

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

API 47-085-10384 County Ritchie District Clay  
Quad Pennsboro 7.5' Pad Name Lynn Camp Pad Field/Pool Name ----  
Farm name Terry Lee Richards Well Number Riggs Unit 1H  
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 4340533m Easting 504746m  
Landing Point of Curve Northing 4340475.58m Easting 504238.38m  
Bottom Hole Northing 4344813m Easting 503045m

Elevation (ft) 1149' 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

RECEIVED  
Office of Oil and Gas  
AUG 31 2020

WV Department of  
Environmental Protection

Date permit issued 2/1/2019 Date drilling commenced 3/19/2019 Date drilling ceased 6/21/2019  
Date completion activities began 1/8/2020 Date completion activities ceased 4/6/2020  
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 222', 459' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1221', 1247' Void(s) encountered (Y/N) depths No  
Coal depth(s) ft 210', 784' Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

Reviewed by:  
DMH  
12-7-20

API 47-085 - 10384 Farm name Terry Lee Richards Well number Riggs Unit 1H

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"	578'	New	54#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2569'	New	36#, H-40	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	21649'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	6657'		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	244	0'	8 Hrs.
Surface	Class A	495 sx	15.6	1.19	402	0'	8 Hrs.
Coal							
Intermediate 1	Class A	890 sx	15.6	1.18	1047	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	798sx (Lead) 3524sx (Tail)	13.5 (Lead), 15.2 (Tail)	1.53 (Lead), 1.83 (Tail)	2819	-500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 21669' MD, 6437' TVD (BHL), 6439' (Deepest Point Drilled) Loggers TD (ft) 21669' MD  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 5800'

RECEIVED  
Office of Oil and Gas

AUG 31 2020

Check all wireline logs run  caliper  density  deviated/directional  induction  
 neutron  resistivity  gamma ray  temperature  sonic

WV Department of Environmental Protection

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 - 10384 Farm name Terry Lee Richards Well number Riggs Unit 1H

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>								

RECEIVED  
Office of Oil and Gas  
AUG 31 2020  
WV Department  
Environmental P...

Please insert additional pages as applicable.

API 47- 085 - 10384 Farm name Terry Lee Richards Well number Riggs Unit 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
Marcellus	6361' (TOP)	TVD	6720' (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 9457 mcfpd Oil 149 bpd NGL --- bpd Water 677 bpd GAS MEASURED BY  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP	BOTTOM	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**


Please insert additional pages as applicable.

Drilling Contractor Frontier Drilling LLC  
Address 562 Spring Run Road City Pennsboro State WV Zip 26415  
Office of Oil and Gas

Logging Company Nine Energy Services  
Address 125 Museum Road City Washington State PA Zip 15301 AUG 31 2020

Cementing Company C&J Energy Services  
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378  
WV Department of Environmental Protection

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

Please insert additional pages as applicable.

Completed by Megan Griffith Telephone 303-357-7223  
Signature  Title Permitting Agent Date 6-26-20

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

## EXHIBIT 1

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	1/5/2020	21542	21498	60	Marcellus
2	1/6/2020	21460.82658	21296.9595	60	Marcellus
3	1/6/2020	21261.78604	21097.9189	60	Marcellus
4	1/7/2020	21062.7455	20898.8784	60	Marcellus
5	1/7/2020	20863.70495	20699.8378	60	Marcellus
6	1/7/2020	20664.66441	20500.7973	60	Marcellus
7	1/8/2020	20465.62387	20301.7568	60	Marcellus
8	1/8/2020	20266.58333	20102.7162	60	Marcellus
9	1/8/2020	20067.54279	19903.6757	60	Marcellus
10	1/9/2020	19868.50225	19704.6351	60	Marcellus
11	1/9/2020	19669.46171	19505.5946	60	Marcellus
12	1/10/2020	19470.42117	19306.5541	60	Marcellus
13	1/10/2020	19271.38063	19107.5135	60	Marcellus
14	1/10/2020	19072.34009	18908.473	60	Marcellus
15	1/11/2020	18873.29955	18709.4324	60	Marcellus
16	1/11/2020	18674.25901	18510.3919	60	Marcellus
17	1/11/2020	18475.21847	18311.3514	60	Marcellus
18	1/12/2020	18276.17793	18112.3108	60	Marcellus
19	1/12/2020	18077.13739	17913.2703	60	Marcellus
20	1/12/2020	17878.09685	17714.2297	60	Marcellus
21	1/13/2020	17679.05631	17515.1892	60	Marcellus
22	1/13/2020	17480.01577	17316.1486	60	Marcellus
23	1/13/2020	17280.97523	17117.1081	60	Marcellus
24	1/13/2020	17081.93468	16918.0676	60	Marcellus
25	1/14/2020	16882.89414	16719.027	60	Marcellus
26	1/16/2020	16683.8536	16519.9865	60	Marcellus
27	1/16/2020	16484.81306	16320.9459	60	Marcellus
28	1/17/2020	16285.77252	16121.9054	60	Marcellus
29	1/17/2020	16086.73198	15922.8649	60	Marcellus
30	1/17/2020	15887.69144	15723.8243	60	Marcellus
31	1/18/2020	15688.6509	15524.7838	60	Marcellus
32	1/18/2020	15489.61036	15325.7432	60	Marcellus
33	1/18/2020	15290.56982	15126.7027	60	Marcellus
34	1/19/2020	15091.52928	14927.6622	60	Marcellus
35	1/19/2020	14892.48874	14728.6216	60	Marcellus
36	1/19/2020	14693.4482	14529.5811	60	Marcellus
37	1/19/2020	14494.40766	14330.5405	60	Marcellus
38	1/20/2020	14295.36712	14131.5	60	Marcellus
39	1/20/2020	14096.32658	13932.4595	60	Marcellus
40	1/20/2020	13897.28604	13733.4189	60	Marcellus
41	1/20/2020	13698.2455	13534.3784	60	Marcellus
42	1/21/2020	13499.20495	13335.3378	60	Marcellus
43	1/21/2020	13300.16441	13136.2973	60	Marcellus
44	1/21/2020	13101.12387	12937.2568	60	Marcellus
45	1/22/2020	12902.08333	12738.2162	60	Marcellus
46	1/22/2020	12703.04279	12539.1757	60	Marcellus
47	1/22/2020	12504.00225	12340.1351	60	Marcellus
48	1/22/2020	12304.96171	12141.0946	60	Marcellus
49	1/23/2020	12105.92117	11942.0541	60	Marcellus
50	1/23/2020	11906.88063	11743.0135	60	Marcellus
51	1/23/2020	11707.84009	11543.973	60	Marcellus
52	1/24/2020	11508.79955	11344.9324	60	Marcellus
53	1/24/2020	11309.75901	11145.8919	60	Marcellus
54	1/24/2020	11110.71847	10946.8514	60	Marcellus
55	1/24/2020	10911.67793	10747.8108	60	Marcellus
56	1/25/2020	10712.63739	10548.7703	60	Marcellus
57	1/25/2020	10513.59685	10349.7297	60	Marcellus
58	1/25/2020	10314.55631	10150.6892	60	Marcellus
59	1/25/2020	10115.51577	9951.64865	60	Marcellus
60	1/26/2020	9916.475225	9752.60811	60	Marcellus
61	1/26/2020	9717.434685	9553.56757	60	Marcellus
62	1/26/2020	9518.394144	9354.52703	60	Marcellus
63	1/27/2020	9319.353604	9155.48649	60	Marcellus
64	1/27/2020	9120.313063	8956.44595	60	Marcellus
65	1/27/2020	8921.272523	8757.40541	60	Marcellus
66	1/27/2020	8722.231982	8558.36486	60	Marcellus
67	1/28/2020	8523.191441	8359.32432	60	Marcellus
68	1/28/2020	8324.150901	8160.28378	60	Marcellus
69	1/29/2020	8125.11036	7961.24324	60	Marcellus
70	1/29/2020	7926.06982	7762.2027	60	Marcellus
71	1/29/2020	7727.029279	7563.16216	60	Marcellus
72	1/29/2020	7527.988739	7364.12162	60	Marcellus
73	1/30/2020	7328.948198	7165.08108	60	Marcellus
74	1/30/2020	7129.907658	6966.04054	60	Marcellus
75	1/30/2020	6930.867117	6767	60	Marcellus

RECEIVED  
Office of Oil and Gas

AUG 31 2020

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	1/5/2020	68.04471	8151.551	7278	3367	161100	5721.056	N/A
2	1/6/2020	78.88329	9120.681	5888	3651	407760	7780.046	N/A
3	1/6/2020	83.69275	9313.783	5939	3770	495520	7543.01	N/A
4	1/7/2020	84.02286	9855.193	5945	3263	404340	7261.95	N/A
5	1/7/2020	82.75217	9639.394	6094	3147	402680	7457.11	N/A
6	1/7/2020	82.06	9424.135	5651	3055	405700	7424.95	N/A
7	1/8/2020	84.90957	9850.349	5995	3011	404960	7415.3	N/A
8	1/8/2020	77.48025	9925.787	6691	3348	402680	9070.75	N/A
9	1/8/2020	84.72959	9916.511	5695	3113	401080	7350.04	N/A
10	1/9/2020	83.70205	10291.61	5859	3234	404120	7332.75	N/A
11	1/9/2020	76.4601	9522.326	5612	3227	406380	7623.94	N/A
12	1/10/2020	79.93196	10007.72	5914	3591	405440	7372.27	N/A
13	1/10/2020	81.39146	9866.356	5894	3299	407760	7533.87	N/A
14	1/10/2020	80.71294	9748.172	6388	4261	404520	9719.16	N/A
15	1/11/2020	80.99546	10023.78	6407	3996	406960	9438.28	N/A
16	1/11/2020	81.54781	10281.63	5439	3162	405320	7334.36	N/A
17	1/11/2020	85.27763	9894.603	6148	3313	404200	9493.8	N/A
18	1/12/2020	79.39271	10303.5	6290	3976	403600	7504.03	N/A
19	1/12/2020	84.71677	10454.12	6357	3457	402980	7213.63	N/A
20	1/12/2020	84.58882	9807.489	6655	3597	403800	7171.44	N/A
21	1/13/2020	84.09572	9933.43	6296	3655	405100	7093.43	N/A
22	1/13/2020	82.36546	9799.052	6514	4130	408260	7577.96	N/A
23	1/13/2020	85.29568	10151.93	5228	3733	403960	7116.04	N/A
24	1/13/2020	83.78783	9825.152	5046	3495	401680	7159.24	N/A
25	1/14/2020	68.89976	10251.47	6227	11907	7400	8000.32	N/A
26	1/16/2020	80.90028	8916.417	6267	3623	404460	7075.27	N/A
27	1/16/2020	83.07537	9218.814	5669	3315	403880	7146.41	N/A
28	1/17/2020	81.91192	9430.724	6313	3274	407480	7204.94	N/A
29	1/17/2020	82.57821	8734.495	6158	3360	405820	7142.84	N/A
30	1/17/2020	85.12937	8732.061	6387	3707	405880	7072.53	N/A
31	1/18/2020	85.59082	8861.499	6219	3315	401780	7060.95	N/A
32	1/18/2020	84.37639	8653.012	4839	3390	405500	7058.56	N/A
33	1/18/2020	85.31621	8720.912	6593	3480	403520	7070.44	N/A
34	1/19/2020	84.84759	9035.639	6585	3609	405500	7042.8	N/A
35	1/19/2020	85.10852	8901.891	6732	3699	403360	7299.29	N/A
36	1/19/2020	85.16888	8856.062	6690	3635	403700	7109.57	N/A
37	1/19/2020	85.66996	8807.005	5938	3716	401300	6993.91	N/A
38	1/20/2020	86.4172	8971.94	6323	3553	404920	7073.43	N/A
39	1/20/2020	85.04659	9004.609	6585	3443	403000	7004.41	N/A
40	1/20/2020	86.24568	8976.473	6261	3668	401060	7013.56	N/A
41	1/20/2020	86.99094	8804.635	5266	3439	404020	6997.9	N/A
42	1/21/2020	84.91514	9003.055	6696	3594	404800	6973.03	N/A
43	1/21/2020	85.24254	8532.925	6791	3683	404820	6966.37	N/A
44	1/21/2020	85.56447	8305.293	5759	4000	405400	7167.6	N/A
45	1/22/2020	82.83886	8337.248	5408	3455	403380	7053.32	N/A
46	1/22/2020	85.74421	8524.274	5182	3402	404620	7045.9	N/A
47	1/22/2020	86.31069	8410.233	6314	3578	401760	7001.14	N/A
48	1/22/2020	83.24598	8362.651	6046	3533	405980	7148.63	N/A
49	1/23/2020	85.56588	8628.388	5543	3397	400500	6957.13	N/A
50	1/23/2020	85.61364	8255.151	6758	3383	401100	6852.04	N/A
51	1/23/2020	83.44956	8065.7	6329	3390	403540	6966.89	N/A
52	1/24/2020	84.80874	8041.266	6440	3222	406420	6943.9	N/A
53	1/24/2020	83.06457	7879.45	6431	3472	407100	7729.58	N/A
54	1/24/2020	85.74246	8361.966	6233	3413	405540	6937.62	N/A
55	1/24/2020	85.36275	9069.841	5285	3413	405480	6977.1	N/A
56	1/25/2020	84.08712	8359.228	6265	4163	405440	8474.05	N/A
57	1/25/2020	86.02112	8229.804	6187	3314	403920	6803.66	N/A
58	1/25/2020	86.16627	8321.937	6393	3251	401960	6793.88	N/A
59	1/25/2020	84.95444	8093.222	6343	3128	409560	6804.55	N/A
60	1/26/2020	84.12836	8149.984	4923	3404	404180	6738.07	N/A
61	1/26/2020	86.25967	8037.21	6298	2933	404180	6821.99	N/A
62	1/26/2020	84.15749	8215.624	6663	3233	402405	6746.15	N/A
63	1/27/2020	86.05919	8224.865	5264	3194	401840	6739.73	N/A
64	1/27/2020	86.71814	8026.137	6880	3057	401660	6763.21	N/A
65	1/27/2020	84.70423	7972.697	6262	3245	395860	6691.96	N/A
66	1/27/2020	84.87286	7863.542	6521	3283	597200	6722.76	N/A
67	1/28/2020	86.05625	8105.261	6025	3226	400400	6760.78	N/A
68	1/28/2020	84.0554	7574.097	6895	3444	404900	6650.23	N/A
69	1/29/2020	88.15057	7784.367	5305	3364	404100	6655.74	N/A
70	1/29/2020	86.5034	8072.721	6364	3232	407160	6794.97	N/A
71	1/29/2020	86.54355	7559.195	5729	3322	405000	6660.76	N/A
72	1/29/2020	84.55599	7461.926	6721	3351	404600	6666.4	N/A
73	1/30/2020	84.44828	7211.746	6455	3838	407400	7859.72	N/A
74	1/30/2020	86.42533	7307.885	5904	3261	403840	6710.79	N/A
75	1/30/2020	86.84678	7897.383	6041	2938	404660	6701.77	N/A
	AVG=	82.5	9,463	6,104	3,692	15,946,480	305,076	TOTAL

RECEIVED  
Office of Oil and Gas

AUG 31 2020

WV Department of  
Environmental Protection

**EXHIBIT 3**

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)		BOTTOM DEPTH (TVD)		TOP DEPTH (MD)		BOTTOM DEPTH (MD)	
	From Surface	85	From Surface	145	From Surface	85	From Surface	145
Black/Gray Shale	145	85	145	145	145	85	145	145
Sandy Shale	655	145	655	655	655	145	655	655
Silty Sandstone	865	655	865	865	865	655	865	865
Silty Shale	1,085	865	1,085	1,085	1,085	865	1,085	1,085
Sandy Siltstone	1,175	1,085	1,175	1,175	1,085	1,175	1,175	1,175
Silty Shale	1,365	1,175	1,365	1,365	1,175	1,365	1,365	1,365
Sandstone	1,295	1,365	1,295	1,295	1,365	1,295	1,295	1,295
Sandstone	1,645	1,295	1,645	1,645	1,295	1,645	1,645	1,645
Shale	1,745	1,645	1,745	1,745	1,645	1,745	1,745	1,745
Sandstone	1,805	1,745	1,805	1,805	1,745	1,805	1,805	1,805
Silty Sandstone	1,795	1,805	1,795	1,795	1,805	1,795	1,795	1,795
Sandstone	1,835	1,795	1,835	1,835	1,795	1,835	1,835	1,835
Sandstone	1,869	1,835	1,869	1,869	1,835	1,869	1,869	1,869
Big Lime	2,612	1,869	2,612	2,612	1,869	2,612	2,612	2,612
Fifty Foot Sandstone	2,740	2,612	2,740	2,740	2,612	2,740	2,740	2,740
Gordon	3,239	2,740	3,239	3,239	2,740	3,239	3,239	3,239
Fifth Sandstone	3,328	3,239	3,328	3,328	3,239	3,328	3,328	3,328
Bayard	3,880	3,328	3,880	3,880	3,328	3,880	3,880	3,880
Speechley	4,273	3,880	4,273	4,273	3,880	4,273	4,273	4,273
Balltown	4,643	4,273	4,643	4,643	4,273	4,643	4,643	4,643
Bradford	4,932	4,643	4,932	4,932	4,643	4,932	4,932	4,932
Benson	5,183	4,932	5,183	5,183	4,932	5,183	5,183	5,183
Alexander	6,064	5,183	6,064	6,064	5,183	6,064	6,064	6,064
Sycamore	6,310	6,064	6,310	6,310	6,064	6,310	6,310	6,310
Middlesex	6,342	6,310	6,342	6,342	6,310	6,342	6,342	6,342
Burkett	6,361	6,342	6,361	6,361	6,342	6,361	6,361	6,361
Tully	NA	6,361	NA	NA	6,361	6,720	6,720	6,720
Marcellus								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

AUG 31 2020

WV Department of  
Environmental Protection

# ANTERO RESOURCES CORPORATION

Location: Ritchie County, WV  
 Facility: Lynn Camp Pad

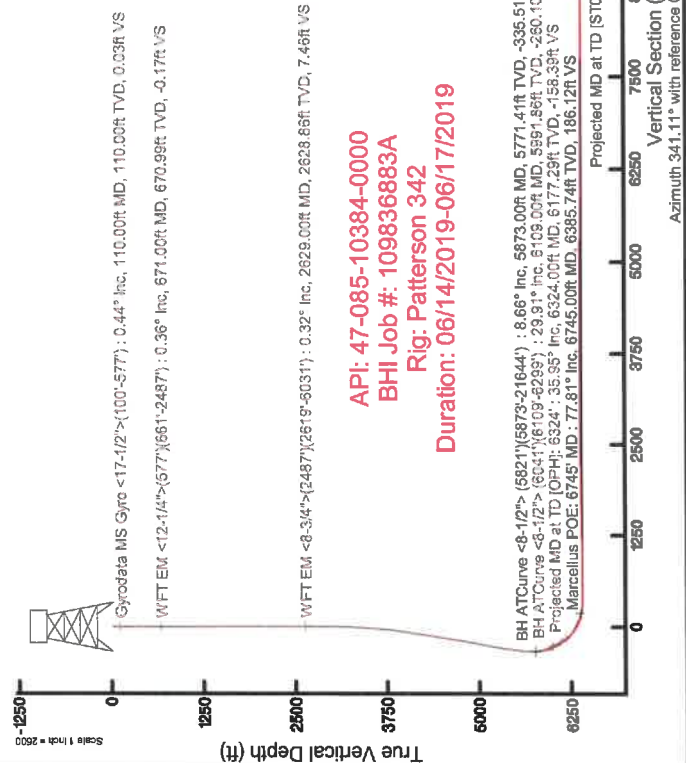
Slot: Slot #06  
 Well: Riggs Unit 1H ST01  
 Wellbore: Riggs Unit 1H ST01 PWB

Plot reference wellpath is Riggs Unit 1H ST01 PWB Rev-0.0  
 True vertical depths are referenced to Patterson 342 (RKB)  
 Measured depths are referenced to Patterson 342 (RKB)  
 Patterson 342 (RKB) to Mean Sea Level: 1174 feet  
 Mean Sea Level to Ground level (At Slot Slot #06): -1149 feet  
 Coordinates are in feet referenced to Slot

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
Lynn Camp Pad	1655924.222	14239828.049	80°56'42.000"W
Slot	Local E (ft)	Local N (ft)	Local E (ft)
Slot #06	25.30	15.79	1655956.843
Patterson 342 (RKB) to Ground level (At Slot Slot #06)	25ft		
Mean Sea Level to Ground level (At Slot Slot #06)	-1149ft		
Patterson 342 (RKB) to Mean Sea Level	1174ft		

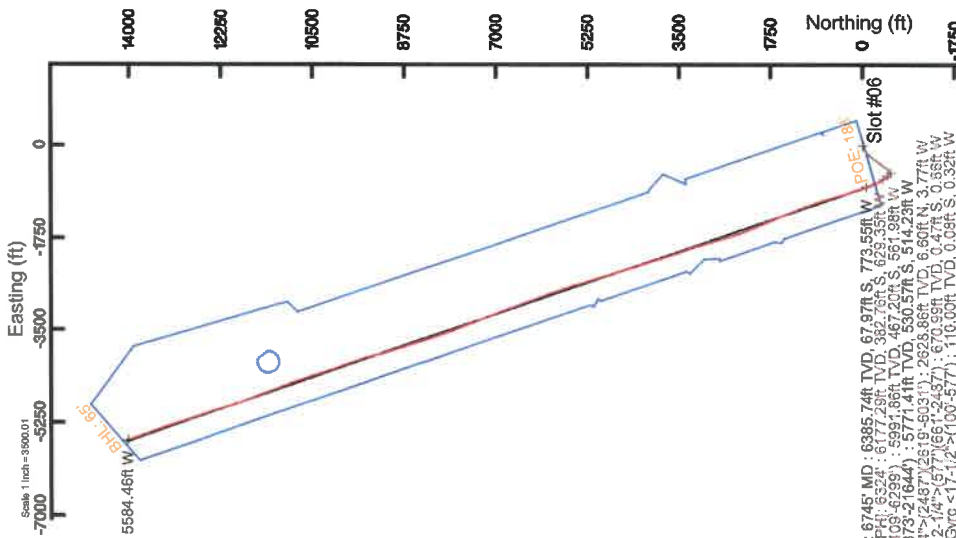
Well Profile Data			
Design Comment	MD (ft)	Az (°)	TVD (ft)
Tie On	5821.00	11.280	296.000
CHKShot @ 5873	5873.00	8.680	298.140
CHKShot @ 5883	5883.00	8.000	298.990
End of 3D Arc	6703.08	75.020	337.632
POE	6741.653	74.865	341.106
Landing PL	6921.84	90.000	341.106
BHL	21605.77	90.000	341.106

Well Data	
Well	Wellbore
Slot #06	Riggs Unit 1H
Slot #06	Riggs Unit 1H ST01
Slot #06	Riggs Unit 1H ST01 PWB



RECEIVED  
 Office of Oil and Gas  
 AUG 31 2020  
 WV Department of  
 Environmental Protection

API: 47-085-10384-0000  
 BHI Job #: 109836883A  
 Rig: Patterson 342  
 Duration: 06/14/2019-06/17/2019



User specified (HDGM) Dip: 66.20° Field: 51666 nT  
 Magnetic North is 7.76 degrees West of True North (at 8772019)  
 Grid North is 0.05 degrees East of True North (at 8772019)  
 To correct from Magnetic to Grid subtract 0.03 degrees  
 To correct azimuth from Magnetic to Grid subtract 7.79 degrees





CalGel 4000	CWS	Gel Slurry											
					Listed Below								
DynaRate 6522	CWS	Friction Reducer											
					Listed Below								
Calbreak 5501	CWS	Breaker											
					Listed Below								
CI-9100G	CWS	Corrosion Inhibitor											
					Listed Below								
Sand (Proppant)	CWS	Propping Agent											
					Listed Below								
SaniFrac 8123	CWS	Microbiocide											
					Listed Below								
Other Chemical (s)	Listed Above	See Trade Name (s) List											
					Listed Below								
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.													
					Crystalline silica (Quartz)	14808-60-7	100.00000					12.84982	
					Illite	12173-60-3	1.00000					0.12849	
					Hydrochloric acid	7647-01-0	37.00000					0.11062	
					Copolymer of 2-propenamide	69418-26-4	30.00000					0.01365	
					Apatite	64476-38-6	0.10000					0.01285	

RECEIVED  
Office of Oil and Gas  
AUG 31 2020  
WV Department of Environmental Protection

					Ilmenite	98072-94-7	0.10000	0.01285	
					Goethite	1310-14-1	0.10000	0.01285	
					Biotite	1302-27-8	0.10000	0.01285	
					Distillates (petroleum), hydrotreated light	64742-47-8	20.00000	0.00910	
					Guar gum	9000-30-0	60.00000	0.00869	
					Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.00869	
					Ammonium chloride	12125-02-9	8.00000	0.00364	
					Glutaraldehyde	111-30-8	14.00000	0.00160	
					Oleic Acid Diethanolamide	93-83-4	2.00000	0.00091	
					Quaternary ammonium compounds, bis (hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00072	
					Alkyl dimethyl benzyl ammonium chloride	68424-85-1	3.00000	0.00034	
					Ethanol	64-17-5	3.00000	0.00034	
					Didecyl dimethyl ammonium chloride	7173-51-5	3.00000	0.00034	
					Ammonium Persulfate	7727-54-0	100.00000	0.00029	
					Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00022	
					Ethylene Glycol	107-21-1	40.00000	0.00006	
					Vinylidene chloride-methyl acrylate copolymer	25038-72-6	20.00000	0.00006	
					Diethylene glycol, monomethyl ether	34590-94-8	20.00000	0.00003	
					Formic acid	64-18-6	10.00000	0.00002	
					Tar bases, quinolone derivs, benzyl chloride-quaternized	72480-70-7	10.00000	0.00002	
					Cinnamaldehyde	104-55-2	10.00000	0.00002	
					Ethoxylated Alcohols	68131-39-5	10.00000	0.00002	

RECEIVED  
Office of Oil and Gas

AUG 31 2020

WV Department of  
Environmental Protection

			Isopropyl alcohol	67-63-0	5.00000	0.00001
--	--	--	-------------------	---------	---------	---------

\* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water  
 \*\* Information is based on the maximum potential for concentration and thus the total may be over 100%  
 \*\*\* If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

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 Oil and Gas  
 AUG 31 2020  
 WV Department of  
 Environmental Protection

LATITUDE 39°15'00"

8,083'

1,859' TO BOTTOM HOLE

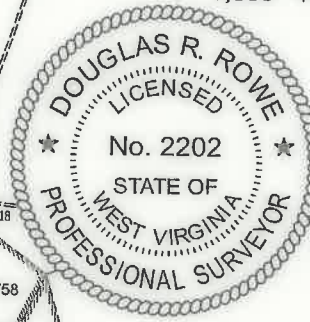
LATITUDE 39°17'30"

LONGITUDE 80°57'30"

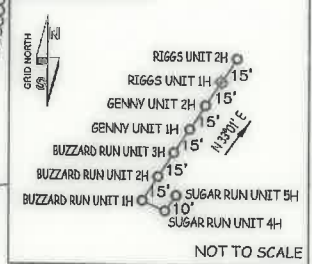
14,247'

LONGITUDE 80°55'00"

Antero Resources Corporation  
Well No. Riggs Unit 1H



PAD LAYOUT

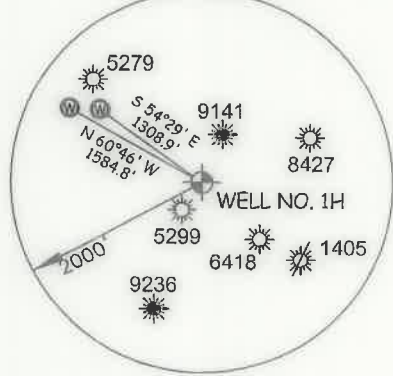


NOT TO SCALE

AS DRILLED DATA:  
WELL 1H TOP HOLE INFORMATION:  
N: 263,339ft E: 1,590,527ft  
LAT: 39°12'50.32" LON: 80°56'42.70"  
BOTTOM HOLE INFORMATION:  
N: 277,477ft E: 1,585,178ft  
LAT: 39°15'09.19" LON: 80°57'53.57"  
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 1H TOP HOLE INFORMATION:  
N: 4,340,533m E: 504,746m  
BOTTOM HOLE INFORMATION:  
N: 4,344,813m E: 503,045m

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



Clay District - Ritchie County

30-15	Joseph Wilson
30-27	Joseph Wilson
30-40	Susie Perkins
30-41	Roy Taylor
30-42	Joseph Wilson
35-05	E L F LLC
35-12	E L F LLC
35-26	Donald McCraw
35-27	Kevin Headley
35-28	Brian Taylor
35-36	H. L. Jones
35-37	W. B. Houue
36-26	Merhan Clavis
36-27	James Elder
39-09	Howard Hornish
40-01	Michael Sammons
40-02	Scott Williams
40-03	Tommy Postlethwait
40-07	James Matters
1H BOTTOM HOLE	
40-71	Terry Lee Richards
40-09	Terry Lee Richards
40-13	Tommy Postlethwait
40-14	Duane Riggs
40-18	Duane Riggs

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 PRESCRIBED 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

JOB # 18-024WA  
DRAWING # RIGGS1HAD  
SCALE 1" = 2000'  
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

LEGEND  
--- Surface Owner Boundary Lines +/-  
--- Interior Surface Tracts +/-  
--- Proposed Well Path  
--- Drilled Well Path  
DOUGLAS R. ROWE P.S. 2202  
DATE 06/04/20  
OPERATOR'S WELL# RIGGS UNIT #1H

- 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 ANTERO RESOURCES CORPORATION.
  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.

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL  47 - 085 - 10384  
(IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW   
LOCATION: ELEVATION 1,149' AS BUILT WATERSHED NORTH FORK HUGHES RIVER QUADRANGLE PULLMAN 7.5' (SHL) PENNSBORO 7.5' (BHL) STATE COUNTY PERMIT  
SURFACE OWNER TERRY LEE RICHARDS ACREAGE 60 ACRES +/- DISTRICT CLAY COUNTY RITCHE  
OIL & GAS ROYALTY OWNER LORETTA K. CLARK BARE ET AL; MILES H. LAMM ET UX; WANEMA RIGGS ET VIR: LEASE ACREAGE 60 AC±; 44 AC±; 23.5 AC±  
STEPHEN LENTZ SR. ET UX; IRA J. LAMM ET AL; DUANE RIGGS; THOMAS G. BEE ET UX; ALMARINE HOUGE; HARRY J. TAYLOR: 7.35 AC±; 38 AC±; 42.5 AC±; 63.19 AC±; 90 AC±; 155 AC±  
MARY HOLLAND ET VIR; GROVER C. TAYLOR ET AL; LENA R. CARR ET AL; DALE WEEKELY ET AL: 220 AC±; 577 AC±; 163 AC±; 140 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 6,437' TVD 21,669' MD  
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM  
ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD  
FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

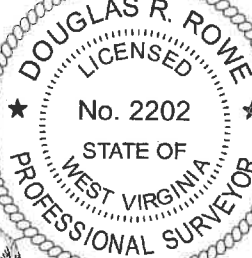
LATITUDE 39°15'00"

8,083'

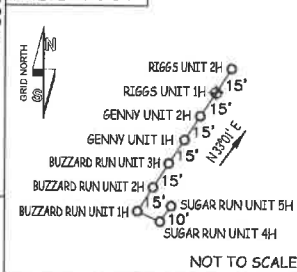
1,859' TO BOTTOM HOLE

LATITUDE 39°17'30"

Antero Resources Corporation  
Well No. Riggs Unit 1H



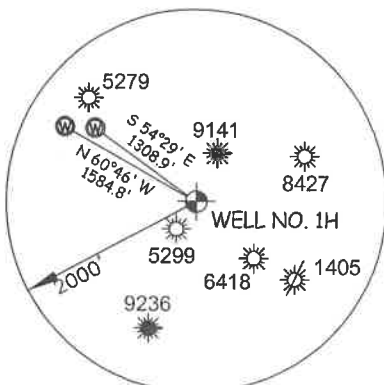
PAD LAYOUT



AS DRILLED DATA:  
WELL 1H TOP HOLE INFORMATION:  
N: 263,339ft E: 1,590,527ft  
LAT: 39°12'50.32" LON: 80°56'42.70"  
BOTTOM HOLE INFORMATION:  
N: 277,477ft E: 1,585,178ft  
LAT: 39°15'09.19" LON: 80°57'53.57"  
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 1H TOP HOLE INFORMATION:  
N: 4,340,533m E: 504,746m  
BOTTOM HOLE INFORMATION:  
N: 4,344,813m E: 503,045m

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



Clay District - Ritchie County

30-15	Joseph Wilson
30-27	Joseph Wilson
30-40	Susie Perkins
30-41	Ray Taylor
30-42	Joseph Wilson
35-05	E L F LLC
35-12	E L F LLC
35-26	Donald McCray
35-27	Kevin Headley
35-28	Brian Taylor
35-36	H. L. Jones
35-37	W. B. House
36-26	Mechan Clovis
36-27	James Elder
39-09	Howard Hornish
40-01	Michael Sammons
40-02	Scott Williams
40-03	Tommy Postlethwait
40-07	James Maters
1H BOTTOM HOLE	
40-7.1	Terry Lee Richards
40-09	Terry Lee Richards
40-13	Tommy Postlethwait
40-14	Duane Riggs
40-18	Duane Riggs

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

JOB # 18-024WA  
DRAWING # RIGGS1HAD  
SCALE 1" = 2000'  
MINIMUM DEGREE OF ACCURACY SUBMETER  
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

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

DOUGLAS R. ROWE P.S. 2202 AUG 5 2020  
DATE 06/04/20  
OPERATOR'S WELL # RIGGS UNIT #1H

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 ANTERO RESOURCES CORPORATION.  
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.

WELL TYPE: OIL \_\_\_ GAS X LIQUID INJECTION \_\_\_ WASTE DISPOSAL \_\_\_ 47 - 085 - 10384  
(IF "GAS") PRODUCTION X STORAGE \_\_\_ DEEP \_\_\_ SHALLOW X STATE COUNTY PERMIT  
LOCATION: ELEVATION 1,149' AS BUILT WATERSHED NORTH FORK HUGHES RIVER QUADRANGLE PULLMAN 7.5' (SHL) PENNSBORO 7.5' (BHL)  
SURFACE OWNER TERRY LEE RICHARDS ACREAGE 60 ACRES +/- DISTRICT CLAY COUNTY RITCHIE  
OIL & GAS ROYALTY OWNER LORETTA K. CLARK BARE ET AL; MILES H. LAMM ET UX; WANEMA RIGGS ET VIR; LEASE ACREAGE 60 AC±; 44 AC±; 23.5 AC±;  
STEPHEN LENTZ SR. ET UX; IRA J. LAMM ET AL; DUANE RIGGS; THOMAS G. BEE ET UX; ALMARINE HOUGE; HARRY J. TAYLOR; 7.35 AC±; 38 AC±; 42.5 AC±; 63.19 AC±; 80 AC±; 155 AC±;  
MARY HOLLAND ET VIR; GROVER C. TAYLOR ET AL; LENA R. CARR ET AL; DALE WEEKLY ET AL; 220 AC±; 577 AC±; 163 AC±; 140 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 6,437' TVD 21,669' MD  
WELL OPERATOR ANTERO RESOURCES CORP DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM  
ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD  
DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME PERMIT