6,894	7,158	7,267
Marcellus	6,894	NA	7,267	NA

*Please note Antero determines formation tops based on mud 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.

RECEIVED
Office of Oil and Gas

RECEIVED
WV Department of Environmental Protection
Office of Oil and Gas
JUL 06 2018

WV Department of Environmental Protection
07/06/2018

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/24/2017
Job End Date:	12/10/2017
State:	West Virginia
County:	Doddridge
API Number:	47-017-06532-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Brocade 2H
Latitude:	39.34885278
Longitude:	-80.76946389
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,964
Total Base Water Volume (gal):	17,558,225
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	Antero Resources	Carrier/Base Fluid	Water	7732-18-5	100.00000	88.55674	
Sand	U.S. Well Services, LLC	Proppant	Crystalline Silica, quartz	14808-60-7	100.00000	11.19048	
HCl Acid (21.8% - 17.5%)	U.S. Well Services, LLC	Bulk Acid	Water	7732-18-5	87.40000	0.11890	
			Hydrogen Chloride	7647-01-0	17.50000	0.02764	
LGC-15	U.S. Well Services, LLC	Gelling Agents	Guar Gum	9000-30-0	50.00000	0.03066	
			Petroleum Distillates	64742-47-8	60.00000	0.02903	
			Suspending agent (solid)	14808-60-7	3.00000	0.00469	
			Surfactant	68439-51-0	3.00000	0.00184	
WFRA-405	U.S. Well Services, LLC	Friction Reducer	2-Propenoic acid, polymer with 2 propenamide	9003-06-9	30.00000	0.01716	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01382	

WV Department of Environmental Protection

RECEIVED
 Office of Oil and Gas

Bioclear 2000	J.S. Well Services, LLC	Anti-Bacterial Agent					
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	20.00000	0.00431	
			Deionized Water	7732-18-5	28.00000	0.00246	
SI-1200s	J.S. Well Services, LLC	Scale Inhibitor					
			Proprietary Scale Inhibitor	Proprietary	10.00000	0.00132	
AP One	J.S. Well Services, LLC	Gel Breakers					
			Ammonium Persulfate	7727-54-0	100.00000	0.00083	
AI-303	J.S. Well Services, LLC	Acid Corrosion Inhibitors					
			Ethylene glycol	107-21-1	40.00000	0.00005	
			Cinnamaldehyde	104-55-2	20.00000	0.00002	
			Formic acid	64-18-6	20.00000	0.00002	
			Butyl cellosolve	111-76-2	20.00000	0.00002	
			Polyether	60828-78-6	10.00000	0.00001	
			Acetophenone, thiourea, formaldehyde polymer	68527-49-1	5.00000	0.00000	

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)

RECEIVED
Office of OH and
JUL 06 2011
WV Department of

LATITUDE 39°22'30"

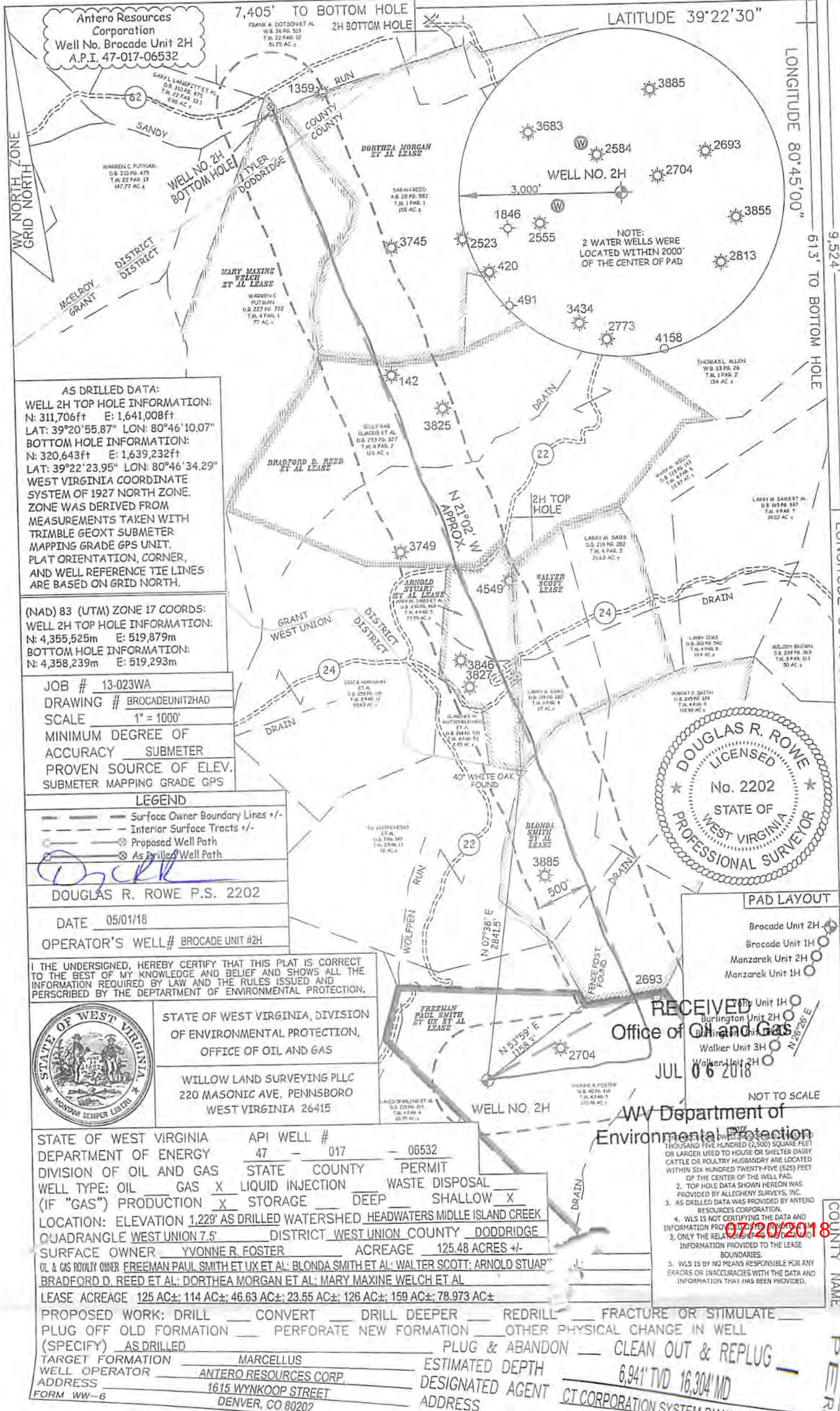
5,504'

LATITUDE 39°22'30"

LONGITUDE 80°45'00"

9,524'

LONGITUDE 80°45'00"



Antero Resources Corporation
Well No. Brocade Unit 2H
A.P.I. 47-017-06532

FRANK A. DOTSON ET AL
W.B. 36 PG. 513
T.M. 22 PAR. 12
81.75 AC ±

GARY L. LANGFLETT ET AL
D.R. 110 PG. 475
T.M. 22 PAR. 13
8.80 AC ±

WASDEW C. PUTNAM
D.B. 310 PG. 475
T.M. 22 PAR. 13
147.77 AC ±

WELL NO. 2H
BOTTOM HOLE

TYLER DODDRIDGE

MARY MAXINE WELCH
ET AL LEASE
WASDEW C. PUTNAM
D.B. 227 PG. 722
T.M. 4 PAR. 1
77 AC ±

DORTHEA MORGAN
ET AL LEASE
SARAH REED
A.B. 28 PG. 592
T.M. 1 PAR. 1
108 AC ±

3745

3749

3825

3846

3827

3885

3885

2584

2704

2693

2813

3855

1846

2555

420

491

3434

2773

4158

3000'

NOTE:
2 WATER WELLS WERE
LOCATED WITHIN 2000'
OF THE CENTER OF PAD

THOMAS L. ALLEN
W.B. 33 PG. 26
T.M. 1 PAR. 2
154 AC ±

LARRY M. SAMS ET AL
D.B. 105 PG. 537
T.M. 8 PAR. 7
85.02 AC ±

LARRY M. SAMS
D.B. 219 PG. 282
T.M. 4 PAR. 2
23.63 AC ±

WALTER SCOTT
LEASE

LARRY M. SAMS
D.B. 209 PG. 282
T.M. 4 PAR. 4
15 AC ±

ROBERT J. SMITH
I.B. 249 PG. 324
T.M. 9 PAR. 9
112.93 AC ±

LARRY SAMS
D.B. 209 PG. 282
T.M. 4 PAR. 9
15.4 AC ±

MELROY BROWN
D.B. 239 PG. 363
T.M. 5 PAR. 111
50 AC ±

BRADFORD D. REED
ET AL LEASE
WILLY RAE
BLANKIE ET AL
D.B. 253 PG. 327
T.M. 4 PAR. 2
12.8 AC ±

AROLD STUART
ET AL LEASE
LARRY M. SAMS ET AL
D.B. 105 PG. 537
T.M. 8 PAR. 7
85.02 AC ±

GLADYS M. SMITH
ET AL
D.B. 246 PG. 311
T.M. 4 PAR. 51
7.43 AC ±

BLONDA SMITH
ET AL LEASE
3885

40" WHITE OAK
FOUND

4549

2693

2704

WELLS: 2H TOP HOLE, 2H BOTTOM HOLE

DRAINS: 22, 24

RUNS: SANDY, WOLFFEN, FENCE POST FOUND

DISTRICTS: SANDY, WEST UNION

GRANTS: MCELROY GRANT

WV NORTH ZONE GRID NORTH

7,405' TO BOTTOM HOLE

613' TO BOTTOM HOLE

9,524'

AS DRILLED DATA:
WELL 2H TOP HOLE INFORMATION:
N: 311,706ft E: 1,641,008ft
LAT: 39°20'55.87" LON: 80°46'10.07"
BOTTOM HOLE INFORMATION:
N: 320,643ft E: 1,639,232ft
LAT: 39°22'23.95" LON: 80°46'34.29"
WEST VIRGINIA COORDINATE
SYSTEM OF 1927 NORTH ZONE.
ZONE WAS DERIVED FROM
MEASUREMENTS TAKEN WITH
TRIMBLE GEOXT SUBMETER
MAPPING GRADE GPS UNIT.
PLAT ORIENTATION, CORNER,
AND WELL REFERENCE TIE LINES
ARE BASED ON GRID NORTH.

(NAD) 83 (UTM) ZONE 17 COORDS:
WELL 2H TOP HOLE INFORMATION:
N: 4,355,525m E: 519,879m
BOTTOM HOLE INFORMATION:
N: 4,358,239m E: 519,293m

JOB # 13-023WA
DRAWING # BROCADEUNIT2HAD
SCALE 1" = 1000'
MINIMUM DEGREE OF
ACCURACY SUBMETER
PROVEN SOURCE OF ELEV.
SUBMETER MAPPING GRADE GPS

LEGEND
- - - Surface Owner Boundary Lines +/-
- - - Interior Surface Tracts +/-
- - - Proposed Well Path
- - - As Drilled Well Path

DOUGLAS R. ROWE P.S. 2202
DATE 05/01/18
OPERATOR'S WELL# BROCADE UNIT #2H

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



STATE OF WEST VIRGINIA, DIVISION
OF ENVIRONMENTAL PROTECTION,
OFFICE OF OIL AND GAS
WILLOW LAND SURVEYING PLLC
220 MASONIC AVE. PENNSBORO
WEST VIRGINIA 26415



PAD LAYOUT
Brocade Unit 2H
Brocade Unit 1H
Manzarek Unit 2H
Manzarek Unit 1H
Walker Unit 1H
Walker Unit 2H
Walker Unit 3H
Walker Unit 2H
Burlington Unit 2H
Burlington Unit 1H
Walker Unit 1H
Walker Unit 2H
Walker Unit 3H
Walker Unit 2H

RECEIVED
Office of Oil and Gas
JUL 06 2018

NOT TO SCALE

STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS

API WELL # 47 - 017 - 06532

STATE COUNTY PERMIT

WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL

(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X

LOCATION: ELEVATION 1,229' AS DRILLED WATERSHED HEADWATERS MIDDLE ISLAND CREEK QUADRANGLE WEST UNION 7.5' DISTRICT WEST UNION COUNTY DODDRIDGE

SURFACE OWNER YVONNE R. FOSTER ACREAGE 125.48 ACRES +/-

OIL & GAS ROYALTY OWNER FREEMAN PAUL SMITH ET UX ET AL; BLONDA SMITH ET AL; WALTER SCOTT; ARNOLD STUART; BRADFORD D. REED ET AL; DORTHEA MORGAN ET AL; MARY MAXINE WELCH ET AL

LEASE ACREAGE 125 AC ±; 114 AC ±; 46.63 AC ±; 23.55 AC ±; 126 AC ±; 159 AC ±; 78.973 AC ±

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE

PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL

(SPECIFY) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG

TARGET FORMATION MARCELLUS

WELL OPERATOR ANTERO RESOURCES CORP. ESTIMATED DEPTH 6,941' TVD 16,304' MD

ADDRESS 1615 WYNKOOP STREET DESIGNATED AGENT CT CORPORATION SYSTEM-DIANNA

FORM WW-6 DENVER, CO 80202 ADDRESS

WV Department of Environmental Protection

THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR HOLSTEIN HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.

2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEYS, INC.

3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.

4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED BY ALLEGHENY SURVEYS, INC.

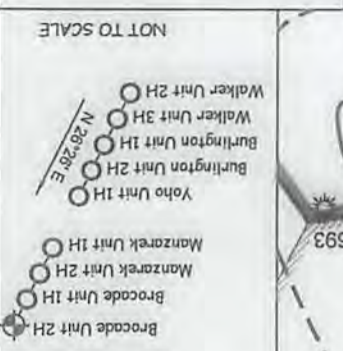
5. ONLY THE RELATIONSHIP OF THE INFORMATION PROVIDED TO THE LEASE BOUNDARIES.

6. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

COUNTY NAME

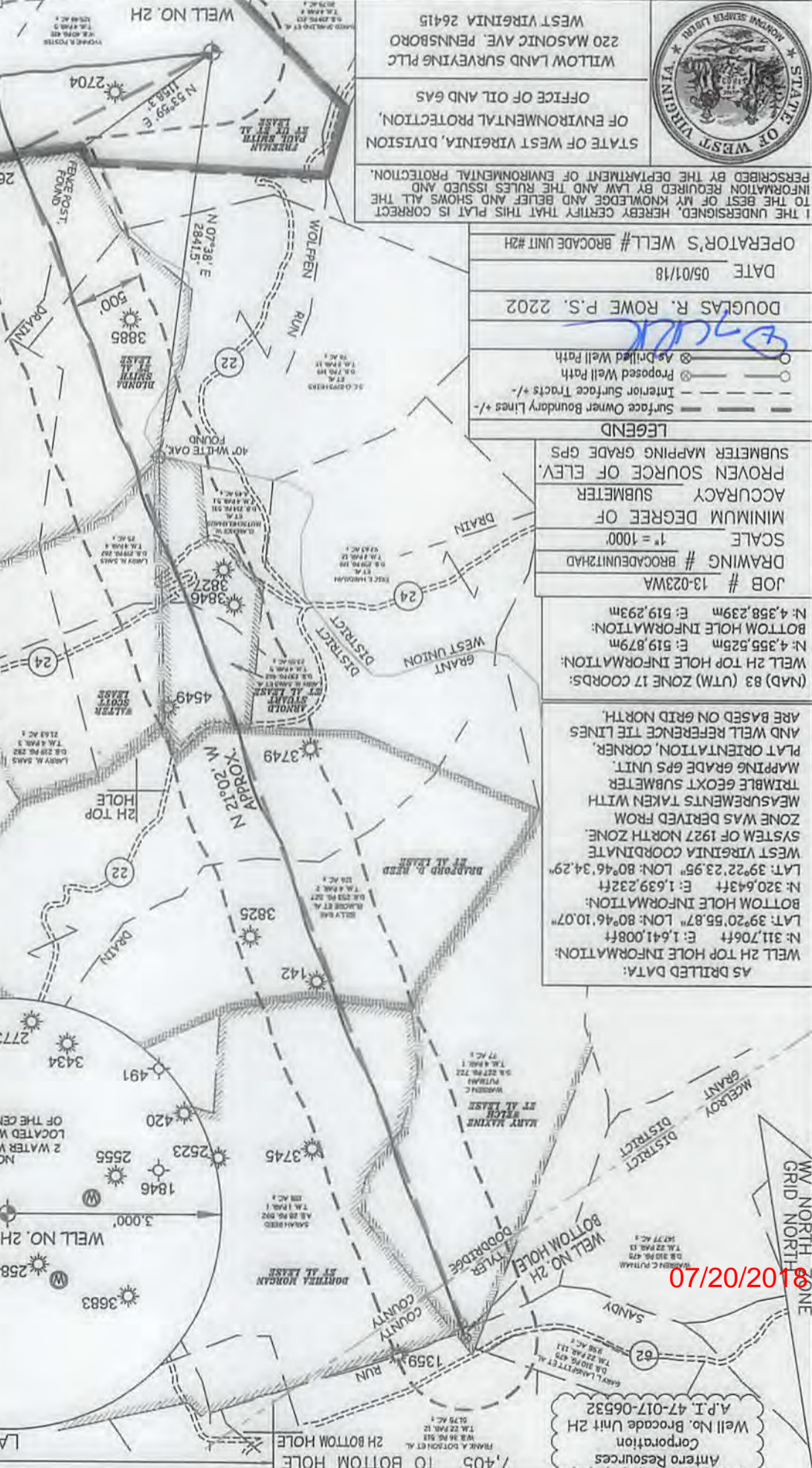
STATE OF WEST VIRGINIA
 DEPARTMENT OF ENERGY
 DIVISION OF OIL AND GAS STATE COUNTY PERMIT
 WASTE DISPOSAL DEEP SHALLOW X
 (IF "GAS") PRODUCTION X STORAGE
 LOCATION: ELEVATION 1,229' AS DRILLED WATERSHED HEADWATERS MIDDLE ISLAND CREEK
 QUADRANGLE WEST UNION 7.5
 SURFACE OWNER YVONNE R. FOSTER ACREAGE 125.48 ACRES +/-
 BRADFORD D. REED ET AL; DORTHEA MORGAN ET AL; MARY MAXINE WELCH ET AL
 LEASE ACREAGE 125 AC±; 114 AC±; 46.63 AC±; 23.55 AC±; 126 AC±; 159 AC±; 78.973 AC±
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL PERFORMATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL
 PLUG OFF OLD FORMATION (SPECIFY) AS DRILLED
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,941' TVD 16,304' MD
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT CT CORPORATION SYSTEM-DIANNA STAMPER
 ADDRESS 1615 WYNKOOP STREET DENVER, CO 80202
 ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313
 FORM WV-6

NOTE
 1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POLARLY HERMANSORY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.
 2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ATLEIGHN SURVEYS, INC.
 3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.
 4. THIS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3. ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE SCHEMATIC.
 5. THIS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.



PROFESSIONAL SURVEYOR
 STATE OF WEST VIRGINIA
 NO. 2202
 LICENSED
 DOUGLAS R. ROWE

LONGITUDE 80°45'00"
 LONGITUDE 80°45'00"
 LONGITUDE 80°45'00"
 9,524' TO BOTTOM HOLE
 613' TO BOTTOM HOLE
 7,405' TO BOTTOM HOLE
 5,504'
 LATITUDE 39°22'30"
 LATITUDE 39°22'30"
 LATITUDE 39°22'30"



WV NORTH ONE GRID NORTH
 8102/20/17
 Antero Resources Corporation
 Well No. Brocade Unit 2H
 A.P.I. 47-017-06532



LEGEND
 - - - Surface Owner Boundary Lines +/-
 - - - Interior Surface Tracts +/-
 - - - Proposed Well Path
 - - - As Drilled Well Path
 OPERATOR'S WELL # BROCADE UNIT #2H
 DATE 05/01/18
 DOUGLAS R. ROWE P.S. 2202

JOB # 13-023WA
 DRAWING # BROCADEUNIT2HAD
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS
 AS DRILLED DATA:
 WELL 2H TOP HOLE INFORMATION: N: 311,706ft E: 1,641,008ft
 LAT: 39°20'55.87" LON: 80°46'10.07"
 BOTTOM HOLE INFORMATION: N: 320,643ft E: 1,639,232ft
 LAT: 39°22'23.95" LON: 80°46'34.29"
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE.
 ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE 660XT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.
 (NAD) 83 (UTM) ZONE 17 COORDS:
 WELL 2H TOP HOLE INFORMATION: N: 4,355,525m E: 519,879m
 BOTTOM HOLE INFORMATION: N: 4,358,239m E: 519,293m
 JOB # 13-023WA
 DRAWING # BROCADEUNIT2HAD
 SCALE 1" = 1000'
 MINIMUM DEGREE OF ACCURACY SUBMETER
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

STATE OF WEST VIRGINIA
 DEPARTMENT OF ENVIRONMENTAL PROTECTION,
 OFFICE OF OIL AND GAS
 WILLOW LAND SURVEYING PLLC
 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415
 API WELL # 47-017-06532