

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

API 47-085-10313 County Ritchie District Clay  
Quad Ellenboro 7.5' Pad Name Bachelor Pad Field/Pool Name -----  
Farm name Marion R. Bachelor Well Number Raines Unit 3H  
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 4351346m Easting 498702m  
Landing Point of Curve Northing 4351261.18m Easting 585131.83m  
Bottom Hole Northing 4348440m Easting 500272m

Elevation (ft) 1193' 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 3/23/2017 Date drilling commenced 5/12/2017 Date drilling ceased 10/7/2017  
Date completion activities began 12/26/2017 Date completion activities ceased 3/7/2018  
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 202', 402' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1355' 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**  
*Michael Doff*

*9/5/18*

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

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API 47-085 - 10313 Farm name Marion R. Bachelor Well number Raines Unit 3H

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	24"	20"	95'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	619'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2561'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	16893'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6437'		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 <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	204 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	531 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	948 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	735 sx (Lead) 1470 sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.44 (Lead), 1.87 (Tail)	3774	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 16913' MD, 6455' TVD (BHL), 6438' (Deepest Point Drilled)      Loggers TD (ft) 16913' MD      RECEIVED  
 Deepest formation penetrated Marcellus      Plug back to (ft) N/A      Office of Oil and Gas  
 Plug back procedure N/A      **JUL 2 2018**

Kick off depth (ft) 5927      WV Department of Environmental Protection

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 N/A

API 47- 085 - 10313 Farm name Marion R. Bachelor Well number Raines Unit 3H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
<b>*PLEASE SEE ATTACHED EXHIBIT 1</b>					

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
<b>*PLEASE SEE ATTACHED EXHIBIT 2</b>								

Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS	
Marcellus	6352' (TOP) TVD	6555' (TOP) MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

SHUT-IN PRESSURE Surface 2800 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW Gas 13262 mcfpd Oil 178 bpd NGL --- bpd Water 1357 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 <sub>2</sub> S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	

**\*PLEASE SEE ATTACHED EXHIBIT 3**

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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

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 Megan Griffith Telephone 303-357-7223  
Signature  Title Permitting Agent Date 6/29/2018

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

API 47-085-10313 Farm Name Marion R. Bachelor Well Number Raines Unit 3H

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	1/9/2018	16693		60	Marcellus
2	1/9/2018	16494	16662	60	Marcellus
3	1/10/2018	16296	16463	60	Marcellus
4	1/11/2018	16098	16265	60	Marcellus
5	1/11/2018	15899	16066	60	Marcellus
6	1/11/2018	15701	15868	60	Marcellus
7	1/13/2018	15502	15670	60	Marcellus
8	1/14/2018	15304	15471	60	Marcellus
9	1/14/2018	15106	15273	60	Marcellus
10	1/15/2018	14907	15074	60	Marcellus
11	1/14/2018	14709	14876	60	Marcellus
12	1/16/2018	14510	14678	60	Marcellus
13	1/17/2018	14312	14479	60	Marcellus
14	1/17/2018	14114	14281	60	Marcellus
15	1/18/2018	13915	14082	60	Marcellus
16	1/20/2018	13717	13884	60	Marcellus
17	1/21/2018	13518	13686	60	Marcellus
18	1/22/2018	13320	13487	60	Marcellus
19	1/22/2018	13122	13289	60	Marcellus
20	1/22/2018	12923	13091	60	Marcellus
21	1/24/2018	12725	12892	60	Marcellus
22	1/25/2018	12526	12694	60	Marcellus
23	1/25/2018	12328	12495	60	Marcellus
24	1/27/2018	12130	12297	60	Marcellus
25	1/28/2018	11931	12099	60	Marcellus
26	1/28/2018	11733	11900	60	Marcellus
27	1/29/2018	11534	11702	60	Marcellus
28	1/29/2018	11336	11503	60	Marcellus
29	1/30/2018	11138	11305	60	Marcellus
30	1/31/2018	10939	11107	60	Marcellus
31	1/31/2018	10741	10908	60	Marcellus
32	2/2/2018	10542	10710	60	Marcellus
33	2/2/2018	10344	10511	60	Marcellus
34	2/3/2018	10146	10313	60	Marcellus
35	2/13/2018	9947	10115	60	Marcellus
36	2/14/2018	9749	9916	60	Marcellus
37	2/14/2018	9550	9718	60	Marcellus
38	2/15/2018	9352	9519	60	Marcellus
39	2/15/2018	9154	9321	60	Marcellus
40	2/15/2018	8955	9123	60	Marcellus
41	2/15/2018	8757	8924	60	Marcellus
42	2/16/2018	8558	8726	60	Marcellus
43	2/16/2018	8360	8527	60	Marcellus
44	2/16/2018	8162	8329	60	Marcellus
45	2/16/2018	7963	8131	60	Marcellus
46	2/17/2018	7765	7932	60	Marcellus
47	2/17/2018	7566	7734	60	Marcellus
48	2/17/2018	7368	7535	60	Marcellus
49	2/17/2018	7170	7337	60	Marcellus
50	2/18/2018	6971	7139	60	Marcellus
51	2/18/2018	6773	6940	60	Marcellus
52	2/18/2018	6575	6742	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	1/9/2018	75.4	7761	5561	4451	326,300	7584	N/A
2	1/9/2018	75.4	7596	5573	4052	498,400	10386	N/A
3	1/10/2018	75	7490	5411	3986	501,080	10746	N/A
4	1/11/2018	76	7657	5077	5065	497,480	10261	N/A
5	1/11/2018	75.5	7542	6230	4170	498,120	11010	N/A
6	1/11/2018	75.6	7350	5224	3353	490,780	10529	N/A
7	1/13/2018	78	7527	5207	3156	489,680	10621	N/A
8	1/14/2018	57.9	7696	6160	3297	501,780	12372	N/A
9	1/14/2018	75	6660	5203	3854	496,120	11884	N/A
10	1/15/2018	77.5	7264	5943	3325	493,100	10619	N/A
11	1/14/2018	78	7347	5612	2894	493,300	10766	N/A
12	1/16/2018	78.7	7294	5013	3412	498,480	10433	N/A
13	1/17/2018	75	6944	5457	3681	492,400	10665	N/A
14	1/17/2018	72	6857	5523	3059	493,200	10791	N/A
15	1/18/2018	74	7037	5386	4619	487,260	10567	N/A
16	1/20/2018	75	7184	5797	3685	500,005	10506	N/A
17	1/21/2018	70.12	76	5565	4984	503,640	10562	N/A
18	1/22/2018	75	7076	7663	4759	512,220	10887	N/A
19	1/22/2018	73	7185	6301	3776	499,660	10595	N/A
20	1/22/2018	75	7241	5927	3586	499,100	10681	N/A
21	1/24/2018	76	7127	4540	4559	499,160	10979	N/A
22	1/25/2018	78.3	6623	4737	3486	506,720	10594	N/A
23	1/25/2018	74.5	6920	4780	3419	506,880	10803	N/A
24	1/27/2018	75	6850	6933	3371	499,500	10962	N/A
25	1/28/2018	76	7229	5682	5298	490,100	12254	N/A
26	1/28/2018	71.8	6546	5323	4799	496,645	10705	N/A
27	1/29/2018	72	6878	5493	4402	501,580	11206	N/A
28	1/29/2018	74.6	7025	4780	3360	501,500	11653	N/A
29	1/30/2018	73	7289	5244	4880	503,400	13227	N/A
30	1/31/2018	74.9	6942	4774	3538	504,390	10424	N/A
31	1/31/2018	74.4	6913	5050	9104	443,800	13189	N/A
32	2/2/2018	75.8	7124	5849	3550	499,025	10729	N/A
33	2/2/2018	77.8	6890	5670	3321	490,160	10642	N/A
34	2/3/2018	74.9	7001	5998	8692	447,860	12705	N/A
35	2/13/2018	76.2	6713	5589	4930	500,440	12078	N/A
36	2/14/2018	77.9	6380	5008	4728	500,140	10293	N/A
37	2/14/2018	78	6632	5467	4208	506,480	10230	N/A
38	2/15/2018	76.8	6636	5746	4550	501,580	10763	N/A
39	2/15/2018	77.7	6460	5617	3276	499,475	10359	N/A
40	2/15/2018	78.5	6482	5563	3904	499,305	10325	N/A
41	2/15/2018	79.2	6449	6012	3764	499,420	10260	N/A
42	2/16/2018	78.5	6354	5117	4278	501,980	10267	N/A
43	2/16/2018	79.1	6274	5154	3683	499,025	10336	N/A
44	2/16/2018	79.2	6229	4799	3537	499,025	11798	N/A
45	2/16/2018	78.8	6113	6280	3599	494,590	10434	N/A
46	2/17/2018		6006	5306	3409	500,540	10645	N/A
47	2/17/2018	77	5845	5020	3433	499,025	10253	N/A
48	2/17/2018	77.5	5787	5169	3965	499,025	10180	N/A
49	2/17/2018	79.5	5776	5326	3473	513,430	10013	N/A
50	2/18/2018	72.6	6172	6416	3359	508,180	11203	N/A
51	2/18/2018	79.3	5883	5937	2833	501,410	10225	N/A
52	2/18/2018	77.6	5718		2916	485,410	11223	N/A
AVG=		211.8	6,693	5,534	4,054	25,671,305	563,422	TOTAL

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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	227'	N/A	227'	N/A
Shale	85	305	85	305
Sandstone	305	485	305	485
Siltstone	485	965	485	965
Shale	965	1,475	965	1,475
Sandstone	1,475	1,685	1,475	1,685
Sandstone	1,685	1,825	1,685	1,825
Sandstone	1,825	1,785	1,825	1,785
Sandstone	1,785	1,835	1,785	1,835
Sandstone	1,835	2,015	1,835	2,015
Shale	2,015	2,025	2,015	2,032
Big Lime	2,025	2,604	2,032	2,618
Gantz	2,604	2,918	2,618	2,910
Fifty Foot Sandstone	2,918	3,034	2,910	3,027
Gordon	3,034	3,485	3,027	3,482
Fifth Sandstone	3,485	3,540	3,482	3,537
Bayard	3,540	4,003	3,537	4,001
Speechley	4,003	4,282	4,001	4,281
Baltown	4,282	4,697	4,281	4,696
Bradford	4,697	5,031	4,696	5,030
Benson	5,031	5,263	5,030	5,262
Alexander	5,263	5,526	5,262	5,549
Elk	5,526	5,758	5,549	5,783
Rhinestreet	5,758	6,117	5,783	6,187
Sycamore	6,117	6,208	6,187	6,306
Middlesex	6,208	6,305	6,306	6,473
Burkett	6,305	6,352	6,473	6,555
Marcellus (Tully-Not Present)	6,352	0	6,555	0

\*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.

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	1/9/2018
Job End Date:	2/18/2018
State:	West Virginia
County:	Ritchie
API Number:	47-085-10313-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Raines 3H
Latitude:	39.31152500
Longitude:	-81.01528900
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,463
Total Base Water Volume (gal):	23,676,240
Total Base Non Water Volume:	0



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## 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	Ascent	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	88.26115	None
Sand (Proppant)	Keane	Proppant					
			Crystalline silica: Quartz (SiO2)	14808-60-7	100.00000	11.46776	None
KWG-111LS	Keane	Gel					
			Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.03167	None
			Guar gum	9000-30-0	55.00000	0.03167	None
KFR-16FW	Keane	Friction Reducer					
			Water	7732-18-5	60.00000	0.03721	None
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.01240	None
			ammonium chloride	12125-02-9	1.50000	0.00093	None
			oleic acid diethanolamide	93-83-4	1.50000	0.00093	None
		alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00062	None	
Hydrochloric Acid (15%)	Keane	Acidizing					
			Hydrochloric Acid	7647-01-0	15.00000	0.01903	None
MBC-516	Keane	Biocide					



			Water	7732-18-5	56.70000	0.00538	None
			Glutaral	111-30-8	26.70000	0.00253	None
			didecyldimethylammonium chloride	7173-51-5	8.00000	0.00076	None
			quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	5.30000	0.00050	None
			ethonal	64-17-5	2.80000	0.00027	None
KSI-19	Keane	Scale Inhibitor					
			Methanol	67-56-1	30.00000	0.00405	None
KWBO-2	Keane	Breaker					
			Sodium persulfate	7775-27-1	99.00000	0.00123	None
KAI-12	Keane	Acid Inhibitor					
			Ethylene glycol	107-21-1	40.00000	0.00004	None
			dipropylene glycol, monomethyl ether	34590-94-8	20.00000	0.00002	None
			formic acid	64-18-6	10.00000	0.00001	None
			Ethoxylated alcohol	68131-39-5	10.00000	0.00001	None
			Tar bases, quinoline derivs., benzyl chloride-quaternized	72480-70-7	10.00000	0.00001	None
			Cinnamaldehyde	104-55-2	10.00000	0.00001	None
			isopropyl alcohol	67-63-0	5.00000	0.00001	None
KFEAC-30	Keane	Iron Control					
			Citric acid	77-92-9	30.00000	0.00009	None
			Acetic acid	64-19-7	5.00000	0.00002	None
Ingredients shown above are subject to 29 CFR 1910.1200(l) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Distillates (petroleum), hydrotreated light	64742-47-8	55.00000	0.03167	
			Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.01240	
			Glutaral	111-30-8	26.70000	0.00253	
			oleic acid diethanolamide	93-83-4	1.50000	0.00093	
			ammonium chloride	12125-02-9	1.50000	0.00093	
			didecyldimethylammonium chloride	7173-51-5	8.00000	0.00076	
			alcohols, C12-16, ethoxylated	68551-12-2	1.00000	0.00062	
			quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	5.30000	0.00050	
			ethonal	64-17-5	2.80000	0.00027	
			Citric acid	77-92-9	30.00000	0.00009	
			dipropylene glycol, monomethyl ether	34590-94-8	20.00000	0.00002	
			Ethoxylated alcohol	68131-39-5	10.00000	0.00001	
			Cinnamaldehyde	104-55-2	10.00000	0.00001	
			Tar bases, quinoline derivs., benzyl chloride-quaternized	72480-70-7	10.00000	0.00001	
			formic acid	64-18-6	10.00000	0.00001	

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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 1910.1206(f) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

				isopropyl alcohol	57-63-0	5.00000	0.00001	
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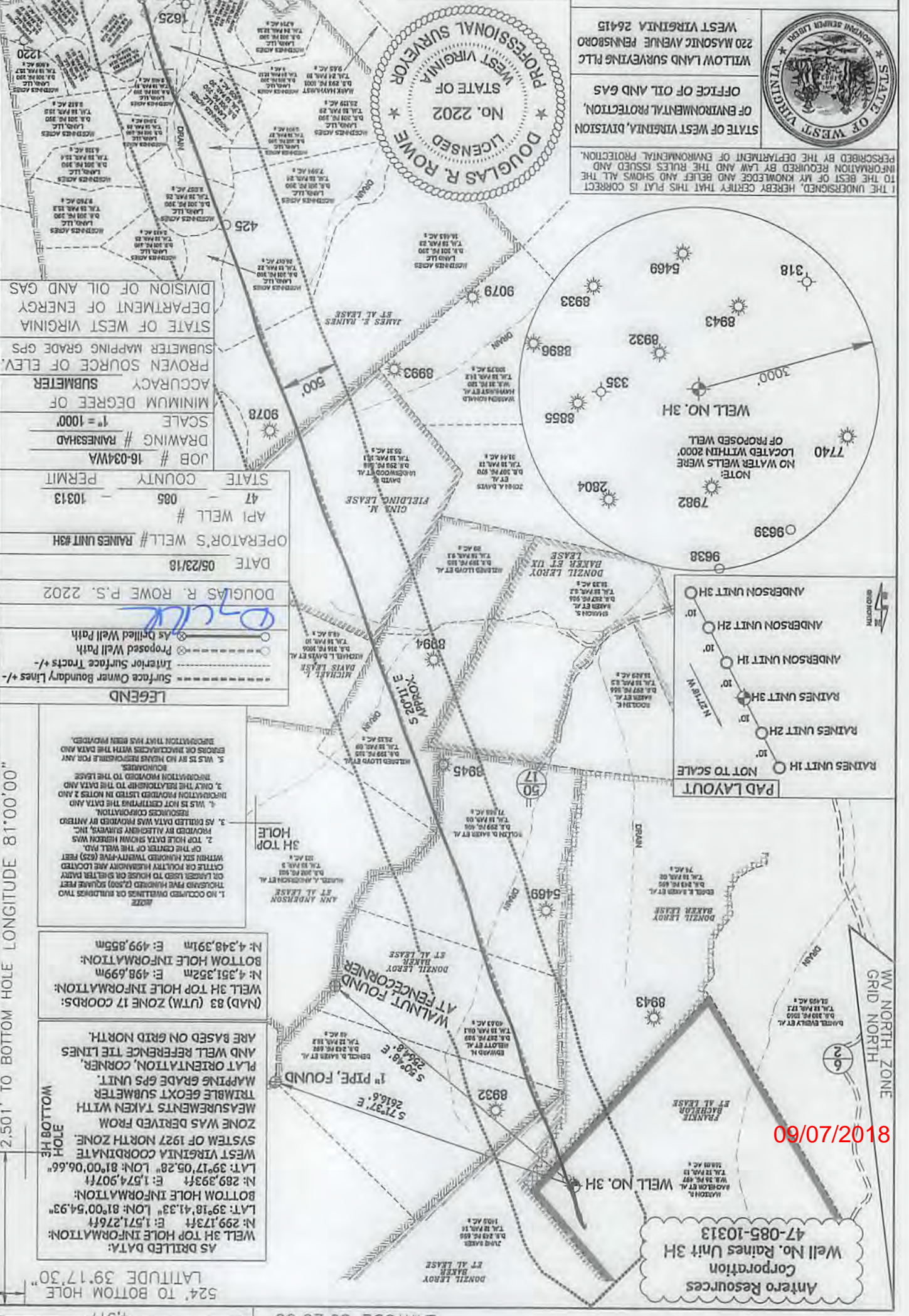
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 220 WASHINGTON AVENUE, PENNSYLVANIA, WEST VIRGINIA 26415

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

WELL TYPE: OIL GAS X LIQUID INJECTION WASTE DISPOSAL  
 (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X  
 LOCATION: ELEVATION 1,193' AS DRILLED  
 QUADRANGLE ELLENBORO 7.5 DISTRICT CLAY COUNTY RITCHIE  
 SURFACE OWNER MARION R. BACHLOR ET AL  
 OIL & GAS ROYALTY OWNER FRANKIE BACHLOR ET AL; DONZIL LEROY BAKER ET AL; DONZIL LEROY BAKER ET AL  
 ANN ANDERSON ET AL; MICHAEL L. DAVIS; GWYN M. FIELDING; JAMES E. RAINES ET AL  
 PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL  
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL  
 TARGET FORMATION MARCELLUS  
 WELL OPERATOR ANTERO RESOURCES CORPORATION  
 ADDRESS 1615 WYMKOP STREET DENVER, CO 80202  
 PERMIT NAME 5400 D BIG TYLER ROAD CHARLESTON, WV 26313



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

PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS  
 ACURACY SUBMETER  
 MINIMUM DEGREE OF SCALE 1" = 1000'  
 DRAWING # RAINES3HAD  
 JOB # 16-034WA  
 STATE COUNTY PERMIT  
 47 085 10313

API WELL #  
 OPERATOR'S WELL # RAINES UNIT #3H  
 DATE 05/23/18  
 DOUGLAS R. ROWE P.S. 2202

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

NOTE  
 1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2500) SQUARE FEET OR LARGER USED TO HOUSE OR SHEEPER PASTURE OR POLYMER HANGAR AND LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL AND  
 2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY SURVEY, INC.  
 3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.  
 4. WAS NOT CERTIFIED THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE LEASE AND INFORMATION PROVIDED TO THE LEASEE.  
 5. WAS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

AS DRILLED DATA:  
 WELL 3H TOP HOLE INFORMATION:  
 N: 299.173ft E: 1,571.276ft  
 LAT: 39°18'41.33" LON: 81°00'54.93"  
 BOTTOM HOLE INFORMATION:  
 N: 289.933ft E: 1,574.907ft  
 LAT: 39°17'05.28" LON: 81°00'06.66"  
 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 3H TOP HOLE INFORMATION:  
 N: 4,351.352m E: 498.699m  
 BOTTOM HOLE INFORMATION:  
 N: 4,348.391m E: 499.855m



Antero Resources Corporation  
 Well No. Raines Unit 3H  
 47-085-10313

18/07/2018

LATITUDE 39.20'00" LONGITUDE 81.00'00"

LATITUDE 39°20'00"

4,317'

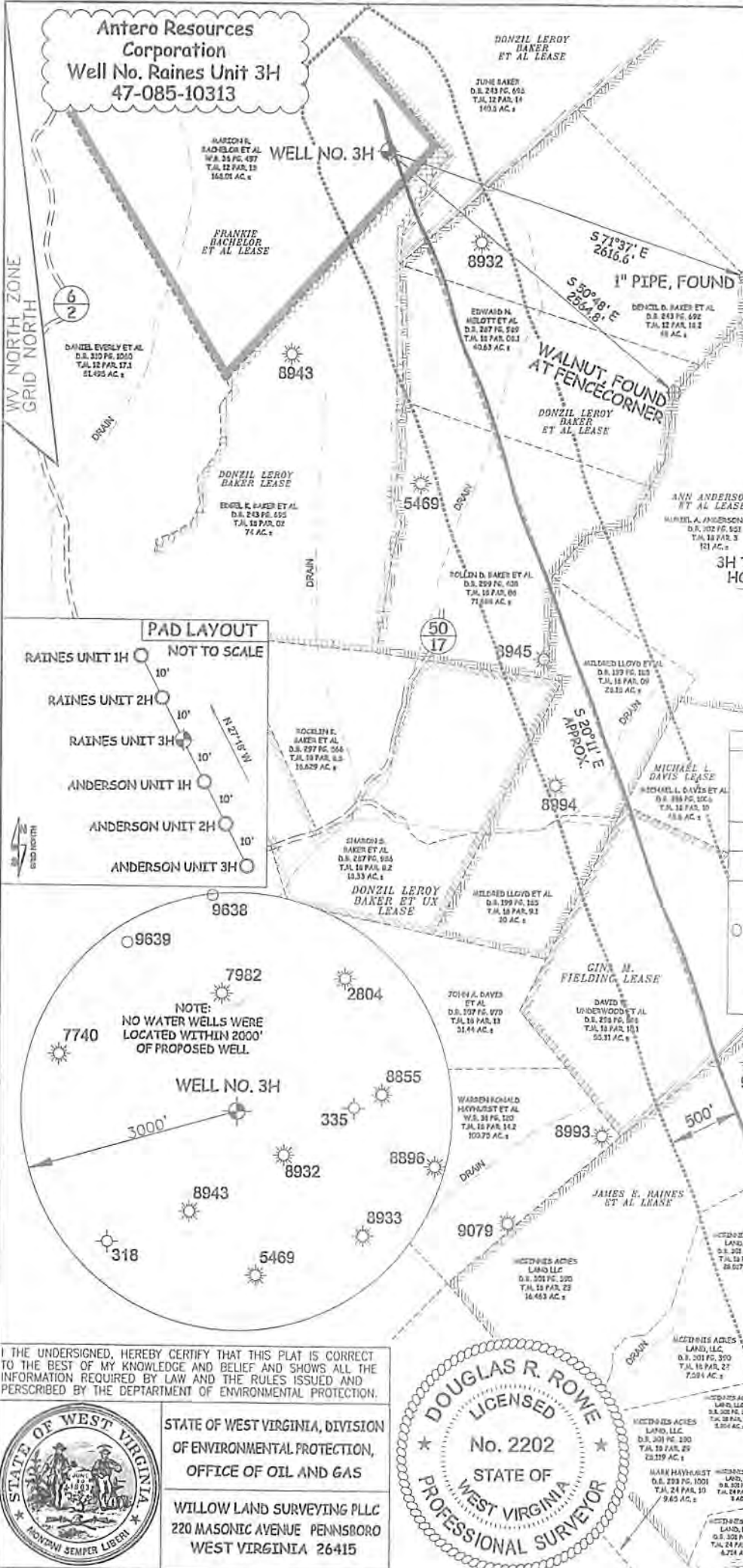
524' TO BOTTOM HOLE  
LATITUDE 39°17'30"

2,501' TO BOTTOM HOLE

7,960'

LONGITUDE 81°00'00"

LONGITUDE 81°00'00"



**AS DRILLED DATA:**  
**WELL 3H TOP HOLE INFORMATION:**  
 N: 299,173ft E: 1,571,276ft  
 LAT: 39°18'41.33" LON: 81°00'54.93"  
**BOTTOM HOLE INFORMATION:**  
 N: 289,393ft E: 1,574,907ft  
 LAT: 39°17'05.28" LON: 81°00'06.66"  
 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 3H TOP HOLE INFORMATION:**  
 N: 4,351,352m E: 498,699m  
**BOTTOM HOLE INFORMATION:**  
 N: 4,348,391m E: 499,855m

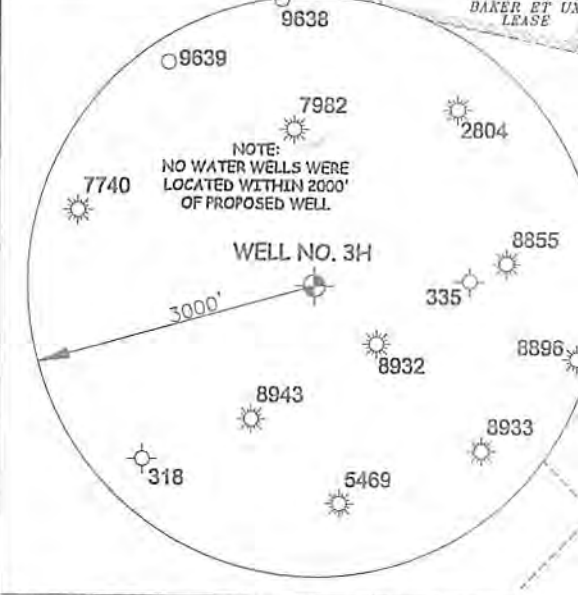
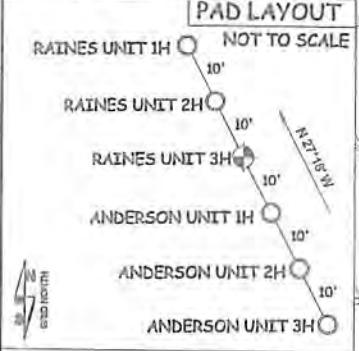
**NOTE**  
 1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.  
 2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ALLEGHENY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

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

*D. Rowe*  
 DOUGLAS R. ROWE P.S. 2202

DATE 05/23/18  
 OPERATOR'S WELL# RAINES UNIT #3H  
 API WELL # 47 - 085 - 10313  
 STATE COUNTY PERMIT

JOB # 16-034WA  
 DRAWING # RAINES3HAD  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY SUBMETER  
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS  
 STATE OF WEST VIRGINIA DEPARTMENT OF ENERGY DIVISION OF OIL AND GAS



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 AVENUE PENNSBORO WEST VIRGINIA 26415



WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW   
 LOCATION: ELEVATION 1,193' AS DRILLED WATERSHED NORTH FORK HUGHES RIVER  
 QUADRANGLE ELLENBORO 7.5' DISTRICT CLAY COUNTY RITCHIE

SURFACE OWNER MARION R. BACHELOR ET AL ACREAGE 168.01 ACRES +/-  
 OIL & GAS ROYALTY OWNER FRANKIE BACHELOR ET AL; DONZIL LEROY BAKER ET AL; DONZIL LEROY BAKER ET AL; LEASE ACREAGE 168 AC +/- 74 AC +/- 140.5 AC +/- 109 AC +/-  
 ANN ANDERSON ET AL; MICHAEL L. DAVIS; GINA M. FIELDING; JAMES E. RAINES ET AL 160 AC +/- 48.8 AC +/- 69.2 AC +/- 300 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 ESTIMATED DEPTH 6,455' TVD 16,913' MD

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

09/07/2018