

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

API 47 - 095 - 02605 County Tyler District McElroy  
Quad Shirley 7.5' Pad Name Colorado East Pad Field/Pool Name ----  
Farm name Antero Resources Corporation Well Number Mammoth 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 4361516m Easting 518255m  
Landing Point of Curve Northing 4361212.59m Easting 518982.35m  
Bottom Hole Northing 4358422m Easting 519907m

Elevation (ft) 743' 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  
JAN 04 2020  
WV Department of Environmental Protection

Date permit issued 4/30/2019 Date drilling commenced 10/31/2019 Date drilling ceased 12/17/2019  
Date completion activities began 3/24/2020 Date completion activities ceased 6/8/2020  
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 235', 241', 298' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 970' 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:  
JOB  
1/27/2019

API 47- 095 - 02605 Farm name Antero Resources Corporation Well number Mammoth 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"	105'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	433'	New	54.5#, J-55	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2685'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	18467'	New	23#, HCP-110	N/A	Y
Tubing		2-3/8"	7035'		4.7#, P-110		
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	284 sx	15.6	1.18	241	0'	8 Hrs.
Surface	Class A	372 sx	15.6	1.20	635	0'	8 Hrs.
Coal							
Intermediate 1	Class A	909 sx	15.6	1.19	1082	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	792 sx (Lead) 2270 sx (Tail)	14.5 (Lead), 15.2(Tail)	1.4 (Lead), 1.6 (Tail)	3003	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 18487' MD, 6439' TVD (BHL), 6461' (Deepest Point Drilled) Loggers TD (ft) 18487' MD

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 6040'

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- 095 - 02605 Farm name Antero Resources Corporation Well number Mammoth 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>								

Please insert additional pages as applicable.

API 47- 095 - 02605 Farm name Antero Resources Corporation Well number Mammoth Unit 1H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>			
<u>Marcellus</u>	<u>6398' (TOP)</u>	<u>TVD</u>	<u>7083' (TOP)</u>	<u>MD</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

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 3148 mcfpd Oil 402 bpd NGL --- bpd Water 192 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	
<b>*PLEASE SEE ATTACHED EXHIBIT 3</b>					


Please insert additional pages as applicable.

Drilling Contractor Patterson UTI  
Address 1660 Wynkoop Street City Denver State CO Zip 80202

Logging Company Nine Energy Services  
Address 6500 West Fwy City Fort Worth State TX Zip 76116

Cementing Company Schlumberger Oilfield Services  
Address 300 Schlumberger Dr City Sugarland State TX Zip 77478

Stimulating Company Halliburton  
Address 3000 W. Sam Houston Pkwy City Houston State TX Zip 76114

Please insert additional pages as applicable.

Completed by Brandi Hankins Telephone 303-357-7223  
Signature \_\_\_\_\_ Title Completions Technician Date \_\_\_\_\_

API 47-095-02605 Farm Name Antero Resources Corporation Well Number Mammoth Unit 1H

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	3/24/2020	18359.6	18314.9	60	Marcellus
2	3/24/2020	18277.61756	18113.2054	60	Marcellus
3	3/24/2020	18077.92292	17913.5107	60	Marcellus
4	3/25/2020	17878.22827	17713.8161	60	Marcellus
5	3/25/2020	17678.53363	17514.1214	60	Marcellus
6	3/25/2020	17478.83899	17314.4268	60	Marcellus
7	3/26/2020	17279.14435	17114.7321	60	Marcellus
8	3/26/2020	17079.4497	16915.0375	60	Marcellus
9	3/26/2020	16879.75506	16715.3429	60	Marcellus
10	3/26/2020	16680.06042	16515.6482	60	Marcellus
11	3/26/2020	16480.36577	16315.9536	60	Marcellus
12	3/27/2020	16280.67113	16116.2589	60	Marcellus
13	3/27/2020	16080.97649	15916.5643	60	Marcellus
14	3/27/2020	15881.28185	15716.8696	60	Marcellus
15	3/27/2020	15681.5872	15517.175	60	Marcellus
16	3/27/2020	15481.89256	15317.4804	60	Marcellus
17	3/28/2020	15282.19792	15117.7857	60	Marcellus
18	3/28/2020	15082.50327	14918.0911	60	Marcellus
19	3/28/2020	14882.80863	14718.3964	60	Marcellus
20	3/28/2020	14683.11399	14518.7018	60	Marcellus
21	3/29/2020	14483.41935	14319.0071	60	Marcellus
22	3/29/2020	14283.7247	14119.3125	60	Marcellus
23	3/29/2020	14084.03006	13919.6179	60	Marcellus
24	3/29/2020	13884.33542	13719.9232	60	Marcellus
25	3/30/2020	13684.64077	13520.2286	60	Marcellus
26	3/30/2020	13484.94613	13320.5339	60	Marcellus
27	3/30/2020	13285.25149	13120.8393	60	Marcellus
28	3/31/2020	13085.55685	12921.1446	60	Marcellus
29	3/31/2020	12885.8622	12721.45	60	Marcellus
30	3/31/2020	12686.16756	12521.7554	60	Marcellus
31	3/31/2020	12486.47292	12322.0607	60	Marcellus
32	4/1/2020	12286.77827	12122.3661	60	Marcellus
33	4/1/2020	12087.08363	11922.6714	60	Marcellus
34	4/1/2020	11887.38899	11722.9768	60	Marcellus
35	4/2/2020	11687.69435	11523.2821	60	Marcellus
36	4/2/2020	11487.9997	11323.5875	60	Marcellus
37	4/2/2020	11288.30506	11123.8929	60	Marcellus
38	4/3/2020	11088.61042	10924.1982	60	Marcellus
39	4/3/2020	10888.91577	10724.5036	60	Marcellus
40	4/3/2020	10689.22113	10524.8089	60	Marcellus
41	4/4/2020	10489.52649	10325.1143	60	Marcellus
42	4/4/2020	10289.83185	10125.4196	60	Marcellus
43	4/4/2020	10090.1372	9925.725	60	Marcellus
44	4/4/2020	9890.44256	9726.03036	60	Marcellus
45	4/5/2020	9690.747917	9526.33571	60	Marcellus
46	4/5/2020	9491.053274	9326.64107	60	Marcellus
47	4/5/2020	9291.358631	9126.94643	60	Marcellus
48	4/6/2020	9091.663988	8927.25179	60	Marcellus
49	4/6/2020	8891.969345	8727.55714	60	Marcellus
50	4/6/2020	8692.274702	8527.8625	60	Marcellus
51	4/6/2020	8492.58006	8328.16786	60	Marcellus
52	4/7/2020	8292.885417	8128.47321	61	Marcellus
53	4/7/2020	8093.190774	7928.77857	62	Marcellus
54	4/7/2020	7893.496131	7729.08393	63	Marcellus
55	4/7/2020	7693.801488	7529.38929	64	Marcellus
56	4/7/2020	7494.106845	7329.69464	65	Marcellus
57	4/8/2020	7294.412202	7130	66	Marcellus

API 47-095-02605 Farm Name Antero Resources Corporation Well Number Mammoth Unit 1H

**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	3/24/2020	72.98	7695	7353	4383	165420	4617.5	N/A
2	3/24/2020	82.06	8266	6319	5148	407540	7357.071	N/A
3	3/24/2020	80.07	8014	6519	4640	407420	7505.762	N/A
4	3/25/2020	81.29	8164	6375	4619	407700	7400.786	N/A
5	3/25/2020	85.09	8359	6187	4651	408040	7325.69	N/A
6	3/25/2020	82.96	8351	6245	4884	405640	7301.143	N/A
7	3/26/2020	80.52	8283	8099	4681	409520	7349.905	N/A
8	3/26/2020	82.09	8153	6461	4629	400320	9415.524	N/A
9	3/26/2020	85.1	8379	6506	4630	406680	7199.31	N/A
10	3/26/2020	83.98	8254	6377	4648	408150	7174	N/A
11	3/26/2020	84.06	8419	6223	4355	406520	7261.167	N/A
12	3/27/2020	85.04	8386	6445	4270	408680	7192.571	N/A
13	3/27/2020	85.08	8511	5968	4131	408680	7169.095	N/A
14	3/27/2020	85.49	8560	6314	4055	407220	7115.5	N/A
15	3/27/2020	82.89	8457	6627	3959	405180	7067.405	N/A
16	3/27/2020	83.28	8430	6238	4290	408260	7171.738	N/A
17	3/28/2020	84.78	8484	5665	4146	407440	7128.857	N/A
18	3/28/2020	84.56	8296	5474	4141	401200	7041.333	N/A
19	3/28/2020	85	8494	6025	4149	404320	7040.476	N/A
20	3/28/2020	85.85	8363	5837	3928	405180	7084.143	N/A
21	3/29/2020	84.62	8290	5736	4162	407340	7074.286	N/A
22	3/29/2020	85.59	8437	5418	4039	403280	6999.5	N/A
23	3/29/2020	85.71	8325	5824	3891	406240	7032.905	N/A
24	3/29/2020	84.07	8209	5935	4452	407180	9539.19	N/A
25	3/30/2020	83.45	8264	5536	4318	405020	7175.048	N/A
26	3/30/2020	85.65	8046	5734	4574	402580	7030.333	N/A
27	3/30/2020	85.66	8152	6107	4636	404400	6999.048	N/A
28	3/31/2020	85.98	8159	5858	4628	408060	7083.571	N/A
29	3/31/2020	85.52	8233	5833	4368	408500	6985.31	N/A
30	3/31/2020	85.47	8125	5790	4648	404900	6896.429	N/A
31	3/31/2020	85.39	8262	6415	4279	407280	6977.5	N/A
32	4/1/2020	85.55	7932	5136	4073.25	406720	6909.476	N/A
33	4/1/2020	85.63	8062	6449	4109	405820	6893	N/A
34	4/1/2020	85.81	8005	6693	4232	402140	6898.571	N/A
35	4/2/2020	85.44	8214	5494	4301	406680	6840.357	N/A
36	4/2/2020	85.65	8099	6142	4320	402960	6839.167	N/A
37	4/2/2020	95.67	8292	5334	4513	402200	6856.643	N/A
38	4/3/2020	92.97	8217	5353	4302	405140	6920.929	N/A
39	4/3/2020	93.55	8218	5643	4293	404120	6830.714	N/A
40	4/3/2020	94.4	8254	5896	4262	404560	6803.19	N/A
41	4/4/2020	95.52	8299	5717	4628	406360	6967.571	N/A
42	4/4/2020	95.49	8112	5651	4423	401860	6838.714	N/A
43	4/4/2020	95.76	8247	4533	5012	403220	6866.405	N/A
44	4/4/2020	92.97	7825	4979	4417	406740	6897.143	N/A
45	4/5/2020	95.65	7775	6232	4364	408180	6915.381	N/A
46	4/5/2020	97.65	8247	5887	4509	408480	6850.762	N/A
47	4/5/2020	96.77	8034	5006	4679	408460	6849.786	N/A
48	4/6/2020	95.68	7934	5626	4429	409880	6952.714	N/A
49	4/6/2020	95.59	7853	5321	4146	406880	6812.69	N/A
50	4/6/2020	94.24	8085	5532	4184	407500	6816.524	N/A
51	4/6/2020	93.6	7787	5447	4325	408500	6947.095	N/A
52	4/7/2020	94.04	7668	5341	4582	406500	6787.952	N/A
53	4/7/2020	95.33	7790	5929	4372	407900	6826.476	N/A
54	4/7/2020	95.45	7624	5615	4279	405000	6821.286	N/A
55	4/7/2020	85.63	7019	5406	4087	405460	6780.905	N/A
56	4/7/2020	93.73	7579	6269	4500	404900	8876.333	N/A
57	4/8/2020	95.94	8006	6430	4354	402360	6811.857	N/A
	AVG=	88	8,140	5,939	4,386	22,902,410	404,124	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
Shale	0	310	0	310
Silty sandstone	310	460	310	460
Shale	460	700	460	700
Silty Shale	700	820	700	820
Shale with interbedded limestone	820	850	820	850
Shale	850	880	850	880
Shale w/ trace coal	880	910	880	910
Shaley Sandstone	910	1,180	910	1,180
Shale	1,180	1,240	1,180	1,240
Sandstone w/ interbedded coals	1,240	1,330	1,240	1,330
Sandstone w/ trace coal	1,330	1,480	1,330	1,480
Sandstone	1,480	1,510	1,480	1,510
Shale	1,510	1,633	1,510	1,637
Big Lime	1,633	2,356	1,637	2,399
Fifty Foot Sandstone	2,356	2,447	2,399	2,499
Gordon	2,447	2,751	2,499	2,834
Fifth Sandstone	2,751	2,798	2,834	2,886
Bayard	2,798	3,575	2,886	3,745
Speechley	3,575	3,789	3,745	3,980
Balltown	3,789	4,307	3,980	4,547
Bradford	4,307	4,757	4,547	5,039
Benson	4,757	5,000	5,039	5,305
Alexander	5,000	6,205	5,305	6,650
Sycamore	6,018	6,180	6,450	6,625
Middlesex	6,180	6,317	6,650	6,856
Burkett	6,317	6,347	6,881	6,927
Tully	6,347	6,398	6,952	7,083
Marcellus	6,398	NA	7,083	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.



# ANTERO RESOURCES CORPORATION

Location: Tyler County, WV  
 Field: Tyler  
 Facility: Colorado East Pad

Slot: Slot #06  
 Well: Mammoth Unit 1H  
 Wellbore: Mammoth Unit 1H PWB



Plot reference wellpath is Mammoth Unit 1H PWP Rev-B.0	Grid System: NAD27 / UTM Zone 17 North, US feet
True vertical depths are referenced to Patterson 342 (RKB)	North Reference: Grid north
Reference wellpath measured depths are referenced to Patterson 342 (RKB)	Scale: True distance
Patterson 342 (RKB) to Mean Sea Level: 769 feet	Coordinates are in feet, referenced to Slot
Mean Sea Level to Ground level (At Slot: Slot #06): -743 feet	Depths are in feet
Other wellpath MDs are referenced to each path's default MD datum	Created by: deland on 2019-12-18; Database: WA_NPL_EasternUS_Data

## Location Information

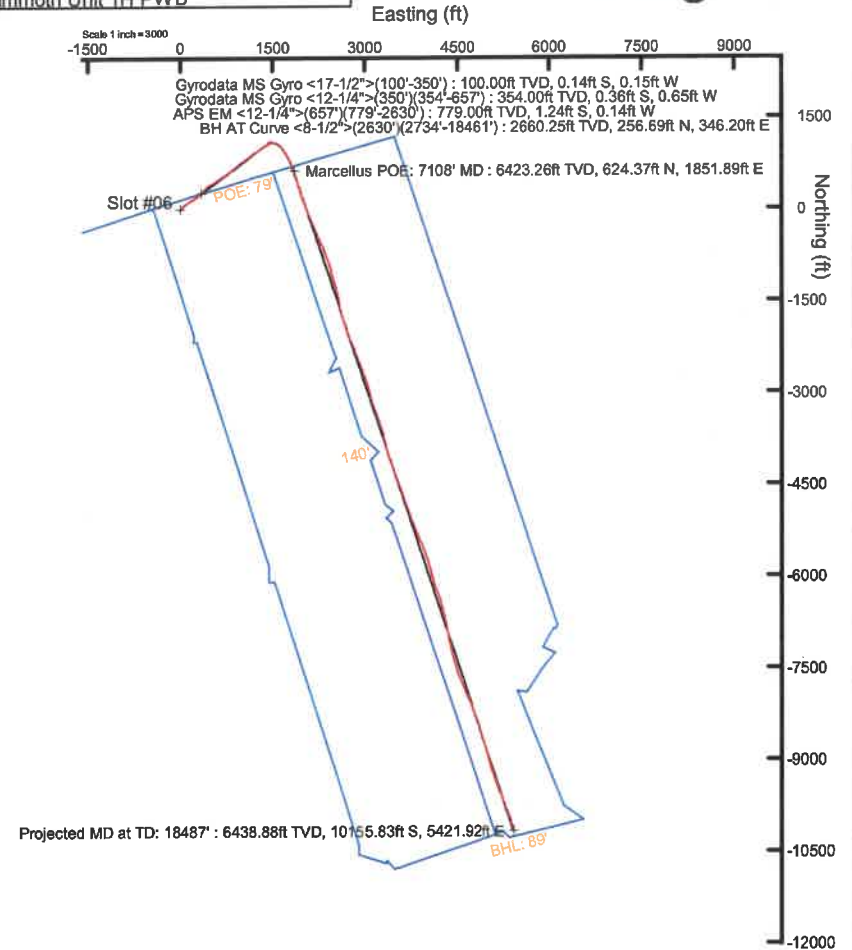
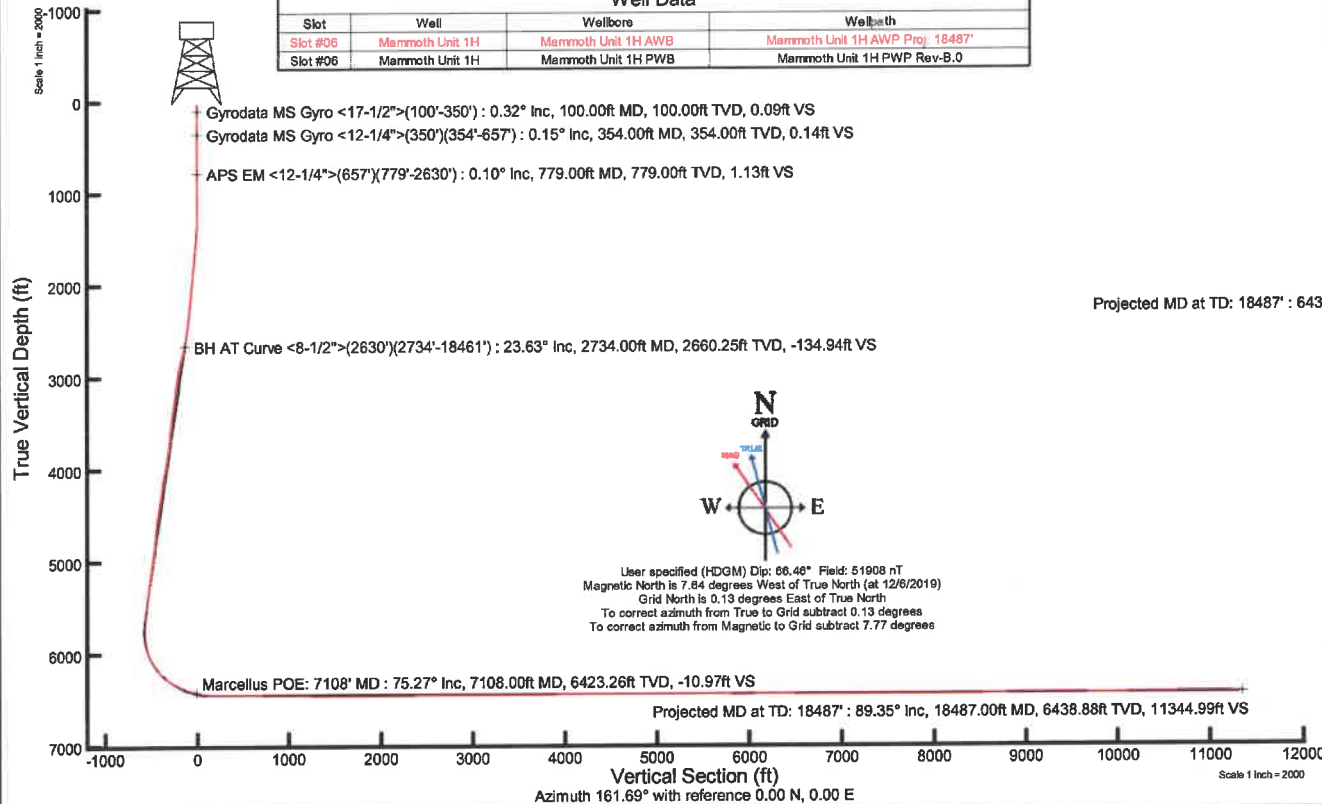
Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude		
Colorado East Pad	1700250.060	14308700.560	39°24'10.4301"N	80°47'17.3804"W		
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Slot #06	-8.50	5.31	1700261.060	14308692.060	39°24'10.3480"N	80°47'17.3220"W
Patterson 342 (RKB) to Ground level (At Slot: Slot #06)						25ft
Mean Sea Level to Ground level (At Slot: Slot #06)						-743ft
Patterson 342 (RKB) to Mean Sea Level						769ft

## Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (°/100ft)	VS (ft)
Tie On	2630.00	25.420	50.860	2565.62	227.71	314.20	1.63	-117.44
Proj. to Bottom	2700.00	25.420	50.860	2628.85	246.68	337.80	0.00	-128.13
Drill Out Csg.	2800.00	25.420	50.860	2719.17	273.77	370.89	0.00	-143.39
End of Build	2875.10	24.228	53.039	2787.33	293.21	395.71	2.00	-154.05
Curve KOP	6039.86	24.228	53.039	5673.32	1074.11	1433.45	0.00	-569.40
POE	7080.84	74.514	161.885	6424.00	648.67	1835.07	8.00	-39.33
Landing Pt.	7274.42	90.000	161.885	6450.00	487.14	1895.16	8.00	151.89
BHL	18420.49	90.000	161.885	6450.00	-10114.32	5397.71	0.00	11297.97

## Well Data

Slot	Well	Wellbore	Wellpath
Slot #06	Mammoth Unit 1H	Mammoth Unit 1H AWB	Mammoth Unit 1H AWP Proj: 18487'
Slot #06	Mammoth Unit 1H	Mammoth Unit 1H PWB	Mammoth Unit 1H PWP Rev-B.0



API: 47-095-02605-0000  
 BHI Job #: 110080411B  
 Rig: Patterson 342  
 Duration: 11/01/2019-12/14/2019



## Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	3/24/2020
Job End Date:	4/8/2020
State:	West Virginia
County:	Tyler
API Number:	47-095-02605-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Mammoth 1H
Latitude:	39.40288000
Longitude:	-80.78814000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,460
Total Base Water Volume (gal):	17,720,146
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
Produced Mixture	Halliburton	Base Fluid					
			Water	7732-18-5	100.00000	86.63418	Density = 8.50
Ingredients	Listed Above	Listed Above					
			Water	7732-18-5	100.00000	0.16750	

OPTIFLO-II DELAYED RELEASE BREAKER	Halliburton	Breaker					
				Listed Below			
Legend LD-2555	MultiChem	Additive					
				Listed Below			
WG-36 GELLING AGENT	Halliburton	Gelling Agent					
				Listed Below			
MC B-8614	Halliburton	Biocide					
				Listed Below			
LD-2950	MultiChem	Friction Reducer					
				Listed Below			
HAI-501	Halliburton	Acid Corrosion Inhibitor					
				Listed Below			
Sand-Common White-100 Mesh, SSA-2	Halliburton	Proppant					
				Listed Below			
HYDROCHLORI C ACID, 22 BAUME	Halliburton	Solvent					
				Listed Below			

Legend LD-2990	MultiChem	Friction Reducer					
				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	13.17301	
			Hydrochloric acid	7647-01-0	30.00000	0.03831	
			Complex Amine Compound	Proprietary	60.00000	0.02412	
			Hydrotreated light petroleum distillate	64742-47-8	30.00000	0.01489	
			Complex Amine Compound	Proprietary	60.00000	0.00566	
			Guar gum	9000-30-0	100.00000	0.00504	
			Glutaraldehyde	111-30-8	30.00000	0.00246	
			Ethoxylated alcohols	Proprietary	5.00000	0.00201	
			Polyethoxylated fatty amine salt	61791-26-2	30.00000	0.00055	
			Sorbitan, mono-9-octadecenoate, (Z)	1338-43-8	5.00000	0.00047	
			Surfactant	Proprietary	5.00000	0.00047	
			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl chlorides	68424-85-1	5.00000	0.00041	
			Poly(oxy-1,2-ethanediyl), alpha-tridecyl-omega-hydroxy-, branched	69011-36-5	1.00000	0.00040	
			Adipic acid	124-04-9	1.00000	0.00040	
			Methanol	67-56-1	100.00000	0.00032	
			Ammonium persulfate	7727-54-0	100.00000	0.00019	
			Ethoxylated alcohols	Proprietary	1.00000	0.00009	
			Organic chloride compound	Proprietary	1.00000	0.00009	
			Alkoxyated polyhydric alcohol	Proprietary	1.00000	0.00009	
			Ethanol	64-17-5	1.00000	0.00008	

			Mixture of dimer and trimer fatty acids of indefinite composition derived from tall oil	61790-12-3	30.00000	0.00007	
			Modified thiourea polymer	Proprietary	30.00000	0.00007	
			Oxylated phenolic resin	Proprietary	30.00000	0.00006	
			Propargyl alcohol	107-19-7	5.00000	0.00001	
			Ethoxylated alcohols	Proprietary	5.00000	0.00001	
			Hexadecene	629-73-2	5.00000	0.00001	
			Acrylamide	79-06-1	0.10000	0.00001	
			Organic salt #1	Proprietary	0.10000	0.00001	
			Phosphoric acid	7664-38-2	0.10000	0.00001	
			C.I. pigment Orange 5	3468-63-1	1.00000	0.00000	
			Formaldehyde	50-00-0	0.01000	0.00000	
			Nitrated acetate salt	Proprietary	0.01000	0.00000	
			Organic salt #3	Proprietary	0.01000	0.00000	
			Sodium hydroxide	1310-73-2	0.01000	0.00000	
			Sodium glycollate	2836-32-0	0.01000	0.00000	
			Organic salt #2	Proprietary	0.01000	0.00000	
			Ethylene oxide	75-21-8	0.01000	0.00000	

\* 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)



LATITUDE 39°25'00"

10,779'

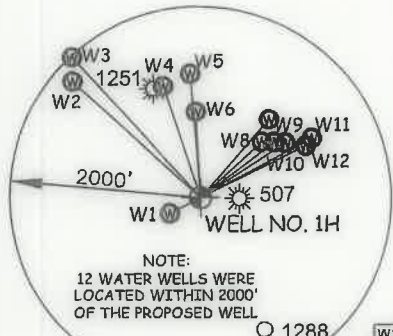
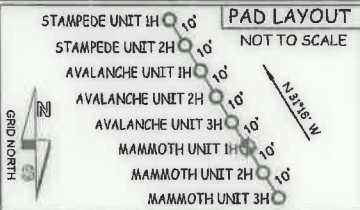
LATITUDE 39°22'30" 5,386' TO BOTTOM HOLE

1H BOTTOM HOLE

Antero Resources Corporation Well No. Mammoth Unit 1H

AS DRILLED DATA: WELL 1H TOP HOLE INFORMATION: N: 331,455ft E: 1,636,007ft LAT: 39°24'10.35" LON: 80°47'17.32" BOTTOM HOLE INFORMATION: N: 321,211ft E: 1,641,259ft LAT: 39°22'29.84" LON: 80°46'08.59" 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: 4,361,516m E: 518,255m BOTTOM HOLE INFORMATION: N: 4,358,422m E: 519,907m



NOTE: 12 WATER WELLS WERE LOCATED WITHIN 2000' OF THE PROPOSED WELL

Table with 3 columns: Well ID, Bearing, Distance. Lists wells W1 through W12 with their respective bearings and distances from the proposed well.

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 # 19-002WA DRAWING # MAMMOTH1HAD SCALE 1" = 2000' MINIMUM DEGREE OF ACCURACY SUBMETER PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

LEGEND

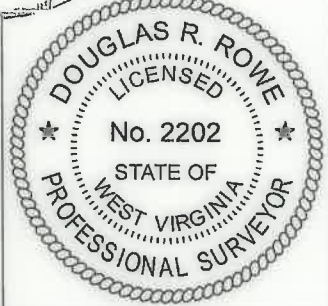
- Surface Owner Boundary Lines +/-
Interior Surface Tracts +/-
Proposed Well Path
As Drilled Well Path

DOUGLAS R. ROWE P.S. 2202

DATE 09/03/20

OPERATOR'S WELL# MAMMOTH UNIT #1H

- NOTE: 1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER... 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... 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 47 095 02605
(IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X STATE COUNTY PERMIT
LOCATION: ELEVATION 743' - AS BUILT WATERSHED McELROY CREEK
QUADRANGLE TH - SHIRLEY 7.5' BH - WEST UNION 7.5' DISTRICT McELROY COUNTY TYLER
SURFACE OWNER ANTERO RESOURCES CORPORATION ACREAGE 127.86 ACRES +/-
OIL & GAS ROYALTY OWNER B.F. REED ET UX; K & D HOLDINGS, LLC; MARK A. BURNETT; LEASE ACREAGE 130 AC.±; 219.39 AC.±; 256 AC.±;
JAMES MALLOY ET UX; MELISSA SMITH; NOBLE ENERGY INC. ET AL.; S.A. SMITH & C. BURKE HEIRS TRUST; FANNY D. DAVIS ET AL.; 90.1 AC.±; 57.63 AC.±; 55 AC.±; 18 AC.±; 74 AC.±;
UNION NATIONAL BANK OF W.V.; WILMA E. LANGFITT; CARL B. & NORMA JEAN PRITCHARD; DONALD SWEENEY; EDWARD LEWIS CASE; LINDA J. DESCHER 25.5 AC.±; 31.82 AC.±; 32.57 AC.±; 25.5 AC.±; 50 AC.±; 76 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 6,439' TVD 18,487' 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 ADDRESS CHARLESTON, WV 25313

McElroy District - Tyler County
TM-Par Surface Owner
16-08 June Griffin
16-8.1 Roger Griffin
16-8.2 Roger Griffin
16-16 Harry Vannoy
16-17 Charles Straight
16-17.3 Charles Kimball
16-18 Albert Bebez
16-19 Todd Orr
19-02 Antero Resources Corp.
19-03 Larry Stevens
19-04 John Owens
19-05 Paul Weekley
19-06 Paul Weekley
19-07 Patricia Montuomery
19-08 John Lewis Jr.
19-09 Robert Wolsh
19-10 Judith Mallory
19-27 Harvey Burns
19-42 Anna Barrola
19-45 Terrence Fraser
19-46 Terrence Fraser
19-47 Ronnie Wilson Jr.
19-48 Lloyd Talkington
19-50 Ronald Cumberledge
19-51 Randall Anderson
19-52 Harold Yost
19-53.1 Larry Marable
19-61 Kenneth Mason
19-63 Jacqueline Wichman Trust
19-64 Kenneth Mason
19-64.1 Michael Kimball
19-65 Bobby Griffin
19-66 Matthew March
19-67 Smith Morris Trust
19-68 Randall Clouston
19-69 Randall Clouston
19-70 Ronald Cumberledge
19-73 Dana Pratt
19-74 Randall Clouston
22-04 Jacqueline Wichman Trust
22-05 William Middleton
22-06 Thomas Allen
22-07 Thomas Allen
22-08 George Kithau
22-10 Thomas Allen
22-12 Terry Dotson
22-12.1 Margaret Dotson
22-13 Warren Putnam
22-13.1 Jacqueline Wichman
Grant District - Doddridge County
01-01 Steven Reed
04-01 Warren Putnam

17' TO BOTTOM HOLE LONGITUDE 80°45'00"

5,024' LONGITUDE 80°45'00"

COUNTY NAME PERMIT



LATITUDE 39°25'00"

10,779'

LATITUDE 39°22'30" 5,386' TO BOTTOM HOLE

17' TO BOTTOM HOLE

5,024'

LONGITUDE 80°45'00"

LONGITUDE 80°45'00"

Antero Resources Corporation Well No. Mammoth Unit 1H

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(NAD) 83 (UTM) ZONE 17 COORDS: WELL 1H TOP HOLE INFORMATION: N: 4,361,516m E: 518,255m BOTTOM HOLE INFORMATION: N: 4,358,422m E: 519,907m

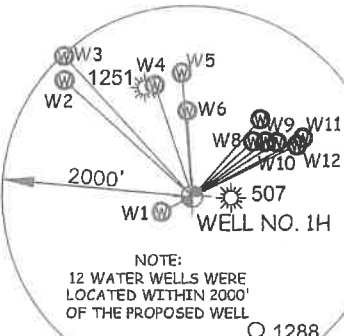
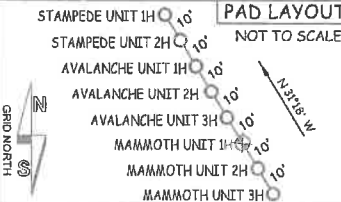
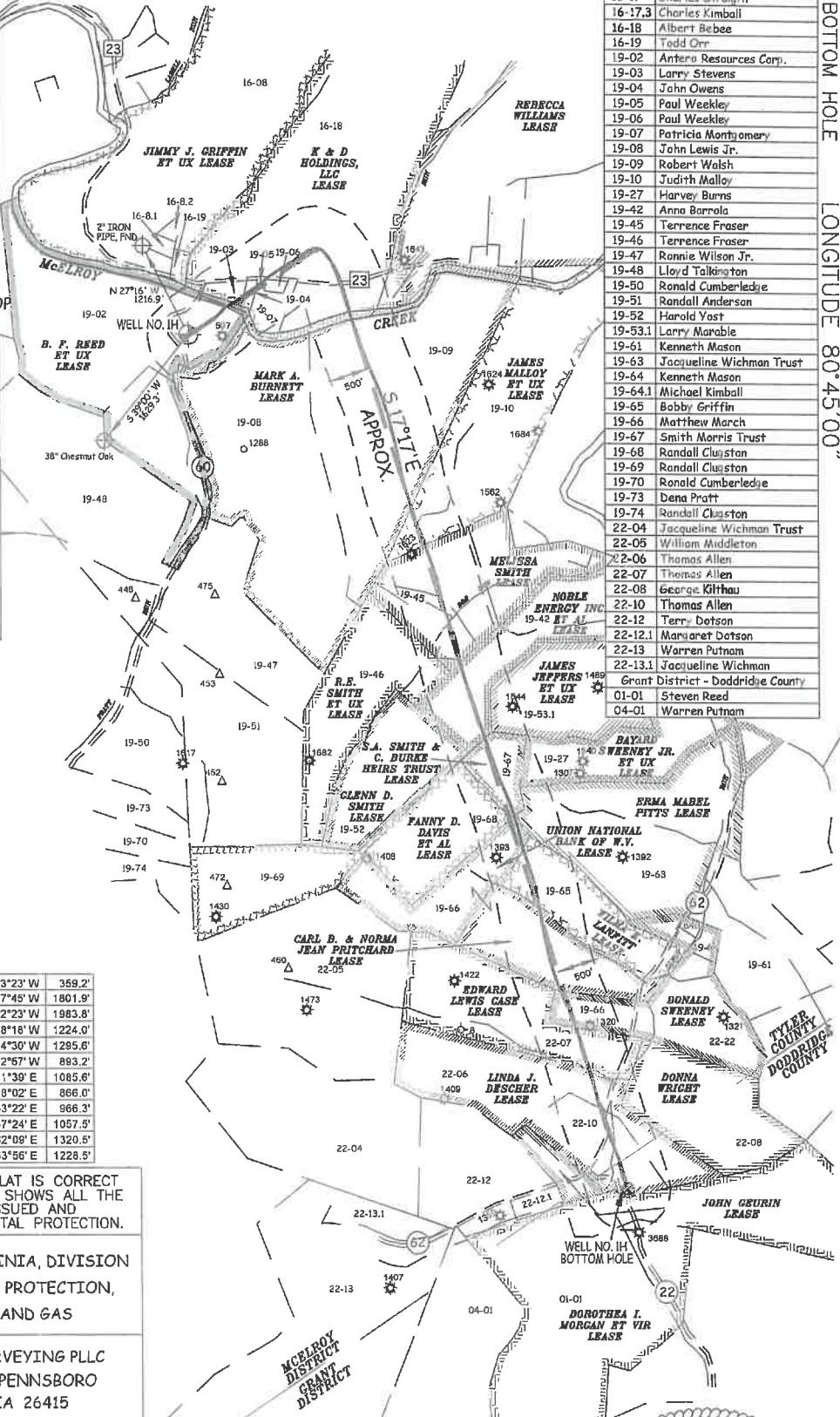


Table with 3 columns: Well ID, Bearing, and Distance. Lists wells W1 through W12 with their respective bearings and distances.



McElroy District - Tyler County table listing well numbers, surface owners, and lease information. Includes names like June Griffin, Roger Griffin, Harry Vannoy, Charles Straight, Charles Kimball, Albert Bebee, Todd Orr, Antero Resources Corp., Larry Stevens, John Owens, Paul Weekley, Patricia Montgomery, John Lewis Jr., Robert Walsh, Judith Malloy, Harvey Burns, Anna Barrola, Terrence Fraser, Terrence Fraser, Ronnie Wilson Jr., Lloyd Talkington, Ronald Cumberlande, Randall Anderson, Harold Yost, Larry Marable, Kenneth Mason, Jacqueline Wichman Trust, Kenneth Mason, Michael Kimball, Bobby Griffin, Matthew March, Smith Morris Trust, Randall Clouston, Ronald Cumberlande, Dena Pratt, Randall Clouston, Jacqueline Wichman Trust, William Middleton, Thomas Allen, Thomas Allen, George Kithau, Thomas Allen, Terry Dotson, Margaret Dotson, Warren Putnam, Jacqueline Wichman, Grant District - Doddridge County, Steven Reed, and Warren Putnam.

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.

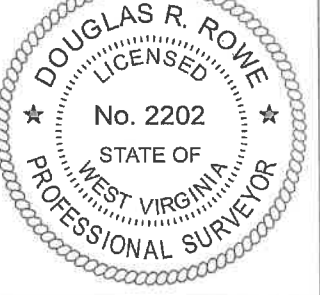


STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS. WILLOW LAND SURVEYING PLLC 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

JOB # 19-002WA DRAWING # MAMMOTH1HAD 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, As Drilled Well Path. Signature of Douglas R. Rowe, P.S. 2202. DATE 09/03/20 OPERATOR'S WELL# MAMMOTH 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 47 095 02605 (IF "GAS") PRODUCTION X STORAGE DEEP SHALLOW X STATE COUNTY PERMIT LOCATION: ELEVATION 743' - AS BUILT WATERSHED McELROY CREEK QUADRANGLE TH - SHIRLEY 7.5' BH - WEST UNION 7.5' DISTRICT McELROY COUNTY TYLER SURFACE OWNER ANTERO RESOURCES CORPORATION ACREAGE 127.86 ACRES +/- OIL & GAS ROYALTY OWNER B.F. REED ET UX; K & D HOLDINGS, LLC; MARK A. BURNETT; LEASE ACREAGE 130 AC.±; 219.39 AC.±; 256 AC.±; JAMES MALLOY ET UX; MELISSA SMITH; NOBLE ENERGY INC. ET AL; S.A. SMITH & C. BURKE HEIRS TRUST; FANNY D. DAVIS ET AL; 90.1 AC.±; 57.63 AC.±; 55 AC.±; 18 AC.±; 74 AC.±; UNION NATIONAL BANK OF W.V.; WILLMAE LANGFITT; CARL B. & NORMA JEAN PRITCHARD; DONALD SWEENEY; EDWARD LEWIS CASE; LINDA J. DESCHER 25.5 AC.±; 31.82 AC.±; 32.57 AC.±; 25.5 AC.±; 50 AC.±; 76 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 6,439' TVD 18,487' MD WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM ADDRESS 1615 WYNKOOP ST. ADDRESS 5400 D BIG TYLER ROAD CHARLESTON, WV 25313 FORM WW-6 DENVER, CO 80202